118 2-203.2

DRAFT OPERABLE UNIT 2 PREDESIGN INVESTIGATION AND SITE SELECTION REPORT FOR ON-SITE DISPOSAL FACILITY VOLUME 2 OF 3 - APPENDICES A-K - JUNE 1995

07/27/95

DOE-1277-95
DOE-FN EPAS
700
REPORT

PREDESIGN INVESTIGATION AND SITE SELECTION REPORT FOR THE ON-SITE DISPOSAL FACILITY

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

VOLUME 2 OF 3
APPENDICES A-K

JULY 1995

U.S. DEPARTMENT OF ENERGY

Appendix A

TABLE OF CONTENTS

List of Tables iv

List of Figures vi

Appendix A Field Activities to Assess Potential Sites

A.0 Field Activities to Assess Potential Sites A-1

A.1 Cone Penetrometer Testing (CPT) A-1

A.1.1 Objectives A-1

A.1.2 Procedures and Field Activities A-1

A.1.3 Data Collected A-2

A.1.4 Results A-6

A.2 Well Installation and Sampling A-17

A.2.1 Objectives A-17

A.2.2 Procedures and Field Activities A-17

A.2.3 Water Sampling A-24

A.2.3.1 Sample Types Collected and Analyzed A-24

A.2.3.2 Radionuclide Results A-24

A.2.3.3 Chemical Results A-31

A.2.4 Soil Sampling A-31

A.2.4.1 Soil Sample Types Collected and Analyzed A-31

A.2.4.2 Results A-34

A.3 Lysimeter Installation, Sampling, and Analysis A-34

A.3.1 Objectives A-34

A.3.2 Procedures and Completed Field Activities A-38

A.3.3 Water Sampling and Results A-39

A.3.4 Soil Sampling and Results A-47

A.4 Geotechnical Boring Installation and Sampling A-47

A.4.1 Objectives A-47

A.4.2 Procedures and Completed Field Activities A-47

A.4.3 Variances for the Work Plan A-48

A.4.4 Results of Geotechnical Testing A-54

A.5 Groundwater Elevation and Precipitation A-55

A.5.1 Objectives A-55

A.5.2 Procedures and Field Activities A-55

TABLE OF CONTENTS
(Continued)

A.5.3 Results A-55
A.6 Uranium Distribution Coefficient Testing (K_d) A-72
A.6.1 Procedures and Completed Activities A-73
A.6.2 Results A-77
A.6.3 Calibration of the K_d Tests A-77
Appendix B Groundwater Elevations Data Sheets
Appendix C Hydrographs
Appendix D Geotechnical Results
Appendix E Cone Penetrometer Testing (CPT) Logs
Appendix F Boring Logs
Appendix G Well Completion Logs
Appendix H Summary of Geotechnical Soil Tests
Appendix I Inverse Groundwater Modeling
I.0 Inverse Groundwater Modeling I-1
I.1 Inverse Groundwater Modeling I-1
I.1.1 Objectives of Inverse Modeling I-1
I.1.2 Methodology I-1
I.1.2.1 MODINV Model Description I-1
I.1.2.2 HELP Model Description I-2
I.1.2.3 Conceptual Model I-3
I.1.2.4 Technical Approach I-6
I.1.3 Data Collection Activities I-11
I.1.3.1 Monitoring Well Water Elevations I-11
I.1.3.2 Extraction Water Volumes I-11
I.1.3.3 Precipitation Data I-19
I.1.4 Input Data for MODINV I-19
I.1.4.1 Layer Elevation I-19
I.1.4.2 Hydrologic Properties I-19
I.1.4.3 Water Withdrawal Rates I-23
I.1.4.4 Infiltration Rates I-23
I.1.4.5 Water Levels I-26

000003

TABLE OF CONTENTS
(Continued)

I.1.4.6 Initial Estimate of Hydraulic Conductivity for Layer 2 . . . . . I-26

I.1.5 Modeling Results I-29

I.1.5.1 Vertical Hydraulic Conductivity of the Gray Till I-29

I.1.5.2 Horizontal Hydraulic Conductivity of Layer 2 . . . . . I-32

I.1.6 Conclusions I-50

Appendix J Variance Requests

Appendix K Cultural and Natural Resources

K.0 Cultural and Natural Resources K-1

K.1 Cultural Resource Investigations K-1

K.2 Natural Resource Evaluation K-4

LIST OF TABLES

Table	Title	Page
A-1	Determination of Potential Granular Zones from (Phase III) CPT Soundings	A-8
A-2	Determination of Potential Granular Zones from (Phase III) CPT Profiles	A-10
A-3	Summary of Distances of Soil Borings from Adjacent CPT Locations	A-16
A-4	Boring Depths and Screened Intervals for Phase II Wells	A-19
A-5	Purge Volumes and Estimated Drilling Water Lost	A-20
A-6	Predesign Investigation Well Reference Information	A-21
A-7	Groundwater Results for Total Uranium, Isotopic Uranium, and Tritium	A-28
A-8	Groundwater Chemical Results	A-32
A-9	Chemicals Detected in Glacial Till Wells Compared to Background Values	A-34
A-10	Radionuclide Results for Soil From Well Borings	A-35
A-11	Predesign Investigation Lysimeter Completion Depths	A-41
A-12	Lysimeter Water Chemical Results	A-42
A-13	Lysimeter Water Results for Total Uranium, Isotopic Uranium, and Tritium	A-46
A-14	Radionuclide Results for Soil from Lysimeter Borings	A-50
A-15	Summary of Geotechnical Tests on Soil Samples and the Intended Use of the Data	A-52
A-16	Summary of ASTM Procedures	A-53
A-17	Summary of Soil Classification and Size Distributions Based on Geotechnical Testing	A-64
A-18	Radionuclide Results for Soils from Geotechnical Borings	A-69
A-19	Summary of Water Level Data, Brown/Gray Till Interface Wells, March 29, 1995	A-70
A-20	Summary of Water Level Data From Paired Wells Completed in the Till	A-71
A-21	K_d Soil Sampling Performed	A-74
A-22	K_d Tests Performed	A-75
A-23	K_d Test Results	A-78
D-1	Summary of Permeability Tests TX/PBP Method, ASTM D5084	D-1

LIST OF TABLES
(Continued)

Table	Title	Page
D-2	Summary of Unit Weights, Porosity and % Saturation from Geotechnical Testing	D-2
D-3	Summary of Grain Size Distribution from Geotechnical Testing	D-4
D-3a	Summary of Soil Classification from Geotechnical Testing	D-8
I-1	Gallons of Water Extracted From Plant 6 Wells	I-12
I-2	Gallon of Water Extracted	I-17
I-3	Input Parameters for the HELP Model and Calculated Infiltration Rates	I-25
I-4	Initial and Optimized Horizontal and Hydraulic Conductivities of the Brown/Gray Till Interface (Model Layer 2)	I-35

LIST OF FIGURES

Figure	Title	Page
A-1	Cone Penetrometer Locations	A-3
A-2	Course Grained Material Interpreted from Cone Penetrometer Results, Section A-A'	A-4
A-3	Course Grained Material Interpreted from Cone Penetrometer Results, Section B-B'	A-5
A-4	Soil Classification Scheme Using the Cone Penetrometer Test	A-7
A-5	Comparison of Tip Stress to Sleeve Stress	A-13
A-6	Empirically Derived CPT Lithological Graph	A-14
A-7	CPT 11435 Complete Data Set	A-15
A-8	New Monitoring Well Locations	A-18
A-9	Cross-Section Location Map	A-25
A-10	Uranium for Water	A-26
A-11	Uranium for Water	A-27
A-12	Existing and New Lysimeter Locations	A-40
A-13	Geotechnical Boring Locations	A-49
A-14	Lithological Cross-Section, Section A-A'	A-56
A-15	Lithological Cross-Section, Section B-B'	A-57
A-16	Geotechnical Samples - Clay Plus Silt vs. Depth	A-58
A-17	Geotechnical Samples - Sand Plus Gravel vs. Depth	A-59
A-18	Geotechnical Samples - Water Content vs. Depth	A-60
A-19	Geotechnical Samples - Pore Space vs. Depth	A-61
A-20	Geotechnical Samples - Permeability vs. Depth	A-62
A-21	Monitoring Wells Spanning the Brown/Gray Interface	A-63
A-22	Sorption Isotherm Graph	A-80

LIST OF FIGURES
(Continued)

Figure	Title	
I-1	Conceptual Model for Inverse Modeling	I-4
I-2	Inverse Modeling Grid and Monitoring Wells	I-7
I-3	Subregions and Zones of Independent Hydraulic Conductivities for Layer 2	I-10
I-4	Brown/Gray Till Interface Surface (December 1994 Data)	I-20
I-5	Elevation of the Bottom of the Model Layer 1	I-21
I-6	Elevations of the Bottom of the Model Layer 2	I-22
I-7	Infiltration Zones for Inverse Modeling	I-24
I-8	Perched Groundwater Elevation in Layer 2 - October 4, 1994	I-27
I-9	Perched Groundwater Elevations in Layer 2 - November 30, 1994	I-28
I-10	Initial Estimates of Horizontal Hydraulic Conductivity for the Brown/Gray Interface Layer	I-30
I-11	Model Predicted Steady State Perched Groundwater Elevation	I-31
I-12	Inverse Modeling Results Horizontal Hydraulic Conductivity for Brown/Gray Interface Layer	I-33
I-13	Order of Magnitude Change in Horizontal Hydraulic Conductivity in Layer 2	I-34
K-1	Results of Part II Cultural Resource Investigation	K-3
K-2	Habitat Types Present on the FEMP	K-5
K-3	Jurisdictional Wetlands at the FEMP	K-6

A.0 FIELD ACTIVITIES TO ASSESS POTENTIAL SITES

A.1 CONE PENETROMETER TESTING (CPT)

A.1.1 Objectives

CPT was conducted to assist in locating interbedded coarse granular material (CGM), in support of identifying the most suitable hydrogeology for the on-site disposal facility.

The CPT activities were conducted in two phases. Phase I activities, which included 40 CPT locations, occurred in October and November 1994, and preceded soil borings to install monitoring wells and collection of lithologic and geotechnical samples for the Predesign Investigation. The CPT locations were selected by three-dimensional modeling of uncertainties (see Section 3.2), and complemented existing data in the following areas:

- where existing lithological sampling was sparse, but the existing data was relatively homogenous with respect to the detection of clay or sand materials; and
- where existing data was inconclusive concerning clay or sand. These areas are possibly geologically heterogeneous and were selected for additional characterization.

These sampling locations were selected to increase the certainty in the geological interpretation of the study area.

Additional CPT soundings (Phase III) were conducted at 48 locations in March 1995 to collect geotechnical information for the design of the disposal facility. Additional CPT data from the Phase III investigation was available for lithologic interpretation and was used to update solid block modeling of the coarse granular zones in the study area. The Phase III CPT results enhanced the identification of the best hydrogeology for the disposal facility. The locations of the Phase I and III CPTs are shown on Figure A-1.

A.1.2 Procedures and Field Activities

Truck-mounted equipment with steel rods were used to push a 1.4-inch diameter instrument probe into the ground. A detailed description of the CPT operation is provided in the Project Specific Plan for Phases I and II of the Predesign Investigation. During advancement, end bearing resistance (tip resistance, Q_c), friction resistance (sleeve stress, F_s), and pore water pressure were measured by

transducers located in the probe. As the instrument was advanced, pressures as high as 40,000 pounds were observed. The rate of penetration was maintained at approximately four feet per minute while instantaneous resistance and pore pressure were recorded by data logging equipment in the truck.

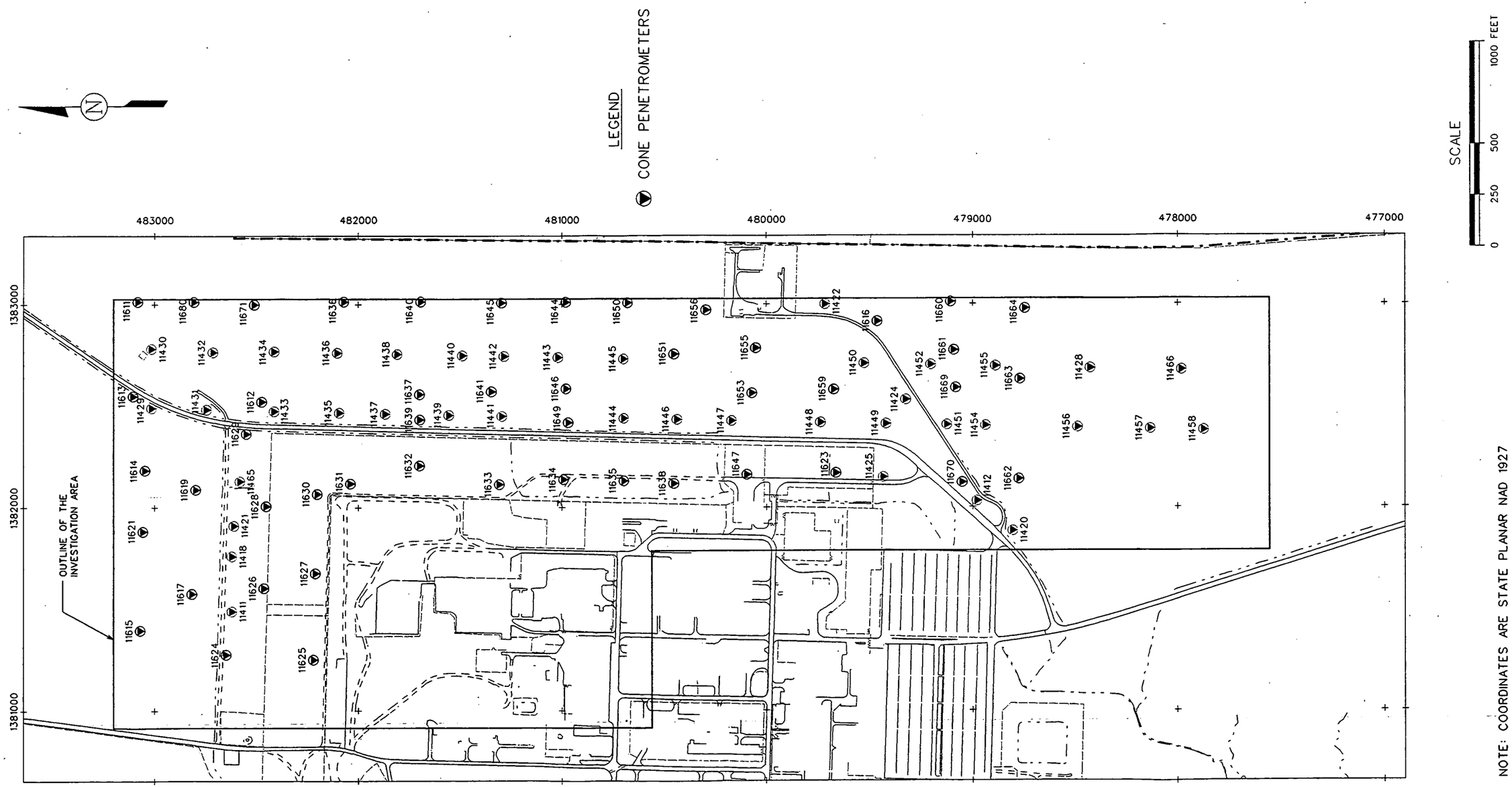
Adjustments were made due to the relative positions of each measuring device on the probe so that data collected was compared at the same depth below ground level at each location. For example, tip resistance was measured approximately 0.3 feet lower on the probe than sleeve stress; therefore, sleeve stress data was adjusted downward 0.3 feet to correlate with tip resistance at the same location.

Calibration of the CPT results was performed by using side-by-side CPT soundings, and comparison to soils descriptions from adjacent soil borings and selected geotechnical tests. The mechanical/electrical precision for the method is stated to be ± 5 to 10 percent in end bearing resistance and ± 10 to 20 percent in friction resistance. The CPT holes were abandoned by overdrilling and filling with a Type-K expanding portland cement grout, using the Tremie method.

A.1.3 Data Collected

Using data from CPT soundings, zones of potential granular material were identified and used as input for modeling activities and graphical methods to estimate the extent and interconnectiveness of granular material. Figures A-2 and A-3 show cross sections that contain the intervals of CGM identified from the CPT locations along the A-A' and B-B' traverses (see Figure A-9).

During Phase I activities, CPT soundings were advanced at 40 locations. Sounding depths ranged from 25 to 40 feet below ground level. Each sounding was projected to terminate approximately five feet above the top of the Great Miami Aquifer (GMA). During Phase III activities, CPT soundings were advanced at 48 locations. Each sounding was again projected to terminate approximately five feet above the top of the GMA, except at 12 locations where the GMA was penetrated outside of the footprint of the disposal facility. The planned depth at these locations was 100 feet in order to obtain engineering data for the detailed design of the disposal facility. However, the maximum penetration of 96 feet was achieved at CPT 11647. At all other similar locations, the range of penetration depth was 36.0 to 80.5 feet.



FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

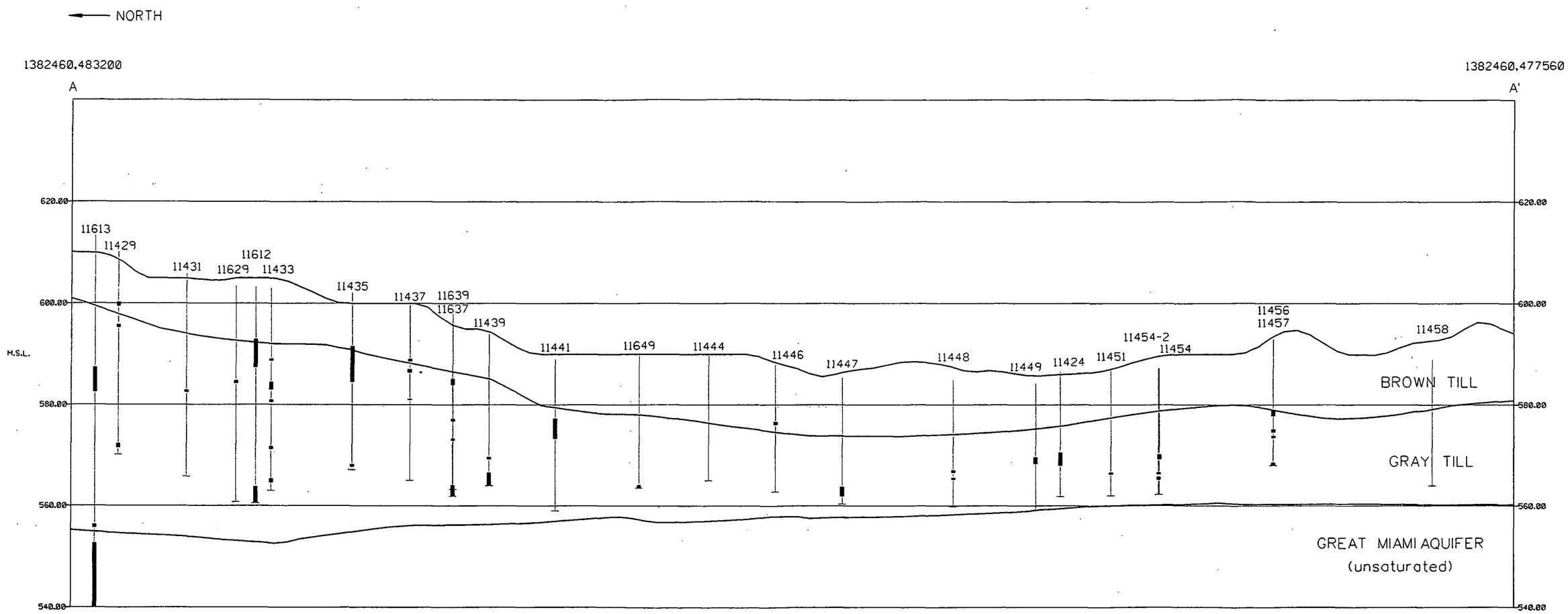
CONE PENETROMETER LOCATIONS

000011

DATE 4-28-95
DRAWN R. WILLIAMS

FIGURE A-1

FILE NAME: /2ccs1/dgn/map/hor/dpth/ph20009.dgn



LEGEND

INTERPRETED LOCATIONS OF COARSE GRAINED MATERIAL

CONE PENETROMETER

HORIZONTAL SCALE: 0 200' 400' 800'

VERTICAL 0 10' 20' 40'

NOTE:

COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

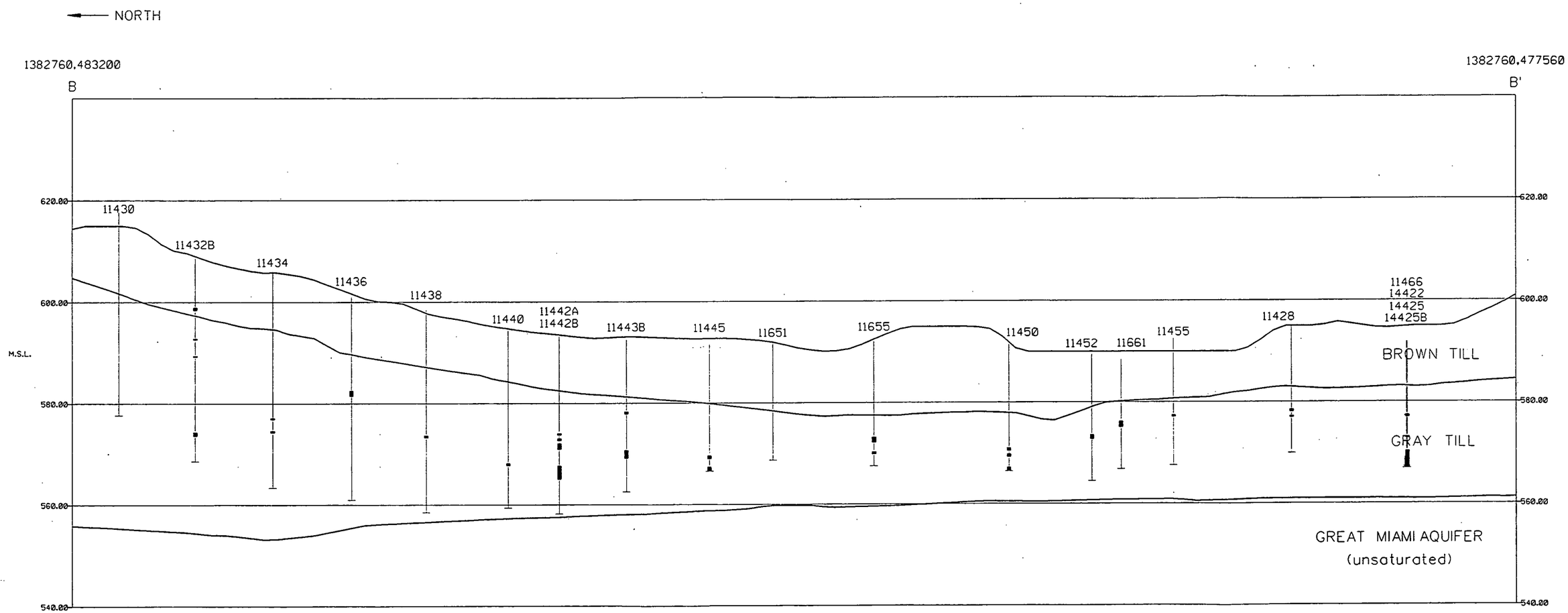
COARSE GRAINED MATERIAL INTERPRETED FROM CONE PENETROMETER RESULTS

SECTION A-A' 000012

DATE 06/06/95
DRAWN DEG

FIGURE A-2

FILE NAME: /usr/erma5/2ccs1/dgn/sec/geo/dpth/cpt_a.dgn



LEGEND

INTERPRETED LOCATIONS OF COARSE GRAINED MATERIAL

CONE PENETROMETER

HORIZONTAL SCALE: 0 200' 400' 800'
VERTICAL 0 10' 20' 40'

NOTE:

COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

COARSE GRAINED MATERIAL INTERPRETED FROM CONE PENETROMETER RESULTS
SECTION B-B'

000013

DATE 06/06/95
DRAWN DEG

FIGURE A-3

FILE NAME: /usr/ermo5/2ccs1/dgn/sec/geo/dpth/cpt_b.dgn

A.1.4 Results

Data from the CPT soundings were used to identify potential zones of CGM which included gravel, sand and silt. A description of the CGM zones is presented in Tables A-1 and A-2. These inferred granular zones constitute approximately five percent of the CPT sounding profiles in the lithologic sections considered to be above the GMA. These zones may represent encounters with large gravel or cobble size particles in a clay matrix rather than interbedded coarse granular materials. Visual field classifications of Rotasonic™ and geotechnical borings strongly support this assessment.

Graphs for each CPT are provided in Appendix E and present sleeve stress, corrected tip resistance, friction ratio, and pore pressure as a function of depth below ground level. An empirical method was used to evaluate CPT data in order to define lithologic profiles at each CPT location and to identify potential zones of CGM. Figure A-4 is a graph adopted from Robertson, et al. 1985, which compares corrected tip resistance (Q_t) in bars to friction ratio (F_{sn}) where,

Eq. 1: $Q_t = Q_c + u(1-A_n/A_t)$

$= Q_c + u(.1890)$

Eq. 2: $F_{sn} = \dfrac{F_s \times 100\%}{Q_t - \sigma_{vo}}$

Q_c = tip resistance

u = penetration pore pressure

A_n = net area behind the tip not subject to pore pressure (1.257 in^2)

A_t = Projected area of the tip (1.550 in^2)

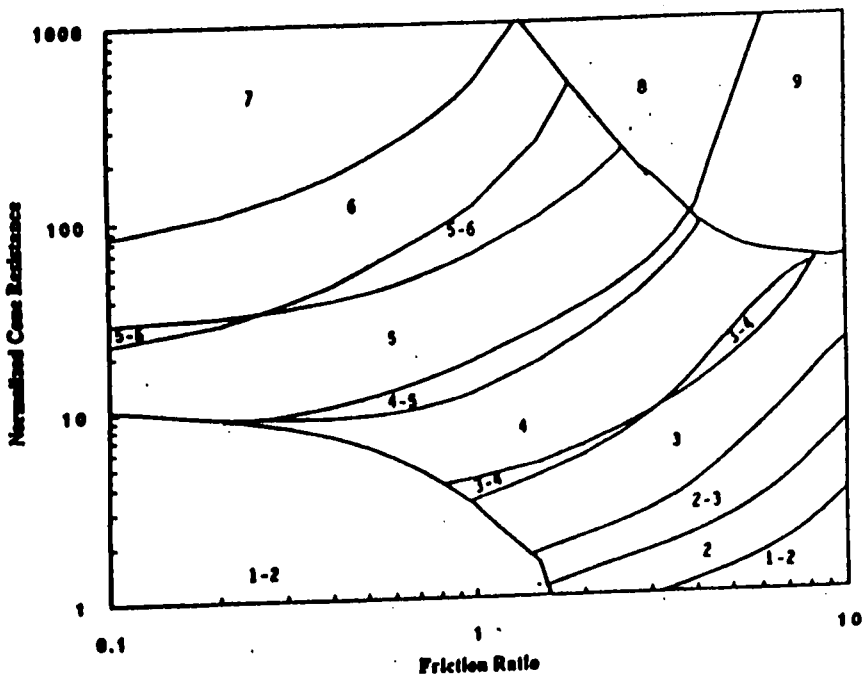
F_s = sleeve stress

σ_{vo} = Total overburden stress

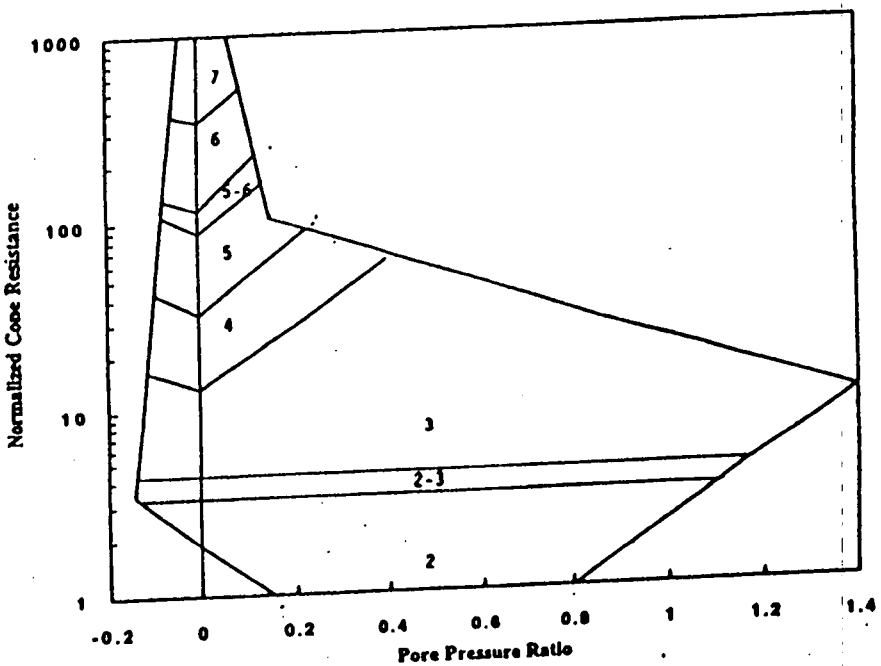
The results for the above equations are expressed in pounds per square inch (psi). Tip stress data was corrected to bars of pressure for use with Figure A-4.

Multiple CPT soundings were made at 17 CPT locations for calibration purposes, or because mechanical difficulties prevented penetration to the proposed depth. Each repeat CPT sounding location was approximately two feet from the original sounding. Borings were placed near 16 Phase I CPT soundings. These borings were placed either by Rotasonic™ methods for the purpose of installing monitoring wells or lysimeters, or by conventional hollow-stem auger methods to obtain

Fresh Kills Friction Ratio Classification Chart



Fresh Kills Pore Pressure Classification Chart



FRICTION RATIO $\frac{f_s}{q_t - \sigma_{vo}} \times 100\%$

1. Sensitive, Fine Grained
2. Organic Soils-Peat
3. Clays - Clay to Silty Clay
4. Silty Mixtures - Clayey Silt to Sandy Silt
5. Sand Mixtures - Silty Sand to Sandy Silt

PORE PRESSURE RATIO $B_q = \frac{u - u_o}{q_t - \sigma_{vo}}$

6. Sands - Clean Sand to Silty Sand
7. Gravelly Sand to Sand
8. Very Stiff Sand to Clayey* Sand
9. Very Stiff, Fine Grained*

(*) Heavily Overconsolidated or Cemented

FIGURE A-4 Soil classification scheme using the cone penetrometer test.

000045

TABLE A-1
DETERMINATION OF POTENTIAL GRANULAR ZONES
FROM (PHASE III) CPT SOUNDINGS

CPT Loc.	CPT ID #	Grnd. Elev.A	Northing	Easting	Date Installed	Granular A Zone # 1		Granular Zone # 2		Granular Zone # 3		Granular Zone # 4		Granular Zone # 5		Granular Zone # 6		Tot. CPT Depth(ft)
500	11664	590.44	1382976.18	478746.79	03/21/95	580.94	580.14	572.74	572.24	571.24	570.64							21.1
501	11663	587.92	1382629.54	478771.04	03/21/95	577.32	576.42	574.52	573.82	560.62	534.12							54.3
502	11662	590.75	1382142.40	478777.64	03/24/95													20.0
502B	11662	590.65	1382137.82	478776.38	03/28/95	581.95	580.45	578.25	577.35									20.0
503	11660	590.70	1383008.80	479107.22	03/29/95	580.20	578.80	561.40	533.80									57.4
504	11661	588.44	1382768.51	479091.69	03/28/95													22.0
504B	11661	588.37	1382771.96	479091.98	03/28/95	576.17	574.97											22.0
505	11669	590.15	1382587.45	479083.14	03/24/95	581.45	580.95	578.85	577.35	573.25	572.65							21.0
506	11670	585.14	1382121.21	479052.26	03/24/95	570.44	569.94	558.04	530.74									55.2
507	11616	590.80	1382913.78	479461.31	03/24/95													23.0
508	11659	588.10	1382579.01	479675.86	03/28/95													25.0
509	11623	582.69	1382168.11	479665.38	03/29/95													19.0
510	11655	592.08	1382783.18	480053.03	03/24/95	573.18	572.08	570.28	569.78									25.0
511	11653	588.97	1382562.20	480071.82	03/28/95	579.87	579.27	566.57	565.37									24.9
512	11647	582.37	1382160.88	480096.28	03/29/95	556.17	555.77	552.47	487.17									96.0
513	11656	593.63	1382969.58	480297.52	03/22/95	575.43	574.33	560.73	537.03									57.3
514	11651	591.88	1382754.05	480442.85	03/22/95													23.8
514B	11651	592.19	1382753.68	480449.78	03/23/95													25.0
515	11638	585.13	1382117.01	480451.01	03/28/95	574.23	573.83	557.53	534.33									51.4
516	11650	595.37	1383006.27	480676.71	03/22/95	577.97	577.57											29.0
517	11635	587.95	1382130.39	480696.06	03/27/95	556.35	534.15											54.3
518	11644	597.10	1383009.53	480981.67	03/22/95	571.00	570.40											30.0
519	11646	590.75	1382584.25	480980.90	03/21/95	583.15	582.35	577.75	577.15									28.0
520	11649	590.24	1382417.91	480970.17	03/24/95	564.14	563.54											27.0
521	11634	588.06			03/27/95													26.0
522	11645	599.07	1383006.73	481297.96	03/22/95	580.77	580.37	577.07	576.07	561.17	532.57							67.7
523	11641	591.03	1382570.67	481348.24	03/21/95	575.43	574.23											29.0
524	11663	588.66	1382113.34	481309.16	03/27/95	577.06	576.36	575.76	574.96	573.06	572.36	556.06	530.06					59.1
525	11640	602.42	1383012.54	481693.36	03/22/95	587.82	586.82	578.82	577.72									39.0
526	11637	596.64	1382557.16	481699.13	03/23/95	585.14	583.94	577.24	576.74	573.34	572.94	564.14	561.94					35.0
527	11639	597.96			03/21/95													35.0

A: All Elevations in feet above mean sea level

000036

TABLE A-1
DETERMINATION OF POTENTIAL GRANULAR ZONES FROM (PHASE III) CPT SOUNDINGS

CPT Loc.	CPT ID #	Grnd. Elev.A	Northing	Easting	Date Installed	Granular A Zone # 1		Granular Zone # 2		Granular Zone # 3		Granular Zone # 4		Granular Zone # 5		Granular Zone # 6		Tot. CPT Depth(ft)
528	11632	593.20	1382206.71	481699.36	03/27/95	575.40	574.30	574.10	573.30	565.90	565.40							30.0
529B	11636	605.21	1383012.24	482075.07	03/24/95													67.4
529	11636	605.16	1383012.25	482072.14	03/22/95	591.46	590.86	572.26	571.56	556.06	538.46							67.3
530	11631	590.90	1382117.73	482039.67	03/27/95	555.40	541.90											49.6
531B	11671	609.24	1382998.08	482510.36	03/23/95	587.54	587.14			578.34	577.84							48.0
531	11671	609.36	1382999.04	482508.91	03/21/95													48.1
532	11612	603.24	1382521.24	482473.98	03/21/95	592.94	587.34	563.84	560.54									43.0
533	11629	603.28	1382366.47	482547.40	03/23/95													16.1
533A	11629	603.38	1382363.10	482550.23	03/23/95	584.78	584.18											43.0
534	11680	612.49	1383011.84	482807.84	03/23/95	568.39	567.19	554.49	539.69									73.4
535	11611	612.75	1383012.06	483084.35	03/22/95	599.75	599.25	566.65	565.55									48.0
536	11613	613.29	1382548.33	483107.53	03/30/95	587.39	582.49	556.39	555.69	552.69	533.39							80.5
537	11614	605.22			03/30/95	596.02	595.22											45.0
538	11630	591.53	1382066.27	482204.00	03/25/95	590.23	589.33	571.13	570.73	555.53	554.83							37.0
538B	11630	591.42	1382064.07	482204.56	03/27/95													37.0
539	11619	603.82			03/31/95	581.62	579.62	571.82	569.82	569.12	568.62							22.9
539B	11619	603.78			03/31/95													30.1
539C	11619	603.66			03/31/95													36.5
540	11628	598.05	1382006.53	482452.76	03/23/95	567.05	565.45	560.65	559.35									39.0
541	11621	603.41			03/30/95	595.51	594.61	576.51	575.41	572.41	571.81							36.0
541A	11621	603.42			03/30/95													27.0
542	11627	590.69	1381675.54	482213.80	03/28/95	578.99	576.89	575.49	575.09	571.39	570.49	554.89	554.29	553.49	552.59	550.79	540.19	51.2
542B	11627	590.64	1381670.64	482213.63	03/30/95													20.0
543	11617	599.70			03/31/95	558.90	557.00											43.0
544	11626	595.22	1381602.22	482463.89	03/23/95	571.52	570.72	570.32	569.82	560.52	558.52							37.0
545	11624	595.18	1381274.58	482649.97	03/23/95	555.98	540.58											45.0
545B	11624	595.12			03/24/95													55.2
546	11615	599.69			03/30/95	587.19	580.89	568.99	568.39									38.8
547	11625	589.82	1381250.02	482223.16	03/28/95	569.92	568.92	557.92	556.12									34.0

A: All Elevations in feet above mean sea level

000047

TABLE A-2
DETERMINATION OF POTENTIAL GRANULAR ZONES
FROM (PHASE II) CPT PROFILES

CPT Loc.	CPT ID #	Grnd. Elev. A	Northing	Easting	Date Installed	Granular A Zone # 1		Granular Zone # 2		Granular Zone # 3		Granular Zone # 4		Granular Zone # 5		Granular Zone # 6		Total CPT Depth(ft)
	11411	596.69	482621.52	1381487.81	11/02/94	560.89	559.59											37.5
	11412	582.75	478980.00	1382030.00	11/01/94													25.0
	11418	598.73	482621.52	1381759.19	11/02/94	581.13	580.73	563.13	562.93									40.0
	11420	582.33	478806.69	1381882.55	11/01/94	569.93	566.53	559.33	557.63									25.0
	11421	599.44	482611.64	1381909.69	11/02/94													40.0
	11422	592.59	479717.94	1382998.03	11/01/94	573.79	573.49											25.0
	11424	586.59	479323.33	1382529.18	11/01/94	570.59	567.99											25.0
	11425	579.88	479432.69	1382147.38	11/02/94	565.38	564.88	557.18	554.88									25.0
	11428	594.87	478428.66	1382683.26	11/01/94	578.47	577.97	577.17	576.87									25.0
	11429	610.13	483015.55	1382489.88	10/26/94	595.83	595.23	572.33	571.43									40.1
	11430	617.71	483016.14	1382780.87	10/28/94													40.1
	11431	605.79	482746.35	1382482.78	10/28/94	582.89	582.39											39.7
	11432	608.60	482714.35	1382764.40	10/28/94	592.90	592.60	589.50	589.20	574.40	573.60							39.7
	11433	603.00	482413.44	1382474.12	10/26/94	589.10	588.70	584.50	583.00	581.00	580.50							40.0
	11434	606.04	482413.40	1382767.70	10/28/94	577.14	576.84	574.64	574.24									24.7
	11435	602.10	482095.11	1382466.56	10/26/94	591.60	584.50	568.20	567.70									35.0
	11436	600.95	482104.55	1382760.76	10/27/94	582.55	581.45											40.0
	11437	600.03	481868.41	1382461.27	10/26/94	589.03	588.53	587.03	586.33	581.13	580.93							35.0
	11438	598.47	481809.51	1382754.24	10/27/94	573.67	573.17											40.0
	11439	593.99	481556.38	1382455.20	10/26/94	569.69	569.19	566.59	563.99									30.0
	11440	594.36	481490.49	1382747.52	10/27/94	568.16	567.66											35.0
	11441	589.00	481296.34	1382449.80	10/26/94	577.30	573.30											30.1
	11442	593.18	481285.78	1382743.96	10/27/94	574.08	573.68	572.08	571.58	567.68	564.98							35.0
	11443	592.55	481020.00	1382738.22	10/27/94	578.35	577.85	570.75	569.15									21.0
	11444	590.01	480696.17	1382438.69	10/31/94													25.0
	11445	591.53	480697.95	1382730.44	10/31/94	569.63	568.93	567.43	566.53									25.0

A: Elevations in feet above mean sea level

000048

TABLE A-2
DETERMINATION OF POTENTIAL GRANULAR ZONES FROM (PHASE II) CPT PROFILES

CPT Loc.	CPT ID #	Grnd. Elev. A	Northing	Easting	Date Installed	Granular A Zone # 1		Granular Zone # 2		Granular Zone # 3		Granular Zone # 4		Granular Zone # 5		Granular Zone # 6		Total CPT Depth(ft)
	11446	587.83	480435.42	1382432.97	10/31/94													25.1
	11447	585.36	480171.84	1382426.35	10/28/94	563.76	561.86											25.0
	11448	584.88	479739.36	1382417.71	10/28/94	567.08	566.58	565.58	565.18									24.7
	11449	584.23	479418.58	1382410.62	10/28/94	569.63	568.33											25.0
	11450	591.39	479526.19	1382706.94	10/31/94	570.99	570.39	569.79	569.19	567.19	566.39							24.7
	11451	587.04	479126.10	1382405.34	10/31/94	566.64	566.24											25.0
	11452	589.44	479203.52	1382700.59	11/01/94	573.54	572.64											25.0
	11454	587.25	478938.18	1382401.57	10/31/94	566.65	566.25	565.75	565.15									25.0
	11455	592.53	478889.68	1382693.63	11/01/94	577.43	577.03											24.7
	11456	592.97	478490.26	1382393.19	10/31/94	575.17	574.57											24.7
	11457	586.14	478136.36	1382385.00	10/31/94	572.04	570.94	561.74	561.14									25.0
	11458	589.00	477874.51	1382379.37	10/31/94													25.0
	11465	601.23	482581.79	1382128.56	10/28/94	583.83	583.33	575.63	574.93									40.0
	11466	591.89	477982.37	1382674.94	11/01/94	570.29	568.99											25.0

A: Elevations in feet above mean sea level

geotechnical samples for analysis. Table A-3 lists all CPT locations and indicates each peripheral soil boring and its approximate distance from the CPT.

Data from nearby CPTs was renewed to assist in determining the potential extent of CGM. One representative analysis includes an evaluation of CPT 11442A and B. A comparison of tip and sleeve stress measurements for CPT 11442A and B is shown in Figure A-5. Similarities exist between these two soundings. However, in CPT 11442A, at the 26- to 28-foot interval, high tip resistance and elevated sleeve stress was interpreted as a sandy zone. Whereas, in CPT 11442B which was only two feet away, little if any evidence of increased tip resistance and sleeve stress was noted. This analysis of nearby CPT data indicates that zones of sand or other coarse fractions apparently have limited areal extent, thereby demonstrating the heterogeneous nature of the till and showing no potential for interconnectability of the coarse grained material over large areas.

Corrected tip stress and friction ratio data for each CPT sounding were plotted in order to clarify the lithologic interpretation at each location (see Figure A-6). Data were plotted for each complete log and for selected segments or intervals below ground level depending on characteristic patterns presented by the CPT data profile. Figure A-7 is an example plot; it presents the complete data set from CPT 11435. The predominant soil classification at each CPT location was a silt clay mixture, typically a lean clay, which is consistent with the Unified Soil Classification System (USCS) from geotechnical samples, with varying amounts of sand. Deviations from this lithologic classification were characterized by increased tip resistance and sleeve stress measurements that represented encounters with gravel, cobbles, sand or silt layers. In the upper portions of the CPT data profiles, near the brown/gray till interface, increased tip and sleeve stress may indicate overconsolidation due to desiccation of the soils. Potential zones of coarse materials such as silt, sand, and gravel were identified and thicknesses estimated. These interpretations are supported by nearby soil borings and geotechnical test results.

One primary lithologic distinction is the brown-gray clay interface, which is defined primarily as a color change from a typically reddish brown color to a gray to olive-gray color. When comparing CPT data to boring logs in which the brown-gray clay interface was defined, no systematic pattern was observed in the CPT data profiles which could be used to accurately predict the location of the brown-gray clay interface.

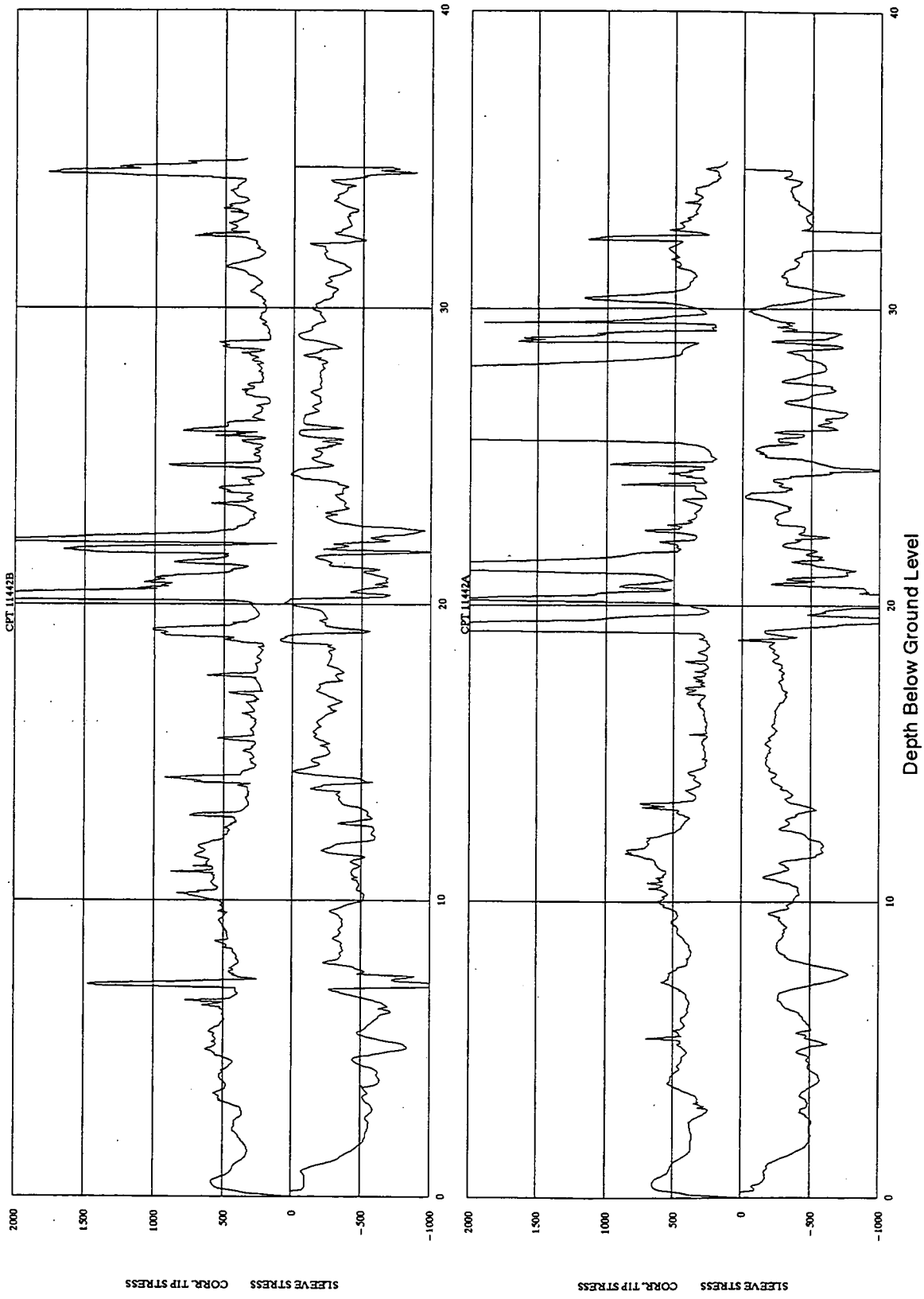
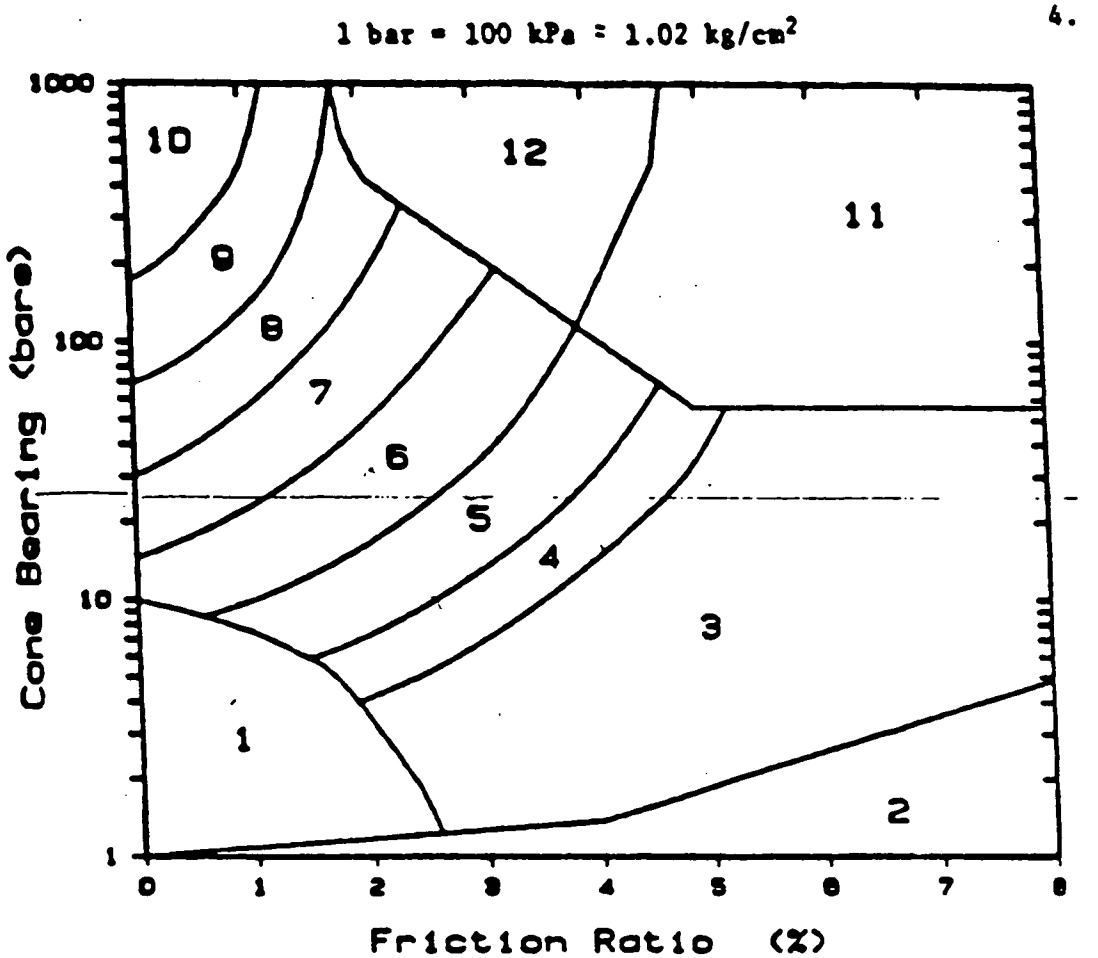


Figure A–5
Comparison of Tip Stress to Sleeve Stress
For CPT 11442 A & 11442 B

000021

4.



Zone	Soil Behaviour Type	Q_c/N
1)	sensitive fine grained	2
2)	organic material	1
3)	clay	1
4)	silty clay to clay	1.5
5)	clayey silt to silty clay	2
6)	sandy silt to clayey silt	2.5
7)	silty sand to sandy silt	3
8)	sand to silty sand	4
9)	sand	5
10)	gravelly sand to sand	6
11)	very stiff fine grained (*)	1
12)	sand to clayey sand (*)	2

(*) overconsolidated or cemented

FIGURE A-6

EMPIRICALLY DERIVED

CPT LITHOLOGICAL GRAPH

FIGURE A-7

CPT 11435 COMPLETE DATA SET

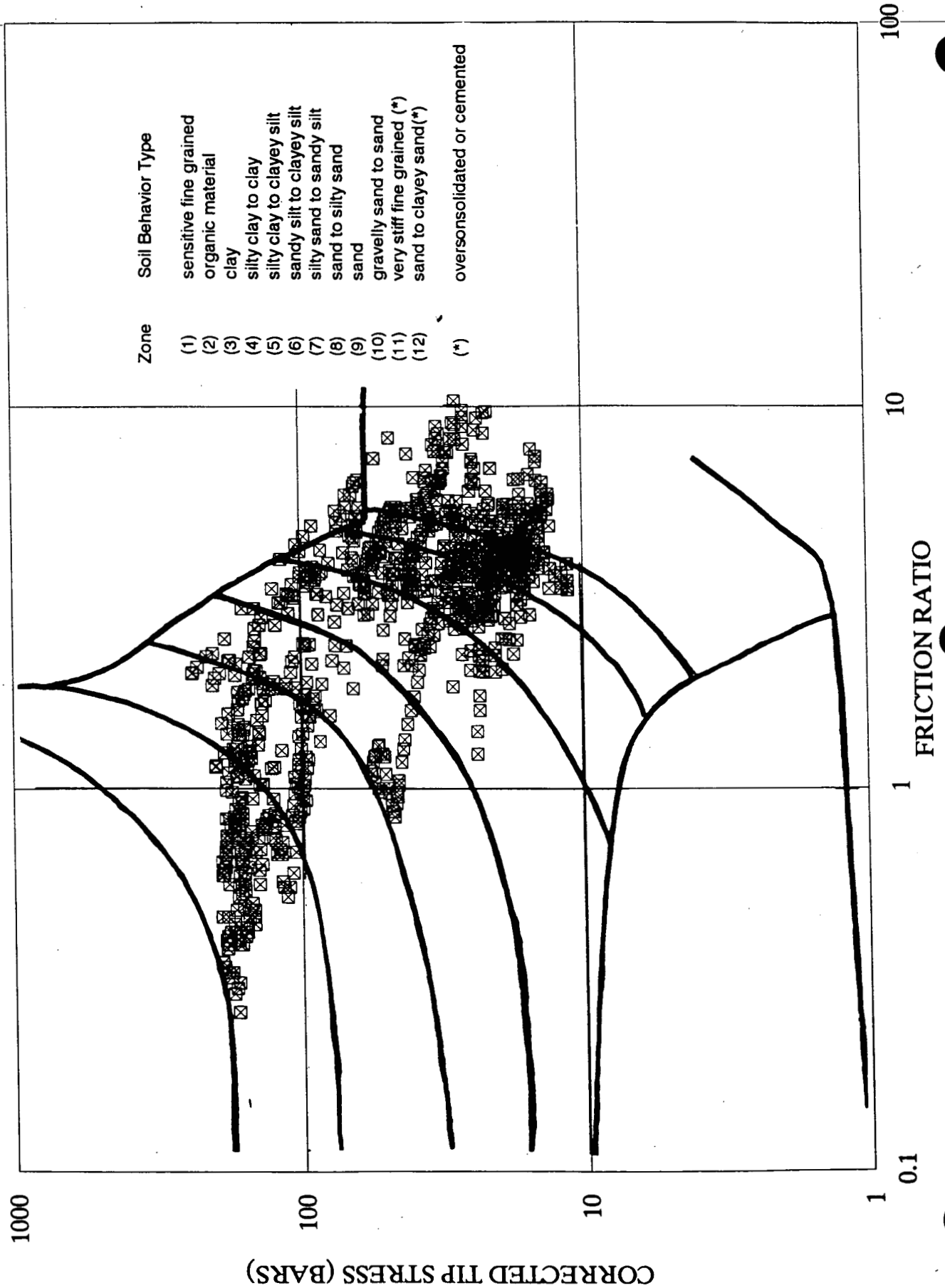


TABLE A-3

SUMMARY OF DISTANCES OF SOIL BORINGS FROM ADJACENT CPT LOCATIONS

CPT	Geotech Boring	Distance From CPT	Well	Distance From CPT	Well	Distance From CPT	Well	Distance From CPT	Well	Distance from CPT
11411										
11418										
11420										
11421	11481	40.6								
11422										
11424										
11425										
11428										
11429	11468	5.6	11482	7.4	11483	14.6	11491	12.7	11492	0.3
11430										
11431	11470	32.3								
11432										
11433			11493	5.5	11494	12.5	11495	15.6		
11434	11480	5.3								
11435	11479	4.7	11496	2.9	11497	8.8				
11436	11478	0.9								
11437										
11438	11477	9.6	11500	1.5	11501	14.5				
11439	11476	5.5	11498	9.0	11499	8.9				
11440										
11441	11471	43.2								
11442			11502	8.3	11503	11.8				
11443										
11444										
11445	11474	9.1								
11446										
11447	11473	9.3								
11448	11472	9.5								
11449										
11450	11475	101.3								
11451										
11452			11504	12.0	11505	19.6				
11454										
11455										
11456										
11457										
11458										
11565										
11466										

In conclusion, the CPTs were valuable in helping to determine zones within the till of interbedded coarse granular material. These data were added to the solid block modeling for an enhanced lithologic interpretation. Also, CPT data were significant in demonstrating heterogeneity of the till; i.e., the zones of coarse grained material were localized making the potential for interconnectability low.

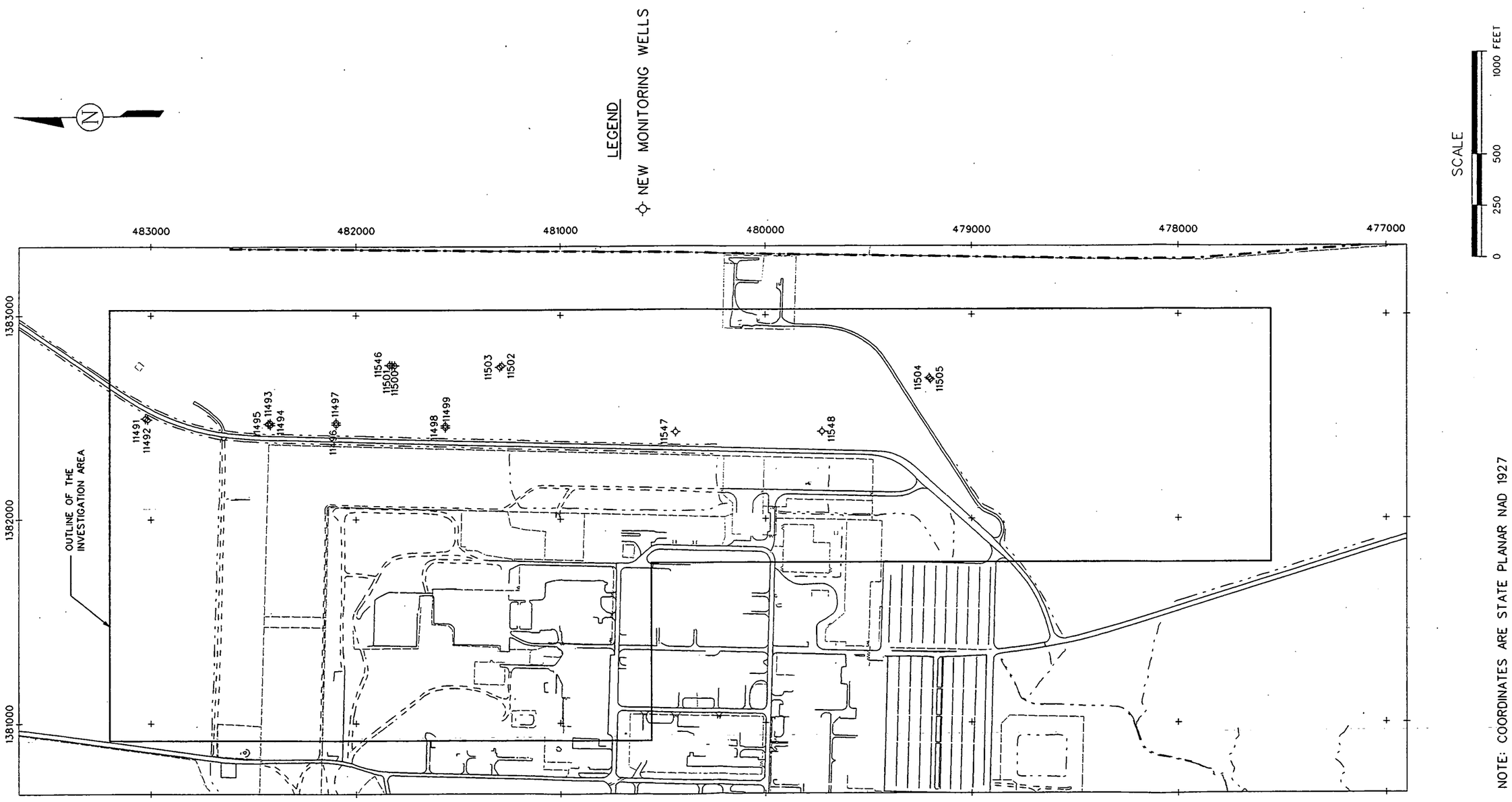
A.2 WELL INSTALLATION AND SAMPLING

A.2.1 Objectives

There were 18 wells installed as part of the Predesign Investigation Phase II (Figure A-8). The objectives of the installations were to (1) identify interbedded and interconnected granular material in the till; (2) verify existing uranium concentrations in the till and perched groundwater; (3) identify the solubility of uranium present in the till; and (4) identify lateral and vertical perched groundwater gradients. The last objective will be discussed in Section A.6. The locations for these wells were selected using a three-dimensional model which was generated from the Site-Wide Environmental Database (SED) and CPT data.

A.2.2 Procedures and Field Activities

The wells were installed according to the Site-Wide CERCLA Quality Assurance Project Plan (SCQ) using a Rotasonic™ drill rig. Continuous samples were collected for lithologic descriptions using the Rotasonic™ barrel to depths summarized on Table A-4. The boring logs are presented in Appendix F. Soil samples were also collected for analysis of total uranium and isotopic uranium, batch tests (K_d), and toxicity characteristic leaching procedure (TCLP) total uranium and isotopic uranium. No boring penetrated through the till into the regional aquifer. Wells were completed using 2-inch diameter, 316 stainless steel riser and .010-inch slotted screen from 2 to 5 feet in length. The placement of the screened interval was determined by the field geologist with approval from the Operable Unit 2 Task Manager. The interval was selected by identifying the zone which had the greatest potential to yield water (i.e., coarsest granular material and/or the wettest zone). Table A-4 shows screened intervals, which are defined by the top and bottom of the sand pack, and other pertinent well information. The filter packs were well-sorted quartz sand of 20-40 mesh (medium). Water was used during well installation for extracting the sample cores and to provide lubrication between the drill casing and the sample barrel. Wells were developed after the grout surface seal cured, per the SCQ requirements. Water lost, purged, and development volumes are provided in



FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

NEW MONITORING WELL LOCATIONS

000026

DATE 3-20-95
DRAWN R. WILLIAMS

FIGURE A-8

FILE NAME: /2ccs1/dgn/map/hor/dpth/ph20010.dgn

TABLE A-4

BORINGS DEPTHS AND SCREENED INTERVALS FOR PHASE II WELLS

Wells	Northing (27)	Easting (27)	Ground Surface (feet) MSL	B/G Interface (feet) BGL	Sand Pack Top (feet) BGL	Sand Pack Bottom (feet) BGL	Bottom of Boring (feet) BGL	Screened in Brown or Gray Clay
11491	483027.45	1382494.45	611.13	12.5	25.0	29.5	47.0	Gray
11492	483015.82	1382490.10	610.53	8.5	15.0	22.0	22.0	Gray
11493	482418.79	1382473.02	603.38	13.5	18.0	24.5	42.0	Gray
11494	482418.88	1382462.87	603.51	10.5	8.0	16.5	17.0	Brown/Gray
11495	482428.05	1382468.65	603.68	11.0	30.5	37.0	42.0	Gray
11496	482096.76	1382464.21	602.65	9.5	9.0	17.0	22.0	Brown/Gray
11497	482096.70	1382475.22	602.34	9.0	28.0	32.0	37.0	Gray
11498	481563.77	1382450.00	594.60	7.0	27.0	33.0	33.0	Gray
11499	481563.81	1382460.03	594.68	9.0	15.0	22.0	22.0	Gray
11500	481810.70	1382753.32	598.93	12.0	19.0	25.5	39.0	Gray
11501	481824.00	1382754.18	598.97	10.5	33.0	37.0	37.0	Gray
11502	481288.13	1382751.92	593.79	13.5	18.0	22.0	35.0	Gray
11503	481297.57	1382744.92	593.47	12.0	24.0	28.0	35.0	Gray
11504	479205.75	1382688.80	590.02	14.8	14.0	18.0	20.0	Brown/Gray
11505	479199.77	1382681.31	590.08	9.8	23.0	27.0	27.0	Gray
11546	481836.06	1382755.00	598.90	13.5	9.0	13.0	17.0	Brown
11547	480438.76	1382426.92	588.22	11.5	9.0	13.0	17.0	Brown/Gray
11548	479728.54	1382427.30	585.72	13.0	10.0	14.0	18.0	Brown/Gray

MSL = Mean Sea Level
BGL = Below Ground Level
B/G = Brown/Gray Till Interface

FER\CRU2\PREDESIGN\TSS\TAB22\July25, 1995 (9:40am)

000027

Table A-5. Table A-6 shows the reference information, current and recent, for all of the wells used for the Predesign Investigation.

TABLE A-5

PURGE VOLUMES AND ESTIMATED DRILLING WATER LOST

Well No.	Date	Total Purge Volume (Gallons)	Estimated Water Lost (Gallons)	Remarks
11491	12-28	10	34	Purged Dry
11492	12-29	2.7	9	Purged Dry
11493	12-30	0.75	13	Purged Dry
11494	01-18	30	25	Purged Dry
11495	12-30	2	14	Purged Dry
11496	12-27	40	8	Purged Dry
11497	01-07	0.75	13	Purged Dry
11498	01-09	4	12	Purged Dry
11499	01-09	2	6	Purged Dry
11500	12-20	6	12	Heavy Turbidity
11501	01-10	12	12	Purged Dry
11502	01-13	5	14	Purged Dry
11503	01-14	14.5	14	Purged Dry
11504	01-15	42	6	Purged Dry
11505	01-18	17.5	8	Purged Dry
11546	01-20	6	0*	Purged Dry
11547	01-23	4	0*	Purged Dry
11548	01-20	2	0*	Purged Dry

* Water not used during drilling and sampling operations.

TABLE A-6

PREDESIGN INVESTIGATION WELL REFERENCE INFORMATION

Wells	Northing (27)	Easting (27)	TPC	TOW	Ref Used	Ground Surface (feet) MSL	B/G Interface (feet) BGL	Sand Pack Top (feet) BGL	Sand Pack Bottom (feet) BGL	Bottom of Boring (feet) BGL	Screened in Brown or Gray Clay
1064	480718.78	1382193.03	590.49	589.92	TOW	588.00	13.5	15.0	31.0	31.0	Gray
1110	480426.28	1381889.78	582.51	582.14	TPC	580.30	13.2	6.0	13.5	13.5	B/G
1111	480196.16	1381878.06	581.69	581.54	TPC	579.70	10.5	4.2	12.0	12.0	B/G
1112	479991.52	1381663.15	581.25	580.93	TPC	578.25	11.0	12.0	19.5	19.5	B/G
1131	480724.38	1381019.82	581.51	581.25	TPC	579.82	6.5	2.0	7.5	7.5	B/G
1151	480443.07	1381171.66	581.96	581.68	TPC	579.90	8.5	4.0	10.5	10.5	B/G
1152	480411.02	1382105.62	579.69	579.55	TPC	577.69	15.0	3.0	10.2	20.0	Brown
1160	480183.25	1382104.51	584.12	583.91	TPC	582.12	-	4.0	9.5	9.5	Brown
1167	480022.72	1380741.19	581.26	581.06	TPC	579.29	17.0	4.0	12.0	12.0	Brown
1171	479941.71	1382070.58	582.60	582.49	TPC	580.60	10.3	2.0	9.0	9.0	Brown
1274	482063.80	1381462.30	593.02	592.94	TPC	591.11	10.0	8.0	16.5	16.5	B/G
1276	482052.32	1381885.01	592.31	592.11	TPC	590.51	7.5	14.0	20.0	20.0	Gray
1278	481854.87	1380973.36	590.85	590.42	TPC	588.82	-	4.2	10.5	10.5	Brown
1293	481407.00	1380962.16	588.71	588.23	TPC	586.99	11.3	5.0	12.0	12.0	B/G
1299	481185.14	1381203.59	587.05	586.74	TPC	585.13	7.5	11.6	18.0	18.0	Gray
1301	481161.40	1381649.39	587.43	587.33	TPC	585.58	7.5	5.5	12.0	12.0	B/G
1340	481618.58	1380734.93	589.81	589.71	TPC	587.95	8.5	8.0	20.0	20.0	B/G
1418	480684.10	1381882.72	582.11	581.98	TPC	580.44	-	6.0	10.5	10.5	Brown
1444	480070.16	1383192.35	602.15	601.74	TPC	600.33	-	6.7	15.0	15.0	Brown

000079

118

TABLE A-6
(Continued)

Wells	Northing (27)	Easting (27)	TPC[A]	TOW[B]	Ref Used	Ground Surface	B/G Interface	Sand Pack Top	Sand Pack Bottom	Bottom of Boring	Screened in Brown or Gray Clay
1733	477080.44	1383156.49	607.45	607.15	TOW	604.70	11.0	23.0	30.0	30.0	Gray
1843	479905.60	1382522.39	593.46	593.04	TPC	591.37	16.0	15.5	20.0	20.0	B/G
1866	479487.97	1381642.45	579.15	578.63	TPC	576.80	-	3.0	11.0	11.0	Brown
1887	482410.68	1380855.73	591.52	591.16	TOW	589.40	-	9.8	13.5	13.5	Brown
1905	478587.09	1381255.00	577.56	577.52	TPC	575.80	NA	NA	NA	32.0	NA
11067	480193.68	1382782.71	592.78	592.19	TOW	590.71	14.5	15.0	20.0	20.0	Gray
11074	481199.10	1380777.36	585.71	585.54	TOW	582.90	5.5	13.0	20.0	20.0	Gray
11075	479755.35	1381651.54	580.89	580.56	TOW	579.49	10.5	7.5	15.0	15.0	B/G
11230	481837.12	1381868.48	591.34	590.91	TOW	595.24	11.5	7.5	12.0	12.0	B/G
11546	481836.06	1382755.00	601.36	600.81	TOW	598.90	13.5	9.0	13.0	17.0	Brown
11547	480438.76	1382426.92	590.70	590.37	TOW	588.22	11.5	9.0	13.0	17.0	B/G
11548	479728.54	1382427.30	588.20	587.68	TOW	585.72	13.0	10.0	14.0	18.0	B/G
11491	483027.45	1382494.45	613.51	613.05	TOW	611.13	12.5	25.0	29.5	47.0	Gray
11492	483015.82	1382490.10	612.86	612.29	TOW	610.53	8.5	15.0	22.0	22.0	Gray
11493	482418.79	1382473.02	606.06	605.41	TOW	603.38	13.5	18.0	24.5	42.0	Gray
11494	482418.88	1382462.87	606.05	605.48	TOW	603.51	10.5	8.0	16.5	17.0	B/G
11495	482428.05	1382468.65	606.21	605.58	TOW	603.68	11.0	30.5	37.0	42.0	Gray
11496	482096.76	1382464.21	605.10	604.63	TOW	602.65	9.5	9.0	17.0	22.0	B/G
11497	482096.70	1382475.22	604.79	604.29	TOW	602.34	9.0	28.0	32.0	37.0	Gray
11498	481563.77	1382450.00	597.08	596.50	TOW	594.60	7.0	27.0	33.0	33.0	Gray

TABLE A-6
(Continued)

Wells	Northing (27)	Easting (27)	TPC	TOW	Ref Used	Ground Surface	B/G Interface	Sand Pack Top	Sand Pack Bottom	Bottom of Boring	Screened in Brown or Gray Clay
11499	481563.81	1382460.03	597.01	596.56	TOW	594.68	9.0	15.0	22.0	22.0	Gray
11500	481810.70	1382753.32	601.43	600.75	TOW	598.93	12.0	19.0	25.5	39.0	Gray
11501	481824.00	1382754.18	601.47	600.80	TOW	598.97	10.5	33.0	37.0	37.0	Gray
11502	481288.13	1382751.92	596.33	595.60	TOW	593.79	13.5	18.0	22.0	35.0	Gray
11503	481297.57	1382744.92	595.99	595.47	TOW	593.47	12.0	24.0	28.0	35.0	Gray
11504	479205.75	1382688.80	592.66	592.07	TOW	590.02	14.8	14.0	18.0	20.0	B/G
11505	479199.77	1382681.31	592.61	591.75	TOW	590.08	9.8	23.0	27.0	27.0	Gray

TPC = Top of Protective Casing
TOW = Top of Well
MSL = Mean Sea Level
BGL = Below Ground Level
B/G = Brown/Gray Till Interface

000031

118

A.2.3 Water Sampling

A.2.3.1 Sample Types Collected and Analyzed

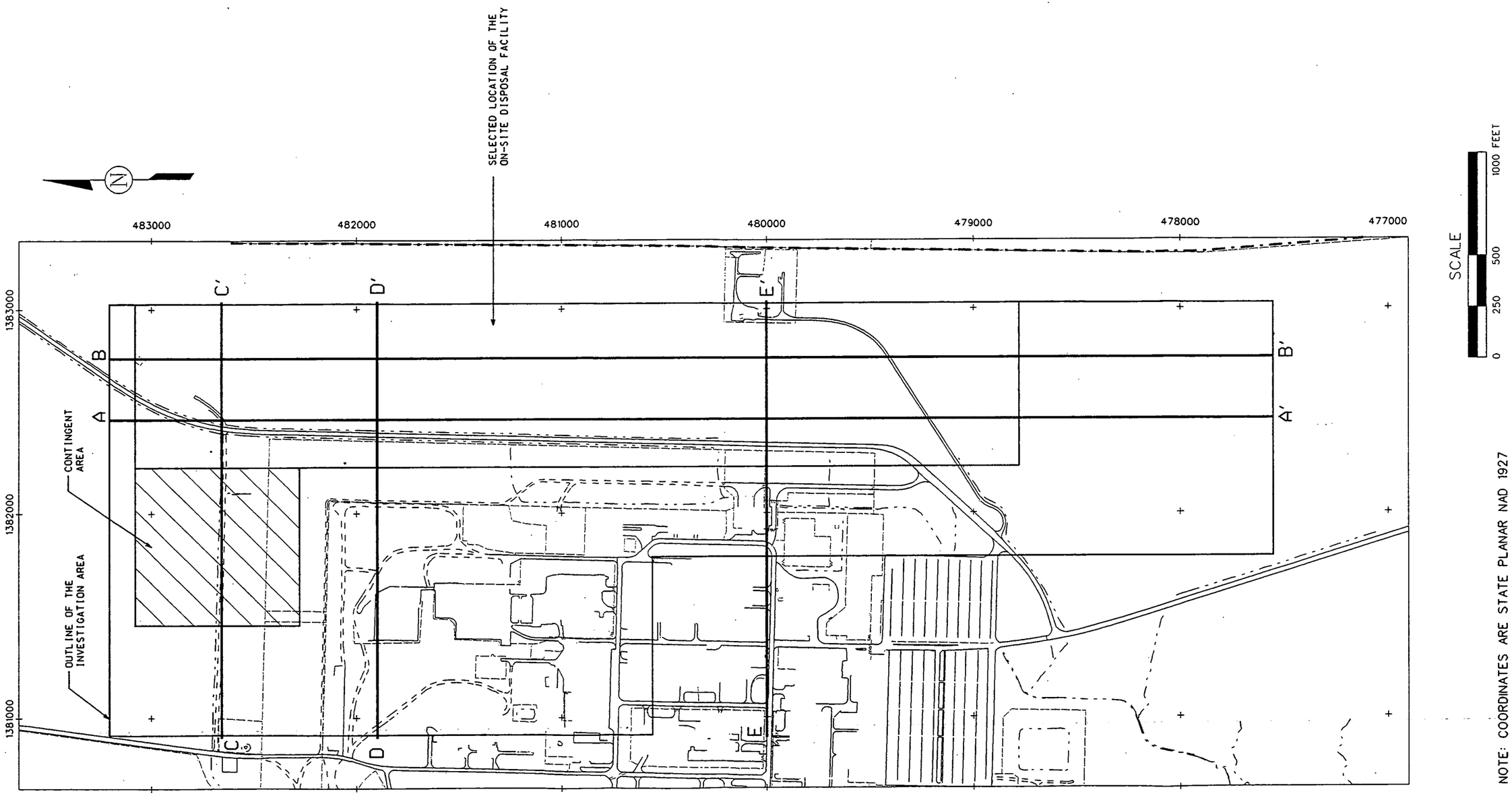
Groundwater sampling was conducted after the newly drilled wells were developed according to the SCQ. Parameter specific and general sample collection procedures were conducted according to the SCQ and RI/FS QAPP. Field measurements of water temperature, pH, conductivity, and dissolved oxygen were taken and recorded. One round of samples was collected and analyzed at a contract laboratory for alkalinity, bromide, chloride, magnesium, nitrate/nitrite, phosphates, sulfate, isotopic uranium, total uranium, carbonate, and tritium.

A.2.3.2 Radionuclide Results

The analytical results for uranium, tritium, and isotopic uranium are shown on Table A-7. Figure A-9 shows the traverses for cross sections. The results for total uranium and tritium are shown on Figures A-10 and A-11 which are cross-sectional views of the wells. Tritium, with a half-life of 12.4 years, was thought to be a potential environmental tracer for precipitation movement in the till. The tritium concentrations varied vertically and laterally, as did the total uranium results. The results will be discussed as nested groups, which is how these wells were installed. There are a total of seven nests, five which contain two wells, and two which contain three wells. Also, there are two isolated wells, which are screened across the brown/gray till interface.

Nest I contains Wells 11491 and 11492. As shown on Table A-7 and Figure A-10, the tritium and total uranium is higher in 11491 (7.77 tritium units (TU) and 3.1 μg/L) than in 11492 (2.48 TU and 0.35 μg/L). Well 11491 is screened from 586.13 feet above mean sea level (MSL); to 581.63 feet above MSL; 11492 is screened from 595.53 feet above MSL to 588.53 feet above MSL.

Nest II, which is south of Nest I, is comprised of Wells 11493, 11494, and 11495. Well 11494 has a tritium value of 14.5 TU, which is the highest for this nest and also higher than Nest I values. Well 11494 is screened from 595.51 feet above MSL to 587.01 above MSL. This is approximately the same elevation interval as for 11492. Well 11493 has a tritium value of 5.46 TU and is screened from 585.38 feet to 578.88 feet, and Well 11495 is dry and screened from 573.18 feet to 566.68 feet above MSL. The total uranium concentration was 14.44 μg/L for 11493 and 5.8 μg/L for 11494 (for reference, the established FEMP 95th percentile background level for total uranium is 4.0 μg/L)



FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

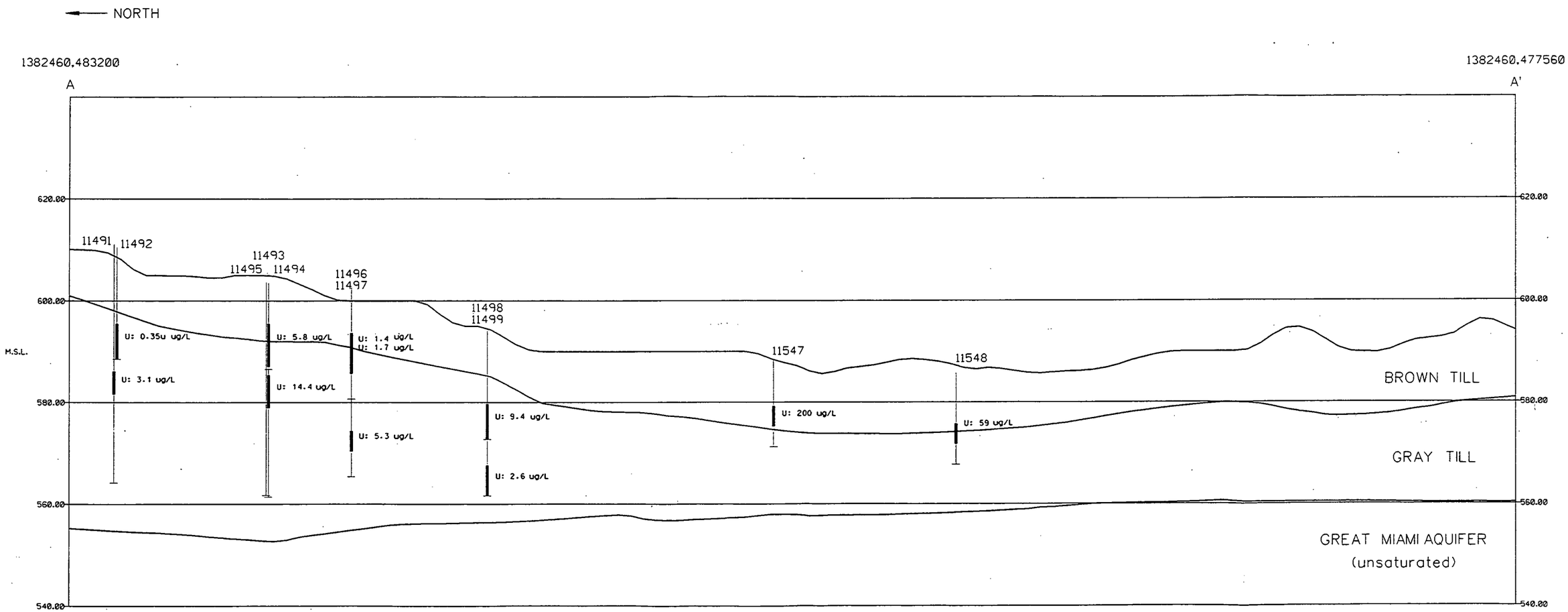
CROSS-SECTION LOCATION MAP

000033

DATE 05/04/95
DRAWN DEG

FIGURE A-9

FILE NAME: /2ccs1/dgn/map/hor/dpth/ph20048.dgn



LEGEND

SAMPLE INTERVAL — U: URANIUM TOTAL

MONITORING WELL

NOTE:

COORDINATES ARE STATE PLANAR NAD 1927

HORIZONTAL SCALE: 0 200' 400' 800'
VERTICAL 0 10' 20' 40'

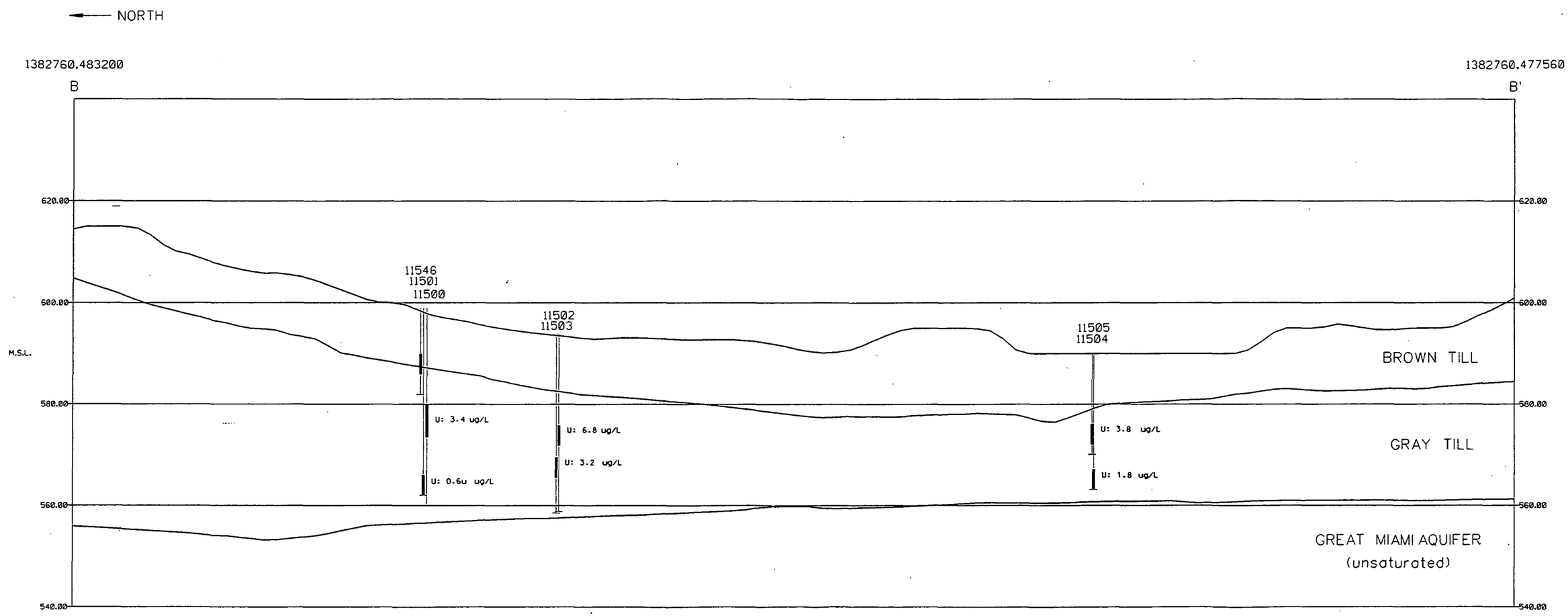
FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

URANIUM FOR WATER
000034

DATE 05/03/95
DRAWN DEG

FIGURE A-10

FILE NAME: /usr/erma5/2ccs1/dgn/sec/geo/dpth/chem_u_o.dgn



LEGEND

SAMPLE INTERVAL

MONITORING WELL

U: URANIUM TOTAL

HORIZONTAL SCALE: 0 200' 400' 800'

VERTICAL SCALE: 0 10' 20' 40'

NOTE:

COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

URANIUM FOR WATER

000035

DATE 05/04/95
DRAWN

FIGURE A-11

FILE NAME: /usr/ermo5/2ccs1/dgn/sec/geo/dpth/chem_u_b.dgn

TABLE A-7

GROUND WATER RESULTS FOR TOTAL URANIUM, ISOTOPIC URANIUM, AND TRITIUM

Well #	Ground Surface above MSL	Screened Int. (feet) BGL	Brown/Gray Interface (feet) BGL	Total U (ug/L)	U 238 (pCi/L)	U 235/236 (pCi/L)	U 234 (pCi/L)	Tritium (TU)
NEST I								
11491	611.13	25.0 - 29.5	12.5	3.1 J	0.81 J	0.031 U	0.98 J	7.77
11492	610.53	15.0 - 22.0	8.5	0.35 U	0.96 J	0.023 U	1.6 J	2.06
NEST II								
11493	603.38	18.0 - 24.5	13.5	14.44 -	6.04 J	0.332 UJ	13.8 J	5.46
11494	603.51	8.0 - 16.5	10.5	5.8 J	1.2 J	0.044 U	1.2 J	14.5
11495	603.68	30.5 - 37.0	11.0	NA	NA	NA	NA	NA
NEST III								
11496	602.65	9.0 - 17.0	9.5	1.4 J	0.54 J	0.055 U	0.81 J	17.2
11497	602.34	28.0 - 32.0	9.0	5.3 J	2.5 J	0.169 J	4.36 J	1.33
NEST IV								
11498	594.60	27.0 - 33.0	7.0	2.6 J	1.8 J	0.099 J	3.1 J	1.85
11499	594.68	15.0 - 22.0	9.0	9.4 -	3.3 J	0.102 J	6.2 J	4.55
NEST V								
11546	598.90	9.0 - 13.0	13.5	NA	NA	NA	NA	17.3
11500	598.93	19.0 - 25.5	12.0	3.4 J	0.077 J	0.026 J	1.6 J	9.7
11501	598.97	33.0 - 37.0	10.5	0.58 U	0.33 J	0.034 J	0.54 J	21.8
NEST VI								
11502	593.79	18.0 - 22.0	13.5	6.78 J	3.12 J	0.128 J	4.94 J	8.5
11503	593.47	24.0 - 28.0	12.0	3,2 J	1.4 J	0.037 J	1.7 J	12.1
NEST VII								
11504	590.02	14.0 - 18.0	14.8	3.8 J	2 J	0.051 J	2.9 J	15.7
11505	590.08	23.0 - 27.0	9.8	1.8 J	1.1 J	0.042 J	3.2 J	10.9
NONNESTED								
11547	588.22	9.0 - 13.0	11.5	198.91 J	56.6 J	2.50 J	62.3 J	12.2

FER\CRU2\PREDESIGN\TSS\TAB25\July25, 1995 (2:03pm)

TABLE A-7
(Continued)

Well #	Ground Surface above MSL	Screened Int. (feet) BGL	Brown/Gray Interface (feet) BGL	Total U (ug/L)	U 238 (pCi/L)	U 235/236 (pCi/L)	U 234 (pCi/L)	Tritium (TU)
11548	585.72	10.0 - 14.0	13.0	59.91 J	15.0 J	0.544 J	19.1 J	19.5

MSL = Mean Sea Level
BGL = Below Ground Level
NA = Not Analyzed

000037

Nest III, which is south of Nest II, contains Wells 11496 and 11497. Well 11496 is screened from 593.65 to 585.65 feet above MSL. It has a tritium value of 17.2 TU, which is the highest for this nest, and a total uranium value of 1.7 μg/L (Figure A-10). Well 11497, which is the deeper well and screened from 574.34 feet to 570.34 feet above MSL, has a tritium value of 1.33 TU and a total uranium concentration of 5.3 μg/L.

Nest IV, south of Nest III, contains Wells 11498 and 11499. These wells are screened from 567.6 feet to 561.6 feet above MSL and 579.68 feet to 572.68 feet above MSL, respectively. The values for 11498 are 1.85 TU for tritium and 2.6 μg/L for total uranium. Well 11499 has a tritium value of 4.55 TU and a total uranium value of 9.4 μg/L.

Nest V is located east and south of Nest III and is comprised of Wells 11500, 11501, and 11546. The screened intervals are from 579.93 feet to 573.43 feet (11500), 565.97 feet to 561.97 feet (11501), and 589.9 feet to 585.9 (11546) feet above MSL. The highest tritium value for this nest was 21.8 TU from 11501, which is the deepest of the three wells. Wells 11500 and 11546 had tritium values of 9.7 TU and 17.3 TU, respectively. The total uranium values were 3.4 μg/L for Well 11500 and 0.58 μg/L for well 11501, which is the deeper well. There is no uranium value available for 11546.

Nest VI, which south of Nest V, is made up of Wells 11502 and 11503. These wells are screened from 575.79 feet to 571.79 feet (Well 11502), and 569.47 feet to 565.47 feet above MSL. The tritium values of 11502 and 11503 are 8.5 TU and 12.1 TU, respectively. The total uranium concentration for 11503 was 3.2 μg/L, and for 11502 was 6.8 μg/L.

Nest VII, which is the nest furthest south, is comprised of Wells 11504 and 11505. The screened intervals for these wells are from 576.02 feet to 572.02 feet (Well 11504), and 567.08 feet to 563.08 feet (Well 11505) above MSL. The tritium values for 11504 and 11505 are 15.7 TU and 10.9 TU, respectively. The total uranium concentrations are 3.8 μg/L for well 11504 and 1.8 μg/L for well 11505.

There were two unnested wells, Wells 11547 and 11548, and the total uranium results were 198.91 μg/L and 58.91 μg/L, respectively. The tritium for Well 11547 was 12.2 TU and for Well 11548 was 19.5 TU. These elevated total uranium levels are discussed further in Section 4.0.

The brown/gray till interface was the only major lithologic feature in the till that could be identified in every borehole. Five wells were screened across this interface during this investigation; Wells 11547, 11548, 11494, 11496, and 11504. As shown on Table A-7, the results for tritium ranged from 12.2 TU to 19.5 TU. Total uranium concentrations ranged from 1.4 μg/L to 200 μg/L.

The total uranium concentrations range from 1.4 μg/L to 200 μg/L for all of the new wells and old well in the study area.

A.2.3.3 Chemical Results

Six ions were analyzed to help develop the conceptual model for water movement in the till. Chloride and bromide were selected because they are components of rainfall and there were no known sources for these ions in the perched groundwater.

Background values for bromide, chloride, sulfate, magnesium, nitrate, and phosphate have been investigated at the FEMP (DOE 1993). The range of values measured in wells completed in the till and observed in background glacial till wells presented in Table A-8 and summarized in Table A-9. There were elevated above background concentrations of sulfate (1,100 mg/L), nitrate/nitrite (4.02 mg/l), and phosphate (518 μg/L), and magnesium (290 mg/kg). These elevated concentrations may be due to prior agricultural practices in the study area. Alkalinity was also sampled and had results ranging from 3 mg/L to 42,000 mg/L; however, background concentrations are not available. Chloride was within the range of background concentrations, and bromide does not have an established background.

A.2.4 Soil Sampling

A.2.4.1 Soil Sample Types Collected and Analyzed

Samples for definition of the distribution coefficient (K_d) for uranium were collected from seven of the borings: one from the gray till and one from the brown till for a total of 14 samples. Soil samples were transferred to containers as quickly as possible with as little disturbance as possible. Also, samples were collected for total uranium, isotopic uranium, TCLP total uranium, and TCLP isotopic uranium.

TABLE A-8

GROUND WATER CHEMICAL RESULTS

Well #	Ground Surface above MSL	Screened Int. (feet) BGL	Brown/Gray Interface (feet) BGL	Bromide (ug/L)	Chloride (mg/L)	Sulfate (mg/L)	Magnesium (ug/L)	Alkalinity (mg/L)	Nitrate/Nitrite (mg/L)	Total Phosphorus (ug/L)
NEST I										
11491	611.13	25.0 - 29.5	12.5	100 U	27.4 -	153 -	121000 -	347 -	.1 U	82.6 UJ
11492	610.53	15.0 - 22.0	8.5	100 U	14.5 -	108 -	290000 -	366 -	.2 -	197 UJ
NEST II										
11493	603.38	18.0 - 24.5	13.5	740 -	24.1 -	458 -	71800 -	439 -	2.26 -	205 UJ
11494	603.51	8.0 - 16.5	10.5	100 U	231 -	79.0 -	61000 J	310 -	0.2 U	518 -
11495	603.68	30.5 - 37.0	11.0	NA	NA	NA	NA	NA	NA	NA
NEST III										
11496	602.65	9.0 - 17.0	9.5	100 U	8.62 -	59.7 -	58400 J	379 -	.1 U	187 UJ
11496 DUP	602.65	9.0 - 17.0	9.5	100 U	8.27 -	59.3 -	73800 J	376 -	.1 U	238 UJ
11497	602.34	28.0 - 32.0	9.0	2820 -	9.61 -	74.5 -	168000 -	1580 -	.04 U	173 UJ
NEST IV										
11498	594.60	27.0 - 33.0	7.0	2640 -	14.7 -	152 -	62400 -	1700 -	.1 U	87.1 UJ
11499	594.68	15.0 - 22.0	9.0	2390 -	7.54 -	149 -	73000 -	4200 -	.1 U	230 UJ
NEST V										
11546	598.90	9.0 - 13.0	13.5	740 -	10.0 -	145 -	181000 -	700 -	0.2 U	160 -
11500	598.93	19.0 - 25.5	12.0	1585 -	4.52 -	140 -	79500 -	458 -	.1 U	249 UJ
11501	598.97	33.0 - 37.0	10.5	686	3.51 -	118 -	50200 -	920	.1 U	139 UJ
NEST VI										
11502	593.79	18.0 - 22.0	13.5	464 -	8.37 -	129 -	120000 J	928 -	0.2 U	NR
11503	593.47	24.0 - 28.0	12.0	1280 -	3.44 -	56 -	59900 -	680 -	.1 U	217 UJ
NEST VII										
11504	590.02	14.0 - 18.0	14.8	100 U	3.91 -	59.9 -	39800 J	412 -	0.2 U	NR
11505	590.08	23.0 - 27.0	9.8	100 U	4.34 -	126 -	124000 J	598 -	0.2 U	153 -

000010

TABLE A-8
(Continued)

Well #	Ground Surface above MSL	Screened Int. (feet) BGL	Brown/Gray Interface (feet) BGL	Bromide (ug/L)	Chloride (mg/L)	Sulfate (mg/L)	Magnesium (ug/L)	Alkalinity (mg/L)	Nitrate/Nitrite (mg/L)	Total Phosphorus (ug/L)
NONNESTED										
11547	588.22	9.0 - 13.0	11.5	1160 -	12.2 -	1100 -	105000 -	728 -	4.02 -	121 -
11548	585.72	10.0 - 14.0	13.0	1240 -	12.8 -	239 -	122000 -	460 -	O.1 U	126 J
FIELD BLANK	NA	NA	NA	100 U	0.08 -	.3 U	74.0 U	4 U	.02 U	55.6 -
RINSATE	NA	NA	NA	100 U	0.13 -	.3 U	74.0 U	3 U	.02 U	98.9 -

Note:
(1) 11495 is a dry well

MSL = Mean Sea Level
BGL = Below Ground Level
NA = Not Applicable
NR = Not Requested
DUP = Duplicate

000031

TABLE A-9

CHEMICALS DETECTED IN GLACIAL TILL WELLS COMPARED TO BACKGROUND VALUES

Chemical	Units	Concentration Detected in Wells During this Study	Concentrations Detected During Background Study[a]
Bromide	μg/L	<100 - 4640	NA
Chloride	mg/L	0.08 - 27.4	1.4 - 50
Sulfate	mg/L	<0.3 - 1100	3.24 - 175
Magnesium	mg/L	39.8 - 290	7 - 220
Alkalinity	mg/L	3 - 42000	NA
Nitrate/Nitrite	μg/L	<0.1 - 4.02	0.012 - 0.30
Phosphate	μg/L	55.6 - 518	26 - 180

[a]Background study report in "Characterization of Background Water Quality for Streams and Groundwater," Fernald Environmental Management Project, Fernald, Ohio. May 1993.

NA = Not analyzed.

A.2.4.2 Results

The results from the K_d study are discussed in Section A.6. The radionuclide results are shown on Table 2-10. The total uranium range is from 1.6 mg/kg to 3.7 mg/kg (for reference, the established FEMP 95th percentile background level for total uranium is 3.4 mg/kg).

A.3 LYSIMETER INSTALLATION, SAMPLING AND ANALYSIS

A.3.1 Objectives

Eight lysimeters were installed and sampled. The primary objective was to determine the nature and concentration of uranium in the vadose zone of the till and the unsaturated GMA for the eastern site and for an off-site location. Lysimeters were used instead of wells since lysimeters can collect samples from unsaturated areas. The data from the off-site location were intended to establish background lysimeter uranium concentrations. Tritium analyses were performed for the vadose zone to estimate the relative age of the perched water with depth. Bromide was added as an environmental tracer to the lysimeter

TABLE A-10

RADIONUCLIDE RESULTS FOR SOIL FROM WELL BORINGS

Well #	Surface Elevation above MSL (feet)	Sample Interval (feet) BGL	Total U (mg/kg)	U 238 (pCi/g)	U 235/236 (pCi/g)	U 234 (pCi/g)	TCLP Total U (ug/L)	TCLP U 238 (pCi/L)	TCLP U 235/236 (pCi/L)	TCLP U 234 (pCi/L)
NEST I										
11491	611.13	13	3.15 J	0.881 J	0.031 J	0.847 J	2.97 J	2.02 J	0.055 J	3.05 J
		13.5	3.21 J	0.949 J	0.043 U	0.678 U	4.46 J	3.20 J	0.12 J	5.01 J
		27.0 - 29.0	1.89 J	1.06 J	0.052 U	1.01 -	10.92 J	6.90 J	0.332 J	9.88 J
11492	610.53	20.0	2.47 J	0.900 J	0.057 U	0.981 -	2.97 J	2.97 J	0.068 J	3.79 J
NEST II										
11493	603.38	13.0 - 13.5	2.82 -	0.822 J	0.088 J	0.686 -	5.95 J	2.52 J	0.081 J	3.81 J
		13.5 - 14.0	3.32 -	1.12 J	0.032 U	0.947 -	9.84 J	3.72 J	0.120 J	4.98 J
		21.0	2.04 J	0.805 J	0.017 U	0.987 -	8.52 J	3.52 J	0.127 J	5.55 J
11494	603.51	11.0 - 11.5	1.77 J	0.826 J	0.023 U	0.767 -	6.15 J	3.02 J	0.074 J	4.73 J
11495	603.68	33.0	2.64 J	1.05 J	0.018 U	0.969 -	17.48 J	4.36 J	0.155 J	8.04 J
NEST III										
11496	602.65	8.0 - 8.5	2.57 -	0.751 J	0.045 J	0.831 J	5.12 J	1.95 J	0.127 J	2.99 J
		8.5 - 9.0	3.04 -	1.00 J	0.050 U	0.894 J	7.19 J	2.71 J	0.144 J	4.59 J
		13.0	1.94 J	0.605 J	0.051 U	0.599 -	5.71 J	2.70 J	0.157 J	4.60 J
11497	602.34	30.0 - 32.0	1.99 -	0.947 -	0.022 U	0.98 -	10.26 J	3.61 J	0.325 J	5.94 J
		30.0 - 32.0 Dup	2.00 -	0.86 -	0.016 U	0.881 -	NA	NA	NA	NA

TABLE A-10
(Continued)

Well #	Surface Elevation above MSL (feet)	Sample Interval (feet) BGL	Total U (mg/kg)	U 238 (pCi/g)	U 235/236 (pCi/g)	U 234 (pCi/g)	TCLP Total U (ug/L)	TCLP U 238 (pCi/L)	TCLP U 235/236 (pCi/L)	TCLP U 234 (pCi/L)
NEST IV										
11498	594.6	6.5 - 7.0	2.69 J	0.846 J	0.082 J	1.03 J	4.64 J	2.03 J	0.077 J	2.39 J
		7.0 - 7.5	2.74 J	0.937 J	0.039 J	0.963 J	5.93 J	2.77 J	0.191 J	3.80 J
		30.0	1.77 -	0.898 J	0.021 U	0.799 -	7.20 J	3.53 J	0.130 J	4.99 J
11499	594.68	18.0	1.69 -	0.704 J	0.06 U	0.845 -	10.29 J	3.31 J	0.294 J	5.45 J
NEST V										
11546	598.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
11500	598.93	10.5 - 11.0	NA	NA	NA	NA	0.010 UJ	2.33 J	0.10 J	3.60 J
		11.0 - 12.0	3.18 -	1.16 -	0.06 J	1.13 -	NA	NA	NA	NA
		12.0 - 12.5	2.59 -	0.757 -	0.015 U	0.825 -	NA	NA	NA	NA
		12.5 - 13.0	NA	NA	NA	NA	7.59 J	2.76 J	0.0156 J	4.62 J
		21.0 - 22.0	1.92 J	0.829 J	0.019 U	0.809 -	6.94 J	2.99 J	0.154 J	4.13 J
11501	598.97	35.0	2.24 J	0.804 J	0.022 U	1.08 -	7.30 J	2.79 J	0.178 J	4.81 J
NEST VI										
11502	593.79	13.0 - 13.5	3.57 -	1.03 J	0.042 J	0.645 -	3.91 J	4.53 J	0.144 J	6.36 J
		13.5 - 14.0	3.35 -	0.968 J	0.056 U	0.837 -	2.40 J	5.35 J	0.238 J	7.63 J
		21.0	1.96 J	1.11 J	0.042 U	0.865 U	5.35 J	3.81 J	0.135 J	6.20 J
11503	593.47	27.0	1.92 J	1.01 J	0.073 J	0.983 -	27.53 J	10.5 J	0.725 J	13.30 J

000044

TABLE A-10
(Continued)

Well #	Surface Elevation above MSL (feet)	Sample Interval (feet) BGL	Total U (mg/kg)	U 238 (pCi/g)	U 235/236 (pCi/g)	U 234 (pCi/g)	TCLP Total U (ug/L)	TCLP U 238 (pCi/L)	TCLP U 235/236 (pCi/L)	TCLP U 234 (pCi/L)
NEST VII										
11504	590.02	14.0 - 15.0	2.88 -	1.02 J	0.041 U	0.84 -	3.14 J	2.06 J	0.122 J	2.89 J
		15.0 - 16.0	2.96 J	0.939 J	0.021 U	1.36 -	NA	NA	NA	NA
		15.0 - 16.0	3.71 -	0.941 J	0.035 J	1.09 -	NA	NA	NA	NA
		16.0 - 18.0	1.59 J	0.706 J	0.022 U	0.706 -	2.89 J	2.24 J	0.128 J	3.39 J
11505	590.08	25.0 - 27.0	2.00 J	1.38 J	0.051 J	1.06 -	3.15 J	2.16 J	0.058 J	3.12 J
NONNESTED										
11547	588.22	NA	NA	NA	NA	NA	NA	NA	NA	NA
11548	585.72	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note:
(1) Wells 11546, 11547, 11548 were added as contingency wells to better define the hydrogeologic conditions of the brown/gray till interface, and environmental soil samples were not taken from these locations.

MSL = Mean Sea Level
BGL = Below Ground Level
NA = Not Applicable

installation water. Samples were analyzed for bromide and chloride to determine when the lysimeters reach equilibrium. A secondary objective was to establish general chemical properties for the groundwater collected from the vadose zone.

A.3.2 Procedures and Completed Field Activities

Locations for the lysimeters are shown in Figure A-12. These locations were selected using three-dimensional solid block modeling (Section 3.2) of the analytical data from the SED and the data collected from CPT. Some of the lysimeters were placed in clusters to monitor the fluid characteristics at multiple depths at one location. There are three on-site locations which include two nested lysimeters, one stand-alone lysimeter, and one off-site location with three lysimeters. The lysimeters were installed using hand-augers and Rotasonic™ drilling, and were completed to depths summarized in Table A-11. General drilling practices were in accordance with the SCQ.

The lysimeters are a two-inch diameter vacuum/pressure soil pore water samplers. Lysimeters allow water to enter a micro-porous cup at the instrument's base by means of capillary forces or vacuum. The cup is attached to an 18-inch polyvinylchloride (PVC) cylindrical body with full-depth riser and a PVC head. The lengths of the nylon tubing extend from the lysimeter body through the riser head at the surface and are used for vacuum extraction and pressure sampling. The sample tube extends from the head through the lysimeter to a point just in contact with the inside base of the lysimeter. The vacuum extraction tube extends into the lysimeter to a point approximately three inches below the inside of the cap.

Prior to installation, the lysimeter and associated tubing were decontaminated, tested, and installed according to the manufacturer's specifications and SCQ procedures. The lysimeter components were assembled and installed with a full-depth, two-inch PVC riser screwed onto the lysimeter body to house the nylon tubing. The tubing was measured and cut to allow approximately two feet of riser above the surface. A three- to six-inch-thick slurry of silica flour and distilled water was tremied into the open borehole. Prior to making the slurry mixture, the composite silica flour was sampled and submitted for analysis for total and isotopic uranium, and grain size analysis. A bromide indicator was added to the water that was used in slurry production so that the influence of the added water on the sample could be assessed. The lysimeter and riser were gently lowered into the boring and secured at the surface to prevent floating.

Additional slurry was placed two to four inches above the top of the ceramic tip of the lysimeter. At that point, 80/100 mesh sand was poured to a minimum of three to six inches above the top of the lysimeter, followed by a column of Volclay grout to within three feet of the surface, then a bentonite seal. This grout was placed with a tremie line and will prohibit perched water from draining into the lysimeter zone.

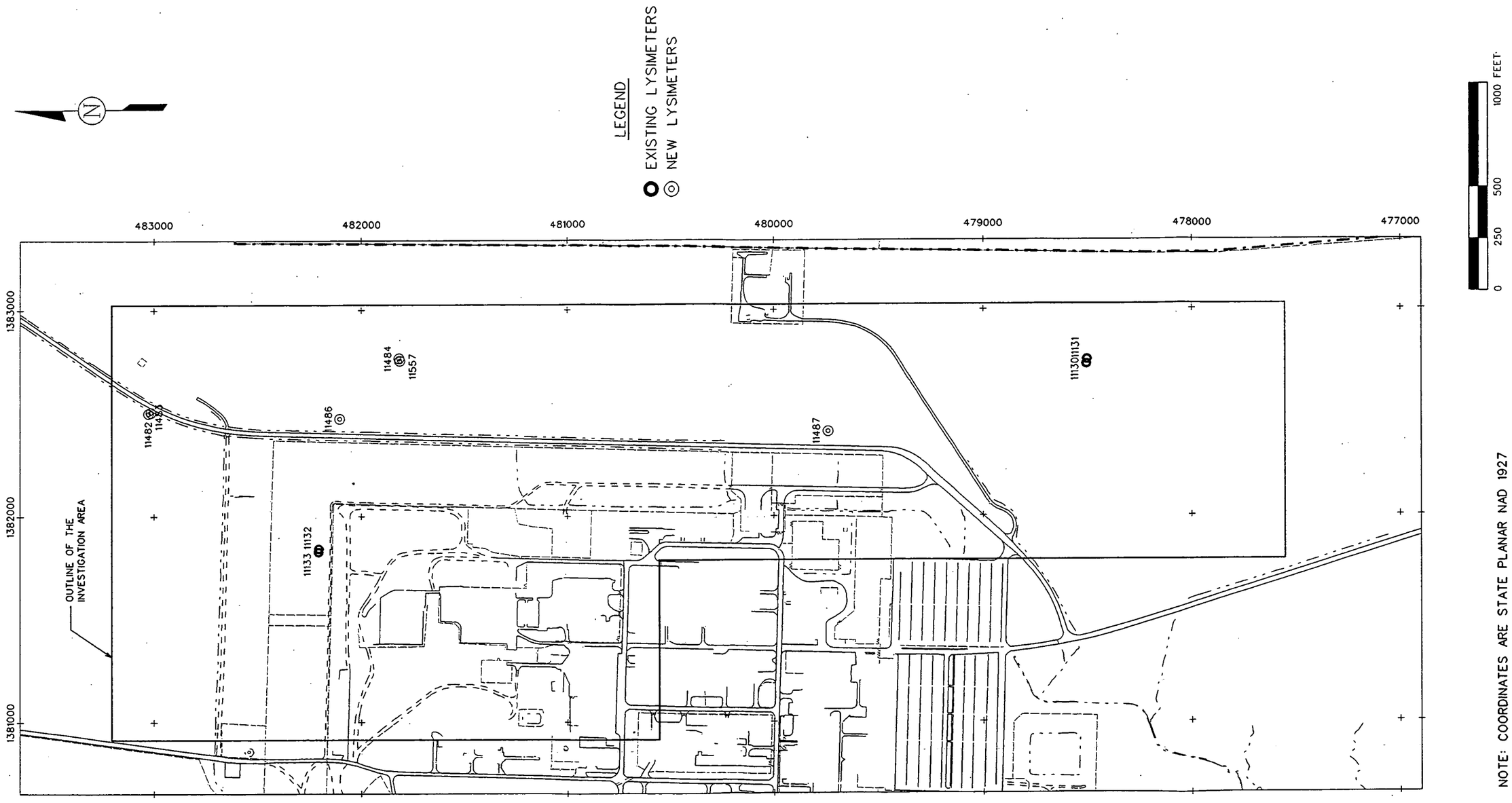
Bromide was added to the slurry as a tracer at a concentration of 50 parts per million (ppm) and was used to determine when to perform the final round of sampling. Uranium analysis was conducted on the final round of sampling to assess potential impacts from previous production activities. Tritium samples were collected and analyzed to assist in estimating the approximate age of the water in the vadose zone. The other analytical results were used in a comparison with the general chemistry of the perched groundwater collected from the wells installed for this investigation.

Sample recovery from the lysimeter was in accordance with manufacturer's instructions, general SCQ protocol, and American Society for Testing Methods (ASTM) D4696-92. After satisfactory installation of each lysimeter, a vacuum hand pump was used to lift the sample into the holding chamber of the lysimeter. Pressure was gently increased to lift the sample into the sample container.

All samples and measurements were collected, handled, documented, shipped, and validated according to SCQ protocol. A comparison of actual samples collected versus those planned is presented in Appendix H.

A.3.3 Water Sampling and Results

After installing and purging the new lysimeters, four rounds of samples were collected. Samples collected during the first three rounds were analyzed for bromide, chloride, sulfate, magnesium, and alkalinity (Table A-12, Lysimeters 11482 through 11559). The results of the analyses were used to determine when, or if, the bromide concentration was approaching background or equilibrium. Also, existing lysimeters were sampled for the same aforementioned parameters, which assisted in determining equilibrium concentrations (Table A-12, Lysimeters 11129 through 11134). When purge volumes for the new lysimeters reached equilibrium, a final round of sampling was conducted for the aforementioned parameters, and total uranium and tritium (Table A-13). A bromide detection limit of 0.1 ppm indicates that installation water had diluted to as low as 0.2% of its original concentration. Samples from the existing lysimeters did not detect bromide above 0.1 ppm. The bromide concentrations in the new lysimeters indicated that Lysimeters 11486 and 11488 were purged completely of water used during



FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

EXISTING AND NEW LYSIMETER LOCATIONS

000048

DATE 3-20-95
DRAWN R. WILLIAMS

FIGURE A-12

FILE NAME: /2ccs1/dgn/map/hor/dpth/ph20013.dgn

TABLE A-11

PRE-DESIGN INVESTIGATION LYSIMETER COMPLETION DEPTHS

Lysimeter	Northing (27)	Easting (27)	Ground Surface (feet) MSL	B/G Interface (feet) BGL	Bottom of Boring (feet) BGL	Lysimeter Depth (feet) BGL
11129	478223.14	1378790.47	566.3	7.0	22.5	22.0
11130	478511.04	1382733.42	592.8	11.0	23.0	22.5
11131	478508.32	1382755.64	592.8	11.0	39.0	36.0
11132	482206.62	1381840.99	591.5	10.0	27.0	26.0
11133	482207.87	1381825.52	591.5	10.0	49.0	48.0
11234	478223.42	1378773.37	566.6	7.0	15.8	14.0
11482	483014.42	1382497.15	610.68	-	7.0	5.0
11483	483025.66	1382500.45	611.07	12.0	40.0	34.5
11484	481816.79	1382765.73	598.86	11.2	40.0	37.5
11557	481813.29	1382745.76	598.89	-	8.0	6.6
11486	482104.79	1382474.03	602.31	16.0	39.0	36.5
11487	479740.98	1382409.74	584.99	16.0	27.0	26.5
BACKGROUND LYSIMETERS						
11488	482819.92	1375993.84	579.84	-	7.0	7.0
11558	482821.93	1375959.49	579.99	11.3	47.0	33.5
11559	482819.05	1376008.82	580.22	12.2	48.0	45.5
DELETED BACKGROUND LYSIMETERS						
11489	482819.81	1375991.80	579.87	9.0	37.0	36.0
11490	482820.02	1375989.04	579.92	9.0	48.0	46.5

MSL = Mean Sea Level
BGL = Below Ground Level
B/G = Brown/Gray Till Interface

000049

TABLE A-12

LYSIMETER WATER CHEMICAL RESULTS

ROUND 1

Lysimeter #	Ground Elevation above MSL (feet)	Lysimeter Depth (feet) BGL	Total U * (μg/L)	Bromide (μg/L)	Chloride (mg/L)	Sulfate (mg/L)	Magnesium (μg/L)	Alkalinity (mg/L)
11482	610.68	5.0	NA	11700	23.5	520	TBR	TBR
11483	611.07	34.5	NA	390 J	42.1 -	177 -	52200	450 -
11484	598.86	37.5	NA	2160 -	7.46	213 -	44100	428 -
11486	602.31	36.5	NA	<100	4.01	11.1	43100	392
11488	579.84	7.0	NA	663 -	15.6	99.2	30700	302
11557	598.89	6.6	NA	2688	3.85	81.8	49100	348
11558	580.22	33.5	1.8 NV	27600 -	31.1 -	1040 -	23700	258 J
11559	579.99	45.5	4.6 NV	5820	26.7	678	43400	382
11129	566.30	22.0	NA	100 U	25.9 -	412 -	67400 -	252 J
11130	592.80	22.5	NA	100 U	4.7 -	90.9 -	59500 -	476 J
11131	592.80	36.0	NA	100 U	10.1 -	323 -	67300 -	592 J
11132	591.50	26.0	NA	100 U	3.67 -	85.3 -	55000 -	390 J
11133	591.50	48.0	NA	100 U	3.19 -	256 -	78000 -	488 J
11234	566.66	14.0	NA	100 U	6.64 -	109 -	40900 -	434 J

TABLE A-12
(Continued)

ROUND 2

Lysimeter #	Ground Elevation above MSL (feet)	Lysimeter Depth (feet) BGL	Total U (μg/L)	Bromide (μg/L)	Chloride (mg/L)	Sulfate (mg/L)	Magnesium (μg/L)	Alkalinity (mg/L)
11482	610.68	5.0	NA	8700	17.1 J	498 J	28400	260 J
11483	611.07	34.5	NA	359	43.4	172	61300	422
11484	598.86	37.5	NA	3534	8.37	184	44700	424
11486	602.31	36.5	0.3 NV	<100	3.43	11.3	TBR	372
11488	579.84	7.0	NA	390	18.2	60.4	29100	302
11557	598.89	6.6	NA	4074	5.15	80.2	48300	348
11558	580.22	33.5	NA	TBR	TBR	TBR	TBR	TBR
11559	579.99	45.5	NA	2667	25.5	718	41800	412
11129	566.30	22.0	NA	100 U	21.8 U	235 -	64600 -	190 -
11130	592.80	22.5	NA	100 U	42.6 -	98.9 -	55400 -	460 -
11131	592.80	36.0	NA	100 U	9.65 -	322 -	52700 -	616 -
11132	591.50	26.0	NA	100 U	3.88 -	87.7 -	46500 -	378 -
11133	591.50	48.0	NA	100 U	3.06 -	255 -	69500 -	470 -
11234	566.60	14.0	NA	100 U	5.77 -	114 -	36500 -	342 -

0000051

TABLE A-12
(Continued)

ROUND 3

Lysimeter #	Ground Elevation above MSL (feet)	Lysimeter Depth (feet) BGL	Total U (μg/L)	Bromide (μg/L)	Chloride (mg/L)	Sulfate (mg/L)	Magnesium (μg/L)	Alkalinity (mg/L)
11482	610.68	5.0	NA	5629	22.1	542	32900	272
11483	611.07	34.5	0.5 NV	<100	57.9	181	63000 -	TBR
11484	598.86	37.5	NA	3029	7.52	216	TBR	TBR
11486	602.31	36.5	NA	100 U	3.58 -	13.8 -	47700	390 -
11488	579.84	7.0	1.7 NV	<100	16.4	64.7		TBR
11557	598.89	6.6	NA	5184		TBR	TBR	TBR
11558	580.22	33.5	NA	TBR	TBR	TBR	TBR	TBR
11559	579.99	45.5	12.0 NV	1964	26.8	828		TBR

TABLE A-12
(Continued)

FINAL ROUND

Lysimeter #	Ground Surface above MSL (feet)	Lysimeter Depth (feet) BGL	Bromide (ug/L)	Chloride (mg/L)	Sulfate (mg/L)	Magnesium (ug/L)	Alkalinity (mg/L)	Nitrate/ Nitrite (mg/L)	Total Phosphorus (ug/L)
11482	610.68	5.0	2560	16.2	401	37200	302	5.07	301
11483	611.07	34.5	<100	47.8	169	60800	468 -	<0.200	140
11484	598.86	37.5	1209	6.37	335	65400	404	117	263
11486	602.31	36.5	TBR	TBR	TBR	TBR	TBR	TBR	TBR
11488	579.84	7.0	100 U	31.6 -	156 -	27700 -	302 -	0.100 U	92.7
11557	598.89	6.6	2623 -	5.06 -	175 -	44300 -	357 -	0.223 -	340 -
11558	580.22	33.5	TBR	TBR	TBR	TBR	TBR	TBR	TBR
11559	579.99	45.5	609	26.4	504	44300	484	1.470	201
11130	592.80	22.5	100 U	3.68 -	82.5 -	60800 -	465 -	0.636 -	51.8 -
11132	591.50	26.0	100 U	3.90	85.3	39200	400	TBR	TBR

MSL = Mean Sea Level
BGL = Below Sea Level
* = Pre-development Sample
TBR = To Be Received
NA = Not Analyzed

000053

TABLE A-13

LYSIMETER WATER RESULTS FOR TOTAL URANIUM, ISOTOPIC URANIUM, AND TRITIUM

FINAL ROUND

Lysimeter #	Ground Surface above MSL (feet)	Lysimeter Depth (feet) BGL	Total U (ug/L)	U 238 (pCi/L)	U 235/236 (pCi/L)	U 234 (pCi/L)	Tritium (tu)
11482	610.68	5.0	22.0	6.70	0.38	15.0	NA
11483	611.07	34.5	0.52	0.14	0.0063	0.45	4.49
11484	598.86	37.5	2.90	0.82	0.044	1.3	TBR
11486	602.31	36.5	0.40	TBR	TBR	TBR	TBR
11488	579.84	7.0	1.88 -	0.731 J	0.05 J	1.16 J	9.8
11557	598.89	6.6	10.8 -	2.95 J	0.165 -	3.26 -	12.7
11558	580.22	33.5	32.0	TBR	TBR	TBR	NA
11559	579.99	45.5	23.62 -	6.03 J	0.393 -	15.2 J	10.0
11130	592.80	22.5	2.13 -	0.718 J	0.036 U	0.838 J	5.23
11131*	592.80	36.0	7.40 NV	NA	NA	NA	NA
11132	591.50	26.0	4.20	0.99	0.032	2.10	NA
11133*	591.50	48.0	9.60 NV	NA	NA	NA	NA
11234*	566.66	14.0	3.80 NV	NA	NA	NA	NA

MSL = Mean Sea Level
BGL = Below Ground Level
NA = Not Analyzed
TBR = To Be received
* = Most recent sample collected during the OU5 Ground Water Sampling of the 8 existing lysimeters project.

FER\CRU2\PREDESIGN\TSS\TABA-13\July25, 1995 (9:40am)

000054

installation indicating the final round of sampling will contain water from the vadose zone.

A.3.4 Soil Sampling and Results

During the drilling for the lysimeter installation, soil samples were collected continuously, and described according to ASTM D2488. Soil samples were collected from the interval selected for placement of the lysimeter and analyzed for total uranium, isotopic uranium, TCLP total uranium, and TCLP isotopic uranium. The uranium analytical results assisted in determining the vertical and horizontal extent of uranium contamination and the solubility of detected uranium. All samples were visually described and all sample collection points were surveyed to define the surface elevation and the northing and easting location.

The results of the lysimeter soil sampling are summarized on Table A-14. Total uranium ranged from 1.5 mg/kg to 2.3 mg/kg (for reference, the established FEMP 95th percentile background level for total uranium is 3.4 mg/kg). The TCLP total uranium concentration of these soils ranged from 1.3 μg/L to 9.9 μg/L.

A.4 GEOTECHNICAL BORING INSTALLATION AND SAMPLING

A.4.1 Objectives

Fourteen borings (see Figure A-13) were advanced to collect soil samples to characterize the preliminary engineering properties (geotechnical properties) of the soil for the preliminary design of the disposal facility. These samples were also used to verify existing vertical and horizontal extent of uranium contamination and assist in identifying interbedded granular material. The geotechnical boring locations were determined using data from the SED and data collected during the CPT investigation (Phase I). Geotechnical samples were collected from both the brown and the gray till.

A.4.2 Procedures and Completed Field Activities

Soil samples were collected from 14 soil borings using split-spoon (ASTM D1586) or Shelby tube-type samplers (ASTM D1587). The borings were advanced by truck-mounted, hollow-stem auger drill rig (ASTM D1452). A comparison of samples proposed in the Predesign Investigation Work Plan to the samples actually collected is provided in Appendix H. A summary of tests conducted and their intended

use in the report are provided in Table A-15. A summary of all geotechnical analyses conducted during the Predesign Investigation are provided in Table A-16.

A.4.3 Variances for the Work Plan

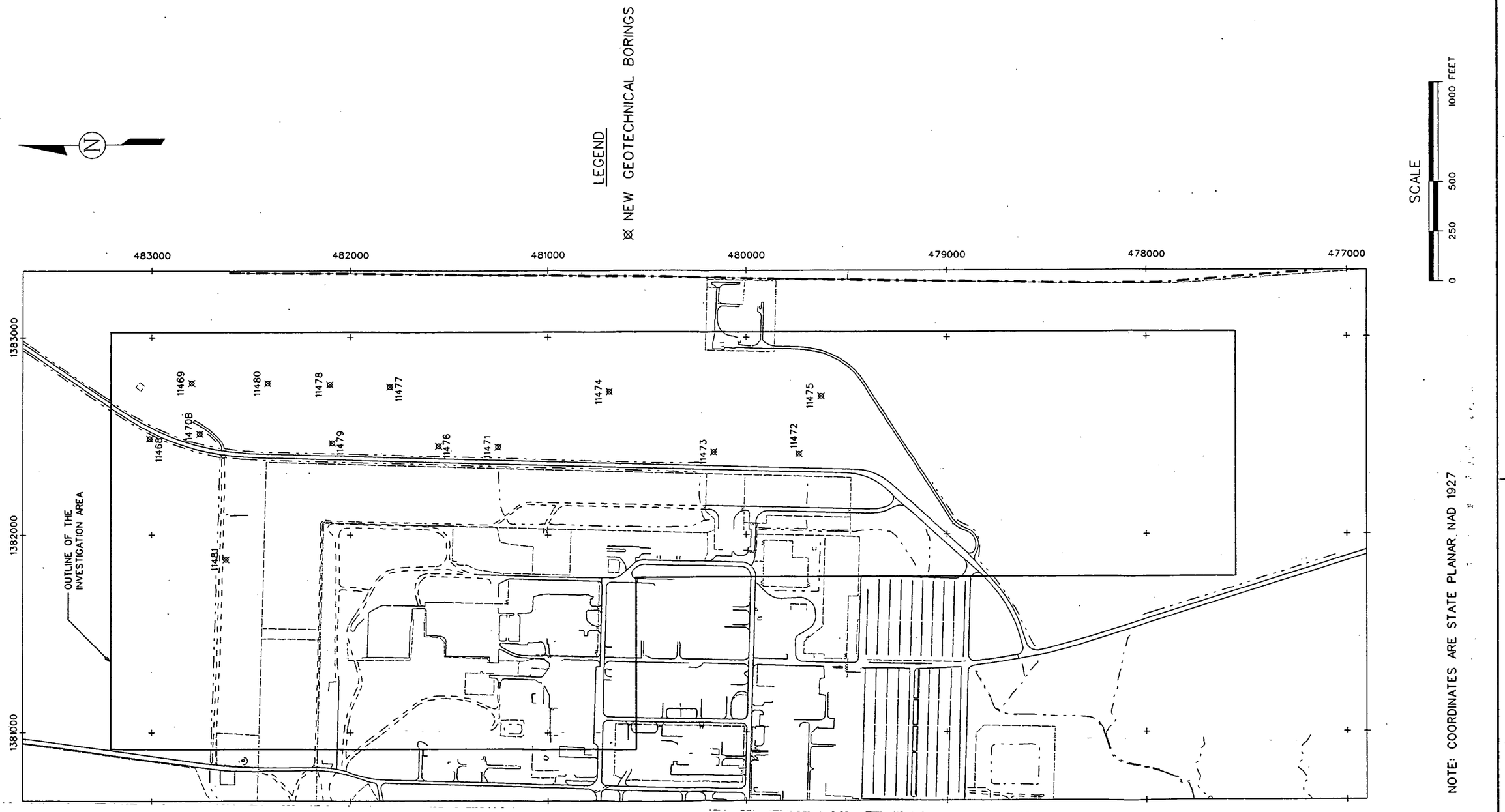
The following sample collection variances from the Work Plan occurred during geotechnical sample collection:

ASTM Method/Description		Proposed Samples	Collected Samples	Variance
D2216	Water Content	91	89	-2
D422	Particle Size Analyses	91	108	+17
D854	Specific Gravity	92	90	-2
D4318	Atterberg Limits	91	116	+25
D698	Compaction	14	14	0
D2435	1-Dimensional Consolidation	8	8	0
D5084	Permeability	28	27	-1
D2937	Unit Weight (1)	91	0	-91
D2435	Remolded Consolidation	0	2	+2
D4767	Triaxial Compressive Strength	0	4	+4
D2166	Unconfined Compressive Strength	0	14	+14

Notes:

(1) Unit weights were measured in D698 and D2435.

A summary table of specific borings and sampling intervals is included in Appendix D. The variances from the work plan were generally to increase the number of analyses, except for unit weight measurements (ASTM 2937). The unit weight measurements were done as part of the compaction (D698) and consolidation (D2435) tests, and were not conducted as a separate test. Therefore, the unit weight test (D2937) was eliminated from the plan.



FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

GEOTECHNICAL BORING LOCATIONS

000057

DATE 3-20-95
DRAWN R. WILLIAMS

FIGURE A-13

FILE NAME: /2ccs1/dgn/map/hor/dpth/ph20012.dgn

TABLE A-14

RADIONUCLIDE RESULTS FOR SOIL FROM LYSIMETER BORINGS

Lysimeter #	Surface Elevation above MSL (feet)	Sample Interval (feet) BGL	Total U (mg/kg)	U 238 (pCi/g)	U 235/236 (pCi/g)	U 234 (pCi/g)	TCLP Total U (ug/L)	TCLP U 238 (pCi/L)	TCLP U 235/236 (pCi/L)	TCLP U 234 (pCi/L)
LOCATION I										
11482	610.68	6.5 - 7.0	2.02	0.893 -	-0.011 U	0.803 -	4.23 J	2.43 J	0.079 J	3.21 J
11483	611.07	39.5	2.04 -	1.06 -	0.011 UJ	0.914 -	4.42 J	3.2	0.067 J	5.08 J
LOCATION II										
11484	598.86	36.0 - 37.0	2.32 -	0.829 -	0.021 U	0.925 -	7.01 J	4.09 J	0.205 J	5.44 J
11485	598.9	7.0 - 8.0	2.17 -	1.22 -	0.071 J	1.10 -	1.26 J	1.08 J	0.049 J	1.03 J
11557	598.89	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOCATION III										
11486	602.31	36.5 - 37.0	2.33 -	0.948 -	0.010 U	0.718 -	4.36 J	5.56 J	0.216 J	6.68 J
LOCATION IV										
11487	584.99	26.0 - 26.5	2.01 -	0.900 -	0.015 U	0.665 -	4.94 J	3.48 J	0.137 J	5.90 J

See footnotes at end of table

FER\CRU2\PREDESIGN\TDO\TABA-14\July 25, 1995 (1:21pm)

000058

TABLE A-14
(Continued)

Lysimeter #	Surface Elevation above MSL (feet)	Sample Interval (feet) BGL	Total U (mg/kg)	U 238 (pCi/g)	U 235/236 (pCi/g)	U 234 (pCi/g)	TCLP Total U (ug/L)	TCLP U 238 (pCi/L)	TCLP U 235/236 (pCi/L)	TCLP U 234 (pCi/L)
LOCATION V										
11488	579.84	6.5 - 7.0	2.03 -	1.08 -	0.035 U	0.882 -	4.76 J	2.96 J	0.127 J	3.14 J
11489	579.87	36.0 - 36.5	2.15 -	0.897 -	0.0725 -	0.764 -	9.91 J	5.09 J	0.15 J	5.59 J
11490	579.92	46.5 - 47.0	1.46 -	0.684 -	0.010 U	0.642 -	5.94 J	3.579 J	0.088 J	3.224 J
11558	580.22	NA	NA	NA	NA	NA	NA	NA	NA	NA
11559	579.99	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note:

(1) Lysimeters 11557, 11558, and 11559 are replacement lysimeters for 11485, 11489, and 11490 respectively. No environmental soil samples were taken from the replacement borings.

MSL = Mean Sea Level
BGL = Below Ground Level
NA = Not Applicable

000059

TABLE A-15

SUMMARY OF GEOTECHNICAL TESTS ON SOIL SAMPLES AND THE INTENDED USE OF THE DATA

ASTM Method	Intended Use
D422	Define sorting and confirm coarse-grained materials and clay behavior.
D4318	Required to establish disposal facility design basis and for development of the Preliminary Design Submittal
D854	Saturation and percentage open area.
D2216	Information required for the engineering design of the disposal facility.
D2166	Information required for the engineering design of the disposal facility.
D4767	Information required for the engineering design of the disposal facility.
D698	Information required for the engineering design of the disposal facility.
D2435	Information required for the engineering design of the disposal facility.
D5084	Undisturbed and remolded permeability used to define potential vertical hydraulic conductivity.
C109	Information required for the engineering design of the disposal facility.

TABLE A-16
SUMMARY OF ASTM PROCEDURES

TEST NO.	TITLE
ASTM D422	Standard Method for Particle Size Analysis for Soils
ASTM D854	Standard Test Method for Specific Gravity of Soils
ASTM D2216	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures
ASTM D4318	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4767	Test Method for Consolidated-Undrained Triaxial Compressive Test on Cohesive Soils
ASTM D5084	Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
ASTM D2435	Test Method for One-Dimensional Consolidation Properties of Soil
ASTM D698	Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D2937	Unit Weight
ASTM D4319	Standard Test Method for Distribution Ratios by the Short-Term Batch Method
ASTM C109	Compressive Strength of Hydraulic Cement Mortars
ASTM C150	Standard Specification for Portland Cement
ASTM D420	Standard Guide for Investigating and Sampling Soil and Rock
ASTM D1452	Standard Practice for Soil Investigation and Sampling by Auger Borings
ASTM D1586	Standard Test Method for Penetrometer Test and Split-Barrel Sampling of Soils
ASTM D1587	Standard Practice for Thin-Walled Tube Sampling of Soils
ASTM D2166	Standard Test Method for Unconfined Compressive Strength of Cohesive Soil
ASTM D2487	Standard Classification of Soils for Engineering Purposes
ASTM D2488	Standard Practice for Description and Identification of Soils
ASTM D3441	Standard Test Method for Deep, Quasi-Static, Cone and Friction Penetration Tests of Soil
ASTM D4696	Standard Guide for Pore-Liquid Sampling from the Vadose Zone
ASTM D4700	Soil Sampling from the Vadose Zone
ASTM D5299	Standard Guide for Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities

A.4.4 Results of Geotechnical Testing

Geotechnical analyses utilized in this study are comprised of Atterberg Limits, particle size measurements, water content measurements, and permeability tests. These data were graphically analyzed to reveal possible relationships between depth, grain size distribution and permeability. Unit weights and measured water content for soils were used to define percent saturation, which was compared to water levels.

Grain size analyses are provided in Appendix D and are summarized in Table A-17. Soil samples were poorly-sorted mixtures of clay and silt with variable percentages of sand and gravel. Silt and clay percentages are displayed on cross sections (Figures A-14 and A-15; Figure A-9 shows the traverses for these sections) to demonstrate the lateral and vertical distribution of the clay and silt. Graphs of percent 'clay plus silt' and 'sand plus gravel,' with depth are provided in Figures A-16 and A-17, These graphs indicate that the upper portion of the brown till (0-10 feet deep) contained significantly less sand and gravel than the gray (Table A-17). The average grain size distribution for samples collected from 10 to 30 feet below ground level is almost constant. Samples below 30 feet show an increase in sand and gravel (Figure A-17). This analysis is consistent with the lithologic soil descriptions which shows that the lithology grades from lean clays near the surface to sandy lean clays with depth.

Water content as a percentage versus the percent of dry weight was calculated for undisturbed soil samples and was plotted versus depth, as shown in Figure A-18. Pore space was calculated and plotted as shown in Figure A-19. The two graphs correlate and indicate that there is significantly more pore space and less water in the soils between 0 and 5 feet below the surface. This factor may be related to the vertical permeability, shown as a plot in Figure A-20. Hydraulic conductivity results range from 1 x 10^{-5} cm/sec to 1 x 10^{-8} cm/sec in samples from above five feet deep but ranged from 1 x 10^{-8} cm/sec to 7 x 10^{-9} cm/sec below five feet deep. This suggests that the permeability of the gray clay, which is lower in the deeper samples, is related to decreasing pore space in the clay.

In addition to geotechnical samples, soil samples were collected for total and isotopic uranium analysis from seven of the geotechnical borings, one from the brown clay and one from the gray clay from each boring, for a total of 14 samples. These data assisted in defining the vertical and horizontal distribution of uranium in the soil of the study area. Total uranium concentrations were from 1.7 mg/kg to 3.4 mg/kg (Table A-18), which is consistent with the established background of 3.4 mg/kg (for reference, the established FEMP 95th percentile background level for total uranium is 3.4 mg/kg.)

A.5 GROUNDWATER ELEVATION AND PRECIPITATION MEASUREMENTS

A.5.1 Objectives

Groundwater levels in monitoring wells and daily precipitation measurements were collected to determine hydraulic gradients in the till and to provided input data for inverse modeling.

A.5.2 Procedures and Field Activities

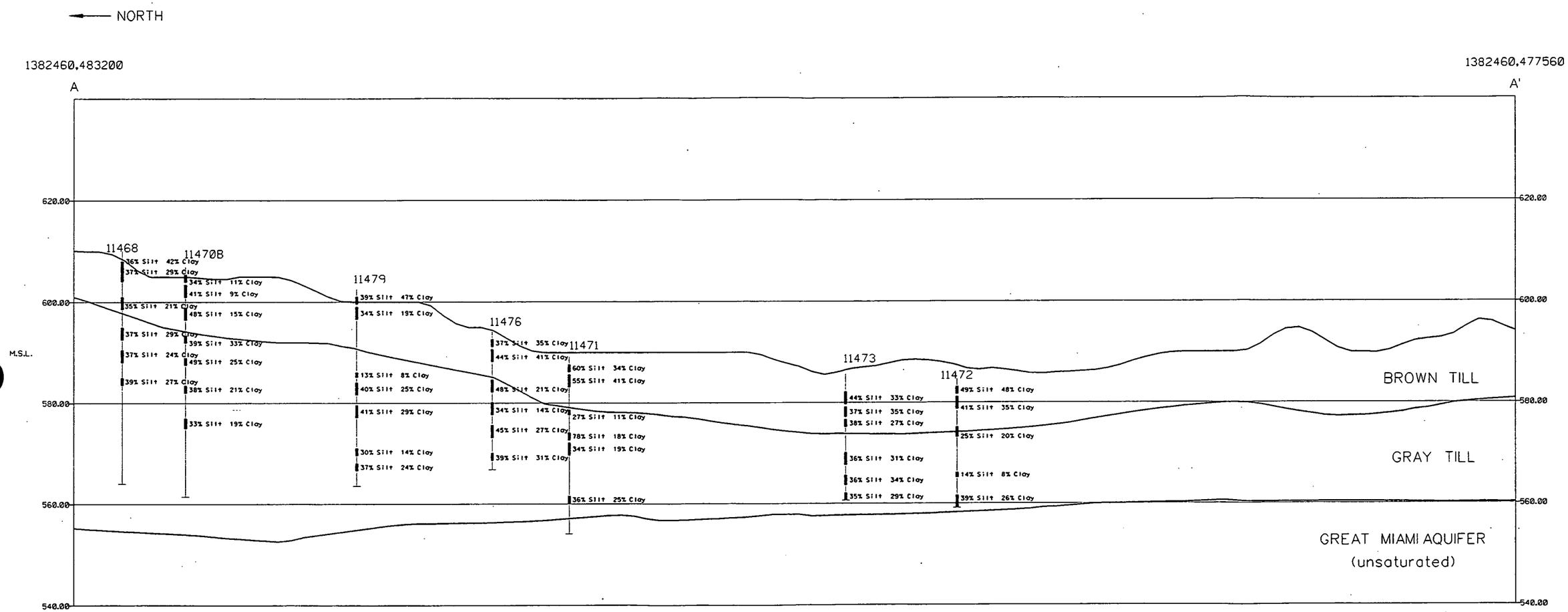
An inverse model was proposed that used measured rainfall data and the corresponding response in selected wells to estimate the hydraulic conductivity of the till. This is called inverse modeling because traditional modeling uses measured values of hydraulic conductivity to predict water level changes. (See Section 3.0 and Appendix I for a detailed description of the inverse modeling.)

To complete the proposed inverse modeling, groundwater elevation data was required from numerous wells within the study area for a relatively long period of time. The following wells that were considered to have potentially rapid responses to precipitation recharge were monitored with transducers and data loggers: 1110, 1112, 1151, 1278, 11230, 1152, 1293, 1274, and 1418. Data loggers collected water levels every hour for a two-month period. Other wells were manually monitored on a regular basis. One manual measurement per week was made, with an additional measurement made one day after rainfall events which exceeded 0.5 inches. These wells include the following: 1274, 1144, 1733, 1843, 1866, 1905, 11067, 1064, 1152, 1160, 1149, 1167, 1124, 1887, 1301, 1293, 1340, 1299, 1276, 11074, 11075, 11491, 11492, 11493, 11494, 11495, 11496, 11497, 11498, 11499, 11500, 11501, 11546, 11547, and 11548. (See Figure A-21).

Groundwater level measurements from wells for each round were collected within a 24-hour period of consistent weather conditions to minimize atmospheric and precipitation effects on groundwater levels. Water level measurements were collected in accordance with the SCQ. All measurements were recorded to the nearest 0.01 feet. All wells were surveyed and their coordinates added to the SED. The water level measurements and precipitation measurements were combined to develop hydrographs for all of the wells. These hydrographs are shown in Appendix C.

A.5.3 Results

The water level measurements for the new wells (shown on Tables A-19 and A-20) demonstrate high vertical hydraulic gradients between adjacent wells (nests) screened at different intervals. The deep wells



LEGEND

SAMPLE INTERVAL

GEOTECHNICAL BORING

HORIZONTAL SCALE: 0 200' 400' 800'

VERTICAL SCALE: 0 10' 20' 40'

NOTE:

COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION

FERMCO

Fernald Environmental Management Project

U.S. DEPARTMENT OF ENERGY

LITHOLOGICAL CROSS-SECTION SECTION A-A'

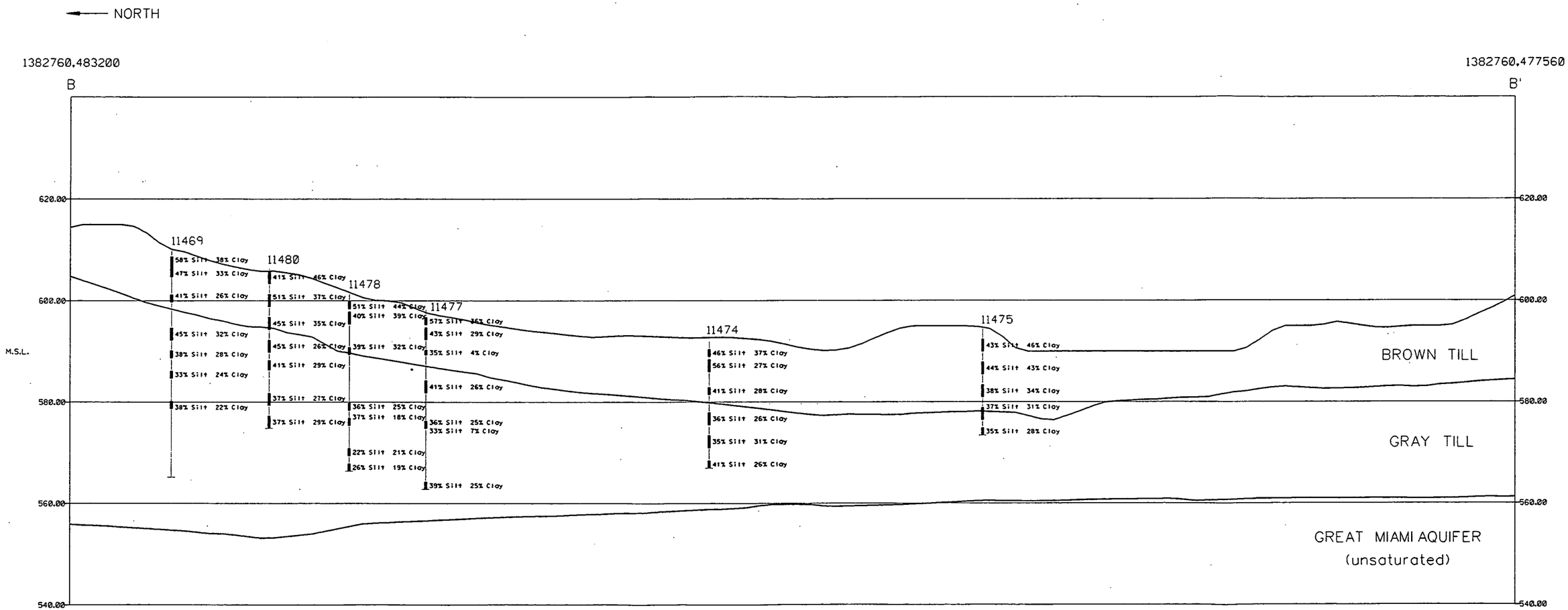
000064

DATE 05/03/95

DRAWN DEG

FIGURE A-14

FILE NAME: /usr/erma5/2ccs1/dgn/sec/geo/dpth/traverse_a.dgn



LEGEND

SAMPLE INTERVAL

GEOTECHNICAL BORING

HORIZONTAL SCALE: 0 200' 400' 800'
VERTICAL 0 10' 20' 40'

NOTE:

COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

LITHOLOGICAL CROSS-SECTION
SECTION B-B'

000065

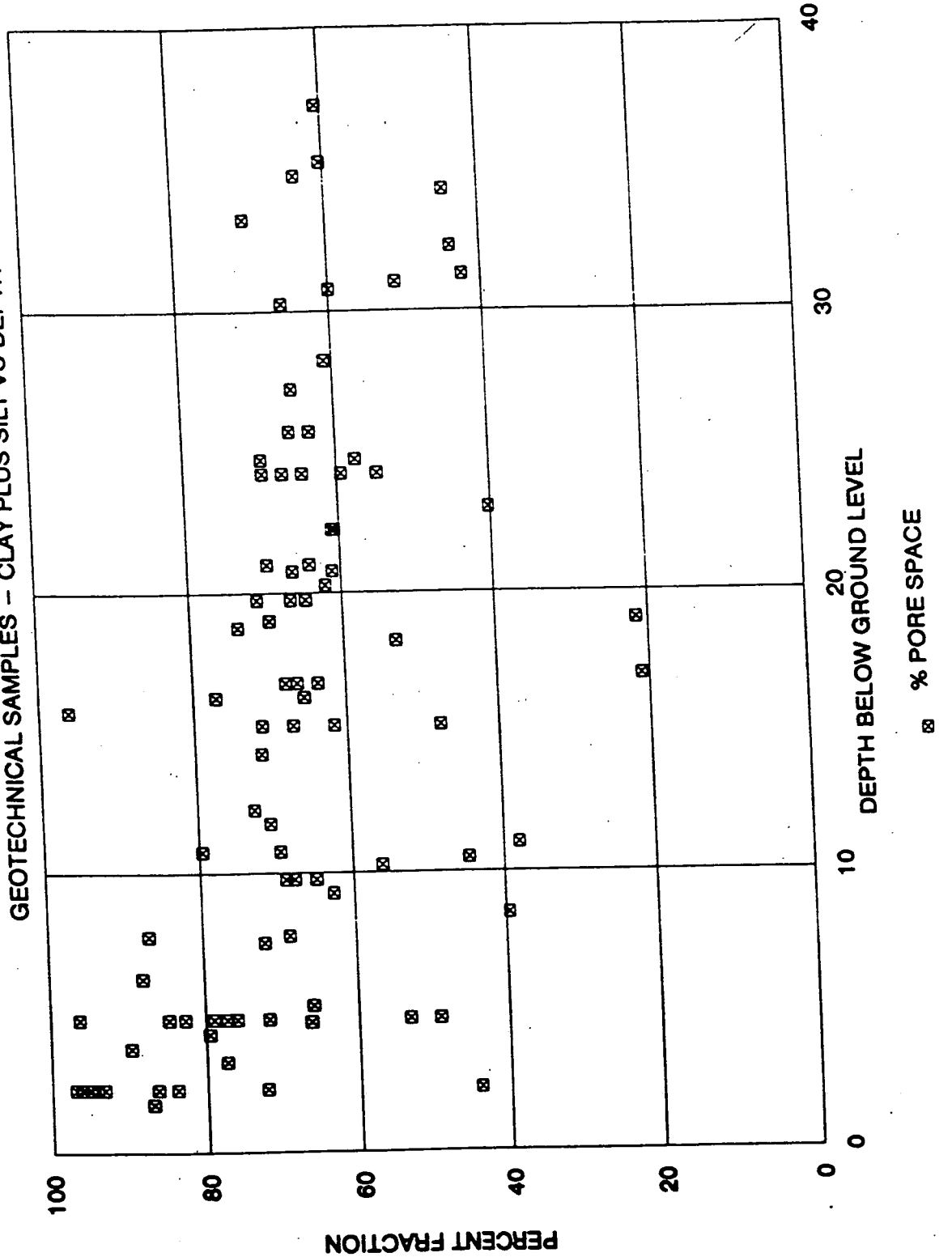
DATE 05/03/95
DRAWN DEG

FIGURE A-15

FILE NAME: /usr/erma5/2ccs1/dgn/sec/geo/dpth/traverse_b.dgn

FIGURE A-16

GEOTECHNICAL SAMPLES – CLAY PLUS SILT VS DEPTH



000066

FIGURE A-17
GEOTECHNICAL SAMPLES - SAND PLUS GRAVEL VS. DEPTH

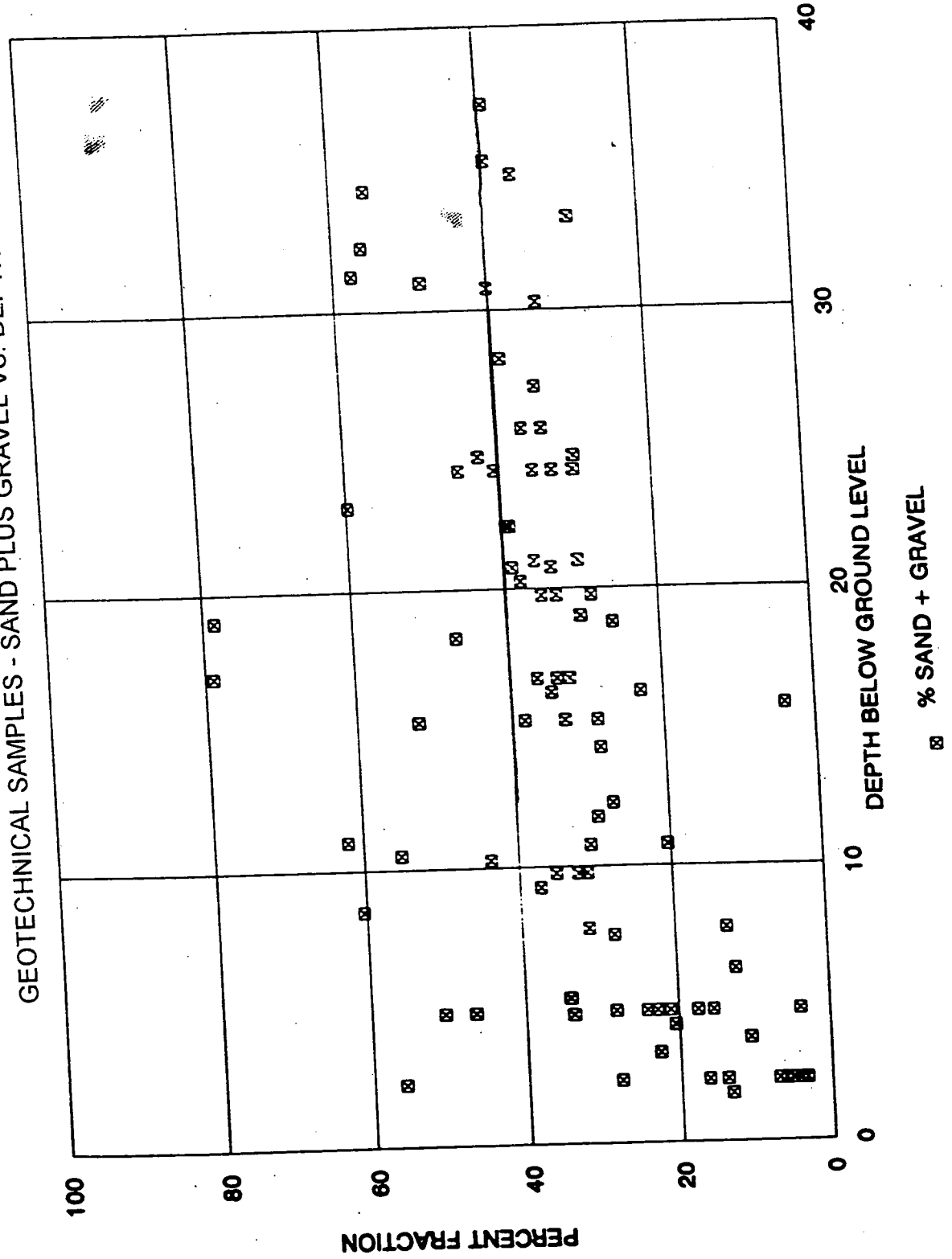


FIGURE A-18
GEOTECHNICAL SAMPLES - WATER CONTENT VS. DEPTH

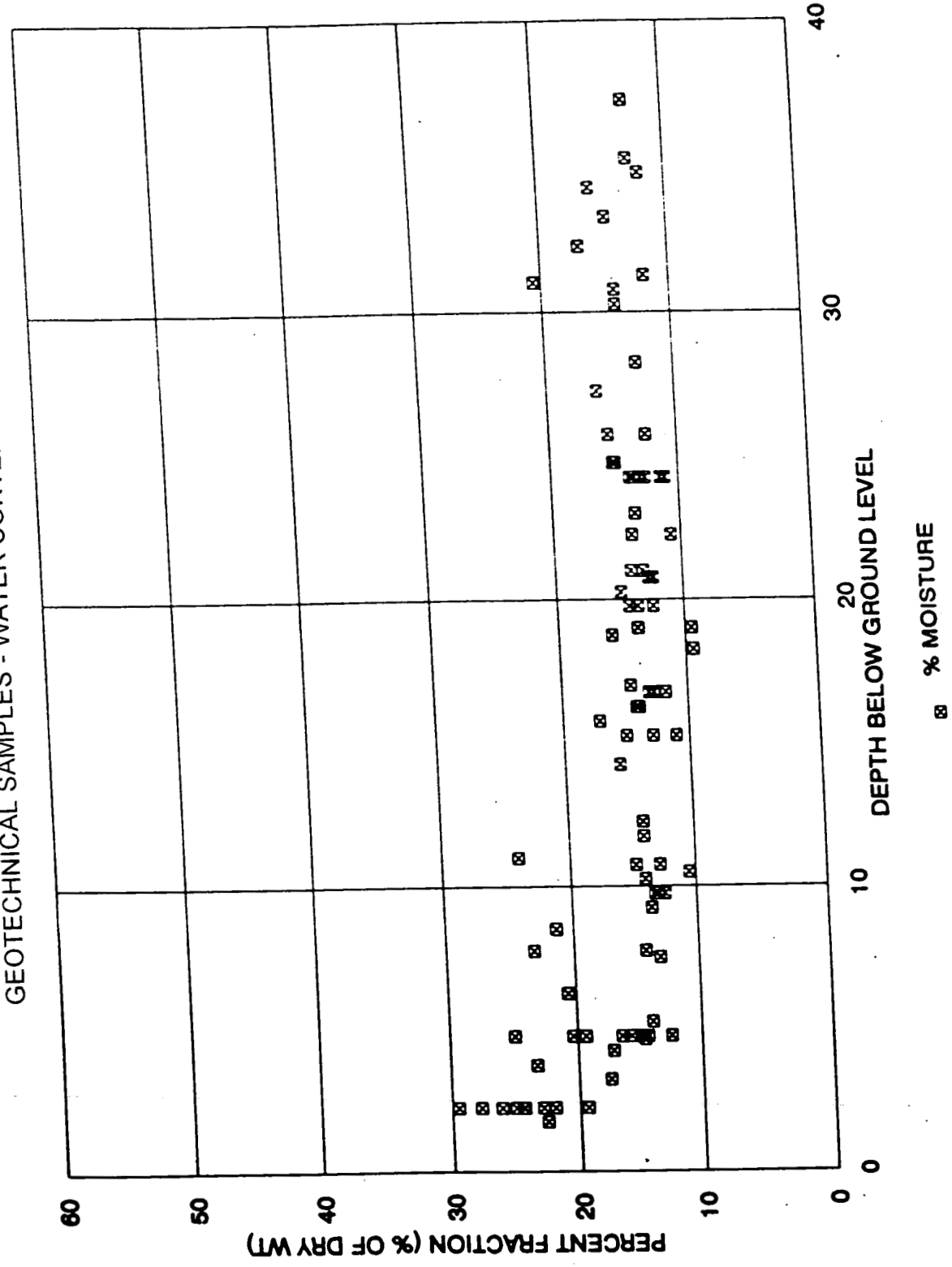
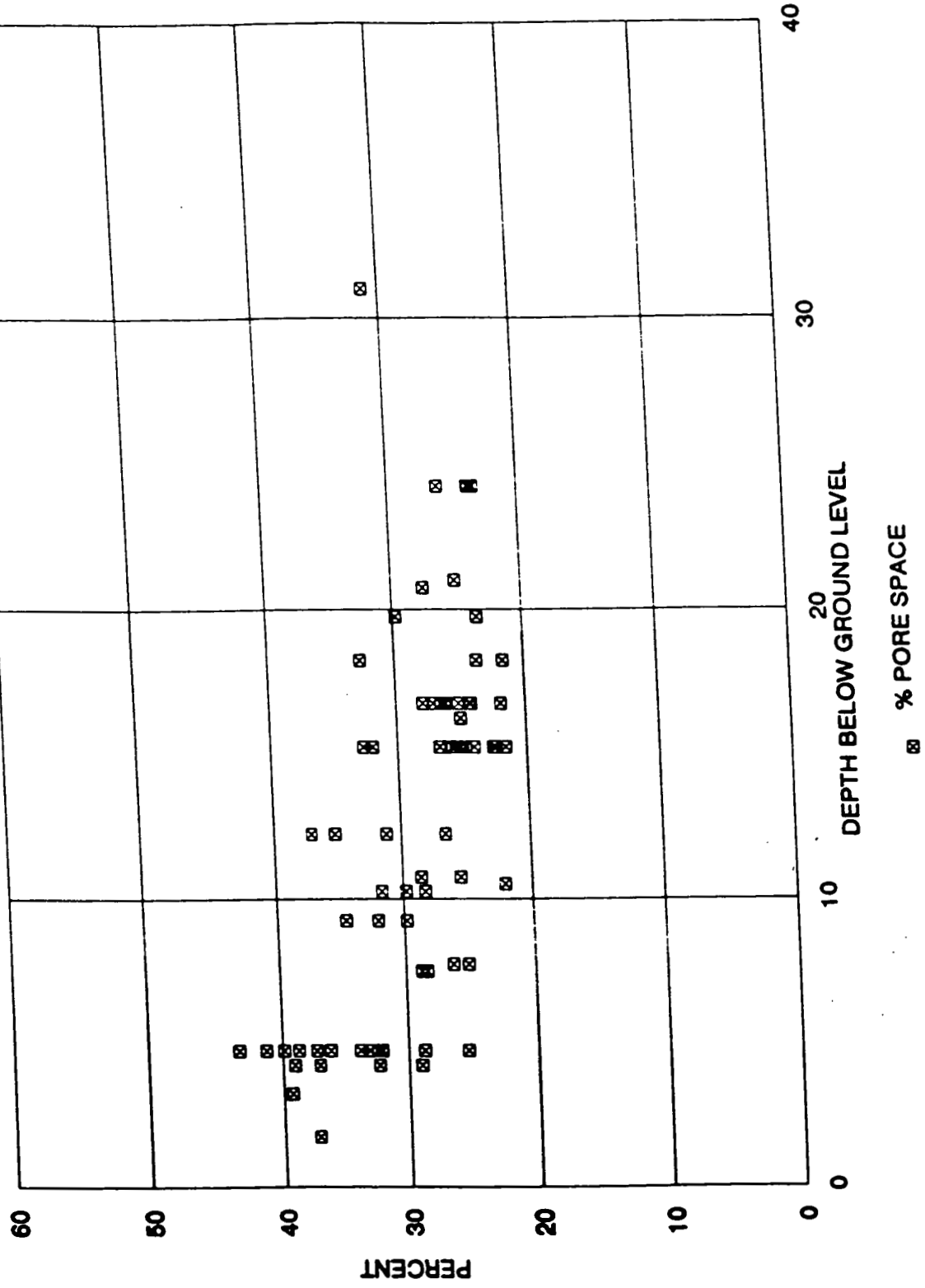
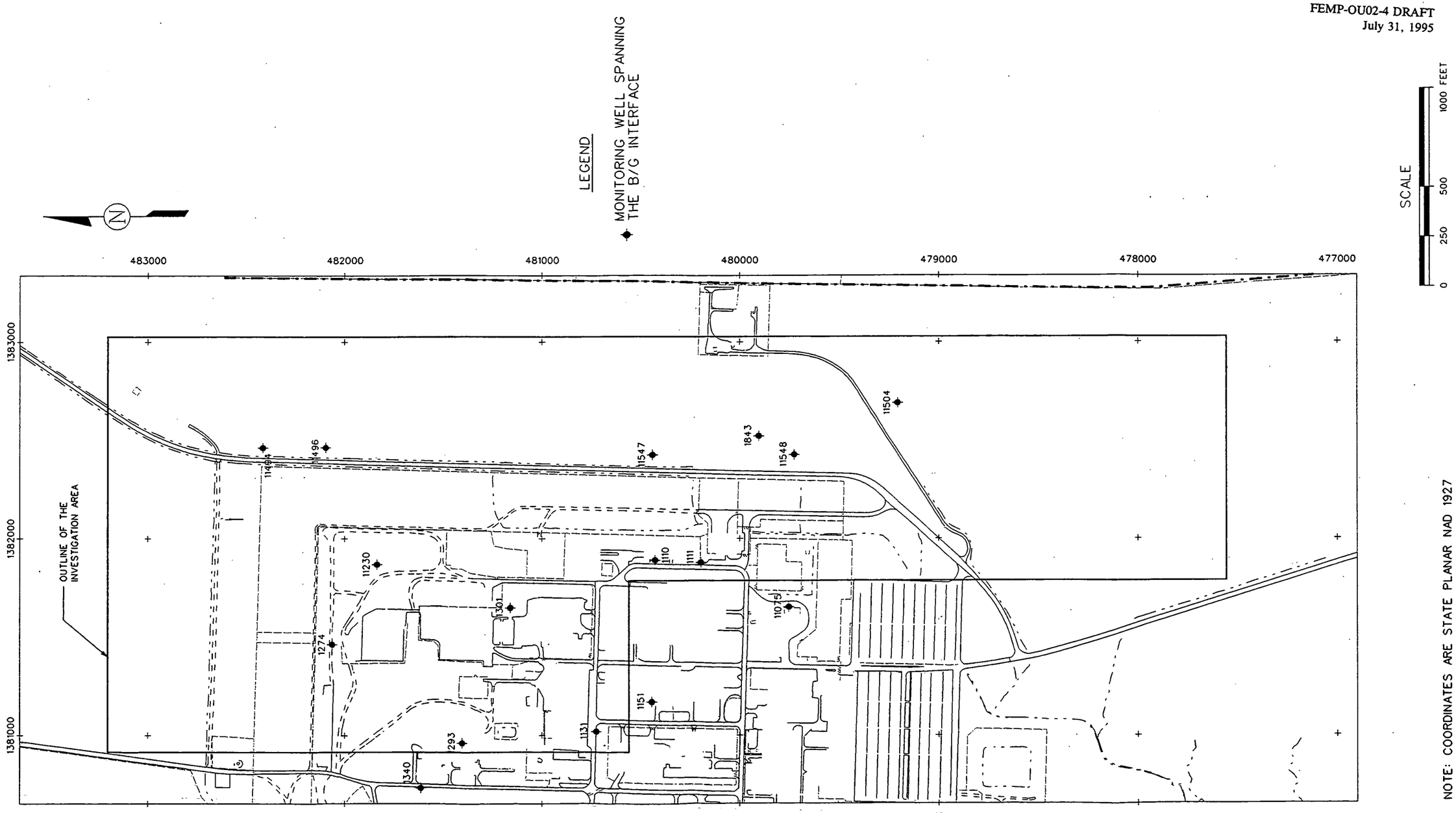


FIGURE A-19
GEOTECHNICAL SAMPLES - PORE SPACE VS. DEPTH





NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

MONIORING WELLS SPANNING THE B/G INTERFACE

000070

DATE 3-20-95
DRAWN R. WILLIAMS

FIGURE A-21

FILE NAME: /2ccs1/dgn/map/hor/dpth/ph20028.dgn

TABLE A-17

SUMMARY OF SOIL CLASSIFICATIONS AND SIZE DISTRIBUTIONS BASED ON GEOTECHNICAL TESTING

Geotech Boring	Depth B.G.L. (ft)	Br/Gr Interface B.G.L. (ft)	USCS Soil Classification	Liquid Limit %	Plastic Limit %	Plastic Index %	Spec. Grav.	Moist. Cont. % Dry Wt.	Gravel %	Sand %	Silt & Clay %	Silt %	Clay %
11468	2.0- 4.5	13.5	Lean Clay W/Sand (CL)	47.2	17.9	29.3	2.72	17.5	3.7	18.9	77.4	35.8	41.6
11468	4.5- 6.0	13.5	Sandy Lean Clay (CL)	31.9	16.1	15.8	2.70	14.0	6.5	27.6	65.9	36.8	29.1
11468	9.0-11.5	13.5	Sandy Lean Clay (CL)	25.5	14.7	10.8	2.74	14.1	2.7	41	56.3	34.9	21.4
11468	15.0-17.5	13.5	Sandy Lean Clay (CL)	28.0	14.7	13.3	2.73	14.0	10.3	24.2	65.5	36.9	28.6
11468	19.5-22.0	13.5	Sandy Lean Clay (CL)	24.1	14.2	9.9	2.76	12.4	13	25.9	61.1	37.2	23.9
11468	25.0-26.5	13.5	Sandy Lean Clay (Cl)	25.3	13.6	11.7	2.70	15.5	6.2	27.8	66.0	38.9	27.1
11469	1.5- 3.0	12.0	Lean Clay (Cl)	45.1	21.1	24.0	2.67	27.7	0	3.9	96.1	58.2	37.9
11469	3.0- 5.5	12.0	Lean Clay W/Sand (CL)	37.1	14.9	22.2	2.70	17.2	2.5	18	79.5	46.9	32.6
11469	9.0-10.5	12.0	Sandy Lean Clay (Cl)	25.8	14.3	11.5	2.69	13.1	7.6	24.8	67.6	41.3	26.3
11469	15.5-18.0	12.0	Lean Clay W/Sand (CL)	25.2	13.7	11.5	2.73	14.2	4.1	18.9	77.0	45.3	31.7
11469	20.0-21.5	12.0	Sandy Lean Clay (Cl)	25.3	14.6	10.7	2.72	12.8	7.2	26.5	66.3	38.0	28.3
11469	24.0-25.5	12.0	Sandy Lean Clay (Cl)	21.6	13.6	8.0	2.73	15.2	10.4	32.1	57.5	33.3	24.2
11469	30.0-31.5	12.0	Sandy Lean Clay (Cl)	24.5	14.3	10.2	2.68	14.4	12.2	27.9	59.9	37.6	22.3
11470B	1.5- 3.0	9.3	Silty Clayey Sand (SC-SM)	19.8	14.3	5.5	2.71	19.4	12.2	43.6	44.2	33.5	10.7
11470B	3.5- 6.0	9.3	Silty Sand (SM)	NP[a]	NP	NP	2.70	14.4	7	43.6	49.4	40.9	8.5
11470B	8.0-10.5	9.3	Sandy Silt (ML)	16.0	15.2	0.8	2.72	13.7	1.2	36.1	62.7	47.9	14.8
11470B	13.5-15.0	9.3	Lean Clay W/Sand (CL)	26.5	14.8	11.7	2.69	15.7	3.2	25.5	71.3	38.8	32.5
11470B	18.0-19.5	9.3	Lean Clay W/Sand (CL)	23.7	13.9	9.8	2.75	15.9	8.3	17.9	73.8	49.3	24.5
11470B	23.5-25.0	9.3	Sandy Lean Clay (Cl)	22.5	12.3	10.2	2.75	13.6	9.5	31.1	59.4	38.1	21.3
11470B	30.0-32.0	9.3	Sandy Lean Clay WGrav (CL)	27.5	14.8	12.7	2.73	20.6	15.7	32.9	51.4	32.8	18.6
11471	1.5- 3.0	11.5	Lean Clay (CL)	51.9	28.0	23.9	2.67	24.4	0	5.9	94.1	60.4	33.7
11471	3.5- 6.0	11.5	Fat Clay (CH)	50.5	18.4	32.1	2.72	24.9	0	3.8	96.2	55.4	40.8
11471	10.5-11.5	11.5	Well Graded Sand (SW)	NP	NP	NP	2.70	24.0	2.4	59.7	37.9	26.8	11.1
11471	15.0-16.5	11.5	Silt (ML)	22.5	19.3	3.2	2.73	17.2	0	3.9	96.1	78.4	17.7

See footnotes at end of table

FER\PREDESIGN\TDO\TABA-17\July 25, 1995 1:30pm

000071

TABLE A-17
(Continued)

Geotech Boring	Depth B.G.L. (ft)	Br/Gr Interface B.G.L. (ft)	USCS Soil Classification	Liquid Limit %	Plastic Limit %	Plastic Index %	Spec. Grav.	Moist. Cont. % Dry Wt.	Gravel %	Sand %	Silt & Clay %	Silt %	Clay %
11471	17.0-19.5	11.5	Sandy Lean Clay (Cl)	21.0	12.4	8.6	2.77	9.4	10.7	36	53.3	34.3	19.0
11471	27.5-29.0	11.5	Sandy Lean Clay (Cl)	25.9	14.7	11.2	2.69	13.0	11.8	27.2	61.0	36.4	24.6
11472	1.5- 3.0	16.5	Lean Clay (CL)	49.1	20.8	28.3	2.65	26.1	0	3.2	96.8	49.3	47.5
11472	3.5- 6.0	16.5	Lean Clay W/Sand (CL)	29.4	15.8	13.6	2.74	15.7	2.7	21.4	75.9	41.0	34.9
11472	9.5-11.5	16.5	Clayey Sand W/Grav (SC)	24.5	13.1	11.4	2.69	10.5	25.8	29.3	44.9	24.9	20.0
11472	18.5-19.5	16.5	Clayey Sand W/Grav (SC)	19.4	11.2	8.2	2.74	9.5	24.2	54.2	21.6	13.8	7.8
11472	23.0-25.5	16.5	Sandy Lean Clay (Cl)	25.0	13.1	11.9	2.69	12.7	7.1	28.4	64.5	38.8	25.7
11473	3.5- 6.0	13.5	Lean Clay W/Sand (CL)	31.1	17.3	13.8	2.70	14.9	5.6	17.2	77.2	44.3	32.9
11473	6.5- 8.5	13.5	Lean Clay W/Sand (CL)	29.3	15.6	13.7	2.74	13.2	7.3	20.8	71.9	37.0	34.9
11473	9.0-10.5	13.5	Sandy Lean Clay (Cl)	25.0	15.1	9.9	2.70	13.4	5.9	29.2	64.9	37.5	27.4
11473	15.5-18.0	13.5	Sandy Lean Clay (Cl)	27.3	14.3	13.0	2.77	12.8	8.9	24.8	66.3	35.6	30.7
11473	20.0-22.0	13.5	Sandy Lean Clay (Cl)	30.9	14.7	16.2	2.71	14.1	5.5	24.9	69.6	35.5	34.1
11473	23.5-25.0	13.5	Sandy Lean Clay (Cl)	24.2	14.9	9.3	2.70	11.5	6.9	28.6	64.5	35.1	29.4
11474	1.5- 3.0	11.3	Lean Clay (CL)	44.2	18.1	26.1	2.63	29.5	7.7	8.5	83.8	46.4	37.4
11474	3.5- 6.0	11.3	Lean Clay W/Sand (CL)	27.9	19.2	8.7	2.79	16.5	0.8	16.6	82.6	56.1	26.5
11474	9.0-10.5	11.3	Sandy Lean Clay (CL)	25.1	13.5	11.6	2.76	12.6	5.1	26.1	68.8	41.2	27.6
11474	14.0-16.5	11.3	Sandy Lean Clay (CL)	24.2	13.6	10.6	2.75	13.0	10.8	27.5	61.7	36.1	25.6
11474	18.5-21.0	11.3	Sandy Lean Clay (CL)	27.9	14.2	13.7	2.70	13.7	8.4	24.9	66.7	35.3	31.4
11474	23.5-25.0	11.3	Sandy Lean Clay (CL)	25.4	13.4	12.0	2.70	13.1	8.5	24.4	67.1	41.1	26.0
11475	2.0- 4.5	16.5	Lean Clay (Cl)	48.5	16.2	32.3	2.62	23.2	0.8	9.7	89.5	43.4	46.1
11475	6.5- 9.0	16.5	Lean Clay (Cl)	49.2	26.0	23.2	2.66	23.1	1.6	11.5	86.9	43.7	43.2
11475	11.0-13.5	16.5	Lean Clay W/Sand (CL)	33.3	17.4	15.9	2.74	14.1	1.8	25.6	72.6	38.3	34.3
11475	15.5-18.0	16.5	Sandy Lean Clay (CL)	26.9	12.9	14.0	2.71	13.2	6.9	25.3	67.8	37.3	30.5
11475	19.5-21.0	16.5	Sandy Lean Clay (CL)	26.7	14.3	12.4	2.72	15.0	14.5	23.4	62.1	34.6	27.5
11476	1.5- 3.0	10.0	Lean Clay W/Sand (CL)	40.7	17.8	22.9	2.70	21.9	11.5	16.4	72.1	37.1	35.0
11476	3.5- 6.0	10.0	Lean Clay W/Sand (CL)	30.5	15.9	14.6	2.64	14.8	2.1	13.2	84.7	43.6	41.1
11476	9.5-12.0	10.0	Sandy Silty Clay (CL-ML)	18.8	14.2	4.6	2.77	12.9	0.1	30.5	69.4	48.2	21.2
11476	14.0-16.5	10.0	Silty Clayey Sand (SC-SM)	18.1	12.3	5.8	2.75	11.1	10.3	41.7	48.0	34.1	13.9

See footnotes at end of table

TABLE A-17
(Continued)

Geotech Boring	Depth B.G.L. (ft)	Br/Gr Interface B.G.L. (ft)	USCS Soil Classification	Liquid Limit %	Plastic Limit %	Plastic Index %	Spec. Grav.	Moist. Cont. % Dry Wt.	Gravel %	Sand %	Silt & Clay %	Silt %	Clay %
11476	18.5-21.0	10.0	Lean Clay W/Sand (CL)	20.2	12.5	7.7	2.70	14.4	2.3	26.6	71.1	44.6	26.5
11476	24.0-25.5	10.0	Sandy Lean Clay (CL)	25.1	14.2	10.9	2.68	15.0	5.2	25	69.8	38.5	31.3
11477	1.5- 3.0	11.5	Lean Clay (Cl)	37.8	20.0	17.8	2.72	22.8	0	6.9	93.1	56.7	36.4
11477	3.5- 6.0	11.5	Lean Clay W/Sand (CL)	30.4	15.0	15.4	2.73	19.4	1.4	26.9	71.7	42.6	29.1
11477	8.0- 9.0	11.5	Silty Sand (Sm)	NP	NP	NP	2.75	21.3	6.6	53.8	39.6	35.2	4.4
11477	14.0-16.5	11.5	Sandy Lean Clay (Cl)	25.1	13.1	12.0	2.72	15.1	5.2	27.8	67.0	40.6	26.4
11477	22.0-22.5	11.5	Sandy Lean Clay (Cl)	21.9	13.0	8.9	2.70	13.9	4.2	34.8	61.0	36.4	24.6
11477	22.5-23.5	11.5	Silty Sand (Sm)	NP	NP	NP	2.75	13.6	6.5	53.2	40.3	33.2	7.1
11477	34.0-35.5	11.5	Sandy Lean Clay (Cl)	25.1	13.3	11.8	2.73	12.1	10	26.2	63.8	39.2	24.6
SUMMARY OF RESULTS FROM STANDARD PROCTOR TESTS													
11468	2.0- 6.5	13.5	Lean Clay W/Sand (CL)	45.3	16.2	29.1			38.1	38.1	2.3	4.5	7.5
11468	9.0-13.0	13.5	Lean Clay W/Sand (CL)	30.8	14.1	16.7			41.5	29.2	3.1	11.8	14.4
11469	3.0- 7.5	12.0	Lean Clay W/Sand (CL)	36.1	15.1	21.0			38.7	34.1	2.8	7.6	11.2
11469	7.5-12.0	12.0	Lean Clay W/Sand (CL)	29.4	13.0	16.4			39.5	32.1	3.4	8.3	13.1
11470B	3.5- 7.5	9.3	Sandy Silt (ML)	17.7	15.7	2.0			44.8	11.1	3.1	12.5	21.6
11470B	7.5-12.0	9.3	Sandy Silt (ML)	17.3	16.7	0.6			53.7	12.3	3.3	6.3	22.9
11471	3.0- 7.5	11.5	Fat Clay (CH)	50.5	19.3	31.2			55.9	40.2	0.0	1.3	2.6
11471	7.5-10.5	11.5	Lean Clay (CL)	43.0	21.8	21.2			63.2	32.8	0.0	0.6	3.4
11472	3.5- 7.5	16.5	Lean Clay W/Sand (CL)	30.9	14.0	16.9			39.4	37.4	2.3	6.5	11.3
11472	9.0-12.0	16.5	Sandy Lean Clay (CL)	28.7	13.8	14.9			31.0	29.6	7.9	13.7	12.0
11473	3.0- 7.5	13.5	Lean Clay W/Sand (CL)	35.4	15.8	19.6			45.3	37.6	1.6	6.5	8.1
11473	7.5-12.0	13.5	Lean Clay W/Sand (CL)	31.0	14.8	16.2			38.5	38.4	2.7	6.5	11.8
11474	3.0- 7.5	11.3	Lean Clay W/Sand (CL)	28.1	16.2	11.9			52.2	29.3	1.5	4.8	11.1
11474	7.5-12.0	11.3	Lean Clay W/Sand (CL)	26.2	13.8	12.4			47.2	29.0	2.3	5.9	13.2
11475	4.5- 8.5	16.5	Lean Clay W/Sand (CL)	42.8	15.8	27.0			46.3	38.2	0.9	5.1	9.1
11476	3.5- 7.5	10.0	Lean Clay W/Sand (CL)	33.0	14.8	18.2			39.2	38.2	2.2	6.3	9.1

See footnotes at end of table

FER\PREDESIGN\TDO\TABA-17\July 25, 1995 1:30pm

000073

TABLE A-17
(Continued)

Geotech Boring	Depth B.G.L. (ft)	Br/Gr Interface B.G.L. (ft)	USCS Soil Classification	Liquid Limit %	Plastic Limit %	Plastic Index %	Spec. Grav.	Moist. Cont. % Dry Wt.	Gravel %	Sand %	Silt & Clay %	Silt %	Clay %
11476	12.0-15.0	10.0	Lean Clay W/Sand (CL)	20.7	12.7	8.0			44.7	28.3	0.9	7.7	18.1
11477	3.5- 7.5	11.5	Lean Clay W/Sand (CL)	42.2	16.6	25.6			40.4	39.9	0.7	4.3	14.3
11477	14.0-18.0	11.5	Sandy Lean Clay (CL)	22.7	14.5	8.2			40.0	18.3	7.7	12.2	19.1
11478	3.5- 7.5	16.0	Lean Clay W/Sand (CL)	35.3	16.6	18.7			37.9	36.5	3.3	7.1	11.7
11478	7.5-10.0	16.0	Sandy Lean Clay (CL)	26.6	14.8	11.8			38.6	30.1	4.0	10.4	13.3
11479	3.5- 7.5	10.0	Sandy Lean Clay (CL)	28.8	14.1	14.7			36.1	27.9	3.8	11.6	17.4
11479	7.5-10.5	10.0	Sandy Lean Clay (CL)	25.2	14.9	10.3			35.7	28.5	6.0	9.1	13.6
11480	3.0- 7.5	12.5	Lean Clay W/Sand (CL)	38.5	15.8	22.7			42.4	40.4	1.6	5.1	9.0
11480	7.5-12.0	12.5	Lean Clay W/Sand (CL)	27.2	14.4	12.8			47.7	31.1	1.3	6.2	13.2
11481	3.5- 7.5	12.5	Sandy Lean Clay (CL)	30.7	14.5	16.2			32.8	29.0	2.2	7.5	11.9
11481	13.5-18.5	12.5	Lean Clay W/Sand (CL)	24.9	12.8	12.1			41.0	29.6	3.0	0.1	25.0
11478	1.5- 3.0	16.0	Fat Clay (CH:)	51.0	20.6	30.4	2.69	24.3	0	5.1	94.9	51.0	43.9
11478	3.5- 6.0	16.0	Lean Clay W/Sand (CL)	37.5	16.5	21.0	2.71	20.3	3.4	17.7	78.9	39.8	39.1
11478	10.5-12.0	16.0	Lean Clay W/Sand (CL)	28.0	16.2	11.8	2.71	14.1	4.5	25	70.5	38.6	31.9
11478	21.5-23.0	16.0	Sandy Lean Clay (Cl)	24.3	13.9	10.4	2.67	10.8	7.3	32.1	60.6	35.7	24.9
11478	24.5-26.0	16.0	Sandy Silty Clay (Cl-Ml)	18.6	12.7	5.9	2.72	11.1	3.9	41.3	54.8	36.7	18.1
11478	30.5-32.0	16.0	Silty Sand (Sm)	NP	NP	NP	2.70	12.0	0	57.4	42.6	22.1	20.5
11478	33.5-35.0	16.0	Silty Clayey Sand (SC-SM)	23.2	16.5	6.7	2.72	16.1	0	55.2	44.8	26.1	18.7
11479	1.5- 3.0	10.0	Fat Clay (CH:)	53.5	16.8	36.7	2.67	25.0	0.6	13.1	86.3	39.3	47.0
11479	3.5- 6.0	10.0	Sandy Lean Clay (Cl)	21.3	14.1	7.2	2.74	12.5	3.9	42.8	53.3	34.4	18.9
11479	16.5-17.5	10.0	Silty Sand(SM)	NP	NP	NP	2.71	14.6	14.2	64.7	21.1	12.9	8.2
11479	18.5-21.0	10.0	Sandy Lean Clay (Cl)	25.2	14.2	11.0	2.69	12.5	6.8	28.4	64.8	39.8	25.0
11479	23.0-25.5	10.0	Sandy Lean Clay (Cl)	24.5	13.9	10.6	2.70	13.9	2	28.3	69.7	41.2	28.5
11479	31.5-33.0	10.0	Silty,Clayey Sand W/Gravel (SC)	19.6	12.4	7.2	2.70	17.1	17.2	38.7	44.1	30.4	13.7
11479	34.5-36.0	10.0	Sandy Lean Clay (Cl)	24.1	14.2	9.9	2.71	13.0	8.6	31	60.4	36.7	23.7
11480	0.5- 3.0	12.5	Lean Clay (CL)	49.6	17.8	31.8	2.71	22.5	2.9	10.2	86.9	41.2	45.7
11480	5.0- 7.5	12.5	Lean Clay (CL)	39.7	18.6	21.1	2.78	20.6	1	11.2	87.8	51.2	36.6
11480	9.5-12.0	12.5	Lean Clay W/Sand (CL)	32.0	18.0	14.0	2.76	14.8	0.4	20	79.6	44.8	34.8
11480	14.0-16.5	12.5	Lean Clay W/Sand (CL)	23.1	13.6	9.5	2.73	13.0	4.7	24.2	71.1	44.8	26.3
11480	18.0-20.0	12.5	Sandy Lean Clay (Cl)	25.1	13.9	11.2	2.69	13.8	4.9	25.5	69.6	40.6	29.0

TABLE A-17
(Continued)

Geotech Boring	Depth B.G.L. (ft)	Br/Gr Interface B.G.L. (ft)	USCS Soil Classification	Liquid Limit %	Plastic Limit %	Plastic Index %	Spec. Grav.	Moist. Cont. % Dry Wt.	Gravel %	Sand %	Silt & Clay %	Silt %	Clay %
11480	24.5-27.0	12.5	Sandy Lean Clay (Cl)	26.2	13.9	12.3	2.71	12.5	8.8	27.9	63.3	36.7	26.6
11480	29.0-31.5	12.5	Sandy Lean Clay (Cl)	25.9	14.5	11.4	2.72	14.4	7.1	26.7	66.2	36.9	29.3
11481	3.5- 6.0	12.5	Sandy Lean Clay (Cl)	31.0	15.5	15.5	2.74	14.7	8.9	24.9	66.2	36.5	29.7
11481	6.5- 9.0	12.5	Sandy Lean Clay (Cl)	26.6	15.4	11.2	2.72	14.3	5.7	25.7	68.6	39.7	28.9
11481	15.5-18.0	12.5	Sandy Lean Clay (Cl)	23.7	13.0	10.7	2.73	11.8	6.5	29.8	63.7	37.8	25.9
11481	20.0-22.0	12.5	Sandy Lean Clay (Cl)	22.6	13.0	9.6	2.73	13.2	7.7	28.2	64.1	38.4	25.7
11481	26.5-28.0	12.5	Sandy Silty Clay (CL-ML)	17.6	13.2	4.4	2.67	16.2	7.2	27.4	65.4	44.2	21.2
11481	32.5-34.0	12.5	Lean Clay W/Sand (CL)	26.0	14.5	11.5	2.73	14.9	5.5	23.7	70.8	40.1	30.7
11481	37.0-38.5	12.5	Sandy Lean Clay (Cl)	26.1	13.7	12.4	2.73	13.1	13.1	26.3	60.6	35.4	25.2

[a]NP = Nonplastic

000075

TABLE A-18

RADIONUCLIDE RESULTS FOR SOILS FROM GEOTECHNICAL BORINGS

Boring #	Surface Elevation above MSL (feet)	Sample Interval (feet) BGL	Total U (mg/kg)	U 238 (pCi/g)	U 235/236 (pCi/g)	U 234 (pCi/g)
11468	610.04	4.5 - 6.0	2.77 -	0.767 -	0.049 -	0.726 -
		22.0 - 23.5	3.04 -	1.314 J	0.031 U	0.969 -
11470	606.96	6.0 - 7.5	2.0 -	0.686 -	0.033 J	0.0575 -
		20.5 - 22.0	2.2 -	0.857 -	0.031 J	1.056 -
11472	584.63	6.0 - 7.5	1.83 -	1.036 -	0.018 U	0.771 -
		12.0 - 13.5	2.04 -	1.019 -	0.060 J	0.83 -
11474	591.94	1.5 - 3.0	1.90 -	1.145 -	0.053 U	1.03 -
		12.0 - 13.5	2.01 -	0.809 -	0.027 J	0.765 -
11476	594.12	6.0 - 7.5	1.98 -	0.945 -	0.017 U	0.842 -
		16.5 - 18.0	1.72 -	0.714 -	0.041 J	0.609 -
11478	601.35	6.0 - 7.5	1.79 J	1.07 J	0.031 U	0.924 -
		20.0 - 21.5	2.36 J	0.858 J	0.1 J	1.06 -
11480	606.28	3.0 - 4.5	3.44 J	2.67 J	0.107 J	2.37 -
		12.0 - 13.5	2.09 J	0.901 J	0.031 J	1.03 -

MSL = Mean Sea Level
BGL = Below Ground Level

FER\CRU2\PREDESIGN\TDO\TABA-18\July25, 1995 (1:37pm)

000076

TABLE A-19

SUMMARY OF WATER LEVEL DATA, BROWN/GRAY TILL INTERFACE WELLS MARCH 29, 1995

Well No.	Depth to Perched Water (feet below surface)	Elevation of Perched Water (feet above brown/gray interface)	Comment
11494	5.77	7	stabilized water level
11496	5.00	6	stabilized water level
11504	7.41	4	declining trend
11546	8.54	5	slow recovery trend
11547	7.60	9	slow recovery trend
11548	5.78	9	slow recovery trend

TABLE A-20

SUMMARY OF WATER LEVEL DATA FROM PAIRED WELLS COMPLETED IN THE TILL

Well No.	Ground Elevation (ft) M.S.L.[b]	Screened Interval (ft) B.G.L.[c]	Brown/Gray Clay Interface (ft) B.G.L.	Center of Screened Interval Depth (ft) M.S.L.	Water Level[a] (ft) M.S.L.	Calculated Gradient (vertical downward)
11492	610.53	15.0 - 22.0	8.5	592.03	596.01	0.26
11491	611.13	25.0 - 29.5	12.5	583.88	593.93	
11494	603.51	8.0 - 16.5	10.5	591.26	599.63	1.10
11493	603.38	18.0 - 24.5	13.5	582.13	589.61	
11496	602.65	9.0 - 17.0	9.5	589.65	600.12	1.25
11497	602.34	28.0 - 32.0	9.0	572.34	578.56	
11499	594.68	15.0 - 22.0	9.0	576.18	590.58	1.77
11498	594.60	27.0 - 33.0	7.0	564.6	570.08	
11500	598.93	19.0 - 25.5	12.0	576.68	594.29	0.45
11501	598.97	33.0 - 37.0	10.5	563.97	588.6	
11502	593.79	18.0 - 22.0	13.5	573.79	588.37	2.43
11503	593.47	24.0 - 28.0	12.0	567.47	572.99	
11504	590.02	14.0 - 18.0	14.8[d]	574.02	586.06	1.13
11505	590.08	23.0 - 27.0	9.8	565.08	575.93	

[a]Water levels measured March 20, 1995

[b]M.S.L. = Mean Sea Level

[c]B.G.L. = Below Ground Level

[d]Brown/gray contact not clearly defined in Rotasonic core sample.

show consistently lower water level elevations than the shallow wells indicating that a vertical hydraulic gradient exists. Also, the data demonstrate that the uppermost perched groundwater surface appears to be approximately halfway between the brown/gray till interface and the surface. Water levels were continuing to recover from chemical sampling in three wells so an exact gradient and direction of potential movement for the upper perched zone water table could not be finalized. The data are consistent with the concept that, in general, the uppermost perched groundwater surface often conforms to the general topography of the land surface. The results show that the perched groundwater has a potential for movement southwest at a gradient ranging from about 0.011 to 0.025.

The water level data are consistent with geotechnical tests (ASTMD D2216) that measured 100% volumetric soil saturation on samples collected from five feet or deeper. Soil samples from zero to five feet deep had water contents that ranged from 93% to 100% saturation. Water content versus depth is presented in Figure 2-18.

Six new wells were installed at the brown-gray interface. Hydrographs for these wells are provided in Appendix C. Table 2-17 summarizes data concerning these water levels. Seven well pairs were installed to measure vertical hydraulic gradients in the till. Hydrographs of these wells are provided in Appendix C, and a summary of vertical gradients is provided in Table 2-18. Water level and precipitation data are in Appendix B. Vertical gradients were calculated to range from 0.26 to 2.43 (Table 2-18).

A.6 URANIUM DISTRIBUTION COEFFICIENT TESTING (K_d)

The K_d study was performed to determine how natural species of uranium in groundwater and soil partition between phases. This information is important in the analysis and evaluation of potential contaminant transport through the geology. Uranium was the focus of this study because it is the principal contaminant at the FEMP that has the potential to impact groundwater within the 1,000 year design life of the on-site disposal facility.

To obtain the most representative results, natural materials were used. This includes natural soils from the area of investigation, natural groundwater contaminated with uranium, and natural groundwater without contamination.

A.6.1 Procedures and Completed Activities

Seven of the eighteen monitoring well borings were used to collect soil samples for K_d analyses. Two samples were collected from each of the seven borings, one from the brown till and one from the gray till. Two gray till samples were selected for the calibration tests, one from Boring 11491 and one from 11493. Eleven samples were split from these two locations. Fourteen standard adsorption/desorption batch tests and eleven calibration batch tests were performed according to ASTM D4319. Contaminated groundwater was collected from the former Production Area and the Waste Pit Area; uncontaminated perched groundwater, was collected from the Predesign Investigation study area. These groundwater samples were used as the solute in the batch testing. Contaminated and uncontaminated perched groundwater samples were verified by off-site total and isotopic uranium analysis. Table A-21 lists the soil and groundwater sampling that was performed for the batch testing.

The standard adsorption batch tests consisted of placing 400 grams of soil in a reactor with 3500 milliliters of contaminated groundwater. The reactor was agitated over a two week period and the solute was sampled at regular intervals to determine when the uranium had reached equilibrium in solution. Once the reaction was at equilibrium, the solution and soil were sampled to determine equilibrium concentrations. The equilibrium concentrations were then used to calculate the amount of contaminant that passed from solution into the soil. This amount, presented as a ratio of soil concentration to solution concentration, is the K_d. The standard desorption test was performed in the same manner, except that the soil from the adsorption test was combined with clean perched groundwater to measure how much contaminant comes out of the soil and returns to solution. This value represents the reversible nature of the K_d. Table A-22 summarizes the K_d tests that were performed.

A number of factors affect the K_d in natural conditions: groundwater-to-soil ratio, the sorption isotherm, pH, dissolved oxygen, temperature, permeability of the soil, and others. During the test, pH and temperature were assumed to remain constant near the in situ levels.

The in-situ soil-to-groundwater ratio is no greater than the inverse of the porosity of the soil, which is the ratio of the volume of soil voids to the volume of soil. This ratio is typically between 1.7 and 5. The ratio of soil to groundwater in the standard K_d method used at the FEMP is 0.114. In order to determine the impact of the soil-to-groundwater ratio on K_d levels, calibration tests were run. These calibration tests consisted of soil samples split from a gray till soil sample collected from Boring 11493. These calibration tests included soil-to-groundwater ratios of 0.228, 0.456, and 0.912. The tests were

TABLE A-21

K_d Soil Sampling Performed

7 brown clay soil samples were collected from the rotasonic cores in a lithology representative of the brown clay. The samples were at least 2000 grams in weight.
7 grey clay soil samples were collected from the rotasonic cores in a lithology representative of the grey clay. The samples were at least 2000 grams in weight.
1 grey clay (split sample) soil sample was collected from rotasonic core B11491 The sample was at least 2000 grams in weight. This split sample from the grey till was used to perform three calibration tests.
1 grey clay (split sample) soil sample was collected from rotasonic core B11493 The sample was at least 2000 grams in weight. This split sample from the grey till was used to perform three calibration tests.
1 Clean groundwater sample was collected from monitoring well 1064, approximately 25 gallons.
1 Contaminated groundwater sample was collected from monitoring well 1085, approximately 15 gallons.
1 Contaminated groundwater sample was collected from monitoring well 1082, approximately 15 gallons.

TABLE A-22

K_d TESTS PERFORMED

7 brown clay adsorption/desorption tests - Standard methods, 100% contaminated water during adsorption test.
7 grey clay adsorption/desorption tests - Standard methods, 100% contaminated water during adsorption test.
4 grey clay (split sample) adsorption/desorption tests - Standard methods, one 75% contaminated water, one 50% contaminated water, one 25%, and one 0% contaminated water during adsorption test.
3 grey clay (split sample) adsorption tests - standard methods except that only 1750, 875, and 438 ml of 100% contaminated groundwater were used.
2 grey clay (split sample) adsorption tests - standard methods except that no agitation of the sample will be performed. Disruption of the soil were kept to a minimum.
2 grey clay (split sample) adsorption tests - standard methods except that only the reactors were sealed and remain unopened until the end of the test. 100% contaminated groundwater were used. No sampling will be conducted during study. Tests should be performed in parallel with standard grey adsorption tests that correspond with the split sample locations to determine equilibrium conditions.

conducted exactly as the normal test. The desorption test was run for the soil samples with the same clean soil-to-groundwater ratio. The results of the calibration test were then compared to the standard test to see what impact the soil-to-groundwater ratio had on the K_d determinations.

The sorption isotherm describes the transfer of an analyte from liquid to soil under different concentrations in solution. The amount of product adsorbing from solution to soil will vary depending on the amount of product available in solution. The relationship is generally assumed to be linear, although many studies have indicated a non-linear relationship. The sorption isotherm can be determined by conducting a series of tests with different concentrations of product in solution. The results of the tests can be plotted on an equilibrium concentration graph. Each final solute concentration is plotted against the amount of solute sorbed onto soil per unit weight of solid, and all the tests are plotted on one graph. The resulting curve represents the sorption isotherm. Equations are available to determine the K_d under linear and non-linear sorption isotherms. Once the sorption isotherm is determined, more exact equations can be used to determine K_d.

In order to determine the sorption isotherm, five tests were run with different initial solute concentrations. The initial concentrations were varied by diluting contaminated groundwater with clean groundwater to achieve the desired initial concentration. The tests were conducted using the standard procedure and the results were plotted to determine the sorption isotherm relationship. The five sorption isotherm tests included the standard sorption test from gray till sample B11491, and four duplicate tests split from gray soil sample B11493.

The permeability of the soil was tested by keeping two calibration samples as undisturbed as possible. Standard K_d practices require the soil samples to be dried, crushed, sifted, and agitated during the test. In an effort to determine the impact that these practices have on K_d values, two duplicate tests were run in which the soil was not disturbed or agitated but allowed to sit in contact with groundwater as in natural conditions. The two duplicate samples were split from gray till soil samples B11491 and B11493. The test was performed identically to the standard method except for the agitation of the sample. The results of this duplicate test were compared to the agitation method to bracket the conservatism inherent in the standard procedure.

The dissolved oxygen factor is difficult to duplicate because dissolved oxygen is limited at depth in the soil. In order to reproduce the in situ dissolved oxygen conditions, the K_d study would have to be

performed in a closed reactor with as little dissolved oxygen as possible. This condition is difficult to achieve because of the sampling required during the test. One alternative to this is to run calibration tests alongside the normal K_d tests. The calibration tests were set up in the same manner as the normal test, but the reactor was sealed until the completion of the test. The two calibration samples were split from two of the seven gray till samples (B11491 and B11493). Equilibrium was determined using the standard test runs for B11491 and B11493. A sample was collected at the end of the test when the duplicate samples achieved equilibrium. The results of the calibration test were compared to the normal test results to determine the affect of dissolved oxygen on the K_d study.

A.6.2 Results

The results of the K_d study are listed in Table A-23. This table indicates the initial and equilibrium soil and solute concentrations and the resulting K_d values. The resulting K_d values are represented in two ways, the linear K_d and the non-linear K_d. The difference between these two K_d values is related to the calibration batch tests results. When a population of K_d values is available, the geometric mean is the standard calculation for determining a representative value for the population. The geometric mean is listed in Table 2-21. The lowest linear K_d measured for the brown till was 8.5 L/kg, and the highest linear K_d measured for the brown till was 18.8 L/kg. The geometric mean of brown till linear K_d values is 12.4 L/kg. The lowest linear K_d measured for the gray till was 8.0 L/kg, and the highest linear K_d measured for the gray till was 27.1 L/kg. The geometric mean of gray till linear K_d values is 10.8 L/kg.

A.6.3 Calibration of the K_d Tests

A series of calibration tests were run on two selected gray till samples in parallel to the fourteen standard batch tests. These calibration tests were designed to assess the impact of a number of variables on K_d measurements. The calibration tests were directed toward determining the impact of the soil to water ratio, dissolved oxygen, agitation, and the nature of the sorption isotherm.

The calibration tests determined that K_d increases as the soil to water mass ratio increases. This is significant because the soil to water mass ratio used in the test was 0.1143, whereas the in-situ soil to water mass ratio is closer to 1.5. As a result, the actual in-situ K_d would be higher than measured values in the batch test. The calibration tests determined that dissolved oxygen did not have a significant effect on the K_d. In one instance the K_d decreased when the reactor was sealed, but in a second case the K_d increased when the reactor remained sealed. The calibration tests determined that the effects of agitation on the K_d test resulted in a higher K_d. When the test reactor was tumbled, the resulting K_d was higher

TABLE A-23

K_d TEST RESULTS

Till Type	BROWN	GRAY	BROWN	GRAY	BROWN	GRAY	BROWN	GRAY
Boring # (sample #)	B11491 (1)	B11491 (2)	B11493 (3)	B11493 (4)	B11496 (5)	B11496 (6)	B11498 (7)	B11498 (8)
Co (ug/l)	3293.20	3293.20	3293.20	3293.20	3293.20	3293.20	3293.20	3293.20
Cw1 (ug/l)	1161.60	1406.50	1588.70	1627.50	1314.80	804.80	1661.80	1523.00
W (g)	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00
V (l)	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Cstar (mg/kg)	18.70	16.50	14.90	14.60	17.30	21.80	14.30	15.50
C (mg/l)	1.20	1.40	1.60	1.60	1.30	0.80	1.70	1.50
Kd (l/kg)	16.10	11.70	9.40	9.00	13.20	27.10	8.60	10.20

Till Type	BROWN	GRAY	BROWN	GRAY	BROWN	GRAY
Boring # (sample #)	B11500 (9)	B11500 (10)	B11502 (11)	B11502 (12)	B11504 (13)	B11504 (14)
Co (ug/l)	3293.20	3293.20	3293.20	3293.20	3293.20	3293.20
Cw1 (ug/l)	1126.10	1596.66	1669.30	1715.30	1044.20	1712.20
W (g)	400.00	400.00	400.00	400.00	400.00	400.00
V (l)	3.50	3.50	3.50	3.50	3.50	3.50
Cstar (mg/kg)	19.00	14.80	14.20	13.80	19.70	13.80
C (mg/l)	1.10	1.60	1.70	1.70	1.00	1.70
Kd (l/kg)	16.80	9.30	8.50	8.00	18.80	8.10

Brown Geometric Mean Kd	12.40
Gray Geometric Mean Kd	10.80

than when the reactor was left idle, even though both reactors achieved equilibrium. This indicates that in-situ K_d values could be less than those determined through batch testing because no agitation of soil occurs in nature. However, contact times in nature between uranium and soil could increase the natural K_d because dissipation of uranium throughout the soil over time will have an effect similar to agitation.

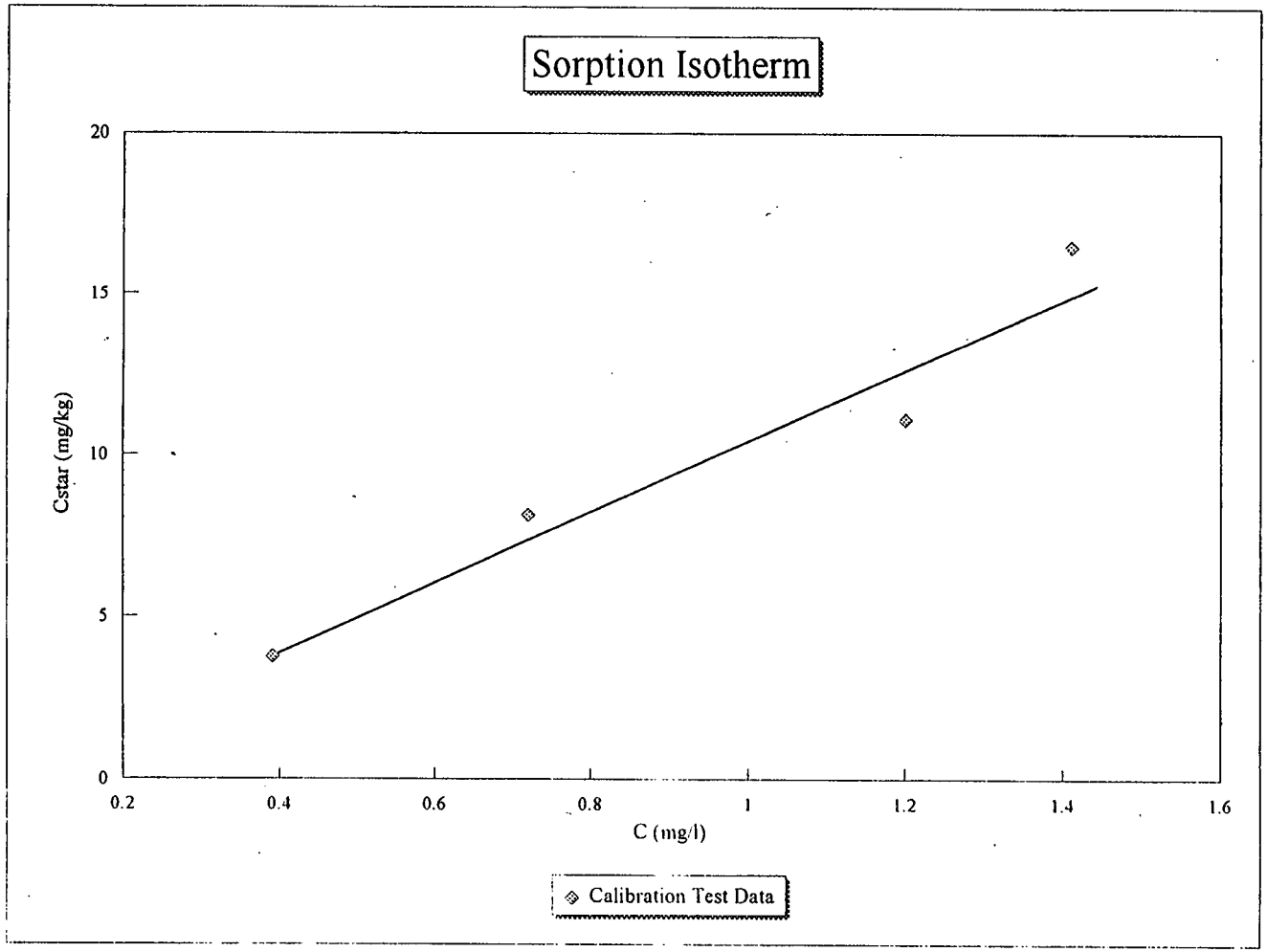
The first three calibration studies indicated that the batch test method is sensitive to a number of factors, but those factors appear to cancel each other out. Dissolved oxygen did not have a significant impact on K_d determinations. The soil-to-water mass ratio had the effect of decreasing the K_d in the test reactor, which underestimates the in-situ K_d. The effects of agitation, however, caused the K_d to increase in the test reactor, thus overestimating the in-situ K_d. The cumulative impact on K_d values seems to be minimal since the effects of the soil to water ratio and agitation cancel each other out.

Based on the calibration test results, the sorption isotherm which governs chemical effects in gray till related to K_d values is linear. By plotting the mass of the solute sorbed to the soil versus the equilibrium solute concentrations in Figure A-22, the data fit a linear sorption isotherm. This is significant because it indicates that the K_d function is linear.

Figure A-22
Sorption Isotherm Graph

Sorption Isotherm Determination

Sample #	C	CSTAR	log C	Log Cstar
2	1.41	16.51	0.149219	1.21772
15	1.20	11.11	0.079181	1.045635
16	0.72	8.15	-0.14267	0.910937
17	0.39	3.77	-0.40894	0.576513



000087

Appendix B

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 4-13-95		MONTLY PAGE: ____ OF ____
RECORDER: K. Collins	REVIEWING TECHNICIAN'S INITIALS AND DATE: P. Riley	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) RG	BZ	DH	βγ (CPM)	COMMENTS
11502	☒ TOW ☐ TPC 7.05	15:20				BG: WELL:	
11503	☒ TOW ☐ TPC 24.01	15:25				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

PR 4-13-95 K.C. 4-13-95 K.C. 4-13-95

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

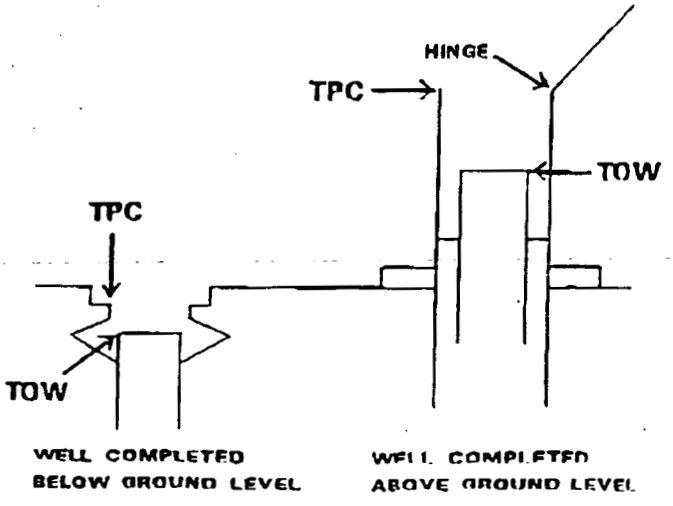
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH GEO EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	960354
PID INSTRUMENT NUMBER:	NA
βγ FRISKER NUMBER:	NA

FS-F-1447 (REV. 12/08/93)



PROJECT: 20-03-07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 4/12/95		MONTLY PAGE: NA OF
RECORDER: J. CAPANNARI	REVIEWING TECHNICIAN'S INITIALS AND DATE: P. RILEY 4/13	VERIFYING TECHNICIAN'S INITIALS AND DATE: VC 4/13

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
11491	☒ TOW ☐ TPC 18.75	1600				BG: WELL:	
11492	☒ TOW ☐ TPC 16.43	1603				BG: WELL:	
11493	☒ TOW ☐ TPC 24.31	1610				BG: WELL:	
11494	☒ TOW ☐ TPC 4.55	1614				BG: WELL:	
11495	☒ TOW ☐ TPC 39.27	1620				BG: WELL:	LESS THAN 1/2 INCH OF WATER
11496	☒ TOW ☐ TPC 4.31	1625				BG: WELL:	
11497	☒ TOW ☐ TPC 25.15	1631				BG: WELL:	
11498	☒ TOW ☐ TPC LOCK JAMMED	1637				BG: WELL:	
11499	☒ TOW ☐ TPC 16.38	1643				BG: WELL:	
11500	☒ TOW ☐ TPC 6.81	1650				BG: WELL:	

PR 4/13/95

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

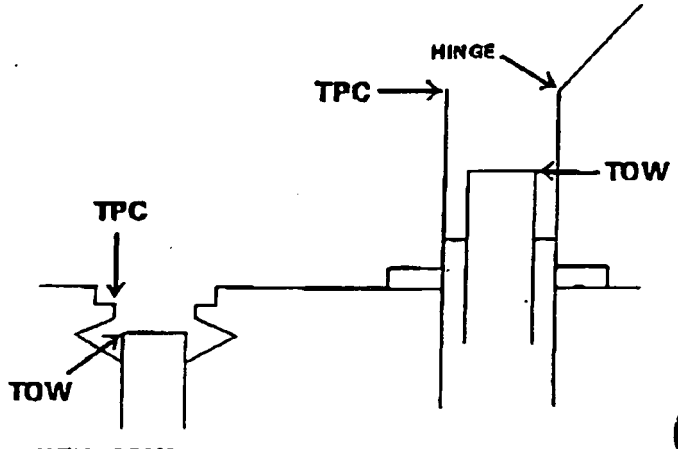
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH GZB EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	960534
PID INSTRUMENT NUMBER:	NA
BY PRICKER NUMBER:	NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 4/12/95		MONTLY PAGE: NA OF NA
RECORDER: J. Capannari	REVIEWING TECHNICIAN'S INITIALS AND DATE: P. Riley 4/13	VERIFYING TECHNICIAN'S INITIALS AND DATE: JC 4/13

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
11501	☒ TOW ☐ TPC 13.16	1653				BG: WELL:	
11546	☒ TOW ☐ TPC 7.98	1657				BG: WELL:	
11547	☒ TOW ☐ TPC 14.04	1703				BG: WELL:	
11548	☒ TOW ☐ TPC 15.41	1710				BG: WELL:	
11504	☒ TOW ☐ TPC 7.93	1719				BG: WELL:	
11505	☒ TOW ☐ TPC 17.21	1721				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

DK 4/13/95

DK 4/13/95

DK 4/13/95

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

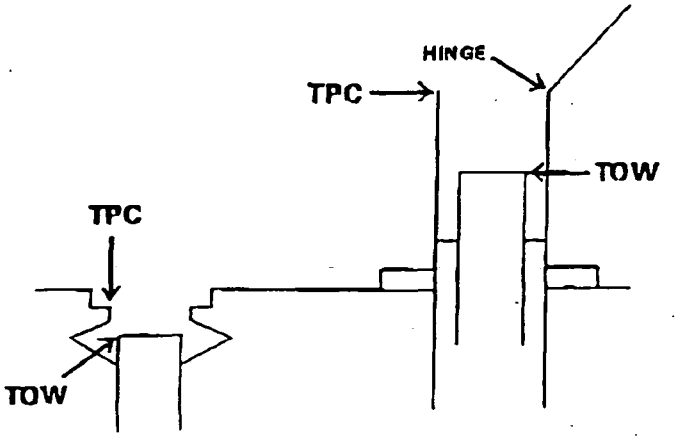
MONITORING WELL WITH GLB EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 960534

PID INSTRUMENT NUMBER: NA

BY PRICKER NUMBER: NA

FS-F-3447 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 3/20/95		MONTLY PAGE: NA OF NA
RECORDER: P. Riley	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) RG	BZ	DH	βγ (CPM)	COMMENTS
11491	☒ TOW ☐ TPC 19.12	1416				BG: WELL:	
11492	☒ TOW ☐ TPC 16.28	1418				BG: WELL:	
11493	☒ TOW ☐ TPC 15.80	1423				BG: WELL:	
11494	☒ TOW ☐ TPC 5.55	1424				BG: WELL:	
11495	☒ TOW ☐ TPC DRY	1426				BG: WELL:	
11496	☒ TOW ☐ TPC 4.51	1428				BG: WELL:	
11497	☒ TOW ☐ TPC 25.73	1430				BG: WELL:	
11498	☒ TOW ☐ TPC 26.42	1432				BG: WELL:	
11499	☒ TOW ☐ TPC 5.98	1434				BG: WELL:	
11500	☒ TOW ☐ TPC 6.46	1443				BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

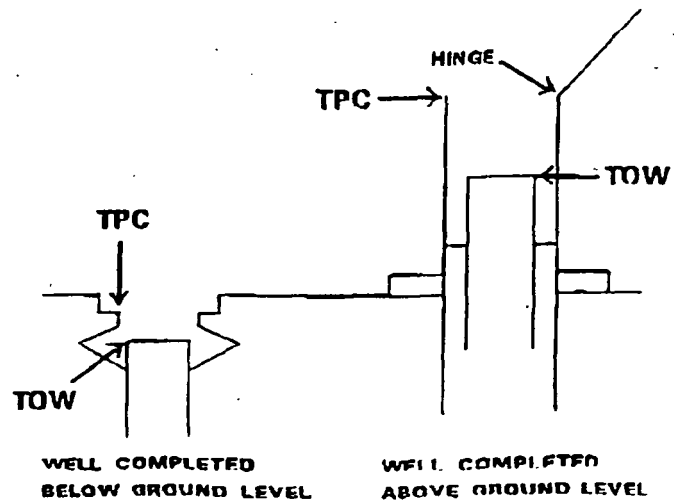
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

MONITORING WELL WITH GEO EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	960534
PID INSTRUMENT NUMBER:	NA
βγ FRISKER NUMBER:	NA

FS-F-1447 (REV. 12/08/93)



PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 3/20/95		MONTLY PAGE: NA OF NA
RECORDER: P. RILEY	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) RG	BZ	DH	BY (CPM)	COMMENTS
11501	☒ TOW ☐ TPC 12.64	1444				BG: WELL:	
11502	☒ TOW ☐ TPC 7.23	1438				BG: WELL:	
11503	☒ TOW ☐ TPC 22.48	11435				BG: WELL:	
11504	☒ TOW ☐ TPC 6.01	1458				BG: WELL:	
11505	☒ TOW ☐ TPC 15.82	1500				BG: WELL:	
11546	☒ TOW ☐ TPC 9.31	1446				BG: WELL:	
11547	☒ TOW ☐ TPC 8.01	1450 ~~11450~~				BG: WELL:	
11543	☒ TOW ☐ TPC 6.41	1455				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

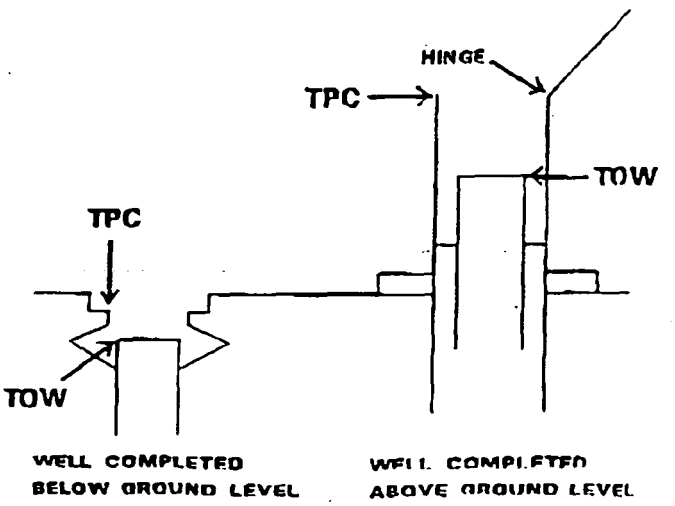
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	960534
PID INSTRUMENT NUMBER:	NA
BY FRISKER NUMBER:	NA

FS-F-1447 (REV. 12/08/93)



000092

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 3/16/95		MONTLY PAGE: NA OF NA
RECORDED: R. Riley	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS
11493	☒ TOW ☐ TPC 16.51	1342				BG: WELL:	
11494	☒ TOW ☐ TPC 5.40	1343				BG: WELL:	
11495	☒ TOW ☐ TPC DRY	1345				BG: WELL:	
11492	☒ TOW ☐ TPC 16.73	1349				BG: WELL:	
11491	☒ TOW ☐ TPC 19.33	1350				BG: WELL:	
11548	☒ TOW ☐ TPC 6.83	1400				BG: WELL:	
11504	☒ TOW ☐ TPC 5.55	1401				BG: WELL:	
11505	☒ TOW ☐ TPC 16.30	1403				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

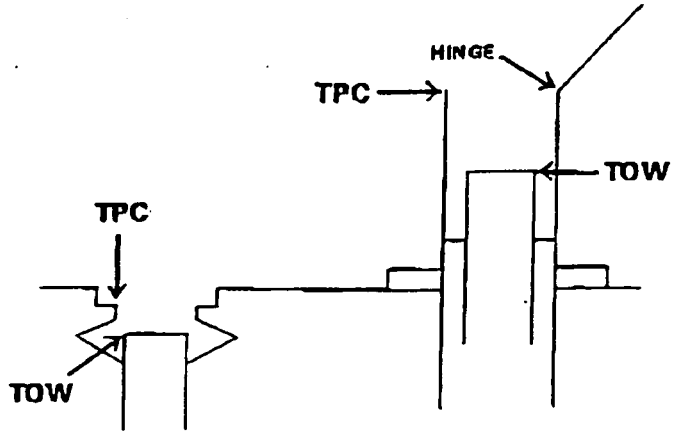
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	960534
PID INSTRUMENT NUMBER:	NA
By PRISKER NUMBER:	M

FS-F-3487 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 3/16/95		MONTLY PAGE: NA OF NA
RECORDER: P. Riley	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11500	☒ TOW ☐ TPC 6.30	1318				BG: WELL:	
11501	☒ TOW ☐ TPC 12.81	1319				BG: WELL:	
11546	☒ TOW ☐ TPC 9.81	1321				BG: WELL:	
11502	☒ TOW ☐ TPC 7.42	1323				BG: WELL:	
11503	☒ TOW ☐ TPC 23.02	1325				BG: WELL:	
11498	☒ TOW ☐ TPC 26.81	1331				BG: WELL:	
11499	☒ TOW ☐ TPC 5.95	1332				BG: WELL:	
11547	☒ TOW ☐ TPC 8.48	1328				BG: WELL:	
11496	☒ TOW ☐ TPC 4.09	1339				BG: WELL:	
11497	☒ TOW ☐ TPC 26.07	1340				BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

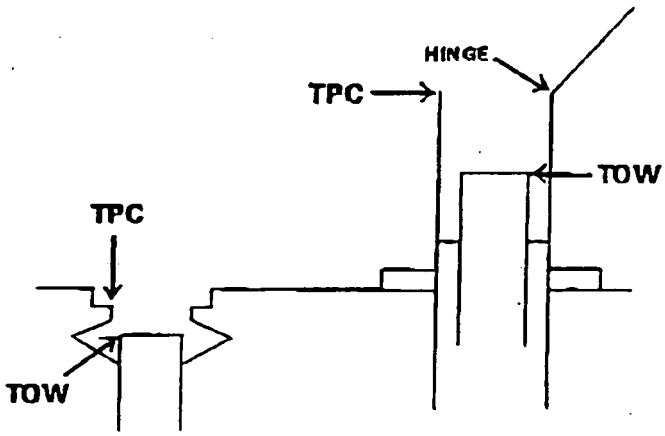
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	960534
PID INSTRUMENT NUMBER:	NA
βγ FRISKER NUMBER:	NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 3/13/95		MONTLY PAGE: NA OF NA
RECORDER: P. Riley	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE: NA

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS Bottom of Well
11494	☒ TOW ☐ TPC 4.98	1318				BG: / WELL:	
11495	☒ TOW ☐ TPC DRY	1320				BG: / WELL:	
11496	☒ TOW ☐ TPC ~~6~~ 6.44	1327				BG: / WELL:	
11497	☒ TOW ☐ TPC 26.34	1329				BG: / WELL:	
11498	☒ TOW ☐ TPC 27.10	1333				BG: / WELL:	
11499	☒ TOW ☐ TPC 6.02	1338				BG: / WELL:	
11547	☐ TOW ☐ TPC 8.42	1345				BG: / WELL:	
11548	☐ TOW ☐ TPC 7.47	1349				BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

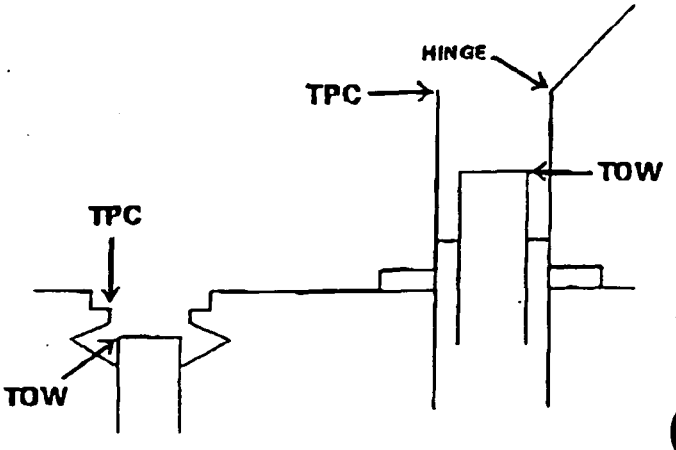
MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

By FRISKER NUMBER:

ES-F-3447 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 3/13/95		MONTLY PAGE: NA OF NA
RECORDER: P. RILEY	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS Bottom of well
11504	☒ TOW ☐ TPC 5.31	1235				BG: WELL:	
11505	☒ TOW ☐ TPC 16.67	1237				BG: WELL:	
11502	☒ TOW ☐ TPC 7.70	1259				BG: WELL:	
11503	☒ TOW ☐ TPC 23.18	1301				BG: WELL:	
11506	☒ TOW ☐ TPC 6.12	1304				BG: WELL:	
11501	☒ TOW ☐ TPC 12.92	1306				BG: WELL:	
11546	☒ TOW ☐ TPC 10.25	1309				BG: WELL:	
11491	☒ TOW ☐ TPC 19.48	1315				BG: WELL:	
11492	☒ TOW ☐ TPC 17.01	1317				BG: WELL:	
11493	☒ TOW ☐ TPC 17.09	1321				BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

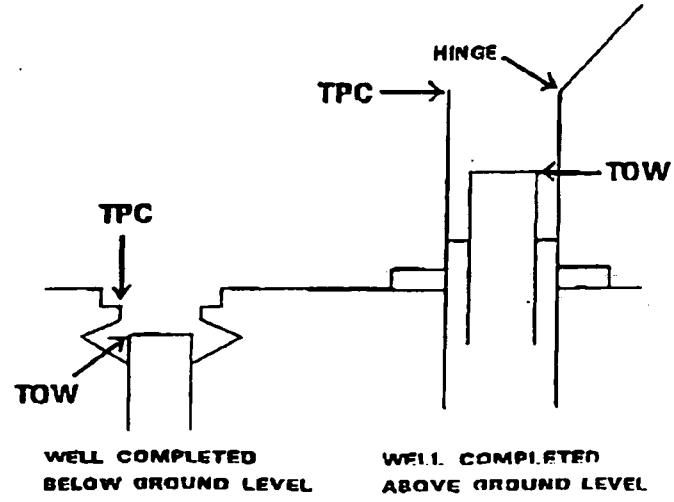
MONITORING WELL WITH GUS EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3487 (REV. 12/08/93)



000096

[148] From: Greg Lupton at FEHN-01-A 3/16/95 2:36PM (1027 bytes: 35 ln)
To: Patrick Riley at FEAS-01-ASI-A
Subject: Re[2]: Water level measurements

---------- Message Contents ----------

Greg,

Please provide the water levels before and after sampling for the wells that were sampled for tritium on 3/10/95 (11493, 11497, 11498, 11546, 11547, and 11548).

We need them to measure the rate of recovery for each well.

Pat

Pat

Well	Water level	Time
11493	16.22	1035
11497	26.01	1053
11498	27.01	1105
11546	10.11	1120
11547	8.59	1135
11548	7.18	1150

Greg

Greg

Could you send me the times also, sorry I didn't think to ask for them.

Pat

Pat

Times are listed above.

Greg

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 3/7/95		MONTLY PAGE: NA OF NA
RECORDER: P. RILEY	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) RG	BZ	DH	βγ (CPM)	COMMENTS
11499	☒ TOW ☐ TPC 6.50	0915				BG: WELL:	
11546	☒ TOW ☐ TPC 9.99	0920				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

NA PR 3/7/95

PR 3/7/95

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

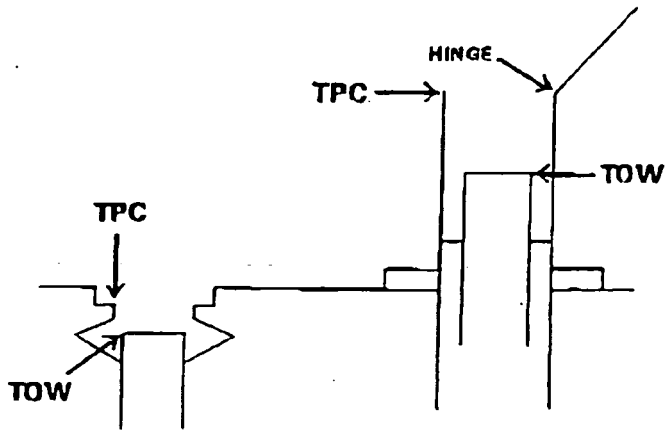
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH GLES EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	960533
PID INSTRUMENT NUMBER:	NA
βγ FRISKER NUMBER:	NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 3/6/95		MONTLY PAGE: NA OF
RECORDER: P. RILEY	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS
11501	☒ TOW ☐ TPC 12.84	1507				BG: WELL:	39.31
11502	☒ TOW ☐ TPC 8.61	1454				BG: WELL:	24.37
11503	☒ TOW ☐ TPC 22.80	1457				BG: WELL:	29.74
11504	☒ TOW ☐ TPC 6.03	1439				BG: WELL:	20.80
11505	☒ TOW ☐ TPC 16.90	1443				BG: WELL:	29.27
11546	☒ TOW ☐ TPC DRY	1510				BG: WELL:	15.00
11547	☒ TOW ☐ TPC 8.82	1429				BG: WELL:	15.05
11548	☒ TOW ☐ TPC 8.11	1434				BG: WELL:	16.11
	☐ TOW ☐ TPC PR 3/6/95					BG: WELL:	NA PR 3/6/95
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

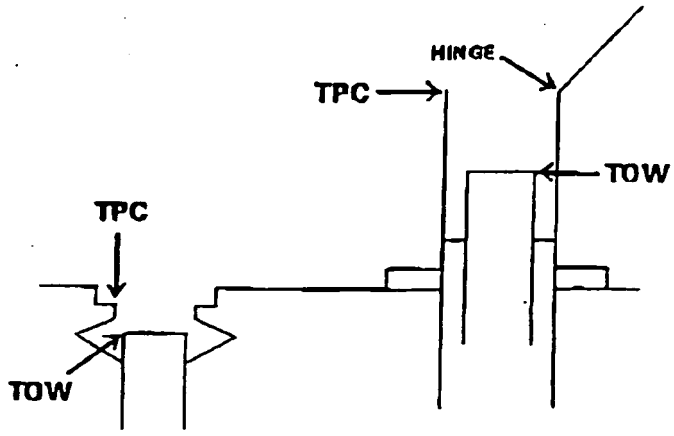
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH GER EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	961354
PID INSTRUMENT NUMBER:	NA
By FRISKER NUMBER:	NA

FS-F-3447 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: NA
DATE: 3/6/95		MONTLY PAGE: NA OF NA
RECORDER: P. RILEY	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	BOTTOM/COMMENTS
11491	☒ TOW ☐ TPC 19.48	1351				BG: WELL:	SLOPE CAUGHT ON RISER PIPE AT 8.92 BOTTOM 31.61
11492	☒ TOW ☐ TPC 16.87	1354				BG: WELL:	23.95
11493	☒ TOW ☐ TPC 16.11	1404				BG: WELL:	CAUGHT ON RISER AT 11.80 BOTTOM 26.16
11494	☒ TOW ☐ TPC 4.57	1406				BG: WELL:	18.13
11495	☒ TOW ☐ TPC DRY	1409				BG: WELL:	39.28
11496	☒ TOW ☐ TPC 6.50	1411				BG: WELL:	19.32.
11497	☒ TOW ☐ TPC 25.61	1414				BG: WELL:	34.65
11498	☒ TOW ☐ TPC 26.41	1419				BG: WELL:	33.12
11499	☒ TOW ☐ TPC 3.55	1421				BG: WELL:	20.78
11500	☒ TOW ☐ TPC 6.57	1500				BG: WELL:	27.49

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

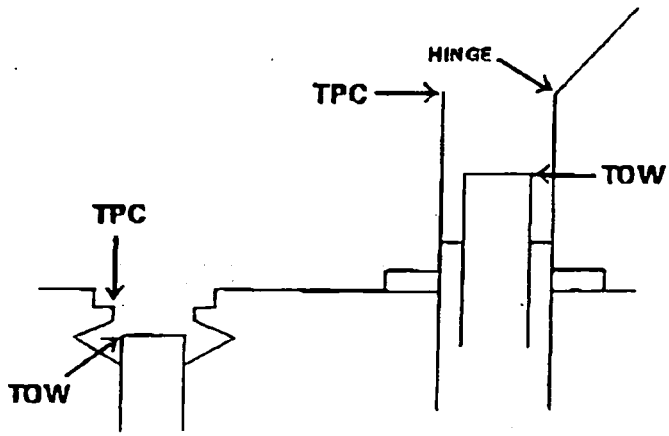
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	961354
PID INSTRUMENT NUMBER:	NA
BY FRISKER NUMBER:	NA

FS-F-3447 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Cru2 Elevations	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 3-1-95		MONTLY PAGE: ____ OF ____
RECORDER: TW	REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 3-1-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11497	☒ TOW ☐ TPC 25.88	0945	0	0	0	BG: NA WELL:	
11498	☒ TOW ☐ TPC 25.60	0959	0	0	0	BG: WELL:	
11499	☒ TOW ☐ TPC 6.71	0952	0	0	0	BG: WELL:	
11502	☒ TOW ☐ TPC 9.48	1019	0	0	0	BG: WELL:	
11546	☒ TOW ☐ TPC 10.82	1055	0	0	0	BG: WELL:	
11493	☒ TOW ☐ TPC 16.97	1331	0	0	0	BG: WELL:	
11547 ~~114~~ TW 3-1-95	☒ TOW ☐ TPC 9.69	1350	0	0	0	BG: WELL:	
11548	☒ TOW ☐ TPC 9.58	1405	0	0	0	BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

Last Entry TW 3-1-95

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

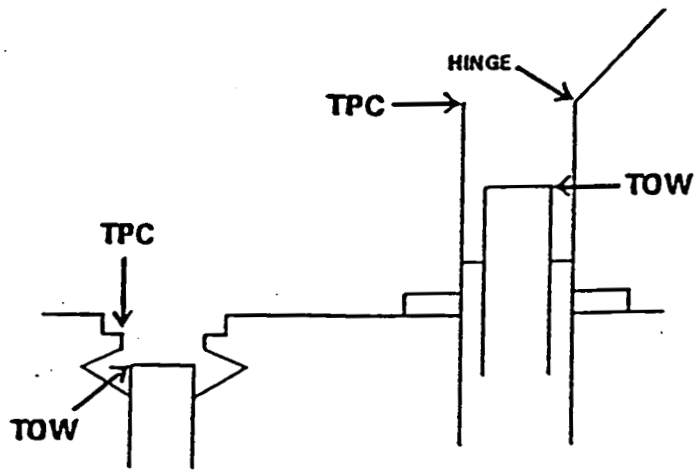
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12.573

PID INSTRUMENT NUMBER: PA930096

βγ FRISKER NUMBER: NA

FS-F-2467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000101

PROJECT: Cru 2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 118
DATE: 2-22-95		MONTLY PAGE: ____ OF ____
RECORDER: TW	REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 2-22-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11504	☒ TOW ☐ TPC 5.25	1359	0	0	0	BG: NA WELL:	TOW 592.07 586.82
11505	☒ TOW ☐ TPC 16.59	1409	0	0	0	BG: WELL:	591.75 575.16
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

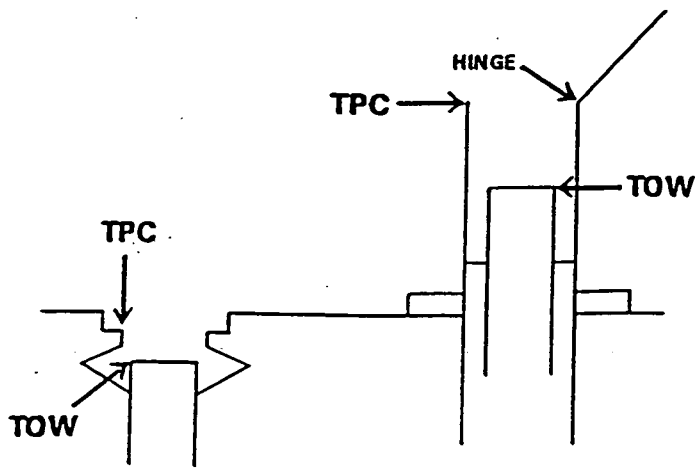
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12.907

PID INSTRUMENT NUMBER: PA930096

PRICKER NUMBER: NA

F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Cru 2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-22-95		MONTLY PAGE: ____ OF ____
RECORDER: TCW	REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 2-22-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS	
1124	☒ TOW ☐ TPC 24.55	0905	0	0	0	BG: NA WELL:	TOW 618.78	594.23 ✓
11495	☒ TOW ☐ TPC DRY	0911	0	0	0	BG: WELL:	TOW 605.58	Dry
11493	☒ TOW ☐ TPC 18.35	0917	0	0	0	BG: WELL:	TOW 605.41	587.06 ✓
11494	☒ TOW ☐ TPC 4.78	0924	0	0	0	BG: WELL:	TOW 605.48	600.70 ✓
11497	☒ TOW ☐ TPC 26.42	0929	0	0	0	BG: WELL:	TOW 604.29	577.87 ✓
~~11498~~	☐ TOW ☐ TPC TW 2-22-95					BG: WELL:		
11496	☒ TOW ☐ TPC 3.88	0941	0	0	0	BG: WELL:	TOW 604.63	600.75 ✓
1887	☒ TOW ☐ TPC 3.87	1145	0	0	0	BG: WELL:	TOW 591.16	587.29 ✓
11492	☒ TOW ☐ TPC 17.05	1201	0	0	0	BG: WELL:	TOW 612.29	595.24 ✓
11491	☒ TOW ☐ TPC 19.52	1211	0	0	0	BG: WELL:	TOW 613.05	593.53 ✓

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

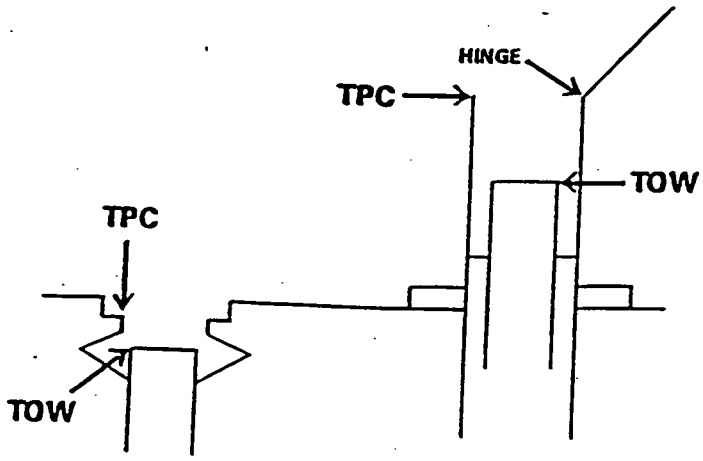
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12907

PID INSTRUMENT NUMBER: PA930096

βγ FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000103

PROJECT: Gw Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 118
DATE: 2-22-95		MONTLY PAGE: ____ OF ____
RECORDER: JCW	REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 2-22-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS	
11498	☐ TOW ☐ TPC 26.80	1219	0	0	0	BG: NA WELL:	TOW 596.50	569.70
11499	☒ TOW ☐ TPC 6.93	1228	0	0	0	BG: WELL:	TOW 596.56	589.63
11503	☐ TOW ☐ TPC 22.80	1240	0	0	0	BG: WELL:	TOW 595.47	572.67
11502	☐ TOW ☐ TPC 11.12	1247	0	0	0	BG: WELL:	TOW 595.60	584.48
11546	☐ TOW ☐ TPC 11.93	1254	0	0	0	BG: WELL:	TOW 600.81	588.88
11501	☒ TOW ☐ TPC 12.84	1259	0	0	0	BG: WELL:	TOW 600.80	587.96
11500	☐ TOW ☐ TPC 6.45	1305	0	0	0	BG: WELL:	TOW 660.75	594.30
11548	☒ TOW ☐ TPC 11.16	1312	0	0	0	BG: WELL:	TOW 587.68	576.52
11547	☐ TOW ☐ TPC 11.03	1328	0	0	0	BG: WELL:	TOW 590.37	579.34
1733	☒ TOW ☐ TPC 19.24	1341	0	0	0	BG: WELL:	TOW 607.15	587.91

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

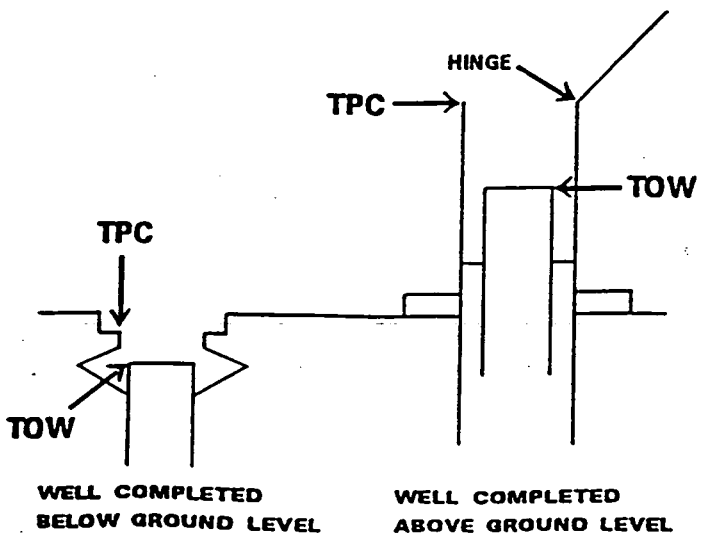
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12907

PID INSTRUMENT NUMBER: 07930096

βγ FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-22-95		MONTLY PAGE: ____ OF ____
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11075 ✓	☒ TOW ☐ TPC 8.82	1040	0	0	0	BG: N/A WELL:	TOW 580.56 571.74 ✓
1112 ✓	☐ TOW ☒ TPC 9.99	1045	0	0	0	BG: WELL:	TPC 581.25 571.26 ✓
1111 ✓	☐ TOW ☒ TPC 7.58	1048	0	0	0	BG: WELL:	TPC 581.69 574.11 ✓
1110 ✓	☐ TOW ☒ TPC 7.88	1055	0	0	0	BG: WELL:	TPC 582.51 574.63 ✓
1418 ✓	☐ TOW ☒ TPC 4.76	1100	0	0	0	BG: WELL:	TPC 582.11 577.35 ✓
1299 ✓	☐ TOW ☒ TPC 4.72	1106	0	0	0	BG: WELL:	TPC 587.05 582.33 ✓
1293 ✓	☐ TOW ☒ TPC 3.92	1110	0	0	0	BG: WELL:	TPC 588.71 584.79 ✓
11074 ✓	☒ TOW ☐ TPC 14.15	1114	0	0	0	BG: WELL:	TOW 585.54 571.39 ✓
1131 ✓	☐ TOW ☒ TPC 6.76	1117	0	0	0	BG: WELL:	TPC 581.51 574.75 ✓
1151 ✓	☐ TOW ☒ TPC 5.56	1120	0	0	0	BG: WELL:	TPC 581.96 576.40 ✓

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

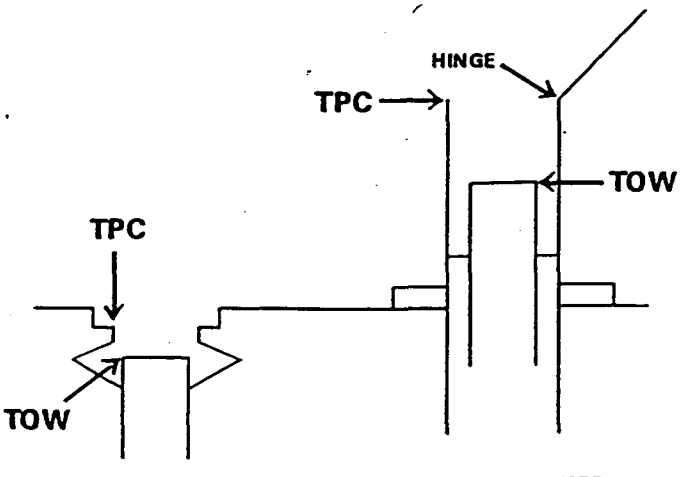
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12914
PID INSTRUMENT NUMBER:	930084
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000105

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-22-95		MONTLY PAGE: ____ OF ____
RECORDER: J. Norther	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1301	☐ TOW ☒ TPC 8.50 ✓	1145	0	0	0	BG: 50 / WELL: 50	TPC 587.43 578.93 ✓
1276	☐ TOW ☒ TPC 6.62 ✓	1155	0	0	0	BG: 50 / WELL: 50	TPC 592.31 585.69 ✓
1274	☐ TOW ☒ TPC 5.74 ✓	1202	0	0	0	BG: 50 / WELL: 50	TPC 593.02 587.28 ✓
1278	☐ TOW ☒ TPC 5.99 ✓	1225	0	0	0	BG: 50 / WELL: 50	TPC 590.85 584.86 ✓
1444	☐ TOW ☒ TPC 6.45 ✓	1440	0	0	0	BG: N/A / WELL:	TPC 602.15 595.70 ✓
11067	☒ TOW ☐ TPC 5.14	1450	0	0	0	BG: / WELL:	TPC 592.19 ~~587.05~~ ✓
1843	☐ TOW ☒ TPC 5.94	1500	0	0	0	BG: / WELL:	TPC 593.46 587.52 ✓
1152	☐ TOW ☒ TPC 4.42	1510	0	0	0	BG: / WELL:	TPC 579.69 575.27 ✓
1064	☒ TOW ☐ TPC 9.93	1515	0	0	0	BG: / WELL:	TOW 589.92 579.99 ✓
1866	☐ TOW ☒ TPC 4.83	1525	0	0	0	BG: / WELL:	TPC 579.15 574.32 ✓

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

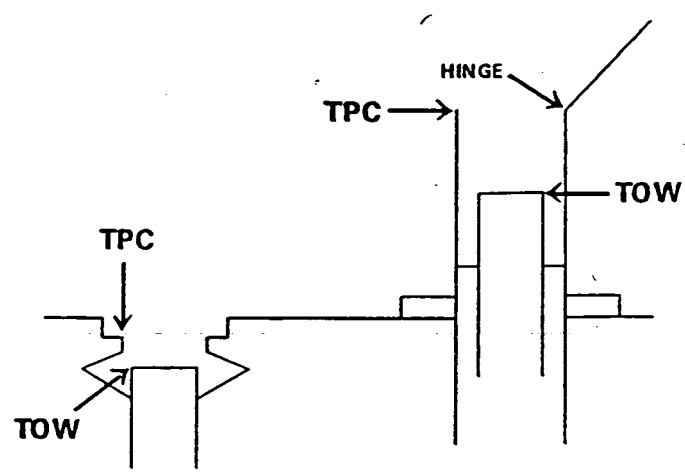
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12914

PID INSTRUMENT NUMBER: 930084

βγ FRISKER NUMBER: 103249

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

911

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-22-95		MONTLY PAGE: ____ OF ____
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS
1160 ✓	☐ TOW ☒ TPC 8.76	1530	0	0	0	BG: NA / WELL:	TPC 584.12 575.36 ✓
1905	☐ TOW ☒ TPC Dry	1535	0	0	0	BG: / WELL:	TPC 577.56 Dry
1171 ✓	☐ TOW ☒ TPC 7.24	1545	0	0	0	BG: / WELL:	TPC 582.60 575.36 ✓
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

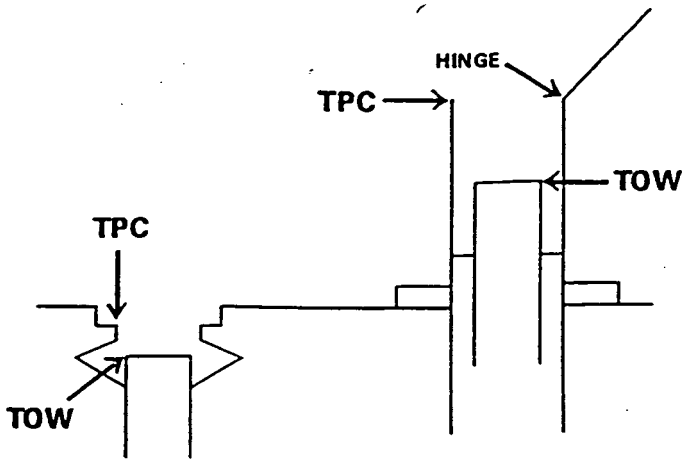
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12914
PID INSTRUMENT NUMBER:	930084
By FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000107

PROJECT: CRU 2 ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2/17/95		MONTLY PAGE: ____ OF ____
RECORDER:	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1151	☐ TOW ☒ TPC 5.61.	1430	0	0	0	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING/CAP. NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

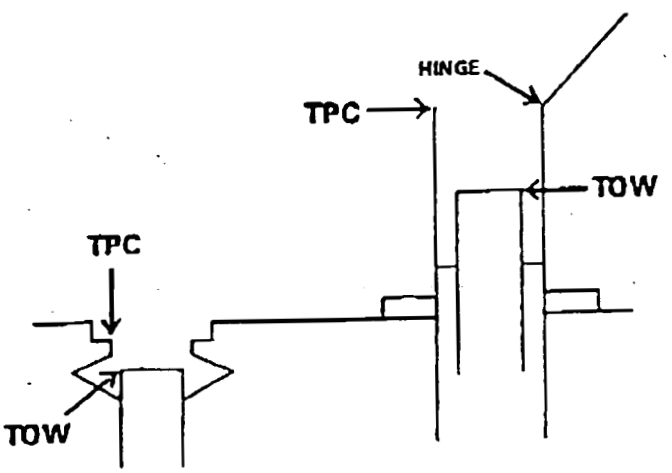
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ PRINCER NUMBER:

PS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Cruz Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2.15.95		MONTLY PAGE: ____ OF ____
RECORDER: TC Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE: TW 2-16-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 7.91	1126	0	0	0	BG: 30 WELL: 30	
1110	☐ TOW ☒ TPC 8.00	1129	0	0	1	BG: 40 WELL: 40	
1418	☐ TOW ☒ TPC 4.43	1131	0	0	0	BG: 30 WELL: 30	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

2-15-95

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

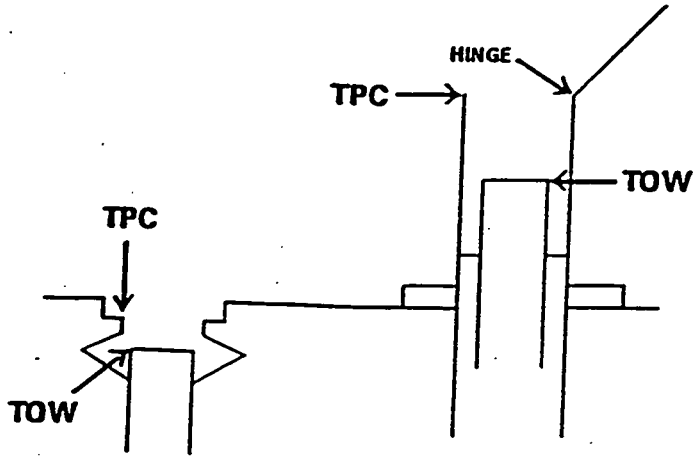
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12913

PID INSTRUMENT NUMBER: 93096

βγ PRICKER NUMBER: 77174

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRL2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-15-95		MONTLY PAGE: ____ OF ____
RECORDER: T. Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE: TW 2-16-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1301	☐ TOW ☒ TPC 8.49	0945	0	0	0	BG: 40 WELL: 40	
1274	☐ TOW ☒ TPC 5.75	1010	0	0	0	BG: 40 WELL: 40	
1276	☐ TOW ☒ TPC 6.60	1020	0	0	0	BG: 40 WELL: 40	
1131	☐ TOW ☒ TPC 6.72	1037	0	0	1	BG: 40 WELL: 40	
1278	☐ TOW ☒ TPC 5.98	1044	0	0	1	BG: 30 WELL: 30	
1293	☐ TOW ☒ TPC 3.97	1048	0	0	0	BG: 30 WELL: 30	
1299	☐ TOW ☒ TPC 4.28	1054	0	0	0	BG: 30 WELL: 30	
1151	☐ TOW ☒ TPC 6.88	1102	0	0	0	BG: 40 WELL: 40	
1112	☐ TOW ☒ TPC 10.08	1115	0	0	1	BG: 40 WELL: 40	
11075	☒ TOW ☐ TPC 8.04	1120	0	0	1	BG: 40 WELL: 40	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

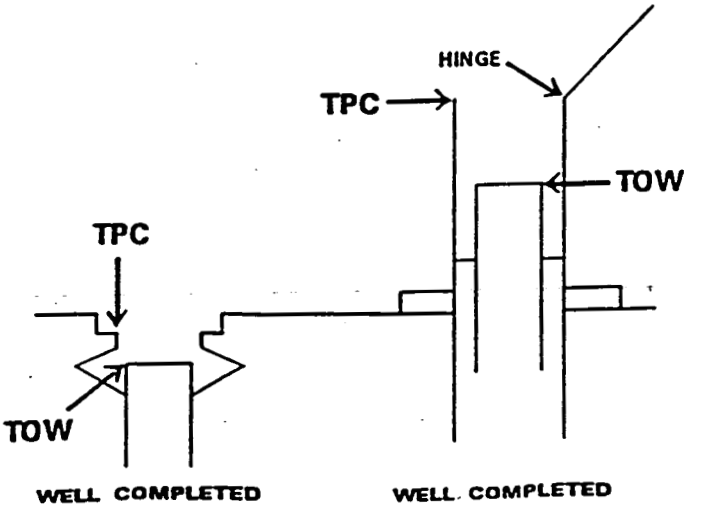
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12913

PID INSTRUMENT NUMBER: 930096

βγ PRISKER NUMBER: 7174

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

811

PROJECT: CRU 2 ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-15-95		MONTLY PAGE: ____ OF ____
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins	VERIFYING TECHNICIAN'S INITIALS AND DAT

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11067	☒ TOW ☐ TPC 5.16	1155	0	0	0	BG: N/A WELL:	
11548	☒ TOW ☐ TPC 13.55	1200	0	0	0	BG: WELL:	TOW 587.65 574.13
1843	☐ TOW ☒ TPC 6.34	1205	0	0	0	BG: WELL:	
11547	☒ TOW ☐ TPC 12.75	1210	0	0	0	BG: WELL:	TOW 590.37 577.62
11491	☒ TOW ☐ TPC 19.42	1215	0	0	0	BG: WELL:	
11492	☒ TOW ☐ TPC 16.82	1217	0	0	0	BG: WELL:	
11493	☒ TOW ☐ TPC 19.89	1230	0	0	0	BG: WELL:	
11495	☒ TOW ☐ TPC DRY	1233	0	0	0	BG: WELL:	
11494	☒ TOW ☐ TPC 5.18	1235	0	0	0	BG: WELL:	
11496	☒ TOW ☐ TPC 4.67	1240	0	0	0	BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

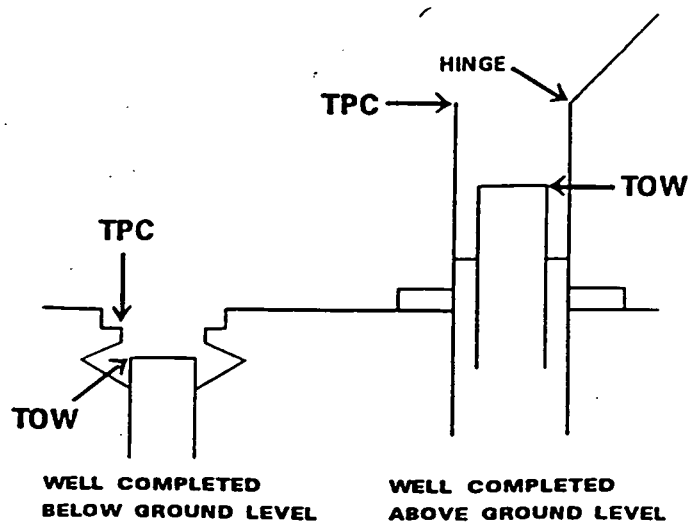
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12914
PID INSTRUMENT NUMBER:	930054
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)



000111

PROJECT: CAU 2 ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-15-95		MONTLY PAGE: ____ OF ____
RECORDER: J. Norbor	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1064	☒ TOW ☐ TPC 11.96	1030	0	0	0	BG: N/A WELL: N/A	
1152	☐ TOW ☒ TPC 4.76	1035	0	0	0	BG: N/A WELL: N/A	
1160	☐ TOW ☒ TPC 8.72	1045	0	0	0	BG: N/A WELL: N/A	
1171	☐ TOW ☒ TPC 7.10	1055	0	0	0	BG: N/A WELL: N/A	
1887	☒ TOW ☐ TPC 5.56	1105	0	0	0	BG: WELL:	
1866	☐ TOW ☒ TPC 5.02	1110	0	0	0	BG: WELL:	
1905	☐ TOW ☒ TPC Dry	1120	0	0	0	BG: WELL:	
11505	☒ TOW ☐ TPC 16.46	1130	0	0	0	BG: WELL:	Barrels By well
11504	☒ TOW ☐ TPC 6.67	1135	0	0	0	BG: WELL:	" " "
1444	☐ TOW ☒ TPC 6.20	1145	0	0	0	BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

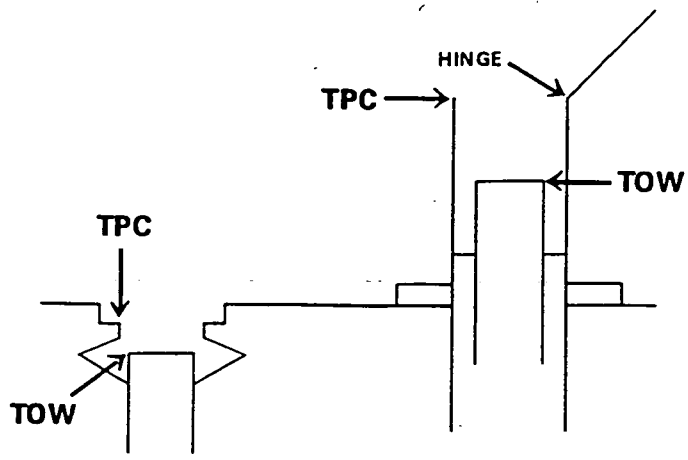
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12914
PID INSTRUMENT NUMBER:	930084
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU 2 ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-15-95		MONTLY PAGE: ____ OF ____
RECORDER: J. Nolder	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins	VERIFYING TECHNICIAN'S INITIALS AND DATE

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11497	☒ TOW ☐ TPC 27.25	1244	0	0	0	BG: N/A WELL:	
11546	☒ TOW ☐ TPC 13.35	1250	0	0	0	BG: WELL:	
11501	☒ TOW ☐ TPC 12.83	1252	0	0	0	BG: WELL:	
11500	☒ TOW ☐ TPC 6.90	1255	0	0	0	BG: WELL	
11503	☒ TOW ☐ TPC 22.78	1300	0	0	0	BG: WELL:	
11502	☒ TOW ☐ TPC 12.44	1303	0	0	0	BG: WELL:	
11499	☒ TOW ☐ TPC 7.58	1305	0	0	0	BG: WELL:	
11498	☒ TOW ☐ TPC 27.18	1308	0	0	0	BG: WELL:	
1124	☒ TOW ☐ TPC ~~25.86~~ 25.82	1315	0	0	0	BG: WELL:	
1733	☒ TOW ☐ TPC 18.43	1322	0	0	0	BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

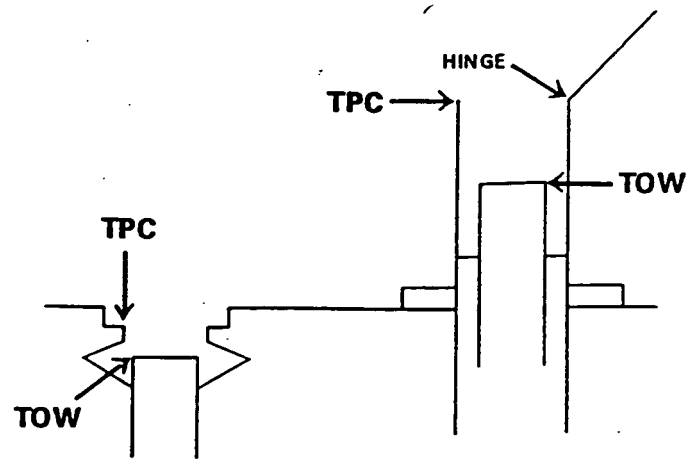
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	1.2914
PID INSTRUMENT NUMBER:	930084
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000113

These values are not used - the other set collected by T. Smith are used.

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 1 of 1
DATE: 02-15-95		MONTLY PAGE: ____ of ____
RECORDER: Jim Capannari	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11493	☒ TOW ☐ TPC 19.84'	1545	NA	NA	NA	BG: NA WELL: NA	
11497	☒ TOW ☐ TPC 27.22'	1550	NA	NA	NA	BG: NA WELL: NA	
11498	☒ TOW ☐ TPC 27.15'	1558	NA	NA	NA	BG: NA WELL: NA	
11499	☒ TOW ☐ TPC 7.57'	1600	NA	NA	NA	BG: NA WELL: NA	
11502	☒ TOW ☐ TPC 13.38'	1605	NA	NA	NA	BG: NA WELL: NA	← used this value
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

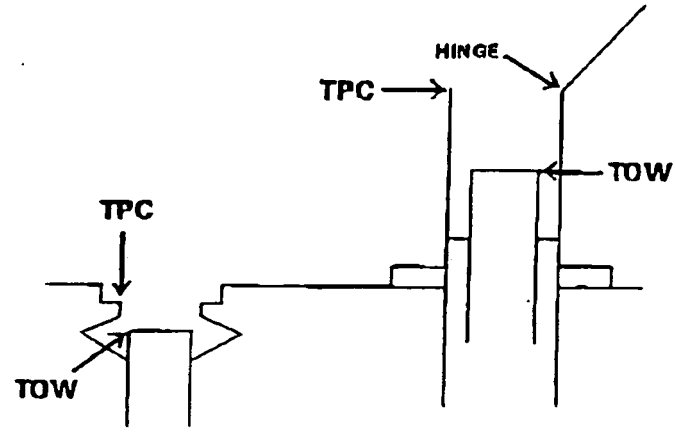
MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 960536

PID INSTRUMENT NUMBER: NA

βγ FRISKER NUMBER: NA

FS-F-3447 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 1 of 1
DATE: 2-17-95		MONTLY PAGE: ____ OF ____
RECORDER: Jim Capannari	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) RG	BZ	DH	BY (CPM)	COMMENTS
11493	☐ TOW ☐ TPC 18.44'	15:45	NA	NA	NA	BG: NA / WELL: NA	
11497	☐ TOW ☐ TPC 27.00'	15:50	NA	NA	NA	BG: NA / WELL: NA	
11498	☐ TOW ☐ TPC 27.13'	15:55	NA	NA	NA	BG: NA / WELL: NA	
11499	☐ TOW ☐ TPC 7.37'	15:58	NA	NA	NA	BG: NA / WELL: NA	
11502	☐ TOW ☐ TPC 12.76'	16:10	NA	NA	NA	BG: NA / WELL: NA	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

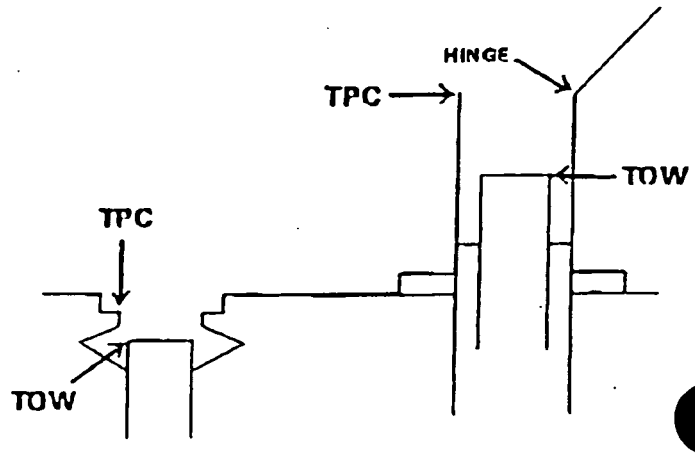
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: ~~9603~~ 960536 2-17-95

PID INSTRUMENT NUMBER:

BY FRISKER NUMBER:

FS-F-3487 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 20.05.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 1 of 1
DATE: 02-13-95		MONTLY PAGE: ____ OF ____
RECORDER: RT Thomas	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS
~~11493~~	~~☒ TOW ☐ TPC 20.13~~	~~2/13/95 1500~~	~~N~~	~~A~~		~~BG: NA WELL: NA~~	
11497	☒ TOW ☐ TPC 27.57	1505	N	A		BG: NA WELL: NA	
11498	☒ TOW ☐ TPC 27.40	1510	N	A		BG: NA WELL: NA	
11499	☒ TOW ☐ TPC 7.79	1508	N	A		BG: NA WELL: NA	
11502	☒ TOW ☐ TPC 14.12	1514	N	A		BG: NA WELL: NA	
11493	☐ TOW ☐ TPC 20.41	1500				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

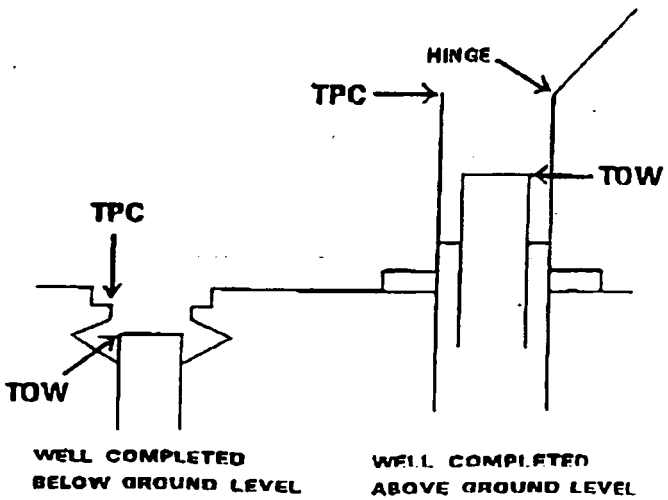
MONITORING WELL WITH GW3 EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

By FRISKER NUMBER:

FS-F-3447 (REV. 12/08/93)



PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-10-95		MONTLY PAGE: ____ OF ____
RECORDER: R Thomas	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) RG	BZ	DH	βγ (CPM)	COMMENTS
11493	☒ TOW ☐ TPC 21.12	1500				BG: WELL:	
11497	☒ TOW ☐ TPC 27.93	1505				BG: WELL:	
11498	☒ TOW ☐ TPC 28.13	1510	N/A RT 2-13-95			BG: N/A WELL: RT	
11499	☒ TOW ☐ TPC 8.04	1508				BG: 2-13-95 WELL:	RT 2-13-95
11502	☒ TOW ☐ TPC 15.34	1514				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC	RT 2-13-95				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

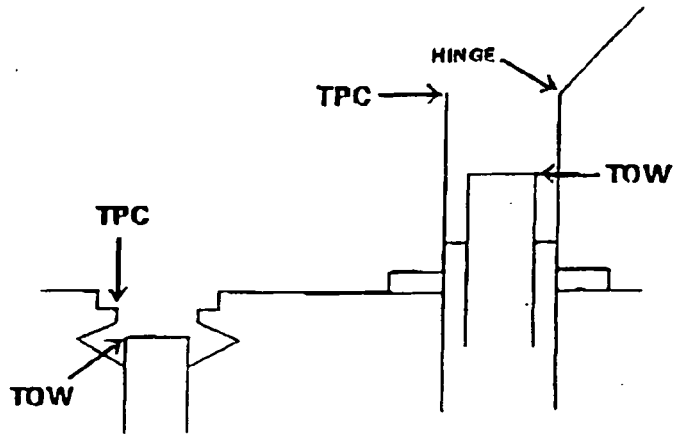
MONITORING WELL WITH GEO EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ PRISKER NUMBER:

ES-F-1447 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Cru2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 118
DATE: 2-9-95		MONTLY PAGE: ____ OF ____
RECORDER: TGW	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins 2-10-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1276	☐ TOW ☒ TPC 6.68	0930	0	0	0	BG: NA WELL:	
1274	☐ TOW ☒ TPC 5.42	0944	0	0	0	BG: WELL:	
1301	☒ TOW ☐ TPC 5.60	1029	0	0	0	BG: WELL:	
1131	☐ TOW ☒ TPC 6.70	1102	0	0	0	BG: WELL:	
11074	☒ TOW ☐ TPC 13.91	1108	0	0	0	BG: WELL:	
1249	☒ TOW ☐ TPC 4.31	1113	0	0	0	BG: WELL:	
1293	☒ TOW ☐ TPC 3.49	1118	0	0	0	BG: WELL:	
1112	☐ TOW ☒ TPC 10.05	1140	0	0	0	BG: WELL:	
11075	☒ TOW ☐ TPC 8.85	1145	0	0	0	BG: WELL:	
1111	☐ TOW ☒ TPC 7.80	1149	0	0	0	BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

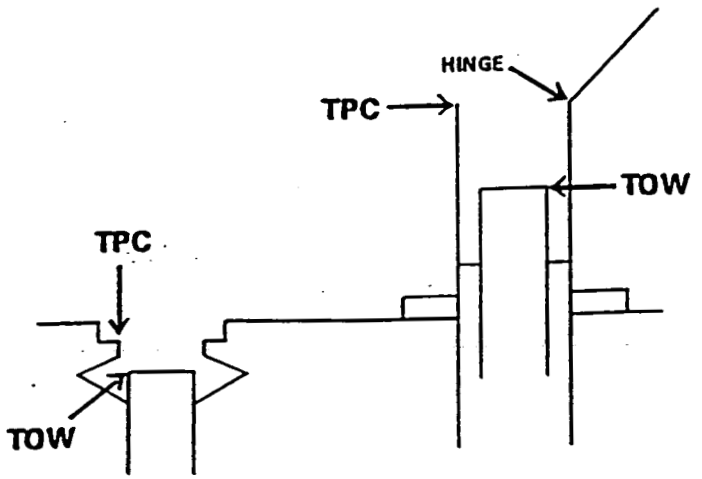
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12914

PID INSTRUMENT NUMBER: PA930096

γ FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Cru2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: •
DATE: 2-9-95		MONTLY PAGE: ____ OF ____
RECORDER: TLW	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. COLLINS 2-10-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1110	☐ TOW ☒ TPC 8.02	1153	0	0	0	BG: NA WELL:	
1418	☐ TOW ☒ TPC 5.15	1158	0	0	0	BG: WELL:	
1278	☐ TOW ☒ TPC 6.10	1205	0	0	0	BG: WELL:	
1151	☐ TOW ☒ TPC 5.60	1212	0	0	0	BG: WELL:	
1124	☒ TOW ☐ TPC NA	1259	0	0	0	BG: WELL:	Frozen
1160	☐ TOW ☒ TPC 8.63	1350	0	0	0	BG: WELL:	TS VR
1171	☐ TOW ☒ TPC 7.25	1400	0	0	0	BG: WELL:	TS VR
1905	☐ TOW ☒ TPC Dry	1405	0	0	0	BG: WELL:	TS VR
1843	☐ TOW ☒ TPC 6.25	1412	0	0	0	BG: WELL:	
1106	☒ TOW ☐ TPC 5.21	1417	0	0	0	BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

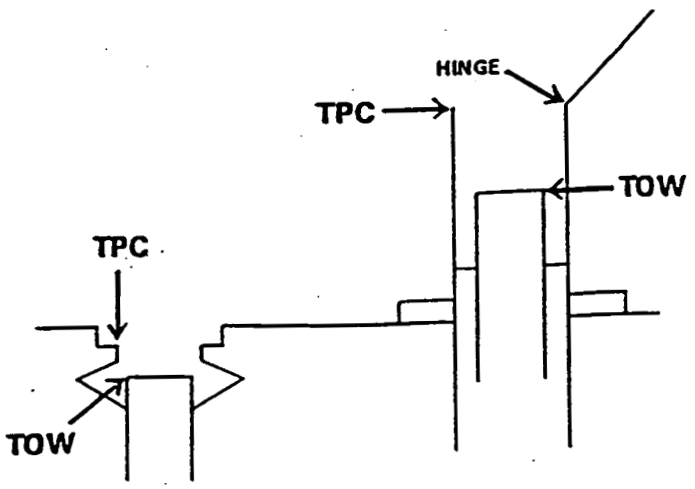
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12914

PID INSTRUMENT NUMBER: PA930096

βγ FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000119

PROJECT: Cru 2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 118
DATE: 2-9-95		MONTLY PAGE: ____ OF ____
RECORDER: TW	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins 2-10-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BG (CPM)	COMMENTS
1152	☐ TOW ☒ TPC 4.90	1426	0	0	0	BG: NA WELL:	TS, VR
1064	☒ TOW ☐ TPC 10.80	1430 ~~1215~~	0	0	0	BG: WELL:	TS, VR
1887	☒ TOW ☐ TPC 5.12	1424	0	0	0	BG: WELL:	
1733	☒ TOW ☐ TPC 19.55	1438	0	0	0	BG: WELL:	
1866	☐ TOW ☒ TPC 5.04	1441	0	0	0	BG: WELL:	TS, VR
1444	☐ TOW ☒ TPC 6.60	1450	0	0	0	BG: WELL:	TS, VR
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

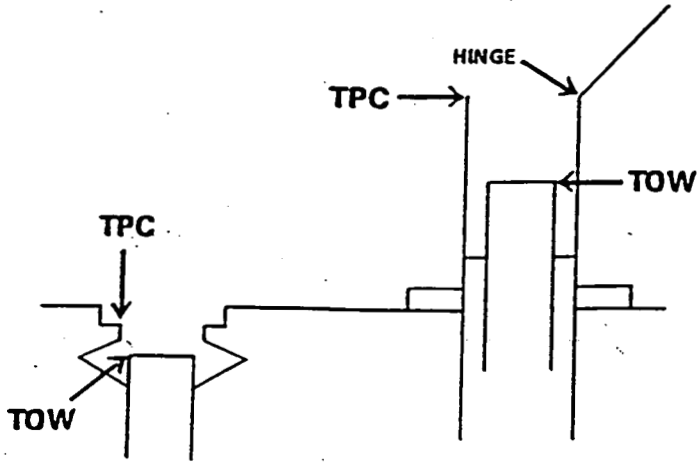
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12914

PID INSTRUMENT NUMBER: PA930090

FRISKER NUMBER: NT

-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000120

PROJECT: Cru2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-9-95		MONITOR PAGE: ____ OF ____
RECORDER: TW	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins 2-10-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11501	☒ TOW ☐ TPC 12.90	1323	0	0	0	BG: NA WELL:	
11502	☒ TOW ☐ TPC 15.78	1330	0	0	0	BG: WELL:	
11503	☒ TOW ☐ TPC 23.11	1334	0	0	0	BG: WELL:	
11504	☒ TOW ☐ TPC 6.22	1401	0	0	0	BG: WELL:	
11505	☒ TOW ☐ TPC 16.83	1407	0	0	0	BG: WELL:	
11546	☒ TOW ☐ TPC 13.81	1326	0	0	0	BG: WELL:	
11547	☒ TOW ☐ TPC 13.88	1347	0	0	0	BG: WELL:	
11548	☒ TOW ☐ TPC 14.72	1354	0	0	0	BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

NA

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

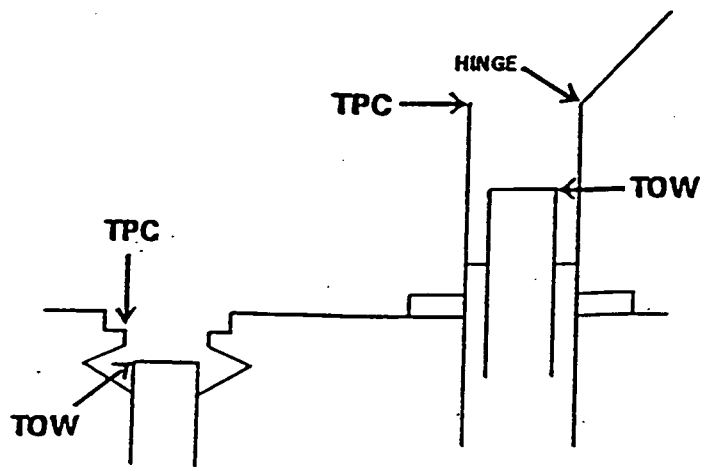
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12914
PID INSTRUMENT NUMBER:	PA930096
βγ FRISKER NUMBER:	NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000121

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 118
DATE: 2-9-95		MONTLY PAGE: ____ OF ____
RECORDER: TW	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. COLLINS 2-10-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11491	☒ TOW ☐ TPC 19.49	1249	0	0	0	BG: NA WELL:	
11492	☒ TOW ☐ TPC 17.10	1254	0	0	0	BG: WELL:	
11493	☒ TOW ☐ TPC 21.35	1300	0	0	0	BG: WELL:	
11494	☒ TOW ☐ TPC ~~DT~~ TW 1354 5.10	1308	0	0	0	BG: WELL:	
11495	☒ TOW ☐ TPC DRY	1304	0	0	0	BG: WELL:	
11496	☒ TOW ☐ TPC 3.85	1309	0	0	0	BG: WELL:	
11497	☒ TOW ☐ TPC 28.24	1312	0	0	0	BG: WELL:	
11498	☒ TOW ☐ TPC 27.67	1343	0	0	0	BG: WELL:	
11499	☒ TOW ☐ TPC 8.31	1338	0	0	0	BG: WELL:	
11500	☒ TOW ☐ TPC 6.74	1319	0	0	0	BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

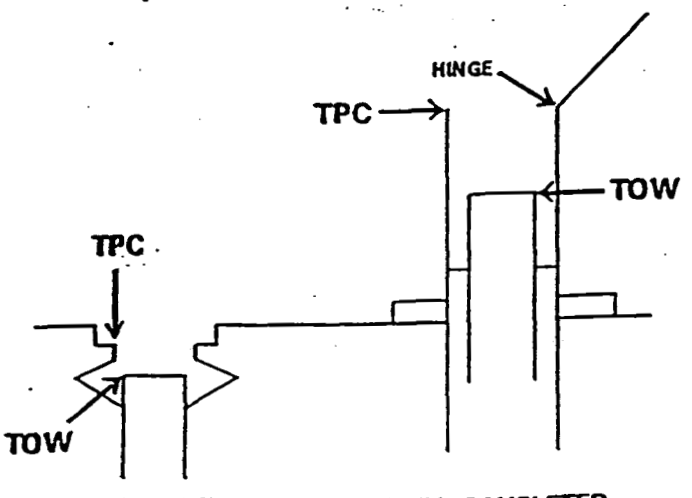
MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12914
PID INSTRUMENT NUMBER:	PA93009 6
PRICKER NUMBER:	NA



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

S-F-3467 (REV. 12/08/93)

000122

Used for [illegible]

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT-PAGE: 1 of 1
DATE: 02-09-95		MONTLY PAGE: ____ OF ____
RECORDER: Jim Capannari	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) RG	BZ	DH	βγ (CPM)	COMMENTS
1493	☐ TOW ☐ TPC 21.34	1500	NA	NA	NA	BG: NA / WELL: NA	
1497	☐ TOW ☐ TPC 28.20	1505	NA	NA	NA	BG: NA / WELL: NA	
1498	☐ TOW ☐ TPC 28.56	1510	NA	NA	NA	BG: NA / WELL: NA	
1499	☐ TOW ☐ TPC 8.30	1508	NA	NA	NA	BG: NA / WELL: NA	
1502	☐ TOW ☐ TPC 16.65	1514	NA	NA	NA	BG: NA / WELL: NA	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

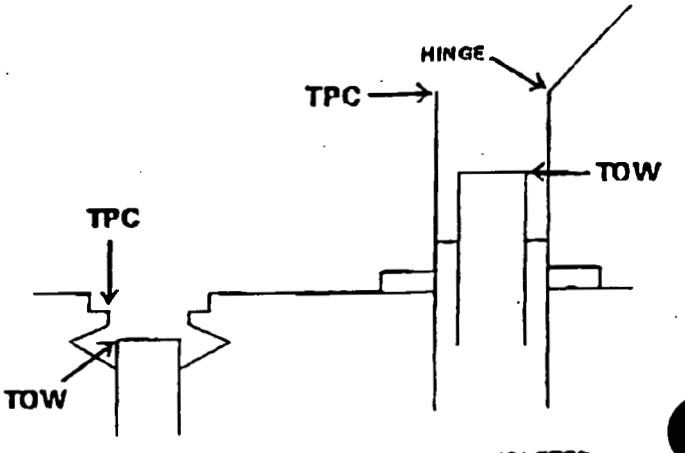
MONITORING WELL WITH GEM EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

118

PROJECT: 20.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 1 of 1
DATE: 02/08/95		MONTLY PAGE: 1 of 1
RECORDER: Jim Capranati	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS
11493	☒ TOW ☐ TPC 21.60	1630	NA	NA	NA	BG: NA / WELL: NA	
11497	☒ TOW ☐ TPC 28.37	1635	NA	NA	NA	BG: NA / WELL: NA	
11498	☒ TOW ☐ TPC 27.72	1639	NA	NA	NA	BG: NA / WELL: NA	
11499	☒ TOW ☐ TPC 8.44	1640	NA	NA	NA	BG: NA / WELL: NA	
1502	☒ TOW ☐ TPC 17.19	1643	NA	NA	NA	BG: NA / WELL: NA	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC	JC 02-08-95				BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

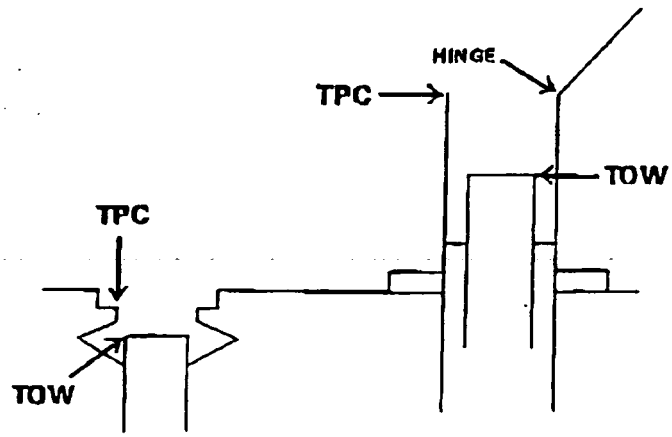
MONITORING WELL WITH GLEE EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

By FRISKER NUMBER:

FS-F-3447 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 10.03.07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT-PAGE: 1
DATE: 2/7/95		MONTLY PAGE: 1 OF 1
RECORDER: R. Thomas	REVIEWING TECHNICIAN'S INITIALS AND DATE: JWC 2/7/95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

	WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) RG	BZ	DH	βγ (CPM)	COMMENTS
583.5	11493	☒ TOW ☐ TPC 21.91'	0935				BG: WELL:	
575.69	11497	☒ TOW ☐ TPC 28.60'	0939				BG: WELL:	
578.73	11502	☒ TOW ☐ TPC 16.87'	0944				BG: WELL:	
587.83	11499	☒ TOW ☐ TPC 8.73	0950				BG: WELL:	
568.71	11498	☒ TOW ☐ TPC 27.79	0955				BG: WELL:	
		☐ TOW ☐ TPC					BG: WELL:	
		☐ TOW ☐ TPC	AF 4/7/87				BG: WELL:	
		☐ TOW ☐ TPC					BG: WELL:	
		☐ TOW ☐ TPC					BG: WELL:	
		☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

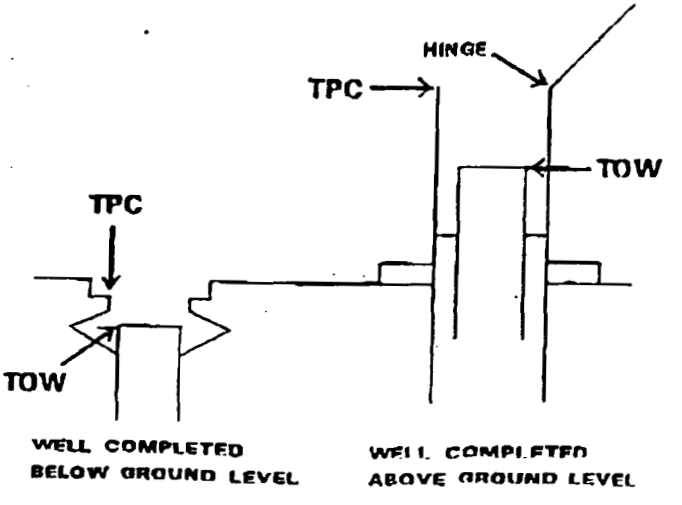
MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

ES-F-3447 (REV. 12/08/93)



PROJECT: 20-03-07	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 1
DATE: 2/6/95		MONTLY PAGE: 1 OF 1
RECORDER: R. Thomas	REVIEWING TECHNICIAN'S INITIALS AND DATE: JMC 2/7/95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11493	☒ TOW ☐ TPC 22.20	1300				BG: WELL:	
11497	☒ TOW ☐ TPC 28.75	1305				BG: WELL:	
11502	☒ TOW ☐ TPC 17.34	1310				BG: WELL:	
11499	☒ TOW ☐ TPC 8.96	1315				BG: WELL:	
11498	☒ TOW ☐ TPC 27.89	1320				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC	RT 2-6-95				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

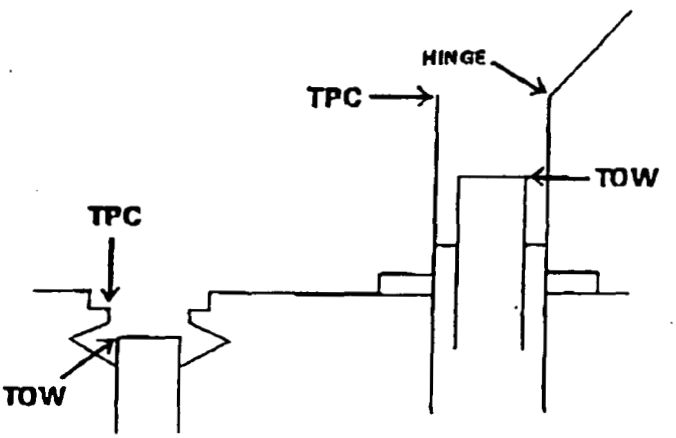
MONITORING WELL WITH GLB EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ PRISKER NUMBER:

FS-F-3447 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: OU2 Pre-Design	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: •
DATE: 2/2/95		MONTLY PAGE: ____ OF ____
RECORDER: Danny Hampson	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS Depth to Bottom
11491	☑ TOW ☐ TPC 19.42	09:27	0	0	0	BG: WELL:	31.63
11492	☑ TOW ☐ TPC 16.82	09:25	0	0	0	BG: WELL:	23.98
11493	☑ TOW ☐ TPC 22.89	09:44	0	0	0	BG: WELL:	26.19
11494	☑ TOW ☐ TPC 4.60	09:40	0	0	0	BG: WELL:	18.14
11495	☑ TOW ☐ TPC 39.30	09:47	0	0	0	BG: WELL:	39.30
11496	☑ TOW ☐ TPC 3.90	09:51	0	0	0	BG: WELL:	19.34
11497	☑ TOW ☐ TPC 29.77	09:55	0	0	0	BG: WELL:	34.66
11498	☑ TOW ☐ TPC 28.39	10:08	0	0	0	BG: WELL:	33.15
11499	☑ TOW ☐ TPC 10.39	10:10	0	0	0	BG: WELL:	20.79
11500	☑ TOW ☐ TPC 6.79	10:42	0	0	0	BG: WELL:	27.50

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

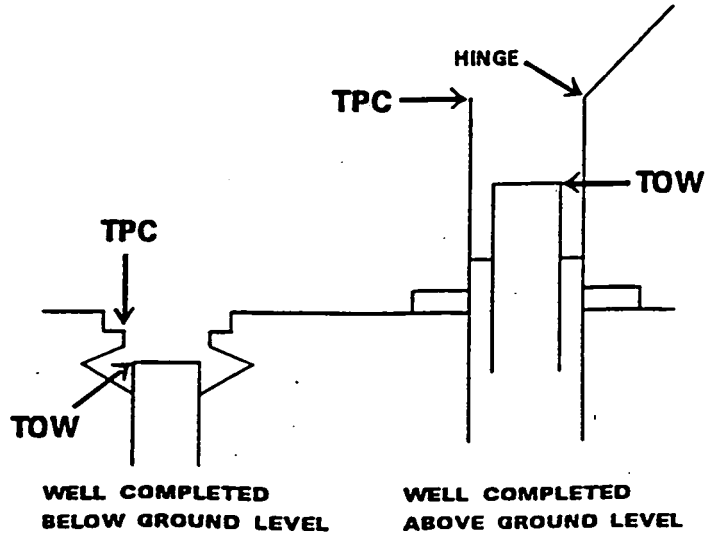
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



PROJECT: 042 Pre-Design	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2/2/95		MONTLY PAGE: ____ OF ____
RECORDER: Damy Hampson	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS Depth to Bottom
11501	☑ TOW ☐ TPC 12.79	10:40	0	0	0	BG: WELL:	39.34
11502	☑ TOW ☐ TPC 19.82	10:14	0	0	0	BG: WELL:	24.39
11503	☑ TOW ☐ TPC 22.98	10:16	0	0	0	BG: WELL:	29.75
11504	☑ TOW ☐ TPC 6.36	13:34	0	0	0	BG: WELL:	20.81
11505	☑ TOW ☐ TPC 17.22	13:30	0	0	0	BG: WELL:	29.29
11546	☑ TOW ☐ TPC 14.82	10:35	0	0	0	BG: WELL:	15.00
11547	☑ TOW ☐ TPC 14.58	13:01	0	0	0	BG: WELL:	15.08
11548	☑ TOW ☐ TPC 15.68	13:05	0	0	0	BG: WELL:	16.12
	☐ TOW ☐ TPC	2/2/95				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

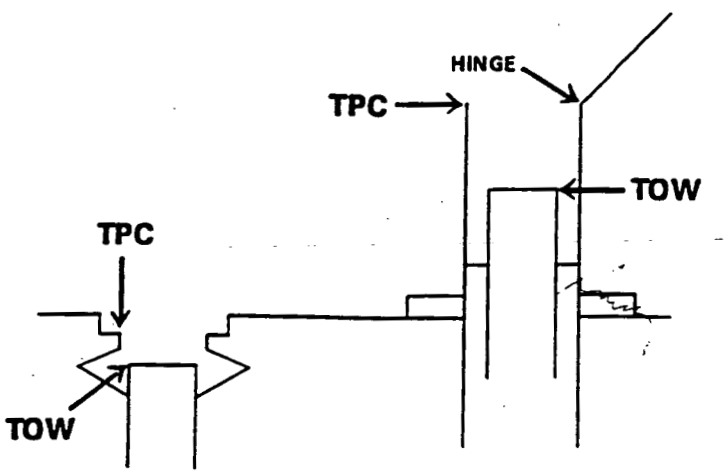
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER:

By FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Gw2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 02-01-95		MONTLY PAGE: ___ OF ___
RECORDER: TCW	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS Total Depth	
11491	☒ TOW ☐ TPC 19.35	1145	0	0	0	BG: NA WELL:	31.63	593.67
11492	☒ TOW ☐ TPC 16.71	1158	0	0	0	BG: WELL:	23.97	595.58
11493	☒ TOW ☐ TPC 23.01	1415	1	1	1	BG: WELL:	26.19	582.70
11494	☒ TOW ☐ TPC 5.04	1421	1	1	1	BG: WELL:	18.14	600.44
11495	☒ TOW ☐ TPC DRY 39.31	1428	1	1	1	BG: WELL:	DRY 39.31	DRY
11496	☒ TOW ☐ TPC 3.85	1344	1	1	1	BG: WELL:	19.33	600.66
11497	☒ TOW ☐ TPC 29.98	1352	1	1	1	BG: WELL:	34.66	574.31
11498	☒ TOW ☐ TPC 28.49	1328	1	1	1	BG: WELL:	33.15	5[illegible]9.01
11499	☒ TOW ☐ TPC 10.72	1334	1	1	1	BG: WELL:	20.80	595.24
11500	☒ TOW ☐ TPC 6.76	1219	0	0	0	BG: WELL:	27.51	593.99

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING/COWL. NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

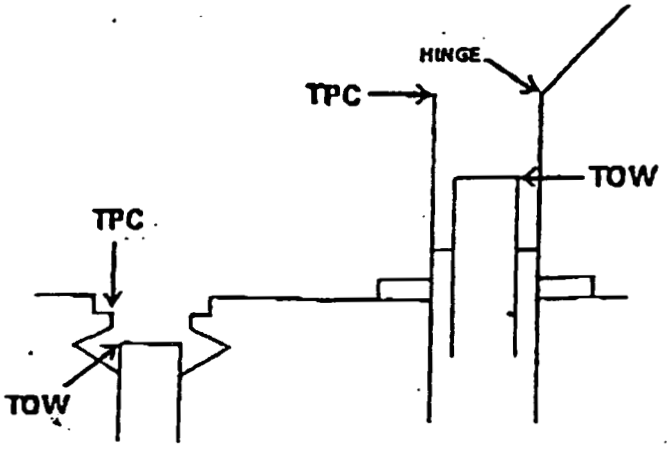
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10.921

PID INSTRUMENT NUMBER: PA-930096

BY PRICKER NUMBER: NA

FS-03487 (REV. 12/06/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Cru2 Elevation
DATE: 02-01-95
RECORDER: TCW

GROUNDWATER ELEVATIONS DATA SHEET

REVIEWING TECHNICIAN'S INITIALS AND DATE:

PROJECT PAGE:
MONTHLY PAGE: ____ OF ____
VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS	
11501	☒ TOW ☐ TPC 12.81	1212	0	0	0	BG: NA WELL:	Total Depth 39.33	587.97
11502	☒ TOW ☐ TPC 20.39	1315	0	0	0	BG: WELL:	24.39	575.23
11503	☒ TOW ☐ TPC 22.84	1322	0	0	0	BG: WELL:	29.76	572.63
11504	☒ TOW ☐ TPC 6.21	1051	0	0	0	BG: WELL:	20.81	585.85
11505	☒ TOW ☐ TPC 17.10	1045	0	0	0	BG: WELL:	29.29	574.65
11546	☒ TOW ☐ TPC 14.63	1232	0	0	0	BG: WELL:	15.00	586.18
11547	☒ TOW ☐ TPC 14.74	0936	0	0	0	BG: WELL:	15.08	575.63
11548	☒ TOW ☐ TPC 15.69	1012	0	0	0	BG: WELL:	16.12	571.99
	☐ TOW ☐ TPC					BG: WELL:		
	☐ TOW ☐ TPC					BG: WELL:		

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

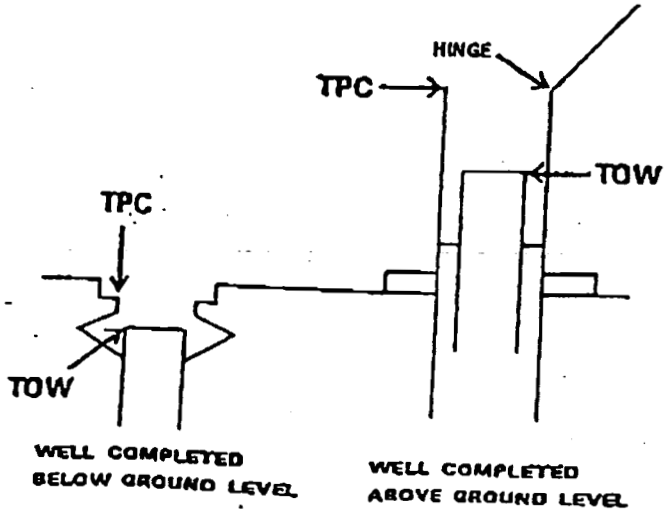
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10921
PID INSTRUMENT NUMBER: PA930096
SPRICKER NUMBER: NA

PS-3487 (REV. 12/08/93)



PROJECT: OPU2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-1-95		MONTLY PAGE: ____ OF ____
RECORDER: [illegible]	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins 2-2-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 7.82	1151	1	1	1	BG: 30 WELL: 30	
1110	☐ TOW ☒ TPC 7.98	1154	1	1	1	BG: 40 WELL: 40	
1418	☐ TOW ☒ TPC 4.82	1157	1	1	1	BG: 40 WELL: 40	
1131	☐ TOW ☒ TPC 6.65	1204	1	1	1	BG: 50 WELL: 50	
1905	☐ TOW ☐ TPC N/A	1430	0	0	0	BG: WELL:	Dry
1152	☐ TOW ☒ TPC 4.74	1440	1	1	1	BG: WELL:	
1064	☒ TOW ☐ TPC 11.13	1442	0	0	0	BG: WELL:	
1887	☒ TOW ☐ TPC 4.99	1448	1	1	1	BG: WELL:	
1124	☒ TOW ☐ TPC 28.36	1454	1	1	1	BG: WELL:	
1160	☐ TOW ☒ TPC 8.74	1500	1	1	1	BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WITH GIDS.

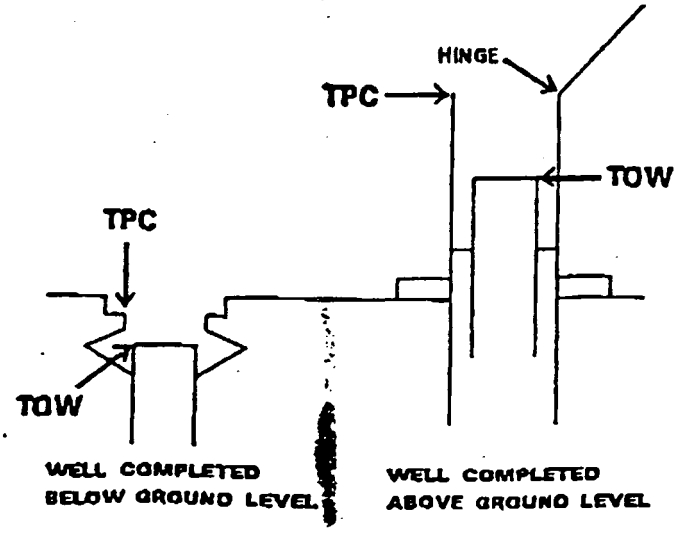
MONITORING WELL WITH GIDS EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12907

PID INSTRUMENT NUMBER: PA30071

BY FRICKER NUMBER: 77174

F2-0-2467 (REV. 12/08/93)



000231

PROJECT: CRUZ Elevation
DATE: 2-1-95
RECORDER: T. Smith

GROUNDWATER ELEVATIONS DATA SHEET

REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins 2-2-95

PROJECT PAGE:
MONTLY PAGE: ____ OF ____
VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1274 ✓	☐ TOW ☒ TPC 5.07	1050	0	0	0	BG: 40 WELL: 40	
1276 ✓	☐ TOW ☒ TPC 6.36	1055	0	0	0	BG: 40 WELL: 40	
1301 ✓	☐ TOW ☒ TPC 8.94	1107	1	1	1	BG: 40 WELL: 40	
1299 ✓	☐ TOW ☒ TPC 4.55	1125	1	1	1	BG: 30 WELL: 30	
1293 ✓	☐ TOW ☒ TPC 3.57	1128	1	1	1	BG: 40 WELL: 40	
1278 ✓	☐ TOW ☒ TPC 5.80	1131	1	1	1	BG: 40 WELL: 40	
11074 ✓	☒ TOW ☐ TPC 13.71	1135	1	1	1	BG: 40 WELL: 40	
1151 ✓	☐ TOW ☒ TPC 5.11	1140	1	1	1	BG: 40 WELL: 40	
1112 ✓	☐ TOW ☒ TPC 10.25	1145	1	1	1	BG: 40 WELL: 40	
11075 ✓	☒ TOW ☐ TPC 8.92	1147	1	1	1	BG: 40 WELL: 40	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING (TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

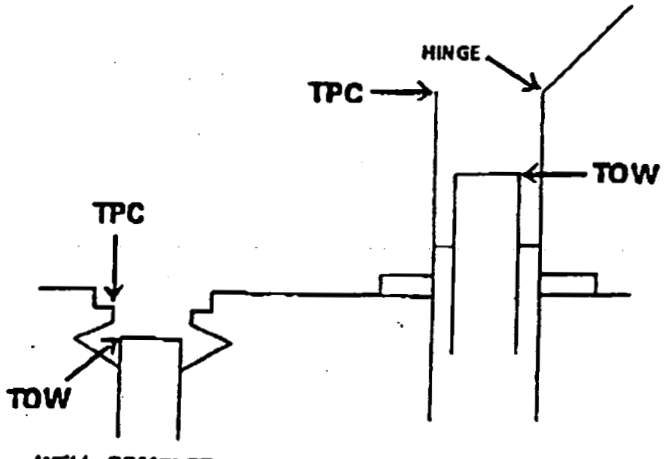
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

MONITORING WELL WITH QED EQUIPMENT
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12907
PID INSTRUMENT NUMBER: PA 930071
βγ PRICKER NUMBER: 77174

PS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Cruz Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 2-1-95		MONTLY PAGE: ____ OF ____
RECORDER: Tim Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE: 2-2-95 J. Collins	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1843	☐ TOW ☒ TPC 6.07	1505	1	1	1	BG: WELL:	
11067	☒ TOW ☐ TPC 4.99	1510	1	1	1	BG: WELL:	
1444	☐ TOW ☒ TPC 6.51	1520	1	1	1	BG: WELL:	
1866	☐ TOW ☐ TPC 4.65	1528	1	1	1	BG: WELL:	
1733	☒ TOW ☐ TPC 19.65	1537	1	1	1	BG: WELL:	
1171	☐ TOW ☐ TPC N/A	1501				BG: WELL:	inaccessible
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	2-1-95
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

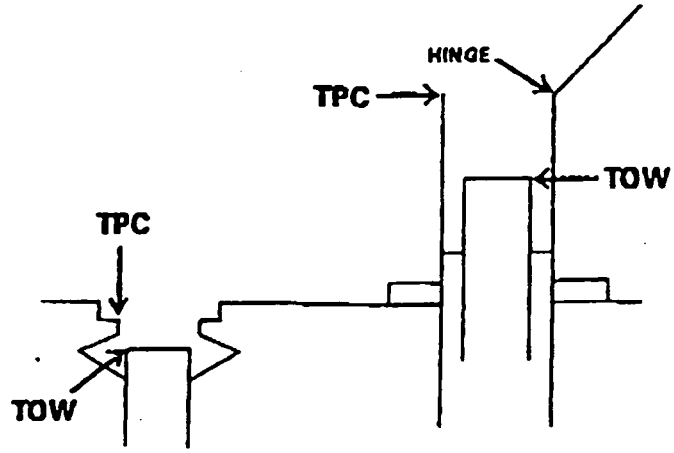
MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12907

PID INSTRUMENT NUMBER: PA930071

βγ PRICKER NUMBER: N/A

FS-F-3487 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Gru 2 Abatement	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 118
DATE: 01-31-95		MONTLY PAGE: ____ OF ____
RECORDER: TCW	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS Total Depth
11491	☒ TOW ☐ TPC 19.45	1155	1	1	1	BG: NA WELL:	31.63
11492	☒ TOW ☐ TPC 16.93	1208	1	1	1	BG: WELL:	23.98 ~~39.31~~ TCW 1-31-95
11493	☒ TOW ☐ TPC 23.20	1115	1	1	1	BG: WELL:	26.19
11494	☒ TOW ☐ TPC 5.01	1109	1	1	1	BG: WELL:	18.14
11495	☒ TOW ☐ TPC (DRY) 39.31	1104	1	1	1	BG: WELL:	39.31
11496	☒ TOW ☐ TPC 4.02	1052	1	1	1	BG: WELL:	19.34
11497	☒ TOW ☐ TPC 30.33	1045	1	1	1	BG: WELL:	34.68
11498	☒ TOW ☐ TPC 28.77	1028	0	0	0	BG: WELL:	33.15
11499	☒ TOW ☐ TPC 11.23	1034	0	0	0	BG: WELL:	20.80
11500	☒ TOW ☐ TPC 6.87	1009	0	0	0	BG: WELL:	27.52

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

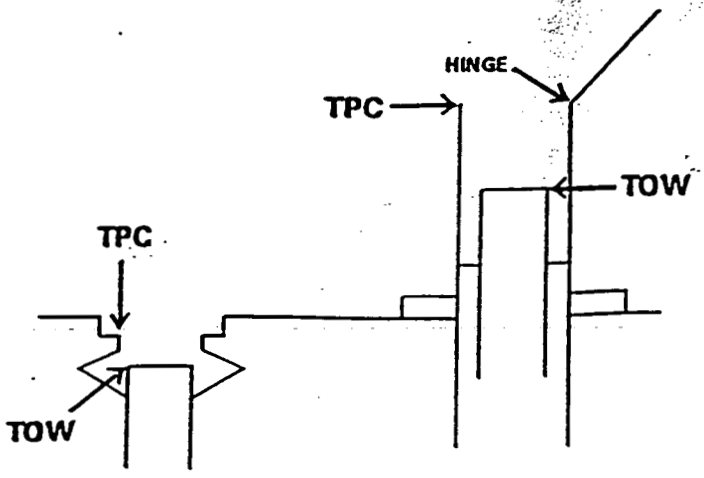
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10.921

PID INSTRUMENT NUMBER: PA 930096

FRICKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000134

PROJECT: Grid Elevations	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-31-95		MONTLY PAGE: ____ OF ____
RECORDER: JW	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BG (CPM)	COMMENTS Total Depth
11501	☒ TOW ☐ TPC 13.04	1015	0	0	0	BG: NA WELL:	39.33
11502	☒ TOW ☐ TPC 21.18	1020	1	1	1	BG: WELL:	24.38
11503	☒ TOW ☐ TPC 23.14	1026	1	1	1	BG: WELL:	29.76
11504	☒ TOW ☐ TPC 8.36	1349	1	1	1	BG: WELL:	20.81
11505	☒ TOW ☐ TPC 17.28	1359	1	1	1	BG: WELL:	29.30
11546	☒ TOW ☐ TPC 14.70	0942	0	0	0	BG: WELL:	15.00
11547	☒ TOW ☐ TPC 14.60	1239	1	1	1	BG: WELL:	15.08
11548	☒ TOW ☐ TPC 15.60	1320	1	1	1	BG: WELL:	16.12
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

NA

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

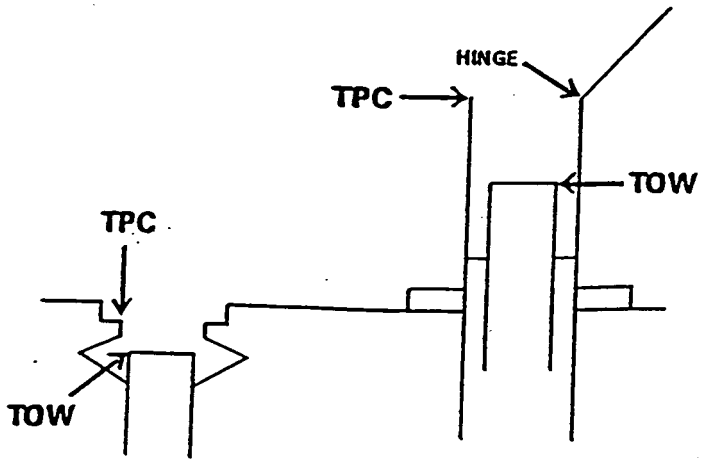
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: PA930096

FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000135

PROJECT: Cru 2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 118
DATE: 1-30-95		MONTLY PAGE: ____ OF ____
RECORDER: TW	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11496	☒ TOW ☐ TPC 4.16	0945	0	0	0	BG: NA WELL:	Total Depth 19.34
11500	☒ TOW ☐ TPC 6.85	0954	0	0	0	BG: WELL:	27.52
11501	☒ TOW ☐ TPC 13.10 ~~13.04~~	1001	0	0	0	BG: WELL:	39.34
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	30.98
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

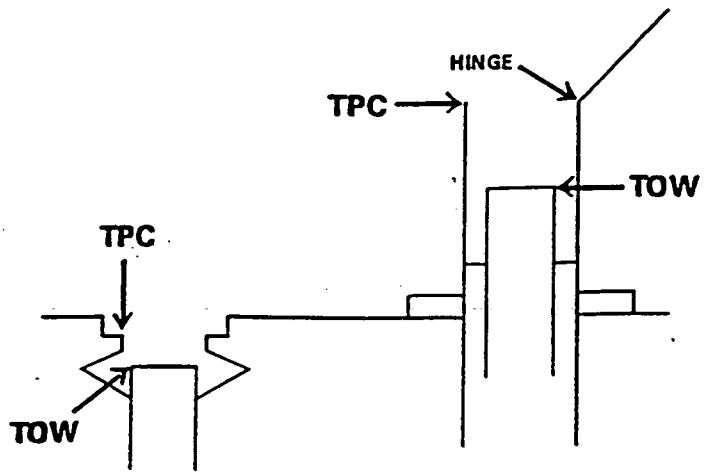
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: PA930096

βγ FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Grid 2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-29-95		MONTLY PAGE: ____ OF ____
RECORDER: TW	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS Total Depth
11496	☒ TOW ☐ TPC 4.31	0901	0	0	0	BG: NA WELL:	19.34'
11500	☒ TOW ☐ TPC 6.80	0921	0	0	0	BG: WELL:	27.52'
11501	☒ TOW ☐ TPC 13.08	0932	0	0	0	BG: WELL:	39.34'
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

TW 1-29-95

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

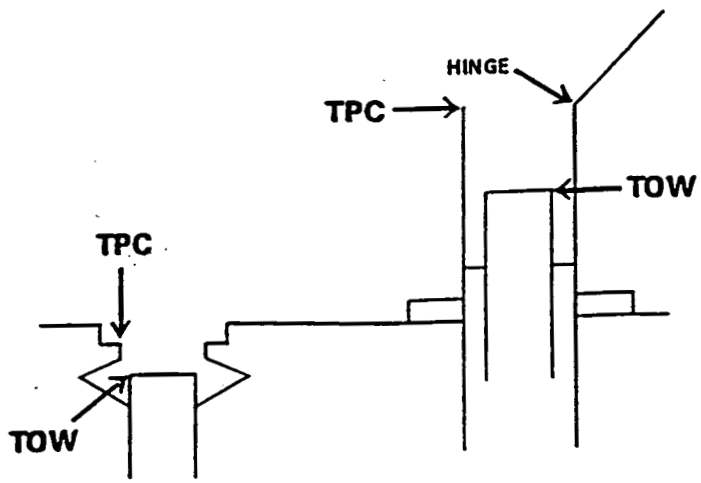
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: PA930096

βγ FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000137

PROJECT: Cruz Products Invest.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 118
DATE: 1-27-95		MONTLY PAGE: ____ OF ____
RECORDER: TCW	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS Total Depth
11496	☒ TOW ☐ TPC 4.20	0859	0	0	0	BG: NA WELL:	19.34'
11500	☒ TOW ☐ TPC 6.86	0911	0	0	0	BG: WELL:	27.52'
11501	☒ TOW ☐ TPC 13.38	0918	0	0	0	BG: WELL:	39.34' ~~33.34'~~ 1-27-95
	☒ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

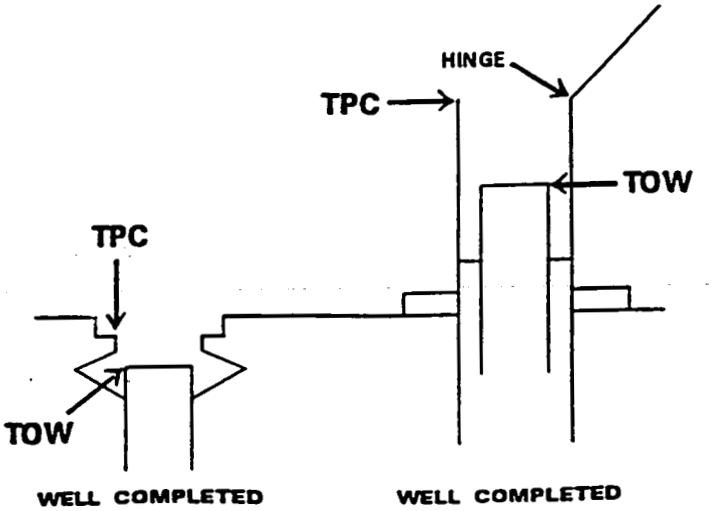
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: PM93 00 96

βγ FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000138

PROJECT: Cru 2 Predesign Investi	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-26-95		MONTLY PAGE: ____ OF ____
RECORDER: TCW	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	Total Depth Bottom COMMENTS
11500	☒ TOW ☐ TPC 6.88	1030	0	0	0	BG: NA WELL:	27.51
11501	☒ TOW ☐ TPC 13.48	1039	0	0	0	BG: WELL:	39.34
~~11549~~	☐ TOW ☐ TPC TW 1-26-95					BG: WELL:	
11496	☒ TOW ☐ TPC 4.35	1015	0	0	0	BG: WELL:	19.34
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

TCW 1-26-95

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

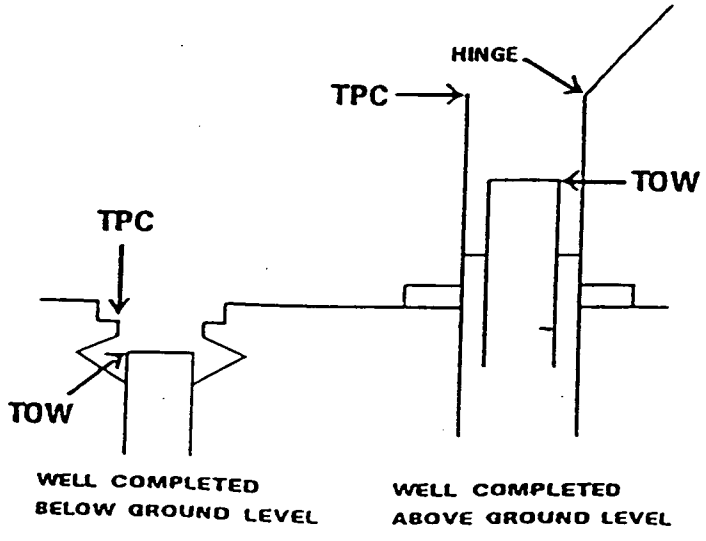
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	10921
PID INSTRUMENT NUMBER:	PA930096
By FRISKER NUMBER:	NA

FS-F-3467 (REV. 12/08/93)



PROJECT: MONTHLY ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1/25/95		MONTLY PAGE: ____ OF ____
RECORDER: J. DeMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11483	☒ TOW ☐ TPC 30.24	0917	3.5	3.5	3.6	BG: N/A WELL: N/A	NO LOCK; 2 WIRES GOING INTO WELL
11491	☒ TOW ☐ TPC IA	0922	3.5	3.5	N/A	BG: N/A WELL: N/A	NEEDS NEW LOCK - CAN'T PUT KEY IN TUMBLER
11492	☒ TOW ☐ TPC 17.28	0926	3.1	3.1	3.5	BG: N/A WELL: N/A	
11493	☒ TOW ☐ TPC 24.26	0930	5.1	5.1	7.0	BG: N/A WELL: N/A	
11495	☒ TOW ☐ TPC DRY	0934	4.7	4.7	8.0	BG: N/A WELL: N/A	BOTTOM 39.32'
11494	☒ TOW ☐ TPC 4.82	0938	3.1	5.1	7.3	BG: N/A WELL: N/A	
11486	☒ TOW ☐ TPC 37.28	0942	5.2	5.2	7.7	BG: N/A WELL: N/A	NO LOCK; 2 WIRES GOING INTO WELL
11497	☒ TOW ☐ TPC 32.46	0946	5.3	5.3	7.4	BG: N/A WELL: N/A	
11496	☒ TOW ☐ TPC IA	0950	5.2	5.3	N/A	BG: N/A WELL: N/A	NEEDS NEW LOCK - OR FROZEN - CAN'T TURN KEY
11499	☒ TOW ☐ TPC 14.74	0955	5.4	5.4	6.4	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

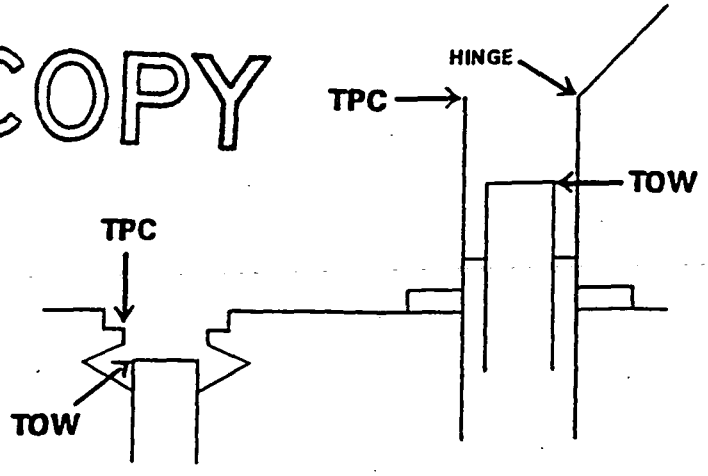
WATER LEVEL INDICATOR NO: 09554

PID INSTRUMENT NUMBER: 930086

βγ PRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: MONTHLY ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 11/25/95		MONTLY PAGE: ____ OF ____
RECORDER: J. DEMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

	WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
202	N498	☒ TOW ☐ TPC 30.20	0959	5.4	5.4	7.0	BG: N/A WELL: N/A	
	11503	☒ TOW ☐ TPC 23.44	1004	5.1	5.1	6.9	BG: N/A WELL: N/A	
202	11502	☒ TOW ☐ TPC 23.60	1008	5.2	5.2	7.1	BG: N/A WELL: N/A	
	2051	☐ TOW ☒ TPC IA	1012	5.3	5.3	N/A	BG: N/A WELL: N/A	LOCK FROZEN
Q	31277	☐ TOW ☒ TPC 91.58	1016	5.0	5.0	6.1	BG: N/A WELL: N/A	
Q	41217	☐ TOW ☒ TPC 90.92	1020	5.3	5.3	7.2	BG: N/A WELL: N/A	
	2424	☐ TOW ☒ TPC 100.46	1026	5.3	5.3	7.0	BG: N/A WELL: N/A	CRACKED CEMENT PAD
Q	3424	☐ TOW ☒ TPC 100.48	1031	5.3	5.3	7.0	BG: N/A WELL: N/A	
Q	4424	☐ TOW ☒ TPC 100.30	1035	5.3	5.3	6.9	BG: N/A WELL: N/A	
	2754	☒ TOW ☐ TPC 83.44	1040	5.7	5.8	7.3	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

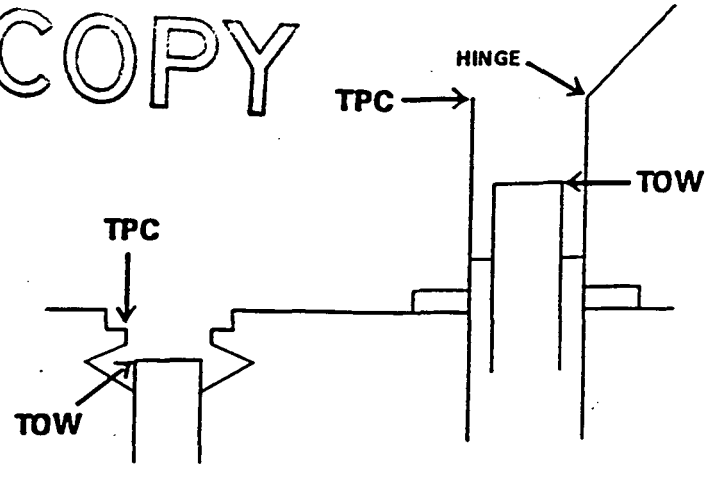
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	09554
PID INSTRUMENT NUMBER:	930086
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000141

PROJECT: MONTHLY ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1/25/95		MONTLY PAGE: ____ OF ____
RECORDER: J. DEMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

	WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
CRU2	7124	☒ TOW ☐ TPC 29.40	1045	5.3	5.3	6.1	BG: N/A WELL: N/A	
	N1547	☒ TOW ☐ TPC 14.72	1052	5.6	5.6	7.3	BG: N/A WELL: N/A	
	11487	☒ TOW ☐ TPC DRY	1058	5.4	5.4	6.3	BG: N/A WELL: N/A	2 WIRES GOING INTO WELL; BOTTOM 19.77'; NO LOCK
	11548	☒ TOW ☐ TPC 15.54	1103	5.4	5.4	6.5	BG: N/A WELL: N/A	
	1843	☐ TOW ☒ TPC 6.46	1109	5.2	5.2	7.1	BG: N/A WELL: N/A	
	X546	☒ TOW ☐ TPC 14.94	1120	5.4	5.4	8.0	BG: N/A WELL: N/A	
	T1501	☒ TOW ☐ TPC 14.52	1124	5.3	5.3	7.0	BG: N/A WELL: N/A	
	11484	☒ TOW ☐ TPC 33.24	1128	5.3	5.3	6.2	BG: N/A WELL: N/A	2 WIRES GOING INTO WELL; NO LOCK
	T1500	☒ TOW ☐ TPC 6.88	1132	5.3	5.3	6.8	BG: N/A WELL: N/A	
RU2	X866	☐ TOW ☒ TPC 7.60	1139	5.1	5.1	6.2	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

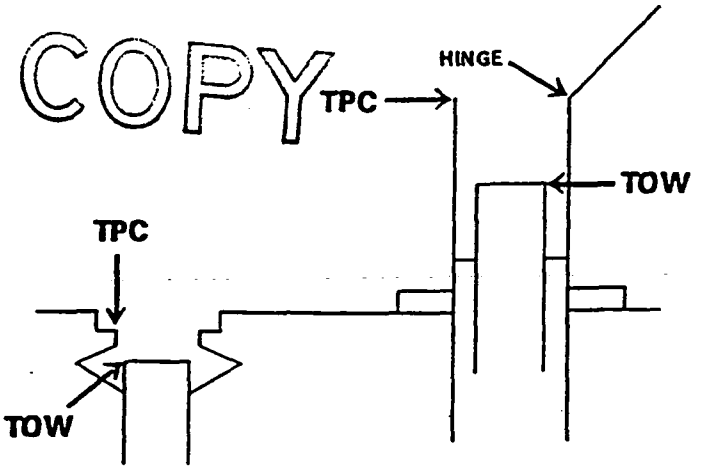
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 09.554

PID INSTRUMENT NUMBER: 930086

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Monthly Elev.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: •
DATE: 1/25/95		MONTLY PAGE: ____ OF ____
RECORDER: J. DeMoth	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

	WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
202	X 1887	☒ TOW ☐ TPC 4.50	1319	0	0	0	BG: N/A WELL: N/A	
	2421	☒ TOW ☐ TPC 71.40	1323	0	0	0	BG: N/A WELL: N/A	
	3421	☒ TOW ☐ TPC 72.10	1327	0	0	0	BG: N/A WELL: N/A	
	2439	☒ TOW ☐ TPC 74.72	1333	0	0	0	BG: N/A WELL: N/A	
	4439	☒ TOW ☐ TPC 75.66	1337	0	0	0	BG: N/A WELL: N/A	
202	X 1064	☒ TOW ☐ TPC 11.12	1342	0	0	0	BG: N/A WELL: N/A	
	2064	☒ TOW ☐ TPC 72.68	1346	0	0	0	BG: N/A WELL: N/A	
	3064	☒ TOW ☐ TPC 73.50	1350	0	0	0	BG: N/A WELL: N/A	
202	X 4152	☐ TOW ☒ TPC 4.66	1355	0	0	0	BG: N/A WELL: N/A	
202	X 4160	☐ TOW ☒ TPC 8.68	1401	0	0	0	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

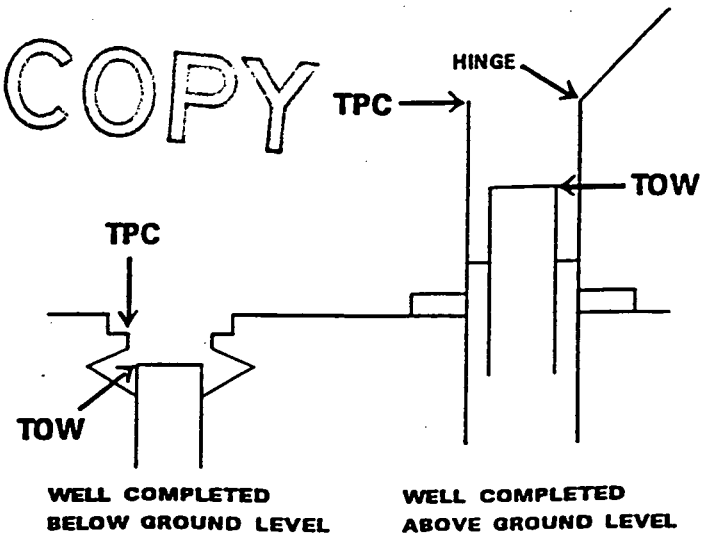
WATER LEVEL INDICATOR NO: 09554

PID INSTRUMENT NUMBER: 930086

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



PROJECT: MONTHLY ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1/25/95		MONTLY PAGE: ____ OF ____
RECORDER: J. DEMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
2120	☒ TOW ☐ TPC 67.62	1405	0	0	0	BG: N/A WELL: N/A	
3120	☐ TOW ☒ TPC 67.28	1409	0	0	0	BG: N/A WELL: N/A	
RU 2 X71	☐ TOW ☒ TPC 6.94	1416	0	0	0	BG: N/A WELL: N/A	
2171	☒ TOW ☐ TPC 65.68	1420	0	0	0	BG: N/A WELL: N/A	
RU2 X11067	☒ TOW ☐ TPC 6.32	1425	0	0	0	BG: N/A WELL: N/A	
X444	☐ TOW ☒ TPC 6.54	1430	0	0	0	BG: N/A WELL: N/A	
X1505	☒ TOW ☐ TPC 18.39	1435	0	0	0	BG: N/A WELL: N/A	
X1504	☒ TOW ☐ TPC 6.46	1440	0	0	0	BG: N/A WELL: N/A	
X1905	☐ TOW ☒ TPC D24	1445	0	0	0	BG: N/A WELL: N/A	BOTTOM 31.77'
RU2 X1733	☒ TOW ☐ TPC 19.80	1455	0	0	0	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

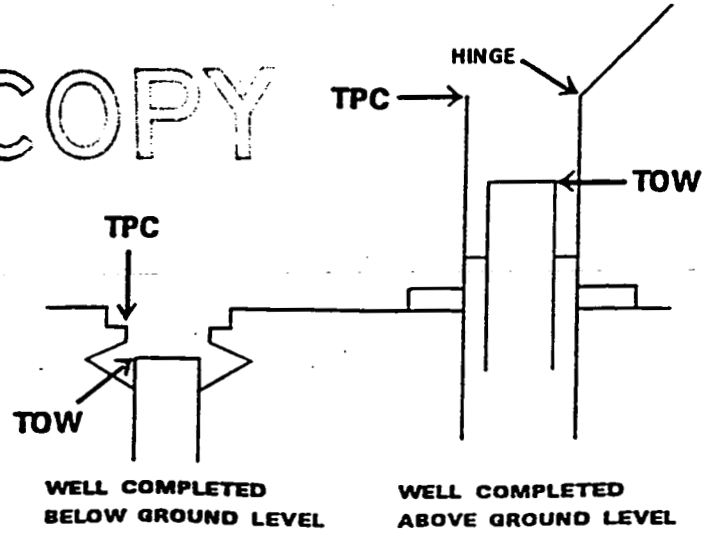
WATER LEVEL INDICATOR NO: 09554

PID INSTRUMENT NUMBER: 930086

βγ PRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



PROJECT: MONTHLY ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: •
DATE: 11/25/95		MONTLY PAGE: ____ OF ____
RECORDER: J. DEMOTH	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
2733	☐ TOW ☒ TPC 91.40	1459	0	0	0	BG: N/A WELL: N/A	
3733	☐ TOW ☒ TPC 90.30	1503	0	0	0	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

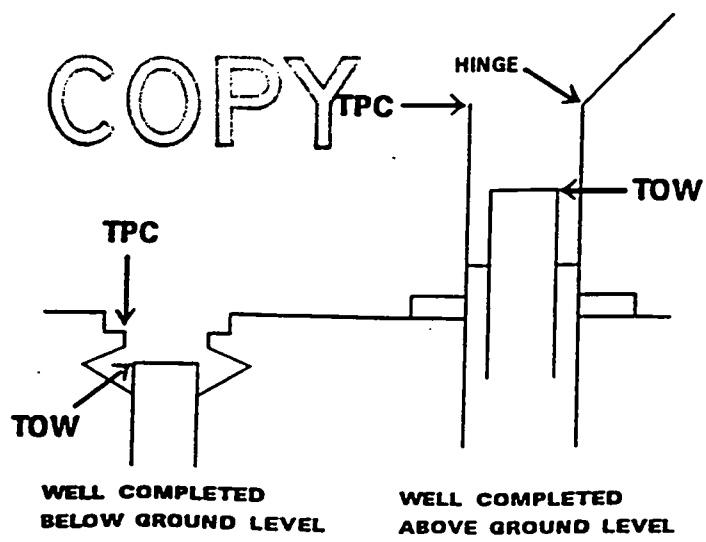
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	09554
PID INSTRUMENT NUMBER:	930086
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)

COPY



PROJECT: CRU 2 elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-19-95		MONTLY PAGE: ____ OF ____
RECORDER: T. Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE: NKM 1-20-95	VERIFYING TECHNICIAN'S INITIALS AND DAT

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 7.63	0939	1	1	1	BG: 40 WELL: 40	
1131	☐ TOW ☒ TPC 6.68	0943	1	1	1	BG: 40 WELL: 40	
1151	☐ TOW ☒ TPC 5.26	0946	1	1	1	BG: 40 WELL: 40	
1167	☐ TOW ☒ TPC 6.77	0948	1	1	2	BG: 35 WELL: 35	
1074	☒ TOW ☐ TPC 13.38	0951	1	1	1	BG: 40 WELL: 40	
1293	☐ TOW ☒ TPC 3.63	0955	1	1	1	BG: 40 WELL: 40	
1299	☐ TOW ☒ TPC 4.49	0958	1	1	2	BG: 35 WELL: 35	
1301	☐ TOW ☒ TPC 9.97	1028	1	1	1	BG: 40 WELL: 40	
1274	☐ TOW ☒ TPC 5.04	1046	1	1	1	BG: 40 WELL: 40	
1276	☐ TOW ☒ TPC 6.33	1050	1	1	1	BG: 40 WELL: 40	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

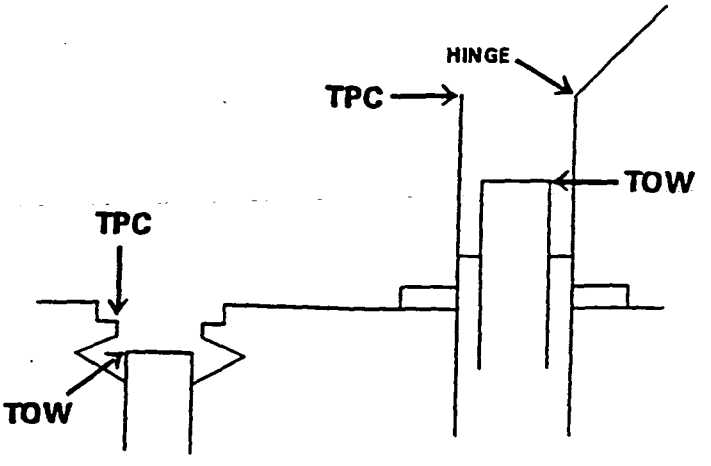
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12912

PID INSTRUMENT NUMBER: PA930072

βγ FRISKER NUMBER: 86064

FS-F-3407 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRMZ Elevations	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-19-95		MONTLY PAGE:
RECORDER: T. Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE: H.K.M. 1-20-95	VERIFYING TECHNICIAN'S INITIALS AND DAT

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1112	☐ TOW ☒ TPC 10.24	1106	1	1	1	BG: 40 WELL: 40	
1075	☒ TOW ☐ TPC 8.99	1110	3	3	3	BG: 40 WELL: 40	
1278	☐ TOW ☒ TPC 5.57	1115	1	1	1	BG: 35 WELL: 35	
1418	☐ TOW ☒ TPC 4.67	1124	1	1	3	BG: 30 WELL: 30	
1110	☐ TOW ☒ TPC 7.94	1127	2	2	3	BG: 35 WELL: 35	
1124	☒ TOW ☐ TPC 30.20	1355	1	1	1	BG: 20 WELL: 20	
1152	☐ TOW ☒ TPC 4.51	1402	1	1	1	BG: 30 WELL: 30	
1064	☒ TOW ~~TPC~~ 11.12	1405	1	1	1	BG: 30 WELL: 30	
1887	☒ TOW ☐ TPC 4.18	1418	1	1	1	BG: 30 WELL: 30	
1160	☐ TOW ☒ TPC 8.53	1415	1	1	1	BG: 30 WELL: 30	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

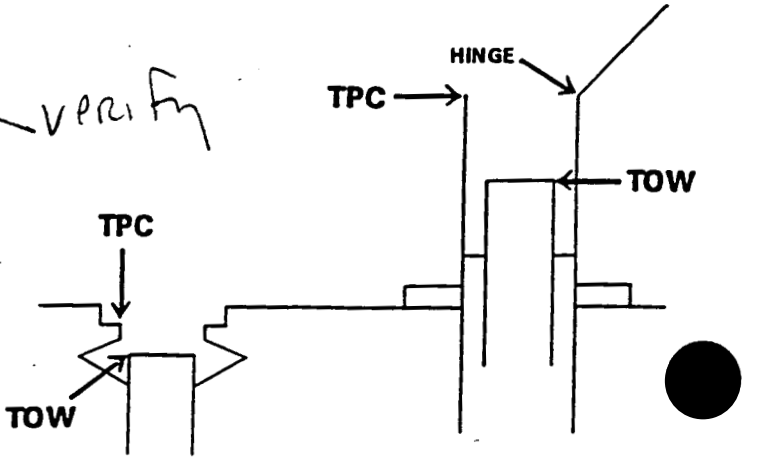
WATER LEVEL INDICATOR NO: 12912

PID INSTRUMENT NUMBER: PA930072

βγ FRISKER NUMBER: 860064

FS-F-3467 (REV. 12/08/93)

verify



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000147

PROJECT: CBU2 elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-19-95		MONTLY PAGE: ____ OF ____
RECORDER: T. Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE: NKM 1-20-95	VERIFYING TECHNICIAN'S INITIALS AND DAT

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1866	☐ TOW ☒ TPC 4.65	1418	1	1	1	BG: 30 WELL: 30	
1444	☐ TOW ☒ TPC 6.38	1426	1	1	1	BG: 30 WELL: 30	
11067	☒ TOW ☐ TPC 4.87	1429	1	1	1	BG: 30 WELL: 30	
1843	☐ TOW ☒ TPC 6.56	1433	1	1	1	BG: 30 WELL: 30	
1905	☐ TOW ☒ TPC Dry	1438	1	1	2	BG: 20 WELL: 20	
1171	☐ TOW ☒ TPC 6.83	1442	1	1	1	BG: 30 WELL: 30	
1733	☒ TOW ☐ TPC 1962	1450	1	1	1	BG: 20 WELL: 20	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

1215 1-19-95

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

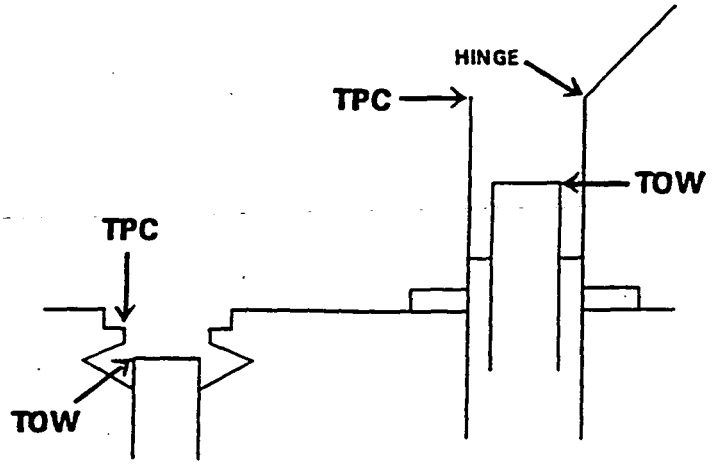
MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12912

PID INSTRUMENT NUMBER: PA930072

BY PRISKER NUMBER: 86064

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 042 Pre-Design	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-19-95		MONTLY PAGE: ____ OF ____
RECORDER: Danny Hampson	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
	☑ TOW ☐ TPC					BG:	Depth
11501	13.82	15:04				WELL:	39.33
	☑ TOW ☐ TPC					BG:	
11502	23.60					WELL:	24.70
	☑ TOW ☐ TPC					BG:	
11503	23.0	14:56				WELL:	29.75
	☑ TOW ☐ TPC					BG:	
11504	6.52	14:32				WELL:	20.81
	☑ TOW ☐ TPC					BG:	
11505	19.83	14:30				WELL:	29.28
	☐ TOW ☐ TPC					BG:	
						WELL:	
	☐ TOW ☐ TPC					BG:	
						WELL:	
	☐ TOW ☐ TPC					BG:	
						WELL:	
	☐ TOW ☐ TPC					BG:	
						WELL:	
	☐ TOW ☐ TPC					BG:	
						WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

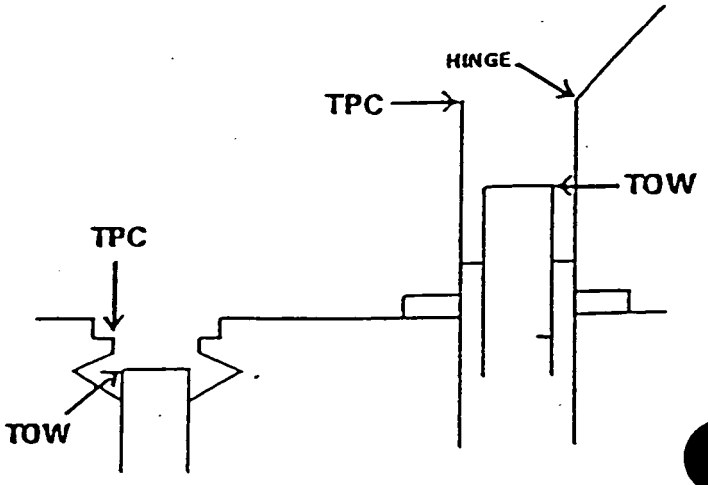
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000149

PROJECT: OU2 Pre-Design	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-19-94		MONTLY PAGE: ____ OF ____
RECORDER: Danny Hampson	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS Depth
11491	☒ TOW ☐ TPC 19.25	14:40				BG: WELL:	31.62
11492	☒ TOW ☐ TPC 16.48	14:42 DPH 1-19-94				BG: WELL:	23.98
11493	☒ TOW ☐ TPC 25.32	14:48				BG: WELL:	26.19
11494	☒ TOW ☐ TPC 4.88	14:50				BG: WELL:	18.14
11495	☒ TOW ☐ TPC 39.31	14:46				BG: WELL:	39.31
11496	☒ TOW ☐ TPC 4.84	14:59				BG: WELL:	19.33
11497	☒ TOW ☐ TPC 34.0					BG: WELL:	34.68
11498	☒ TOW ☐ TPC 32.08					BG: WELL:	33.15
11499	☒ TOW ☐ TPC 19.60					BG: WELL:	~~20.85~~ DPH 1-19-94 20.80
11500	☒ TOW ☐ TPC 6.82	1503				BG: WELL:	27.51

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

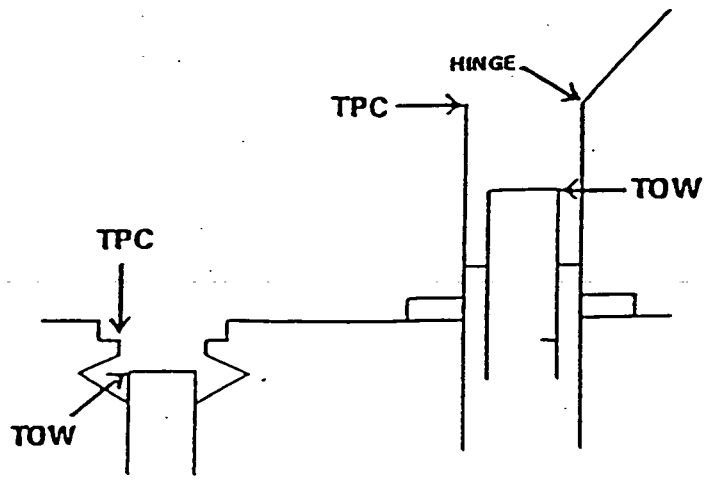
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

ES-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

8 I I

PROJECT: 042 Pre-Design	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-18-95		MONTLY PAGE: ____ OF ____
RECORDER: Danny Hampson	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	OH	βγ (CPM)	COMMENTS Depth of well
11491	☒ TOW ☐ TPC 19.40	11:05				BG: WELL:	31.62
11492	☒ TOW ☐ TPC 16.93	11:08				BG: WELL:	23.98
11493	☒ TOW ☐ TPC 25.55	10:56				BG: WELL:	26.19
11494	☒ TOW ☐ TPC 4.75	10:57				BG: WELL:	18.14
11495	☒ TOW ☐ TPC 39.31	10:58				BG: WELL:	39.31
11496	☒ TOW ☐ TPC 7.36	0922				BG: WELL:	19.33
11497	☒ TOW ☐ TPC 34.21	09:25				BG: WELL:	34.67
11498	☒ TOW ☐ TPC 32.06	10:18				BG: WELL:	33.15
11499	☒ TOW ☐ TPC 19.72	10:05				BG: WELL:	20.80
11500	☒ TOW ☐ TPC 7.14	10:52				BG: WELL:	27.51

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

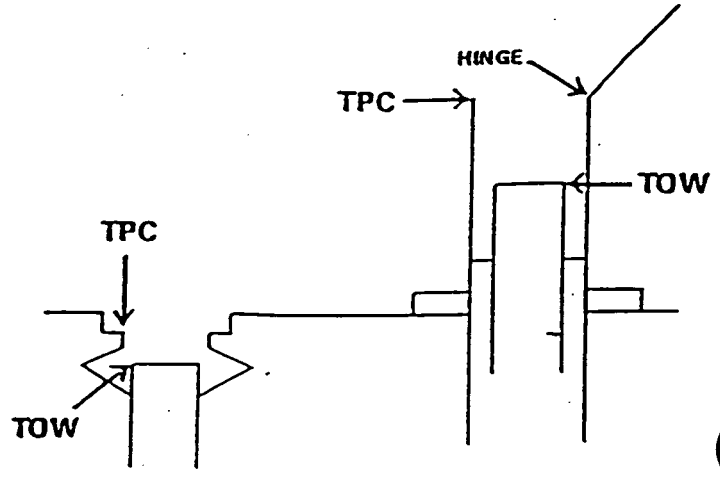
MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: OU2 Pre Design	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-18-95		MONTLY PAGE: ____ OF ____
RECORDER: Danny Hampson	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS Depth of well
11501	☒ TOW ☐ TPC 14.30	10:51				BG: WELL:	39.33
11502	☒ TOW ☐ TPC 23.66	10:38				BG: WELL:	24.38
11503	☒ TOW ☐ TPC 23.68	10:35				BG: WELL:	29.75
11504	☒ TOW ☐ TPC 7.21	12:25				BG: WELL:	20.81
11505	☒ TOW ☐ TPC 18.96	12.35				BG: WELL:	29.28
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

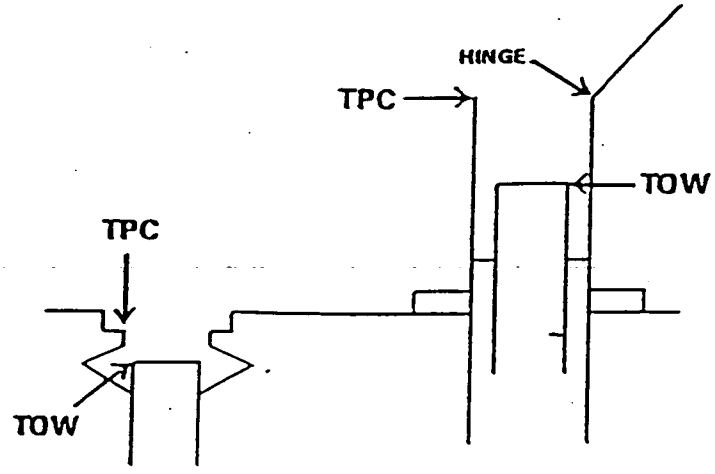
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: Dua Pre-Design

DATE: 1-17-95

RECORDER: Danny Hampson

GROUNDWATER ELEVATIONS DATA SHEET

REVIEWING TECHNICIAN'S INITIALS AND DATE:

PROJECT PAGE:

MONTLY PAGE: ____ OF ____

VERIFYING TECHNICIAN'S INITIALS AND DA

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11497	☒ TOW ☐ TPC 34.03	09:15				BG: WELL:	Depth of well 34.67
11498	☒ TOW ☐ TPC 32.15	10:00				BG: WELL:	33.15
11499	☒ TOW ☐ TPC 19.75	10:25				BG: WELL:	20.8
11503	☒ TOW ☐ TPC 24.06	10:50				BG: WELL:	29.75
11502	☒ TOW ☐ TPC 23.68	10:55				BG: WELL:	24.38
11501	☒ TOW ☐ TPC 14.60	11:20				BG: WELL:	39.34
11500	☒ TOW ☐ TPC 7.40	11:22				BG: WELL:	27.51
11496	☒ TOW ☐ TPC 5.50	11:24				BG: WELL:	19.33
11493	☒ TOW ☐ TPC 25.76	11:28				BG: WELL:	26.19
11495	☐ TOW ☐ TPC 39.31	11:31				BG: WELL:	39.31

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

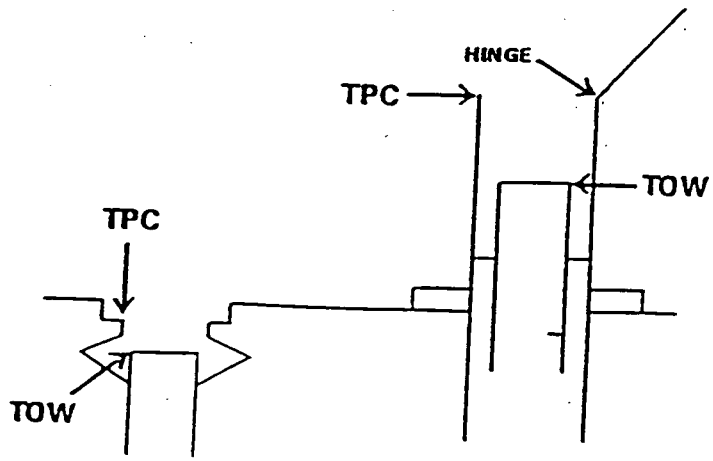
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000153

PROJECT: 042 Pre-Design	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-17-94		MONTLY PAGE: ____ OF ____
RECORDER: Danny Hampson	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS Depth of well
11494	☒ TOW ☐ TPC 4.55	11:33				BG: WELL:	18.14
11491	☒ TOW ☐ TPC 19.40	11:39				BG: WELL:	31.63
11492	☒ TOW ☐ TPC 16.94	11:42				BG: WELL:	23.98
11504	☒ TOW ☐ TPC 7.04	13:20				BG: WELL:	20.81
11505	☒ TOW ☐ TPC 19.35	13:55				BG: WELL:	29.28
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

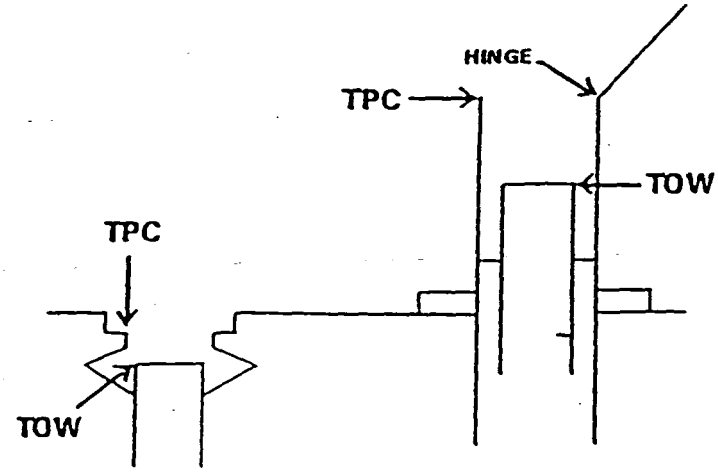
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 042 Pre-Design
DATE: 1-16-94
RECORDER: Donny Hampson

GROUNDWATER ELEVATIONS DATA SHEET

REVIEWING TECHNICIAN'S INITIALS AND DATE:

PROJECT PAGE:
MONTLY PAGE: ____ OF ____
VERIFYING TECHNICIAN'S INITIALS AND DA

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	OH	βγ (CPM)	COMMENTS
11491	☑ TOW ☐ TPC 19.38	14.50				BG: WELL:	Depth of well 31.62
11492	☑ TOW ☐ TPC 16.86	14:54				BG: WELL:	23.98
11493	☑ TOW ☐ TPC 25.74	10:10 ~~14:45~~ DPH 1-16-94				BG: WELL:	26.18
11494	☑ TOW ☐ TPC 4.82	14:45				BG: WELL:	18.14
11495	☑ TOW ☐ TPC 39.31	10:15				BG: WELL:	39.31
11496	☑ TOW ☐ TPC 5.89	10:37				BG: WELL:	19.33
11497	☒ TOW ☐ TPC 33.97	10:32				BG: WELL:	34.67
11498	☒ TOW ☐ TPC 31.95	10:53				BG: WELL:	33.15
11499	☒ TOW ☐ TPC 19.76	11:15				BG: WELL:	20.78
11500	☒ TOW ☐ TPC 7.71	14:42				BG: WELL:	27.50

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

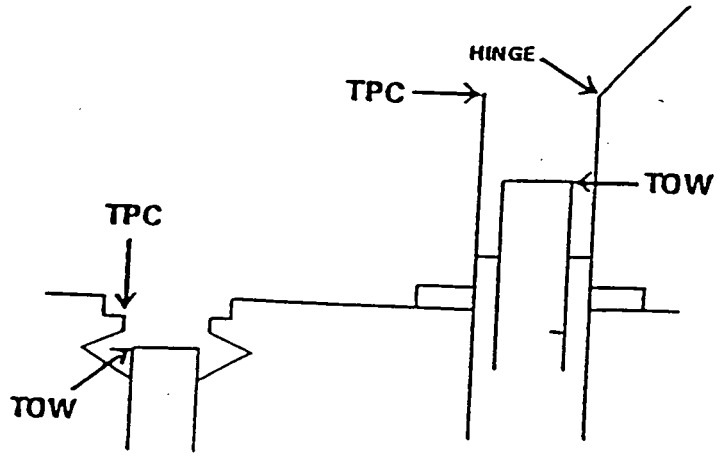
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: 042 - Pre Design	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-16-95		MONTLY PAGE: ____ OF ____
RECORDER: Danny Hampson	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
							Depth of well
11501	☑ TOW ☐ TPC 14.88	14:40				BG: / WELL:	39.32
11502	☑ TOW ☐ TPC 23.60	12:55				BG: / WELL:	24.38
11503	☑ TOW ☐ TPC 23.13	13:39				BG: / WELL:	29.75
11504	☑ TOW ☐ TPC 7.54	15:00				BG: / WELL:	20.81
11505	☑ TOW ☐ TPC 20.35	15:03				BG: / WELL:	29.29
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

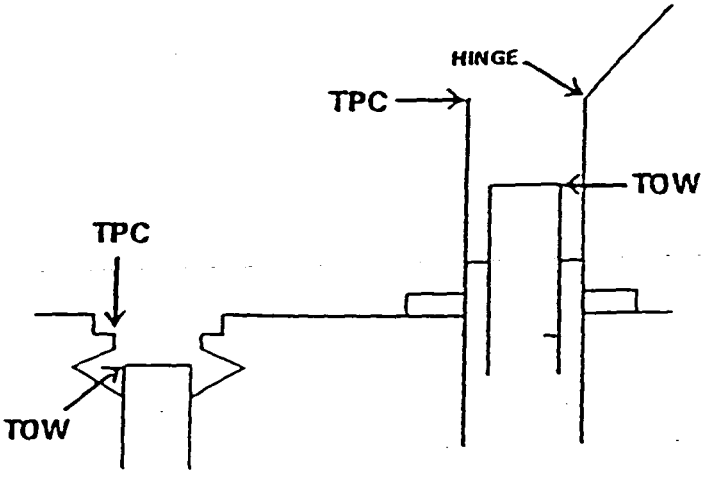
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

ETI

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-15-95		MONTLY PAGE: ____ OF ____
RECORDER: T. Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS Bottom
11491	☒ TOW ☐ TPC 19.24	0750				BG: WELL:	31.61
11492	☒ TOW ☐ TPC 16.48	0752				BG: WELL:	23.96
11493	☒ TOW ☐ TPC 25.66	0842				BG: WELL:	26.17
11495	☒ TOW ☐ TPC 39.29	0840				BG: WELL:	39.29 Dry
11494	☒ TOW ☐ TPC 4.21	0845				BG: WELL:	18.13
11496	☒ TOW ☐ TPC 6.40	0900				BG: WELL:	19.32 Soft
11497	☒ TOW ☐ TPC 33.96	0850				BG: WELL:	34.68
11504	☒ TOW ☐ TPC 7.75	1215				BG: WELL:	20.80
11505	☒ TOW ☐ TPC 17.63	1340				BG: WELL:	29.26
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

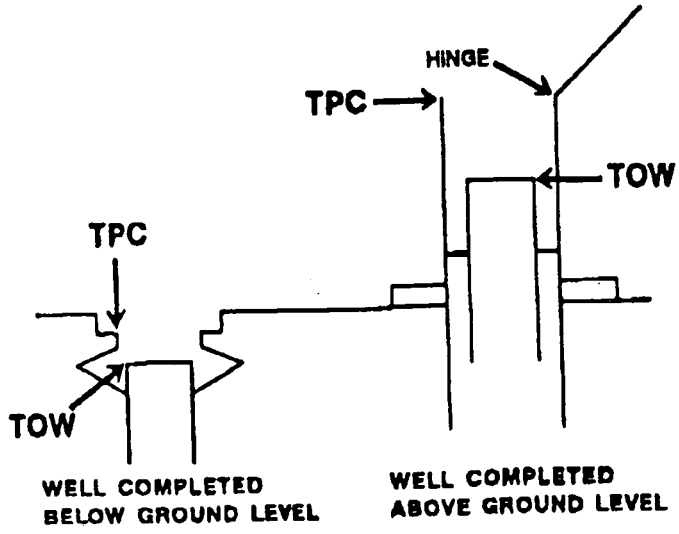
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12913

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:



FS-F-5387 (REV. 12/08/93)

000157

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-15-95		MONTLY PAGE: ____ OF ____
RECORDER: J Norbert	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS Bottom
11500	☒ TOW ☐ TPC 8.23	1315				BG: WELL:	27.52
11501	☒ TOW ☐ TPC 15.54	1318				BG: WELL:	39.34
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

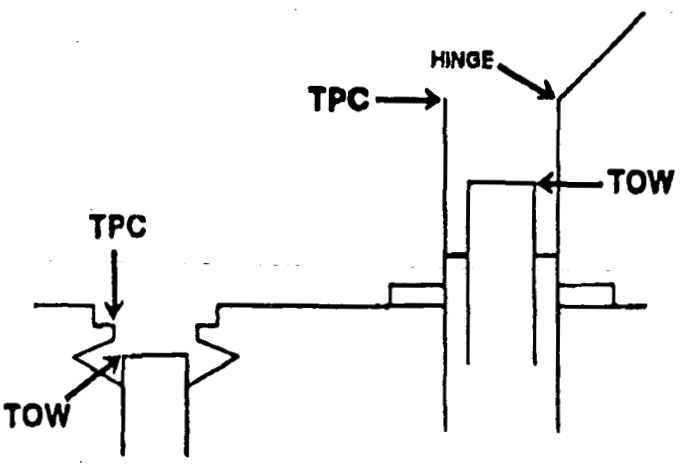
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRISKER NUMBER:

FS-F-3487 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

311

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-14-95		MONTLY PAGE: ____ OF ____
RECORDER: T= Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS Bottom
11493	☒ TOW ☐ TPC 25.91	0905				BG: WELL:	26.19
11495	☒ TOW ☐ TPC 39.29	0956				BG: WELL:	39.32
11496	☒ TOW ☐ TPC 6.58	1030				BG: WELL:	19.34
11497	☒ TOW ☐ TPC 33.79	1035				BG: WELL:	34.67
11498	☒ TOW ☐ TPC 31.88	1230				BG: WELL:	33.15
11499	☒ TOW ☐ TPC 19.74	1440				BG: WELL:	20.80
11500	☒ TOW ☐ TPC 9.20	1505				BG: WELL:	27.50
11501	☒ TOW ☐ TPC 17.76	1510				BG: WELL:	39.34
11491	☒ TOW ☐ TPC 19.21	0755				BG: WELL:	31.62
11492	☒ TOW ☐ TPC 16.32	0800				BG: WELL:	23.96

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

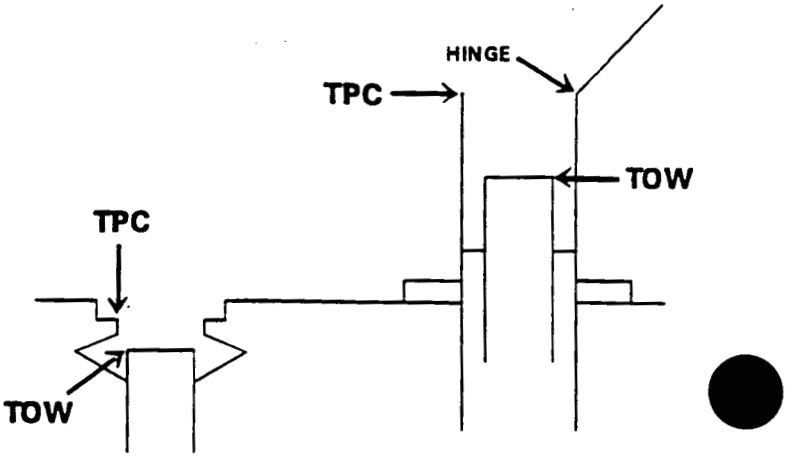
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

By FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000159

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-14-95		MONTLY PAGE: ____ OF ____
RECORDER: T. Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS
11494	☒ TOW ☐ TPC 4.84	1515				BG: / WELL:	Bottom 18.50
11502	☒ TOW ☐ TPC 22.94	0910				BG: / WELL:	24.37
11503	☒ TOW ☐ TPC 21.79	0931				BG: / WELL:	29.74
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	
	☐ TOW ☐ TPC					BG: / WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

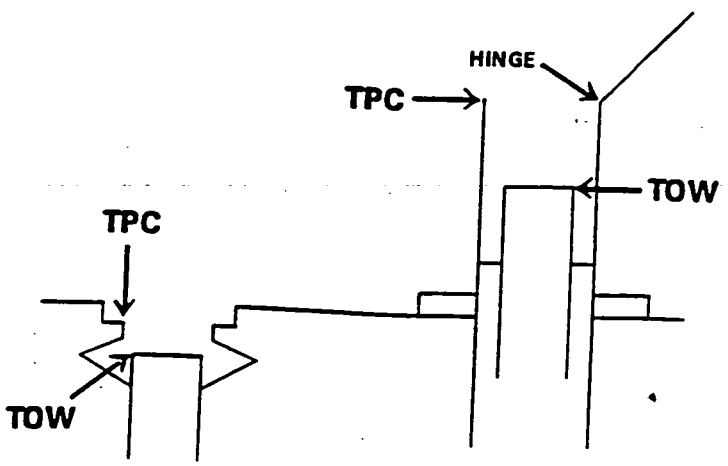
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

By FRISKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-13-95		MONTLY PAGE: ____ OF ____
RECORDER: Tim Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BG (CPM)	COMMENTS
11500	☒ TOW ☐ TPC 10.94	1442				BG: WELL:	N/A
11496	☒ TOW ☐ TPC 7.03	1445				BG: WELL:	N/A
11491	☒ TOW ☐ TPC 19.25	1451				BG: WELL:	N/A
11492	☒ TOW ☐ TPC 16.29	1454				BG: WELL:	N/A
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

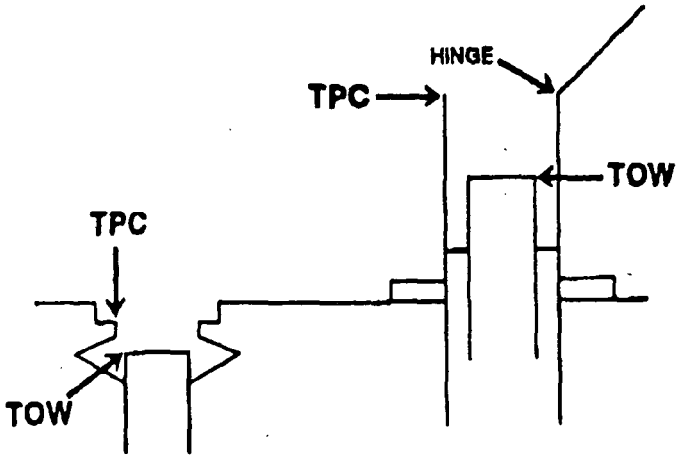
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12913

PID INSTRUMENT NUMBER: N/A

BG FRISKER NUMBER: N/A

FS-F-5487 (REV. 12/08/93)



000161

PROJECT: OU2 Pre-Design	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-13-94		MONTLY PAGE: ____ OF ____
RECORDER: Danny Hampson	REVIEWING TECHNICIAN'S INITIALS AND DATE:	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	OH	βγ (CPM)	COMMENTS Depth of well
11493	☒ TOW ☐ TPC 25.75					BG: WELL:	26.18
11494	☒ TOW ☐ TPC 4.65					BG: WELL:	18.13
11495	☒ TOW ☐ TPC 39.29					BG: WELL:	39.32
11497	☒ TOW ☐ TPC 33.95					BG: WELL:	34.67
11498	☒ TOW ☐ TPC 31.98					BG: WELL:	33.14
11499	☒ TOW ☐ TPC 19.72					BG: WELL:	20.79
11502	☒ TOW ☐ TPC 8.18					BG: WELL:	24.36
11503	☒ TOW ☐ TPC 14.42					BG: WELL:	29.74
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

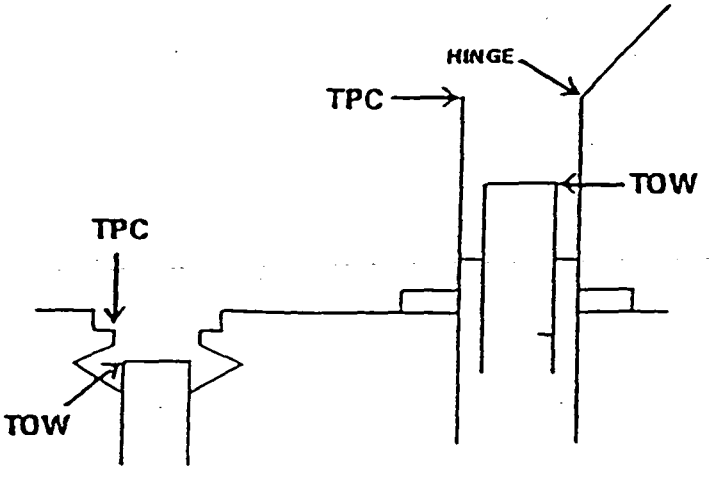
MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:

PID INSTRUMENT NUMBER:

βγ FRIBKER NUMBER:

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-12-95		MONTLY PAGE: ____ OF ____
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins 1-13-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1444	☐ TOW ☒ TPC 6.24	1405	0	0	0	BG: N/A WELL:	
1843	☐ TOW ☒ TPC 7.50	1415	0	0	0	BG: WELL:	
11067	☒ TOW ☐ TPC 5.04	1420	0	0	0	BG: WELL:	
1124	☒ TOW ☐ TPC 30.22	1430	0	0	0	BG: WELL:	
1905	☐ TOW ☒ TPC Dry	1436	0	0	0	BG: WELL:	
1733	☒ TOW ☐ TPC 19.82	1445				BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

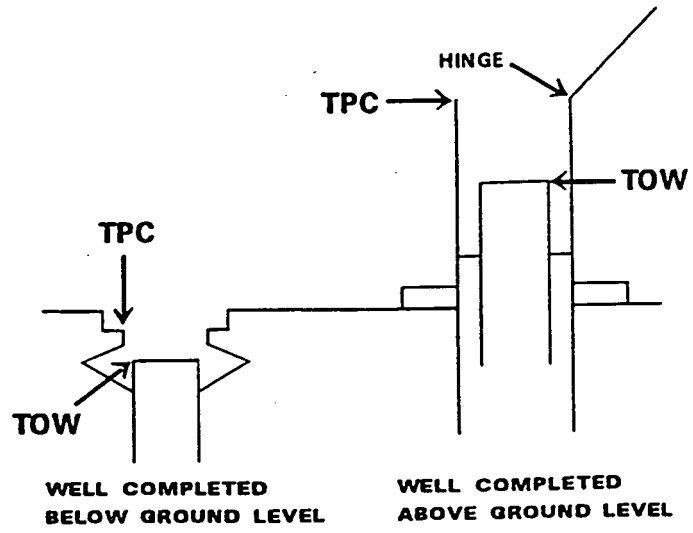
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	07170
PID INSTRUMENT NUMBER:	930084
βγ FRISKER NUMBER:	100321

FS-F-3467 (REV. 12/08/93)



000163

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-12-95		MONTLY PAGE: ____ OF ____
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Collins 1-13-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1110	☐ TOW ☒ TPC 7.88	1110	0	0	0	BG: 50 WELL: 50	
1274	☐ TOW ☒ TPC 5.54	1120	0	0	0	BG: 50 WELL: 50	
1276	☐ TOW ☒ TPC 6.69	1130	0	0	0	BG: 50 WELL: 50	
1301	☐ TOW ☒ TPC 10.24	1150	0	0	0	BG: 50 WELL: 50	
1887	☒ TOW ☐ TPC 3.18	1315	0	0	0	BG: N/A WELL:	
1064	☒ TOW ☐ TPC 13.84	1330	0	0	0	BG: WELL:	
1152	☐ TOW ☒ TPC 3.79	1340	0	0	0	BG: WELL:	
1160	☐ TOW ☒ TPC 8.30	1344 ~~1344~~	0	0	0	BG: WELL:	
1171	☐ TOW ☒ TPC 6.14	1348	0	0	0	BG: WELL:	
1866	☐ TOW ☒ TPC 4.34	1350	0	0	0	BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

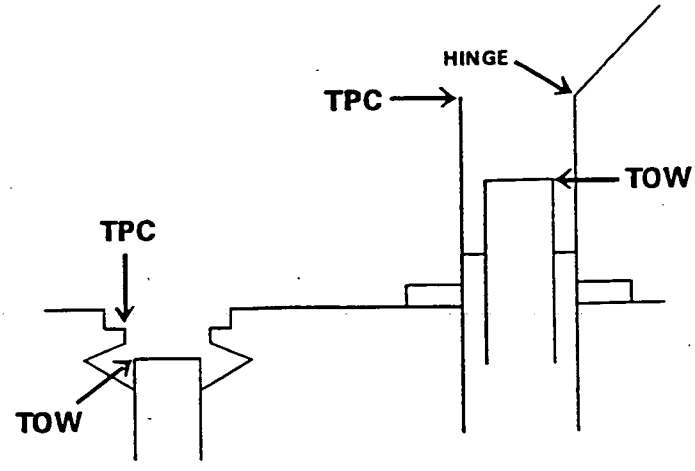
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	0.7170
PID INSTRUMENT NUMBER:	930084
βγ FRISKER NUMBER:	110321

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT:	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 1-12-95		MONTLY PAGE: ____ OF ____
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE: J-Collins 1-13-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 7.40	1000	0	0	~~0~~ 147	BG: ~~50~~ 50 WELL: 50	
1418 ✓	☐ TOW ☒ TPC 4.82	1010	0	0	0	BG: 50 WELL: 50	
1299 ✓	☐ TOW ☒ TPC 4.66	1015	0	0	0	BG: 50 WELL: 50	
1293 ✓	☐ TOW ☒ TPC 3.36	1020	0	0	0	BG: 50 WELL: 50	
11074 ✓	☒ TOW ☐ TPC 13.24	~~10~~ 1030	0	0	0	BG: 50 WELL: 50	
1278	☐ TOW ☒ TPC N/A	1035	N/A			BG: N/A WELL: N/A	Construction Area Heavy Equipment
1131	☐ TOW ☒ TPC 6.74	1038	0	0	0	BG: 50 WELL: 50	
1151 ✓	☐ TOW ☒ TPC 5.92	1045	0	0	0	BG: 50 WELL: 50	
1112 ✓	☐ TOW ☒ TPC 10.27	1100	0	0	0	BG: 50 WELL: 50	
11075 ✓	☒ TOW ☐ TPC 9.05	1105	0	0	0	BG: 50 WELL: 50	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

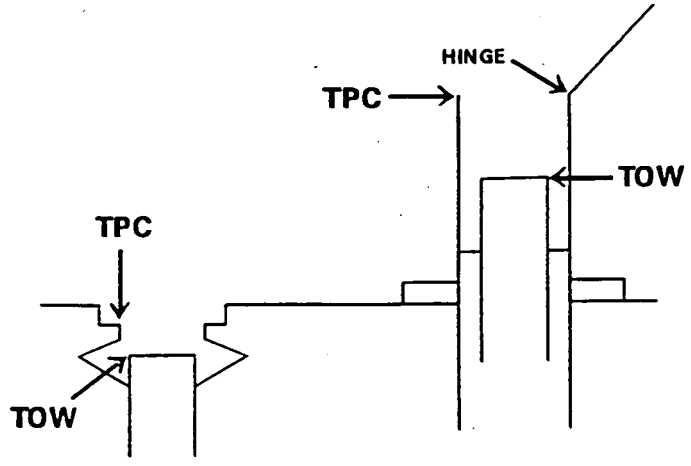
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 07170

PID INSTRUMENT NUMBER: 930084

βγ FRISKER NUMBER: 100321

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000165

Ref Point TOW

GROUND WATER LEVELS

20.03.07 WELLS 1/12/95

WELL	WATER LEVEL	BOTTOM
11491	19.26	31.61
11492	14.11	23.95
11493	25.76	26.18
11494	4.35	18.13
11495	39.28	39.30
11496	7.67	19.32
11497	33.92	34.66
11498	32.00	33.14
11499	19.86	20.79
11500	13.12	27.49
11501	21.67	39.32
11502	8.31	24.36
11503	14.61	29.73
11504	7.38	20.79
11505	PAD CONSTRUCTION CAP TAPED	

PROJECT: CRUD ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 01-04-95		MONTLY PAGE: ____ OF ____
RECORDER: GREG O'NEILL	REVIEWING TECHNICIAN'S INITIALS AND DATE: HKM 1-5-95 NKM 1-5-95	VERIFYING TECHNICIAN'S INITIALS AND DATE

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1444	☐ TOW ☒ TPC 7.25	1343	1	1	1	BG: 30 WELL: 30	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	95
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

LAST ENTRY CPO

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING (TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

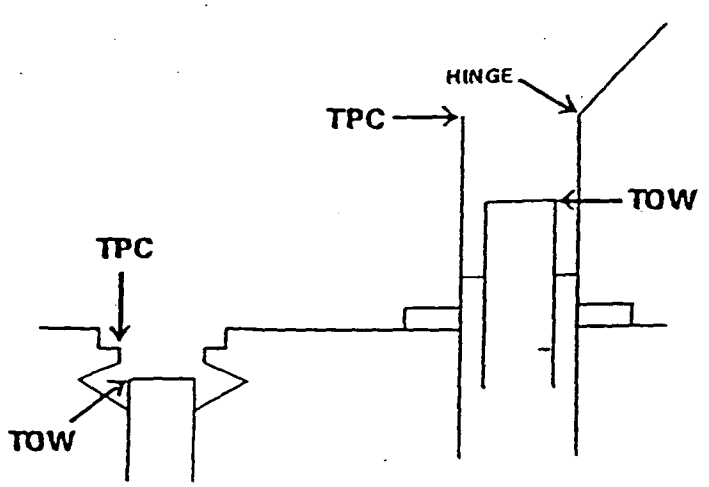
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 09554

PID INSTRUMENT NUMBER: PA 930096

βγ FRISKER NUMBER: 100321

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU2 ELEVATIONS
DATE: 01-04-95
RECORDER: GREG O'NEILL

GROUNDWATER ELEVATIONS DATA SHEET

PROJECT PAGE:
MONTLY PAGE: _____ OF _____
REVIEWING TECHNICIAN'S INITIALS AND DATE: HKM 1-5-95
VERIFYING TECHNICIAN'S INITIALS AND DATE: HKM 1-5-95

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 8.23	1049	1	1	1	BG: 20 WELL: 20	
1131	☐ TOW ☒ TPC 6.78	1052	1	1	1	BG: 20 WELL: 20	
1167	☐ TOW ☒ TPC 7.58	1055	1	1	1	BG: 20 WELL: 20	
11075	☒ TOW ☐ TPC 9.06	1112	1	1	1	BG: 20 WELL: 20	
1112	☐ TOW ☒ TPC 10.31	1115	1	1	1	BG: 20 WELL: 20	
1151	☐ TOW ☒ TPC 6.24	1119	2	2	4	BG: 40 WELL: 40	
11074	☒ TOW ☐ TPC 13.13	1124	1	1	3	BG: 30 WELL: 30	
1340	☐ TOW ☒ TPC 11.05	1130	1	1	1	BG: 30 WELL: 30	
1299	☐ TOW ☒ TPC 5.13	1134	2	2	1	BG: 40 WELL: 40	
1276	☐ TOW ☒ TPC 7.30	1150	1	1	1	BG: 80 WELL: 80	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING (TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

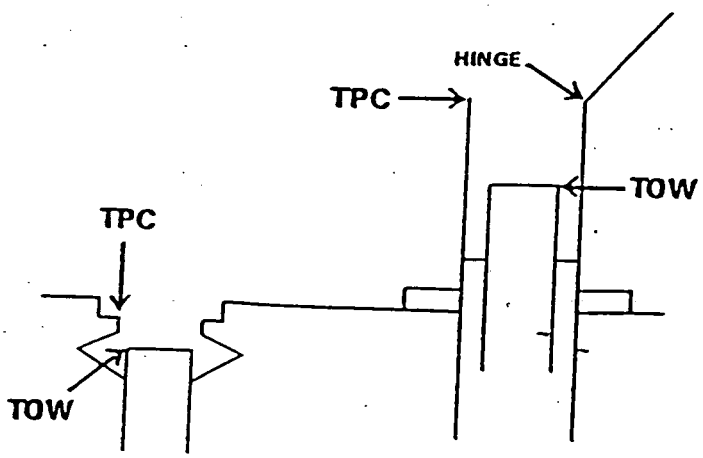
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 09554
PID INSTRUMENT NUMBER: PA 930096
βγ FRISKER NUMBER: 100321

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU2 ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 01-04-95		MONTLY PAGE: ____ OF ____
RECORDER: GREG O'NEILL	REVIEWING TECHNICIAN'S INITIALS AND DATE: NKM 1-5-95 NFM 1-5-95	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1301	☐ TOW ☒ TPC 10.42	1220	1	1	1	BG: 100 WELL: 100	
1887	☒ TOW ☐ TPC 5.73	1243	1	1	1	BG: 20 WELL: 20	
1064	☒ TOW ☐ TPC 26.25	1300	1	1	1	BG: 20 WELL: 20	GWM 2" GRUNFOS PUMP IN WELL
1160	☐ TOW ☒ TPC 9.08	1304	2	1	1	BG: 20 WELL: 20	
1843	☐ TOW ☒ TPC 8.61	1309	1	1	1	BG: 20 WELL: 20	
11067	☒ TOW ☐ TPC 5.32	1312	1	1	1	BG: 30 WELL: 30	
1124	☒ TOW ☐ TPC 30.02	1316	1	1	1	BG: 20 WELL: 20	
1866	☐ TOW ☒ TPC 5.80	1320	1	1	1	BG: 20 WELL: 20	
1905	☐ TOW ☒ TPC DRY	1325	1	1	1	BG: 20 WELL: 20	
1733	☒ TOW ☐ TPC 19.84	1330	1	1	1	BG: 20 WELL: 20	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

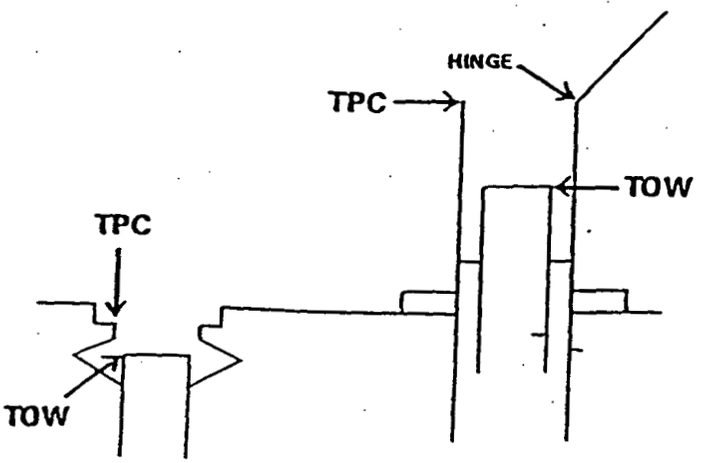
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 0.9554

PID INSTRUMENT NUMBER: PA 930096

βγ FRISKER NUMBER: 100324

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU2 ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 118
DATE: 12/28/94		MONTLY PAGE: ____ OF ____
RECORDER: J. DEMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE: HKM 12-29-94	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1887	☒ TOW ☐ TPC 5.37	1117	6	6	8	BG: N/A WELL: N/A	
1111	☐ TOW ☒ TPC 7.84	1130	4	4	6	BG: N/A WELL: N/A	
1131	☐ TOW ☒ TPC 6.74	1138	4	4	6	BG: N/A WELL: N/A	
1151	☐ TOW ☒ TPC 5.82	1144	4	4	6	BG: N/A WELL: N/A	
1167	☐ TOW ☒ TPC 7.32	1154	6	6	8	BG: N/A WELL: N/A	
1074	☒ TOW ☐ TPC 12.89	1158	6	7	10	BG: N/A WELL: N/A	DEDICATED BAILER
1299	☐ TOW ☒ TPC 4.79	1202	6	6	9	BG: N/A WELL: N/A	APPEARS TO BE ANIMAL HOLE GOING UNDER
N/A	☐ TOW ☐ TPC JED 12/28/94					BG: WELL:	CEMENT PAD
1340	☐ TOW ☒ TPC 10.71	1210	7	7	9	BG: N/A WELL: N/A	
1301	☐ TOW ☒ TPC 10.54	1310	5	5	9	BG: 20 WELL: 20	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

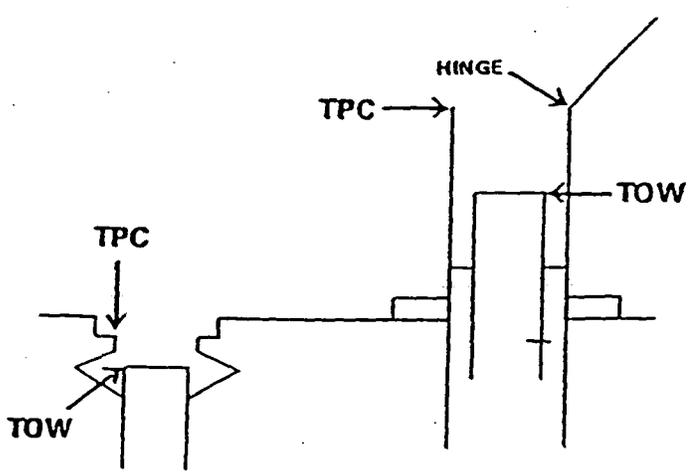
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	6996
PID INSTRUMENT NUMBER:	930089
βγ FRISKER NUMBER:	100321

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: KRU 2 ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 12/28/94		MONTLY PAGE: ____ OF ____
RECORDER: J. DEMOTH	REVIEWING TECHNICIAN'S INITIALS AND DATE: HKM 12-29-94	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1733	☒ TOW ☐ TPC 19.74	1000	1	1	1	BG: N/A WELL: N/A	LOCK DIFFICULT TO REMOVE/PUT ON
1905	☐ TOW ☒ TPC DRY	1015	3	3	3	BG: N/A WELL: N/A	BOTTOM 31.68' - QUESTION IF M. SCALE IS NOT WORKING
N/A	☐ TOW ☐ TPC JED 12/28/94					BG: WELL:	
1866	☐ TOW ☒ TPC 5.43	1023	4	4	5	BG: N/A WELL: N/A	
1444	☐ TOW ☒ TPC 7.00	1027	4	4	4	BG: N/A WELL: N/A	
1843	☐ TOW ☒ TPC 8.28	1040	4	5	6	BG: N/A WELL: N/A	
11067	☒ TOW ☐ TPC 5.07	1046	6	6	7	BG: N/A WELL: N/A	
1124	☒ TOW ☐ TPC 29.81	1054	7	7	7	BG: N/A WELL: N/A	COW PATTY ON WELL
1160	☐ TOW ☒ TPC 8.93	1104	7	7	8	BG: N/A WELL: N/A	CONSTRUCTION DEBRIS AROUND WELL
1064	☒ TOW ☐ TPC 12.43	1110	6	6	8	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

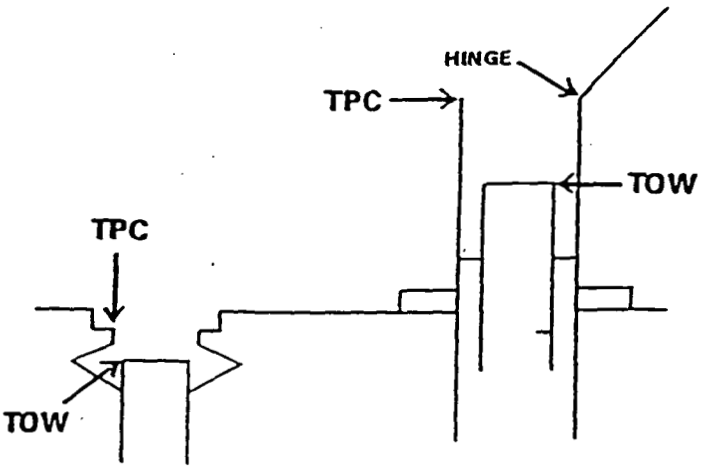
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	6996
PID INSTRUMENT NUMBER:	930089
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000171

PROJECT: CRU 2 ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 12/28/94		MONTLY PAGE: ____ OF ____
RECORDER: J. DEMOTH	REVIEWING TECHNICIAN'S INITIALS AND DATE: NKM 12-29-94	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1276	☐ TOW ☒ TPC 6.94	1404	2	2	6	BG: 30 WELL: 30	
1112	☐ TOW ☒ TPC 10.08	1530	0	0	1	BG: N/A WELL: N/A	
11075	☒ TOW ☐ TPC 9.04	1535	0	0	0	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

CRUSHED 12/28/94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

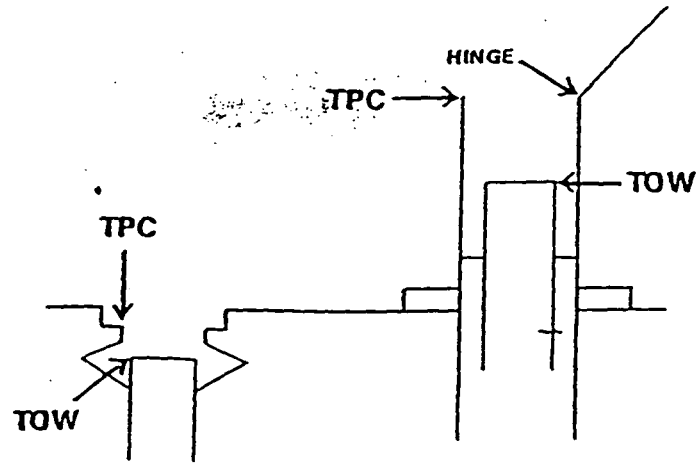
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	6996
PID INSTRUMENT NUMBER:	930089
βγ FRISKER NUMBER:	100321

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CLU 2	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 816
DATE: 12-19-94		MONTLY PAGE: 1 OF 3
RECORDER: G. Mense 10181	REVIEWING TECHNICIAN'S INITIALS AND DATE: TCJ 12.19.94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 12/20/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1124	☒ TOW ☐ TPC 29.50	1217	0	0	0	BG: NA WELL: NA	
11067	☑ TOW ☐ TPC 5.18	1332	0	0	0	BG: NA WELL: NA	
1843	☐ TOW ☑ TPC 8.44	1350	0	0	0	BG: NA WELL: NA	
1444	☐ TOW ☑ TPC 6.39	1400	0	0	0	BG: NA WELL: NA	
1905	☐ TOW ☑ TPC 31.86	1410	0	0	0	BG: NA WELL: NA	
1866	☐ TOW ☑ TPC 4.12	1416	0	0	0	BG: NA WELL: NA	
1887	☑ TOW ☐ TPC 3.49	1423	0	0	0	BG: NA WELL: NA	
1160	☐ TOW ☑ TPC 8.58	1432	0	0	0	BG: NA WELL: NA	
7064	☒ TOW ☐ TPC 11.07	1437	0	0	0	BG: NA WELL: NA	
1733	☑ TOW ☐ TPC 19.68	1449	0	0	0	BG: NA WELL: NA	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

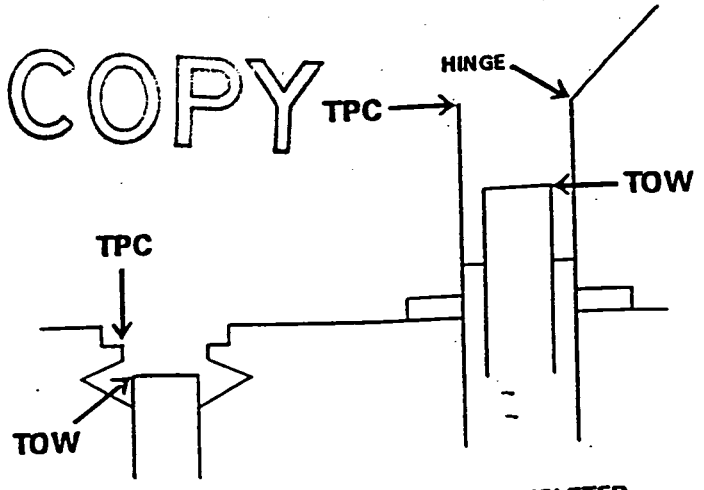
WATER LEVEL INDICATOR NO: 09554

PID INSTRUMENT NUMBER: PA960096

BY FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000173

PROJECT: CFU 2	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 817
DATE: 12-19-94		MONTLY PAGE: 2 OF 3
RECORDER: TCW	REVIEWING TECHNICIAN'S INITIALS AND DATE: SAC 12-20-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 12/20/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1131	☐ TOW ☒ TPC 6.82	0900	2	2	2	BG: 60 WELL: 80	
1299	☐ TOW ☒ TPC 4.58	0910	4	4	4	BG: 180 WELL: 200	hole under pad (animal?)
1340	☐ TOW ☒ TPC 11.44	0924	5	5	5	BG: 100 WELL: 100	
1167	☐ TOW ☒ TPC 6.74	0940	5	5	6	BG: 80 WELL: 80	
1151	☐ TOW ☒ TPC 5.32	0952	6	6	7	BG: 80 WELL: 80	
1112	☐ TOW ☒ TPC 9.84	1001	6	6	7	BG: 50 WELL: 50	
11075	☒ TOW ☐ TPC 9.12	1007	7	7	7	BG: 50 WELL: 50	
1111	☐ TOW ☒ TPC 7.44	1013	7	7	7	BG: 50 WELL: 50	
11074	☒ TOW ☐ TPC 12.70	1020	6	6	7	BG: 100 WELL: 100	
1301	☐ TOW ☒ TPC 10.90	1045	5	5	5	BG: 300 WELL: 300	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

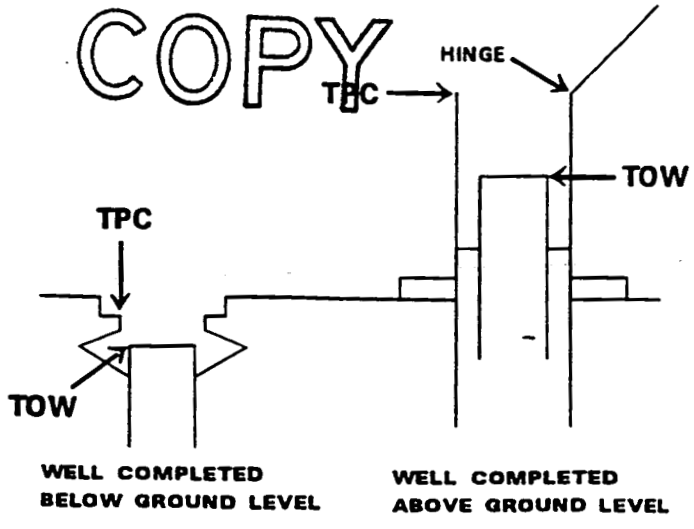
WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: PA930089

By FRISKER NUMBER: ~~14798~~ 77198

FS-F-3467 (REV. 11/93)

COPY



PROJECT: Cru 2	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 818
DATE: 12-19-94		MONTLY PAGE: 3 OF 3
RECORDER: TCW	REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 12-20-94	VERIFYING TECHNICIAN'S INITIALS AND D: JED 12/20/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS
1276	☐ TOW ☒ TPC 7.14	1100	5	5	5	BG: 20 WELL: 20	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

NA TCW 12-19-94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

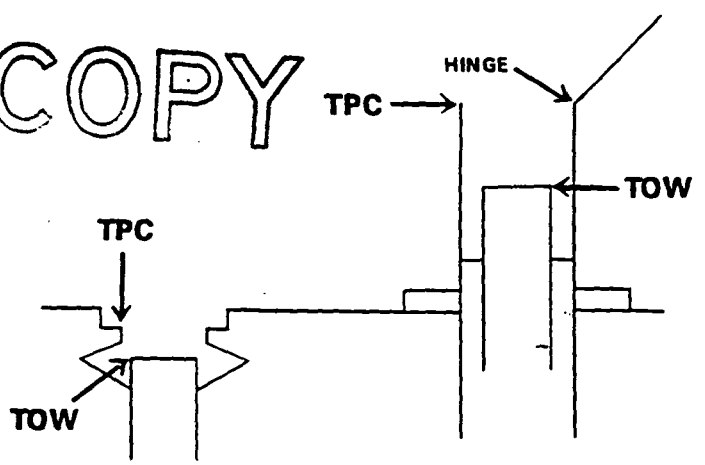
WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: PA930089

By FRISKER NUMBER: TCW 11798 77198 12-19-94

FS-F-3467 (REV. 12/08/83)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000175

PROJECT: CRUZ ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 813
DATE: 12/14/94		MONTLY PAGE: 1 OF 3
RECORDER: J. DEMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 12-15-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: AJ2 12/15/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1167	☐ TOW ☒ TPC 6.81	1250	1	2	2	BG: N/A WELL: N/A	
1151	☐ TOW ☒ TPC 5.47	1256	2	2	2	BG: N/A WELL: N/A	
1131	☐ TOW ☒ TPC 6.76	1302	2	2	2	BG: N/A WELL: N/A	RUMPKE DUMPSTER NEXT TO MW
11074	☒ TOW ☐ TPC 12.58	1311	1	2	2	BG: N/A WELL: N/A	WL 10921
1340	☐ TOW ☒ TPC 11.80	1315	2	2	2	BG: N/A WELL: N/A	WL 10921
1299	☐ TOW ☒ TPC 4.58	1325	1	1	1	BG: N/A WELL: N/A	WL 10921
1301	☐ TOW ☒ TPC 11.04	1400	3	3	4	BG: 50 WELL: 50	WL 10921
1276	☐ TOW ☒ TPC 7.24	1420	4	4	5	BG: 70 WELL: 70	WL 10921
1111	☐ TOW ☒ TPC 7.52	1430	3	4	5	BG: N/A WELL: N/A	WL 10921
1112	☐ TOW ☒ TPC 9.79	1435	3	3	3	BG: N/A WELL: N/A	WL 10921

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

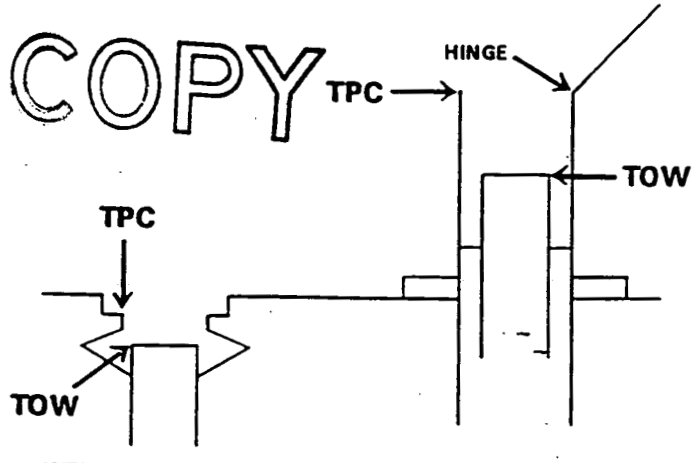
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	10922
PID INSTRUMENT NUMBER:	930073
βγ PRISKER NUMBER:	97187

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU 2 ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 814
DATE: 12/14/94		MONTLY PAGE: 2 OF 3
RECORDER: J. DeMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 12-15-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: SJZ 12/15/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
11075	☒ TOW ☐ TPC 9.18	1439	3	5	5	BG: N/A WELL: N/A	
1160	☐ TOW ☒ TPC 8.66	1455	3	3	4	BG: N/A WELL: N/A	CONSTRUCTION MATERIAL AROUND WELL
1064	☒ TOW ☐ TPC 11.22	1500	3	3	6	BG: N/A WELL: N/A	
1887	☒ TOW ☐ TPC 12.30	1505	3	3	7	BG: N/A WELL: N/A	
1124	☒ TOW ☐ TPC 29.35	1511	3	3	6	BG: N/A WELL: N/A	
1866	☐ TOW ☒ TPC 4.26	1520	5	5	6	BG: N/A WELL: N/A	
1444	☐ TOW ☒ TPC 6.41	1530	6	6	9	BG: 50 WELL: 50	
1843	☐ TOW ☒ TPC 9.28	1542	5	5	5	BG: N/A WELL: N/A	
11067	☒ TOW ☐ TPC 5.26	1547	5	5	7	BG: N/A WELL: N/A	
1905	☐ TOW ☒ TPC 31.80	1555	5	5	11	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

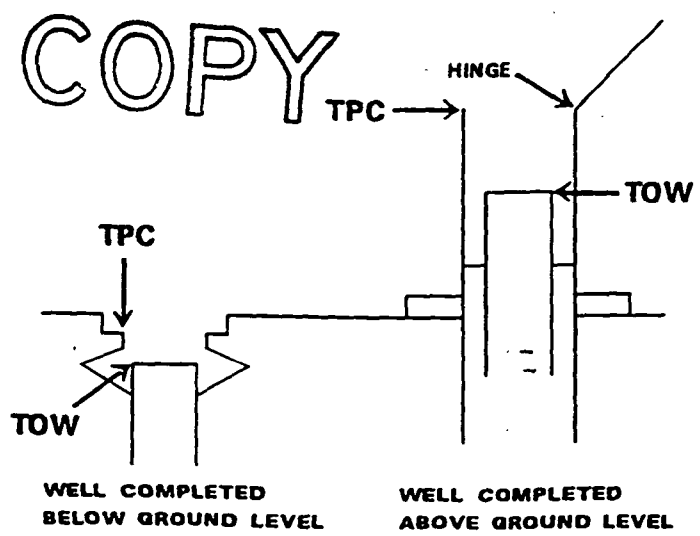
WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: 930673

BY FRISKER NUMBER: 97187

FS-F-3467 (REV. 12/08/93)

COPY



PROJECT: CRUZ ELEVATIONS

DATE: 12/14/94

RECORDER: J. DEMUTH

GROUNDWATER ELEVATIONS DATA SHEET

REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 12-15-94

PROJECT PAGE: 118 815

MONTLY PAGE: 3 OF 3

VERIFYING TECHNICIAN'S INITIALS AND DATE: 12/15/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1733	☒ TOW ☐ TPC 19.64	1605	5	5	7	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

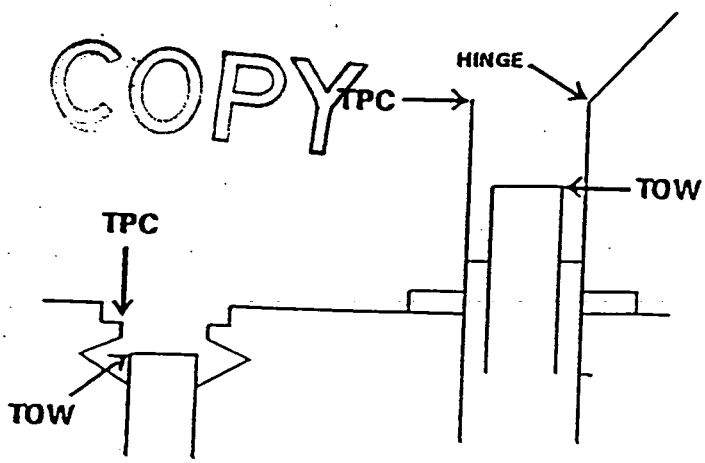
WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: 930073

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CAMD	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 810
DATE: 12/12/94		MONTLY PAGE: 1 OF 2
RECORDER: G. LUPTON	REVIEWING TECHNICIAN'S INITIALS AND DATE: JED 12/12/94	VERIFYING TECHNICIAN'S INITIALS AND DATE: GEM 12-12-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1276	☐ TOW ☒ TPC 7.41	0924	2	2	2	BG: 50 WELL: 50	
1301	☐ TOW ☒ TPC 11.11	0956	2	2	2	BG: 250 WELL: 250	
1299	☐ TOW ☒ TPC 4.62	1017	0	0	1	BG: N/A WELL: N/A	
1340	☐ TOW ☒ TPC 11.03	1022	0	0	0	BG: N/A WELL: N/A	ELEVATION FROM B TEAM
1107A	☒ TOW ☐ TPC 12.54	1024	1	1	1	BG: N/A WELL: N/A	
1167	☐ TOW ☒ TPC 6.54	1032	1	1	1	BG: N/A WELL: N/A	
1151	☐ TOW ☒ TPC 5.26	1038	1	1	1	BG: N/A WELL: N/A	
1131	☐ TOW ☒ TPC 6.80	1043	1	1	1	BG: N/A WELL: N/A	
1111	☐ TOW ☒ TPC 7.18	1052	0	0	0	BG: N/A WELL: N/A	
1112	☐ TOW ☒ TPC 9.73	1057	0	0	0	BG: N/A WELL: N/A	FLOATING PAD

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

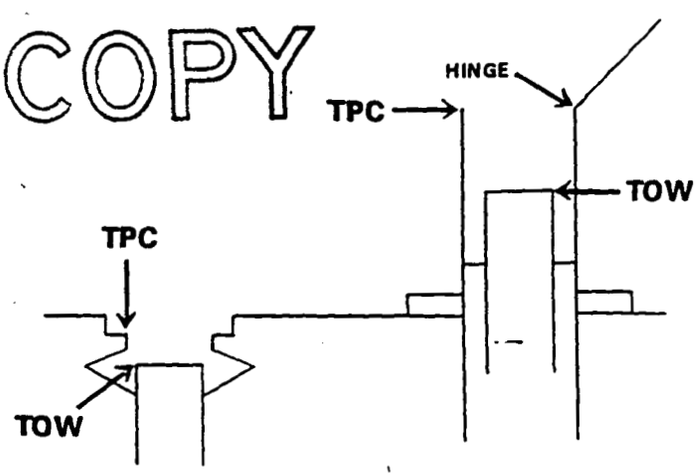
WATER LEVEL INDICATOR NO: 10922

PID INSTRUMENT NUMBER: 930073

βγ FRISKER NUMBER: 97187

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000179

PROJECT: CRV2	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 811
DATE: 12/12/94		MONTLY PAGE: 2 OF 3
RECORDER: G. LUDTON	REVIEWING TECHNICIAN'S INITIALS AND DATE: JED 12/12/94	VERIFYING TECHNICIAN'S INITIALS AND DATE: GEM 12-12-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
11075	☒ TOW ☐ TPC 9.22	1101	0	0	1	BG: N/A WELL: N/A	
1064	☒ TOW ☐ TPC 11.52	1121	0	0	0	BG: N/A WELL: N/A	
1160	☐ TOW ☒ TPC 8.38	1125	0	0	0	BG: N/A WELL: N/A	
1866	☐ TOW ☒ TPC 3.26	1129	0	0	0	BG: N/A WELL: N/A	
1905	☐ TOW ☒ TPC 31.58	1137	0	0	0	BG: N/A WELL: N/A	
1444	☐ TOW ☒ TPC 8.28	1145	0	0	1	BG: 50 WELL: 50	
1843	☐ TOW ☒ TPC 9.86	1155	0	0	0	BG: N/A WELL: N/A	
11067	☒ TOW ☐ TPC 5.31	1158	0	0	1	BG: N/A WELL: N/A	
1124	☒ TOW ☐ TPC 29.13	1209	1	2	2	BG: N/A WELL: N/A	
1887	☒ TOW ☐ TPC 2.88	1215	~~1~~ 2 12/12/94	1	1	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

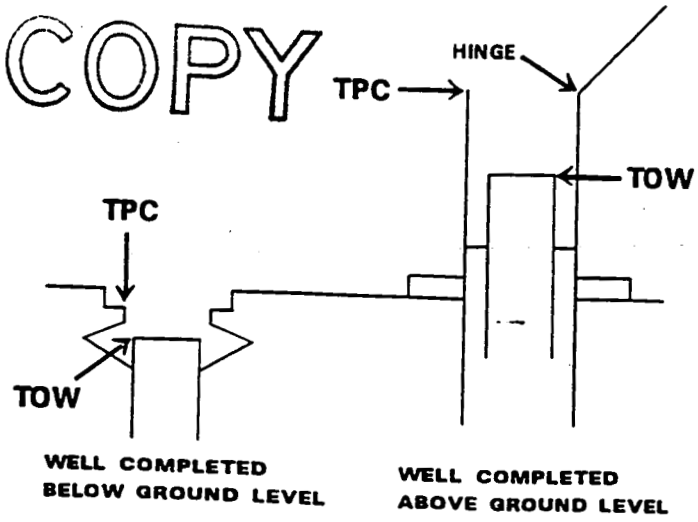
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	10922
PID INSTRUMENT NUMBER:	930073
βγ FRISKER NUMBER:	97187

FS-F-3467 (REV. 12/08/93)

COPY



PROJECT: CRU2	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 812
DATE: 12/12/94		MONTLY PAGE: 3 OF 3
RECORDER: G. LUPTON	REVIEWING TECHNICIAN'S INITIALS AND DATE: JED 12/12/94	VERIFYING TECHNICIAN'S INITIALS AND DATE: GEM 12-12-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1733	☒ TOW ☐ TPC 19.59	1225	1	2	2	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

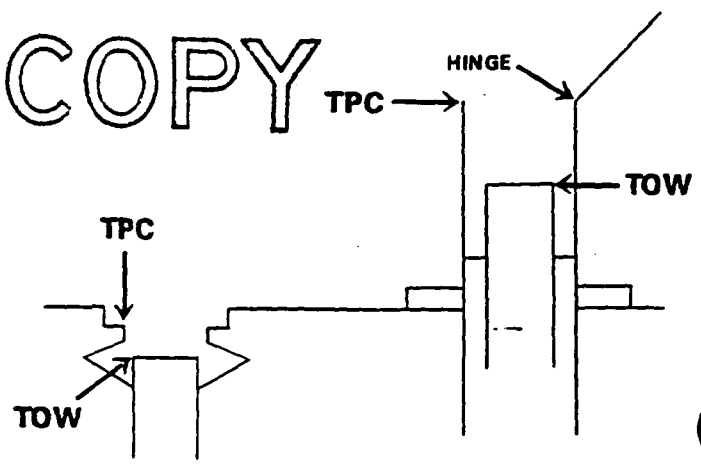
WATER LEVEL INDICATOR NO: 10722

PID INSTRUMENT NUMBER: 930073

βγ FRISKER NUMBER: 97187

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU-2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 806
DATE: 12-7-94		MONTLY PAGE: 1 OF 3
RECORDER: Tim Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 12-7-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 12/8/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 7.73	0915	1	1	1	BG: 40 WELL: 40	
1131	☐ TOW ☒ TPC 6.80	0922	2	2	2	BG: 40 WELL: 40	
1167	☐ TOW ☒ TPC 6.84	0927	2	2	2	BG: 40 WELL: 40	
1151	☐ TOW ☒ TPC 5.72	0934	3	3	3	BG: 50 WELL: 50	
1112	☐ TOW ☒ TPC 9.83	0938	2	2	2	BG: 100 WELL: 100	
11075	☒ TOW ☐ TPC 9.19	0942	3	3	3	BG: 50 WELL: 50	
11074	☒ TOW ☐ TPC 12.34	0947	2	2	2	BG: 50 WELL: 50	
1299	☐ TOW ☒ TPC 4.82	0953	5	5	5	BG: 225 WELL: 150	
1340	☐ TOW ☒ TPC 10.53	1000	5	5	5	BG: 50 WELL: 50	
1301	☐ TOW ☒ TPC 11.18	1015	3	3	5	BG: 50 WELL: 50	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

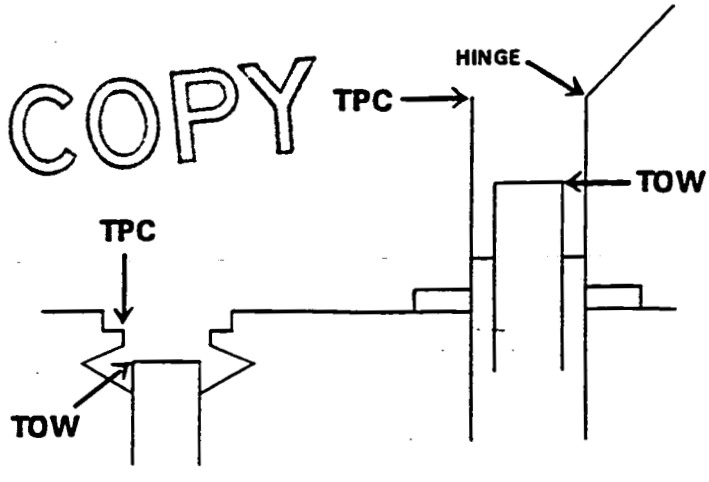
WATER LEVEL INDICATOR NO: 11768

PID INSTRUMENT NUMBER: PA930089

βγ FRISKER NUMBER: 100321

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU-2 Elevation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 807
DATE: 12-7-94		MONTLY PAGE: 2 OF 3
RECORDER: T. Smith	REVIEWING TECHNICIAN'S INITIALS AND DATE: JAC 12-7-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 12/8/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1276	☐ TOW ☒ TPC 7.56	1028	2	2	5	BG: 10 WELL: 10	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	12-7-94
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

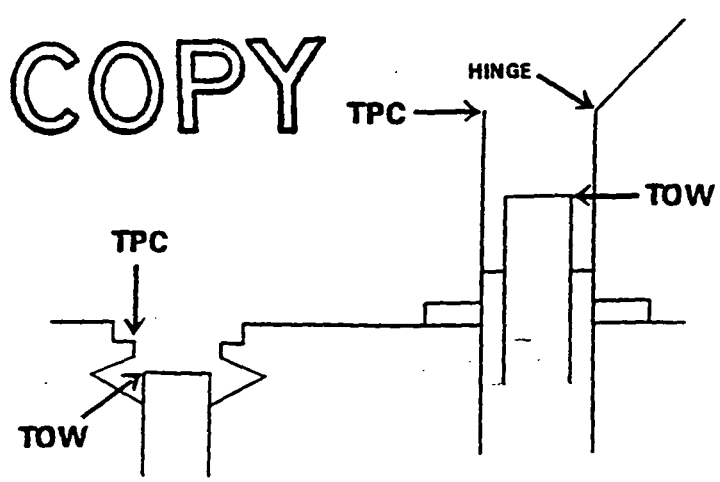
WATER LEVEL INDICATOR NO: 117668

PID INSTRUMENT NUMBER: PA930089

βγ FRISKER NUMBER: 100321

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000183

PROJECT: CRUZ ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 808
DATE: 12-7-94		MONTLY PAGE: 3 OF 3
RECORDER: G&M	REVIEWING TECHNICIAN'S INITIALS AND DATE: DPO 12-07-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 12/8/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1866	☐ TOW ☑ TPC 5.07	1315	0	0	0	BG: NA WELL: NA	
1444	☐ TOW ☑ TPC 6.54	1325	0	0	0	BG: NA WELL: NA	
1843	☐ TOW ☑ TPC 11.17	1331	0	0	0	BG: NA WELL: NA	
11067	☑ TOW ☐ TPC 5.24	1336	0	0	0	BG: NA WELL: NA	
1160	☐ TOW ☑ TPC 8.89	1342	0	0	0	BG: NA WELL: NA	
1064	☑ TOW ☐ TPC 12.90	1347	0	0	0	BG: NA WELL: NA	
1887	☑ TOW ☐ TPC 4.38	1353	0	0	0	BG: NA WELL: NA	
1124	☑ TOW ☐ TPC 28.93	1402	0	0	0	BG: NA WELL: NA	
1905	☐ TOW ☑ TPC 31.49	1412	0	0	0	BG: NA WELL: NA	
1733	☑ TOW ☐ TPC 19.41	1420	0	0	0	BG: NA WELL: NA	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

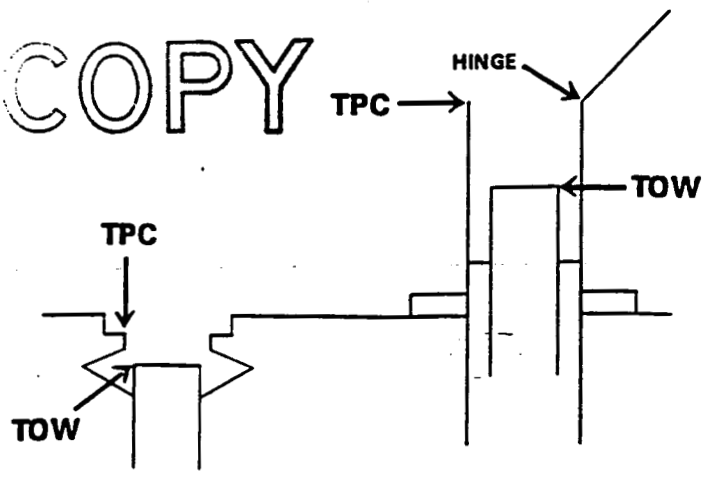
WATER LEVEL INDICATOR NO: 1168

PID INSTRUMENT NUMBER: PA930089

BY FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRUZ ELEVATIONS

DATE: 11-30-94

RECORDER: GREG O'NEILL

GROUNDWATER ELEVATIONS DATA SHEET

REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Norber 11-30-94

PROJECT PAGE: 801

MONTLY PAGE: 1 OF 2

VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 11/30

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1733	☒ TOW ☐ TPC 19.34	0918	0	0	0	BG: 50 WELL: 50	
1843	☐ TOW ☒ TPC 11.52	0932	0	0	0	BG: 20 WELL: 20	
11067	☒ TOW ☐ TPC 5.50	0936	0	0	0	BG: 40 WELL: 40	
1444	☐ TOW ☒ TPC 6.58	0945	0	0	0	BG: 50 WELL: 50	
1124	☒ TOW ☐ TPC 28.47	0957	0	0	0	BG: 20 WELL: 20	
1887	☒ TOW ☐ TPC 3.70	1011	0	0	0	BG: 20 WELL: 20	
1064	☒ TOW ☐ TPC 13.44	1017	0	0	0	BG: 20 WELL: 20	
1160	☐ TOW ☒ TPC 8.84	1024	0	N/A 0	0	BG: 20 WELL: 20	CONSTRUCTION MATERIALS NEAR BASE OF WELL- CONSTRUCTION WORKERS MOVE FENCE TO ALLOW ACCESS TO WELL
1866	☐ TOW ☒ TPC 4.88	1029	0	0	0	BG: 20 WELL: 20	
1905	☐ TOW ☒ TPC 31.45	1035	0	0	0	BG: 20 WELL: 20	2" PVC NEEDS TO BE CUT

GRO 11-30-94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

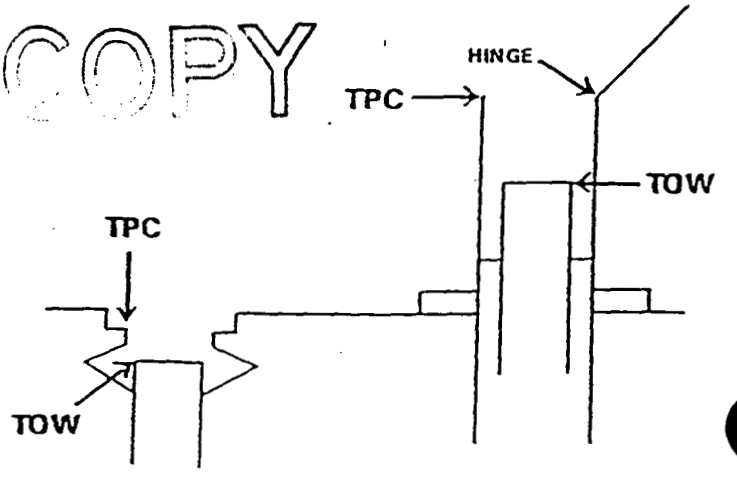
WATER LEVEL INDICATOR NO: 11768

PID INSTRUMENT NUMBER: PA930096

βγ FRISKER NUMBER: 100321

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU2 ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 802
DATE: 11-30-94		MONTLY PAGE: 2 OF 2
RECORDER: GREG O'NEILL	REVIEWING TECHNICIAN'S INITIALS AND DATE: J. Norber 11-30-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 11/30/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 7.64	1049	0	0	0	BG: 20 WELL: 20	
1276	☐ TOW ☒ TPC 8.56	1115	0	0	0	BG: 100 WELL: 100	
1301	☐ TOW ☒ TPC 11.27	1200	0	0	0	BG: 200 WELL: 200	
1299	☐ TOW ☒ TPC 5.18	1209	0	0	0	BG: 40 WELL: 40	
1151	☐ TOW ☒ TPC 5.94	1212	0	0	0	BG: 40 WELL: 40	FLOATING PAD
1340	☐ TOW ☒ TPC 10.94	1216	0	0	0	BG: 40 WELL: 40	
11074	☒ TOW ☐ TPC 12.24	1220	0	0	0	BG: 40 WELL: 40	
11075	☒ TOW ☐ TPC 9.18	1225	0	0	0	BG: 40 WELL: 40	
1112	☐ TOW ☒ TPC 9.88	1230	0	0	0	BG: 40 WELL: 40	FLOATING PAD
	☐ TOW ☐ TPC	GPO	11-30-94			BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

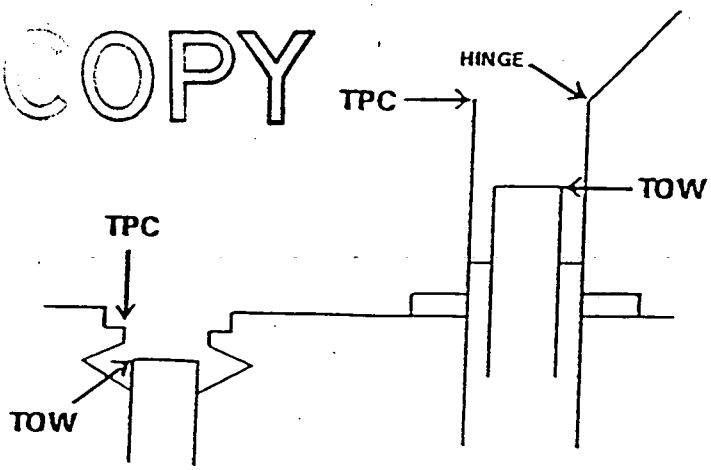
WATER LEVEL INDICATOR NO: 11768

PID INSTRUMENT NUMBER: PA 930096

βγ FRISKER NUMBER: 100321

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

811

PROJECT: CRUZ ELEVATIONS

DATE: 11-28-94

RECORDER: J. Norber

GROUNDWATER ELEVATIONS DATA SHEET

REVIEWING TECHNICIAN'S INITIALS AND DATE: DPO 11-28-94

PROJECT PAGE: 798

MONTLY PAGE: 1 OF 2

VERIFYING TECHNICIAN'S INITIALS: JED DATE: 11/30

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1887	☒ TOW ☐ TPC 4.16	0930	0	0	0	BG: 20 / WELL: 20	
1064	☒ TOW ☐ TPC 14.36	0940	0	0	0	BG: 20 / WELL: 20	
1160	☐ TOW ☒ TPC N/A	0952	0	N/A	N/A	BG: 20 / WELL: N/A	CONSTRUCTION AREA HEAVY EQUIP. WORKING
1124	☒ TOW ☐ TPC ~~22.30~~ 28 JN 11-28-94	1004	0	0	0	BG: ~~20~~ 20 JN 11-28-94 / WELL: 20	
1843	☐ TOW ☒ TPC 11.62	1015	0	0	0	BG: 20 / WELL: 20	
1444	☐ TOW ☒ TPC 6.60	1021	0	0	0	BG: 50 / WELL: 50	
11067	☒ TOW ☐ TPC 5.28	1032	0	0	0	BG: 20 / WELL: 20	
1866	☐ TOW ☒ TPC 3.94	1039	0	0	0	BG: 20 / WELL: 20	
1905	☐ TOW ☒ TPC 31.42	1047	0	0	0	BG: 20 / WELL: 20	STANDING WATER AROUND WELL
1733	☒ TOW ☐ TPC 19.24	1055	0	0	0	BG: 20 / WELL: 20	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

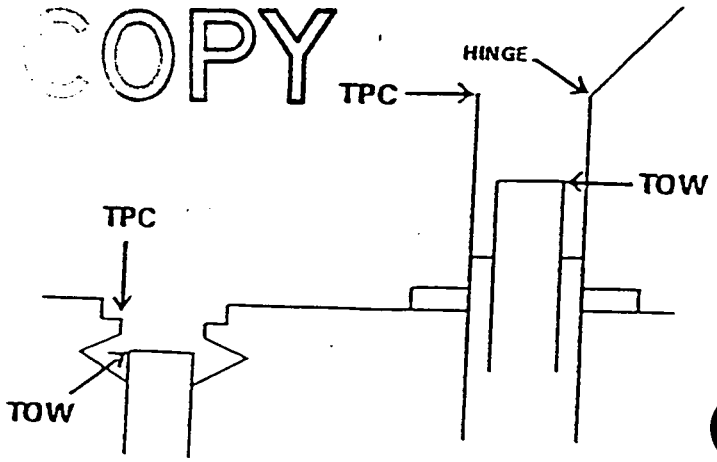
WATER LEVEL INDICATOR NO: 12910

PID INSTRUMENT NUMBER: JN 11-28-94 ~~103249~~ 930084

BY FRISKER NUMBER: 103249

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRUZ ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 799
DATE: 11-28-94		MONTLY PAGE: 2 OF 2
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE: DPO 11-28-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 11/30/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 7.00	1115	0	0	0	BG: 50 WELL: 50	
11074	☒ TOW ☐ TPC 12.10	1123	0	0	0	BG: 50 WELL: 50	
1151	☐ TOW ☒ TPC 5.78	1128	0	0	0	BG: 50 WELL: 50	NO DRAIN HOLE IN PROTECTIVE CASING PAD MOUNTS
11075	☒ TOW ☐ TPC 9.18	1133	0	0	0	BG: 50 WELL: 50	
1112	☐ TOW ☒ TPC 9.82	1141	0	0	0	BG: 50 WELL: 50	WRONG WELL CAP ON WELL NEEDS SCREW LID
1340	☐ TOW ☒ TPC 10.38	1152	0	0	0	BG: 50 WELL: 50	
1299	☐ TOW ☒ TPC 5.37	1200	0	0	0	BG: 50 WELL: 50	
1301	☐ TOW ☒ TPC 11.28	1210	0	0	0	BG: 100 WELL: 100	
1276	☐ TOW ☒ TPC 8.34	1240	0	0	0	BG: 150 WELL: 150	
	☐ TOW ☐ TPC			N/A		BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING (TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

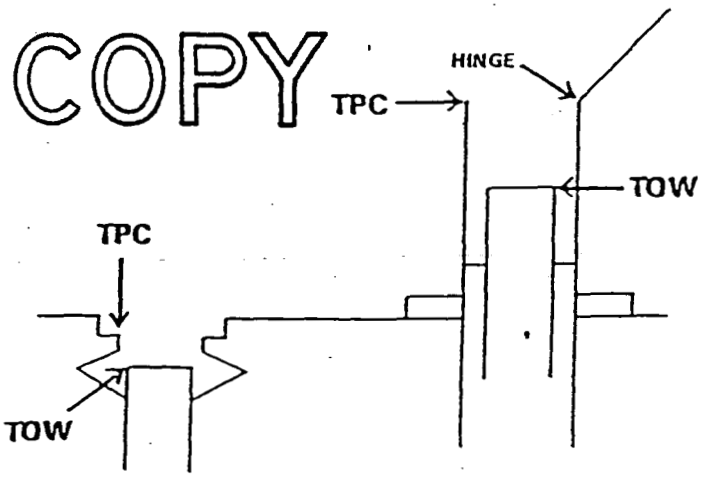
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12910
PID INSTRUMENT NUMBER:	930084
βγ FRISKER NUMBER:	103249

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

811

PROJECT: CRU 2 ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 794
DATE: 11-23-94		MONTLY PAGE: 1 OF 3
RECORDER: V Reynolds 174	REVIEWING TECHNICIAN'S INITIALS AND DATE: TWS 11.23.94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 11/23/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1866	☐ TOW ☒ TPC 5.79	0845	0	0	0	BG: NA WELL: NA	
1160	☐ TOW ☒ TPC 9.09	0850	3	3	5	BG: NA WELL: NA	contamination area Digging ditch first in front of work site
1064	☒ TOW ☐ TPC 14.44	0905	3	3	4	BG: NA WELL: NA	
1887	☒ TOW ☐ TPC 5.47	0909	0	0	0	BG: NA WELL: NA	
1124	☒ TOW ☐ TPC 28.05	0916	0	0	0	BG: NA WELL: NA	
11067	☒ TOW ☐ TPC 5.82	0925	8	8	9	BG: NA WELL: NA	
1444	☐ TOW ☒ TPC 7.45	0940	8	8	9	BG: NA WELL: NA	
1843	☐ TOW ☒ TPC 11.97	0948	8	8	8	BG: NA WELL: NA	
1733	☒ TOW ☐ TPC 19.30	0958	0	0	0	BG: NA WELL: NA	
1905	☐ TOW ☒ TPC 31.42	1007	0	0	0	BG: NA WELL: NA	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

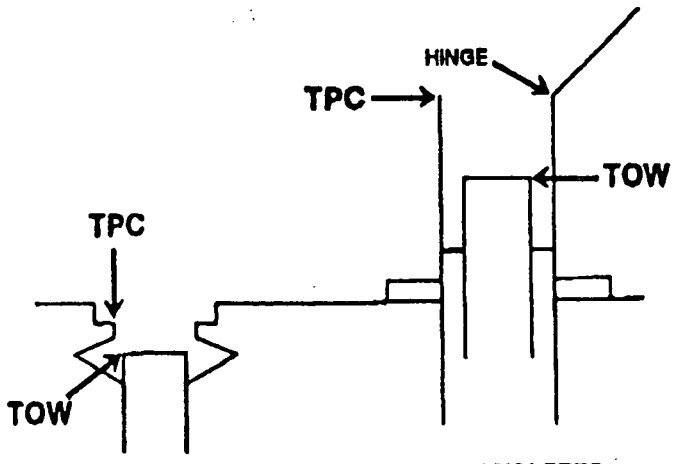
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12906

PID INSTRUMENT NUMBER: 930084

βγ FRISKER NUMBER: NA

FS-F-0487 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

COPY

000189

PROJECT: Chem Elevations	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 795
DATE: 11-23-94		MONTLY PAGE: 2 OF 3
RECORDER: D Raymond 114	REVIEWING TECHNICIAN'S INITIALS AND DATE: TWS 11-23-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 11/23/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 7.94	1020	1	1	3	BG: NA WELL: NA	
1131	☐ TOW ☒ TPC 6.80	1025	1	1	3	BG: NA WELL: NA	
1167	☐ TOW ☒ TPC 7.47	1030	3	3	4	BG: NA WELL: NA	
11074	☒ TOW ☐ TPC 12.07	1034	4	4	4	BG: NA WELL: NA	
1340	☐ TOW ☒ TPC 10.92	1037	4	4	9	BG: NA WELL: NA	
1299	☐ TOW ☒ TPC 5.95	1041	4	4	9	BG: NA WELL: NA	
1112	☐ TOW ☒ TPC 9.85	1050	3	3	3	BG: NA WELL: NA	
11075	☒ TOW ☐ TPC 9.19	1153	2	2	3	BG: NA WELL: NA	
1151	☐ TOW ☒ TPC 6.12	1200	2	2	3	BG: NA WELL: NA	
1276	☐ TOW ☒ TPC 9.20	1130	1	1	4	BG: NA WELL: NA	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

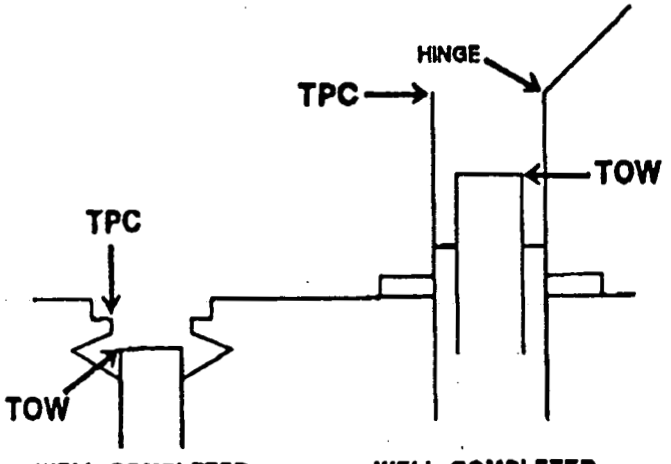
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE.

MONITORING WELL WITH GED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12906
PID INSTRUMENT NUMBER:	930084
βγ FRISKER NUMBER:	NA

FS-F-8487 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

COPY

PROJECT: Ou 2 Elevations	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 796
DATE: 11-23-94		MONTLY PAGE: 3 OF 3
RECORDER: D. Raymond	REVIEWING TECHNICIAN'S INITIALS AND DATE: TWS 11-23-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JED 11/23/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1301	☐ TOW ☒ TPC 11.39	1210	0	0	3	BG: NA WELL: NA	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

Page Total Reviewed D. Raymond 11-23-94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

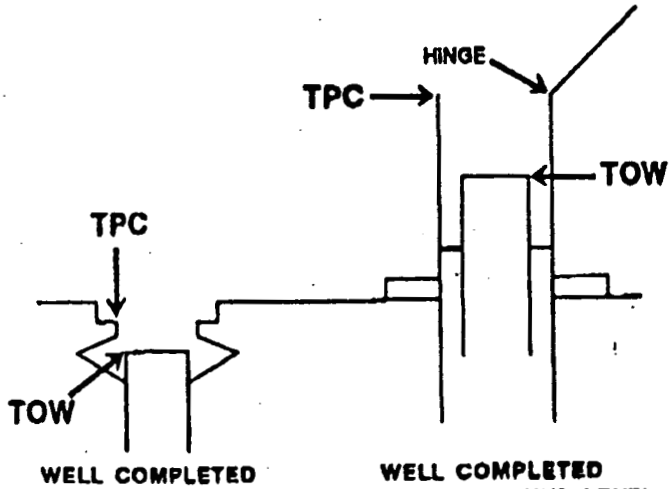
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12906

PID INSTRUMENT NUMBER: 930084

FRISKER NUMBER: NA

FS-F-5787 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

COPY

PROJECT: CRU2 ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 158
DATE: 11-16-94		MONTLY PAGE: 1 OF 3
RECORDER: GREG O'NEILL	REVIEWING TECHNICIAN'S INITIALS AND DATE: H.K.M. 11-16-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMF 11-18-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1887	☒ TOW ☐ TPC 5.41	0831	0	0	0	BG: N/A WELL:	
7064	☒ TOW ☐ TPC 15.40	0839	0	0	0	BG: WELL:	
1152	☐ TOW ☒ TPC 7.54	0843	0	0	0	BG: WELL:	
1160	☐ TOW ☒ TPC 8.72	0847	0	0	0	BG: WELL:	
1843	☐ TOW ☒ TPC 11.75	0853	0	0	0	BG: WELL:	
11067	☒ TOW ☐ TPC 6.20	0859	0	0	0	BG: WELL:	
1444	☐ TOW ☒ TPC 7.83	0915	0	0	0	BG: WELL:	
1124	☒ TOW ☐ TPC 27.61	0930	0	0	0	BG: WELL:	
1866	☐ TOW ☒ TPC 5.77	0940	0	0	0	BG: WELL:	
1905	☐ TOW ☒ TPC 31.38	0945	0	0	0	BG: WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

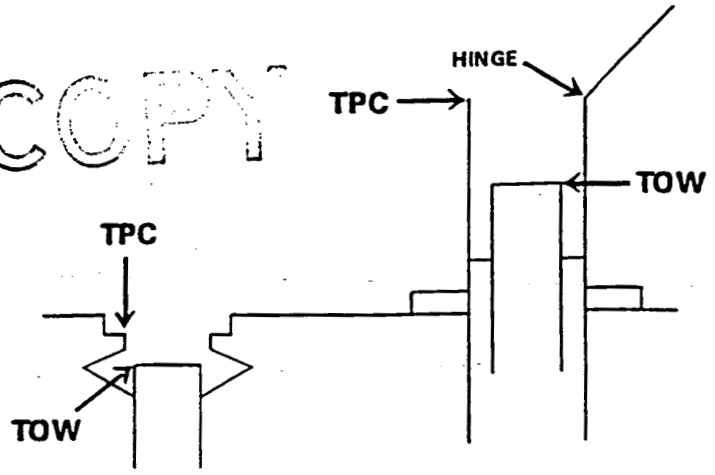
WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: PA930073

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU2 ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 759
DATE: 11-16-94		MONTLY PAGE: 2 OF 3
RECORDER: GREG O'NEILL	REVIEWING TECHNICIAN'S INITIALS AND DATE: H.K.M 11-16-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMF 11-18-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1733	☒ TOW ☐ TPC 19.18	0955	0	0	0	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

LAST ENTRY GO 11-16-94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

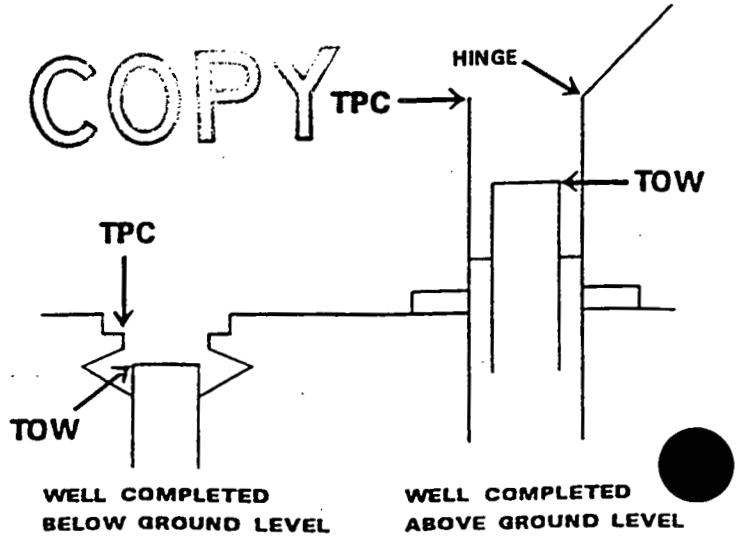
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	10921
PID INSTRUMENT NUMBER:	PA 930073
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)

COPY



PROJECT: CKU2 WK. Elev.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 760
DATE: 11-16-94		MONTLY PAGE: 3 OF 3
RECORDER: G Hess 10151	REVIEWING TECHNICIAN'S INITIALS AND DATE: TWS 11-14-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DNF 11-18-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1167	☐ TOW ☑ TPC 7.56	1300	4	4	4	BG: NA WELL:	
1111	☐ TOW ☑ TPC 7.21	1310	4	4	4	BG: WELL:	
1131	☐ TOW ☑ TPC 6.81	1319	5	5	5	BG: WELL:	
1293	☐ TOW ☑ TPC 3.14	1330	5	5	5	BG: WELL:	
1301	☐ TOW ☑ TPC 11.34	1350	5	5	5	BG: WELL:	
1274	☐ TOW ☑ TPC 6.86	1410	5	5	5	BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

Gary Eustis
G Hess 11-16-94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

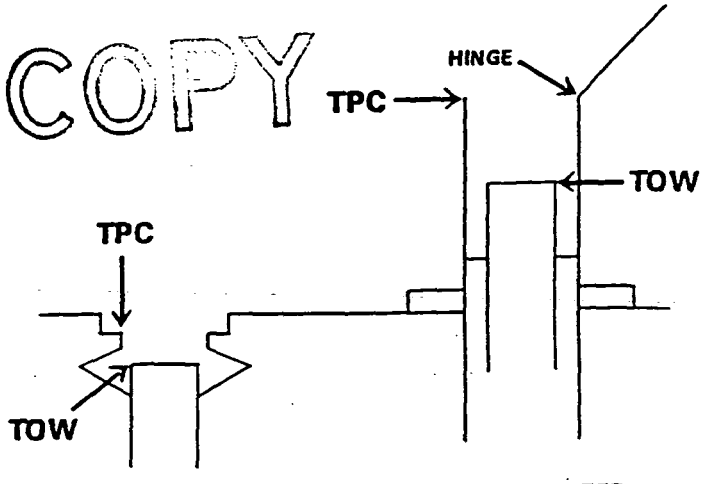
WATER LEVEL INDICATOR NO: 12906

PID INSTRUMENT NUMBER: PA93089

BY FRISKER NUMBER: 77198

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: DFPDI	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 749
DATE: 11-10-94		MONTLY PAGE: 1 OF 2
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE: GPO 11-10-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMF 11-10-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1111	☐ TOW ☒ TPC 7.20	1000	0	0	0	BG: N/A WELL: N/A	
1167	☐ TOW ☒ TPC 7.79	1008	0	0	0	BG: N/A WELL: N/A	
1131	☐ TOW ☒ TPC 6.76	1015	0	0	0	BG: N/A WELL: N/A	
1293	☐ TOW ☒ TPC 3.06	1022	0	0	0	BG: N/A WELL: N/A	
1301	☐ TOW ☒ TPC 11.36	1100	0	0	0	BG: N/A WELL: N/A	
1274	☐ TOW ☒ TPC 9.02	1125	0	0	1	BG: N/A WELL: N/A	
1152	☐ TOW ☒ TPC 8.25	1145	0	0	0	BG: N/A WELL: N/A	
1064	☒ TOW ☐ TPC 16.44	1150	0	0	0	BG: N/A WELL: N/A	
1887	☒ TOW ☐ TPC 5.52	1155	0	0	0	BG: N/A WELL: N/A	
1124	☒ TOW ☐ TPC 27.12	1202	0	0	0	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

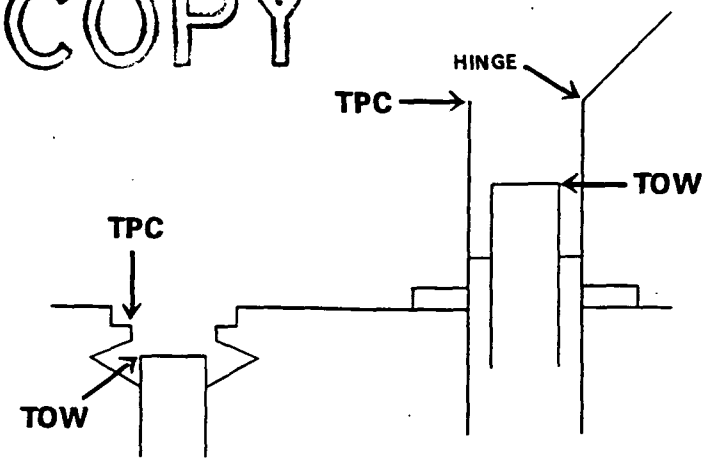
WATER LEVEL INDICATOR NO: 07431

PID INSTRUMENT NUMBER: 930073

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000195

PROJECT: DFPDI	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 750
DATE: 11-10-94		MONTLY PAGE: 2 OF 2
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE: GPO 11-10-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DME 11-10-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1067	☒ TOW ☐ TPC 6.76	1210	0	0	0	BG: N/A WELL: N/A	
1843	☐ TOW ☒ TPC 11.56	1215	0	0	0	BG: N/A WELL: N/A	
1444	☐ TOW ☒ TPC 7.78	1230	0	0	0	BG: N/A WELL: N/A	
1160	☐ TOW ☒ TPC 9.68	1240	0	0	0	BG: N/A WELL: N/A	
1866	☐ TOW ☒ TPC 6.32	1245	0	0	0	BG: N/A WELL: N/A	
1905	☐ TOW ☒ TPC 31.34	1250	0	0	0	BG: N/A WELL: N/A	Doesn't Lock Right Holes Next to Well/Standing Water
1733	☒ TOW ☐ TPC 19.06	1255	0	0	0	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	11-10-94
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

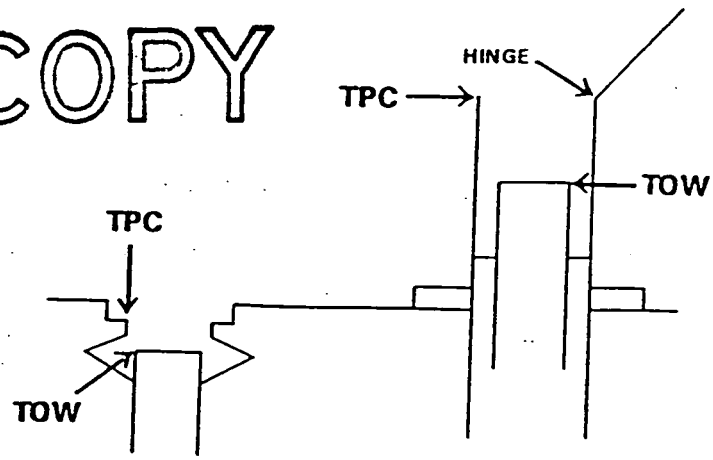
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	07431
PID INSTRUMENT NUMBER:	930073
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: DFPDI	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 747
DATE: 11-9-94		MONTLY PAGE: 1 OF 2
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE: TWS 11-9-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMF 11-9-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1866	☐ TOW ☒ TPC 6.77	0930	0	0	1	BG: N/A WELL: N/A	
1160	☐ TOW ☒ TPC 10.46	0940	3	3	4	BG: N/A WELL: N/A	
1152	☐ TOW ☒ TPC 8.89	0950	4	3	3	BG: N/A WELL: N/A	
1064	☒ TOW ☐ TPC 16.43	1000	6	3	3	BG: N/A WELL: N/A	Floating Pad
1887	☒ TOW ☐ TPC 6.38	1010	6	4	4	BG: N/A WELL: N/A	
1905	☐ TOW ☒ TPC 31.33	1045	5	5	5	BG: N/A WELL: N/A	Protective Casing Doesn't Shut All The Wall
1733	☒ TOW ☐ TPC 18.99	1055	4	4	4	BG: N/A WELL: N/A	
1444	☐ TOW ☒ TPC 8.26	1102	6	6	6	BG: N/A WELL: N/A	
11067	☒ TOW ☐ TPC 6.27	1110	6	6	6	BG: N/A WELL: N/A	
1843	☐ TOW ☒ TPC 6.43	1115	6	6	6	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

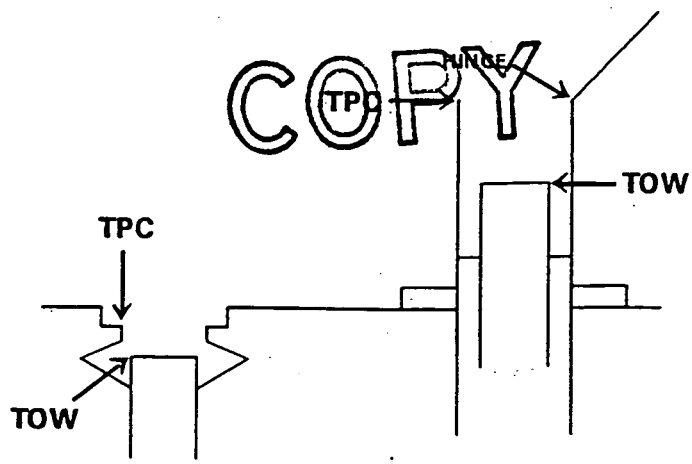
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	07431
PID INSTRUMENT NUMBER:	930096
βγ FRISKER NUMBER:	N/A

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000197

PROJECT: DFPDI	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 748
DATE: 11-9-94		MONTLY PAGE: 2 OF 2
RECORDER: J. Norber	REVIEWING TECHNICIAN'S INITIALS AND DATE: TWS 11-9-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMT 11-9-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1124	☒ TOW ☐ TPC 27.10	1120	6	6	6	BG: N/A WELL: N/A	
1111	☐ TOW ☒ TPC 8.22	1132	4	4	4	BG: N/A WELL: N/A	
1293	☐ TOW ☒ TPC 2.83	1135	4	4	2	BG: N/A WELL: N/A	
1167	☐ TOW ☒ TPC 7.83	1140	4	4	4	BG: N/A WELL: N/A	
1131	☐ TOW ☒ TPC 6.75	1145	3	3	2	BG: N/A WELL: N/A	
1301	☐ TOW ☒ TPC 11.72	1152	2	2	2	BG: N/A WELL: N/A	
1274	☐ TOW ☒ TPC 8.82	1200	2	2	2	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

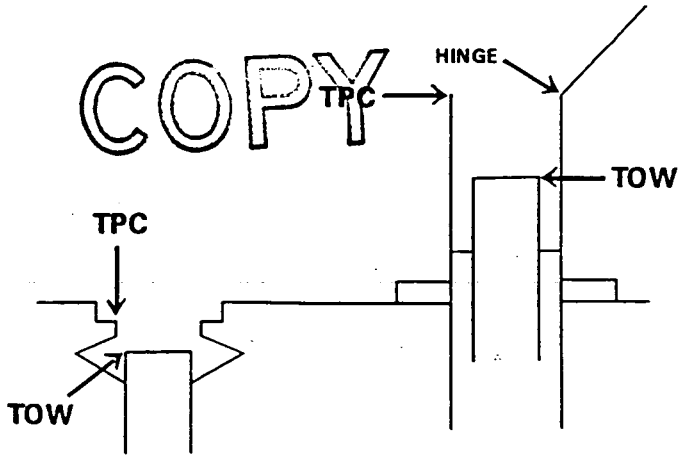
WATER LEVEL INDICATOR NO: 07431

PID INSTRUMENT NUMBER: 930096

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU 2 ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 745
DATE: 11/2/94		MONTLY PAGE: 1 OF 2
RECORDER: J. DEMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE: TLOS 11.2.94	VERIFYING TECHNICIAN'S INITIALS AND DATE: XMF 11-3-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1866	☐ TOW ☒ TPC 6.85	0927	11	11	14	BG: N/A WELL: N/A	
1160	☐ TOW ☒ TPC 10.59	0935	7	7	12	BG: N/A WELL: N/A	
1887	☒ TOW ☐ TPC 6.78	0955	2	2	3	BG: N/A WELL: N/A	
1152	☐ TOW ☒ TPC 8.79	1000	1	1	2	BG: N/A WELL: N/A	
1064	☒ TOW ☐ TPC 16.30	1005	1	1	2	BG: N/A WELL: N/A	HIGH GRASS FLOATING CEMENT PAD
1124	☒ TOW ☐ TPC 25.56	1015	1	1	4	BG: N/A WELL: N/A	
1843	☐ TOW ☒ TPC 11.34	1030	0	0	0	BG: N/A WELL: N/A	
11067	☒ TOW ☐ TPC 6.62	1040	0	0	0	BG: N/A WELL: N/A	
1444	☐ TOW ☒ TPC 8.50	1043	0	0	7	BG: N/A WELL: N/A	
1905	☐ TOW ☒ TPC 31.32	1052	0	0	0	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

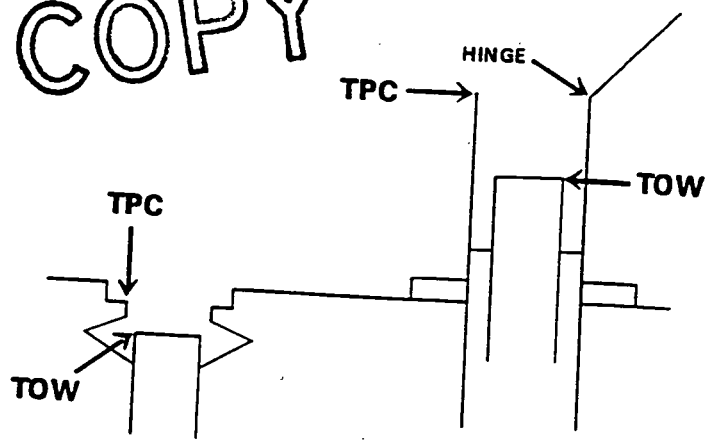
WATER LEVEL INDICATOR NO: 12911

PID INSTRUMENT NUMBER: 930096

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU 2 ELEV.	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 746
DATE: 11/2/94		MONTLY PAGE: 2 OF 2
RECORDER: J. DEMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE: TWS 11.2.94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMF 11-3-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1733	☒ TOW ☐ TPC 18.96	1105	0	0	0	BG: N/A WELL: N/A	
1111	☐ TOW ☒ TPC 8.25	1305	0	0	0	BG: N/A WELL: N/A	
1167	☐ TOW ☒ TPC 7.97	1321	0	0	0	BG: N/A WELL: N/A	
1131	☐ TOW ☒ TPC 6.75	1325	0	0	0	BG: N/A WELL: N/A	
1293	☐ TOW ☒ TPC 3.92	1331	0	0	0	BG: N/A WELL: N/A	
1274	☐ TOW ☒ TPC 9.05	1343	0	0	0	BG: N/A WELL: N/A	
1301	☐ TOW ☒ TPC 11.22	1410	0	0	0	BG: N/A WELL: N/A	ORANGE PLASTIC FENCING AROUND
JED	☐ TOW ☐ TPC 11/2/94					BG: WELL:	AREA MW IS IN BUT ACCESS THROUGH
JED	☐ TOW ☐ TPC 11/2/94					BG: WELL:	WIRE TIES
	☐ TOW ☐ TPC LAST	ENTRY		JED		BG: 11/2/94 WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

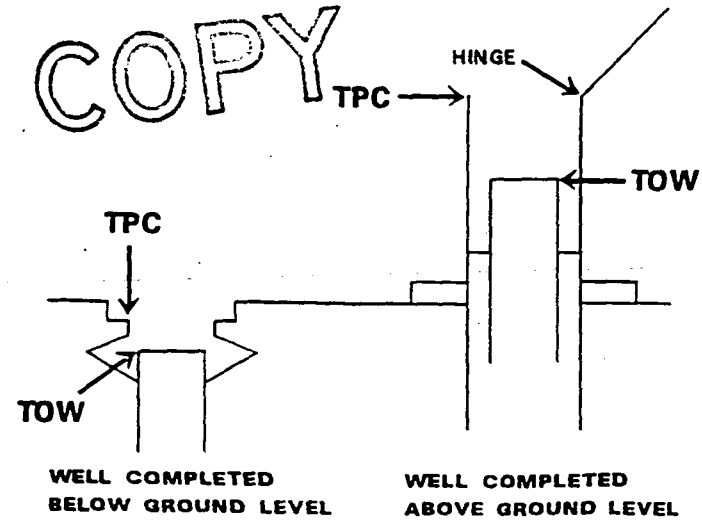
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12911

PID INSTRUMENT NUMBER: 950096

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)



311

PROJECT: CRU 2	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: ~~741~~ 741
DATE: 10/26/94		MONTLY PAGE: 1 OF 3
RECORDER: J. DEMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE: GEM 10-26-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMF 10-26-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	By (CPM)	COMMENTS
1733	☒ TOW ☐ TPC 18.98	0825	0	0	0	BG: N/A WELL: N/A	
1866	☐ TOW ☒ TPC 6.80	0840	0	0	0	BG: N/A WELL: N/A	
1887	☒ TOW ☐ TPC 6.76	0907	0	0	0	BG: N/A WELL: N/A	
1064	☒ TOW ☐ TPC 16.22	0915	0	0	0	BG: N/A WELL: N/A	LOCK DIFFICULT TO OPEN
1152	☐ TOW ☒ TPC 8.59	0920	0	0	0	BG: N/A WELL: N/A	
1124	☒ TOW ☐ TPC 26.01	0935	0	0	0	BG: N/A WELL: N/A	
1160	☐ TOW ☒ TPC 10.47	0943	0	0	0	BG: N/A WELL: N/A	
1843	☐ TOW ☒ TPC 11.30	0950	0	0	0	BG: N/A WELL: N/A	
11067	☒ TOW ☐ TPC 6.35	0954	0	0	0	BG: N/A WELL: N/A	
1444	☐ TOW ☒ TPC 8.51	1000	0	0	0	BG: N/A WELL: N/A	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

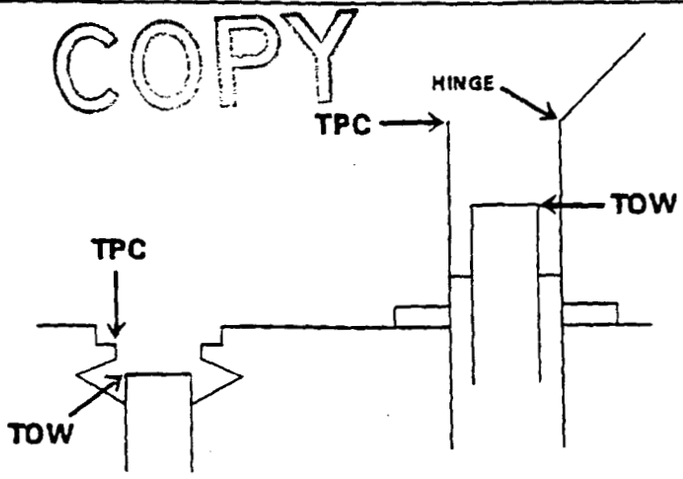
WATER LEVEL INDICATOR NO: 10921

PID INSTRUMENT NUMBER: 930086

By PRISKER NUMBER: N/A

FS-F-3487 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000201

GROUNDWATER ELEVATIONS DATA SHEET

PROJECT: CRU2
DATE: 10/26/94
RECORDER: J. DeMOTH
REVIEWING TECHNICIAN'S INITIALS AND DATE: JEM 10-26-94
PROJECT PAGE: 742
MONTLY PAGE: 2 OF 3
VERIFYING TECHNICIAN'S INITIALS AND DATE: DMF 10-26-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1905	☐ TOW ☒ TPC 31.31	1010	0	0	0	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

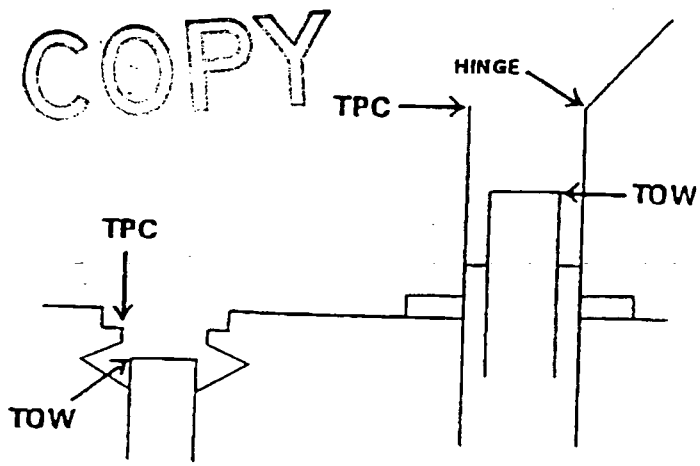
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 10921
PID INSTRUMENT NUMBER: 930086
BY PRICKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

311

PROJECT: DFPDI	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 743
DATE: 10-26-94		MONTLY PAGE: 3 OF 3
RECORDER: JAN	REVIEWING TECHNICIAN'S INITIALS AND DATE: TS 10-26-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMF 10-26-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1167	☐ TOW ☒ TPC 7.88	0845	2	2	5	BG: N/A WELL: N/A	
1131	☐ TOW ☒ TPC 6.72	0852	2	2	4	BG: N/A WELL: N/A	
1111	☐ TOW ☒ TPC 8.52	0855	2	2	4	BG: N/A WELL: N/A	
1293	☐ TOW ☒ TPC 4.73	0902	2	2	4	BG: N/A WELL: N/A	
1301	☐ TOW ☒ TPC 11.10	0935	2	2	2	BG: N/A WELL: N/A	JN 10-26-94 100 cpms Rad tech Frisker
1274	☐ TOW ☒ TPC 8.96	0945	2	2	2	BG: 150 WELL: 150	> 150 cpms Rad. Tech Frisker
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC		N/A			BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

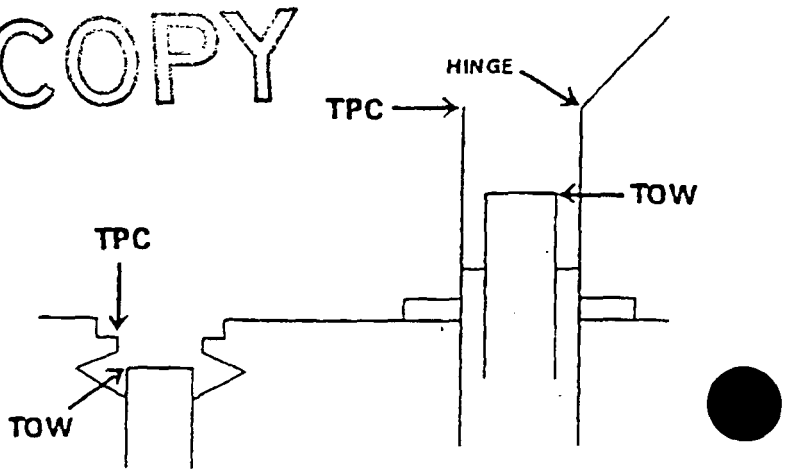
WATER LEVEL INDICATOR NO: 12904

PID INSTRUMENT NUMBER: 930092

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000203

PROJECT: CRU 2	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 640
DATE: 10/19/94		MONTLY PAGE: 1 OF 3
RECORDER: J. DeMUTH	REVIEWING TECHNICIAN'S INITIALS AND DATE: DMF 10-19-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JCW 10-19-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1887	☒ TOW ☐ TPC 6.65	0921	4	4	4	BG: N/A WELL: N/A	
1152	☐ TOW ☒ TPC 8.41	0949	4	4	4	BG: N/A WELL: N/A	
1160	☐ TOW ☒ TPC 10.28	0953	3	3	3	BG: N/A WELL: N/A	
1866	☐ TOW ☒ TPC 6.71	1009	4	4	4	BG: N/A WELL: N/A	
1444	☐ TOW ☒ TPC 8.27	1015	4	4	4	BG: N/A WELL: N/A	
1843	☐ TOW ☒ TPC 10.95	1023	4	4	5	BG: N/A WELL: N/A	
11067	☒ TOW ☐ TPC 5.87	1027	4	4	4	BG: N/A WELL: N/A	
1124	☒ TOW ☐ TPC 25.43	1043	3	3	3	BG: N/A WELL: N/A	
1064	☒ TOW ☐ TPC 15.83	1047	3	3	3	BG: N/A WELL: N/A	
1905	☐ TOW ☒ TPC 31.27	1052	4	4	4	BG: N/A WELL: N/A	WELL CAP STICKS - DIFFICULT TO REMOVE

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

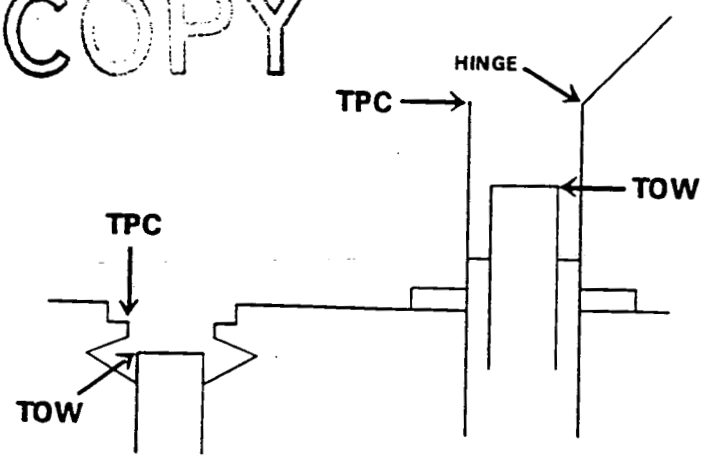
WATER LEVEL INDICATOR NO: 12911

PID INSTRUMENT NUMBER: 930072

βγ FRISKER NUMBER: N/A

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: CRU 2	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 691
DATE: 10/19/94		MONTLY PAGE: 2 OF 3
RECORDER: J. DeMuth	REVIEWING TECHNICIAN'S INITIALS AND DATE: DMF 10-19-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: JCW 10-19-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1733	☒ TOW ☐ TPC 18.93	1105	3	3	3	BG: N/A WELL: N/A	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

LAST READING TAKEN 10/19/94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

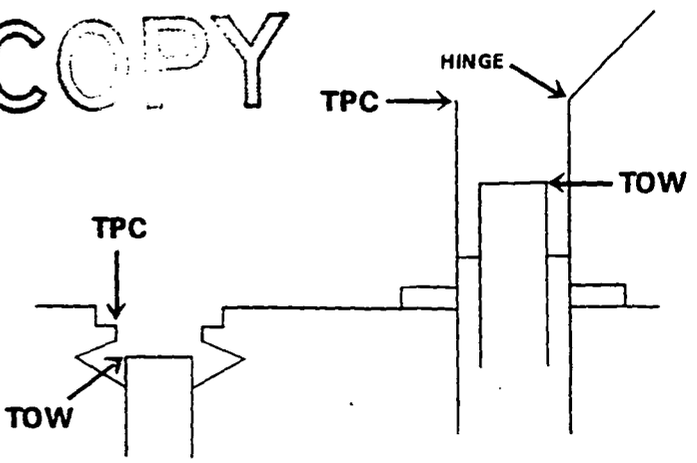
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12.911
PID INSTRUMENT NUMBER:	93CC72
βγ FRISKER NUMBER:	N/A

FS-F-3487 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: GW Elevations	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 692
DATE: 10-19-94		MONTLY PAGE: 3 OF 3
RECORDER: J Reynolds	REVIEWING TECHNICIAN'S INITIALS AND DATE: DMF 10-19-94	VERIFYING TECHNICIAN'S INITIALS AND DATE: SJZ 10/18/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1167	☐ TOW ☒ TPC 7.86	908	1	1	1	BG: NA WELL: NA	
1274	☐ TOW ☒ TPC 8.55	946	0	0	0	BG: NA WELL: NA	
1293	☐ TOW ☒ TPC 3.98	1008	0	0	0	BG: NA WELL: NA	
1111	☐ TOW ☒ TPC 8.27	1014	0	0	0	BG: NA WELL: NA	
~~1113~~ 1131	☐ TOW ☒ TPC 6.70	1020	0	0	0	BG: NA WELL: NA	
1301	☐ TOW ☒ TPC 10.92	1030	0	0	1	BG: 100 WELL: 100	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

1131

Unlocked 10-19-94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

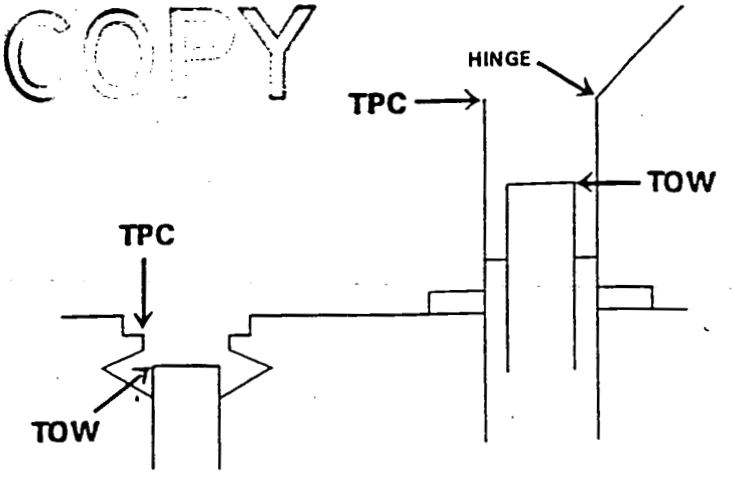
WATER LEVEL INDICATOR NO: Solinst 1516

PID INSTRUMENT NUMBER: Microtip PA93 0234

BY FRISKER NUMBER: Lindum 97154

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

PROJECT: DFPDI	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 685
DATE: 10-12-94		MONTLY PAGE: 1 OF 3
RECORDER: DMF	REVIEWING TECHNICIAN'S INITIALS AND DATE: 8/7 10/12/94	VERIFYING TECHNICIAN'S INITIALS AND D JED 10/13/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
✓ 1149	☒ TOW ☐ TPC 6.80	0840	6	6	6	BG: 800 WELL: 800	No notch on well Well has pump installed in it Perched water well
✓ 1301	☐ TOW ☒ TPC 10.73	0920	10	10	16	BG: 275 WELL: 275	
✓ 1274	☐ TOW ☒ TPC 8.58	0950	5	5	7	BG: 120 WELL: 120	
✓ 1293	☐ TOW ☒ TPC 4.12	1005	0	0	0	BG: 100 WELL: 100	
✓ 1131 ~~1301~~ DF 10-12-94	☐ TOW ☒ TPC 6.63	1009	0	0	0	BG: 75 WELL: 75	
✓ 1167	☐ TOW ☒ TPC 7.86	1013	0	0	0	BG: 50 WELL: 50	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	DMF 10-12-94
	☐ TOW ☐ TPC					BG: WELL:	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

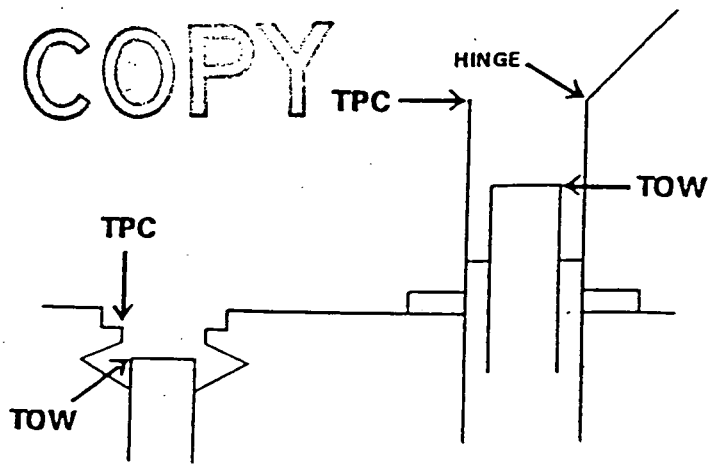
FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	12906
PID INSTRUMENT NUMBER:	PA930096
βγ FRISKER NUMBER:	86064

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000207

PROJECT: CRU2 GW ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 686
DATE: 10-12-94		MONTLY PAGE: 2 OF 3
RECORDER: URETNOLDS	REVIEWING TECHNICIAN'S INITIALS AND DATE: JED 10/12/94	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1866	☐ TOW ☒ TPC 6.67	0835	0	0	0	BG: NA WELL: NA	
1160	☐ TOW ☒ TPC 10.18	0845	0	0	0	BG: NA WELL: NA	
1152	☐ TOW ☒ TPC 8.27	0850	0	0	0	BG: NA WELL: NA	
1064	☒ TOW ☐ TPC 15.65	0855	0	0	0	BG: NA WELL: NA	FLOATING PAD TOW 589.92 574.27
1887	☒ TOW ☐ TPC 6.58	0900	0	0	0	BG: NA WELL: NA	FLOATING PAD
1843	☐ TOW ☒ TPC 11.01	0907	0	0	0	BG: NA WELL: NA	
11067	☒ TOW ☐ TPC 5.81	0912	0	0	0	BG: NA WELL: NA	
1124	☒ TOW ☐ TPC 24.89	0955	0	0	0	BG: NA WELL: NA	
1444	☐ TOW ☒ TPC 8.18	1020	0	0	0	BG: NA WELL: NA	
1733	☒ TOW ☐ TPC 18.95	1116	0	0	0	BG: NA WELL: NA	

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

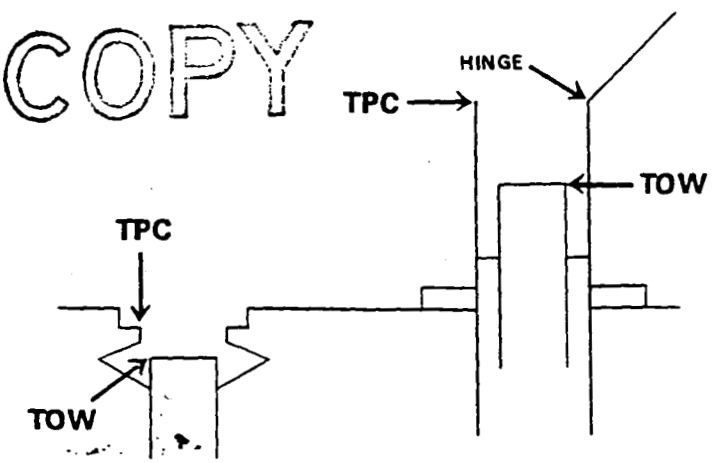
WATER LEVEL INDICATOR NO: SOLINST 12910

PID INSTRUMENT NUMBER: Photovac PA930084

By FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)

COPY



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

3

PROJECT: CRU 2 GW ELEVATIONS	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 687
DATE: 10-12-94		MONTLY PAGE: 3 OF 3
RECORDER: U REYNOLDS	REVIEWING TECHNICIAN'S INITIALS AND DATE: JED 10/12/94	VERIFYING TECHNICIAN'S INITIALS AND DATE:

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
✓ 1905	☐ TOW ☒ TPC 31.23	1025	0	0	0	BG: NA WELL: NA	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

EAS REVIEWED 10/12/94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

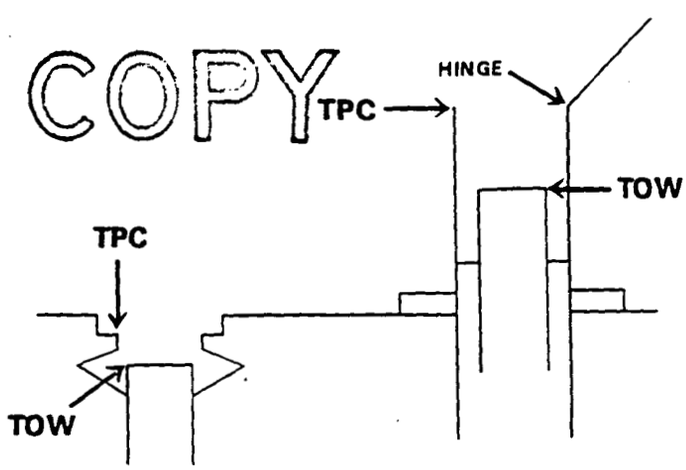
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: SOLINST 12910

PID INSTRUMENT NUMBER: MEASTIP PA930034

βγ FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

000209

PROJECT: Disposal Facility - Pre Design Investigation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 680
DATE: 10-4-94		MONTLY PAGE: 1 OF 1
RECORDER: D. Foster	REVIEWING TECHNICIAN'S INITIALS AND DATE: SJL 10/7/94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMR 10/7/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS	
1230	☒ TOW ☐ TPC 7.21	1440	0	0	0	BG: 125 WELL: 125	TOW 590.91	MSL 582.7
1418	☐ TOW ☒ TPC 6.50	1510	0	0	0	BG: 75 WELL: 75	TPC 582.11	575.61
1110	☐ TOW ☒ TPC 8.28	1543	0	0	0	BG: 75 WELL: 75	TPC 582.51	574.23
1112	☐ TOW ☒ TPC 10.46	1608	0	0	0	BG: 75 WELL: 75	TPC 581.25	570.79
1151	☐ TOW ☒ TPC 6.41	1627	0	0	0	BG: 50 WELL: 50	TPC 581.96	575.55
1278	☐ TOW ☒ TPC 8.46	1643	0	0	0	BG: 50 WELL: 50	TPC 590.85	582.39
	☐ TOW ☐ TPC					BG: WELL:		
	☐ TOW ☐ TPC					BG: WELL:		
	☐ TOW ☐ TPC					BG: WELL:	DMR 10-4-94	
	☐ TOW ☐ TPC					BG: WELL:		

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

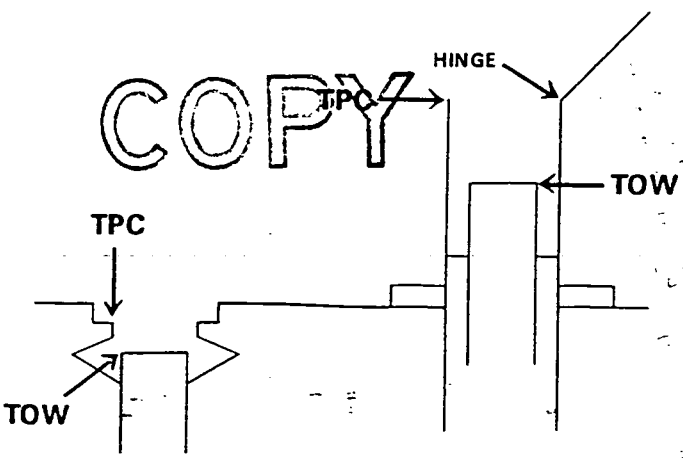
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12906

PID INSTRUMENT NUMBER: 11930096

βγ FRISKER NUMBER: 86064

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

DFPDI

PROJECT: Disposal Facility/Pre-Design Investigation	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 681
DATE: 10-5-94		MONTLY PAGE: 1 OF 2
RECORDER: DMF	REVIEWING TECHNICIAN'S INITIALS AND DATE: SJZ 10/7/94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMR 10/7/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1149	☒ TOW ☐ TPC 6.82	1050	0	0	0	BG: 500 WELL: 100	No notch to indicate Measuring Point TPC 581.39 TOW 581.24 574.42
1301	☐ TOW ☒ TPC 10.41	1120	0	0	0	BG: 150 WELL: 150	TOW 587.33 TPC 587.43 577.02
1274	☐ TOW ☒ TPC 8.36	1200	0	0	0	BG: 50 WELL: 50	TOW 592.94 TPC 593.02 584.66
1131	☐ TOW ☒ TPC 6.58	1219	0	0	0	BG: 100 WELL: 100	TOW 581.25 TPC 581.51 574.93
1167	☐ TOW ☒ TPC 7.74	1234	0	0	0	BG: 50 WELL: 50	TOW 581.06 TPC 581.26 573.52
1293	☐ TOW ☒ TPC 4.11	1241	0	0	0	BG: 50 WELL: 50	TOW 588.23 TPC 588.71 584.60
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

DMF 10-5-94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

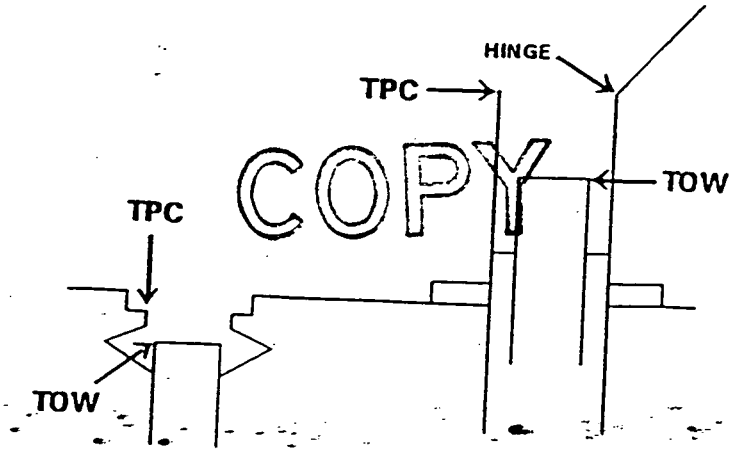
PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO:	1296
PID INSTRUMENT NUMBER:	PA43008U
βγ FRISKER NUMBER:	97187

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

COPY

PROJECT: DFPDI	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE:
DATE: 10-5-94		MONTLY PAGE: 2 OF 2
RECORDER: DMF	REVIEWING TECHNICIAN'S INITIALS AND DATE: SJZ 10/7/94	VERIFYING TECHNICIAN'S INITIALS AND DATE: UMR 10/7/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1444	☐ TOW ☒ TPC 7.65	1448	0	0	0	BG: 75 WELL: 75	TOW 601.74 TPC 602.15 594.5
1067	☒ TOW ☐ TPC 5.47	1459	0	0	0	BG: NA WELL: NA	TOW 592.19 TPC 592.78 556.72
1843	☐ TOW ☒ TPC 10.79	1504	0	0	0	BG: NA WELL: NA	TOW 593.01 TPC 593.46 582.67
1152	☐ TOW ☒ TPC 8.06	1528	0	0	0	BG: NA WELL: NA	TOW 579.55 TPC 579.69 571.63
1064	☒ TOW ☐ TPC 15.46	1532	0	0	0	BG: NA WELL: NA	TOW 589.92 TPC 590.49 574.46
1837	[illegible]	1537	0	0	0	BG: NA WELL: NA	
1121	24.37	[illegible]	0	0	0	BG: NA WELL: NA	TOW 612.78 TPC 613.90 594.42
1905	31.19	1556	0	0	0	BG: NA WELL: NA	TOW 577.52 TPC 577.56 546.37
1866	☐ TOW ☒ TPC 6.58	1620	0	0	0	BG: NA WELL: NA	Well had a dedicated bailer on the bottom. The water level wasn't over the bailer. We removed the bailer and disposed of the water. Took an elevation from well, but will take another reading tomorrow
1733	18.87	1654	0	0	0	BG: NA WELL: NA	TOW 607.15 TPC 607.45 588.28

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING (TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

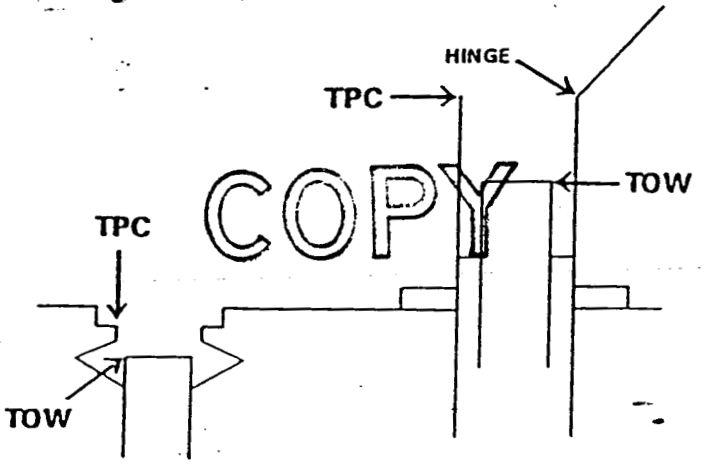
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12911

PID INSTRUMENT NUMBER: PA-93008

BY FRISKER NUMBER: 97187

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

COPY

PROJECT: DF PDI	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 683
DATE: 10-6-94		MONTLY PAGE: 1 OF 1
RECORDER: D. Foster	REVIEWING TECHNICIAN'S INITIALS AND DATE: 10/7/94	VERIFYING TECHNICIAN'S INITIALS AND DATE: UNR 10/7/94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	BY (CPM)	COMMENTS
1866	☐ TOW ☒ TPC 6.58	0756	2	2	2	BG: NA WELL: NA	TOW TPC 578.63 579.15 572.57
1160	☐ TOW ☒ TPC 10.07	0801	2	2	2	BG: NA WELL: NA	Well has a dedicated bailer on the bottom. The water level wasn't over the bailer. We removed the bailer and disposed of the water. Took an elevation from the well, but will take another reading tomorrow
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

10-6-94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

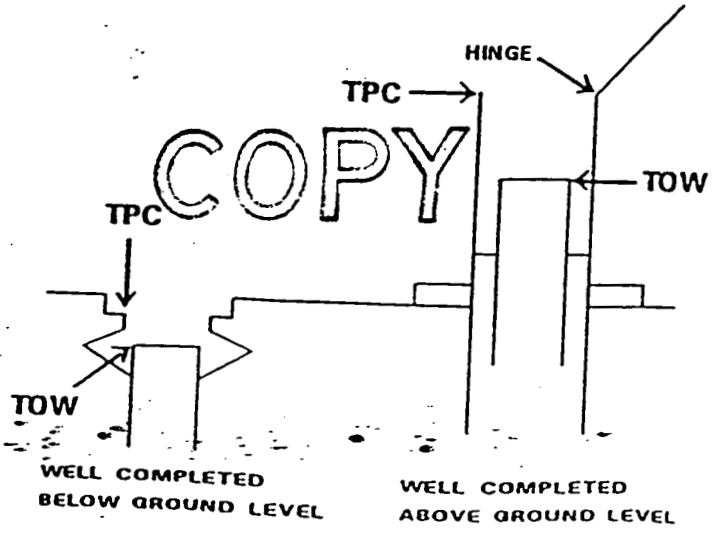
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: 12911

PID INSTRUMENT NUMBER: PAG 0084

BY FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



COPY

000213

PROJECT: GW ELEVATIONS-LRW	GROUNDWATER ELEVATIONS DATA SHEET	PROJECT PAGE: 684
DATE: 10/07/94		MONTLY PAGE: 1 OF 1
RECORDER: VAR	REVIEWING TECHNICIAN'S INITIALS AND DATE: SJL 10/7/94	VERIFYING TECHNICIAN'S INITIALS AND DATE: DMF 10-7-94

WELL NUMBER	DEPTH TO WATER (FEET)	TIME	PID READING (PPM) BG	BZ	DH	βγ (CPM)	COMMENTS
1160	☐ TOW ☒ TPC 10.04	09:10	0	0	0	BG: NA WELL: NA	TOW 583.91 TPC 584.12 574.08
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	
	☐ TOW ☐ TPC					BG: WELL:	

NA TO OXYLAS VAR 10-7-94

STANDARD GROUNDWATER ELEVATION REFERENCE POINTS

MONITORING WELL:
MEASURE TO NOTCH LOCATED ON THE TOP OF WELL CASING(TOW). NO NOTCH, MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

PIEZOMETER:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF WELL CASING.

FLUSH MOUNT WELL:
MEASURE AT TOP OF WELL CASING (TOW) WEST SIDE

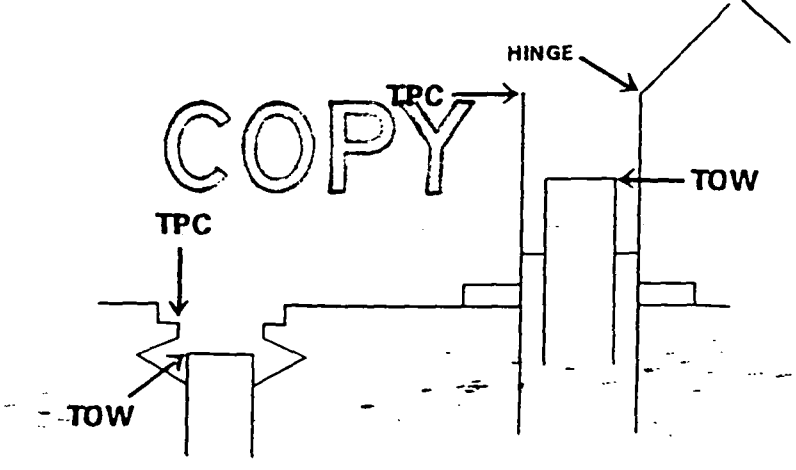
MONITORING WELL WITH QED EQUIPMENT:
MEASURE AT TOP OF PROTECTIVE CASING (TPC) WITH LEVELER DIRECTLY VERTICAL OF THE WATER LEVEL ACCESS HOLE.

WATER LEVEL INDICATOR NO: SOL. WST 12910

PID INSTRUMENT NUMBER: Mini RAE PA 930023

βγ FRISKER NUMBER: NA

FS-F-3467 (REV. 12/08/93)



WELL COMPLETED BELOW GROUND LEVEL

WELL COMPLETED ABOVE GROUND LEVEL

COPY

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	03/12/95	69	25	0.00	0.0	
Monday	03/13/95	73	27	0.00	0.0	
Tuesday	03/14/95	75	29	0.00	0.0	am Fog
Wednesday	03/15/95	72	33	0.00	0.0	am Fog
Thursday	03/16/95	73	32	0.00	0.0	am Fog
Friday	03/17/95	67	31	0.00	0.0	am Fog
Saturday	03/18/95	60	36	0.00	0.0	

Notes: * – Values are preliminary and snow amounts are estimates.

From: Ed Ray and James Selasky
738–8994
MS – 65–3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	03/05/95	54	37	0.29	0.0	
Monday	03/06/95	49	38	0.29	0.0	
Tuesday	03/07/95	68	32	0.99	0.0	
Wednesday	03/08/95	32	24	0.24	2.0	
Thursday	03/09/95	30	21	0.00	0.0	
Friday	03/10/95	48	19	0.00	0.0	
Saturday	03/11/95	64	23	0.00	0.0	

Notes: * – Values are preliminary and snow amounts are estimates.

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	02/26/95	65	38	0.00	0.0	
Monday	02/27/95	56	42	0.26	0.0	Fog
Tuesday	02/28/95	41	33	0.00	0.0	Fog
Wednesday	03/01/95	36	23	0.00	0.0	
Thursday	03/02/95	28	21	T	T	
Friday	03/03/95	38	21	0.00	0.0	
Saturday	03/04/95	47	17	0.00	0.0	

Notes: * – Values are preliminary and snow amounts are estimates.

000217

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	02/19/95	57	21	0.00	0.0	
Monday	02/20/95	55	24	0.00	0.0	
Tuesday	02/21/95	39	26	T	T	
Wednesday	02/22/95	57	25	0.00	0.0	
Thursday	02/23/95	56	38	0.04	0.0	
Friday	02/24/95	38	23	T	T	
Saturday	02/25/95	54	20	0.00	0.0	

Notes: * – Values are preliminary and snow amounts are estimates.

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	02/12/95	13	-8	0.00	0.0	
Monday	02/13/95	29	1	0.00	0.0	
Tuesday	02/14/95	33	15	0.00	0.0	
Wednesday	02/15/95	45	28	0.75	T	Fog
Thursday	02/16/95	37	24	0.00	0.0	
Friday	02/17/95	43	18	0.00	0.0	am Fog
Saturday	02/18/95	54	18	0.00	0.0	am Fog

Notes: * - Values are preliminary and snow amounts are estimates.

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	02/05/95	19	-1	T	T	
Monday	02/06/95	19	-9	0.00	0.0	
Tuesday	02/07/95	21	-11	0.03	0.5	Fog
Wednesday	02/08/95	17	1	0.00	0.0	
Thursday	02/09/95	35	1	0.00	0.0	
Friday	02/10/95	37	29	T	T	
Saturday	02/11/95	29	4	0.00	0.0	

Notes: * - Values are preliminary and snow amounts are estimates.

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	01/29/95	30	19	0.00	0.0	
Monday	01/30/95	29	8	0.00	0.0	
Tuesday	01/31/95	35	5	0.00	0.0	
Wednesday	02/01/95	46	31	T	T	
Thursday	02/02/95	38	32	0.00	0.0	
Friday	02/03/95	33	19	0.44	5.5	
Saturday	02/04/95	29	20	T	T	

Notes: * – Values are preliminary and snow amounts are estimates.

000221

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	01/22/95	29	22	0.05		snow amount is unavailable
Monday	01/23/95	24	18	0.11		snow amount is unavailable
Tuesday	01/24/95	26	7	0.00	0.0	
Wednesday	01/25/95	31	1	0.00	0.0	Fog
Thursday	01/26/95	33	5	0.00	0.0	Fog
Friday	01/27/95	36	11	0.00	0.0	
Saturday	01/28/95	33	21	0.57		Fog; snow amount is unavailable

Notes: * - Values are preliminary and snow amounts are estimates.

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	01/15/95	49	36	0.12	0.0	
Monday	01/16/95	36	31	T	T	
Tuesday	01/17/95	47	32	0.00	0.0	
Wednesday	01/18/95	47	37	0.00	0.0	
Thursday	01/19/95	57	36	0.53	0.0	
Friday	01/20/95	35	28	0.35		snow amount is unavailable
Saturday	01/21/95	28	23	0.04		snow amount is unavailable

Notes: * - Values are preliminary and snow amounts are estimates.

000223

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (:::: F)	*Low (:::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	01/08/95	32	21	0.00	T	
Monday	01/09/95	30	22	0.00	T	
Tuesday	01/10/95	37	25	0.00	0.0	
Wednesday	01/11/95	52	33	0.14	0.0	
Thursday	01/12/95	66	53	0.00	0.0	
Friday	01/13/95	67	53	0.00	0.0	
Saturday	01/14/95	61	49	0.37	0.0	

Notes: * - Values are preliminary and snow amounts are estimates.

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	01/01/95	45	23	0.04	0.1	
Monday	01/02/95	28	16	0.00	0.1	
Tuesday	01/03/95	29	18	T	T	
Wednesday	01/04/95	17	6	0.00	0.0	
Thursday	01/05/95	23	-1	0.00	0.0	
Friday	01/06/95	31	10	0.70	1.6	Fog
Saturday	01/07/95	31	26	0.02	T	

Notes: * - Values are preliminary and snow amounts are estimates.

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	12/25/94	43	29	0.00	0.0	
Monday	12/26/94	39	27	0.00	0.0	
Tuesday	12/27/94	36	25	0.00	0.0	am Fog
Wednesday	12/28/94	52	25	0.00	0.0	am Fog
Thursday	12/29/94	40	35	0.00	0.0	
Friday	12/30/94	53	30	0.00	0.0	
Saturday	12/31/94	46	38	0.10	T	Fog

Notes: * – Values are preliminary and snow amounts are estimates.

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	12/18/94	40	34	T	T	
Monday	12/19/94	40	27	0.00	0.0	
Tuesday	12/20/94	50	23	0.00	0.0	am Fog
Wednesday	12/21/94	53	25	0.00	0.0	am Fog
Thursday	12/22/94	54	32	0.00	0.0	
Friday	12/23/94	49	31	0.00	0.0	am Fog
Saturday	12/24/94	39	36	0.00	0.0	

Notes: * - Values are preliminary and snow amounts are estimates.

To: Phil Ruwe
738-8403
MS: 51-2

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	12/11/94	31	25	T	T	
Monday	12/12/94	35	26	0.00	0.0	
Tuesday	12/13/94	40	20	0.00	0.0	am Fog
Wednesday	12/14/94	41	26	0.00	0.0	
Thursday	12/15/94	43	27	0.00	0.0	
Friday	12/16/94	49	37	0.73	0.0	
Saturday	12/17/94	49	41	0.00	0.0	

Notes: * – Values are preliminary and snow amounts are estimates.

To: Phil Ruwe
738-8403
MS: 51-2

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	12/04/94	57	48	0.34	0.0	Fog
Monday	12/05/94	59	54	0.12	0.0	Fog
Tuesday	12/06/94	56	52	0.00	0.0	Fog
Wednesday	12/07/94	56	36	0.09	0.0	
Thursday	12/08/94	42	34	0.00	0.0	
Friday	12/09/94	46	37	0.92	0.0	Fog
Saturday	12/10/94	37	31	0.69	0.25	

Notes: * – Values are preliminary and snow amounts are estimates.

To: Phil Ruwe
738-8403
MS: 51-2

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	11/27/94	62	44	0.94	0.0	Thunderstorms
Monday	11/28/94	62	42	0.28	0.0	
Tuesday	11/29/94	50	29	0.00	0.0	
Wednesday	11/30/94	38	24	0.00	0.0	
Thursday	12/01/94	49	19	0.00	0.0	am Fog/Heavy Frost
Friday	12/02/94	57	32	0.00	0.0	
Saturday	12/03/94	58	33	0.00	0.0	

Notes: * – Values are preliminary and snow amounts are estimates.

To: Phil Ruwe
738-8403
MS: 51-2

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	11/13/94	69	38	0.00	0.0	
Monday	11/14/94	68	57	0.00	0.0	
Tuesday	11/15/94	59	47	0.09	0.0	
Wednesday	11/16/94	51	42	0.71	0.0	Fog
Thursday	11/17/94	54	44	T	0.0	
Friday	11/18/94	62	37	0.00	0.0	
Saturday	11/19/94	56	29	0.00	0.0	

Notes: * - Values are preliminary and snow amounts are estimates.

11/20/94 -

11/21/94 - 0.30

22 -

23 -

24 -

25 -

26 -

27 - 0.44

28 - 0.28

29 -

30 -

To: Phil Ruwe
738-8403
MS: 51-2

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (° F)	*Low (° F)	*Precip (in)	*Snow (in)	Remarks
Sunday	11/06/94	66	45	0.00	0.0	
Monday	11/07/94	59	32	0.00	0.0	am Fog
Tuesday	11/08/94	68	36	0.00	0.0	
Wednesday	11/09/94	65	44	0.89	0.0	
Thursday	11/10/94	54	42	0.14	0.0	
Friday	11/11/94	56	37	0.00	0.0	
Saturday	11/12/94	65	32	0.00	0.0	

Notes: * – Values are preliminary and snow amounts are estimates.

To: Phil Ruwe
738-8403
MS: 51-2

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP): Corrected Copy

	Date	*High (:::: F)	*Low (:::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	10/30/94	69	33	0.00	0.0	
Monday	10/31/94	64	44	0.30	0.0	Thunderstorms, Fog
Tuesday	11/01/94	57	38	0.09	0.0	
Wednesday	11/02/94	62	30	0.00	0.0	
Thursday	11/03/94	71	54	0.00	0.0	
Friday	11/04/94	70	58	0.01	0.0	
Saturday	11/05/94	72	56	0.38	0.0	

Notes: * – Values are preliminary and snow amounts are estimates.

000233

To: Phil Ruwe
738-8403
MS: 51-2

From: Ed Ray and James Selasky
738-8994
MS - 65-3

Weekly Weather (FEMP):

	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	10/23/94	66	42	0.00	0.0	
Monday	10/24/94	59	36	0.03	0.0	
Tuesday	10/25/94	49	30	0.00	0.0	
Wednesday	10/26/94	50	34	0.00	0.0	
Thursday	10/27/94	56	27	0.00	0.0	
Friday	10/28/94	65	28	0.00	0.0	
Saturday	10/29/94	66	35	0.00	0.0	

Notes: * – Values are preliminary and snow amounts are estimates.

Precipitation Report for October 1994

DAY	AMOUNT
10-08	0.05
10-09	0.29
10-13	0.19
10-14	0.02
10-18	0.09
10-19	0.13
10-22	0.01
10-24	0.03
10-31	0.31
	1.12

We apologize for the delay. We have upgraded our data collection system during October, and we are reformatting our final reports. When we have the final reports we will mail them to you.

Thanks,

James A. Selasky and Ed Ray

To: Phil Ruwe
738-8403
MS: 51-2

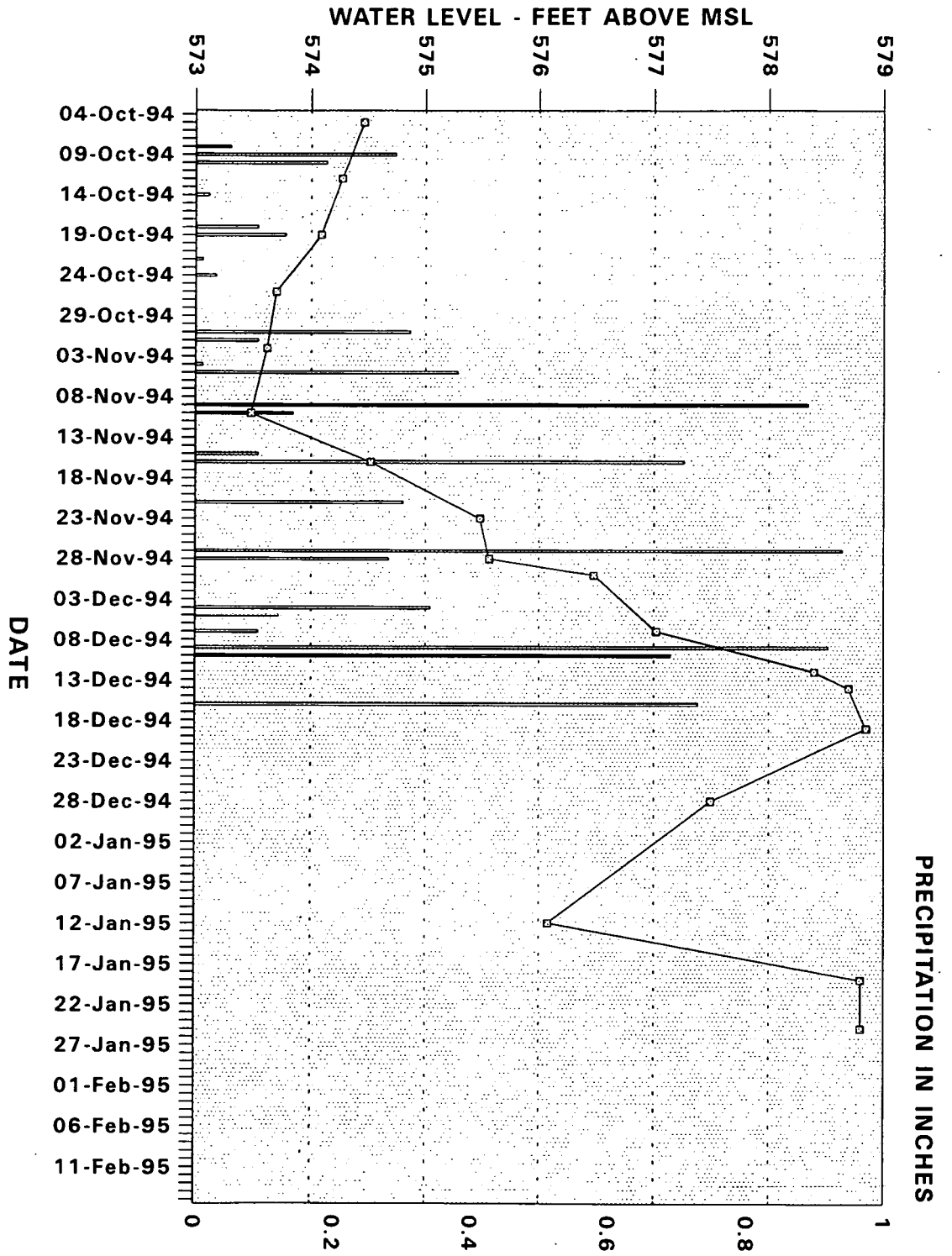
From: Ed Ray and James Selasky
738-8994
MS: 65-3

Weekly Weather (FEMP):

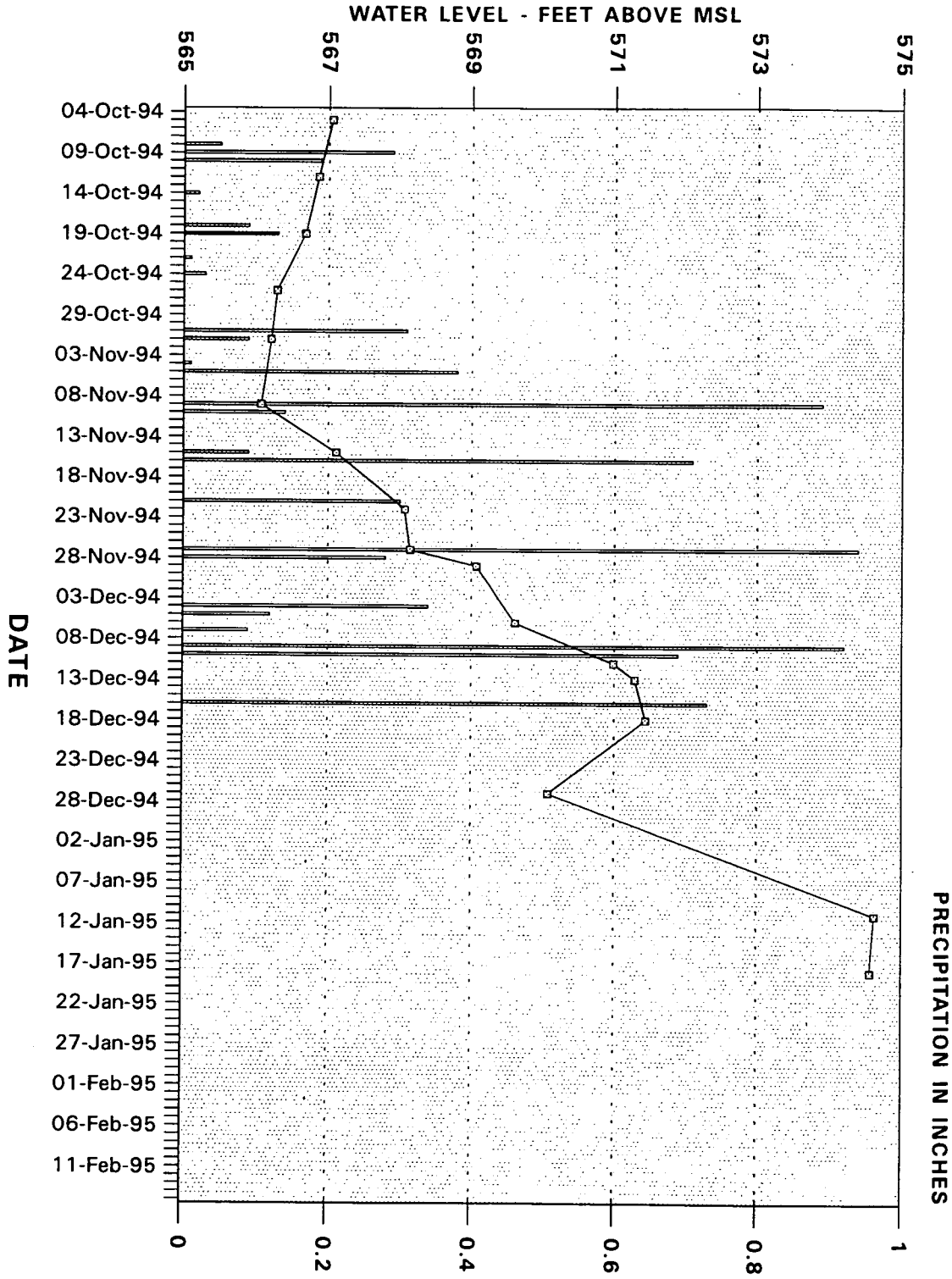
	Date	*High (::: F)	*Low (::: F)	*Precip (in)	*Snow (in)	Remarks
Sunday	10/02/94	69	58	0.00	0.0	
Monday	10/03/94	N/A	N/A	0.00	0.0	Data unavailable due to software upgrade
Tuesday	10/04/94	N/A	N/A	0.00	0.0	Data unavailable due to software upgrade
Wednesday	10/05/94	58	46	0.00	0.0	
Thursday	10/06/94	69	39	0.00	0.0	
Friday	10/07/94	80	44	0.00	0.0	
Saturday	10/08/94	78	57	~~0.00~~	0.0	.05

Notes: * – Values are preliminary and snow amounts are estimates.

Appendix C

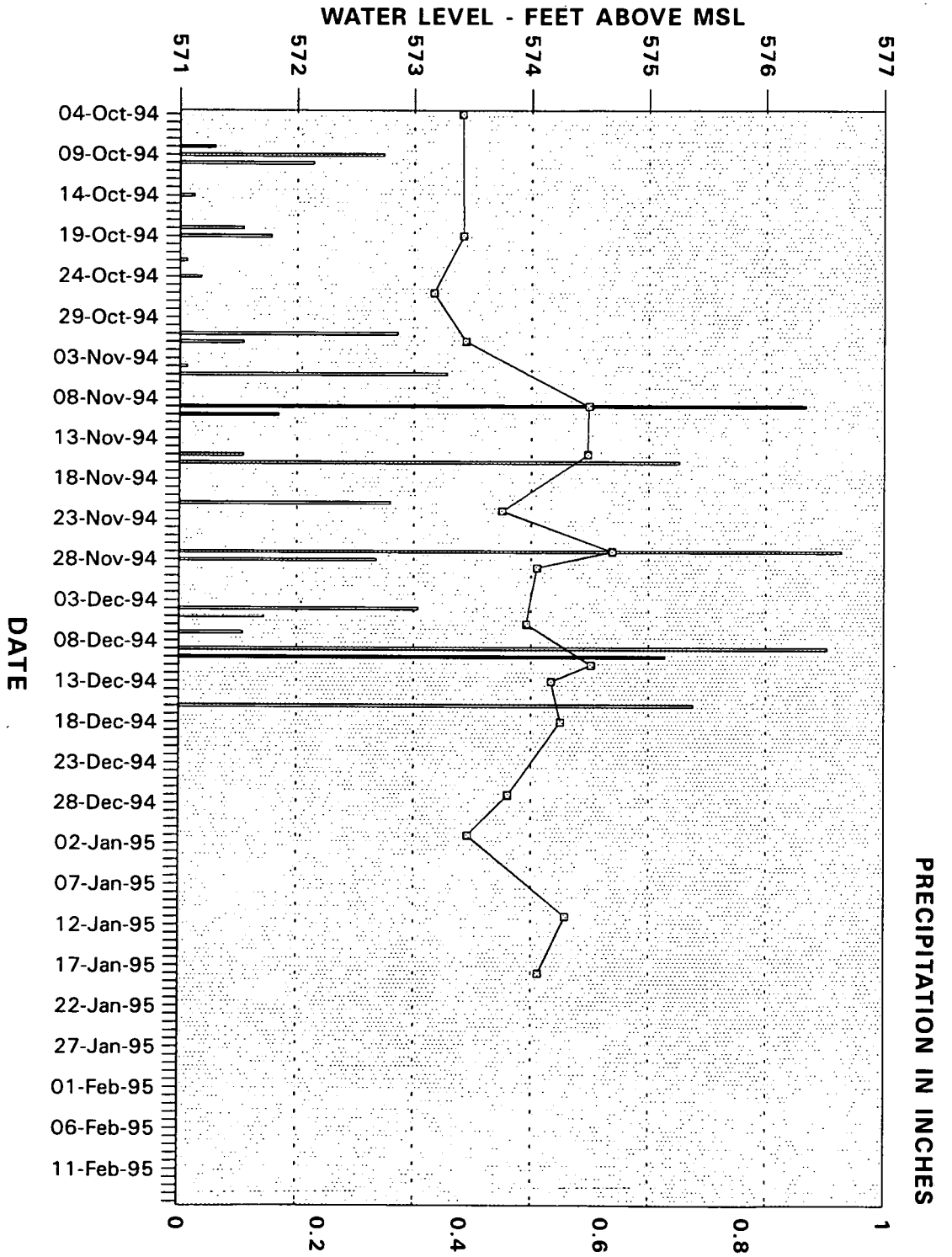

WATER LEVEL - FEET ABOVE MSL
573
574
575
576
577
578
579
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

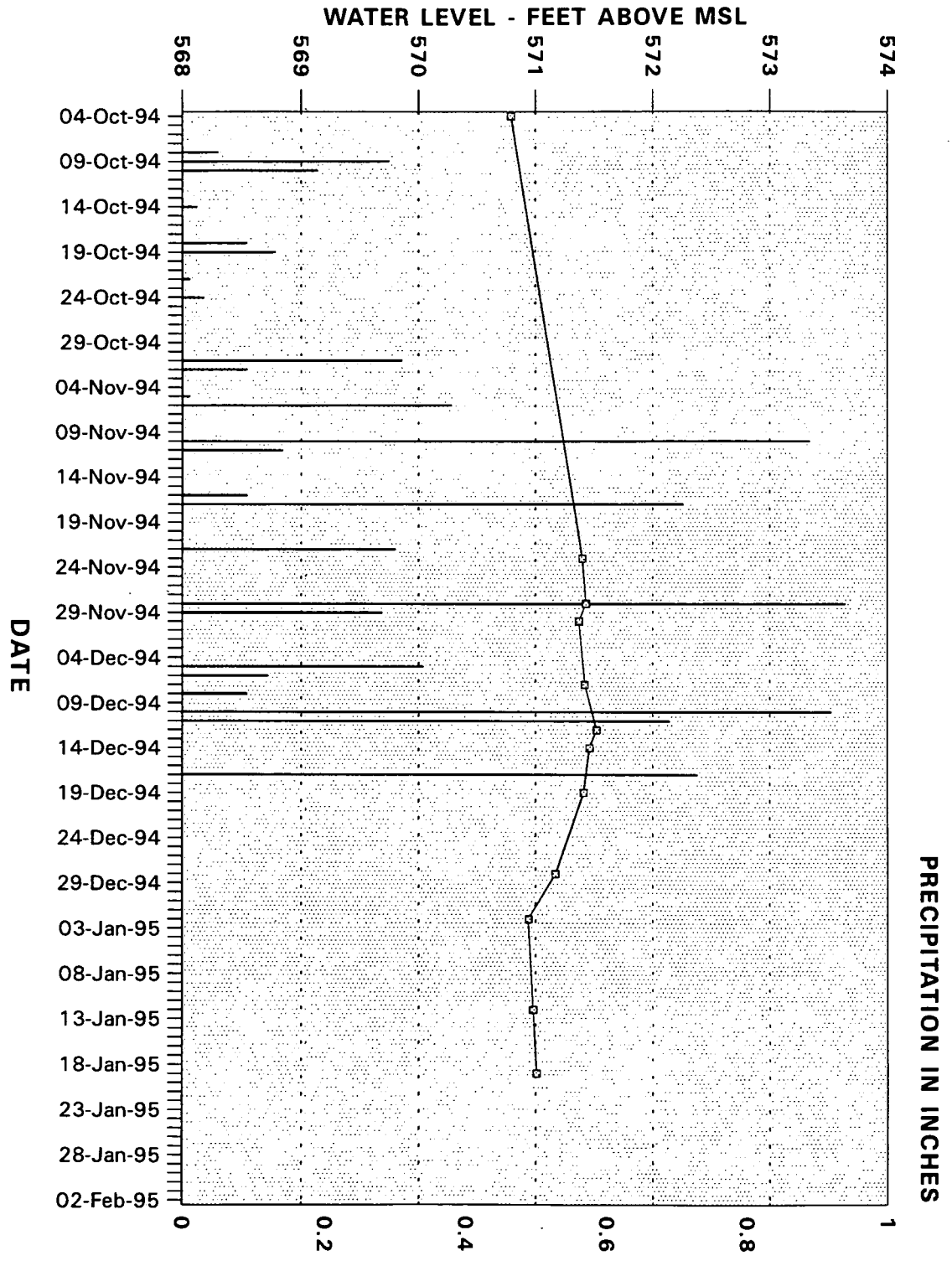
MW 1064


WATER LEVEL - FEET ABOVE MSL
575
573
571
569
567
565
PRECIPITATION IN INCHES
1
0.8
0.6
0.4
0.2
0
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

MW 1110

MW 1111

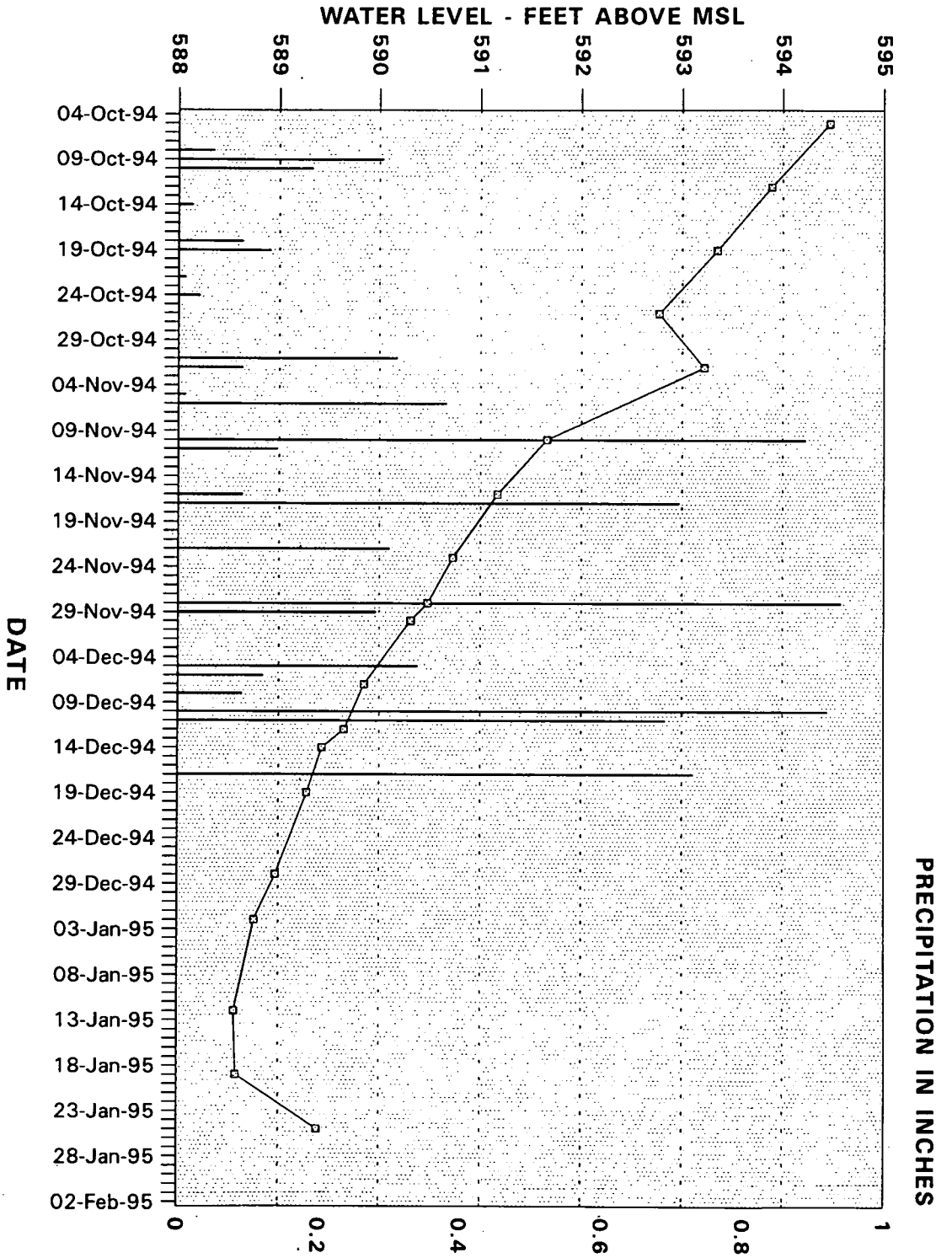

WATER LEVEL - FEET ABOVE MSL
577
576
575
574
573
572
571
PRECIPITATION IN INCHES
1
0.8
0.6
0.4
0.2
0
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

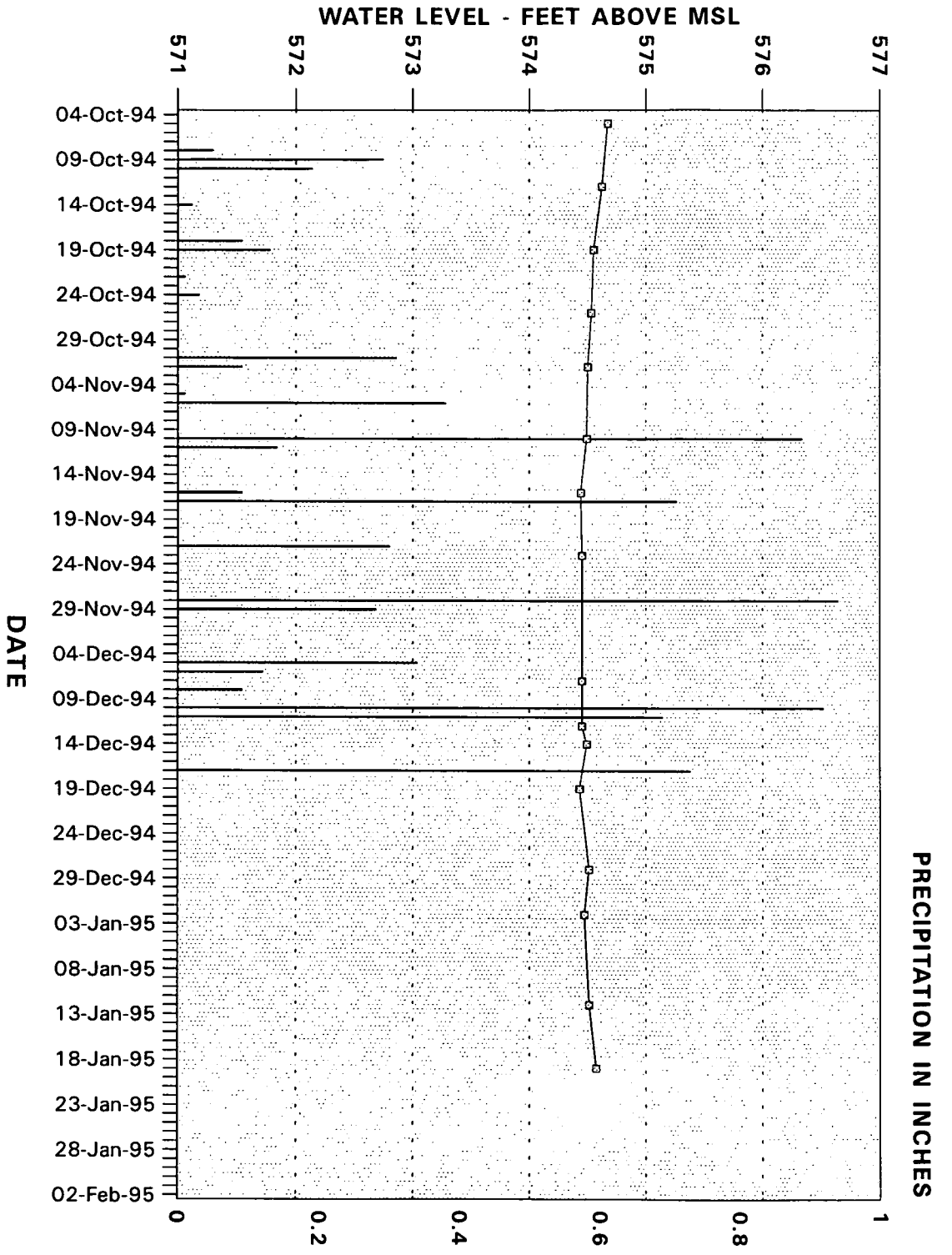


MW 1112

000240

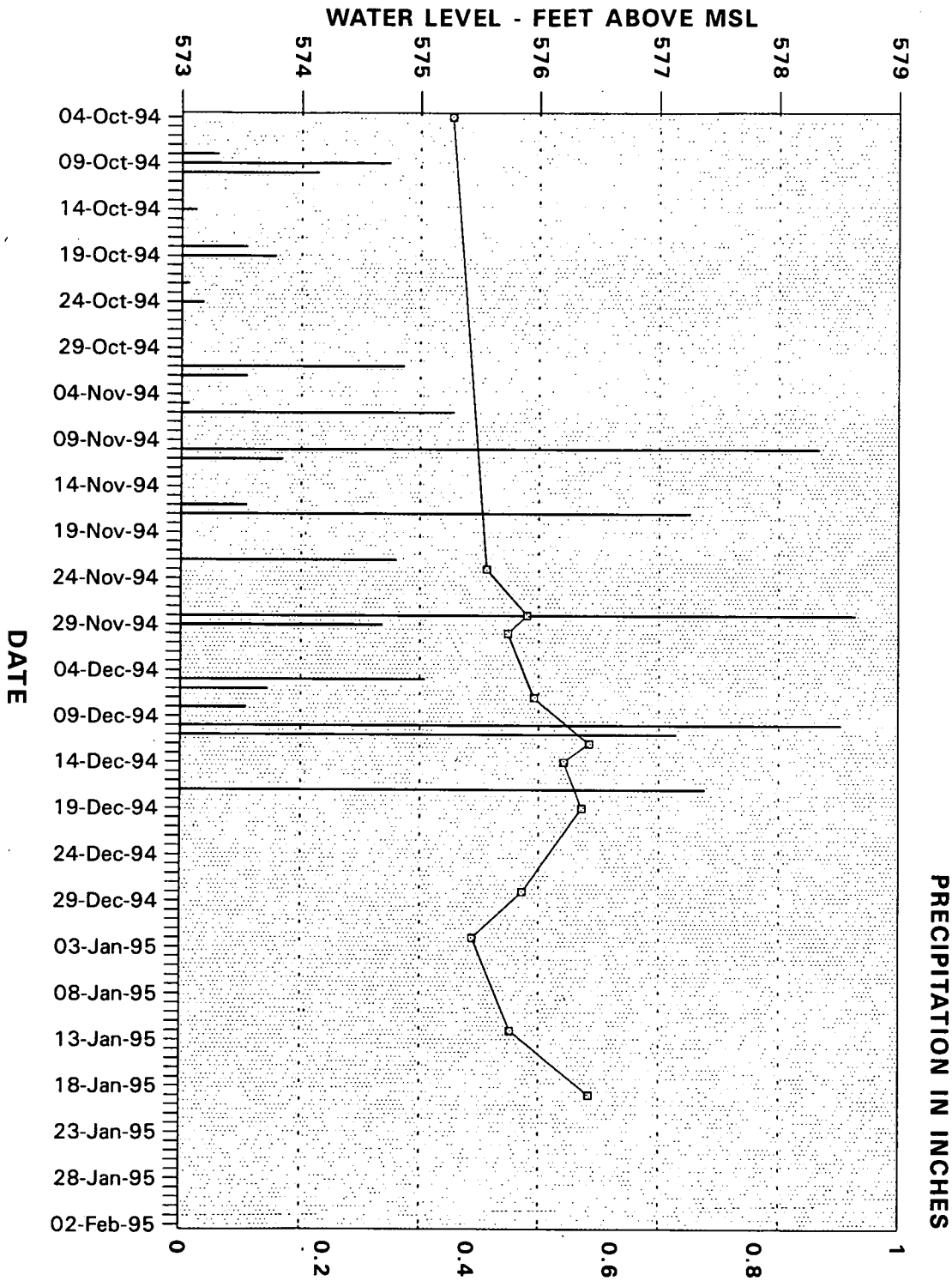
MW 1124

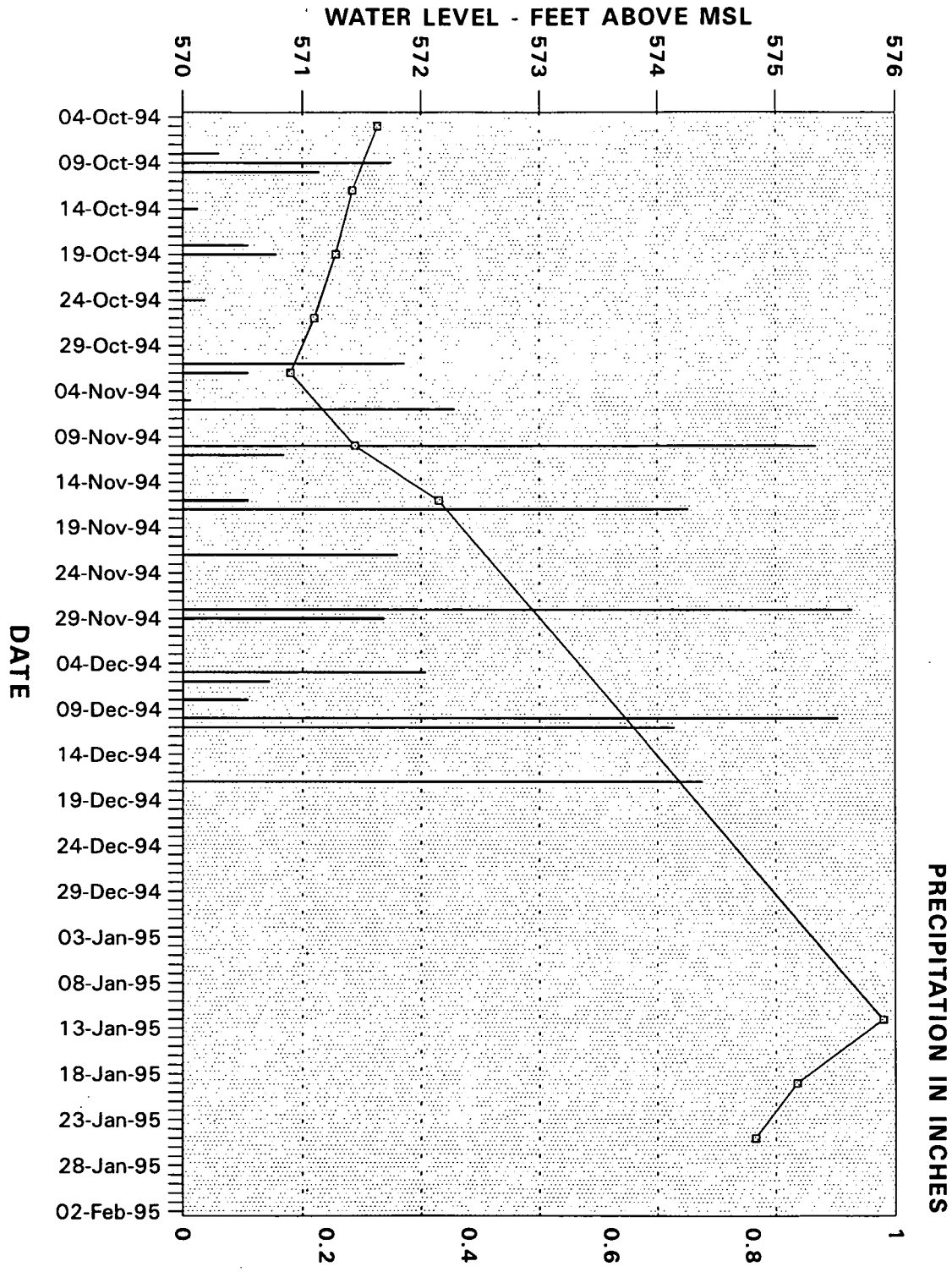

WATER LEVEL - FEET ABOVE MSL
588
589
590
591
592
593
594
595
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
04-Nov-94
09-Nov-94
14-Nov-94
19-Nov-94
24-Nov-94
29-Nov-94
04-Dec-94
09-Dec-94
14-Dec-94
19-Dec-94
24-Dec-94
29-Dec-94
03-Jan-95
08-Jan-95
13-Jan-95
18-Jan-95
23-Jan-95
28-Jan-95
02-Feb-95



MW 1131

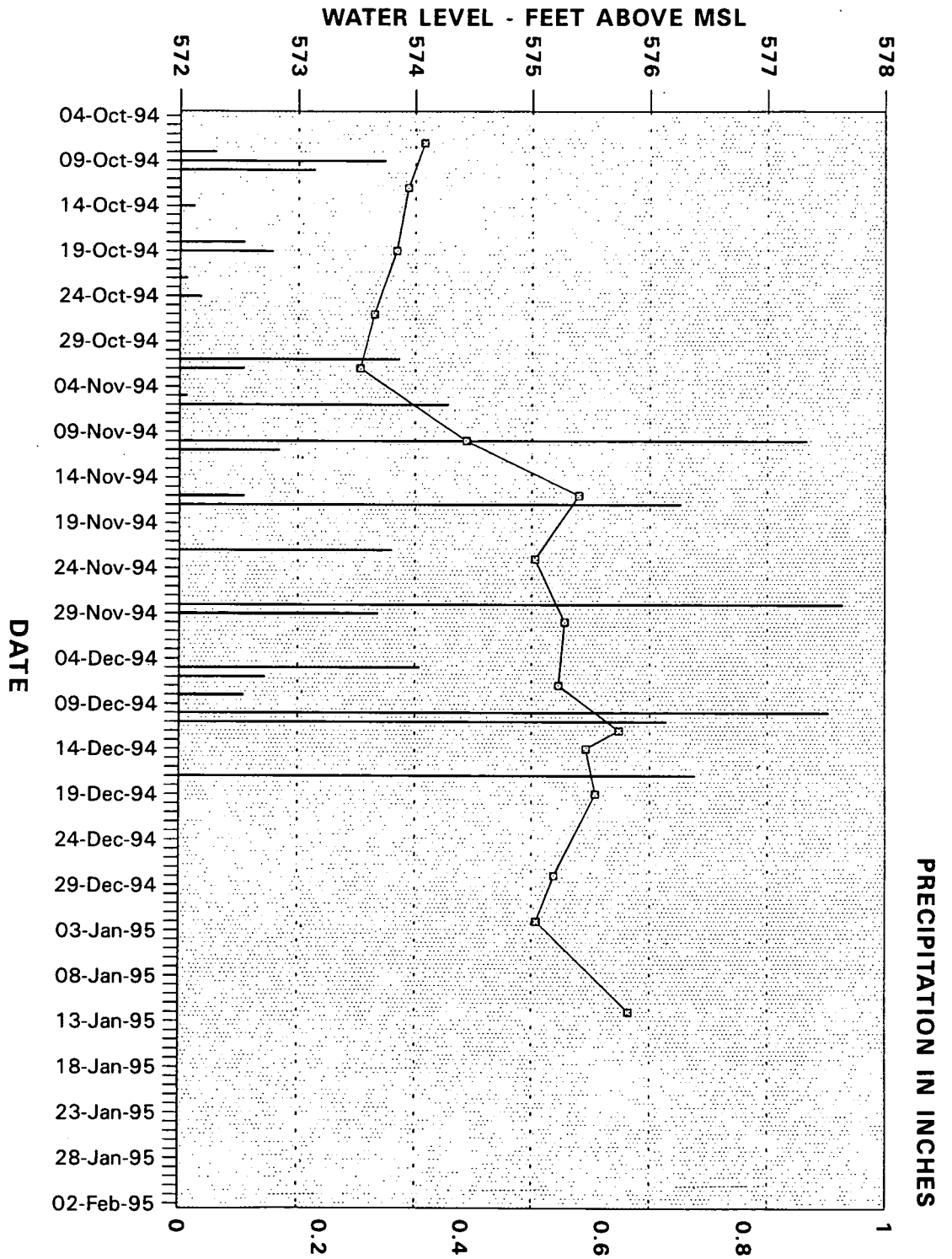
000242

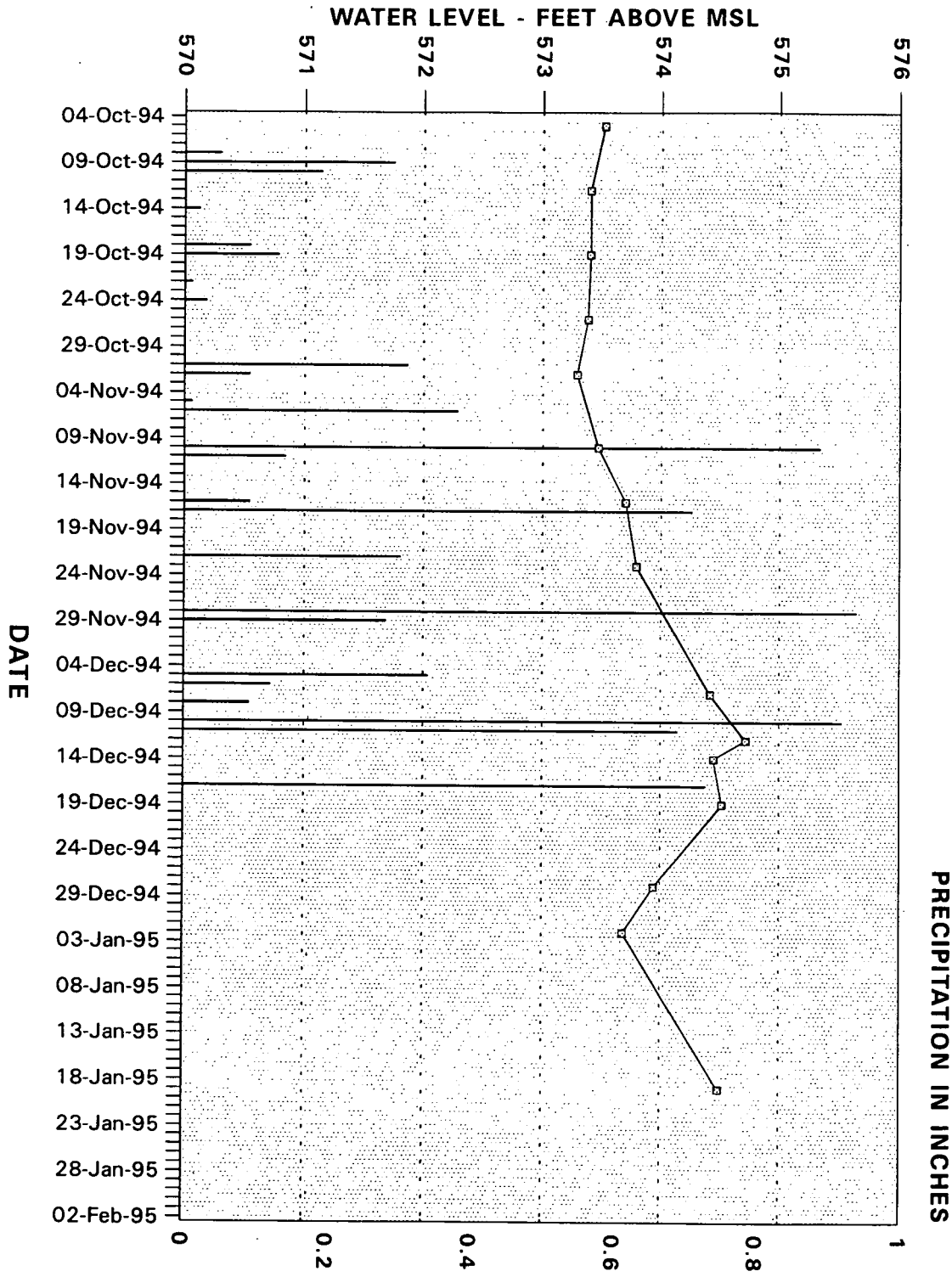

MW 1151
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
WATER LEVEL - FEET ABOVE MSL
573
574
575
576
577
578
579
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
04-Nov-94
09-Nov-94
14-Nov-94
19-Nov-94
24-Nov-94
29-Nov-94
04-Dec-94
09-Dec-94
14-Dec-94
19-Dec-94
24-Dec-94
29-Dec-94
03-Jan-95
08-Jan-95
13-Jan-95
18-Jan-95
23-Jan-95
28-Jan-95
02-Feb-95



MW 1152

000244

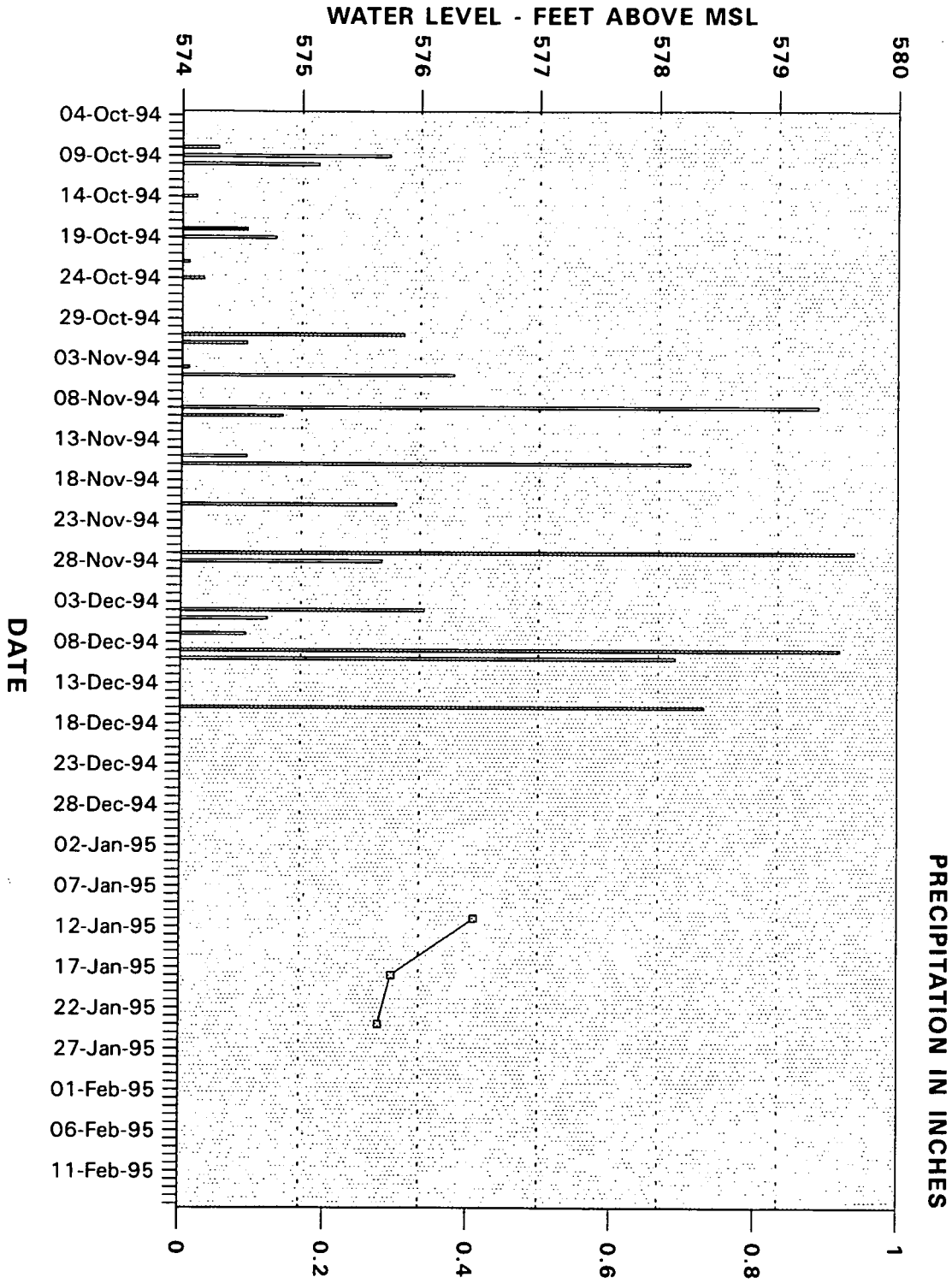

MW 1160
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
WATER LEVEL - FEET ABOVE MSL
572
573
574
575
576
577
578
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
04-Nov-94
09-Nov-94
14-Nov-94
19-Nov-94
24-Nov-94
29-Nov-94
04-Dec-94
09-Dec-94
14-Dec-94
19-Dec-94
24-Dec-94
29-Dec-94
03-Jan-95
08-Jan-95
13-Jan-95
18-Jan-95
23-Jan-95
28-Jan-95
02-Feb-95

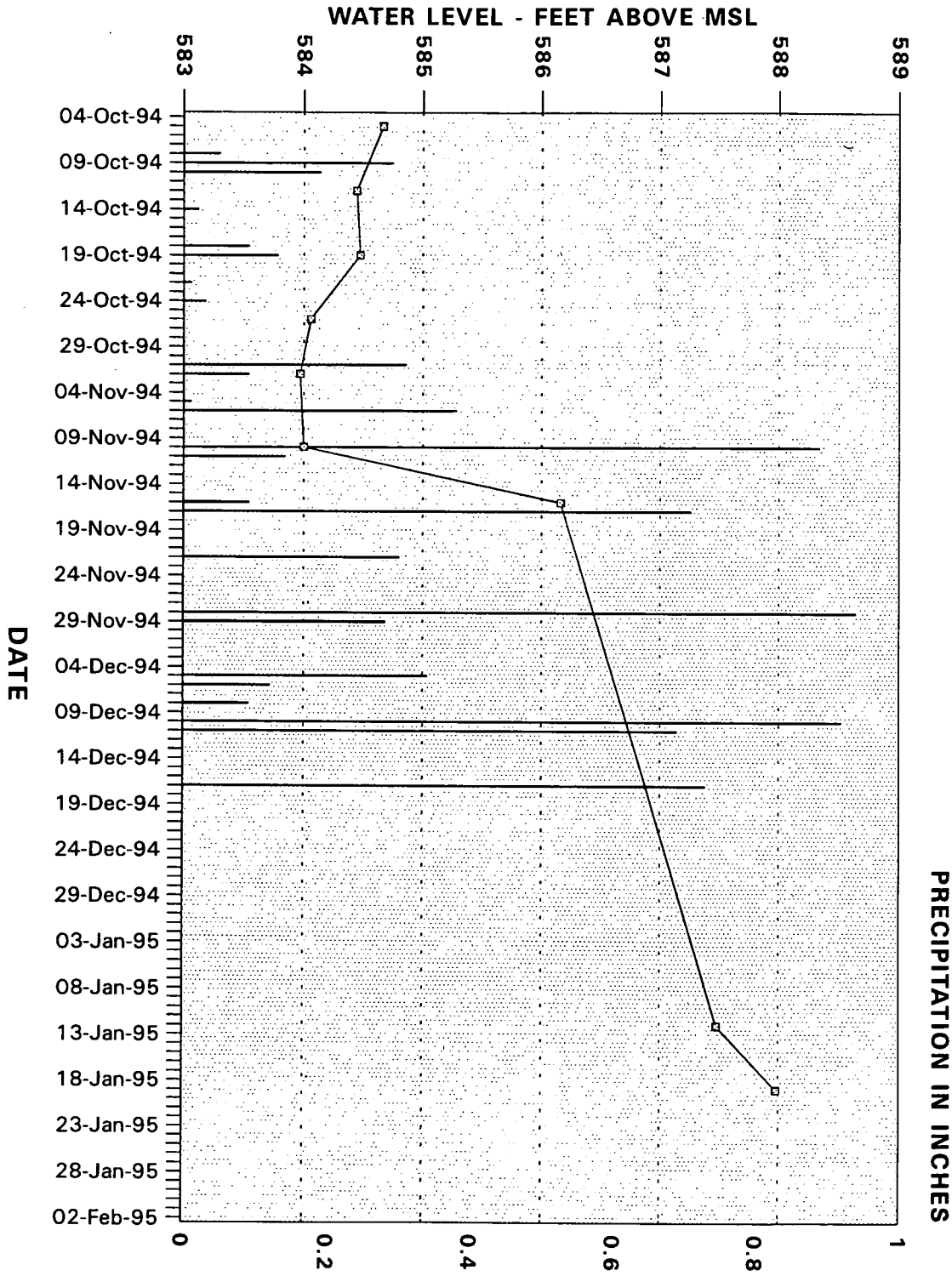


MW 1167

000246

MW 1171

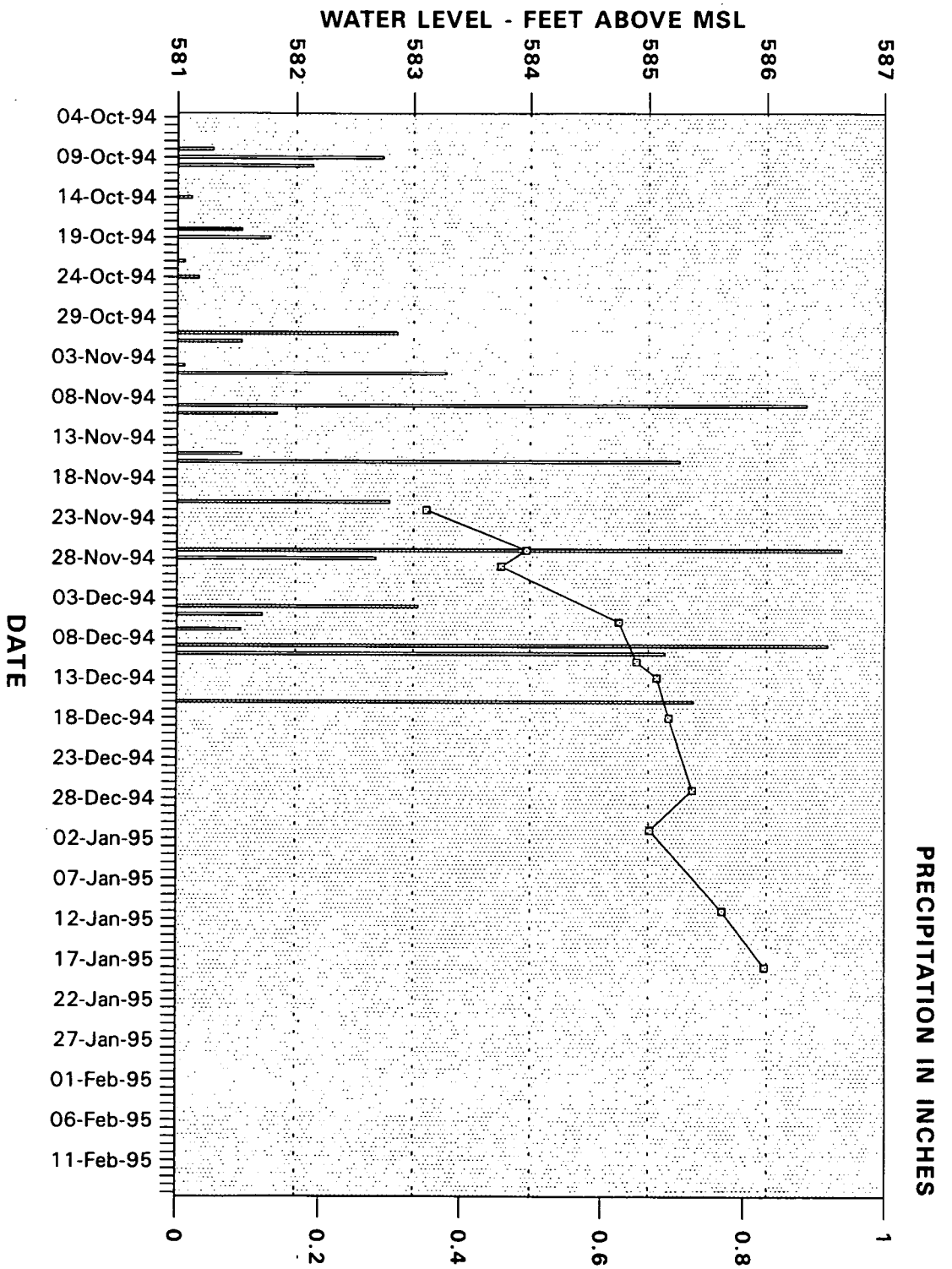

WATER LEVEL - FEET ABOVE MSL
580
579
578
577
576
575
574
PRECIPITATION IN INCHES
1
0.8
0.6
0.4
0.2
0
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

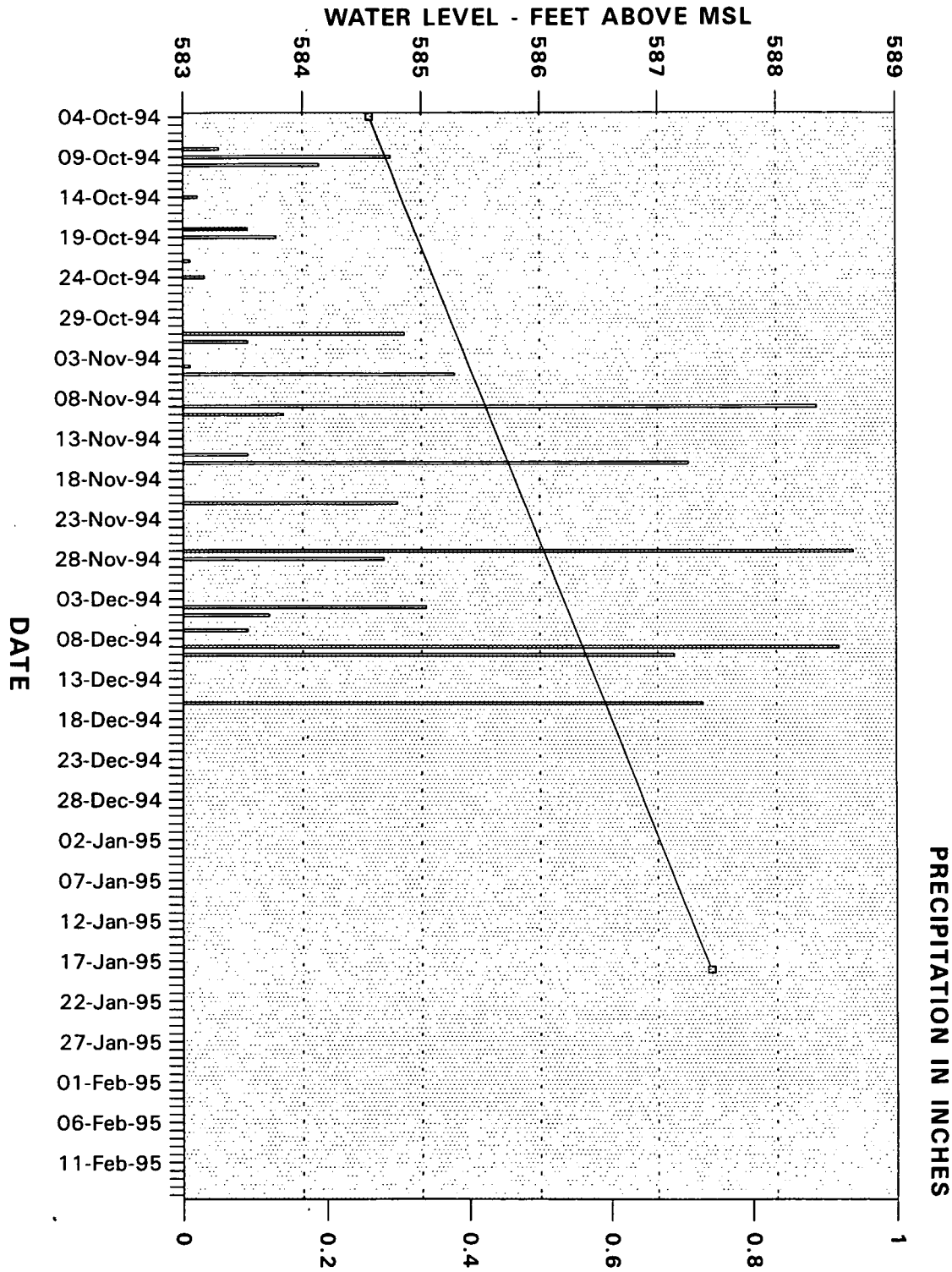


MW 1274

000248

MW 1276

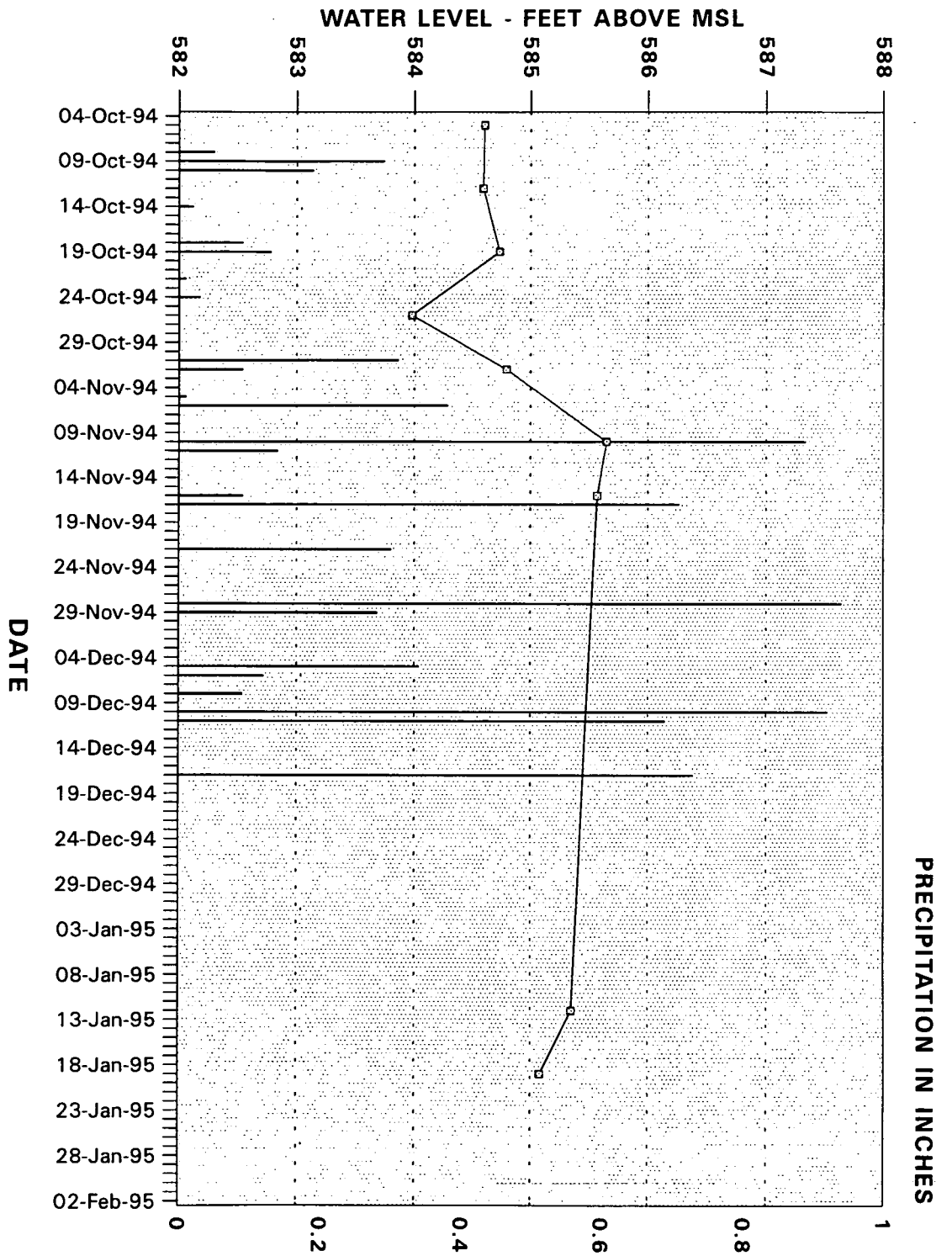

WATER LEVEL - FEET ABOVE MSL
581
582
583
584
585
586
587
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

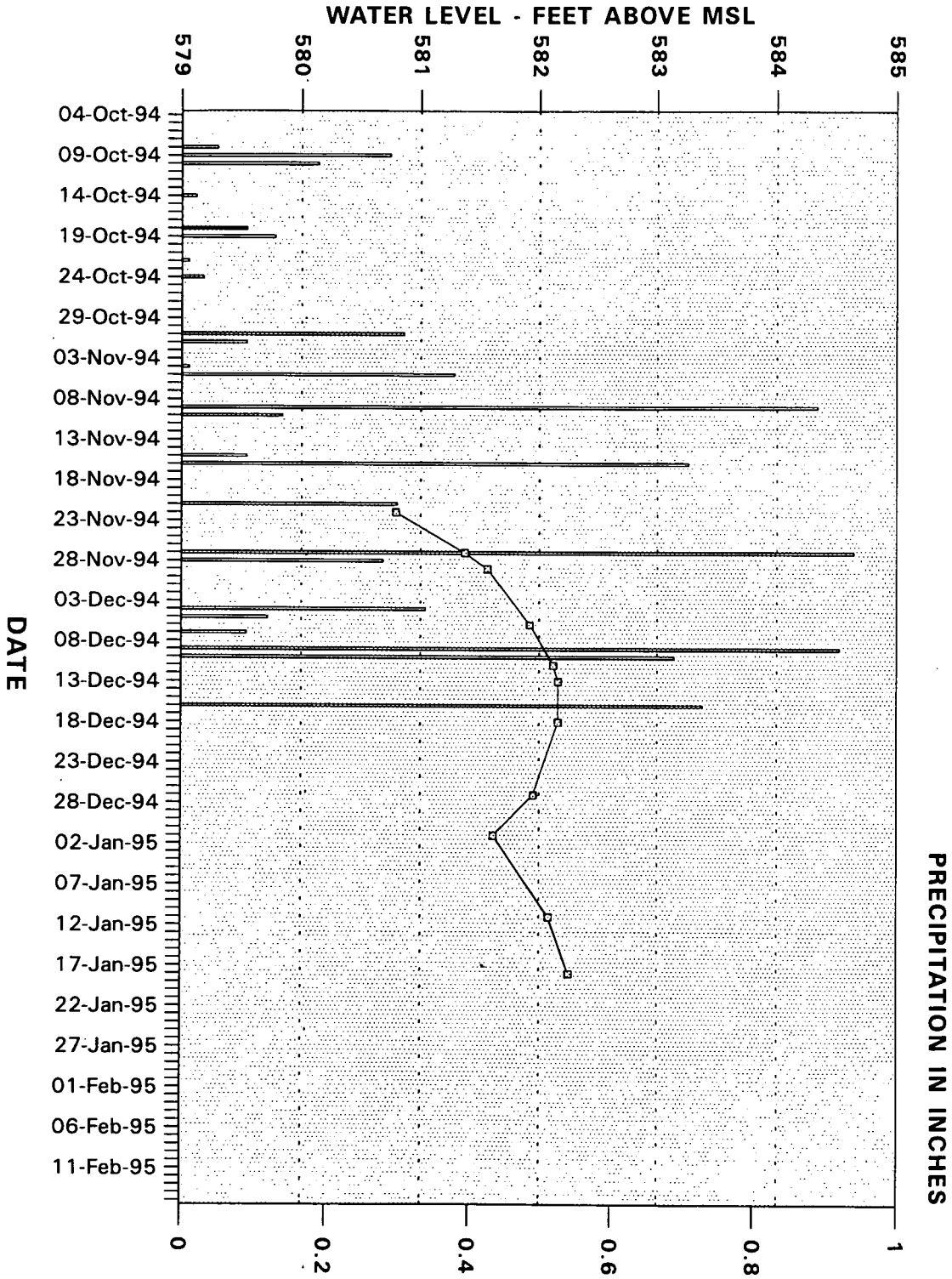


MW 1278

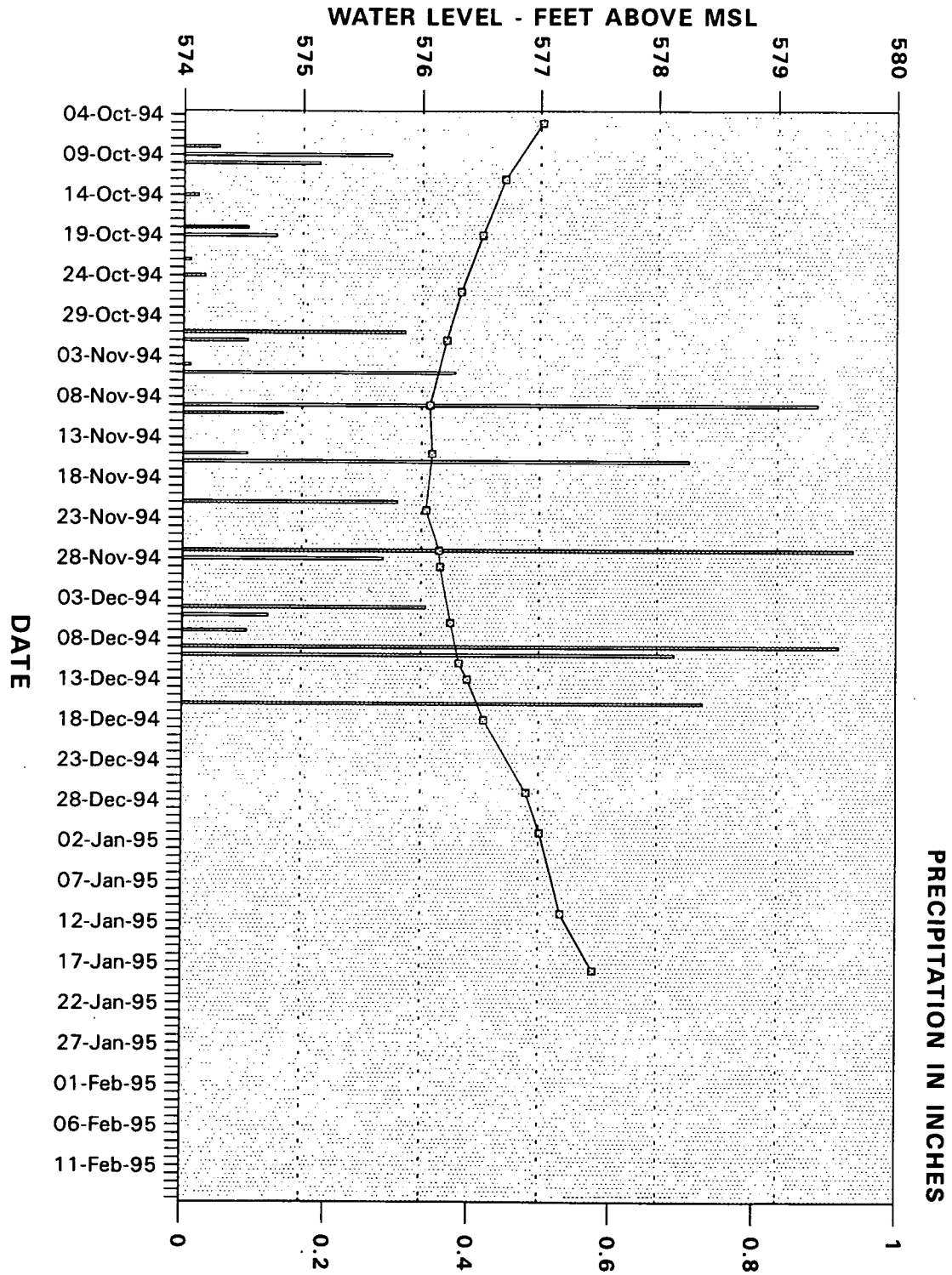
000250

MW 1293

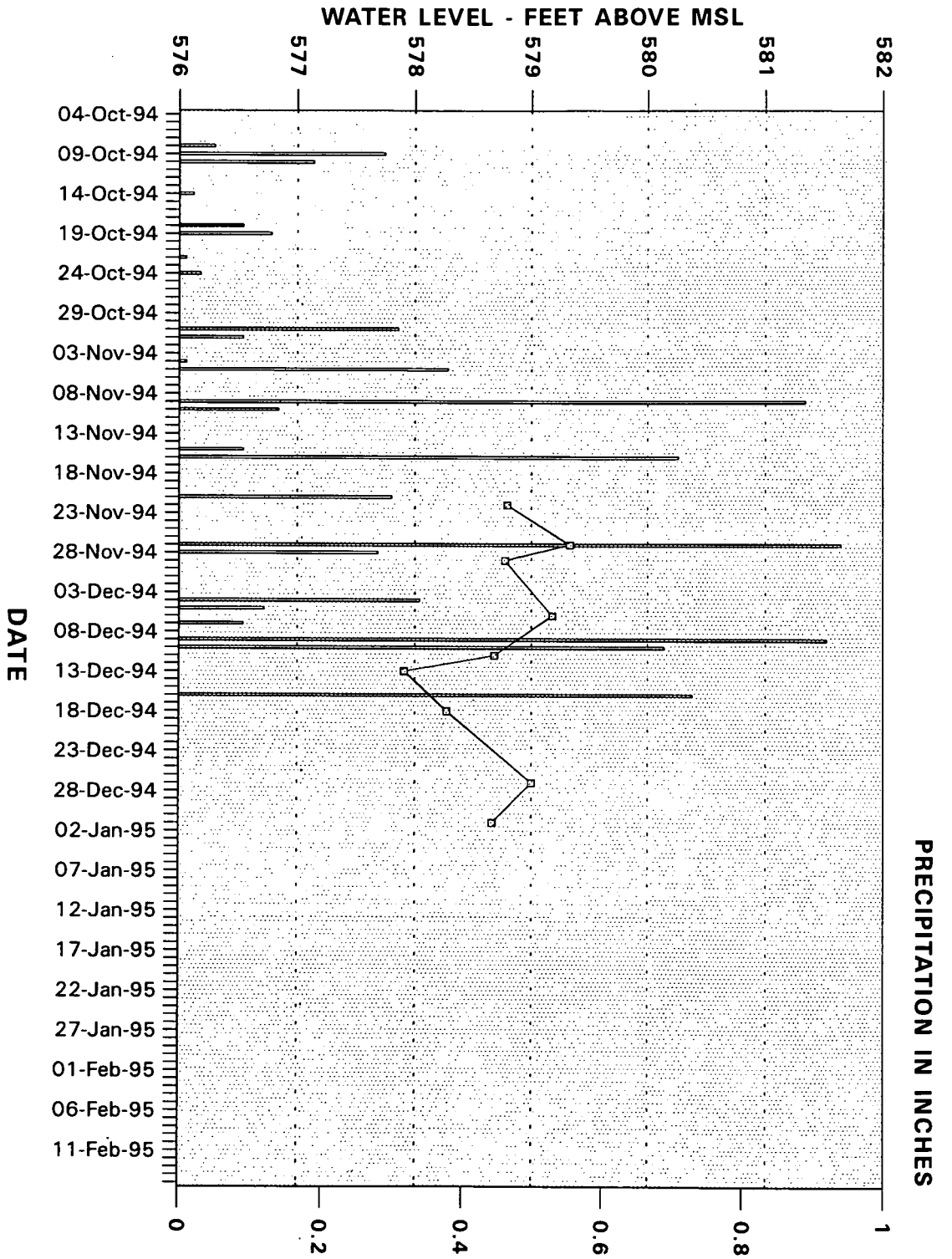

WATER LEVEL - FEET ABOVE MSL
582
583
584
585
586
587
588
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
04-Nov-94
09-Nov-94
14-Nov-94
19-Nov-94
24-Nov-94
29-Nov-94
04-Dec-94
09-Dec-94
14-Dec-94
19-Dec-94
24-Dec-94
29-Dec-94
03-Jan-95
08-Jan-95
13-Jan-95
18-Jan-95
23-Jan-95
28-Jan-95
02-Feb-95


WATER LEVEL - FEET ABOVE MSL
579
580
581
582
583
584
585
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

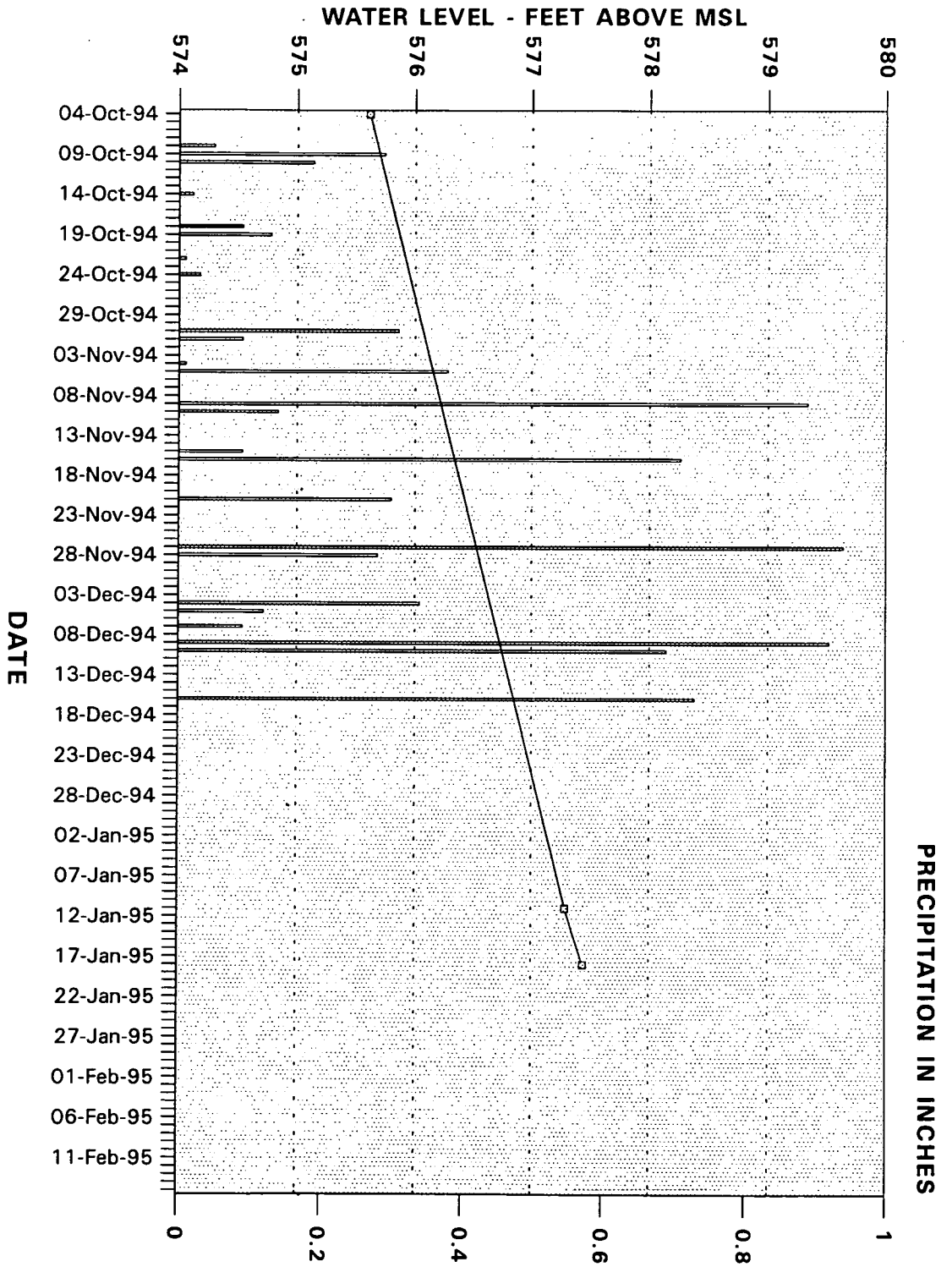
MW 1299


WATER LEVEL - FEET ABOVE MSL
580
579
578
577
576
575
574
PRECIPITATION IN INCHES
1
0.8
0.6
0.4
0.2
0
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

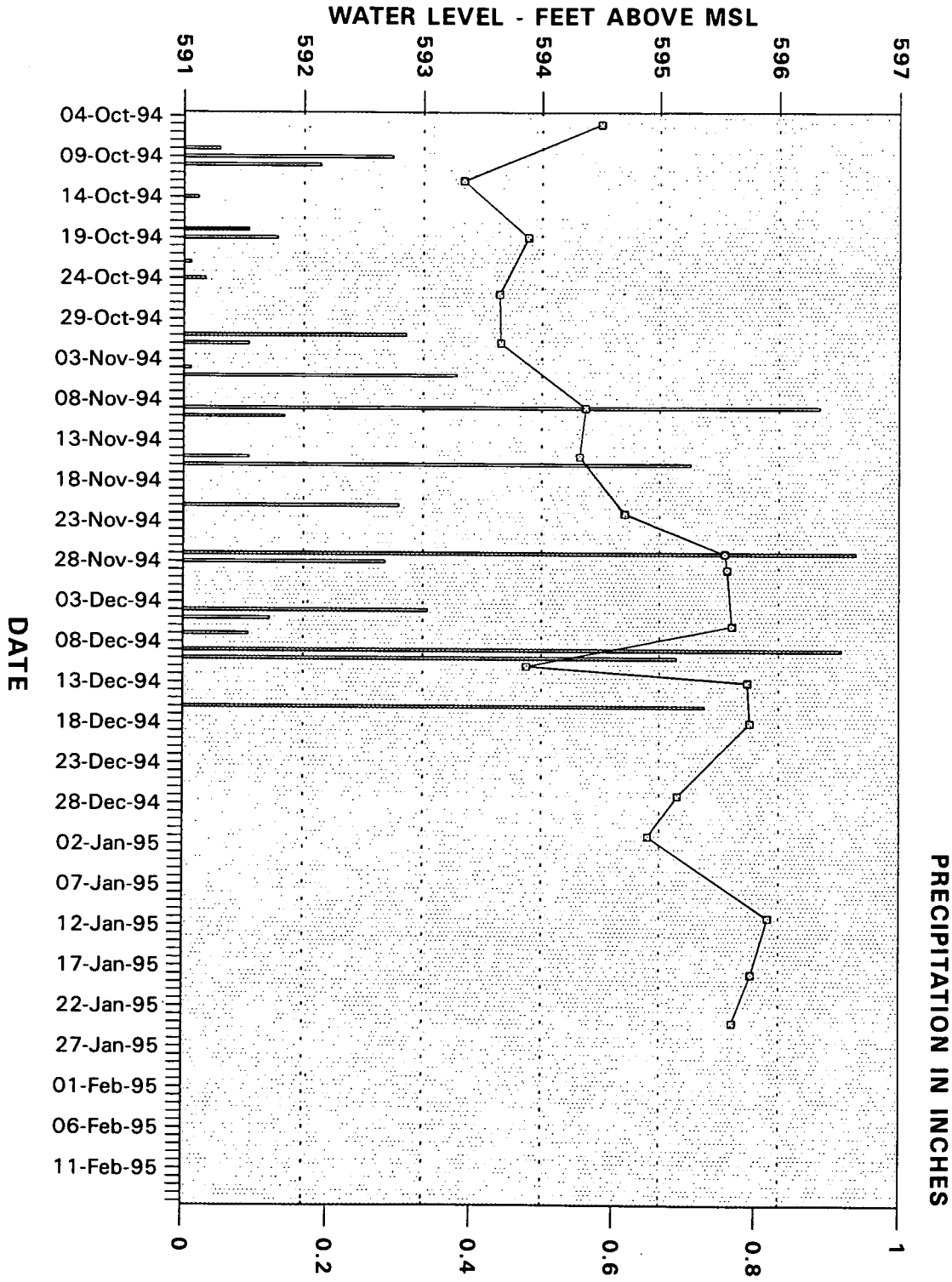
MW 1301


WATER LEVEL - FEET ABOVE MSL
576
577
578
579
580
581
582
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

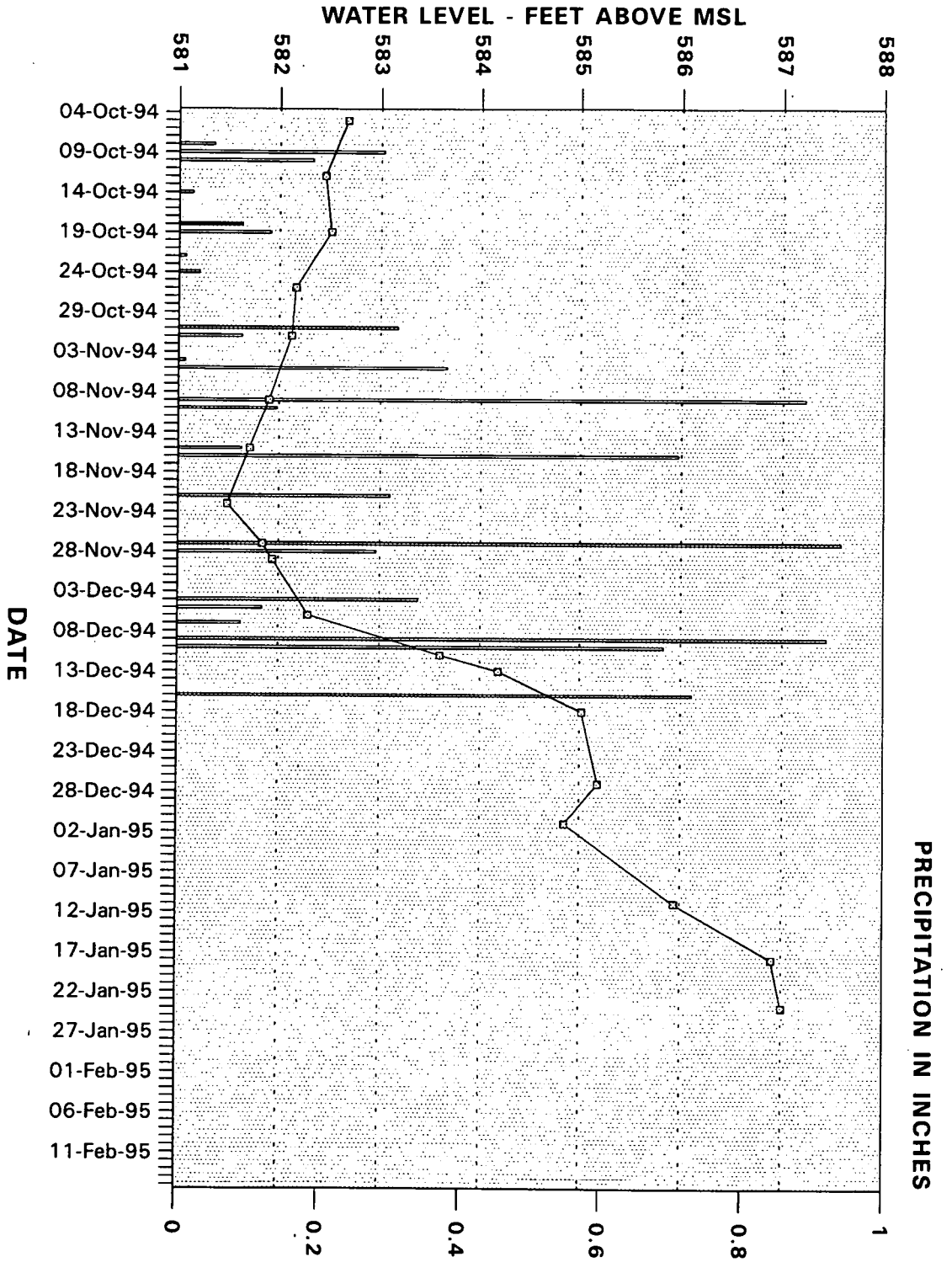
MW 1340


WATER LEVEL - FEET ABOVE MSL
580
579
578
577
576
575
574
PRECIPITATION IN INCHES
1
0.8
0.6
0.4
0.2
0
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

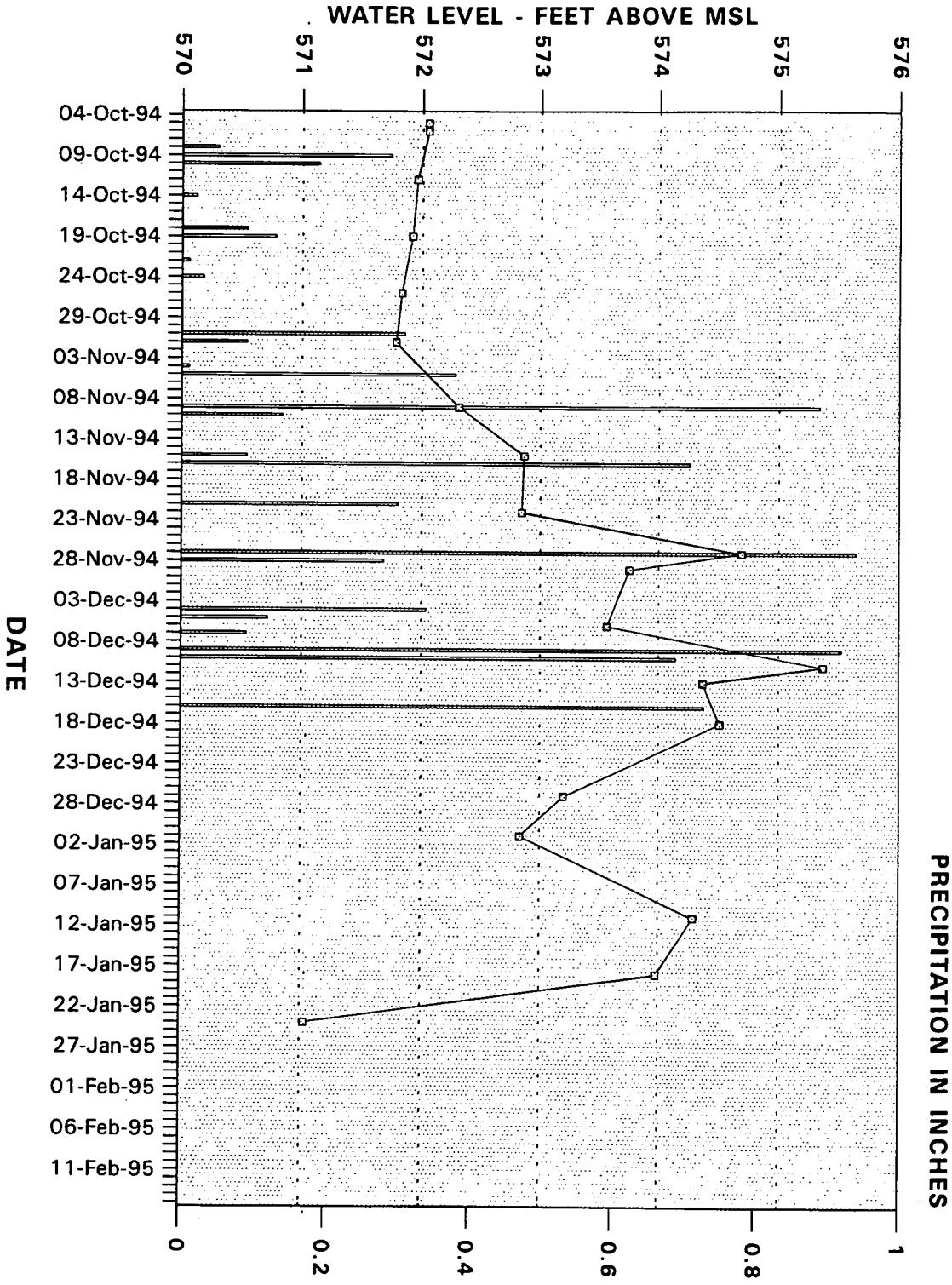
MW 1418


WATER LEVEL - FEET ABOVE MSL
597
596
595
594
593
592
591
PRECIPITATION IN INCHES
1
0.8
0.6
0.4
0.2
0
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

MW 1444

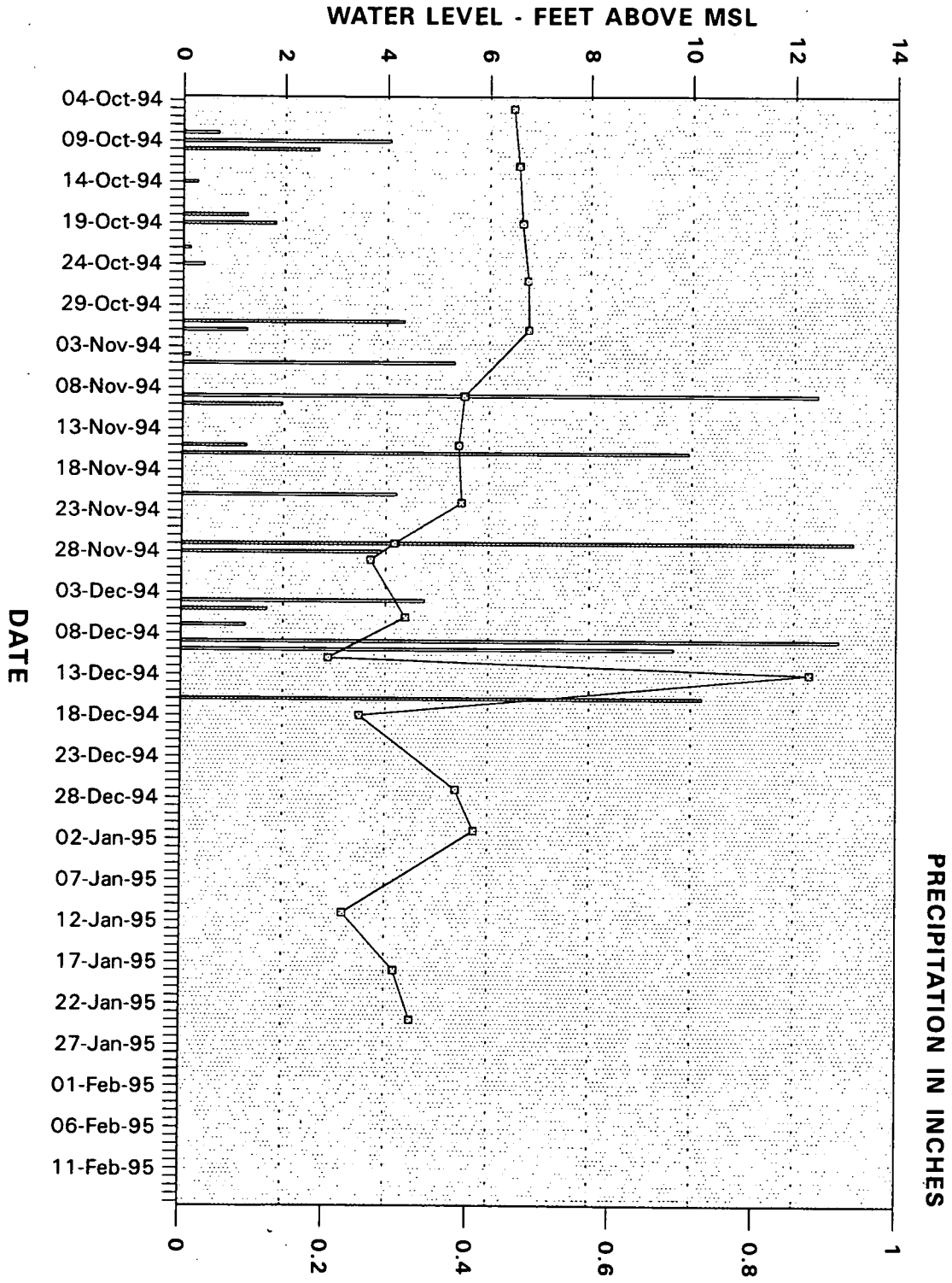

WATER LEVEL - FEET ABOVE MSL
588
587
586
585
584
583
582
581
PRECIPITATION IN INCHES
1
0.8
0.6
0.4
0.2
0
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

MW 1843



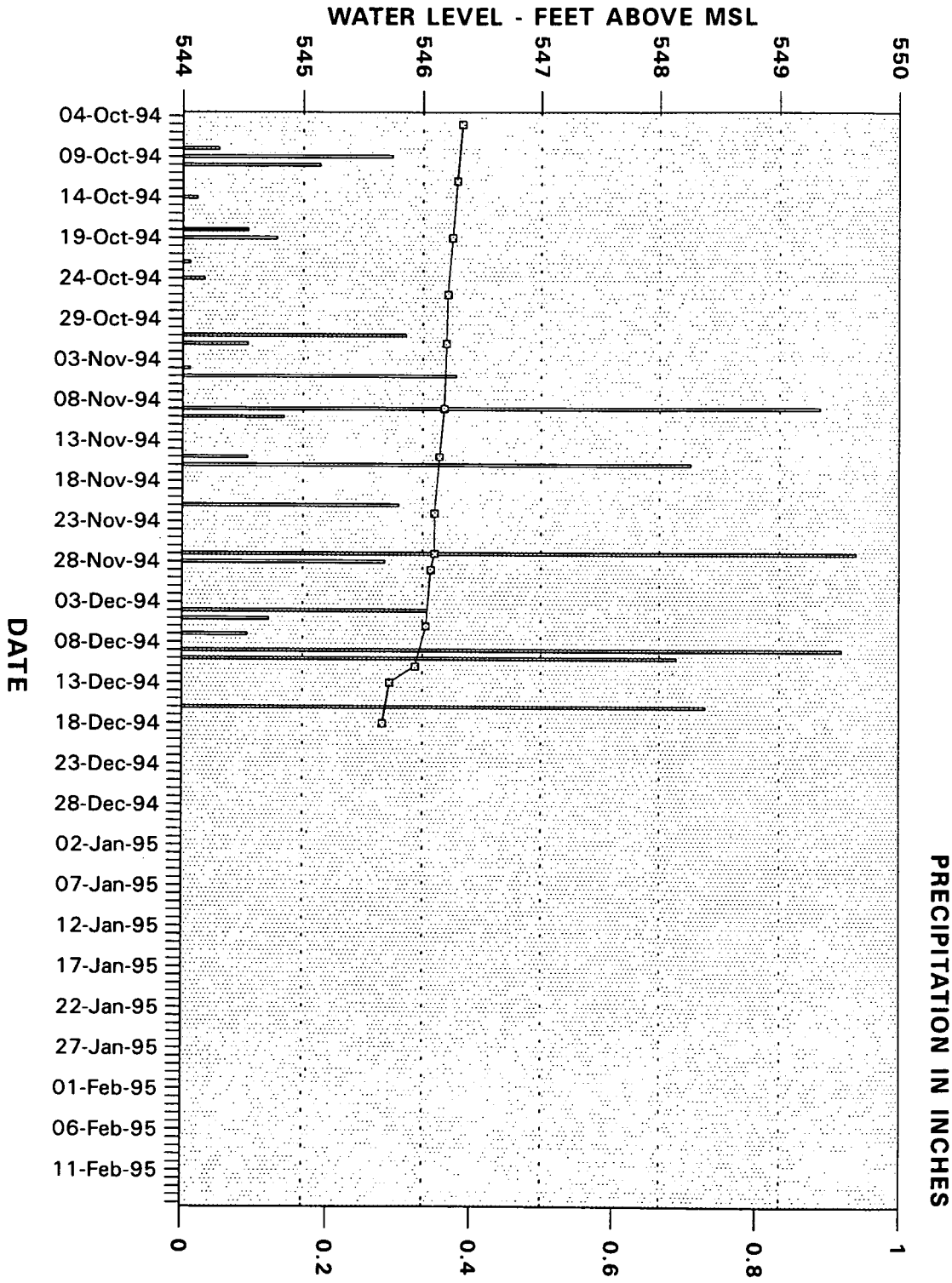
MW 1866

000258



MW 1887

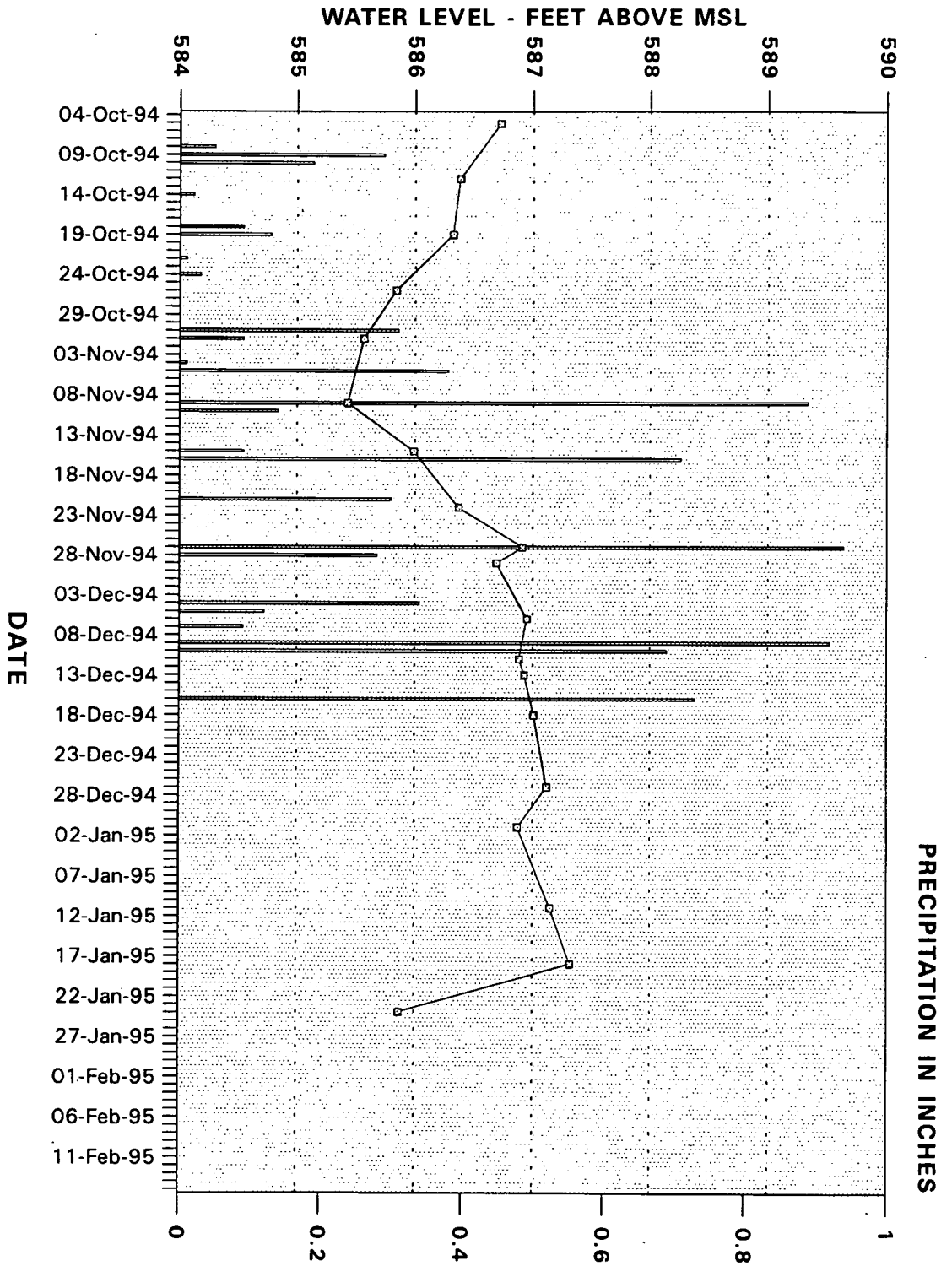
000259

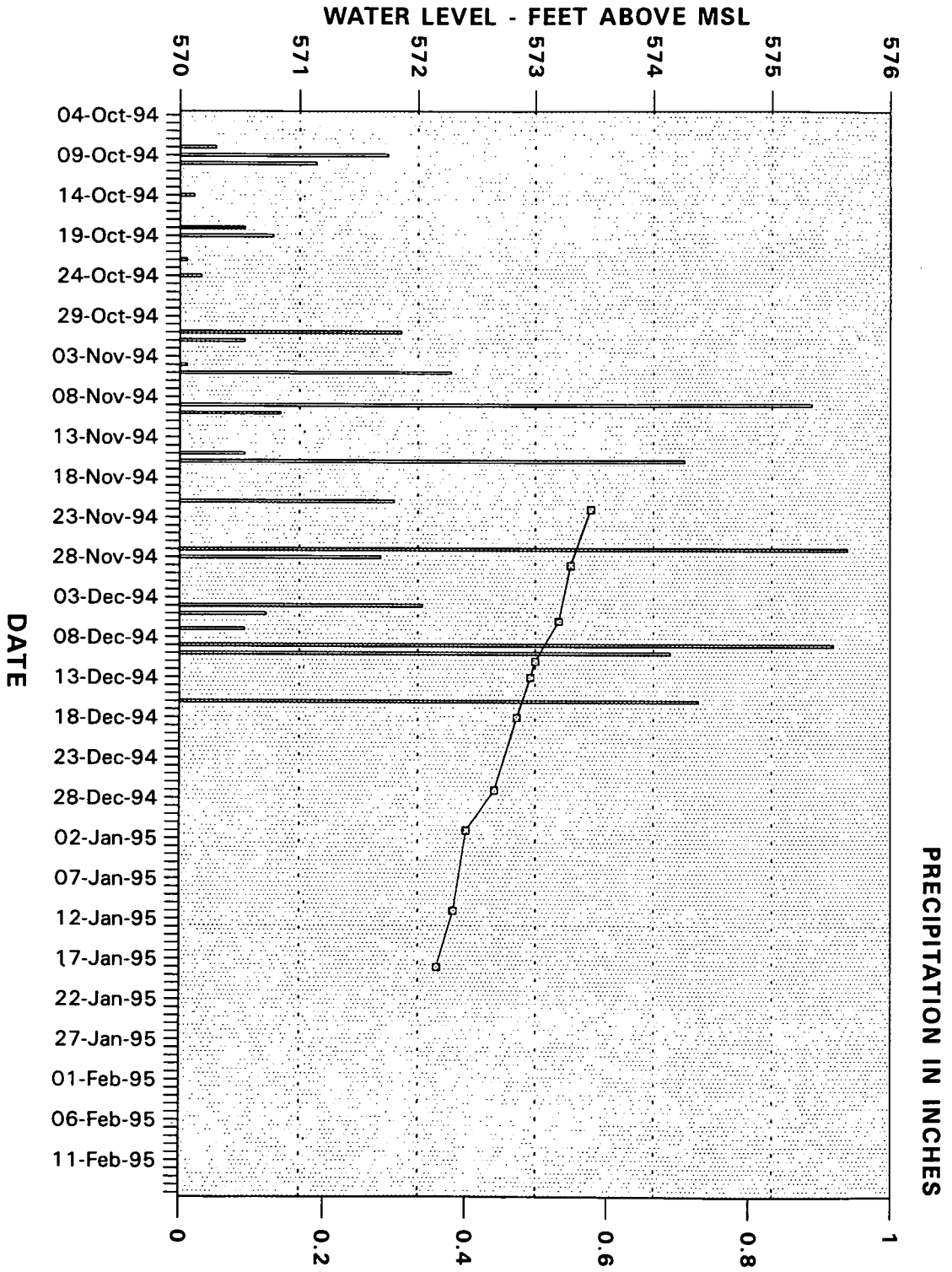


MW 1905

000260

MW 11067

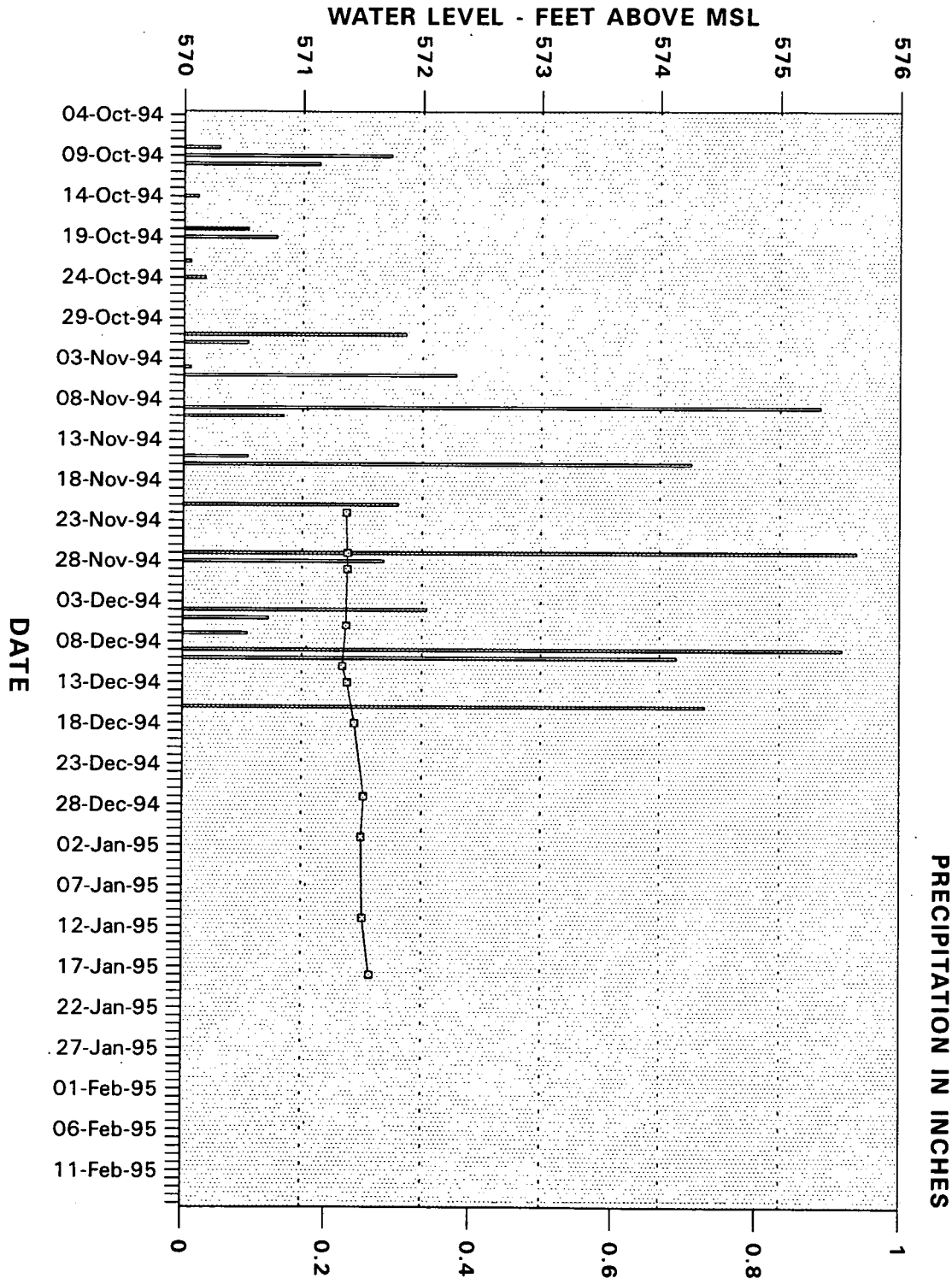

WATER LEVEL - FEET ABOVE MSL
590
589
588
587
586
585
584
PRECIPITATION IN INCHES
1
0.8
0.6
0.4
0.2
0
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95

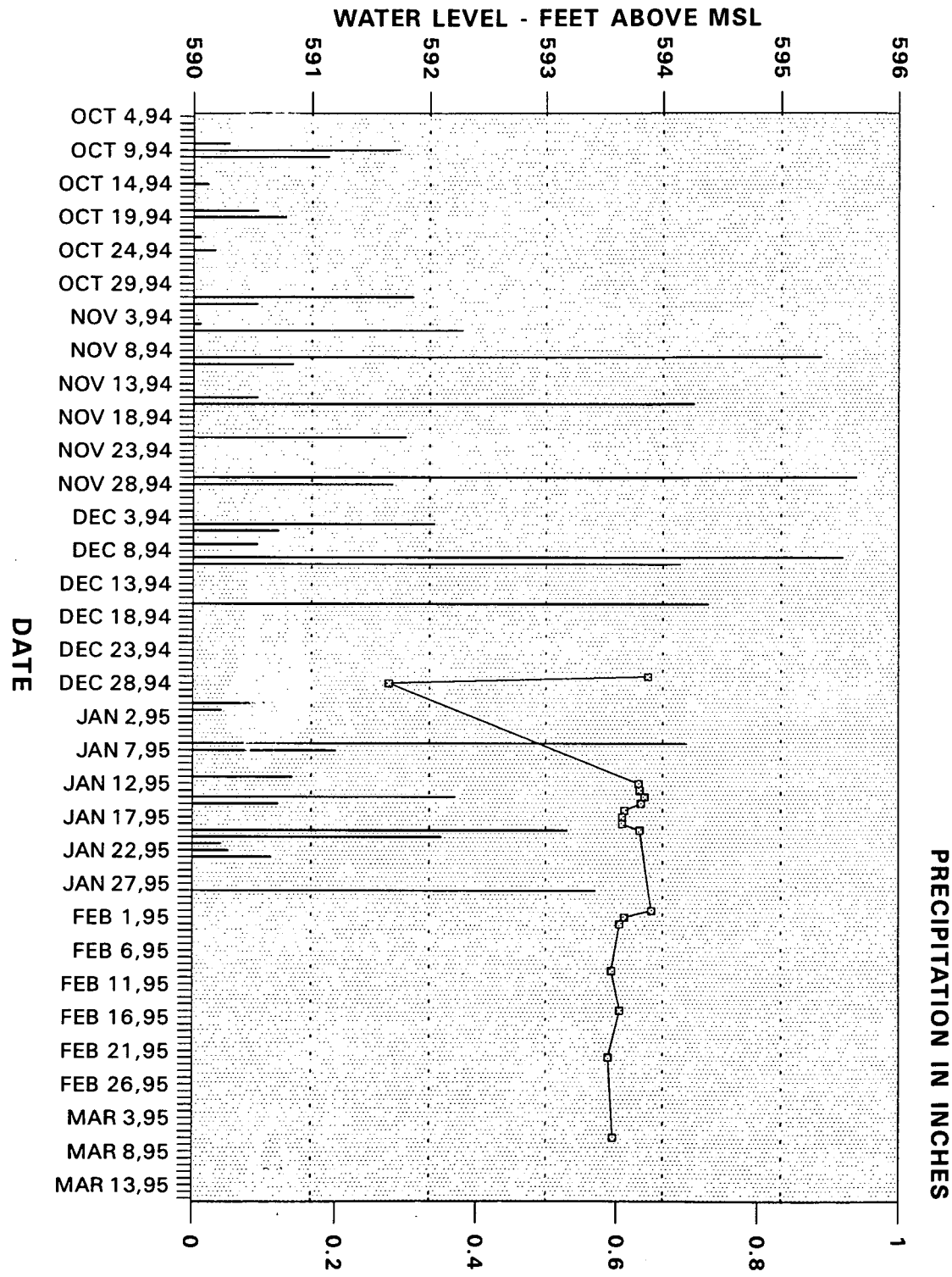


MW 11074

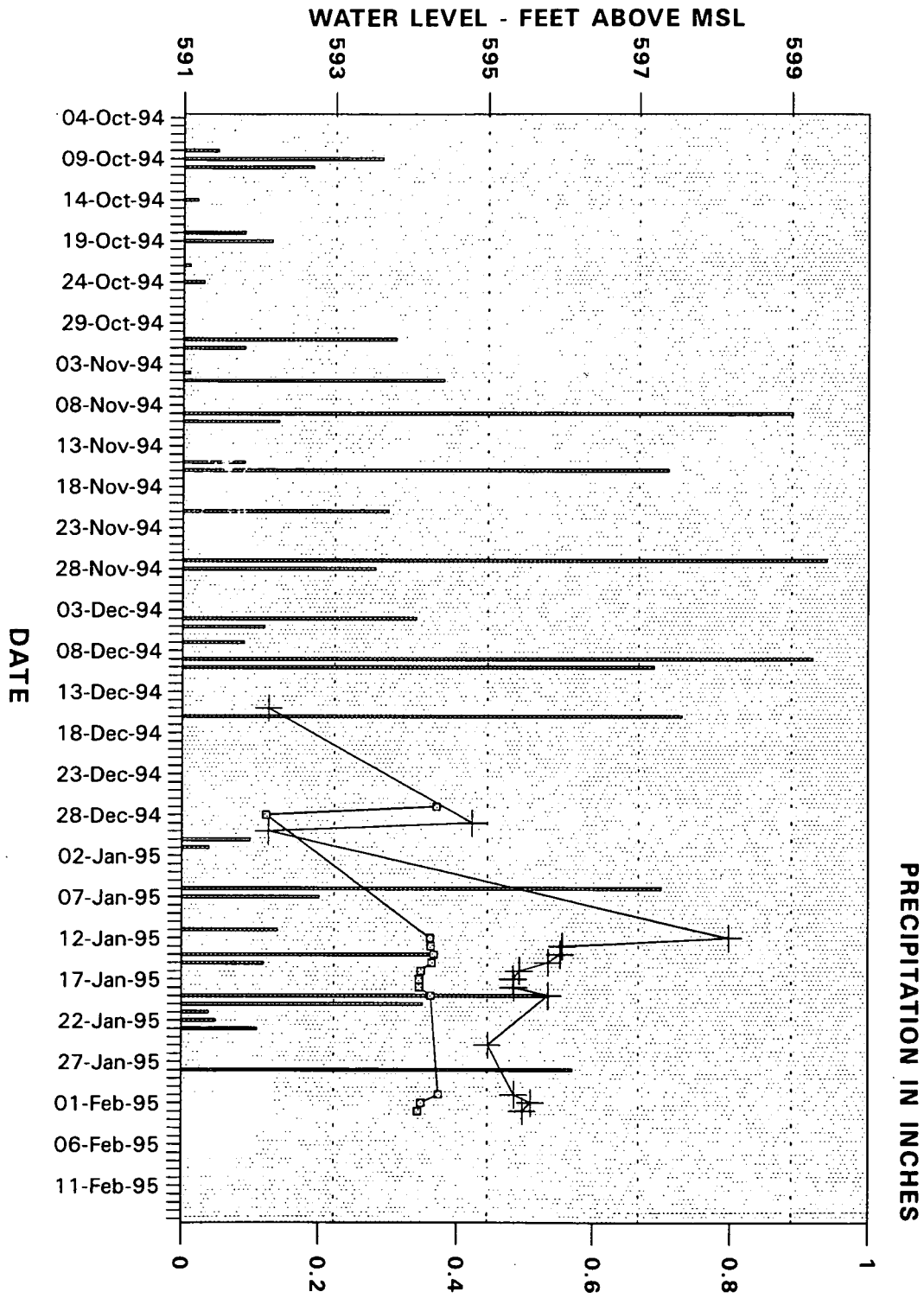
000262

MW 11075

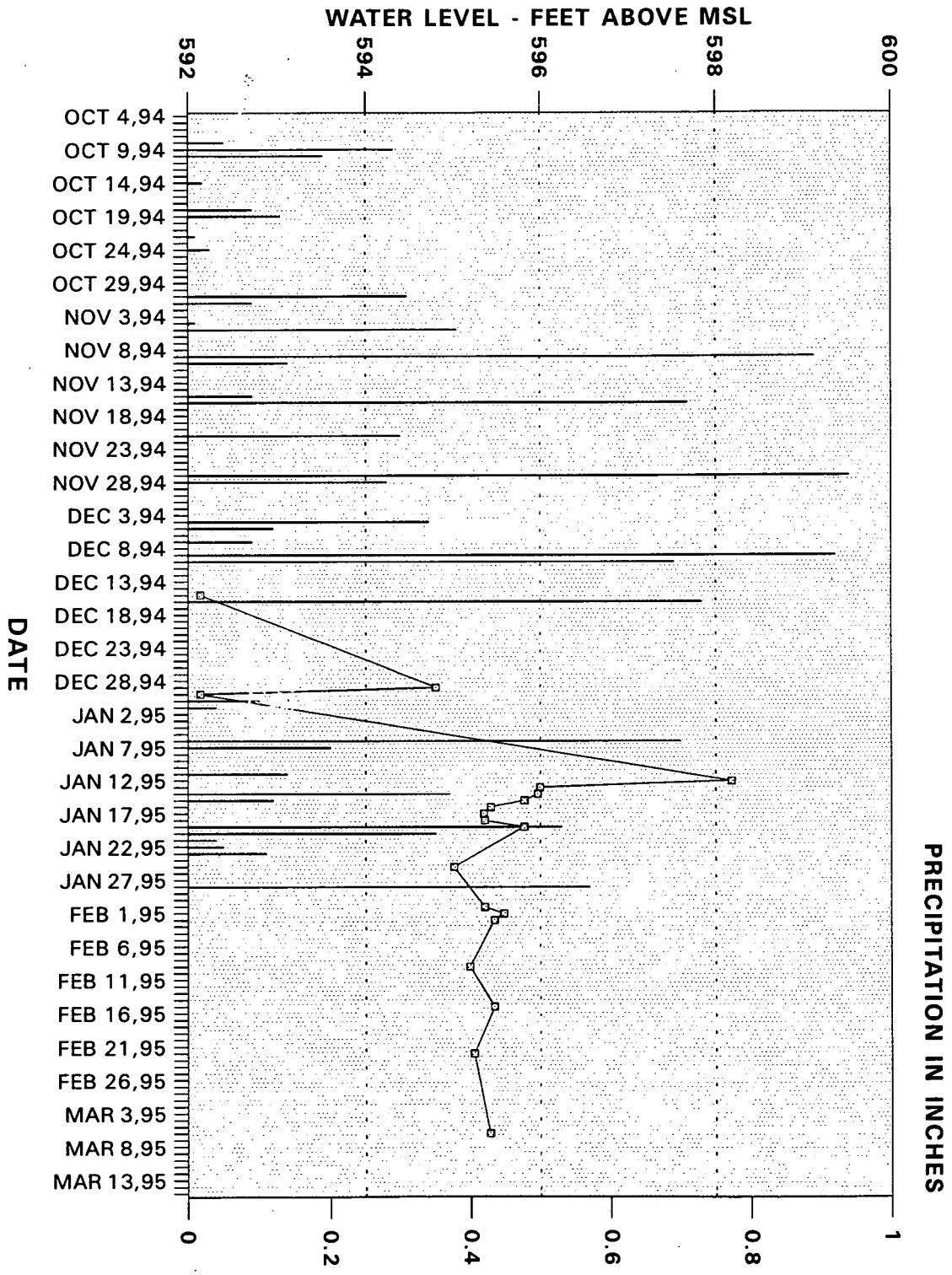

WATER LEVEL - FEET ABOVE MSL
570
571
572
573
574
575
576
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95


WATER LEVEL - FEET ABOVE MSL
590
591
592
593
594
595
596
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

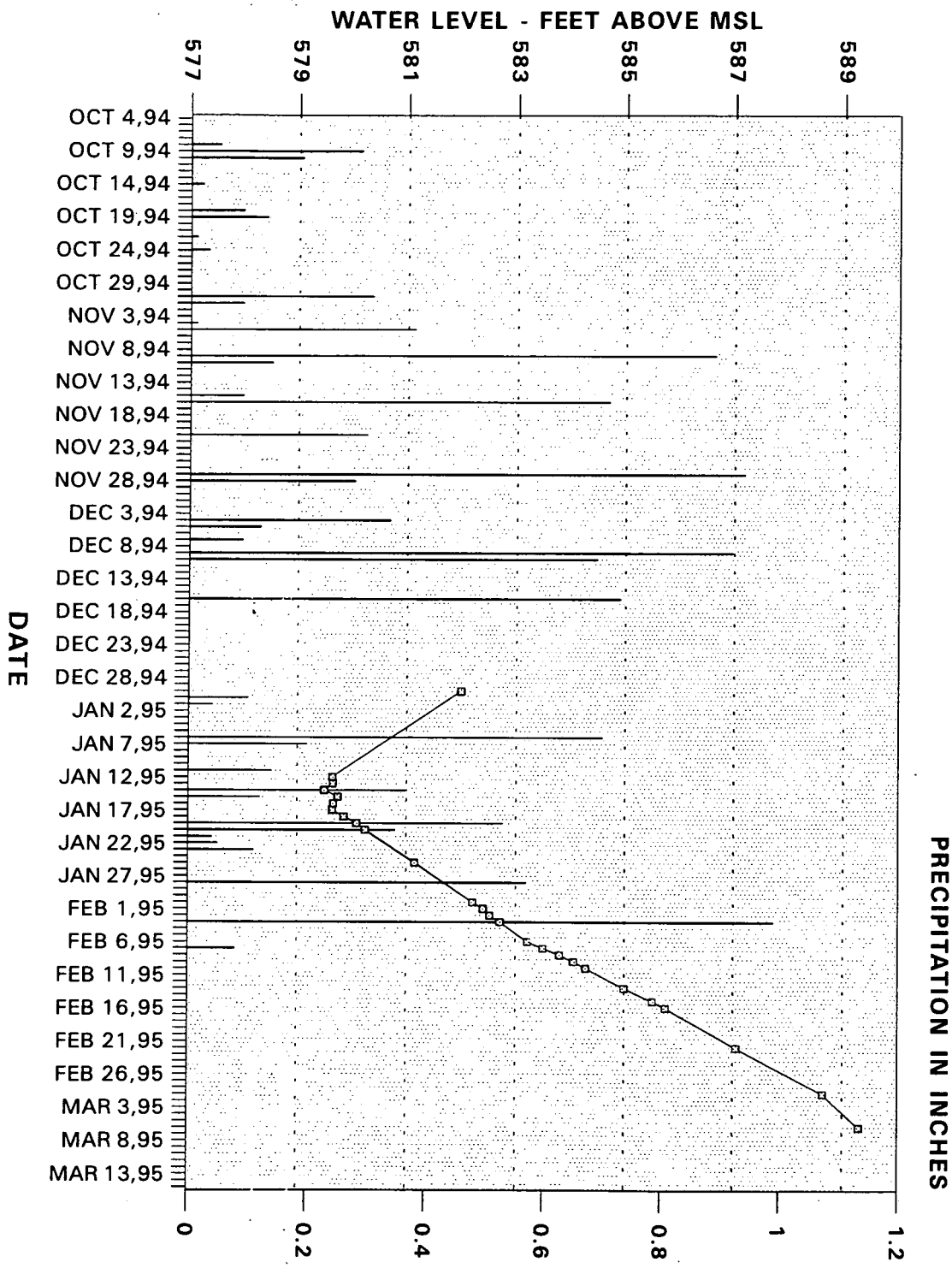
MW 11491


WATER LEVEL - FEET ABOVE MSL
591
593
595
597
599
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
04-Oct-94
09-Oct-94
14-Oct-94
19-Oct-94
24-Oct-94
29-Oct-94
03-Nov-94
08-Nov-94
13-Nov-94
18-Nov-94
23-Nov-94
28-Nov-94
03-Dec-94
08-Dec-94
13-Dec-94
18-Dec-94
23-Dec-94
28-Dec-94
02-Jan-95
07-Jan-95
12-Jan-95
17-Jan-95
22-Jan-95
27-Jan-95
01-Feb-95
06-Feb-95
11-Feb-95
MW 11491
MW 11492

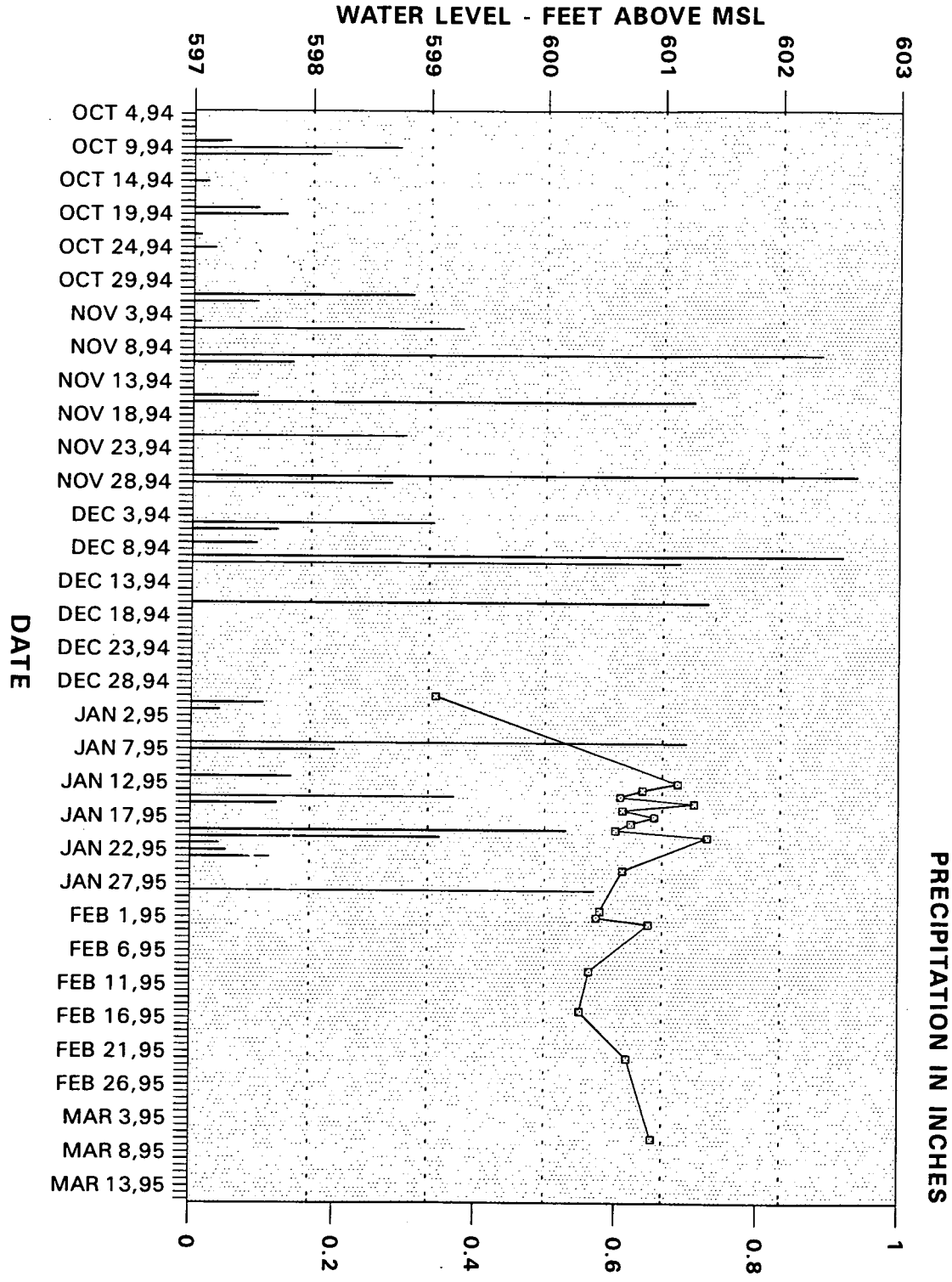
MW 11491-2


WATER LEVEL - FEET ABOVE MSL
592
594
596
598
600
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

MW 11492

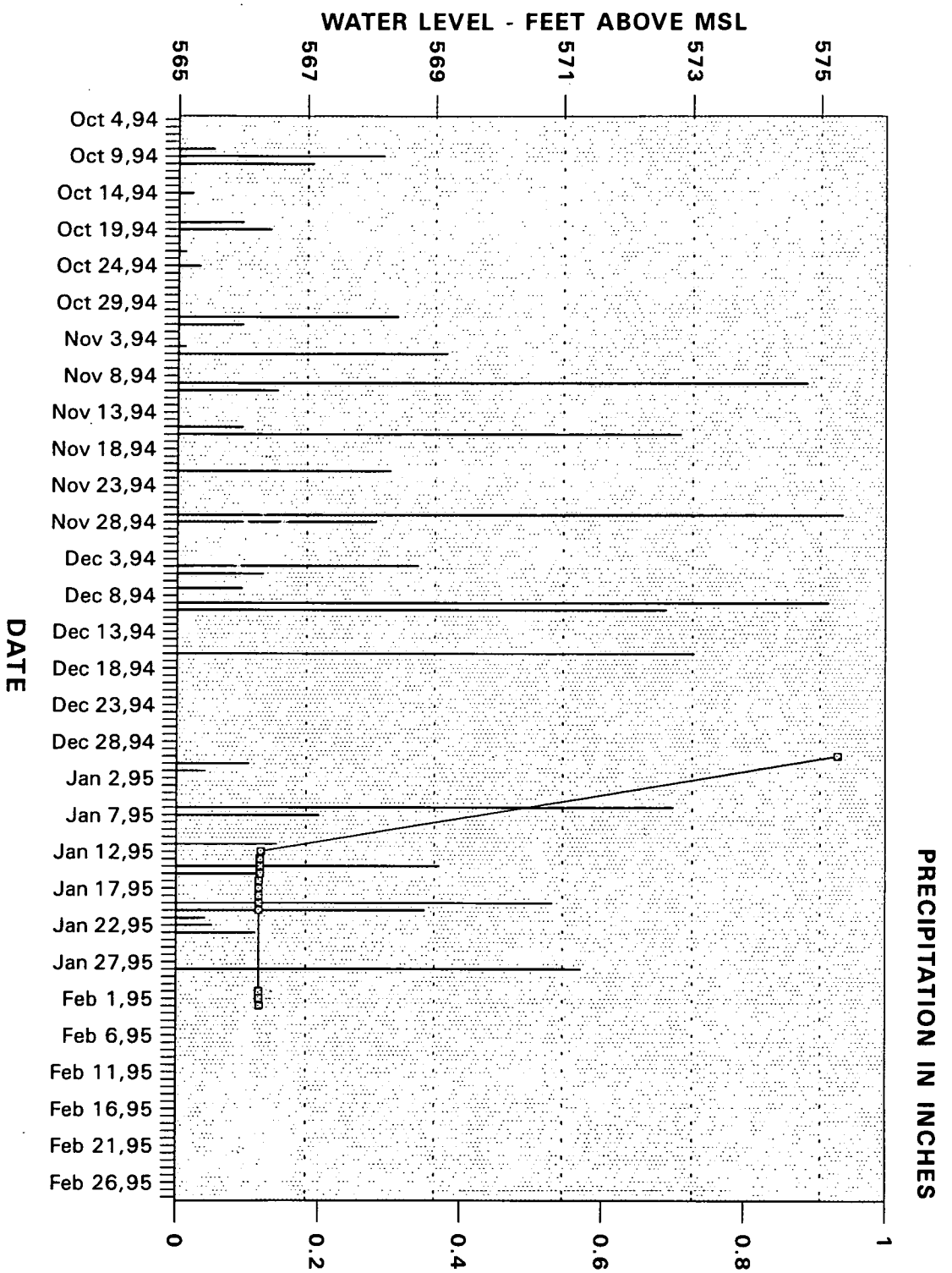

WATER LEVEL - FEET ABOVE MSL
577
579
581
583
585
587
589
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
1.2
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

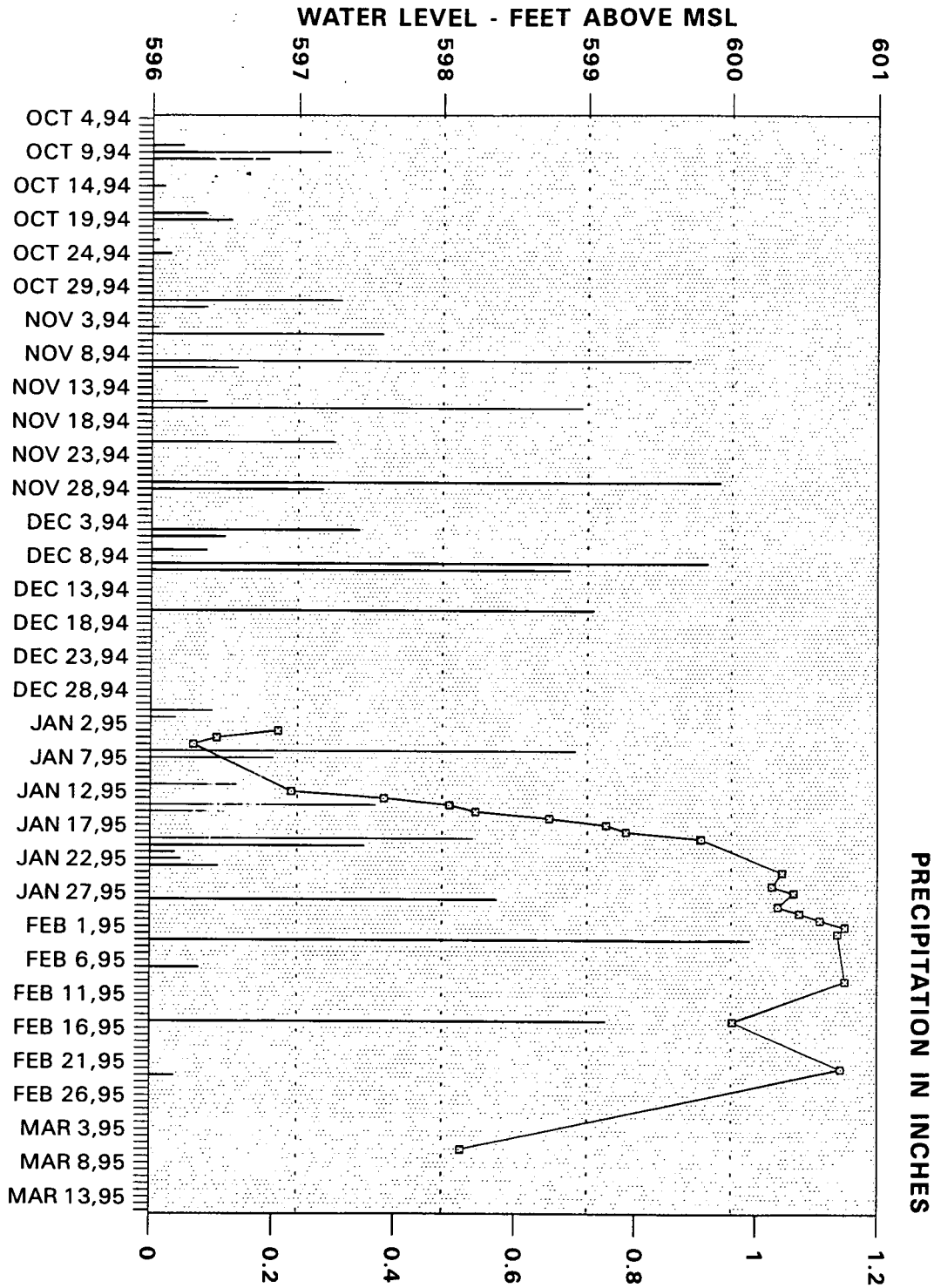
MW 11493


WATER LEVEL - FEET ABOVE MSL
597
598
599
600
601
602
603
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

MW 11494

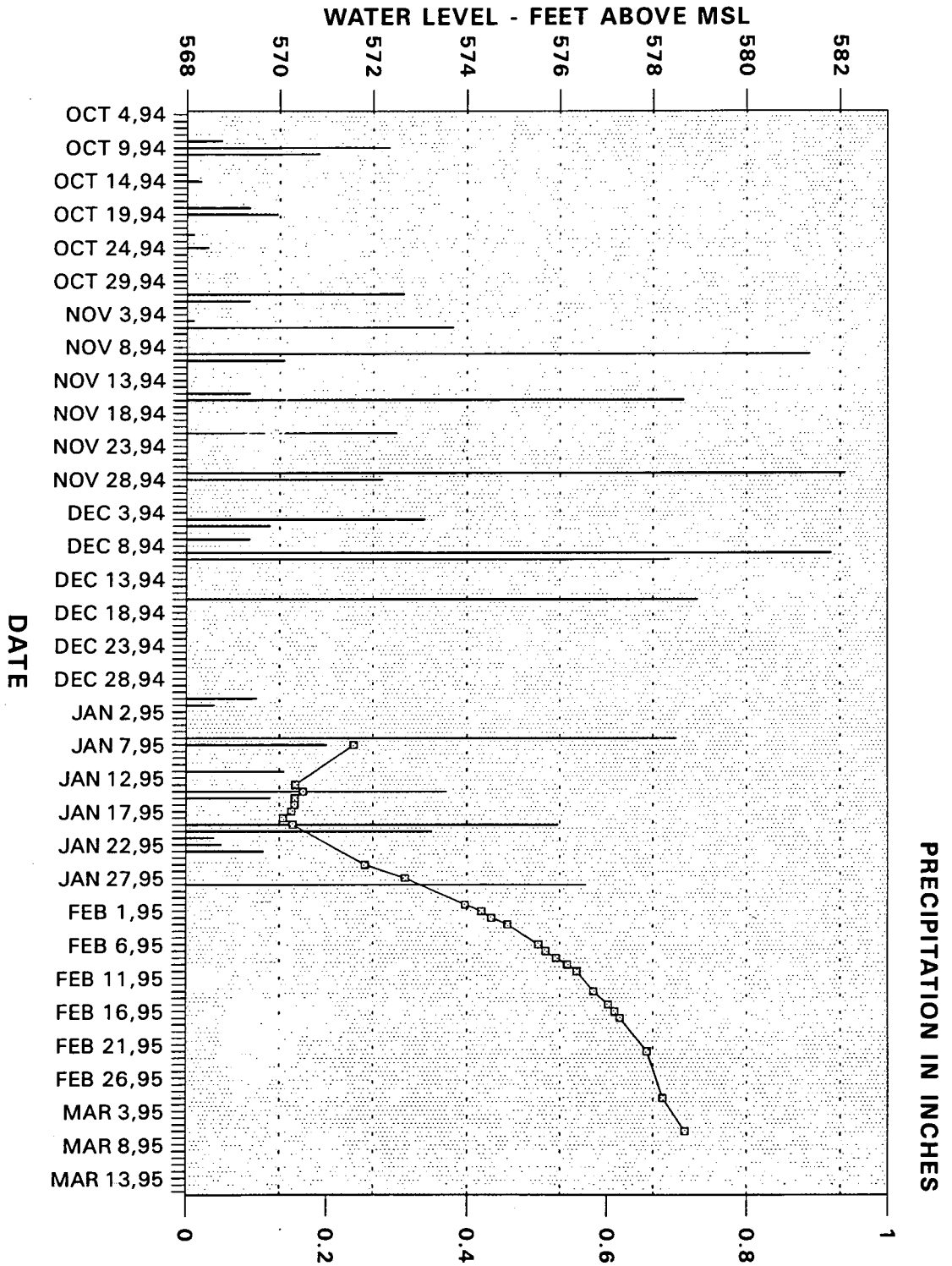
MW 11495

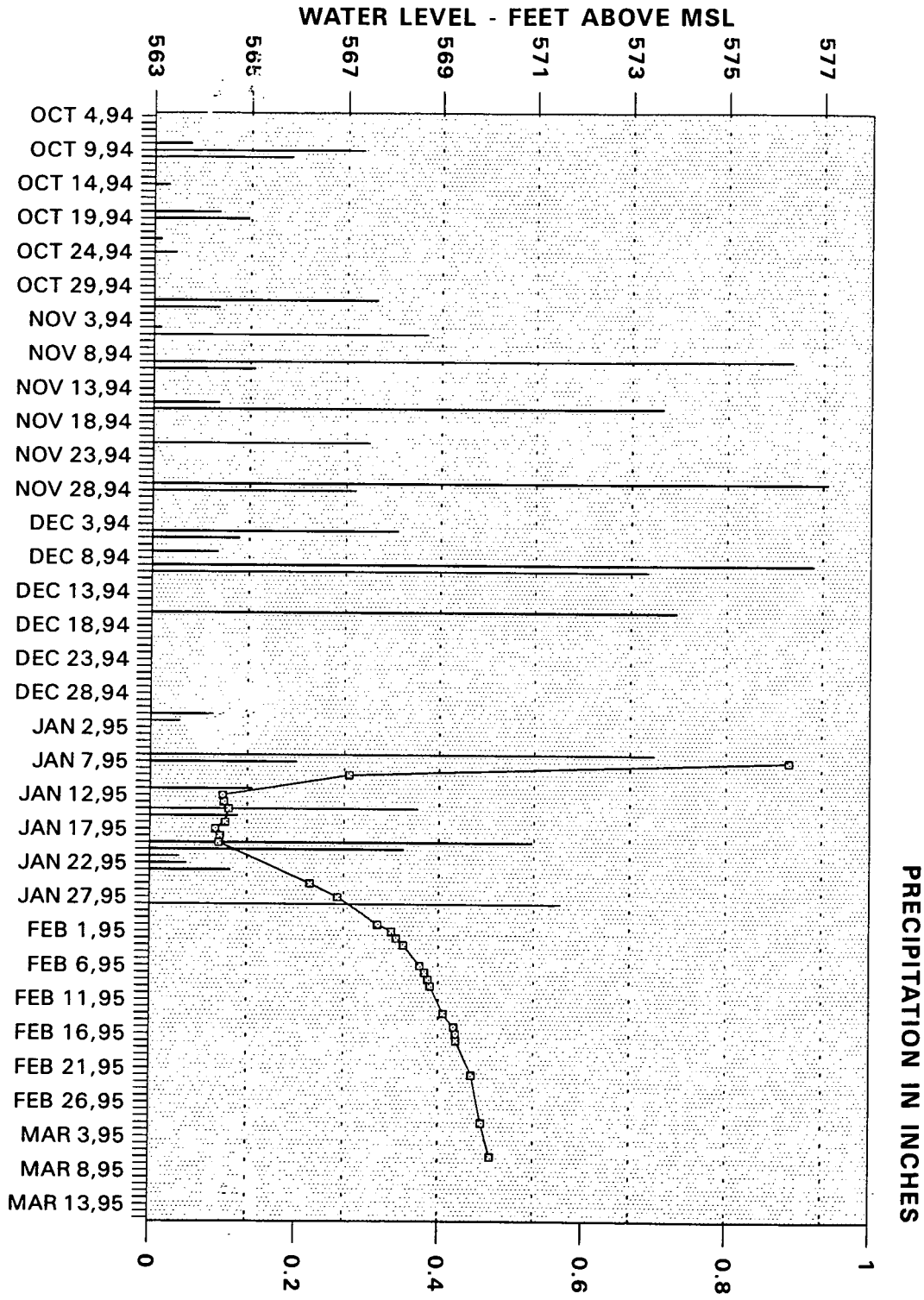

WATER LEVEL - FEET ABOVE MSL
565
567
569
571
573
575
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
Oct 4,94
Oct 9,94
Oct 14,94
Oct 19,94
Oct 24,94
Oct 29,94
Nov 3,94
Nov 8,94
Nov 13,94
Nov 18,94
Nov 23,94
Nov 28,94
Dec 3,94
Dec 8,94
Dec 13,94
Dec 18,94
Dec 23,94
Dec 28,94
Jan 2,95
Jan 7,95
Jan 12,95
Jan 17,95
Jan 22,95
Jan 27,95
Feb 1,95
Feb 6,95
Feb 11,95
Feb 16,95
Feb 21,95
Feb 26,95


WATER LEVEL - FEET ABOVE MSL
596
597
598
599
600
601
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
1.2
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

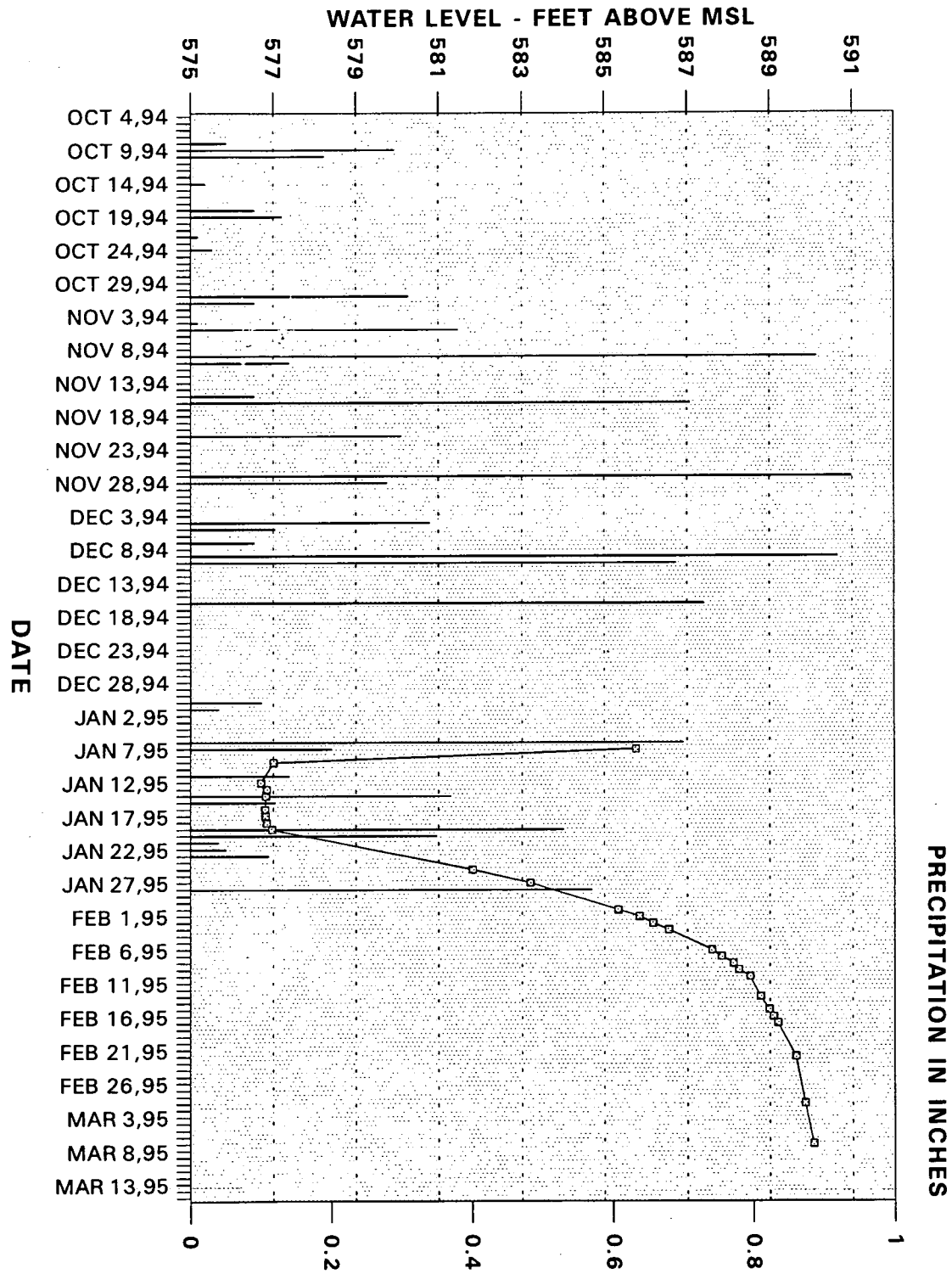
MW 11496

MW 11497


WATER LEVEL - FEET ABOVE MSL
568
570
572
574
576
578
580
582
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

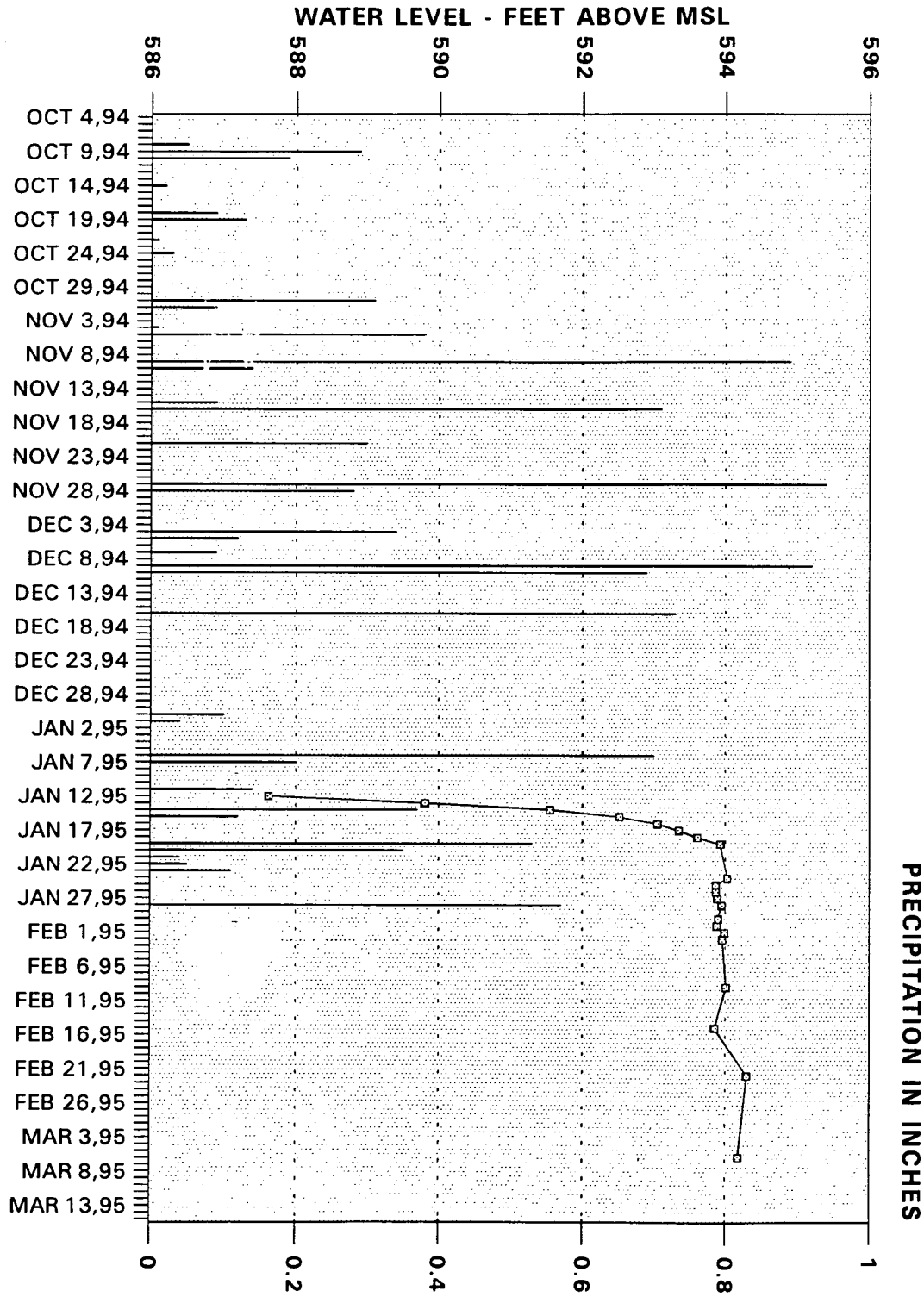

WATER LEVEL - FEET ABOVE MSL
563
565
567
569
571
573
575
577
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

MW 11498



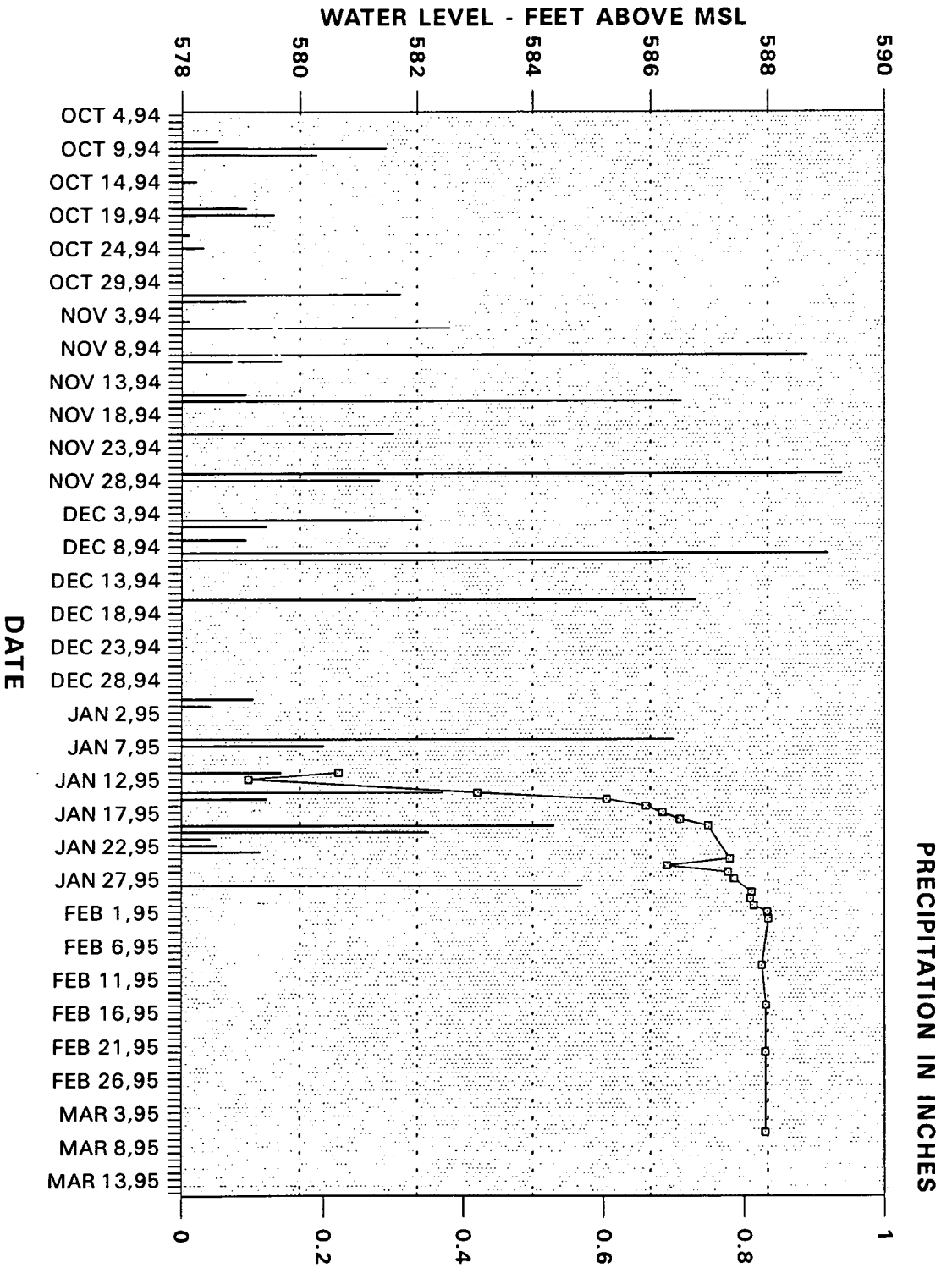
MW 11499

000273

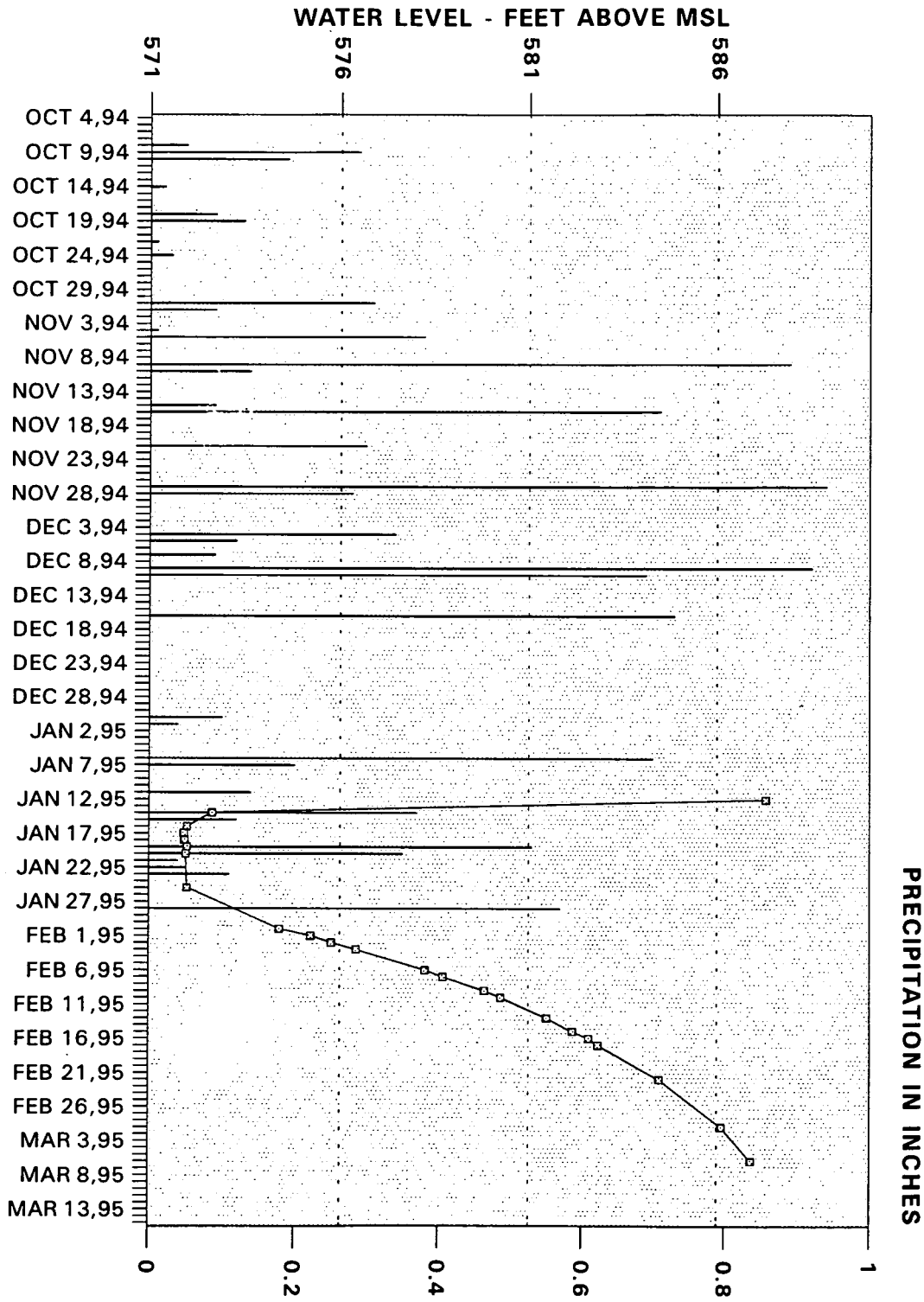


MW 11500

000274

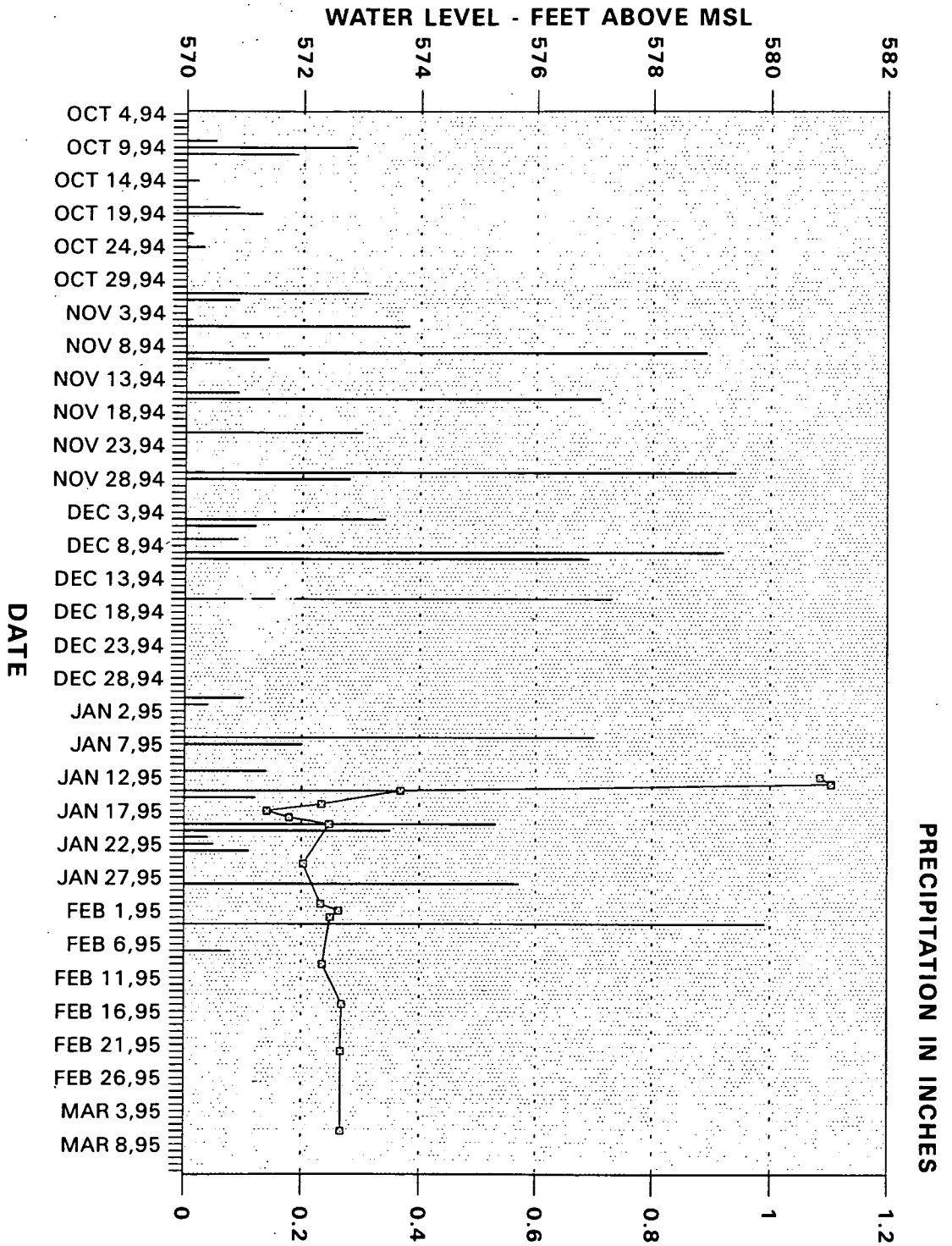

WATER LEVEL - FEET ABOVE MSL
578
580
582
584
586
588
590
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

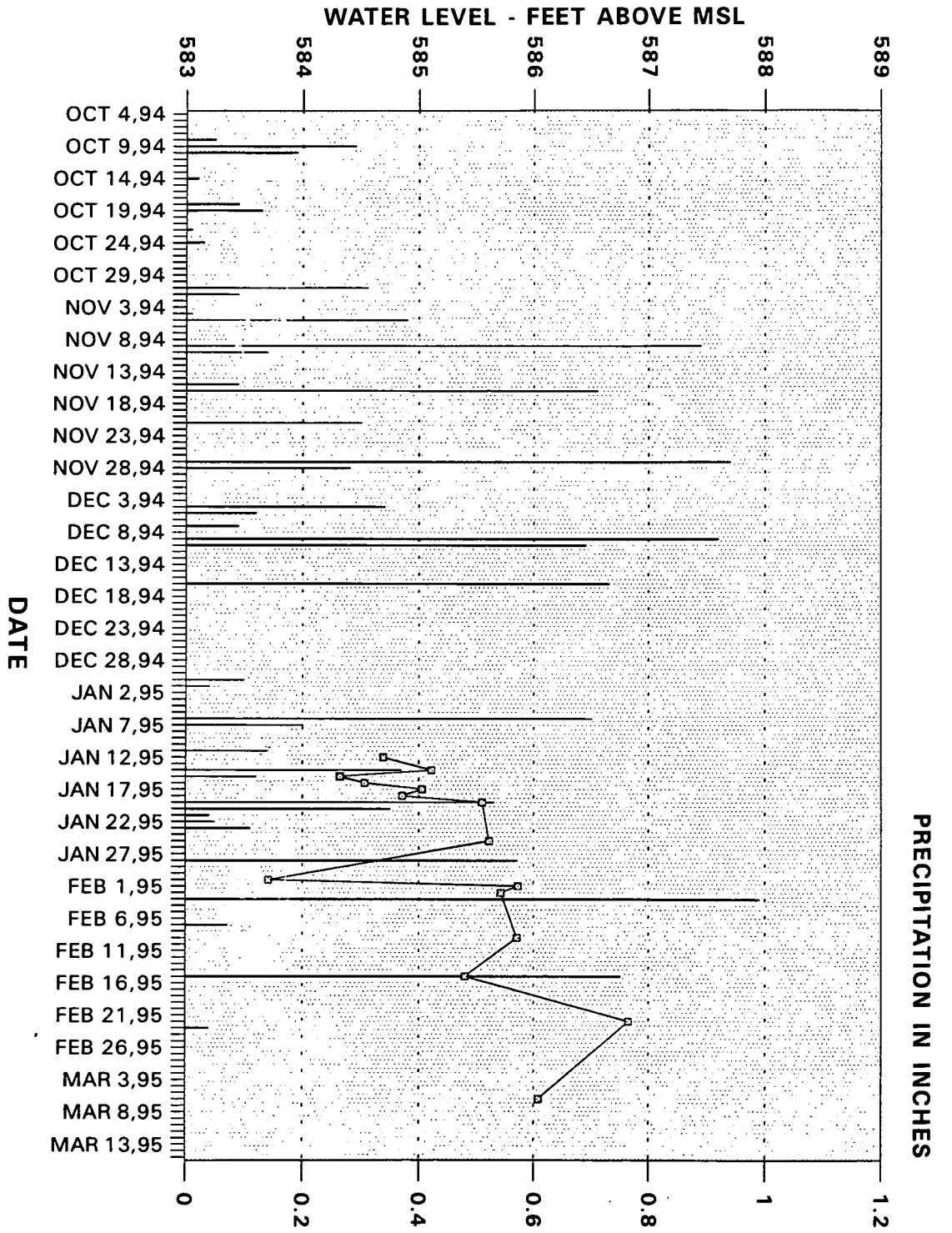
MW 11501


WATER LEVEL - FEET ABOVE MSL
571
576
581
586
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

MW 11502

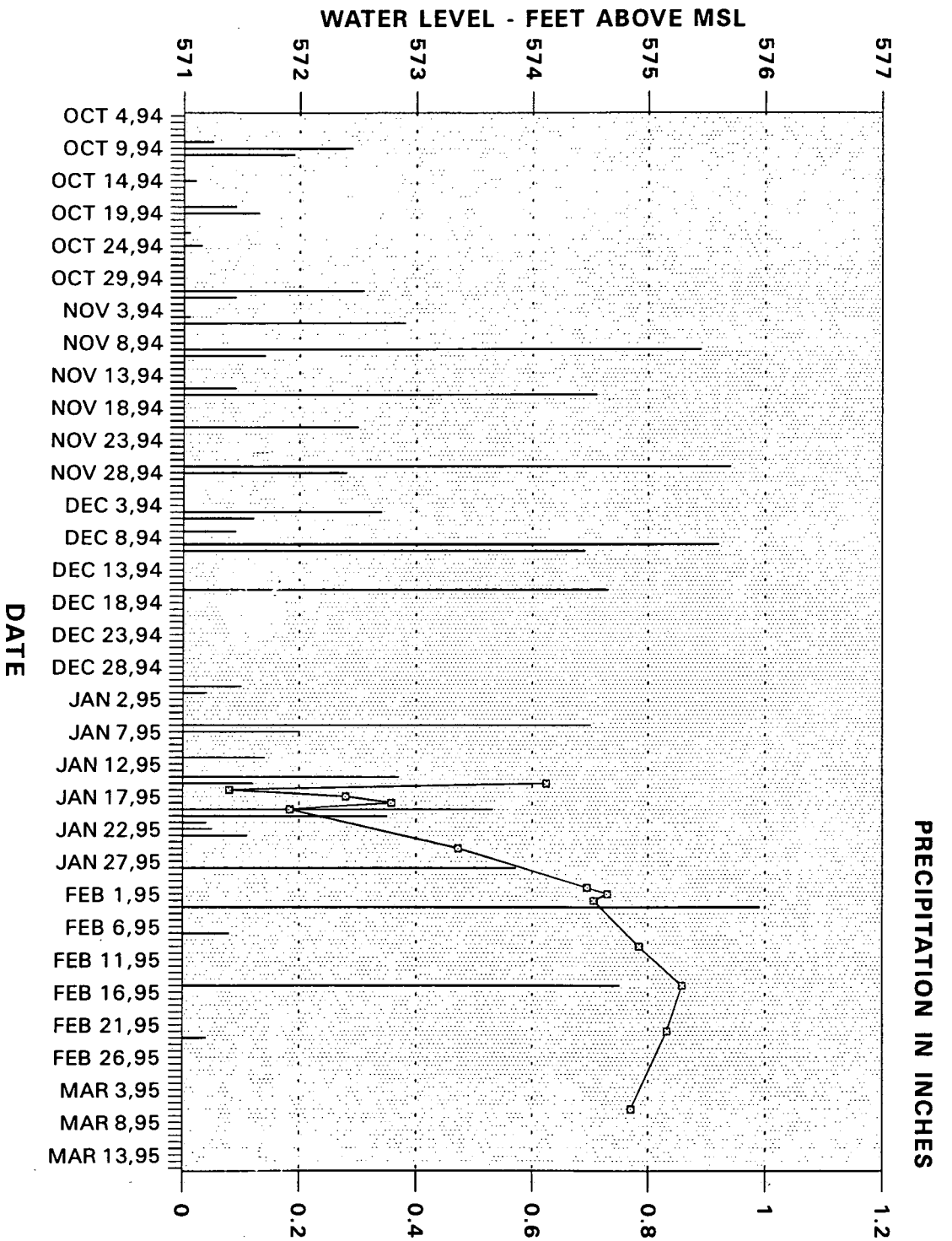
MW 11503


WATER LEVEL - FEET ABOVE MSL
570
572
574
576
578
580
582
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
1.2
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95

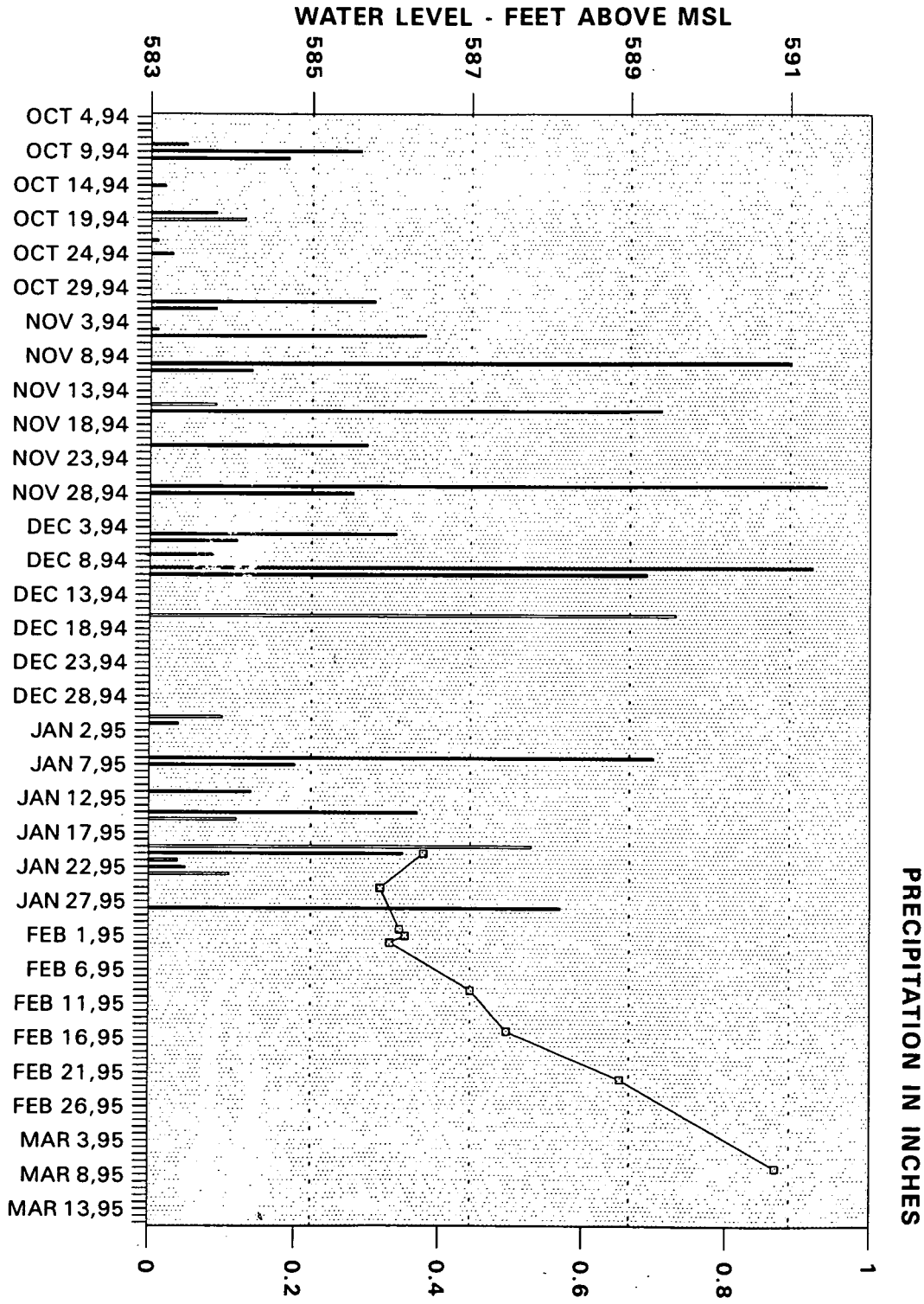


MW 11504

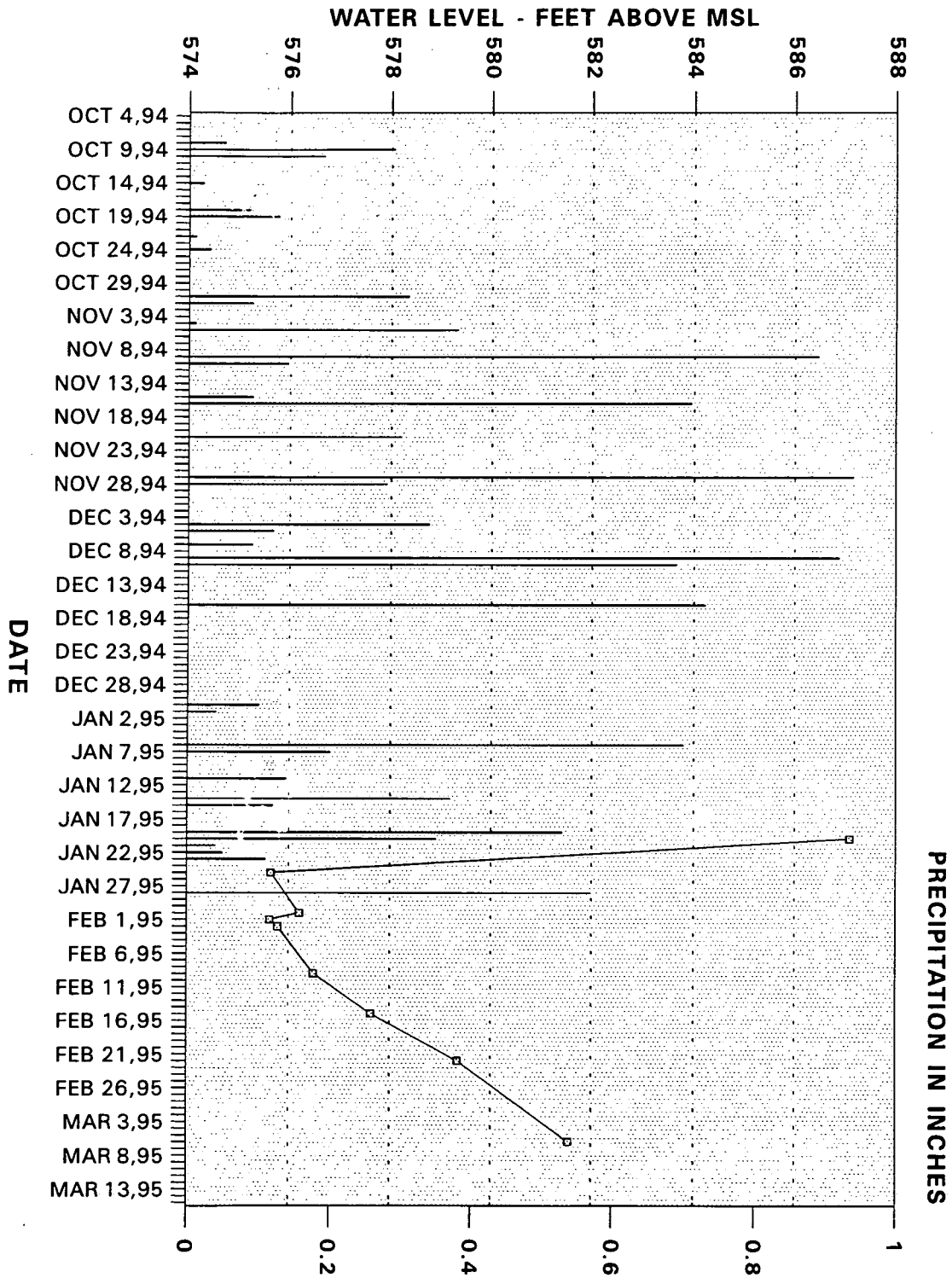
000278


WATER LEVEL - FEET ABOVE MSL
571
572
573
574
575
576
577
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
1.2
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

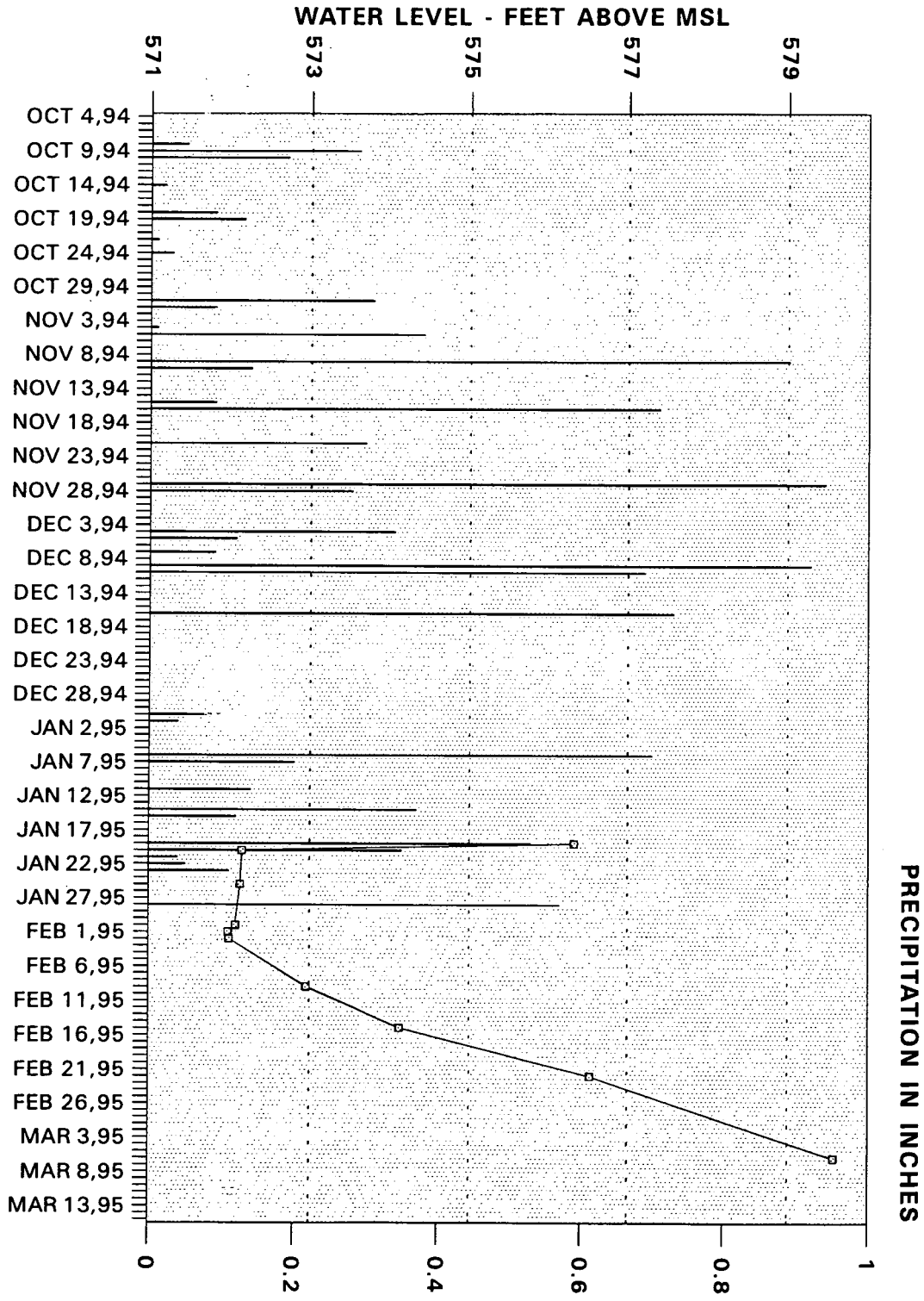
MW 11505


WATER LEVEL - FEET ABOVE MSL
583
585
587
589
591
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

MW 11546


WATER LEVEL - FEET ABOVE MSL
574
576
578
580
582
584
586
588
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

MW 11547


WATER LEVEL - FEET ABOVE MSL
571
573
575
577
579
PRECIPITATION IN INCHES
0
0.2
0.4
0.6
0.8
1
DATE
OCT 4,94
OCT 9,94
OCT 14,94
OCT 19,94
OCT 24,94
OCT 29,94
NOV 3,94
NOV 8,94
NOV 13,94
NOV 18,94
NOV 23,94
NOV 28,94
DEC 3,94
DEC 8,94
DEC 13,94
DEC 18,94
DEC 23,94
DEC 28,94
JAN 2,95
JAN 7,95
JAN 12,95
JAN 17,95
JAN 22,95
JAN 27,95
FEB 1,95
FEB 6,95
FEB 11,95
FEB 16,95
FEB 21,95
FEB 26,95
MAR 3,95
MAR 8,95
MAR 13,95

MW 11548

Appendix D - Geotechnical Results

TABLE D-1
SUMMARY OF PREMEABILITY TESTS
TX/PBP METHOD - ASTM D5084

GEOTECH BORING	DEPTH B.G.L.	SAMP. #	PERMEABILITY K (cm/sec)			
			MAXIMUM	MINIMUM	AVE.	GEOM. AVE.
11468	2.0- 4.5	403071A	9.60E-06	4.30E-06	6.35E-06	6.06E-06
11468	19.5-22.0	403084	1.20E-08	8.80E-09	1.05E-08	1.04E-08
11469	3.0- 5.5	402821B	9.90E-08	8.60E-08	9.03E-08	9.01E-08
11469	15.5-18.0	402831A	9.30E-09	7.00E-09	8.68E-09	8.62E-09
11470B	3.5- 6.0	403132A	1.00E-05	9.80E-06	9.95E-06	9.95E-06
11470B	30.0-32.0	403154C	8.60E-08	8.20E-08	8.43E-08	8.42E-08
11471	3.5- 6.0	402963A	1.10E-08	9.50E-09	1.04E-08	1.03E-08
11471	17.0-19.5	402974C	3.20E-08	2.80E-08	2.98E-08	2.97E-08
11472	3.5- 6.0	402940B	4.20E-08	4.00E-08	4.13E-08	4.12E-08
11472	23.0-25.5	402956D	1.60E-08	1.30E-08	1.43E-08	1.42E-08
11473	6.5- 8.5	402920B	2.30E-08	2.20E-08	2.25E-08	2.25E-08
11473	15.5-18.0	402928A	9.60E-09	8.30E-09	8.68E-09	8.66E-09
11474	3.5- 6.0	402892A	9.90E-08	9.60E-08	9.73E-08	9.72E-08
11474	14.0-16.5	402904A	1.50E-08	1.30E-08	1.40E-08	1.40E-08
11475	11.0-13.5	403258D	1.10E-08	8.20E-09	1.03E-08	1.02E-08
11475	15.5-18.0	403260A	1.00E-08	7.50E-09	8.75E-09	8.70E-09
11476	3.5- 6.0	402989A	1.30E-08	1.10E-08	1.15E-08	1.15E-08
11476	14.0-16.5	402998D	2.40E-08	1.50E-08	1.98E-08	1.95E-08
11477	3.5- 6.0	402864A	1.80E-07	1.70E-07	1.75E-07	1.75E-07
11477	14.0-16.5	402873D	5.70E-08	5.50E-08	5.60E-08	5.60E-08
11478	3.5- 6.0	402792D	1.00E-08	7.90E-09	8.95E-09	8.92E-09
11479	3.5- 6.0	403022A	3.30E-07	2.90E-07	3.13E-07	3.13E-07
11479	18.5-21.0	403034C	1.30E-08	1.20E-08	1.28E-08	1.27E-08
11480	9.5-12.0	402773A	2.90E-08	2.50E-08	2.73E-08	2.72E-08
11480	14.0-16.5	402777A	1.80E-08	1.70E-08	1.73E-08	1.72E-08
11481	6.5- 9.0	403204B	1.80E-08	1.60E-08	1.68E-08	1.67E-08
11481	20.0-22.0	403214A	2.60E-08	2.20E-08	2.38E-08	2.37E-08

TABLE D-2
SUMMARY OF UNIT WEIGHTS, POROSITY AND % SATURATION
FROM GEOTECHNICAL TESTING

Loc.	USCS Description	Depth	Sample No.	Unit Wt. Lb/Ft3	S.G.	Dry Unit Wt	Soil + H2O	H2O	Vol. Water	Vol. Soil	Vol. Total	% Sat.	% Pore Sp.	Type Test	ASTM Method
11469	Sandy Lean Clay (CL)	15.5 -18.0	402831	141.7	2.73	124.1	169.6	21.0	17.5	45.5	63.0	103.9	27.1	CON	D 2435
11471	Sandy Lean Clay (CL)	17.0 -19.5	402974	149.4	2.77	135.4	178.9	16.7	13.9	48.9	62.8	103.5	21.6	CON	D 2435
11472	Clayey Sand (SC)	9.5 -11.5	402945	145.0	2.69	130.8	173.6	17.0	14.2	48.6	62.8	103.3	22.0	CON	D 2435
11474	Sandy Lean Clay (CL)	14.0 -16.5	402904	142.9	2.75	127.4	171.1	18.5	15.5	46.3	61.8	96.4	25.7	CON	D 2435
11476	Sandy Silty Clay(Cl-Ml)	9.5 -12.0	402995	140.5	2.77	123.5	168.2	20.4	17.0	44.6	61.6	95.7	28.5	CON	D 2435
11477	Sandy Lean Clay (CL)	14.0 -16.5	402873	134.5	2.72	114.3	161.0	24.2	20.2	42.0	62.2	99.3	32.6	CON	D 2435
11468	Sandy Lean Clay (CL)	9.0 -11.5	403077A	136.7	2.74	120.1	808.5	98.3	16.6	43.8	60.4	89.6	29.7	COMP	D 4767
11468	Sandy Lean Clay (CL)	9.0 -11.5	403077B	136.5	2.74	116.9	980.5	141.0	19.6	42.7	62.3	99.6	31.6	COMP	D 4767
11468	Sandy Lean Clay (CL)	9.0 -11.5	403077C	140.7	2.74	122.6	915.7	117.9	18.1	44.7	62.9	102.8	28.3	COMP	D 4767
11469	Lean Clay W/Sand(CL)	3.0 - 5.5	402821C	130.8	2.70	114.1	808.7	103.7	16.8	42.2	59.0	83.3	32.3	COMP	D 4767
11469	Lean Clay W/Sand(CL)	3.0 - 5.5	402821E	122.2	2.70	102.6	772.0	123.7	19.6	38.0	57.6	80.4	39.1	COMP	D 4767
11469	Lean Clay W/Sand(CL)	3.0 - 5.5	402821D	124.4	2.70	106.1	831.8	122.0	18.2	39.3	57.6	79.1	37.0	COMP	D 4767
11470E	Silt (ML)	8.0 -10.5	403137C	137.8	2.72	119.1	972.1	132.1	18.7	43.8	62.5	100.7	29.8	COMP	D 4767
11470E	Silt (ML)	8.0 -10.5	403137D	131.9	2.72	111.1	856.6	134.9	20.8	40.9	61.6	96.6	34.5	COMP	D 4767
11470E	Silt (ML)	8.0 -10.5	403137E	135.0	2.72	115.3	929.6	135.3	19.6	42.4	62.1	98.4	32.0	COMP	D 4767
11472	Sandy Lean Clay (CL)	23.0 -25.5	402956A	144.3	2.69	128.0	985.2	111.3	16.3	47.6	63.9	110.3	23.7	COMP	D 4767
11472	Sandy Lean Clay (CL)	23.0 -25.5	402956B	144.4	2.69	128.6	998.5	109.4	15.8	47.8	63.6	108.6	23.4	COMP	D 4767
11472	Sandy Lean Clay (CL)	23.0 -25.5	402956C	144.1	2.69	127.8	991.6	111.8	16.2	47.5	63.8	109.5	23.8	COMP	D 4767
11475	Lean Clay W/Sand (CL)	11.0 -13.5	403258A	141.6	2.74	125.6	965.5	109.1	16.0	45.8	61.8	96.8	26.5	COMP	D 4767
11475	Lean Clay W/Sand (CL)	11.0 -13.5	403258B	137.5	2.74	117.7	931.0	133.8	19.8	43.0	62.7	101.9	31.1	COMP	D 4767
11475	Lean Clay W/Sand (CL)	11.0 -13.5	403258B	133.1	2.74	110.9	950.0	158.7	22.2	40.5	62.7	101.5	35.1	COMP	D 4767
11476	Silty Clayey Sand (SC-SM)	14.0 -16.5	402998A	146.2	2.75	134.4	1024.5	82.3	11.7	48.9	60.6	87.2	21.6	COMP	D 4767
11476	Silty Clayey Sand (SC-SM)	14.0 -16.5	402998B	144.4	2.75	133.2	914.7	71.2	11.2	48.4	59.7	80.6	22.4	COMP	D 4767
11476	Silty Clayey Sand (SC-SM)	14.0 -16.5	402998C	146.1	2.75	132.8	961.4	87.6	13.3	48.3	61.6	94.5	22.6	COMP	D 4767
11477	Sandy Lean Clay (CL)	14.0 -16.5	402873A											COMP	D 4767
11477	Sandy Lean Clay (CL)	14.0 -16.5	402873B	144.1	2.72	128.9	971.4	102.5	15.2	47.4	62.6	101.5	24.0	COMP	D 4767
11477	Sandy Lean Clay (CL)	14.0 -16.5	402873C	140.9	2.72	124.4	831.9	96.9	16.4	45.8	62.2	98.9	26.6	COMP	D 4767
11478	Lean Clay W/Sand (CL)	3.5 - 6.0	402792A	134.9	2.71	114.8	898.9	134.0	20.1	42.4	62.5	100.5	32.1	COMP	D 4767
11478	Lean Clay W/Sand (CL)	3.5 - 6.0	402792B	126.8	2.71	106.2	858.1	139.5	20.6	39.2	59.8	88.9	37.2	COMP	D 4767
11478	Lean Clay W/Sand (CL)	3.5 - 6.0	402792C	120.1	2.71	95.8	778.7	157.3	24.3	35.4	59.6	89.8	43.3	COMP	D 4767
11481	Sandy Lean Clay (CL)	15.5 -18.0	403211A	147.9	2.73	133.0	1048.2	105.8	14.9	48.7	63.6	109.3	21.9	COMP	D 4767
11481	Sandy Lean Clay (CL)	15.5 -18.0	403211B	144.7	2.73	128.8	989.1	108.3	15.8	47.2	63.0	104.4	24.3	COMP	D 4767
11481	Sandy Lean Clay (CL)	15.5 -18.0	403211C	144.3	2.73	129.0	998.8	106.0	15.3	47.2	62.6	101.3	24.2	COMP	D 4767

000285

TABLE D-2
SUMMARY OF UNIT WEIGHTS, POROSITY AND % SATURATION
FROM GEOTECHNICAL TESTING

Loc.	USCS Description	Depth	Sample No.	Unit Wt. Lb/Ft3	S.G.	Dry Unit Wt	Soil + H2O	H2O	Vol. Water	Vol. Soil	Vol. Total	% Sat.	% Pore Sp.	Type Test	ASTM Method
11468	Sandy Lean Clay (CL)	15.0 -17.5	403081B	144.2	2.73	127.2	1436.1	164.3	16.5	46.8	63.3	105.8	25.0	UCS	D 2166
11469	Lean Clay W/Sand (CL)	15.5 -18.0	402831B	143.2	2.73	125.9	1452.9	176.0	17.3	46.1	63.4	106.6	26.1	UCS	D 2166
11470E	Silt (ML)	8.0 -10.5	403137B	135.9	2.72	119.1	906.4	112.2	16.8	43.8	60.6	90.5	29.8	UCS	D 2166
11471	Silt (ML)	17.0 -19.5	402974B	145.9	2.77	132.0	1010.8	96.4	13.9	47.6	61.6	94.5	23.6	UCS	D 2166
11472	Lean Clay W/Sand (CL)	3.5 - 6.0	402940A	138.9	2.74	121.8	961.0	118.4	17.1	44.4	61.6	95.5	28.7	UCS	D 2166
11473	Lean Clay W/Sand (CL)	6.5 - 8.5	402920A	140.1	2.74	121.8	962.3	125.7	18.3	44.5	62.8	102.1	28.7	UCS	D 2166
11473	Sandy Lean Clay (CL)	15.5 -18.0	402928B	143.9	2.77	127.4	1016.5	116.0	16.4	46.0	62.4	100.4	26.2	UCS	D 2166
11474	Sandy Lean Clay (CL)	14.0 -16.5	402904B	144.7	2.75	129.1	1484.2	159.4	15.5	47.0	62.5	100.9	24.7	UCS	D 2166
11475	Sandy Lean Clay (CL)	15.5 -18.0	403260B	143.7	2.71	128.2	1320.9	142.7	15.5	47.3	62.8	103.0	24.2	UCS	D 2166
11476	Sandy Silty Clay (CL-ML)	9.5 -12.0	402995B	144.8	2.77	128.9	1019.9	112.3	15.9	46.5	62.5	100.6	25.4	UCS	D 2166
11477	Lean Clay W/Sand (CL)	3.5 - 6.0	402864B	124.3	2.73	100.1	868.9	169.4	24.2	36.7	60.9	94.2	41.2	UCS	D 2166
11479	Sandy Lean Clay (CL)	18.5 -21.0	403034A	144.7	2.69	128.4	1031.0	116.1	16.3	47.7	64.0	111.3	23.5	UCS	D 2166
11480	Lean Clay (CL)	0.5 - 3.0	402768A	128.3	2.71	106.3	815.6	140.0	22.0	39.2	61.2	95.1	37.1	UCS	D 2166
11481	Sandy Lean Clay (CL)	6.5 - 9.0	403204A	143.4	2.72	127.1	1462.0	166.1	16.3	46.7	63.0	104.2	25.1	UCS	D 2166
11468	Lean Clay W/Sand (CL)	2.0 - 4.5	403071A	124.1	2.72	103.0	444.8	75.8	21.1	37.8	59.0	86.3	39.3	Vt/TX-p	D 5084
11468	Sandy Lean Clay (CL)	19.5 -22.0	403084	141.8	2.76	124.8	504.5	60.6	17.0	45.2	62.2	99.2	27.5	Vt/TX-p	D 5084
11469	Lean Clay W/Sand (CL)	3.0 - 5.5	402821B	134.8	2.70	119.7	478.5	53.9	15.2	44.3	59.5	84.0	29.0	Vt/TX-p	D 5084
11469	Lean Clay W/Sand (CL)	15.5 -18.0	402831A	140.7	2.73	122.7	500.6	63.9	18.0	45.0	62.9	103.2	27.9	Vt/TX-p	D 5084
11470E	Silty Sand (SM)	3.5 - 6.0	403132A	134.5	2.70	112.9	473.4	76.2	21.6	41.8	63.4	105.2	33.0	Vt/TX-p	D 5084
11470E	Sandy Lean Clay W/Grav(CL	30.0 -32.0	403154C	136.8	2.73	117.2	467.6	67.1	19.6	42.9	62.5	100.9	31.2	Vt/TX-p	D 5084
11471	Fat Clay (CH)	3.5 - 6.0	402963A	127.3	2.72	102	454.6	90.3	25.3	37.5	62.8	101.7	39.9	Vt/TX-p	D 5084
11471	Sandy Lean Clay (CL)	17.0 -19.5	402974C	137.4	2.77	116.4	491.3	75.1	21.0	42.0	63.0	103.2	32.6	Vt/TX-p	D 5084
11472	Lean Clay W/Sand (CL)	3.5 - 6.0	402940B	135.6	2.74	116.2	485.0	69.5	19.4	42.4	61.8	97.3	32.0	Vt/TX-p	D 5084
11472	Sandy Lean Clay (CL)	23.0 -25.5	402956D	140.6	2.69	123.9	498.4	59.1	16.7	46.1	62.7	102.3	26.1	Vt/TX-p	D 5084
11473	Lean Clay W/Sand (CL)	6.5 - 8.5	402920B	140.7	2.74	122.5	499.0	64.6	18.2	44.7	62.9	103.1	28.3	Vt/TX-p	D 5084
11473	Sandy Lean Clay (CL)	15.5 -18.0	402928A	143.0	2.77	127	506.4	56.6	16.0	45.9	61.8	96.8	26.5	Vt/TX-p	D 5084
11474	Lean Clay W/Sand (CL)	3.5 - 6.0	402892A	135.8	2.79	115.3	484.8	73.1	20.5	41.3	61.8	97.3	33.7	Vt/TX-p	D 5084
11474	Sandy Lean Clay (CL)	14.0 -16.5	402904A	144.3	2.75	128.5	522.0	57.1	15.8	46.7	62.5	100.9	25.1	Vt/TX-p	D 5084
11475	Lean Clay W/Sand (CL)	11.0 -13.5	403258D	130.2	2.74	107.7	472.5	81.7	22.5	39.3	61.8	97.6	37.0	Vt/TX-p	D 5084
11475	Sandy Lean Clay (CL)	15.5 -18.0	403260A	142.3	2.71	126.6	511.3	56.4	15.7	46.7	62.4	100.3	25.1	Vt/TX-p	D 5084
11476	Lean Clay W/Sand (CL)	3.5 - 6.0	402989A	140.8	2.64	123	502.9	63.7	17.8	46.6	64.4	112.9	25.3	Vt/TX-p	D 5084
11476	Silty Clayey Sand (SC-SM)	14.0 -16.5	402998D	142.9	2.75	125.7	504.7	60.8	17.2	45.7	62.9	103.3	26.7	Vt/TX-p	D 5084
11477	Lean Clay W/Sand (CL)	3.5 - 6.0	402864A	130.8	2.73	108.9	402.9	67.5	21.9	39.9	61.8	97.5	36.0	Vt/TX-p	D 5084
11477	Sandy Lean Clay (CL)	14.0 -16.5	402873D	136.3	2.72	115.5	487.1	74.4	20.8	42.5	63.3	104.5	31.9	Vt/TX-p	D 5084
11478	Lean Clay W/Sand (CL)	3.5 - 6.0	402792D	126.6	2.71	126.6	452.0	81.9	22.9	38.3	61.2	95.1	38.7	Vt/TX-p	D 5084
11479	Sandy Lean Clay (CL)	3.5 - 6.0	403022A	134.4	2.74	115.6	464.3	65.1	18.8	42.2	61.0	93.3	32.4	Vt/TX-p	D 5084
11479	Sandy Lean Clay (CL)	18.5 -21.0	403034C	136.1	2.69	117.9	482.6	64.5	18.2	43.8	62.0	98.1	29.7	Vt/TX-p	D 5084
11480	Lean Clay W/Sand (CL)	14.0 -16.5	402777A	143.3	2.73	127	512.5	58.4	16.3	46.5	62.8	103.0	25.4	Vt/TX-p	D 5084
11481	Sandy Lean Clay (CL)	6.5 - 9.0	403204B	141.1	2.72	125.1	385.2	43.6	16.0	46.0	62.0	97.6	26.2	Vt/TX-p	D 5084
11481	Sandy Lean Clay (CL)	20.0 -22.0	402214A	144.1	2.73	127.6	519.6	59.4	16.5	46.7	63.2	105.5	25.0	Vt/TX-p	D 5084

TABLE D-3
SUMMARY OF GRAIN SIZE DISTRIBUTION FROM GEOTECHNICAL TESTING

Geotech Boring	Adjacent CPTs (Borings	Distance from Geotech Boring	Sample ID #	Depth B.G.L.	Passing (US Standard Sieve #)										Gravel		Sand			Silt & Clay	Silt	Clay
					1.5"	3/4"	3/8"	4	10	20	40	60	100	200	Crse	Fine	Crse	Med	Fine			
				(ft)	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
11468	11429	5.6	403071	2.0- 4.5	100.0	100.0	98.5	96.3	94.2	90.9	88.3	85.6	81.9	77.4	0.0	3.7	2.1	5.9	10.9	77.4	35.8	41.6
11468	(11482)	10.3	403074	4.5- 6.0	100.0	98.1	96.3	93.5	87.8	81.1	77.2	73.9	70.3	65.9	1.9	4.6	5.7	10.6	11.3	65.9	36.8	29.1
11468	(11483)	19.9	403077	9.0-11.5	100.0	100.0	98.8	97.3	92.5	82.8	76.7	71.1	64.1	56.3	0.0	2.7	4.8	15.8	20.4	56.3	34.9	21.4
11468	(11491)	18.4	403081	15.0-17.5	100.0	97.8	91.2	89.7	85.4	80.7	77.0	73.8	69.8	65.5	2.2	8.1	4.3	8.4	11.5	65.5	36.9	28.6
11468	(11492)	6.0	403084	19.5-22.0	100.0	93.9	89.2	87.0	83.3	77.9	73.8	70.4	66.3	61.1	6.1	6.9	3.7	9.5	12.7	61.1	37.2	23.9
11468			403089	25.0-26.5	100.0	100.0	97.5	93.8	89.0	84.0	79.8	76.0	71.7	66.0	0.0	6.2	4.8	9.2	13.8	66.0	38.9	27.1
11469			402820	1.5- 3.0	100.0	100.0	100.0	100.0	100.0	99.2	98.5	97.9	97.0	96.1	0.0	0.0	0.0	1.5	2.4	96.1	58.2	37.9
11469			402821	3.0- 5.5	100.0	100.0	98.3	97.5	95.5	92.0	89.5	87.0	83.9	79.5	0.0	2.5	2.0	6.0	10.0	79.5	46.9	32.6
11469			402826	9.0-10.5	100.0	100.0	95.9	92.4	88.4	84.5	81.2	78.0	73.5	67.6	0.0	7.6	4.0	7.2	13.6	67.6	41.3	26.3
11469			402831	15.5-18.0	100.0	100.0	100.0	95.9	94.7	89.7	86.8	84.3	81.2	77.0	0.0	4.1	1.2	7.9	9.8	77.0	45.3	31.7
11469			402835	20.0-21.5	100.0	100.0	96.3	92.8	89.0	83.7	79.7	75.8	71.7	66.3	0.0	7.2	3.8	9.3	13.4	66.3	38.0	28.3
11469			402838	24.0-25.5	100.0	96.9	93.8	89.6	80.0	74.7	70.6	67.0	62.8	57.5	3.1	7.3	9.6	9.4	13.1	57.5	33.3	24.2
11469			402842	30.0-31.5	100.0	100.0	93.2	87.8	82.9	77.3	73.2	69.0	64.9	59.9	0.0	12.2	4.9	9.7	13.3	59.9	37.6	22.3
11470B	11431	32.3	403131	1.5- 3.0	100.0	93.7	91.3	87.8	81.1	73.6	68.0	62.4	54.5	44.2	6.3	5.9	6.7	13.1	23.8	44.2	33.5	10.7
11470B			403132	3.5- 6.0	100.0	100.0	97.5	93.0	86.5	79.5	74.9	70.1	62.3	49.4	0.0	7.0	6.5	11.6	25.5	49.4	40.9	8.5
11470B			493137	8.0-10.5	100.0	100.0	99.1	98.8	98.6	97.9	96.6	91.8	80.7	62.7	0.0	1.2	0.2	2.0	33.9	62.7	47.9	14.8
11470B			403141	13.5-15.0	100.0	100.0	99.3	96.8	92.5	87.7	83.8	80.4	76.4	71.3	0.0	3.2	4.3	8.7	12.5	71.3	38.8	32.5
11470B			403144	18.0-19.5	100.0	97.1	94.1	91.7	88.8	85.9	83.2	80.6	77.4	73.8	2.9	5.4	2.9	5.6	9.4	73.8	49.3	24.5
11470B			403150	23.5-25.0	100.0	97.6	94.0	90.5	85.1	79.0	74.2	70.2	65.6	59.4	2.4	7.1	5.4	10.9	14.8	59.4	38.1	21.3
11470B			403154	30.0-32.0	100.0	97.9	90.7	84.3	79.0	70.8	65.8	61.7	57.1	51.4	2.1	13.6	5.3	13.2	14.4	51.4	32.8	18.6
11471	11441	43.2	402962	1.5- 3.0	100.0	100.0	100.0	100.0	100.0	99.5	98.8	97.8	96.2	94.1	0.0	0.0	0.0	1.2	4.7	94.1	60.4	33.7
11471			402963	3.5- 6.0	100.0	100.0	100.0	100.0	100.0	99.4	98.5	97.8	97.0	96.2	0.0	0.0	0.0	1.5	2.3	96.2	55.4	40.8
11471			402969	10.5-11.5	100.0	100.0	100.0	97.6	91.9	81.8	71.4	60.4	48.7	37.9	0.0	2.4	5.7	20.5	33.5	37.9	26.8	11.1
11471			402973	15.0-16.5	100.0	100.0	100.0	100.0	99.7	99.2	98.6	98.0	97.0	96.1	0.0	0.0	0.3	1.1	2.5	96.1	78.4	17.7
11471			402974	17.0-19.5	100.0	100.0	95.0	89.3	82.0	76.1	71.2	66.5	60.7	53.3	0.0	10.7	7.3	10.8	17.9	53.3	34.3	19.0
11471			402979	27.5-29.0	100.0	100.0	91.9	88.2	83.4	78.3	74.2	70.7	66.3	61.0	0.0	11.8	4.8	9.2	13.2	61.0	36.4	24.6
11472	11448	9.5	402939	1.5- 3.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	99.1	98.3	96.8	0.0	0.0	0.0	0.5	2.7	96.8	49.3	47.5
11472			402940	3.5- 6.0	100.0	100.0	99.1	97.3	94.7	91.7	88.7	85.3	81.1	75.9	0.0	2.7	2.6	6.0	12.8	75.9	41.0	34.9
11472			402945	9.5-11.5	100.0	96.3	84.8	74.2	67.0	61.3	56.6	52.9	49.0	44.9	3.7	22.1	7.2	10.4	11.7	44.9	24.9	20.0
11472			402953	18.5-19.5	100.0	100.0	88.8	75.8	58.2	44.2	34.9	29.3	25.0	21.6	0.0	24.2	17.6	23.3	13.3	21.6	13.8	7.8
11472			402956	23.0-25.5	100.0	100.0	96.8	92.9	88.4	83.1	79.0	75.0	70.3	64.5	0.0	7.1	4.5	9.4	14.5	64.5	38.8	25.7

000287

TABLE D-3 (CONTINUED)
SUMMARY OF GRAIN SIZE DISTRIBUTION
FROM GEOTECHNICAL TESTING

Geotech Boring	Adjacent CPTs (Borings	Distance from Geotech Boring	Sample ID #	Depth B.G.L. (ft)	Passing (US Standard Sieve #) 1.5" %	3/4" %	3/8" %	4 %	10 %	20 %	40 %	60 %	100 %	200 %	Gravel Crse %	Gravel Fine %	Sand Crse %	Sand Med %	Sand Fine %	Silt & Clay %	Silt %	Clay %
11473	11447	9.3	402918	3.5- 6.0	100.0	97.1	96.1	94.4	91.7	87.6	85.2	82.9	80.3	77.2	2.9	2.7	2.7	6.5	8.0	77.2	44.3	32.9
11473			402920	6.5- 8.5	100.0	96.7	94.4	92.7	89.7	85.9	82.6	79.7	76.3	71.9	3.3	4.0	3.0	7.1	10.7	71.9	37.0	34.9
11473			402922	9.0-10.5	100.0	100.0	98.3	94.1	88.7	82.4	78.2	74.6	70.5	64.9	0.0	5.9	5.4	10.5	13.3	64.9	37.5	27.4
11473			402928	15.5-18.0	100.0	96.6	94.1	91.1	87.3	81.8	77.9	74.8	70.9	66.3	3.4	5.5	3.8	9.4	11.6	66.3	35.6	30.7
11473			402931	20.0-22.0	100.0	100.0	97.1	94.5	90.7	86.9	83.3	79.6	75.1	69.6	0.0	5.5	3.8	7.4	13.7	69.6	35.5	34.1
11473			402934	23.5-25.0	100.0	98.5	95.9	93.1	87.8	82.4	78.4	74.6	70.1	64.5	1.5	5.4	5.3	9.4	13.9	64.5	35.1	29.4
11474	11445	9.1	402891	1.5- 3.0	100.0	93.3	92.4	92.3	92.0	90.1	88.6	87.4	85.8	83.8	6.7	1.0	0.3	3.4	4.8	83.8	46.4	37.4
11474			402892	3.5- 6.0	100.0	100.0	100.0	99.2	98.2	95.7	93.5	91.4	88.1	82.6	0.0	0.8	1.0	4.7	10.9	82.6	56.1	26.5
11474			402898	9.0-10.5	100.0	100.0	97.7	94.9	90.9	86.0	82.1	78.7	74.5	68.8	0.0	5.1	4.0	8.8	13.3	68.8	41.2	27.6
11474			402904	14.0-16.5	100.0	100.0	93.8	89.2	84.8	79.6	75.3	71.6	66.7	61.7	0.0	10.8	4.4	9.5	13.6	61.7	36.1	25.6
11474			402907	18.5-21.0	100.0	100.0	95.0	91.6	87.1	82.3	78.6	75.6	71.6	66.7	0.0	8.4	4.5	8.5	11.9	66.7	35.3	31.4
11474			402911	23.5-25.0	100.0	100.0	94.6	91.5	87.5	82.8	79.2	76.0	71.9	67.1	0.0	8.5	4.0	8.3	12.1	67.1	41.1	26.0
11475	11450	101.3	403251	2.0- 4.5	100.0	100.0	100.0	99.2	97.6	96.7	95.6	94.3	92.3	89.5	0.0	0.8	1.6	2.0	6.1	89.5	43.4	46.1
11475			403254	6.5- 9.0	100.0	100.0	98.4	98.4	98.2	97.2	95.4	93.3	90.3	86.9	0.0	1.6	0.2	2.8	8.5	86.9	43.7	43.2
11475			403258	11.0-13.5	100.0	100.0	99.6	98.2	95.2	90.4	86.5	82.8	78.3	72.6	0.0	1.8	3.0	8.7	13.9	72.6	38.3	34.3
11475			403260	15.5-18.0	100.0	100.0	96.6	93.1	89.0	83.1	79.1	75.9	72.4	67.8	0.0	6.9	4.1	9.9	11.3	67.8	37.3	30.5
11475			403263	19.5-21.0	100.0	96.9	90.4	85.5	81.4	77.5	74.0	70.7	66.9	62.1	3.1	11.4	4.1	7.4	11.9	62.1	34.6	27.5
11476	11439	5.5	402988	1.5- 3.0	100.0	93.0	91.4	88.5	86.4	83.7	81.4	78.8	76.3	72.1	7.0	4.5	2.1	5.0	9.3	72.1	37.1	35.0
11476	(11498)	7.0	402989	3.5- 6.0	100.0	100.0	99.5	97.9	95.7	93.3	91.4	89.8	87.7	84.7	0.0	2.1	2.2	4.3	6.7	84.7	43.6	41.1
11476	(11499)	12.6	402995	9.5-12.0	100.0	100.0	100.0	99.9	99.5	96.0	91.2	85.5	78.6	69.4	0.0	0.1	0.4	8.3	21.8	69.4	48.2	21.2
11476			402998	14.0-16.5	100.0	100.0	95.0	89.7	82.9	72.8	66.6	61.4	55.6	48.0	0.0	10.3	6.8	16.3	18.6	48.0	34.1	13.9
11476			403002	18.5-21.0	100.0	100.0	98.9	97.7	95.5	89.7	85.8	82.0	77.4	71.1	0.0	2.3	2.2	9.7	14.7	71.1	44.6	26.5
11476			403006	24.0-25.5	100.0	100.0	97.9	94.8	90.6	85.9	82.1	78.8	74.9	69.8	0.0	5.2	4.2	8.5	12.3	69.8	38.5	31.3
11477	11438	9.6	402863	1.5- 3.0	100.0	100.0	100.0	100.0	100.0	99.1	98.1	97.0	95.3	93.1	0.0	0.0	0.0	1.9	5.0	93.1	56.7	36.4
11477	(11484)	22.8	402864	3.5- 6.0	100.0	100.0	98.7	98.6	98.0	96.5	93.1	87.6	80.8	71.7	0.0	1.4	0.6	4.9	21.4	71.7	42.6	29.1
11477	(11500)	10.1	402868	8.0- 9.0	100.0	100.0	99.5	93.4	83.3	72.1	63.6	56.8	49.3	39.6	0.0	6.6	10.1	19.7	24.0	39.6	35.2	4.4
11477	(11501)	22.9	402873	14.0-16.5	100.0	100.0	97.2	94.8	91.5	86.1	81.8	77.8	73.2	67.0	0.0	5.2	3.3	9.7	14.8	67.0	40.6	26.4
11477			402878	22.0-22.5	100.0	100.0	100.0	95.8	86.5	82.0	78.0	74.0	68.6	61.0	0.0	4.2	9.3	8.5	17.0	61.0	36.4	24.6
11477			402879	22.5-23.5	100.0	100.0	95.5	93.5	91.9	89.5	86.1	76.2	57.4	40.3	0.0	6.5	1.6	5.8	45.8	40.3	33.2	7.1
11477			402887	34.0-35.5	100.0	94.2	92.1	90.0	86.2	82.3	78.3	74.6	70.0	63.8	5.8	4.2	3.8	7.9	14.5	63.8	39.2	24.6

TABLE D-3 (CONTINUED)
SUMMARY OF GRAIN SIZE DISTRIBUTION
FROM GEOTECHNICAL TESTING

Geotech Boring	Adjacent CPTs (Borings	Distance from Geotech Boring	Sample ID #	Depth B.G.L. (ft)	Passing (US Standard Sieve #) 1.5" %	3/4" %	3/8" %	4 %	10 %	20 %	40 %	60 %	100 %	200 %	Gravel Crse %	Gravel Fine %	Sand Crse %	Sand Med %	Sand Fine %	Silt & Clay %	Silt %	Clay %
11478	11436	0.9	402790	1.5- 3.0	100.0	100.0	100.0	100.0	100.0	99.6	99.0	98.1	96.7	94.9	0.0	0.0	0.0	1.0	4.1	94.9	51.0	43.9
11478			402792	3.5- 6.0	100.0	100.0	98.0	96.6	95.0	91.6	88.9	86.2	82.7	78.9	0.0	3.4	1.6	6.1	10.0	78.9	39.8	39.1
11478			402798	10.5-12.0	100.0	100.0	97.6	95.5	90.0	86.0	82.9	79.8	76.0	70.5	0.0	4.5	5.5	7.1	12.4	70.5	38.6	31.9
11478			402805	21.5-23.0	100.0	98.3	97.0	92.7	84.3	79.7	75.6	71.2	66.5	60.6	1.7	5.6	8.4	8.7	15.0	60.6	35.7	24.9
11478			402807	24.5-26.0	100.0	100.0	98.4	96.1	92.9	89.9	87.1	79.6	66.6	54.8	0.0	3.9	3.2	5.8	32.3	54.8	36.7	18.1
11478			402810	30.5-32.0	100.0	100.0	100.0	100.0	100.0	99.8	98.5	86.7	62.8	42.6	0.0	0.0	0.0	1.5	55.9	42.6	22.1	20.5
11478			402812	33.5-35.0	100.0	100.0	100.0	100.0	100.0	99.9	99.2	88.1	67.2	44.8	0.0	0.0	0.0	0.8	54.4	44.8	26.1	18.7
11479	11435	4.7	403021	1.5- 3.0	100.0	100.0	99.7	99.4	98.8	97.4	95.7	92.9	89.7	86.3	0.0	0.6	0.6	3.1	9.4	86.3	39.3	47.0
11479	(11486)	16.7	403022	3.5- 6.0	100.0	100.0	99.0	96.1	88.8	79.9	74.7	69.4	62.9	53.3	0.0	3.9	7.3	14.1	21.4	53.3	34.4	18.9
11479	(11496)	6.0	403032	16.5-17.5	100.0	95.8	93.3	85.8	74.5	63.0	47.3	35.2	27.1	21.1	4.2	10.0	11.3	27.2	26.2	21.1	12.9	8.2
11479	(11497)	11.9	403034	18.5-21.0	100.0	99.2	95.8	93.2	88.6	82.9	78.3	74.6	70.0	64.8	0.8	6.0	4.6	10.2	13.6	64.8	39.8	25.0
11479			403037	23.0-25.5	100.0	100.0	100.0	98.0	95.1	88.5	84.0	80.1	75.6	69.7	0.0	2.0	2.9	11.1	14.3	69.7	41.2	28.5
11479			403043	31.5-33.0	100.0	100.0	92.9	82.8	71.5	66.4	58.3	53.9	48.9	44.1	0.0	17.2	11.3	13.2	14.2	44.1	30.4	13.7
11479			403045	34.5-36.0	100.0	97.6	95.3	91.4	86.2	80.1	75.2	71.0	66.2	60.4	2.4	6.2	5.2	11.0	14.8	60.4	36.7	23.7
11480	11434	5.3	402768	0.5- 3.0	100.0	97.5	97.5	97.1	96.9	95.8	94.6	92.7	90.2	86.9	2.5	0.4	0.2	2.3	7.7	86.9	41.2	45.7
11480			402770	5.0- 7.5	100.0	100.0	99.5	99.0	98.2	96.2	94.3	92.6	90.5	87.8	0.0	1.0	0.8	3.9	6.5	87.8	51.2	36.6
11480			402773	9.5-12.0	100.0	100.0	100.0	99.6	98.0	93.9	90.7	87.9	83.9	79.6	0.0	0.4	1.6	7.3	11.1	79.6	44.8	34.8
11480			402777	14.0-16.5	100.0	100.0	98.0	95.3	91.4	86.9	83.6	80.5	76.4	71.1	0.0	4.7	3.9	7.8	12.5	71.1	44.8	26.3
11480			402779	18.0-20.0	100.0	100.0	98.6	95.1	91.4	87.0	82.9	79.3	75.0	69.6	0.0	4.9	3.7	8.5	13.3	69.6	40.6	29.0
11480			402784	24.5-27.0	100.0	100.0	94.5	91.2	87.3	82.0	77.6	73.4	68.7	63.3	0.0	8.8	3.9	9.7	14.3	63.3	36.7	26.6
11480			402787	29.0-31.5	100.0	100.0	95.8	92.9	89.2	83.1	78.5	75.1	71.1	66.2	0.0	7.1	3.7	10.7	12.3	66.2	36.9	29.3
11481	11421	40.6	403202	3.5- 6.0	100.0	100.0	94.1	91.1	88.4	83.2	79.3	75.7	71.5	66.2	0.0	8.9	2.7	9.1	13.1	66.2	36.5	29.7
11481			403204	6.5- 9.0	100.0	100.0	97.4	94.3	90.3	85.3	81.7	78.2	74.0	68.6	0.0	5.7	3.9	8.7	13.1	68.6	39.7	28.9
11481			403211	15.5-18.0	100.0	100.0	96.6	93.5	88.6	82.5	77.9	73.9	69.4	63.7	0.0	6.5	4.9	10.7	14.2	63.7	37.8	25.9
11481			403214	20.0-22.0	100.0	96.0	94.9	92.3	88.0	82.4	78.1	74.3	69.9	64.1	4.0	3.7	4.3	9.9	14.0	64.1	38.4	25.7
11481			403219	26.5-28.0	100.0	93.9	93.6	92.8	91.1	87.4	83.2	79.3	73.9	65.4	6.1	1.1	1.7	7.9	17.8	65.4	44.2	21.2
11481			403223	32.5-34.0	100.0	100.0	98.4	94.5	89.9	85.6	82.0	78.7	75.3	70.8	0.0	5.5	4.6	7.9	11.2	70.8	40.1	30.7
11481			403227	37.0-38.5	100.0	95.6	91.5	86.9	82.0	77.0	73.1	69.6	65.7	60.6	4.4	8.7	4.9	8.9	12.5	60.6	35.4	25.2

A Note: NP = Non Plastic

B Note: 11479 18.5-21.0 had single grain on 1.5 screen

C Note: 11481 6.5-9.0 had single grain on 1.5 screen

11479			403034	18.5-21.0	92.8	92.1	88.9	86.5	82.2	76.9	72.7	69.2	65.0	60.1	7.9	5.6	4.3	9.5	12.6	60.1	35.10	25.0
11481			403204	6.5- 9.0	81.8	81.8	79.7	77.1	73.9	69.8	66.8	64.0	60.5	56.1	18.2	4.7	3.2	7.1	10.7	56.1	32.50	23.6

000289

TABLE D-3 (CONTINUED)
SUMMARY OF GEOTECHNICAL ANALYSES FOR GRAIN SIZE DISTRIBUTION

Geotech Boring	Adjacent CPTs (Borings	Distance from Geotech Boring	Sample ID #	Depth B.G.L. (ft)	Passing (US Standard Sieve #) 1.5" %	3/4" %	3/8" %	4 %	10 %	20 %	40 %	60 %	100 %	200 %	Gravel Crse %	Gravel Fine %	Sand Crse %	Sand Med %	Sand Fine %	Silt & Clay %	Silt %	Clay %
SUMMARY OF RESULTS FROM STANDARD PROCTOR SAMPLES																						
11468			403103	2.0-6.5	100.0	100.0	93.7	90.5	88.2	85.6	83.7	81.8	79.3	76.2	0.0	9.5	2.3	4.5	7.5	76.2	38.1	38.1
11468			403104	9.0-13.0	100.0	100.0	100.0	100.0	96.9	89.6	85.1	80.4	75.0	70.7	0.0	0.0	3.1	11.8	14.4	70.7	41.5	29.2
11469			402824	3.0-7.5	100.0	98.5	96.5	94.4	91.6	87.0	84.0	81.0	77.6	72.8	1.5	4.1	2.8	7.6	11.2	72.8	38.7	34.1
11469			402828	7.5-12.0	100.0	100.0	98.6	96.4	93.0	88.5	84.7	81.4	77.3	71.6	0.0	3.6	3.4	8.3	13.1	71.6	39.5	32.1
11470B			403169	3.5-7.5	100.0	97.2	95.3	93.1	90.0	82.0	77.5	73.1	66.6	55.9	2.8	4.1	3.1	12.5	21.6	55.9	44.8	11.1
11470B			403170	7.5-12.0	100.0	100.0	99.7	98.5	95.2	91.6	88.9	85.5	79.0	66.0	0.0	1.5	3.3	6.3	22.9	66.0	53.7	12.3
11471			402966	3.0-7.5	100.0	100.0	100.0	100.0	100.0	99.4	98.7	98.1	97.3	96.1	0.0	0.0	0.0	1.3	2.6	96.1	55.9	40.2
11471			402978	7.5-10.5	100.0	100.0	100.0	100.0	100.0	99.8	99.4	98.7	97.6	96.0	0.0	0.0	0.0	0.6	3.4	96.0	63.2	32.8
11472			402958	3.5-7.5	100.0	100.0	100.0	96.9	94.6	91.7	88.1	85.0	81.3	76.8	0.0	3.1	2.3	6.5	11.3	76.8	39.4	37.4
11472			402959	9.0-12.0	100.0	100.0	99.4	94.2	86.3	78.1	72.6	68.6	64.7	60.6	0.0	5.8	7.9	13.7	12.0	60.6	31.0	29.6
11473			402923	3.0-7.5	100.0	100.0	100.0	99.1	97.5	93.7	91.0	88.8	86.1	82.9	0.0	0.9	1.6	6.5	8.1	82.9	45.3	37.6
11473			402925	7.5-12.0	100.0	100.0	99.1	97.9	95.2	92.0	88.7	85.7	81.8	76.9	0.0	2.1	2.7	6.5	11.8	76.9	38.5	38.4
11474			402896	3.0-7.5	100.0	100.0	99.5	98.9	97.4	94.8	92.6	90.6	87.1	81.5	0.0	1.1	1.5	4.8	11.1	81.5	52.2	29.3
11474			402901	7.5-12.0	100.0	100.0	98.9	97.6	95.3	92.3	89.4	86.7	82.4	76.2	0.0	2.4	2.3	5.9	13.2	76.2	47.2	29.0
11475			403264	4.5-8.5	100.0	100.0	100.0	99.6	98.7	96.2	93.6	90.9	87.9	84.5	0.0	0.4	0.9	5.1	9.1	84.5	46.3	38.2
11476			402993	3.5-7.5	100.0	100.0	96.8	95.0	92.8	89.1	86.5	84.0	81.1	77.4	0.0	5.0	2.2	6.3	9.1	77.4	39.2	38.2
11476			403010	12.0-15.0	100.0	100.0	99.8	99.7	98.8	95.3	91.1	86.6	79.9	73.0	0.0	0.3	0.9	7.7	18.1	73.0	44.7	28.3
11477			402866	3.5-7.5	100.0	100.0	99.7	99.6	98.9	96.9	94.6	91.4	87.0	80.3	0.0	0.4	0.7	4.3	14.3	80.3	40.4	39.9
11477			402874	14.0-18.0	100.0	100.0	100.0	97.3	89.6	82.7	77.4	72.9	67.4	58.3	0.0	2.7	7.7	12.2	19.1	58.3	40.0	18.3
11478			402796	3.5-7.5	100.0	100.0	98.1	96.5	93.2	89.4	86.1	83.0	79.2	74.4	0.0	3.5	3.3	7.1	11.7	74.4	37.9	36.5
11478			402813	7.5-10.0	100.0	100.0	99.4	96.4	92.4	86.2	82.0	78.4	74.1	68.7	0.0	3.6	4.0	10.4	13.3	68.7	38.6	30.1
11479			403048	3.5-7.5	100.0	100.0	99.7	96.8	93.0	86.3	81.4	77.0	71.1	64.0	0.0	3.2	3.8	11.6	17.4	64.0	36.1	27.9
11479			403049	7.5-10.5	100.0	100.0	97.3	92.9	86.9	82.0	77.8	74.2	69.7	64.2	0.0	7.1	6.0	9.1	13.6	64.2	35.7	28.5
11480			402771	3.0-7.5	100.0	100.0	99.5	98.5	96.9	94.0	91.8	89.5	86.6	82.8	0.0	1.5	1.6	5.1	9.0	82.8	42.4	40.4
11480			402774	7.5-12.0	100.0	100.0	100.0	99.5	98.2	95.1	92.0	88.8	84.6	78.8	0.0	0.5	1.3	6.2	13.2	78.8	47.7	31.1
11481			403230	3.5-7.5	100.0	88.8	85.1	83.4	81.2	76.8	73.7	70.6	66.9	61.8	11.2	5.4	2.2	7.5	11.9	61.8	32.8	29.0
11481			403231	13.5-18.5	100.0	100.0	100.0	98.7	95.7	89.9	95.6	81.2	76.6	70.6	0.0	1.3	3.0	0.1	25.0	70.6	41.0	29.6

000390

118

TABLE D-3a
SUMMARY OF SOIL CLASSIFICATION FROM GEOTECHNICAL TESTING

Geotech Boring	Adjacent CPTs (Borings	Distance from Geotech Boring	Sample ID #	Depth B.G.L. (ft)	USCS SOIL CLASSIFICATION file totaltab.wk3	Liquid Limit %	Plastic Limit %	Plastic Index %	Spec. Grav.	Moist. Cont. Dry Wt. %	Br/Gr B.G.L (ft)
11468	11429	5.6	403071	2.0 - 4.5	Lean Clay W/Sand (CL)	47.2	17.9	29.3	2.72	17.5	13.5
11468	(11482)	10.3	403074	4.5 - 6.0	Sandy Lean Clay (CL)	31.9	16.1	15.8	2.70	14.0	13.5
11468	(11483)	19.9	403077	9.0 - 11.5	Sandy Lean Clay (CL)	25.5	14.7	10.8	2.74	14.1	13.5
11468	(11491)	18.4	403081	15.0 - 17.5	Sandy Lean Clay (CL)	28.0	14.7	13.3	2.73	14.0	13.5
11468	(11492)	6.0	403084	19.5 - 22.0	Sandy Lean Clay (CL)	24.1	14.2	9.9	2.76	12.4	13.5
11468			403089	25.0 - 26.5	Sandy Lean Clay (CL)	25.3	13.6	11.7	2.70	15.5	13.5
11469			402820	1.5 - 3.0	Lean Clay (CL)	45.1	21.1	24.0	2.67	27.7	12.0
11469			402821	3.0 - 5.5	Lean Clay W/Sand (CL)	37.1	14.9	22.2	2.70	17.2	12.0
11469			402826	9.0 - 10.5	Sandy Lean Clay (CL)	25.8	14.3	11.5	2.69	13.1	12.0
11469			402831	15.5 - 18.0	Lean Clay W/Sand (CL)	25.2	13.7	11.5	2.73	14.2	12.0
11469			402835	20.0 - 21.5	Sandy Lean Clay (CL)	25.3	14.6	10.7	2.72	12.8	12.0
11469			402838	24.0 - 25.5	Sandy Lean Clay (CL)	21.6	13.6	8.0	2.73	15.2	12.0
11469			402842	30.0 - 31.5	Sandy Lean Clay (CL)	24.5	14.3	10.2	2.68	14.4	12.0
11470B	11431	32.3	403131	1.5 - 3.0	Silty Clayey Sand (SC - SM)	19.8	14.3	5.5	2.71	19.4	9.3
11470B			403132	3.5 - 6.0	Silty Sand (SM)	NP[A]	NP	NP	2.70	14.4	9.3
11470B			493137	8.0 - 10.5	Sandy Silt (ML)	16.0	15.2	0.8	2.72	13.7	9.3
11470B			403141	13.5 - 15.0	Lean Clay W/Sand (CL)	26.5	14.8	11.7	2.69	15.7	9.3
11470B			403144	18.0 - 19.5	Lean Clay W/Sand (CL)	23.7	13.9	9.8	2.75	15.9	9.3
11470B			403150	23.5 - 25.0	Sandy Lean Clay (CL)	22.5	12.3	10.2	2.75	13.6	9.3
11470B			403154	30.0 - 32.0	Sandy Lean Clay WGrav (CL	27.5	14.8	12.7	2.73	20.6	9.3
11471	11441	43.2	402962	1.5 - 3.0	Fat Clay (CH)	51.9	28.0	23.9	2.67	24.4	11.5
11471			402963	3.5 - 6.0	Fat Clay (CH)	50.5	18.4	32.1	2.72	24.9	11.5
11471			402969	10.5 - 11.5	Well Graded Sand (SW)	NP	NP	NP	2.70	24.0	11.5
11471			402973	15.0 - 16.5	Silt (ML)	22.5	19.3	3.2	2.73	17.2	11.5
11471			402974	17.0 - 19.5	Sandy Lean Clay (CL)	21.0	12.4	8.6	2.77	9.4	11.5
11471			402979	27.5 - 29.0	Sandy Lean Clay (CL)	25.9	14.7	11.2	2.69	13.0	11.5
11472	11448	9.5	402939	1.5 - 3.0	Lean Clay (CL)	49.1	20.8	28.3	2.65	26.1	16.5
11472			402940	3.5 - 6.0	Lean Clay W/Sand (CL)	29.4	15.8	13.6	2.74	15.7	16.5
11472			402945	9.5 - 11.5	Clayey Sand W/Grav (SC)	24.5	13.1	11.4	2.69	10.5	16.5
11472			402953	18.5 - 19.5	Clayey Sand W/Grav (SC)	19.4	11.2	8.2	2.74	9.5	16.5
11472			402956	23.0 - 25.5	Sandy Lean Clay (CL)	25.0	13.1	11.9	2.69	12.7	16.5
11473	11447	9.3	402918	3.5 - 6.0	Lean Clay W/Sand (CL)	31.1	17.3	13.8	2.70	14.9	13.5
11473			402920	6.5 - 8.5	Lean Clay W/Sand (CL)	29.3	15.6	13.7	2.74	13.2	13.5
11473			402922	9.0 - 10.5	Sandy Lean Clay (CL)	25.0	15.1	9.9	2.70	13.4	13.5
11473			402928	15.5 - 18.0	Sandy Lean Clay (CL)	27.3	14.3	13.0	2.77	12.8	13.5
11473			402931	20.0 - 22.0	Sandy Lean Clay (CL)	30.9	14.7	16.2	2.71	14.1	13.5
11473			402934	23.5 - 25.0	Sandy Lean Clay (CL)	24.2	14.9	9.3	2.70	11.5	13.5
11474	11445	9.1	402891	1.5 - 3.0	Lean Clay (CL)	44.2	18.1	26.1	2.63	29.5	11.3
11474			402892	3.5 - 6.0	Lean Clay W/Sand (CL)	27.9	19.2	8.7	2.79	16.5	11.3
11474			402898	9.0 - 10.5	Sandy Lean Clay (CL)	25.1	13.5	11.6	2.76	12.6	11.3
11474			402904	14.0 - 16.5	Sandy Lean Clay (CL)	24.2	13.6	10.6	2.75	13.0	11.3
1[illegible]			402907	18.5 - 21.0	Sandy Lean Clay (CL)	27.9	14.2	13.7	2.70	13.7	11.3
[illegible]			402911	23.5 - 25.0	Sandy Lean Clay (CL)	25[illegible]	[illegible]4	12.0	2.70	13.1	11.3

A [illegible]P = Non Plastic

000231

TABLE D-3a
SUMMARY OF SOIL CLASSIFICATION FROM GEOTECHNICAL TESTING

Geotech Boring	Adjacent CPTs (Borings	Distance from Geotech Boring	Sample ID #	Depth B.G.L. (ft)	USCS SOIL CLASSIFICATION file totaltab.wk3	Liquid Limit %	Plastic Limit %	Plastic Index %	Spec. Grav.	Moist. Cont. Dry Wt. %	Br/Gr B.G.L (ft)
11475	11450	101.3	403251	2.0- 4.5	Lean Clay (CL)	48.5	16.2	32.3	2.62	23.2	16.5
11475			403254	6.5- 9.0	Lean Clay (CL)	49.2	26.0	23.2	2.66	23.1	16.5
11475			403258	11.0-13.5	Lean Clay W/Sand (CL)	33.3	17.4	15.9	2.74	14.1	16.5
11475			403260	15.5-18.0	Sandy Lean Clay (CL)	26.9	12.9	14.0	2.71	13.2	16.5
11475			403263	19.5-21.0	Sandy Lean Clay (CL)	26.7	14.3	12.4	2.72	15.0	16.5
11476	11439	5.5	402988	1.5- 3.0	Lean Clay W/Sand (CL)	40.7	17.8	22.9	2.70	21.9	10.0
11476	(11498)	7.0	402989	3.5- 6.0	Lean Clay W/Sand (CL)	30.5	15.9	14.6	2.64	14.8	10.0
11476	(11499)	12.6	402995	9.5-12.0	Sandy Silty Clay (CL-ML)	18.8	14.2	4.6	2.77	12.9	10.0
11476			402998	14.0-16.5	Silty Clayey Sand (SC-SM)	18.1	12.3	5.8	2.75	11.1	10.0
11476			403002	18.5-21.0	Lean Clay W/Sand (CL)	20.2	12.5	7.7	2.70	14.4	10.0
11476			403006	24.0-25.5	Sandy Lean Clay (CL)	25.1	14.2	10.9	2.68	15.0	10.0
11477	11438	9.6	402863	1.5- 3.0	Lean Clay (CL)	37.8	20.0	17.8	2.72	22.8	11.5
11477	(11484)	22.8	402864	3.5- 6.0	Lean Clay W/Sand (CL)	30.4	15.0	15.4	2.73	19.4	11.5
11477	(11500)	10.1	402868	8.0- 9.0	Silty Sand (SM)	NP	NP	NP	2.75	21.3	11.5
11477	(11501)	22.9	402873	14.0-16.5	Sandy Lean Clay (CL)	25.1	13.1	12.0	2.72	15.1	11.5
11477			402878	22.0-22.5	Sandy Lean Clay (CL)	21.9	13.0	8.9	2.70	13.9	11.5
11477			402879	22.5-23.5	Silty Sand (SM)	NP	NP	NP	2.75	13.6	11.5
11477			402887	34.0-35.5	Sandy Lean Clay (CL)	25.1	13.3	11.8	2.73	12.1	11.5
11478	11436	0.9	402790	1.5- 3.0	Fat Clay (CH)	51.0	20.6	30.4	2.69	24.3	16.0
11478			402792	3.5- 6.0	Lean Clay W/Sand (CL)	37.5	16.5	21.0	2.71	20.3	16.0
11478			402798	10.5-12.0	Lean Clay W/Sand (CL)	28.0	16.2	11.8	2.71	14.1	16.0
11478			402805	21.5-23.0	Sandy Lean Clay (CL)	24.3	13.9	10.4	2.67	10.8	16.0
11478			402807	24.5-26.0	Sandy Silty Clay (CL-ML)	18.6	12.7	5.9	2.72	11.1	16.0
11478			402810	30.5-32.0	Silty Sand (SM)	NP	NP	NP	2.70	12.0	16.0
11478			402812	33.5-35.0	Silty Clayey Sand (SC-SM)	23.2	16.5	6.7	2.72	16.1	16.0
11479	11435	4.7	403021	1.5- 3.0	Fat Clay (CH)	53.5	16.8	36.7	2.67	25.0	10.0
11479	(11486)	16.7	403022	3.5- 6.0	Sandy Lean Clay (CL)	21.3	14.1	7.2	2.74	12.5	10.0
11479	(11496)	6.0	403032	16.5-17.5	Silty Sand(SM)	NP	NP	NP	2.71	14.6	10.0
11479	(11497)	11.9	403034	18.5-21.0	Sandy Lean Clay (CL)	25.2	14.2	11.0	2.69	12.5	10.0
11479			403037	23.0-25.5	Sandy Lean Clay (CL)	24.5	13.9	10.6	2.70	13.9	10.0
11479			403043	31.5-33.0	Silty,Clayey Sand W/Gravel (	19.6	12.4	7.2	2.70	17.1	10.0
11479			403045	34.5-36.0	Sandy Lean Clay (CL)	24.1	14.2	9.9	2.71	13.0	10.0
11480	11434	5.3	402768	0.5- 3.0	Lean Clay (CL)	49.6	17.8	31.8	2.71	22.5	12.5
11480			402770	5.0- 7.5	Lean Clay (CL)	39.7	18.6	21.1	2.78	20.6	12.5
11480			402773	9.5-12.0	Lean Clay W/Sand (CL)	32.0	18.0	14.0	2.76	14.8	12.5
11480			402777	14.0-16.5	Lean Clay W/Sand (CL)	23.1	13.6	9.5	2.73	13.0	12.5
11480			402779	18.0-20.0	Sandy Lean Clay (CL)	25.1	13.9	11.2	2.69	13.8	12.5
11480			402784	24.5-27.0	Sandy Lean Clay (CL)	26.2	13.9	12.3	2.71	12.5	12.5
11480			402787	29.0-31.5	Sandy Lean Clay (CL)	25.9	14.5	11.4	2.72	14.4	12.5

A Note: NP = Non Plastic

B Note: 11479 18.5-21.0 had single grain on 1.5 screen

C Note: 11481 6.5-9.0 had single grain on 1.5 screen

11479			403034	18.5-21.0	Gravely Lean Clay W/S (CL)	25.2	14.2	11.0	2.69	12.5	10.0
11481			403204	6.5- 9.0	Sandy Lean Clay (CL)	26.6	15.4	11.2	2.72	14.3	12.5

TABLE D-3a
SUMMARY OF SOIL CLASSIFICATION FROM GEOTECHNICAL TESTING

Geotech Boring	Adjacent CPTs (Borings	Distance from Geotech Boring	Sample ID #	Depth B.G.L. (ft)	USCS SOIL CLASSIFICATION file totaltab.wk3	Liquid Limit %	Plastic Limit %	Plastic Index %	Spec. Grav.	Moist. Cont. Optim. %	Br/Gr B.G.L (ft)
11481			403204	6.5- 9.0	Sandy Lean Clay (CL)	26.6	15.4	11.2	2.72	14.3	12.5
11481			403211	15.5-18.0	Sandy Lean Clay (CL)	23.7	13.0	10.7	2.73	11.8	12.5
11481			403214	20.0-22.0	Sandy Lean Clay (CL)	22.6	13.0	9.6	2.73	13.2	12.5
11481			403219	26.5-28.0	Sandy Silty Clay (CL-ML)	17.6	13.2	4.4	2.69	16.2	12.5
11481			403223	32.5-34.0	Lean Clay W/Sand (CL)	26.0	14.5	11.5	2.73	14.9	12.5
11481			403227	37.0-38.5	Sandy Lean Clay (CL)	26.1	13.7	12.4	2.73	13.1	12.5
SUMMARY OF RESULTS FROM STANDARD PROCTOR SAMPLES											
11468			403103	2.0- 6.5	Lean Clay W/Sand (CL)	45.3	16.2	29.1		16.7	13.5
11468			403104	9.0-13.0	Lean Clay W/Sand (CL)	30.8	14.1	16.7		11.6	13.5
11469			402824	3.0- 7.5	Lean Clay W/Sand (CL)	36.1	15.1	21.0		13.9	12.0
11469			402828	7.5-12.0	Lean Clay W/Sand (CL)	29.4	13.0	16.4		11.3	12.0
11470B			403169	3.5- 7.5	Sandy Silt (ML)	17.7	15.7	2.0		11.1	9.3
11470B			403170	7.5-12.0	Sandy Silt (ML)	17.3	16.7	0.6		11.4	9.3
11471			402966	3.0- 7.5	Fat Clay (CH)	50.5	19.3	31.2		19.3	11.5
11471			402978	7.5-10.5	Lean Clay (CL)	43.0	21.8	21.2		17.4	11.5
11472			402958	3.5- 7.5	Lean Clay W/Sand (CL)	30.9	14.0	16.9		14.4	16.5
11472			402959	9.0-12.0	Sandy Lean Clay (CL)	28.7	13.8	14.9		12.0	16.5
11473			402923	3.0- 7.5	Lean Clay W/Sand (CL)	35.4	15.8	19.6		15.1	13.5
11473			402925	7.5-12.0	Lean Clay W/Sand (CL)	31.0	14.8	16.2		13.7	13.5
11474			402896	3.0- 7.5	Lean Clay W/Sand (CL)	28.1	16.2	11.9		13.7	11.3
11474			402901	7.5-12.0	Lean Clay W/Sand (CL)	26.2	13.8	12.4		12.8	11.3
11475			403264	4.5- 8.5	Lean Clay W/Sand (CL)	42.8	15.8	27.0		18.1	16.5
11476			402993	3.5- 7.5	Lean Clay W/Sand (CL)	33.0	14.8	18.2		15.2	10.0
11476			403010	12.0-15.0	Lean Clay W/Sand (CL)	20.7	12.7	8.0		10.5	10.0
11477			402866	3.5- 7.5	Lean Clay W/Sand (CL)	42.2	16.6	25.6		14.6	11.5
11477			402874	14.0-18.0	Sandy Lean Clay (CL)	22.7	14.5	8.2		10.5	11.5
11478			402796	3.5- 7.5	Lean Clay W/Sand (CL)	35.3	16.6	18.7		14.7	16.0
11478			402813	7.5-10.0	Sandy Lean Clay (CL)	26.6	14.8	11.8		12.7	16.0
11479			403048	3.5- 7.5	Sandy Lean Clay (CL)	28.8	14.1	14.7		11.8	10.0
11479			403049	7.5-10.5	Sandy Lean Clay (CL)	25.2	14.9	10.3		13.0	10.0
11480			402771	3.0- 7.5	Lean Clay W/Sand (CL)	38.5	15.8	22.7		15.2	12.5
11480			402774	7.5-12.0	Lean Clay W/Sand (CL)	27.2	14.4	12.8		12.5	12.5
11481			403230	3.5- 7.5	Sandy Lean Clay (CL)	30.7	14.5	16.2		13.4	12.5
11481			403231	13.5-18.5	Lean Clay W/Sand (CL)	24.9	12.8	12.1		12.5	12.5

A Note: NP = Non Plastic

000293

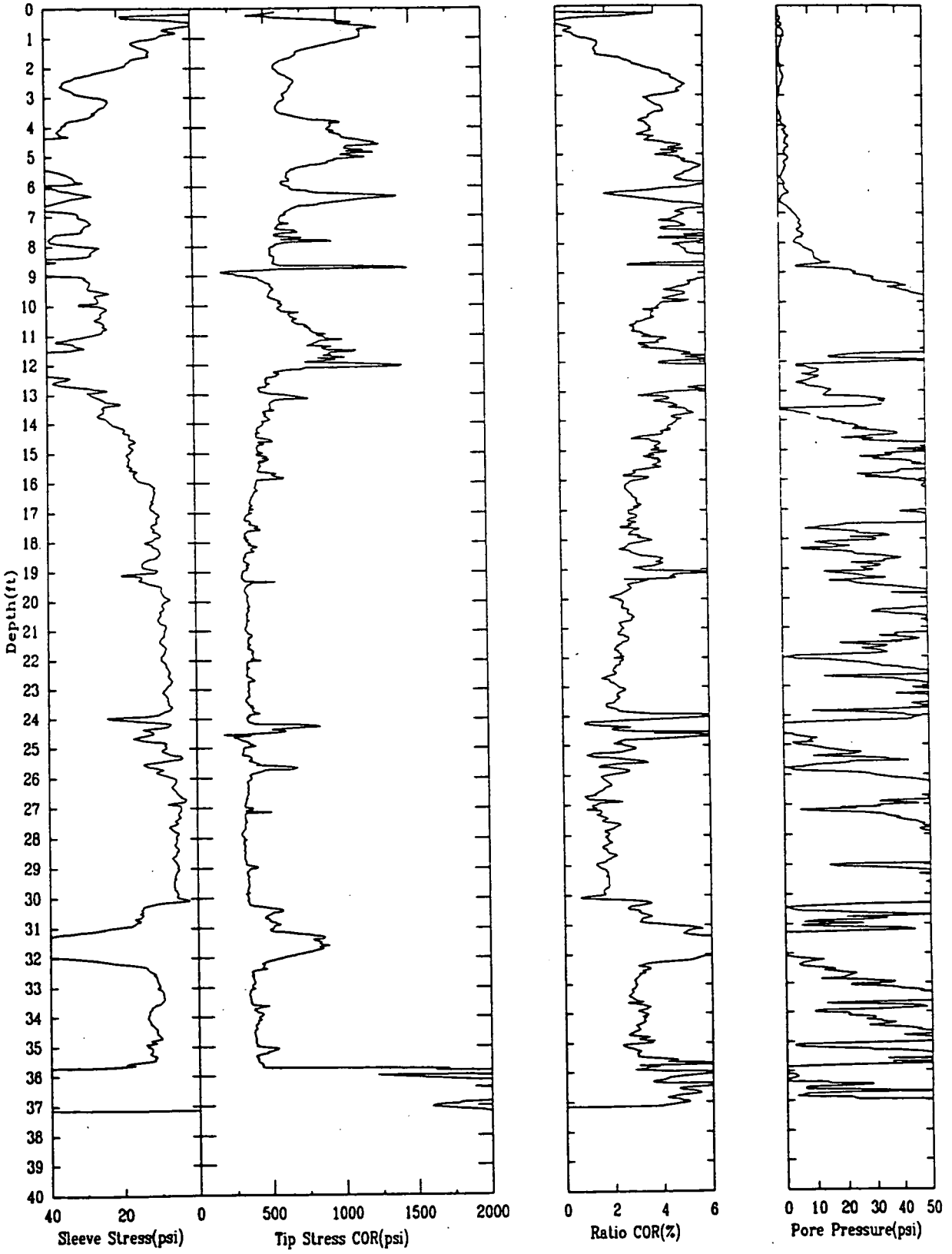
Appendix E

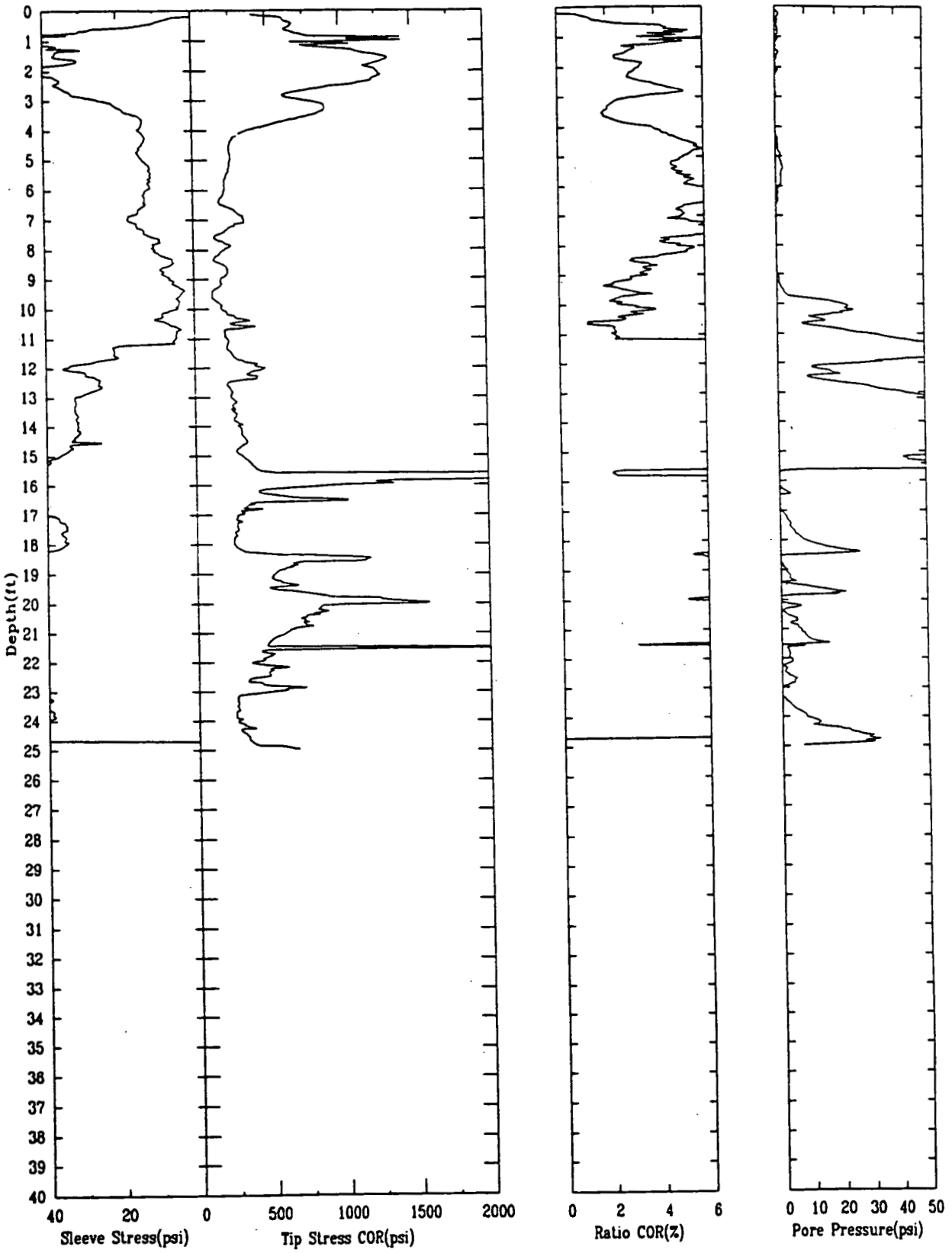
SUMMARY OF PHASE II CPT ACTIVITIES (OCT–NOV 1994), CONCERNING CLOSURE

PUSH SEQUENCE							COORDINATES		
#	ID #	CPT	DATE	TIME	Planned Depth	Actual Depth	Northing	Easting	Ground Elevation
1	11664	500	21–Mar–95	0830	21	21.1	478746.79	1382976.18	590.44
2	11663	501	21–Mar–95	1023	100	54.3	478771.04	1382629.54	587.92
3	11612	532	21–Mar–95	1300	43	43.0	482473.98	1382521.24	603.24
4	11639	527	21–Mar–95	1400	35	35.0	481698.08	1382432.88	597.96
5	11641	523	21–Mar–95	1446	29	29.0	481348.24	1382570.67	591.03
6	11646	519	21–Mar–95	1521	28	28.0	480980.90	1382584.25	590.75
7	11635	531	21–Mar–95	1600	48	48.1			
8	11611	535	22–Mar–95	0730	48	48.0	483084.35	1383012.06	612.75
9	11640	525	22–Mar–95	0837	39	39.0	481693.36	1383012.54	602.42
10	11651	514	22–Mar–95	0946	25	23.8			
11	11650	516	22–Mar–95	1033	29	29.0	480676.71	1383006.27	595.37
12	11656	513	22–Mar–95	1210	100	57.3	480297.52	1382969.58	593.63
13	11644	518	22–Mar–95	1334	30	30.0	480981.67	1383009.53	597.10
14	11645	522	22–Mar–95	1409	100	67.7	481297.96	1383006.73	599.07
15	11636	529	22–Mar–95	1552	100	67.3	482072.14	1383012.25	605.16
16	11680	534	23–Mar–95	0740	100	73.4	482807.84	1383011.84	612.49
17	11629	533	23–Mar–95	0940	43	16.1			
18	11629	533 A	23–Mar–95	1220	43	43.0	482550.23	1382363.10	603.38
19	11628	540	23–Mar–95	1310	39	39.0	482452.76	1382006.53	598.05
20	11626	544	23–Mar–95	1348	37	37.0	482463.89	1381602.22	595.22
21	11624	545	23–Mar–95	1422	45	45.0	482649.97	1381274.58	595.18
22	11635	531 B	23–Mar–95	1516	48	48.0	482510.36	1382998.08	609.24
23	11637	526	23–Mar–95	1610	35	35.0	481699.13	1382557.16	596.64
24	11649	520	24–Mar–95	0735	27	27.0	480970.17	1382417.91	590.24
25	11636	529 B	24–Mar–95	0810	100	67.4			
26	11624	545 B	24–Mar–95	0936	100	55.2			
27	11662	502	24–Mar–95	1047	20	20.0			
28	11669	505	24–Mar–95	1227	21	21.0	479083.14	1382587.45	590.15
29	11651	514 B	24–Mar–95	1308	25	25.0	480449.78	1382753.68	592.19
30	11655	510	24–Mar–95	1350	25	25.0	480053.03	1382783.18	592.08
31	11616	507	24–Mar–95	1450	23	23.0	479461.31	1382913.78	590.80
32	11670	506	24–Mar–95	1533	100	55.2	479052.26	1382121.21	585.14
33	11630	538	25–Mar–95	0740	37	37.0	482204.00	1382066.27	591.53
34	11633	524	27–Mar–95	1025	100	59.1	481309.16	1382113.34	588.66
35	11632	528	27–Mar–95	1135	30	30.0	481699.36	1382206.71	593.20
36	11631	530	27–Mar–95	1310	100	49.6	482039.67	1382117.73	590.90
37	11630	538 B	27–Mar–95	1405	37	37.0			
38	11634	521	27–Mar–95	1447	26	26.0	480993.03	1382137.35	588.06
39	11635	517	27–Mar–95	1522	100	54.3	480696.06	1382130.39	587.95
40	11638	515	28–Mar–95	0740	100	51.4	480451.01	1382117.01	585.13
41	11627	542	28–Mar–95	0842	100	51.2	482213.80	1381675.54	590.69
42	11625	547	28–Mar–95	0958	34	34.0	482223.16	1381250.02	589.82
43	11653	511	28–Mar–95	1247	24	24.9	480071.82	1382562.20	588.97
44	11659	508	28–Mar–95	1330	25	25.0	479675.86	1382579.01	588.10
45	11662	502 B	28–Mar–95	1405	20	20.0	478776.38	1382137.82	590.65
46	11661	504	28–Mar–95	1445	22	22.0			
47	11661	504 B	28–Mar–95	1524	22	22.0	479091.98	1382771.96	588.37
48	11660	503	29–Mar–95	0747	100	57.4	479107.22	1383008.80	590.70
49	11623	509	29–Mar–95	0940	19	19.0	480071.82	1382562.20	588.97
50	11647	512	29–Mar–95	1014	100	96.0	480096.28	1382160.88	582.37
51	11627	542 B	30–Mar–95	0805	20	20.0			
52	11613	536	30–Mar–95	0912	100	80.5	483107.53	1382548.33	613.29
53	11614	537	30–Mar–95	1057	45	45.0	483048.56	1382183.20	605.22
54	11621	541	30–Mar–95	1308	100	36.0	483058.97	1381880.82	603.41
55	11621	541 A	30–Mar–95	1453	100	27.1			
56	11615	546	30–Mar–95	1527	45	38.8	483072.50	1381393.70	599.67
57	11617	543	31–Mar–95	0756	43	43.0	482817.98	1381574.68	599.70
58	11619	539	31–Mar–95	0840	45	22.9	482799.60	1382088.14	603.82
59	11619	539 B	31–Mar–95	0916	45	30.1			
60	11619	539 C	31–Mar–95	1009	45	36.5			

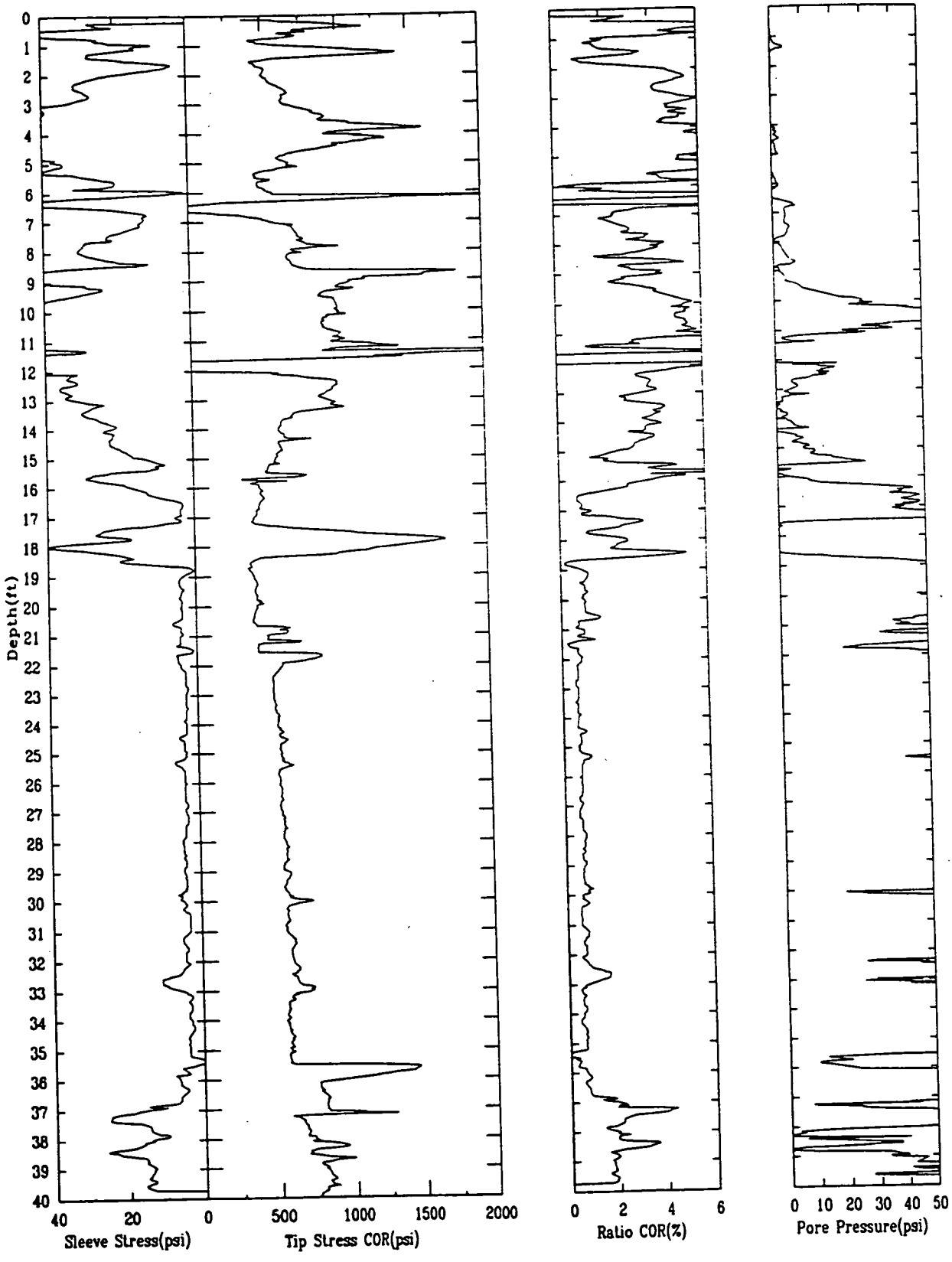
SUMMARY OF PHASE II CPT ACTIVITIES (OCT–NOV 1994), CONCERNING CLOSURE

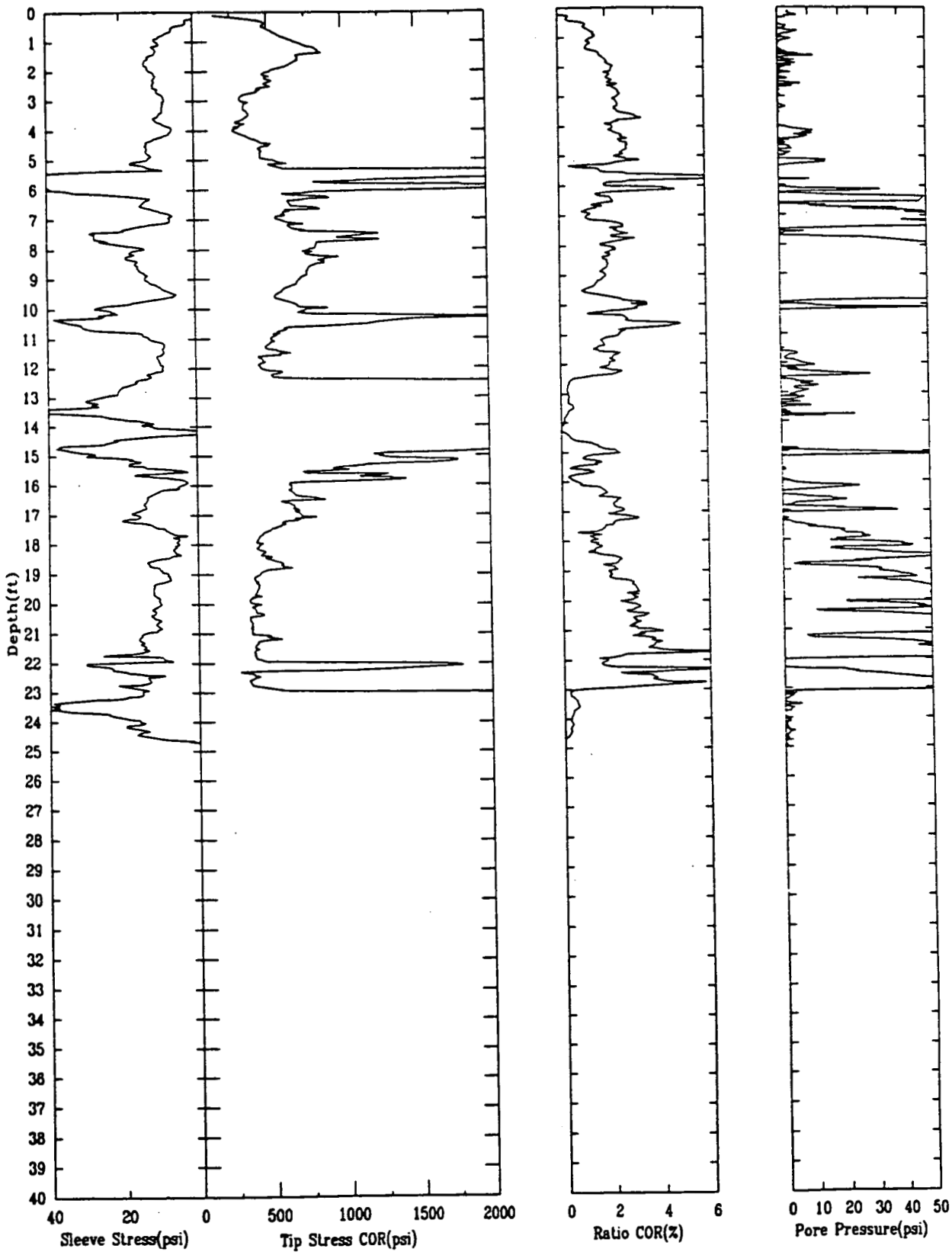
PUSH SEQUENCE							COORDINATES		
#	ID #	CPT	DATE	TIME	Planned Depth	Actual Depth	Northing	Easting	Ground Elevation
1	11429		26–Oct–94	1028	40	40.1	483015.55	1382489.88	610.13
2	11433		26–Oct–94	1245	40	40.0	482413.44	1382474.12	603.00
3	11435		26–Oct–94	1323	35	35.0	482104.55	1382760.76	600.95
4	11437		26–Oct–94	1355	35	35.0	481868.41	1382461.27	600.03
5	11439		26–Oct–94	1426	30	30.0	481556.38	1382455.20	593.99
6	11441		26–Oct–94	1455	30	30.1	481296.34	1382449.80	589.00
7	11443		27–Oct–94	0810	30	21.0	481020.00	1382738.22	592.55
8	11443		27–Oct–94	1115	30	30.0			
9	11442		27–Oct–94	1240	35	35.0	481285.78	1382743.96	593.18
10	11442		27–Oct–94	1308	35	35.0			
11	11440		27–Oct–94	1335	35	35.0	481490.49	1382747.52	594.36
12	11438		27–Oct–94	1410	40	40.0	481809.51	1382754.24	598.47
13	11436		27–Oct–94	1446	40	40.0			
14	11434		28–Oct–94	0800	25	24.7	482413.40	1382767.70	606.04
15	11432		28–Oct–94	1017	40	39.7	482714.35	1382764.40	608.60
16	11431		28–Oct–94	1116	40	39.7	482746.35	1382482.78	605.79
17	11465		28–Oct–94	1255	40	40.0	482581.79	1382128.56	601.23
18	11449		28–Oct–94	1349	25	25.0	479418.58	1382410.62	584.23
19	11448		28–Oct–94	1416	25	24.7	479739.36	1382417.71	584.88
20	11447		28–Oct–94	1444	25	25.0	480171.84	1382426.35	585.36
21	11446		31–Oct–94	0818	25	25.1	480435.42	1382432.97	587.83
22	11444		31–Oct–94	0847	25	25.0	480696.17	1382438.69	590.01
23	11445		31–Oct–94	0920	30	25.0	480697.95	1382730.44	591.53
24	11450		31–Oct–94	1003	25	24.7	479526.19	1382706.94	591.39
25	11451		31–Oct–94	1026	25	25.0	479126.10	1382405.34	587.04
26	11454		31–Oct–94	1217	25	25.0	478938.18	1382401.57	587.25
27	11454		31–Oct–94	1236	25	25.0			
28	11456		31–Oct–94	1310	25	24.7	478490.26	1382393.19	592.97
29	11457		31–Oct–94	1430	25	25.0			
30	11458		31–Oct–94	1500	25	25.0	477874.51	1382379.37	589.00
31	11466		01–Nov–94	0758	25	25.0	477982.37	1382674.94	591.89
32	11428		01–Nov–94	0830	25	25.0	478428.66	1382683.26	594.87
33	11455		01–Nov–94	0905	25	24.7	477982.37	1382674.94	591.89
34	11452		01–Nov–94	0944	25	25.0	479203.52	1382700.59	589.44
35	11452		01–Nov–94	1015	25	24.7			
36	11420		01–Nov–94	1222	25	25.0	478806.69	1381882.55	582.33
37	11412		01–Nov–94	1258	25	25.0	478980.00	1382030.00	582.75
38	11424		01–Nov–94	1327	25	25.0	479323.33	1382529.18	586.59
39	11422		01–Nov–94	1358	25	10.4	479717.94	1382998	592.59
40	11422		01–Nov–94	1412	25	5.3			
41	11422		02–Nov–94	0800	25	25.0			
42	11425		02–Nov–94	0834	25	25.0	479432.69	1382147.4	579.88
43	11425		02–Nov–94	0902	25	25.0			
44	11421		02–Nov–94	1002	40	40.0	482611.64	1381909.69	599.44
45	11411		02–Nov–94	1044	40	37.5	482621.52	1381487.81	596.69
46	11418		02–Nov–94	1124	40	40.0	482621.52	1381759.19	598.73

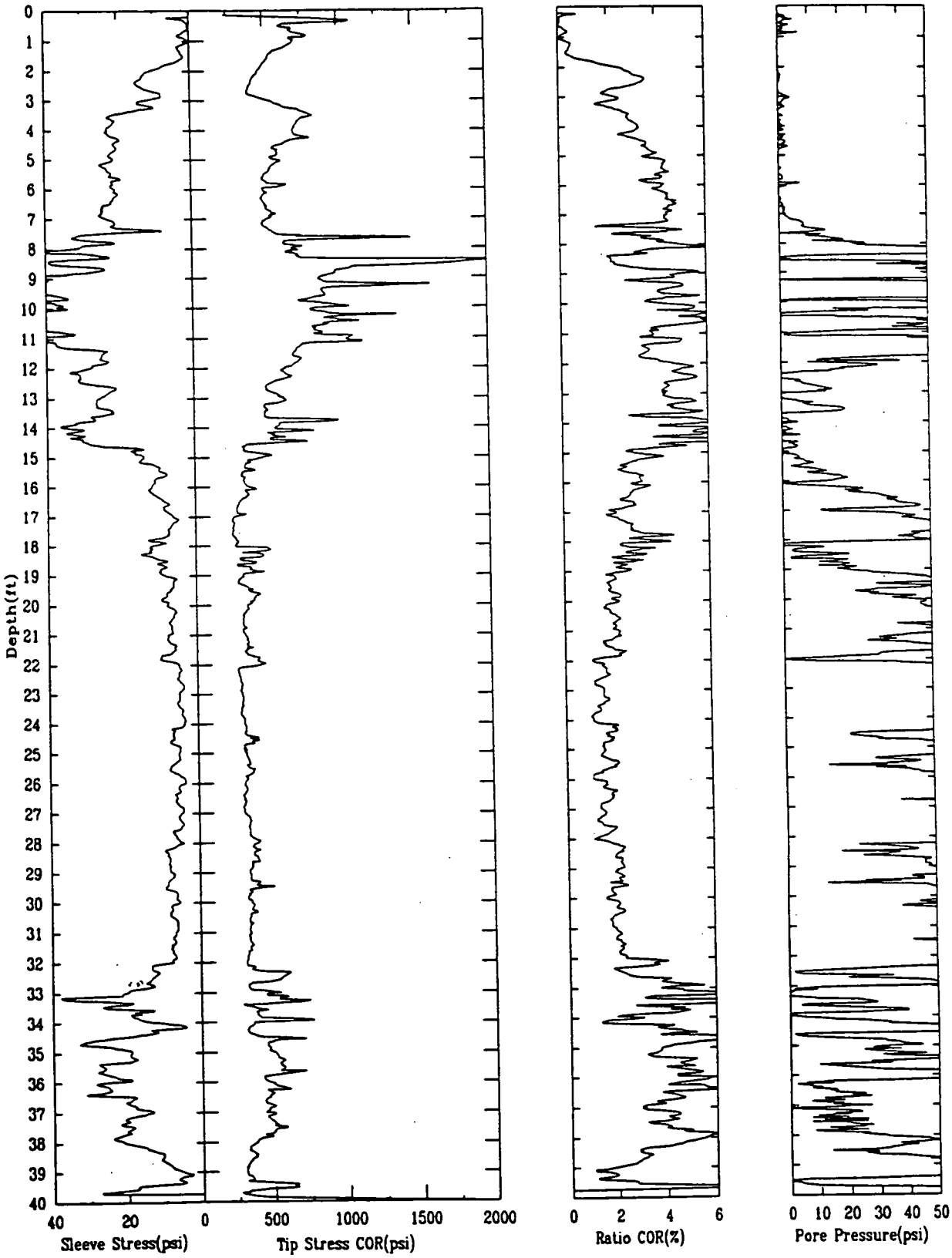

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
0 500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)

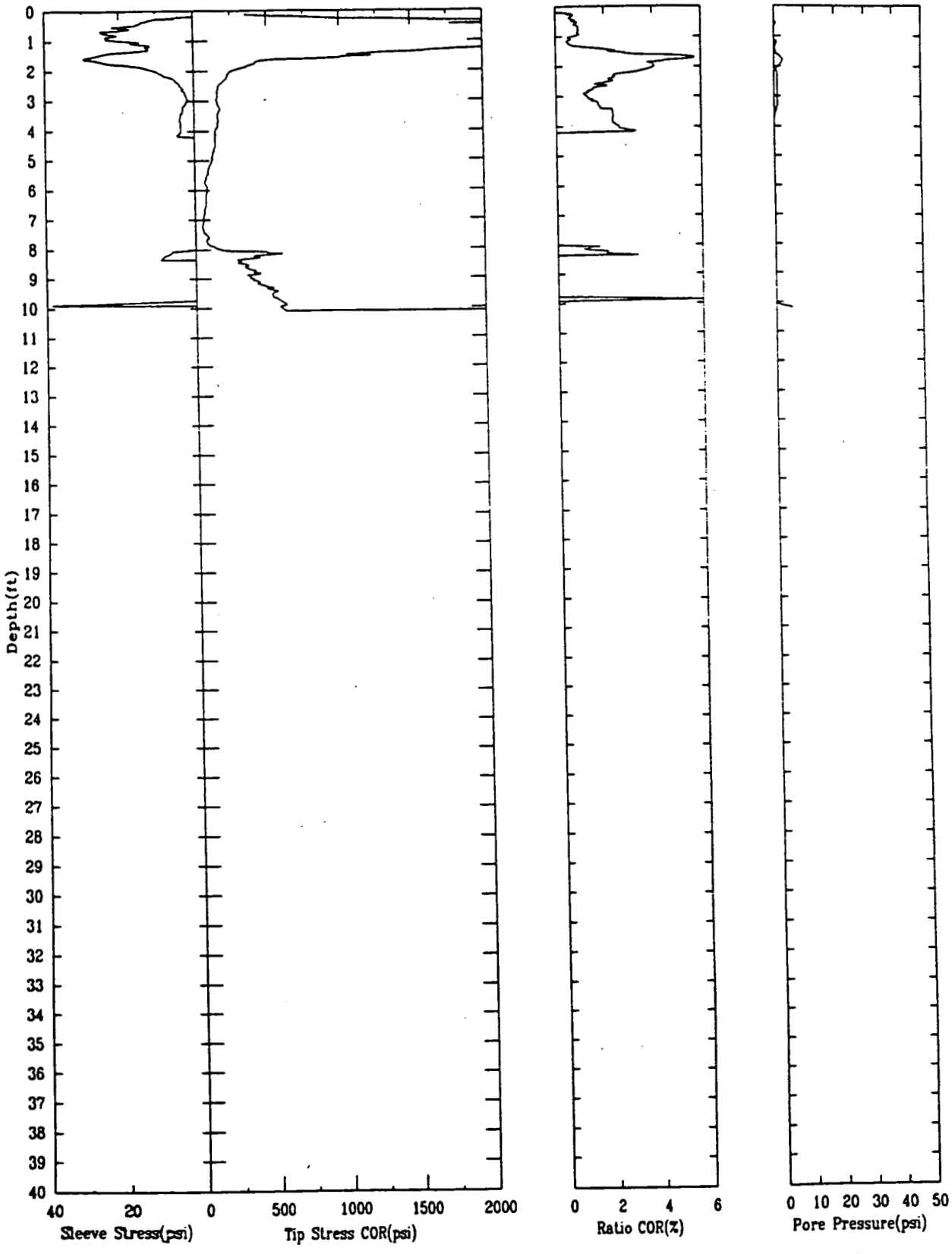

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
0 500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)

11418/CPT19 APPLIED RESEARCH ASSOCIATES, INC. 11/02/94

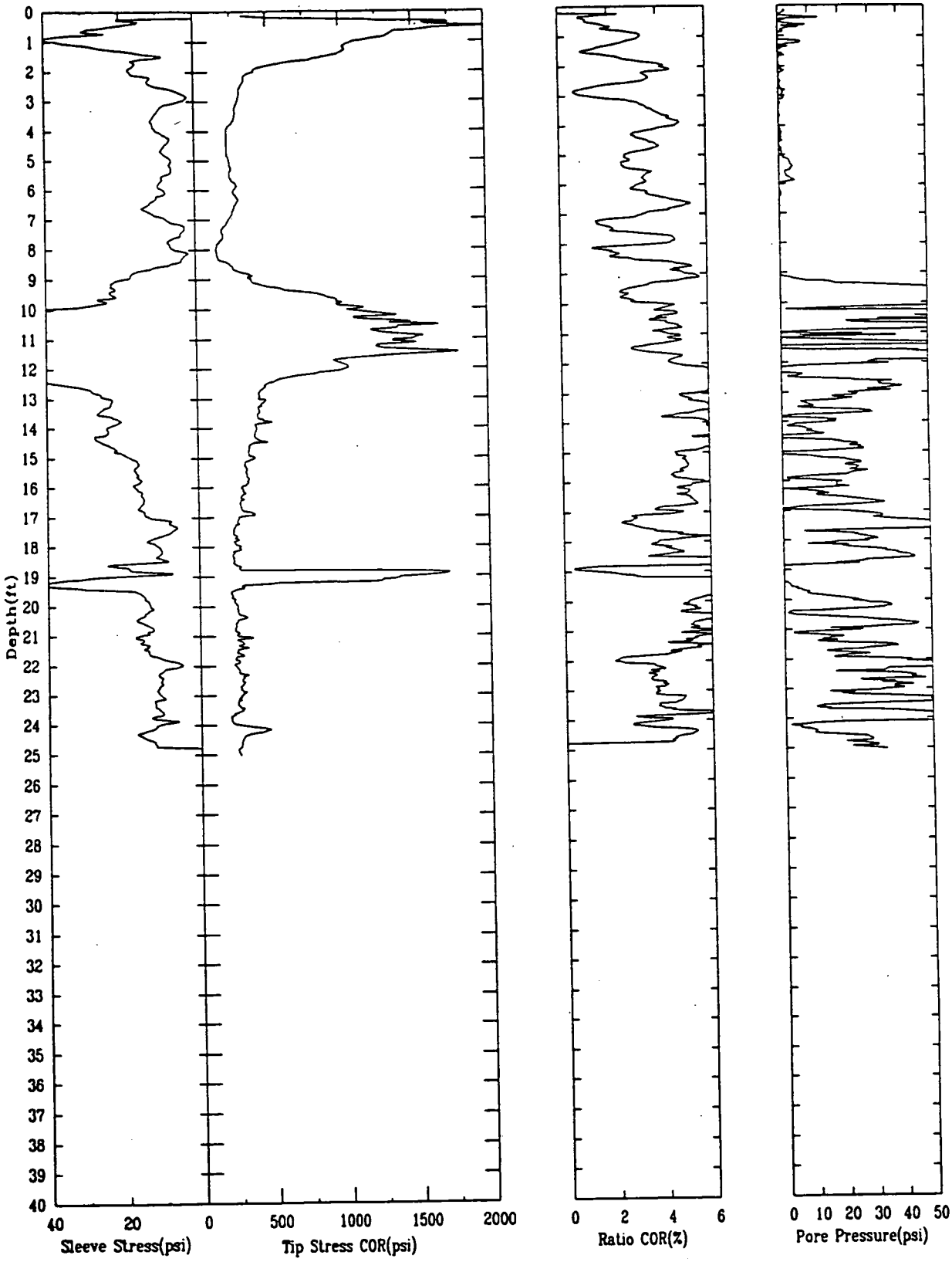


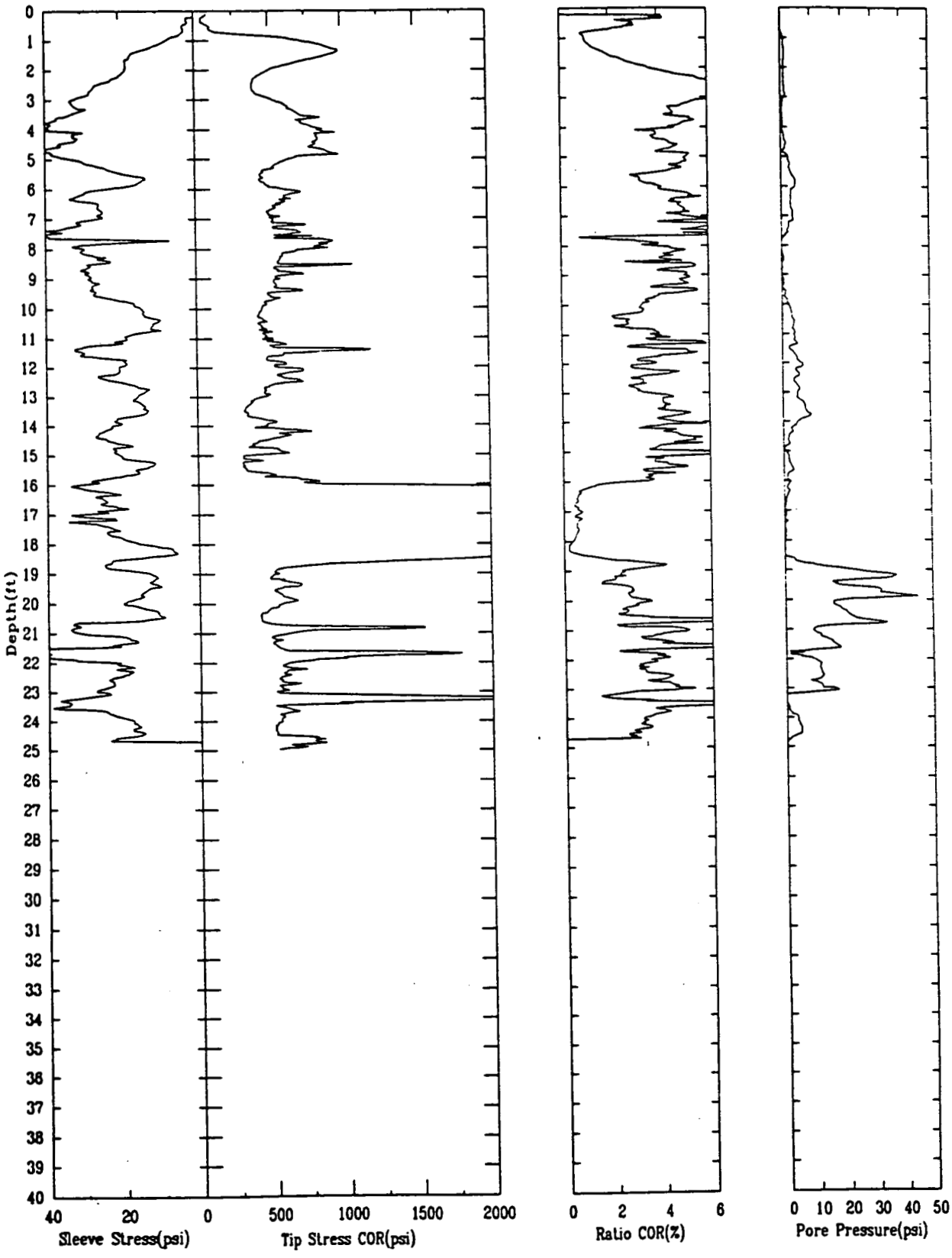

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
0 500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)

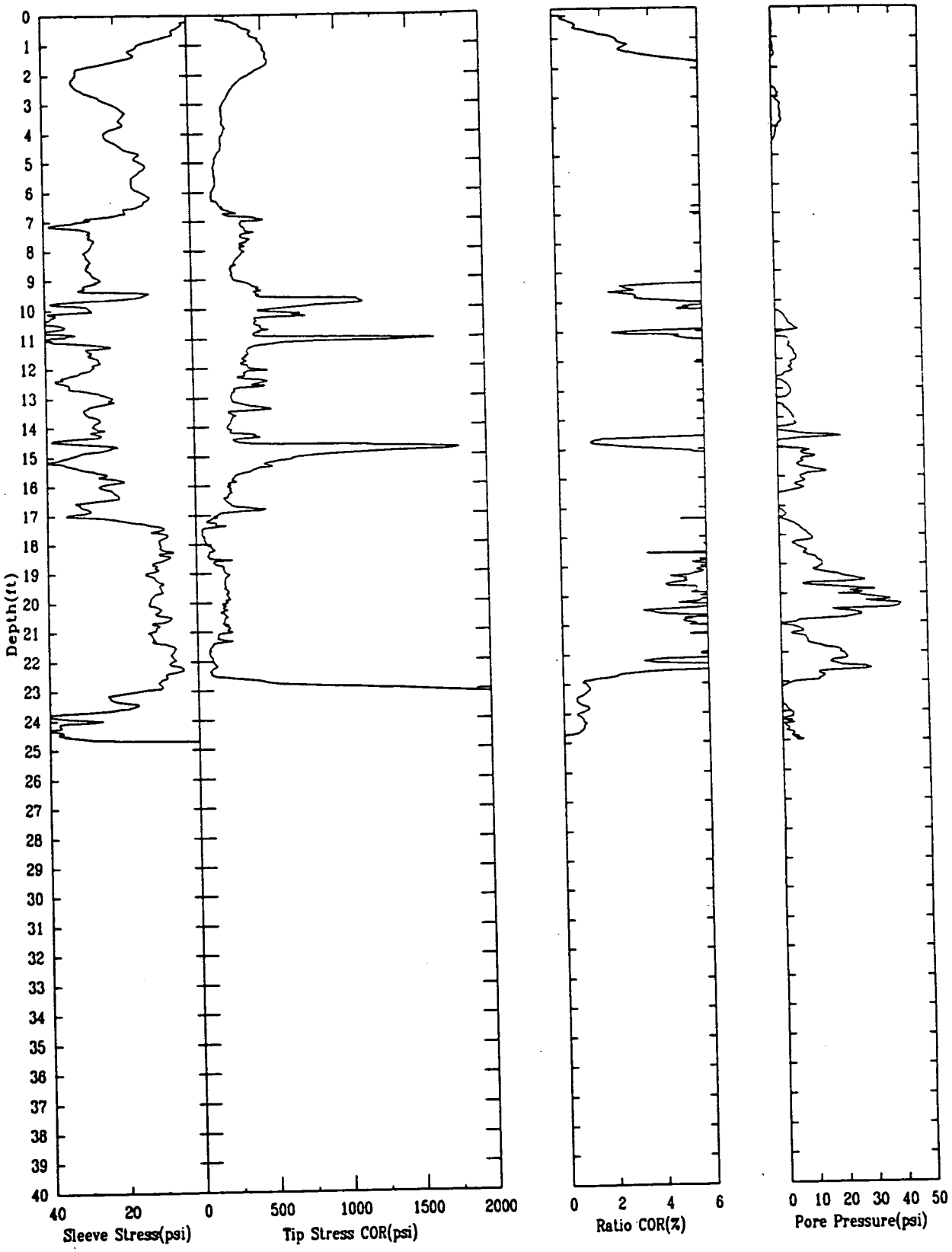

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)

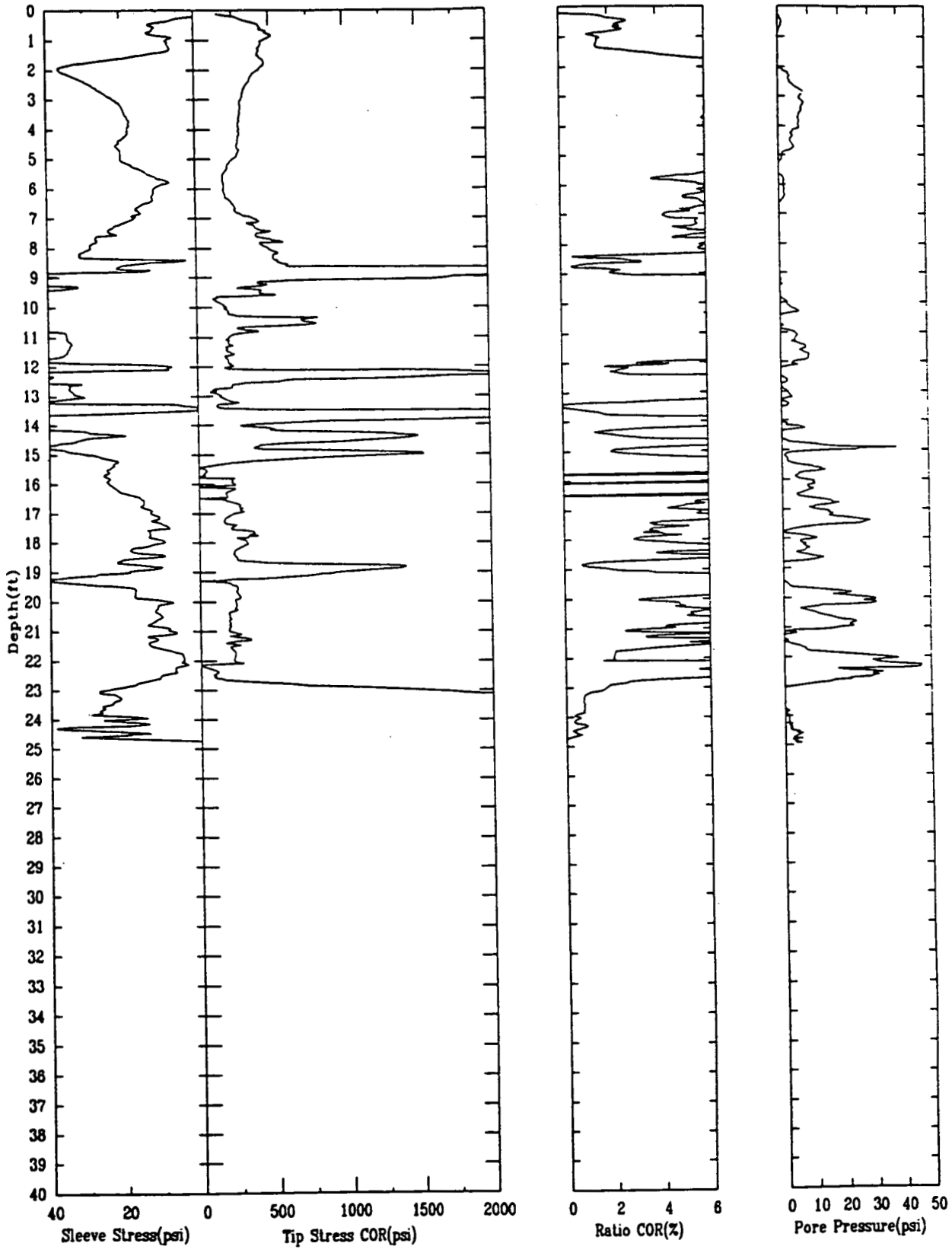
14422/CPT38/C APPLIED RESEARCH ASSOCIATES, INC. 11/02/94

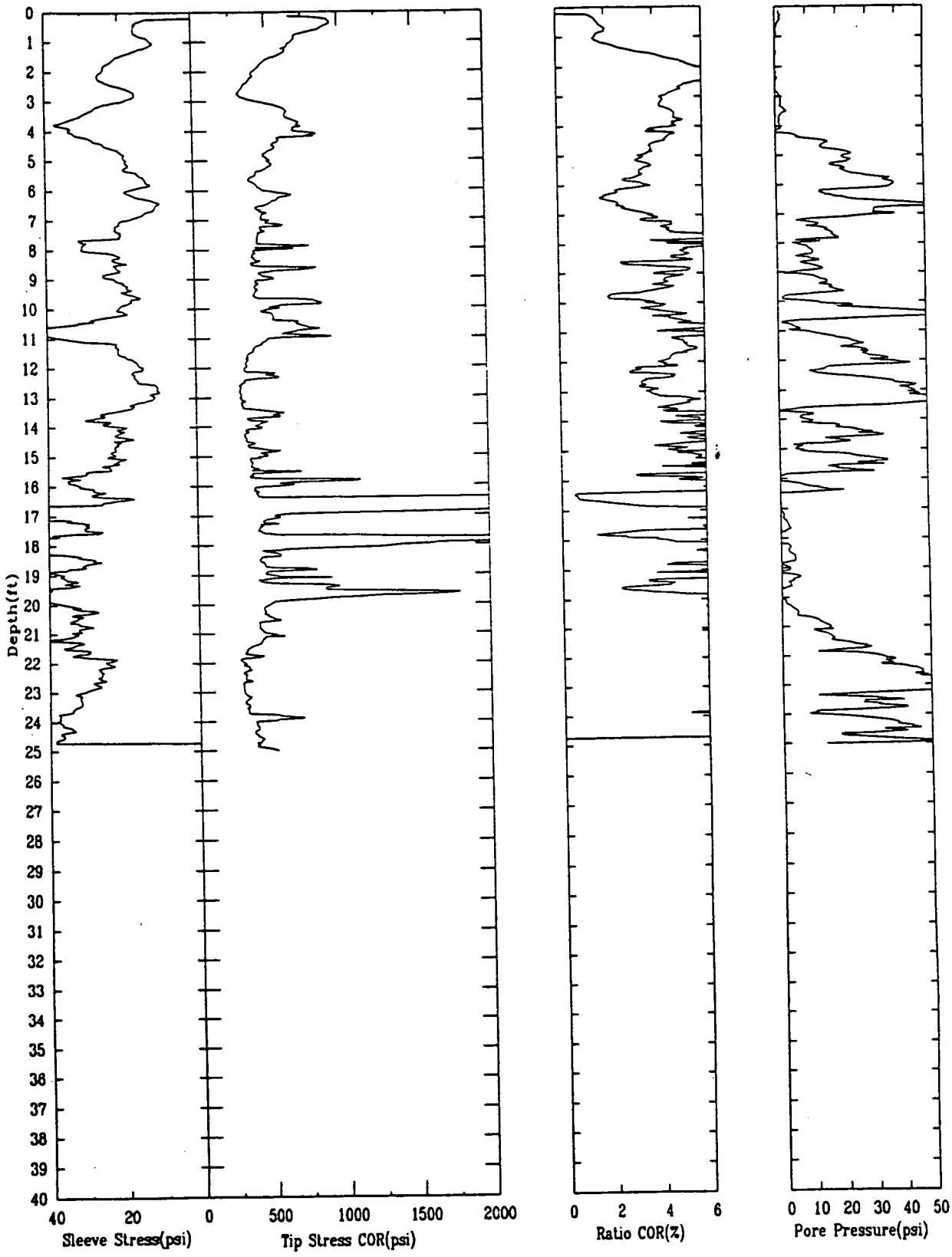


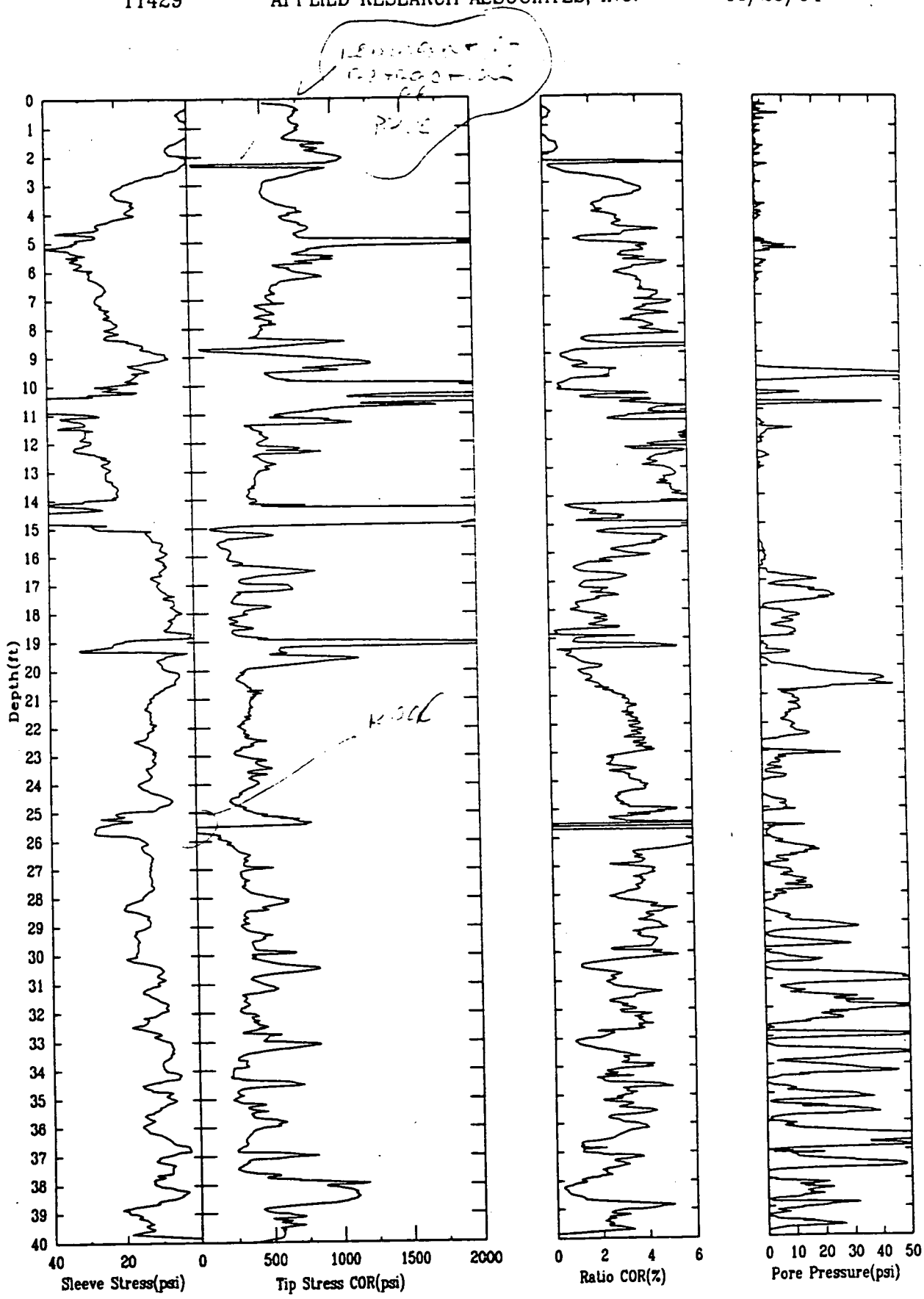

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

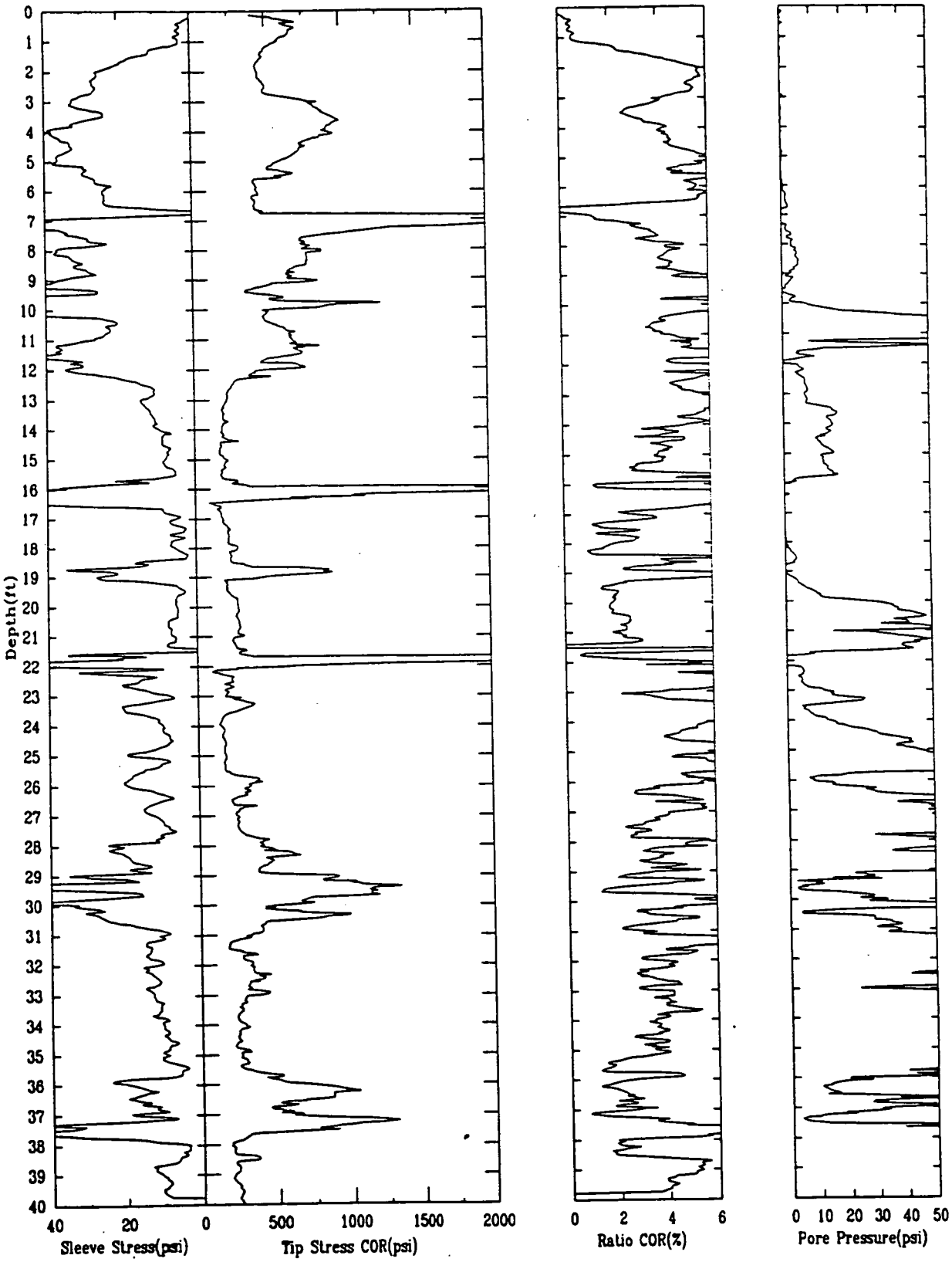
14425/CPT44 APPLIED RESEARCH ASSOCIATES, INC. 11/02/94

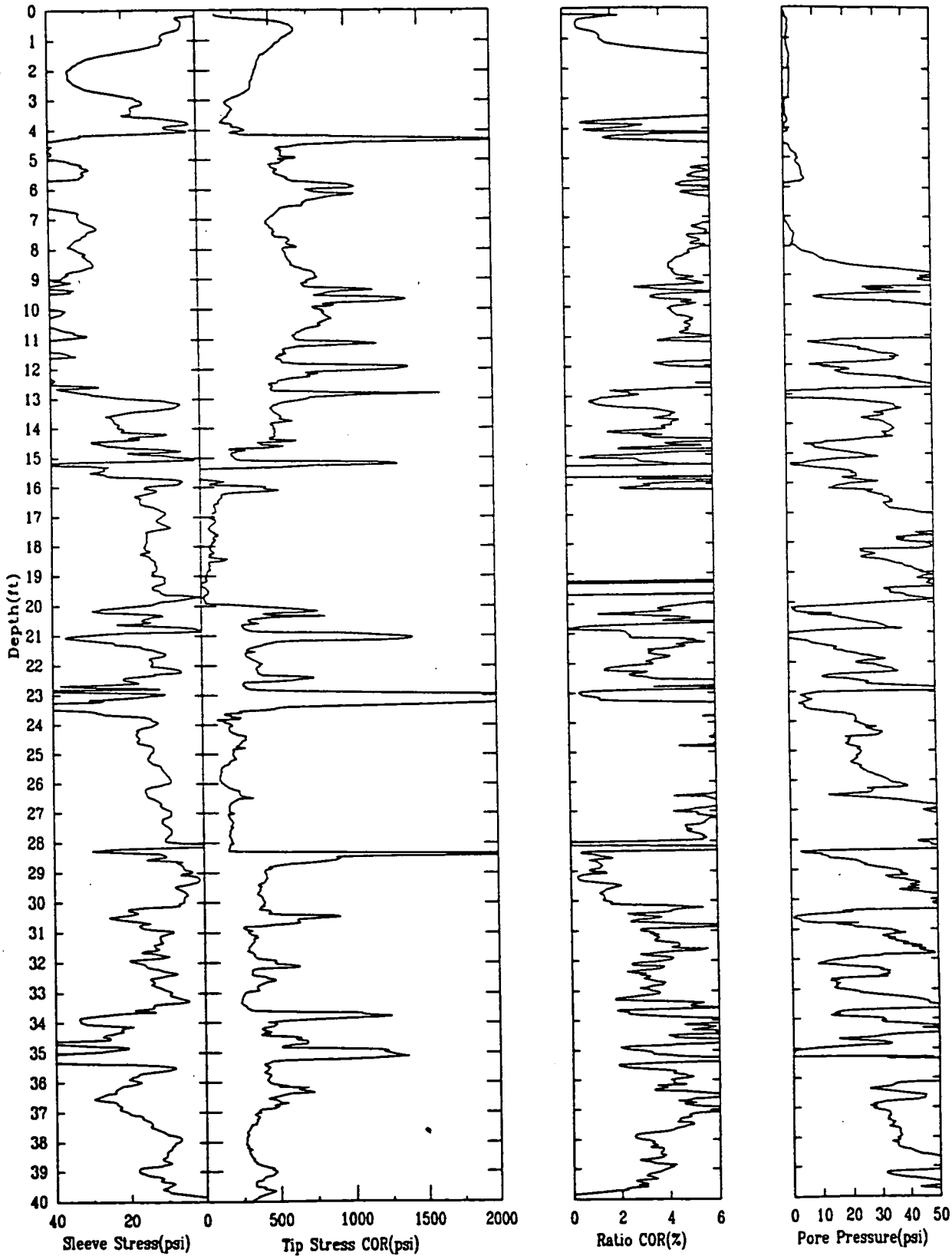


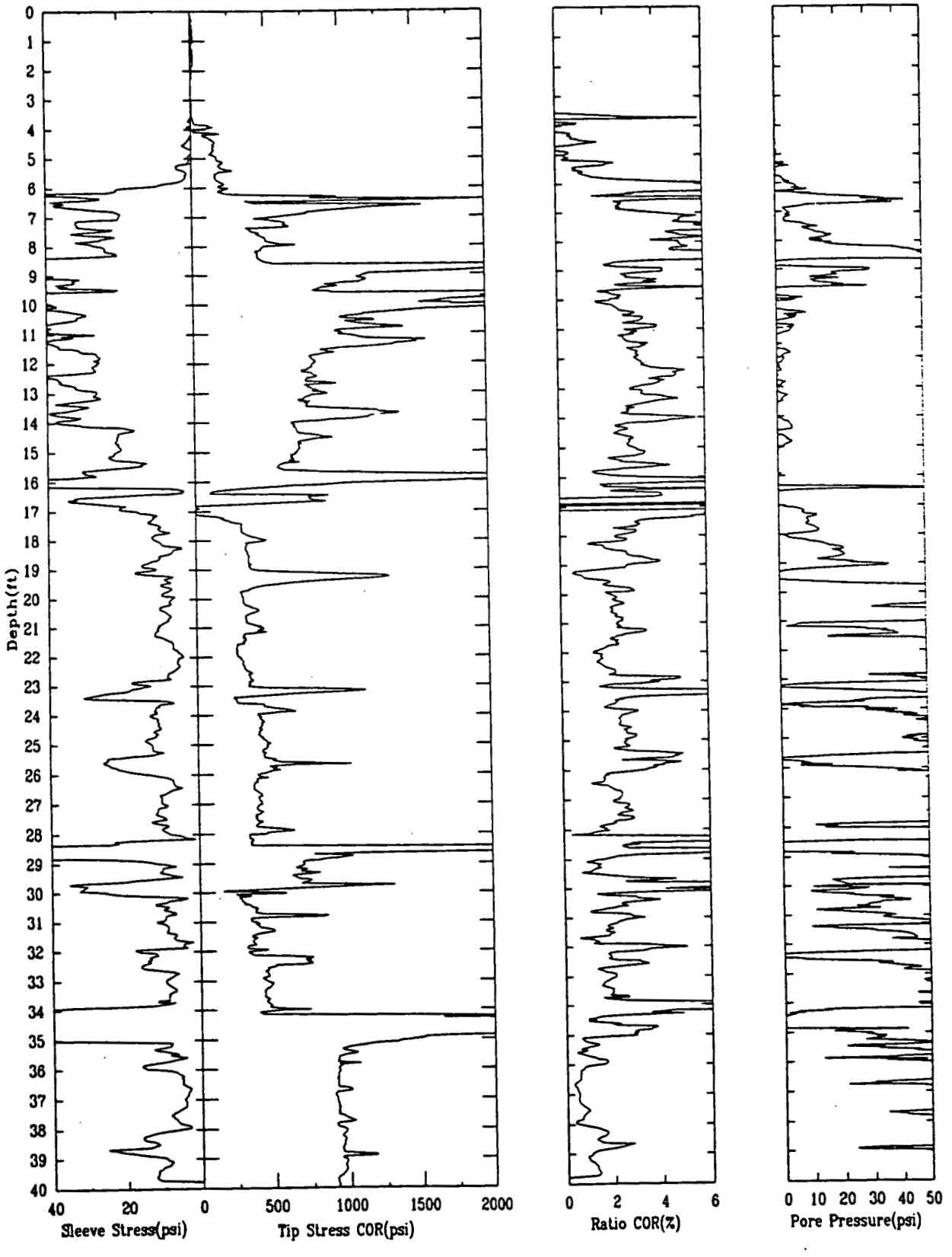

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

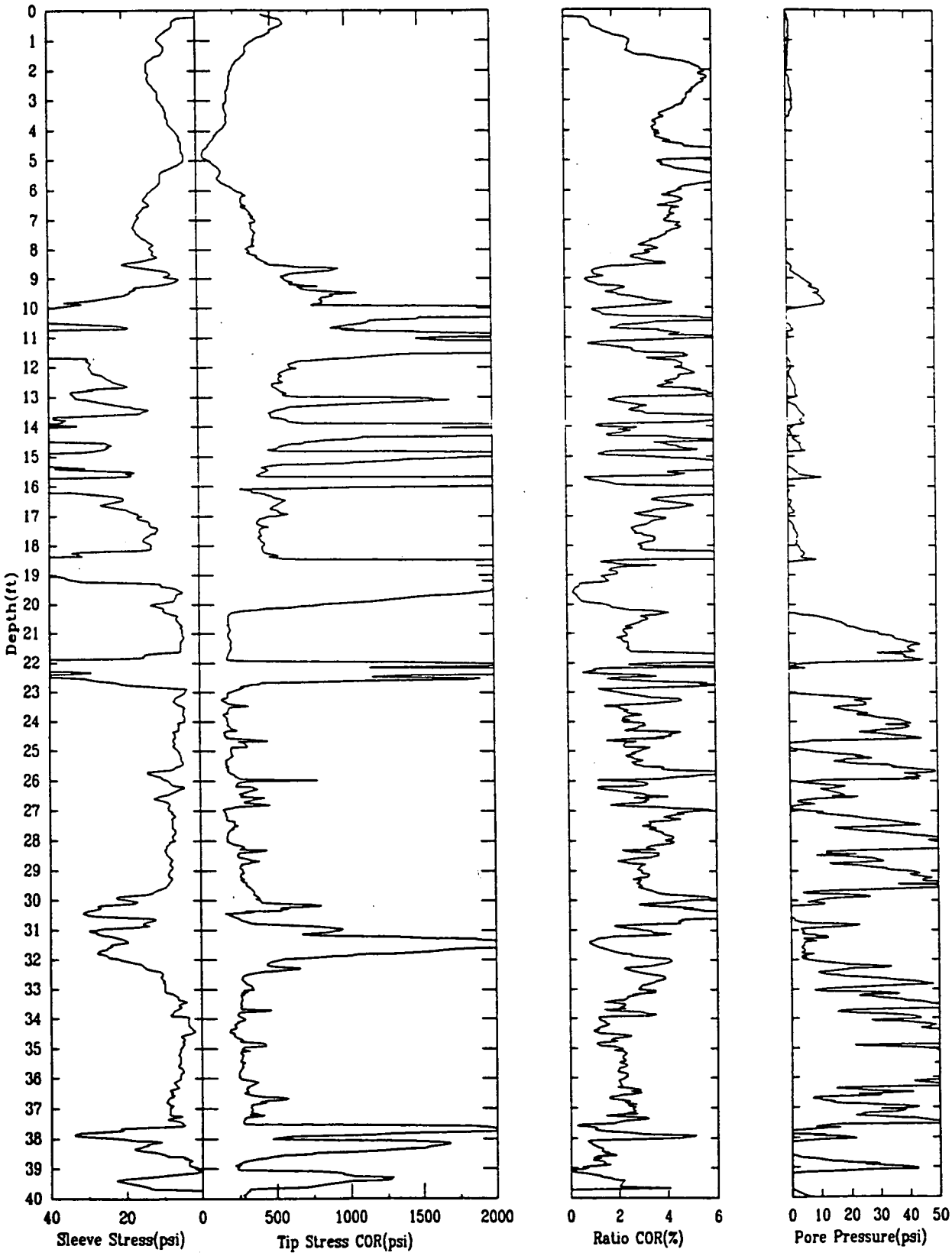

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)


Depth(ft)
Sleeve Stress(psi)
Tip Stress COR(psi)
Ratio COR(%)
Pore Pressure(psi)
ROCK

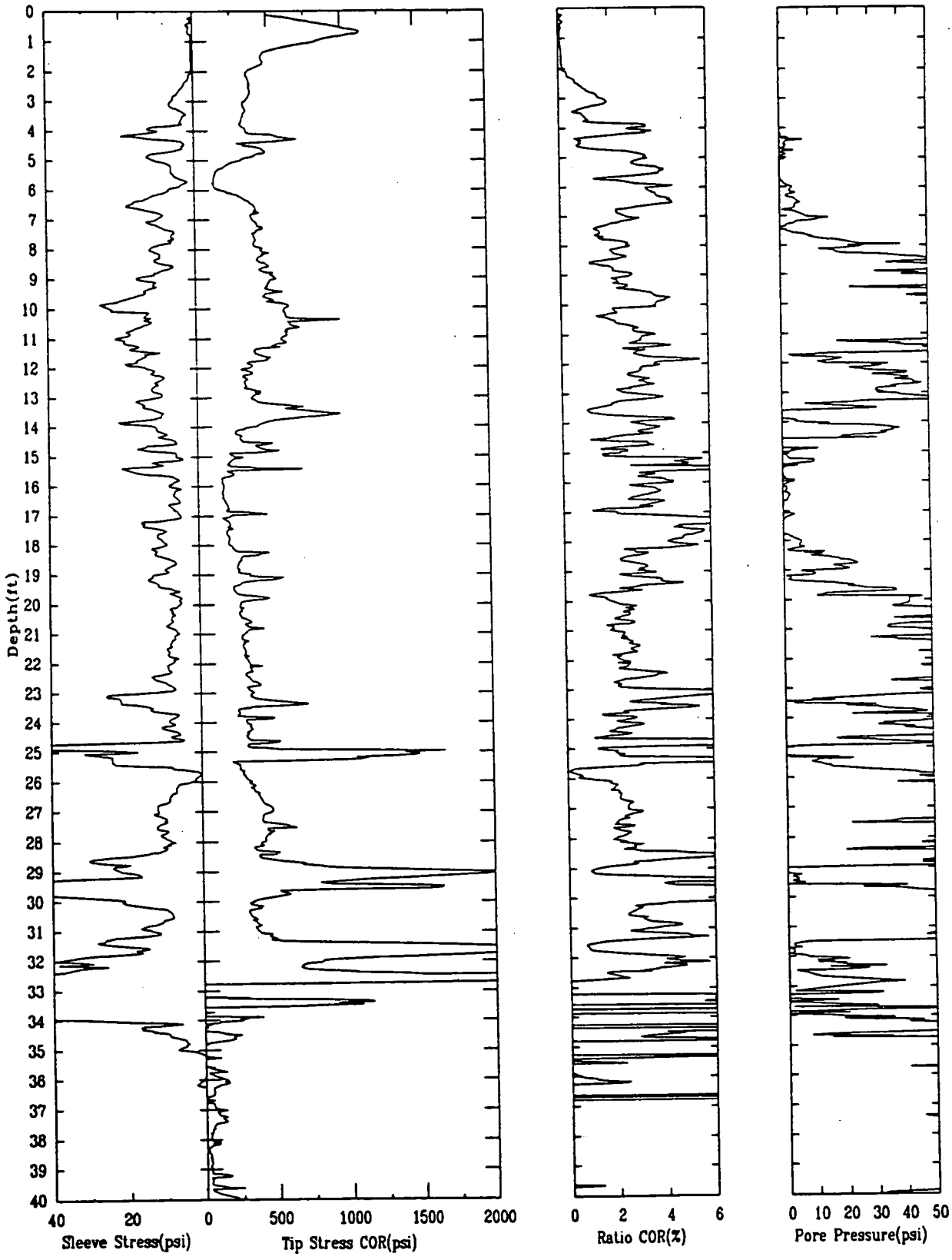

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

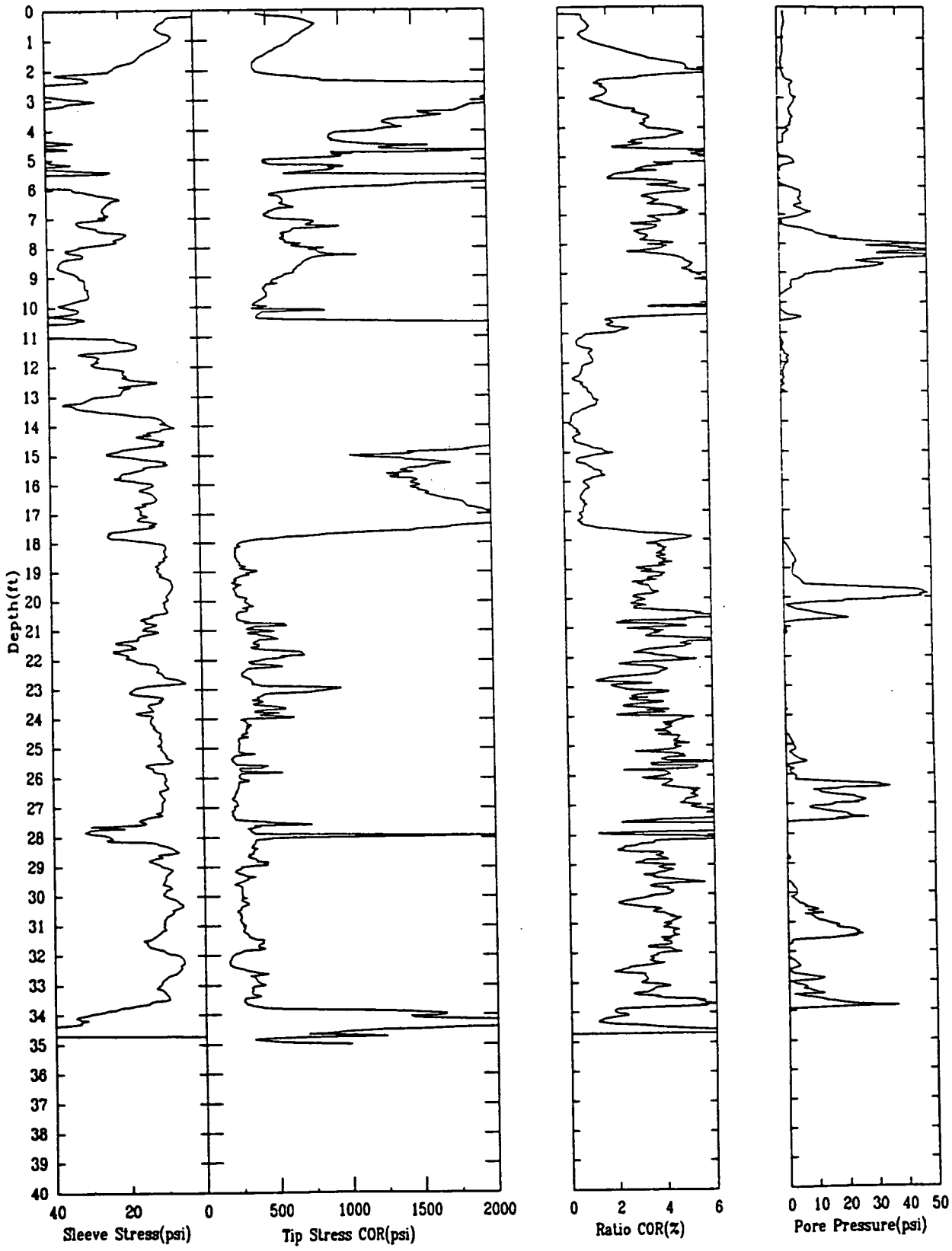

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

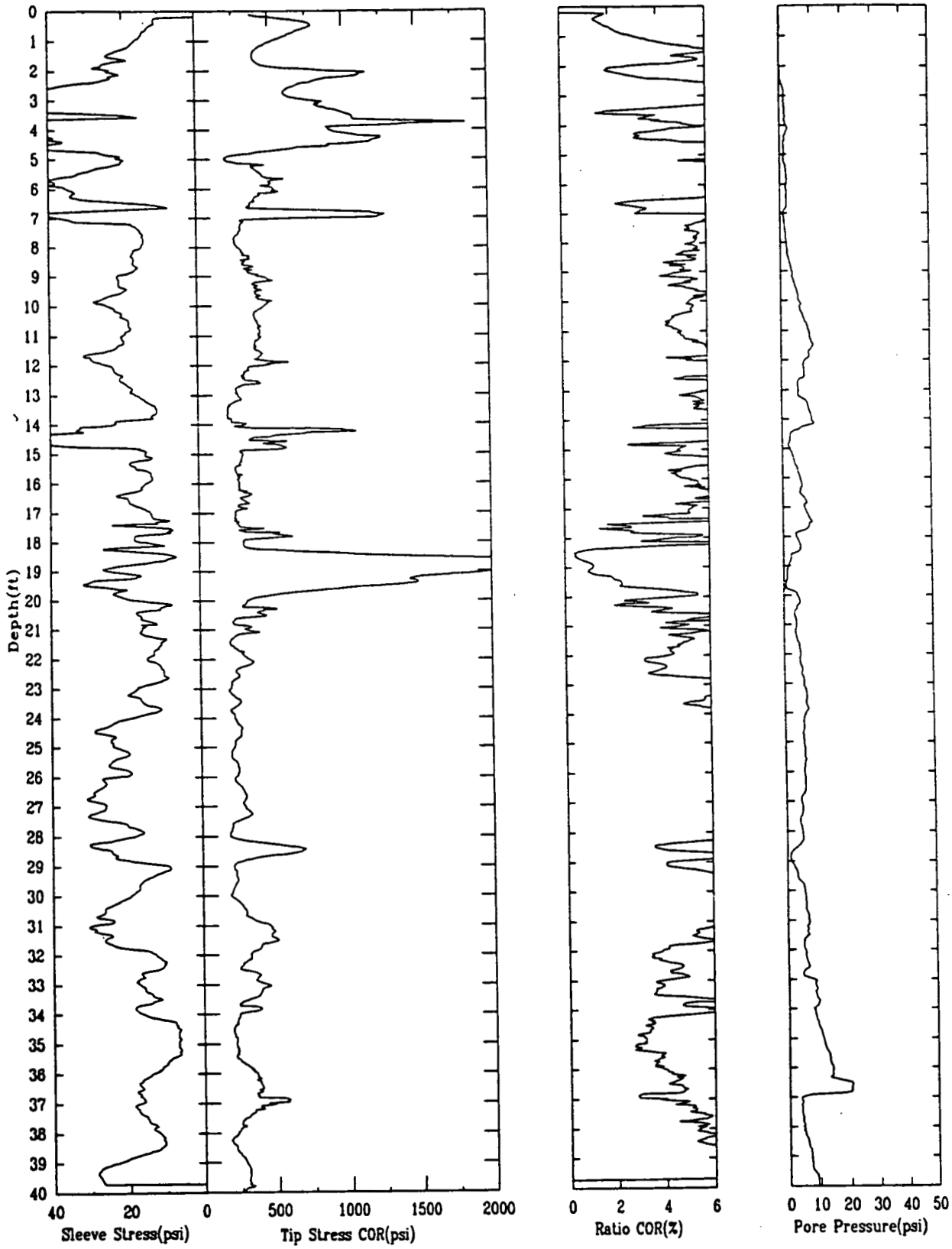

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
0 500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)

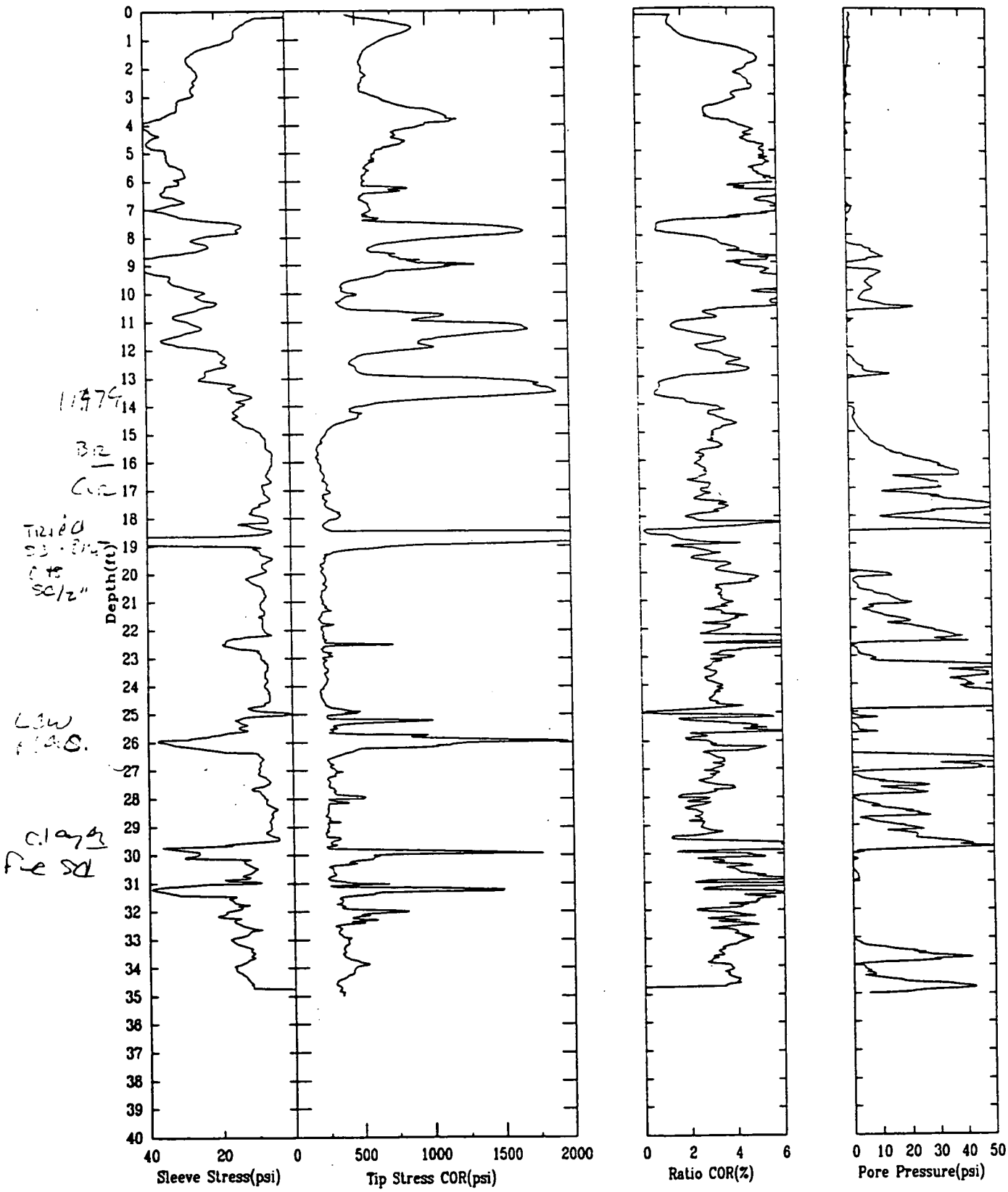

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
0 500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)

000311

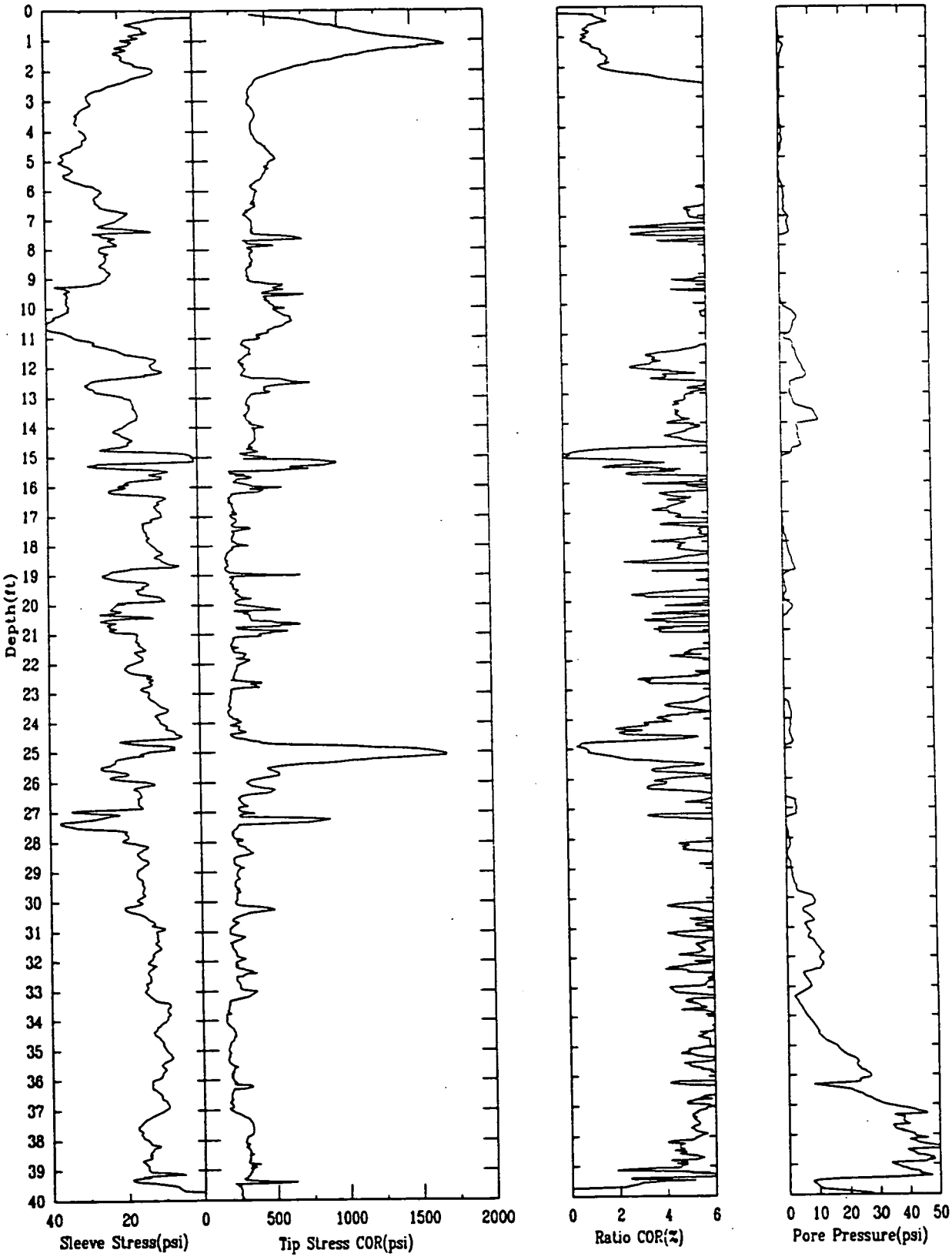

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

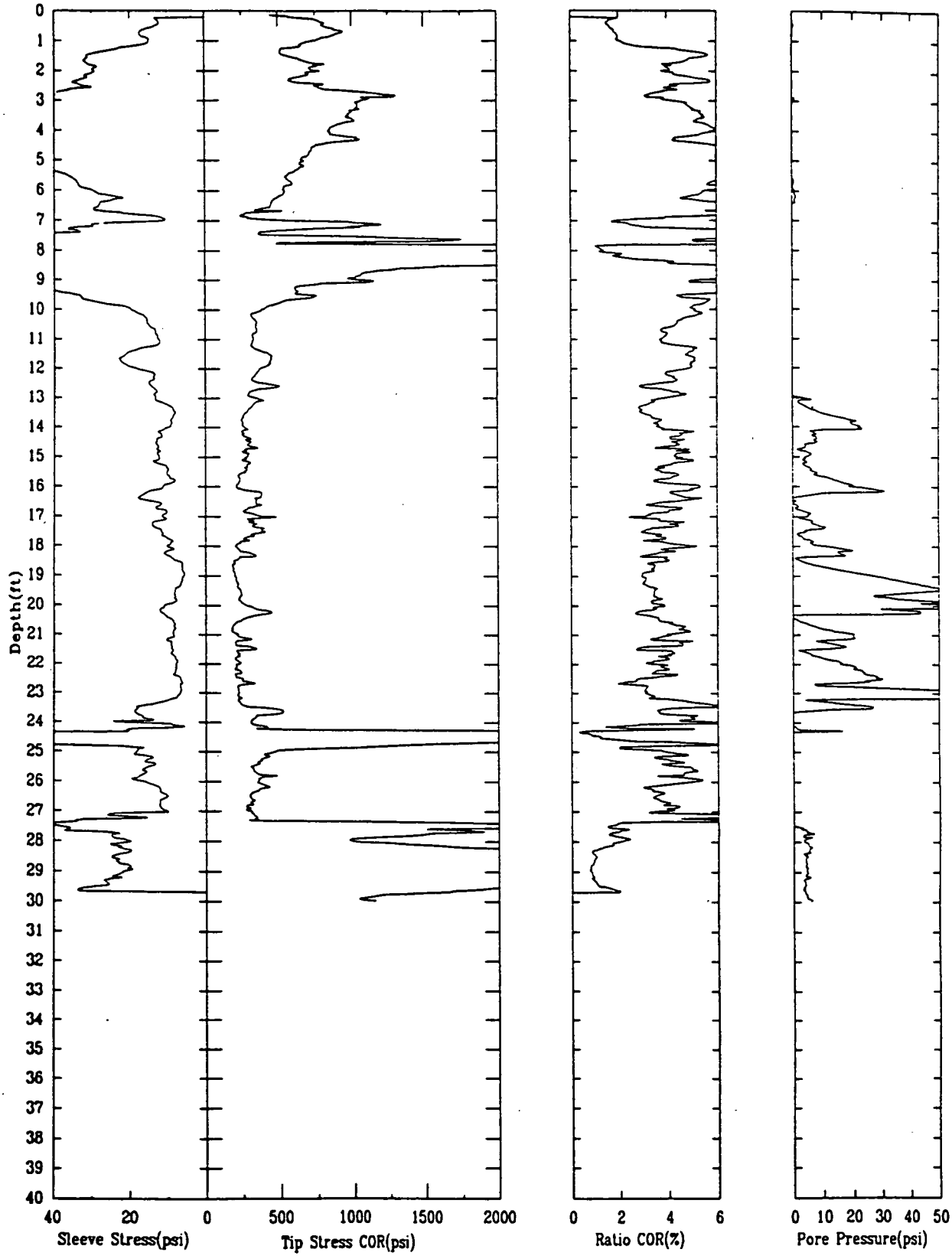

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

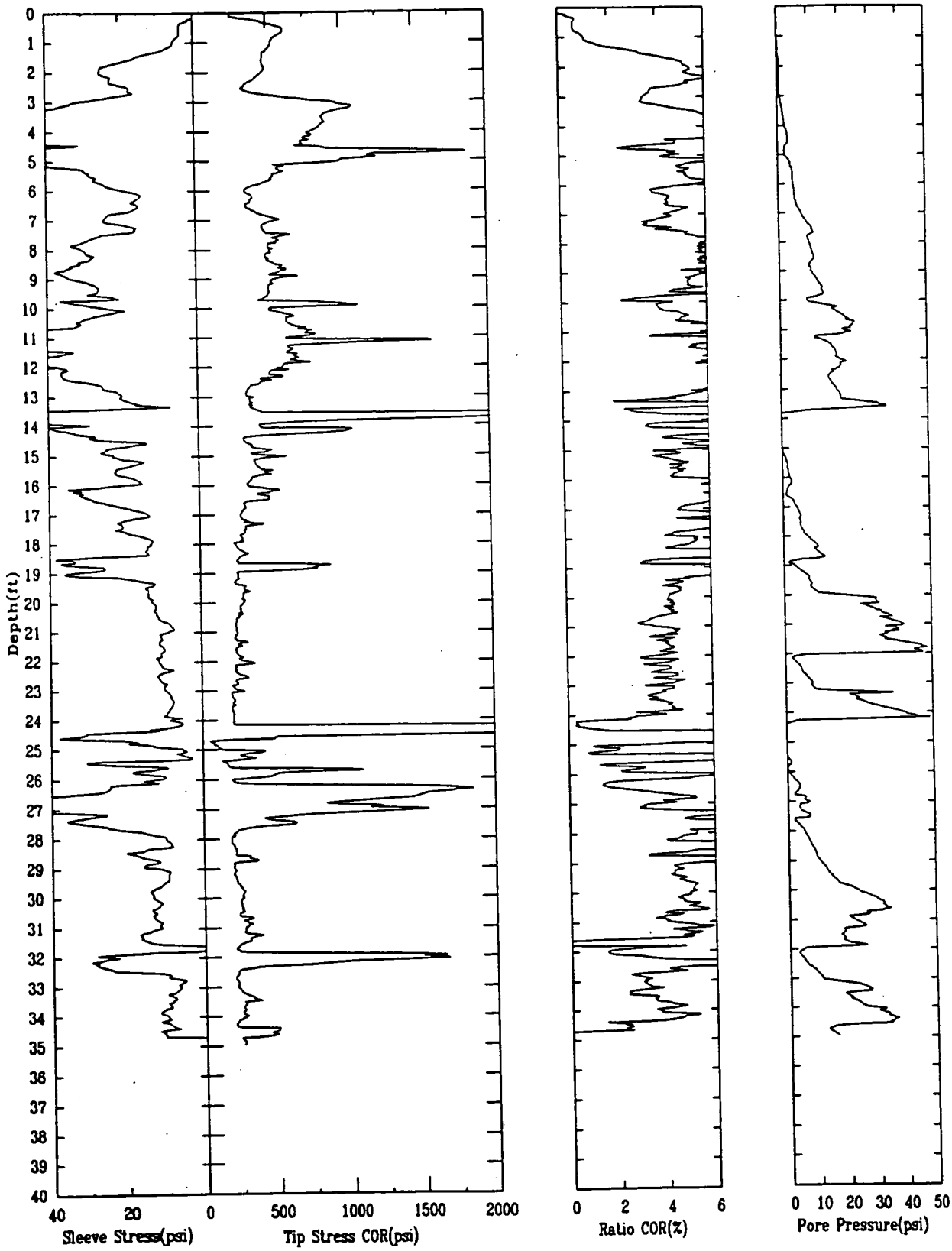

Depth(ft)
Sleeve Stress(psi)
Tip Stress COR(psi)
Ratio COR(%)
Pore Pressure(psi)
1147.4
B2
C2
Tried
SS - Bad
Cts
SC/2"
Low
Fric.
Clayey
Fine Sd

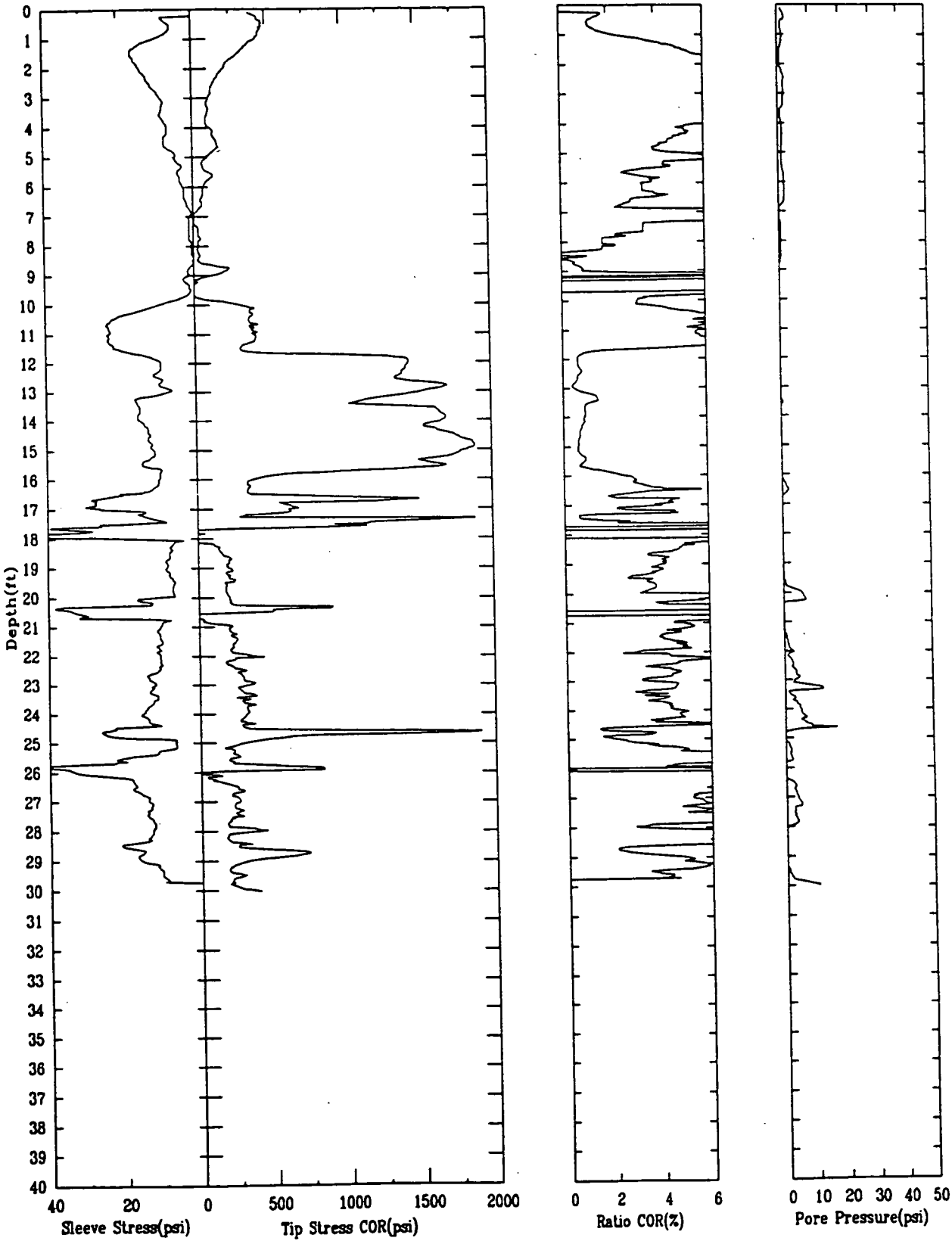
000315


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

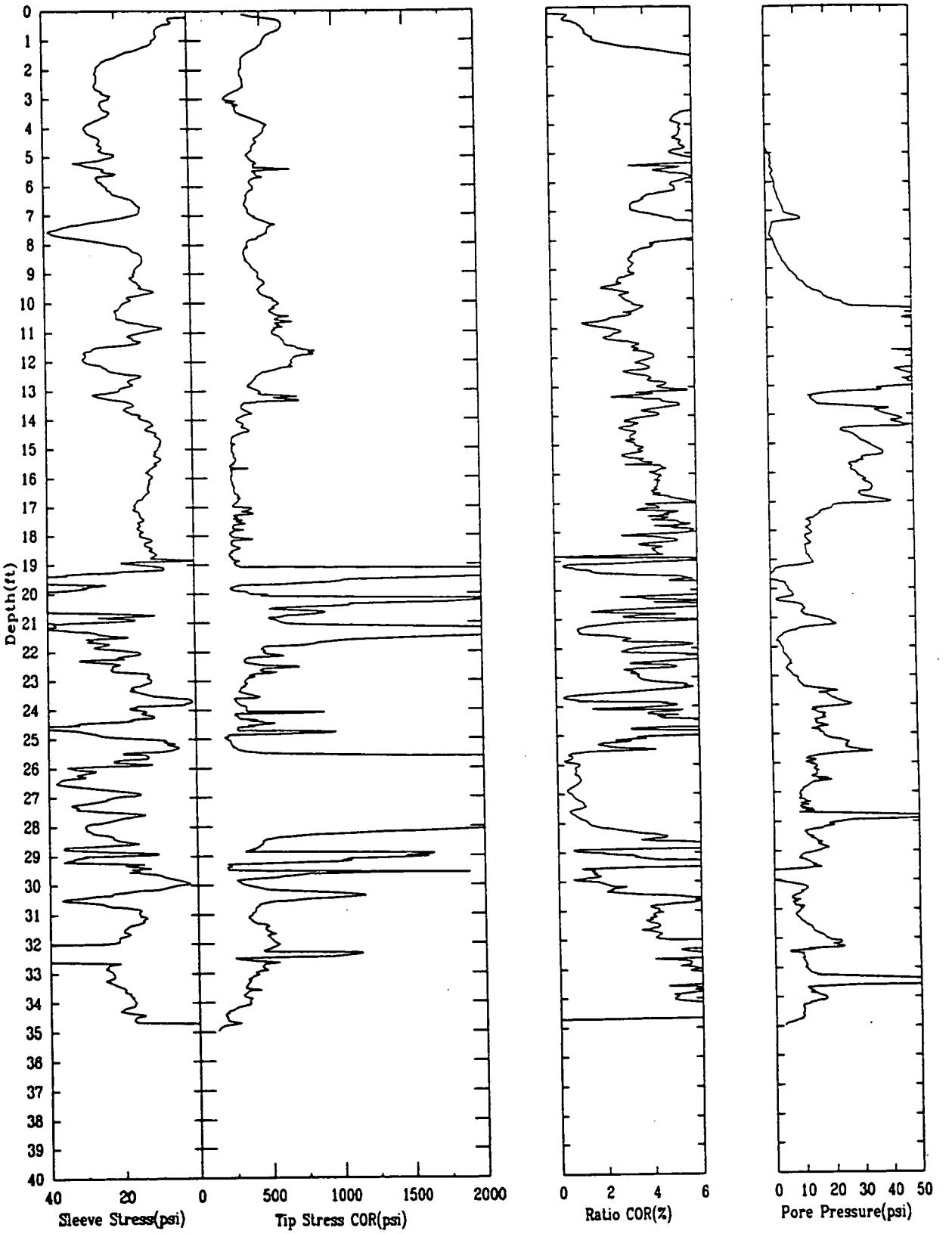

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

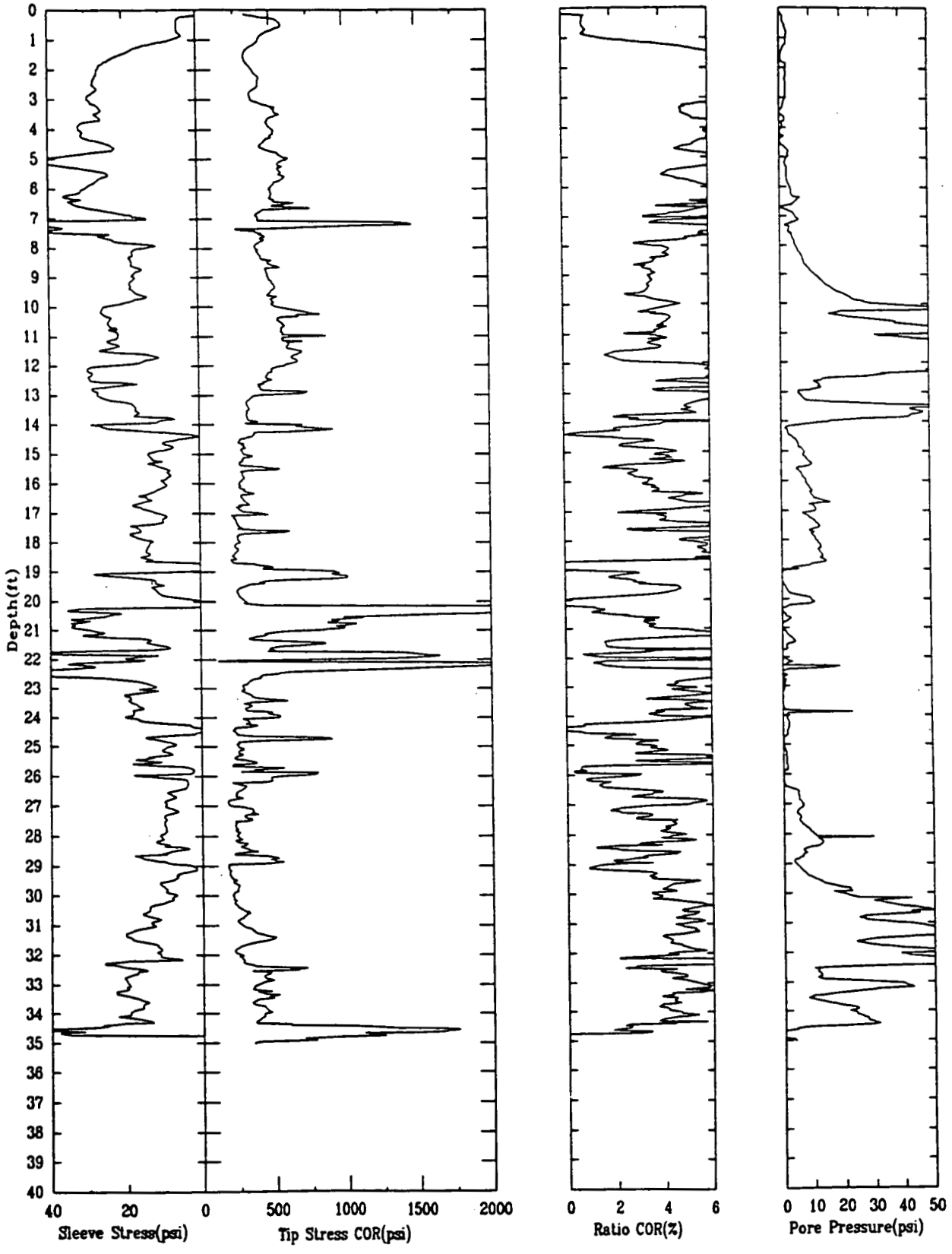
000327


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

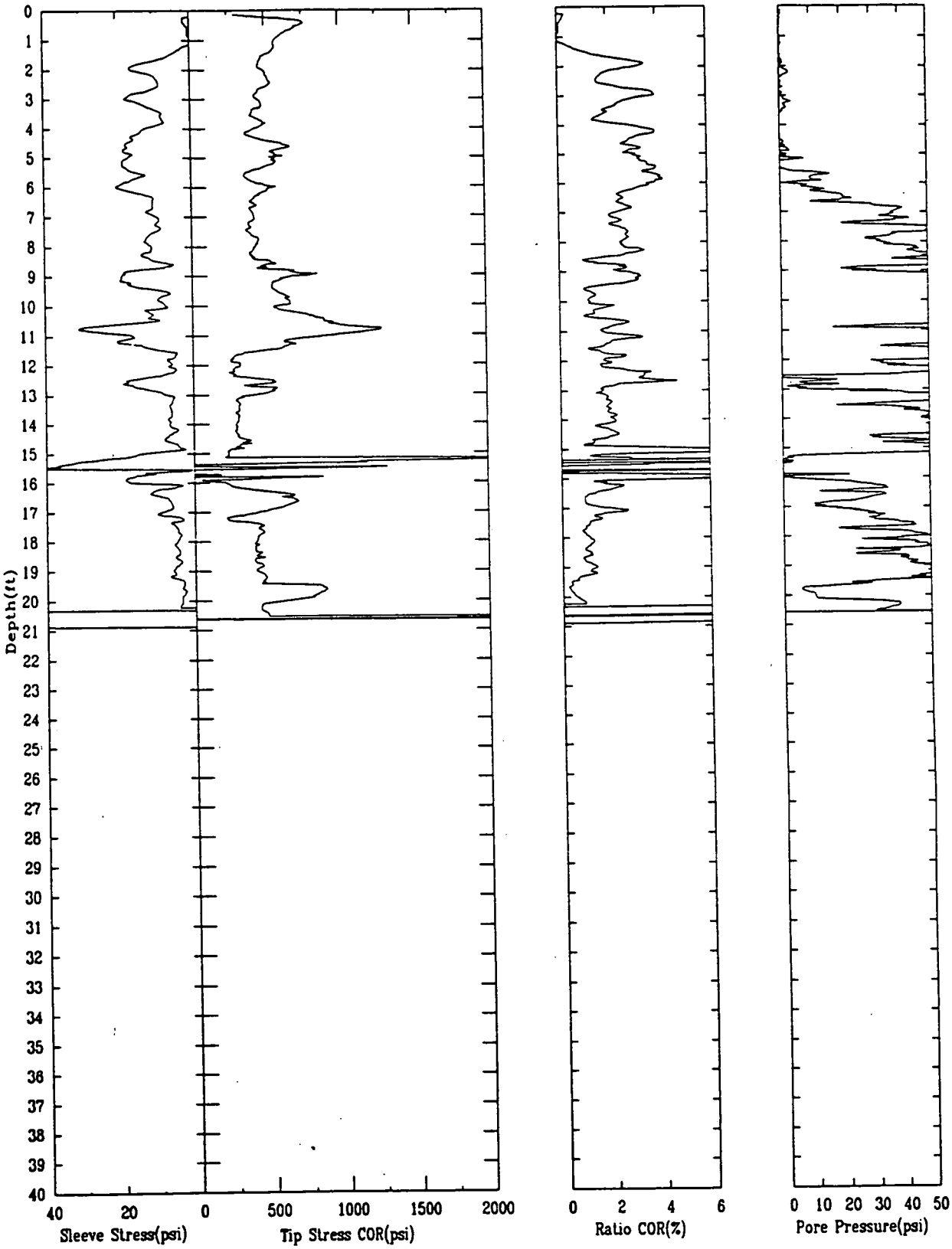

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

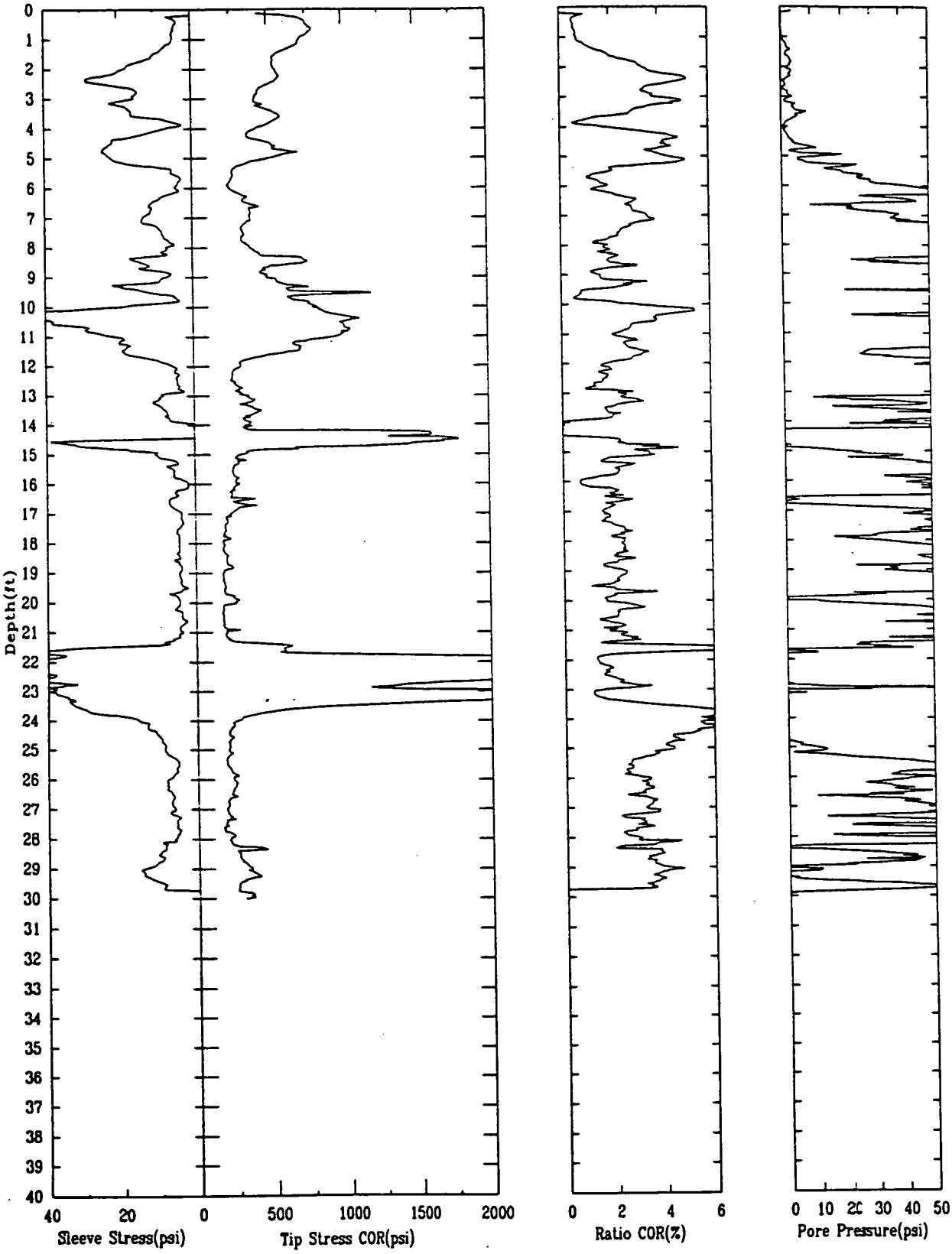
000319

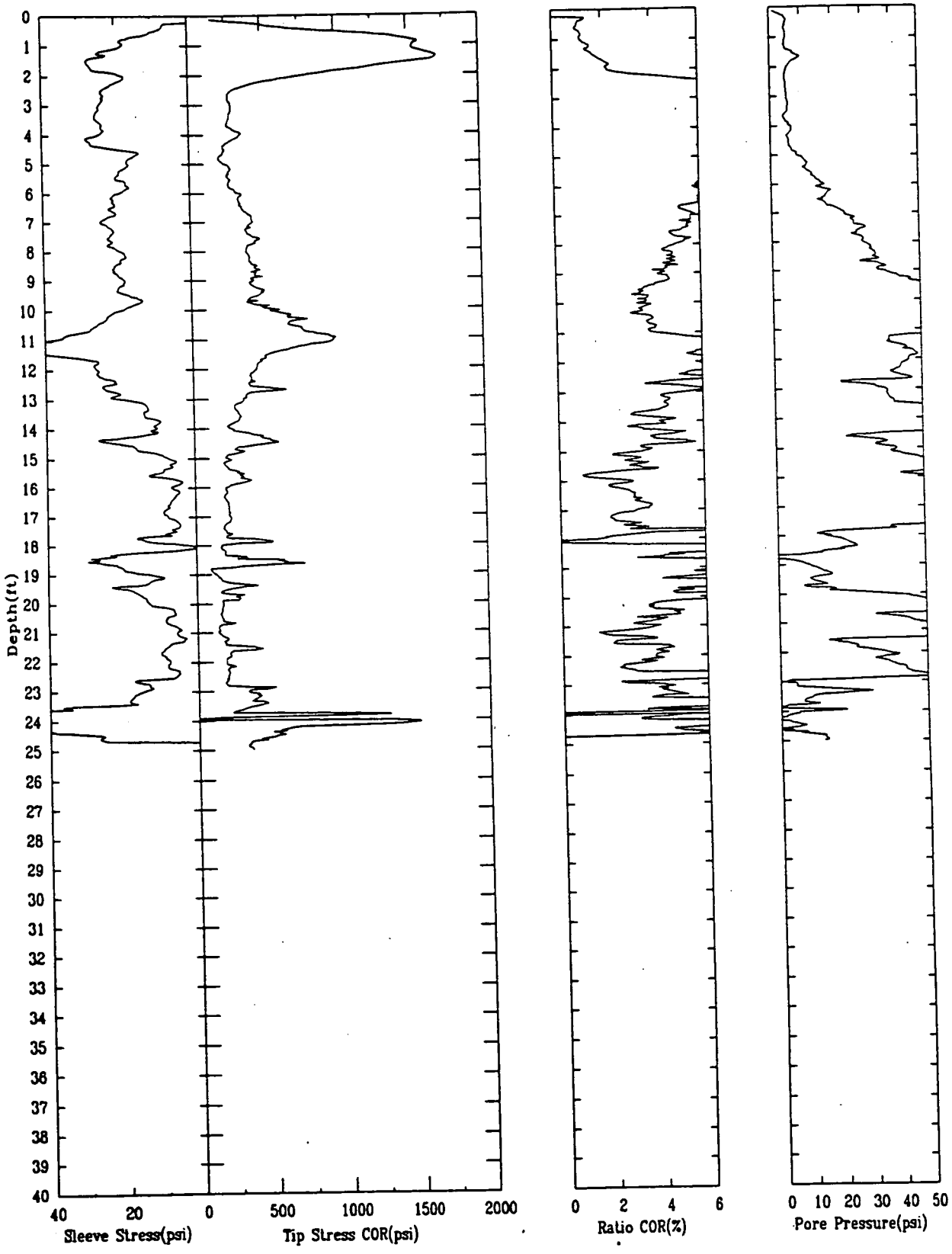

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

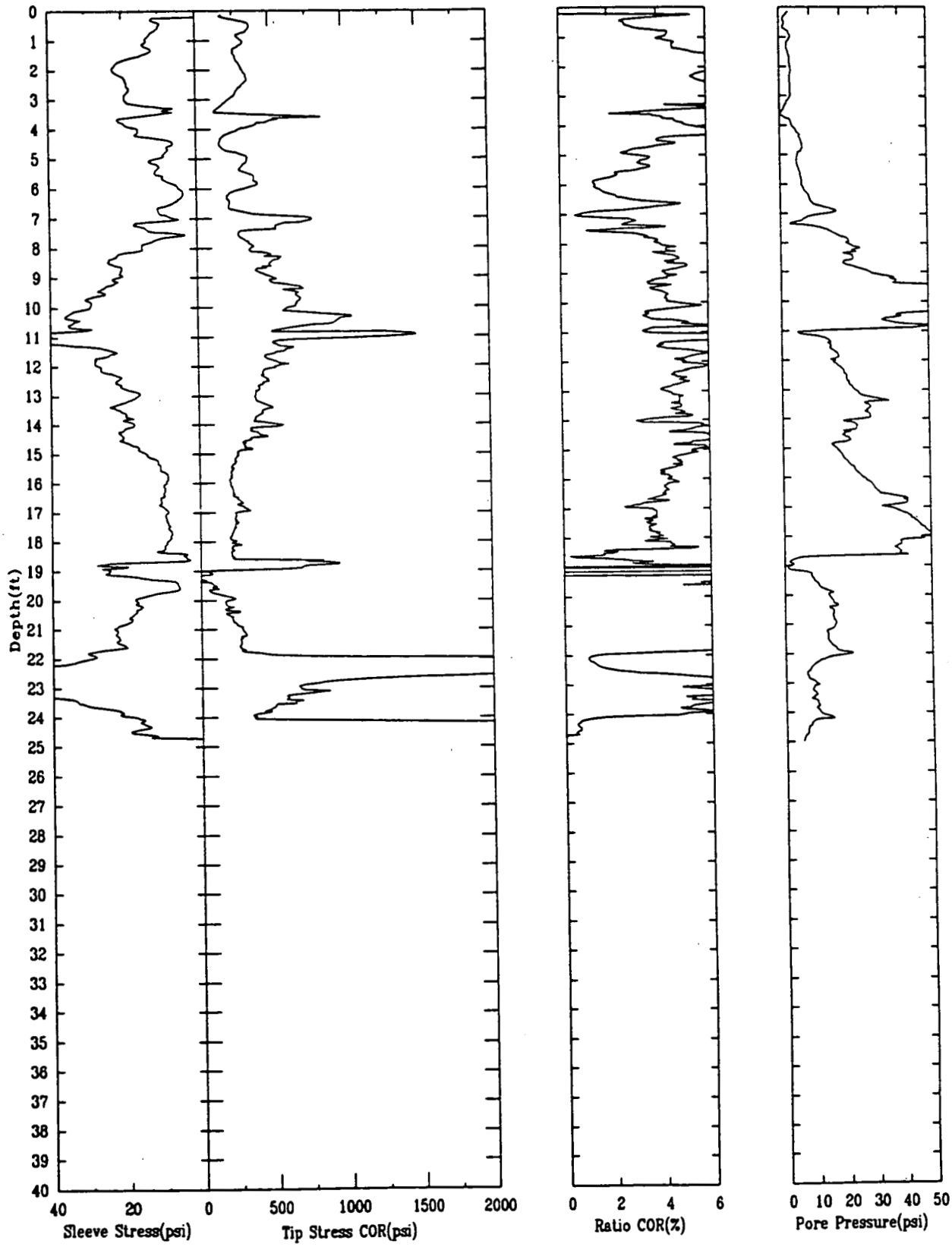

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

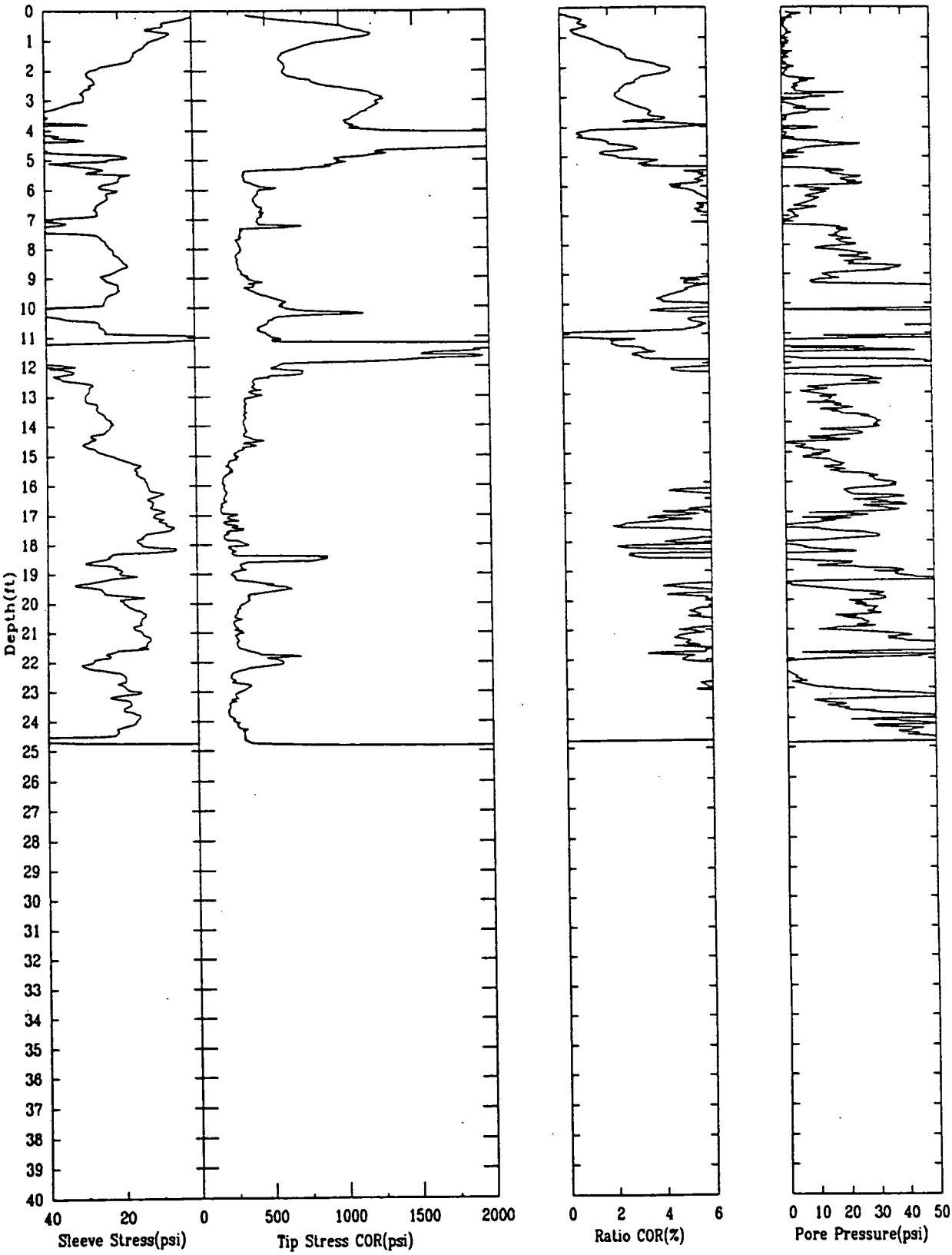
000321

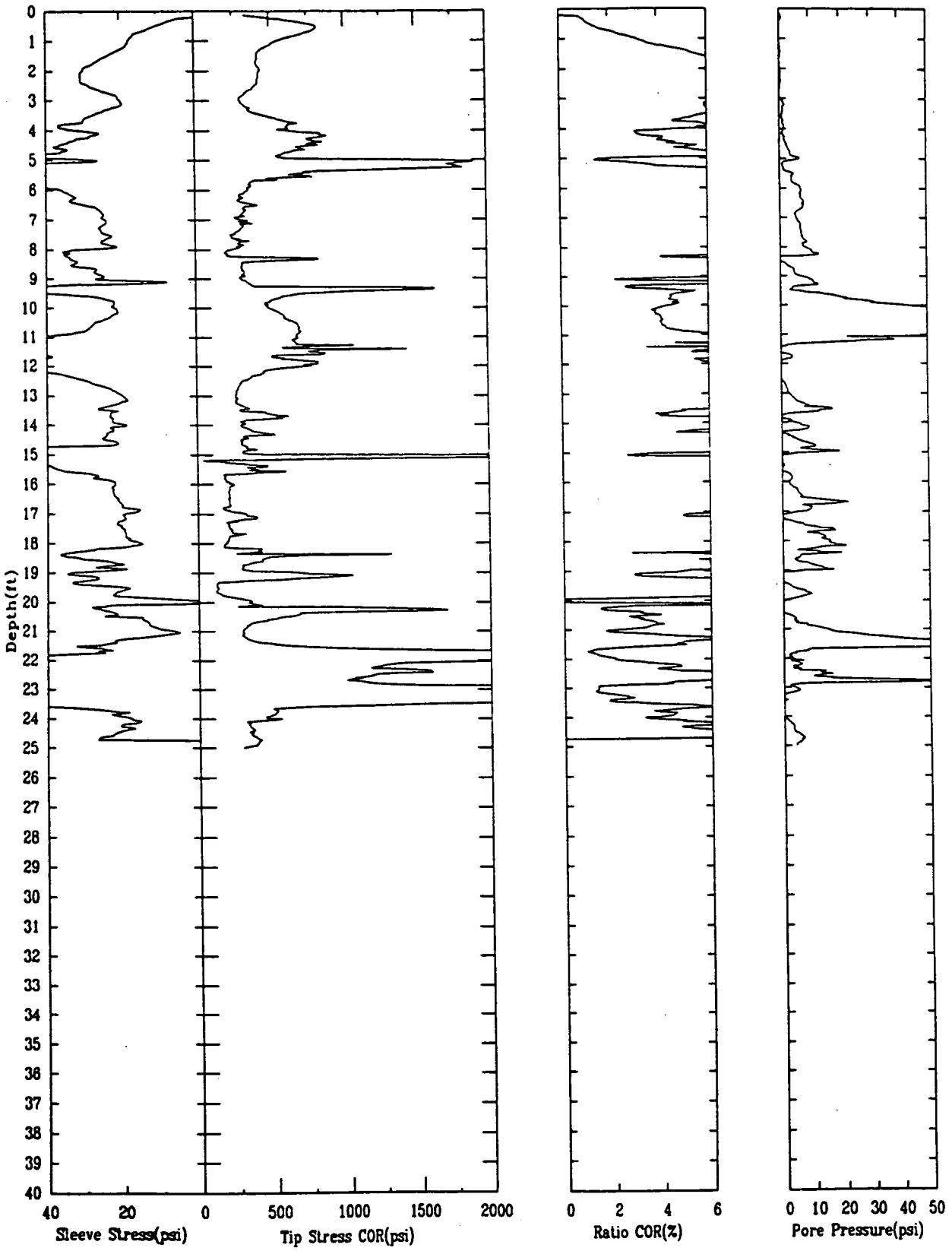

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
0 500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)

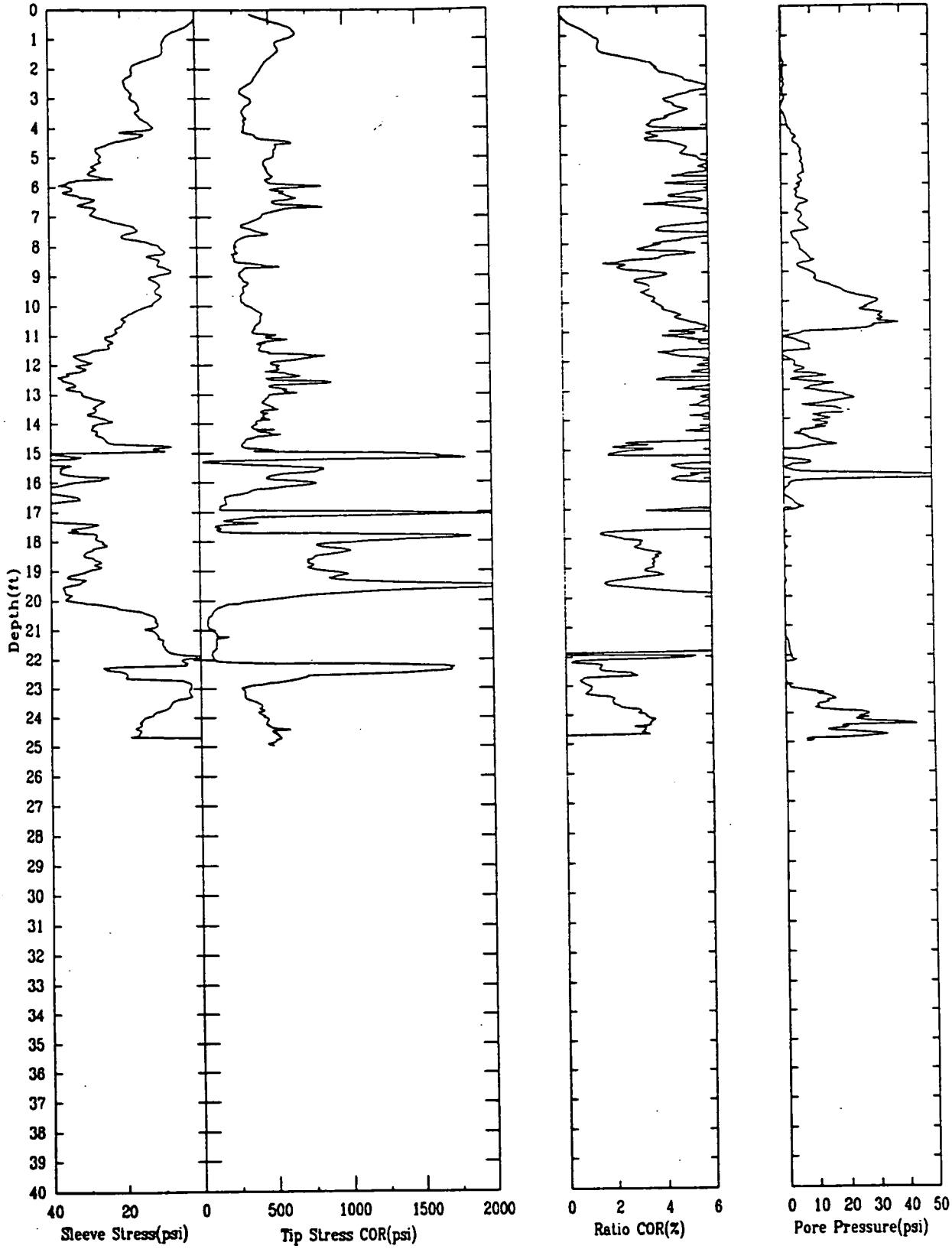

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

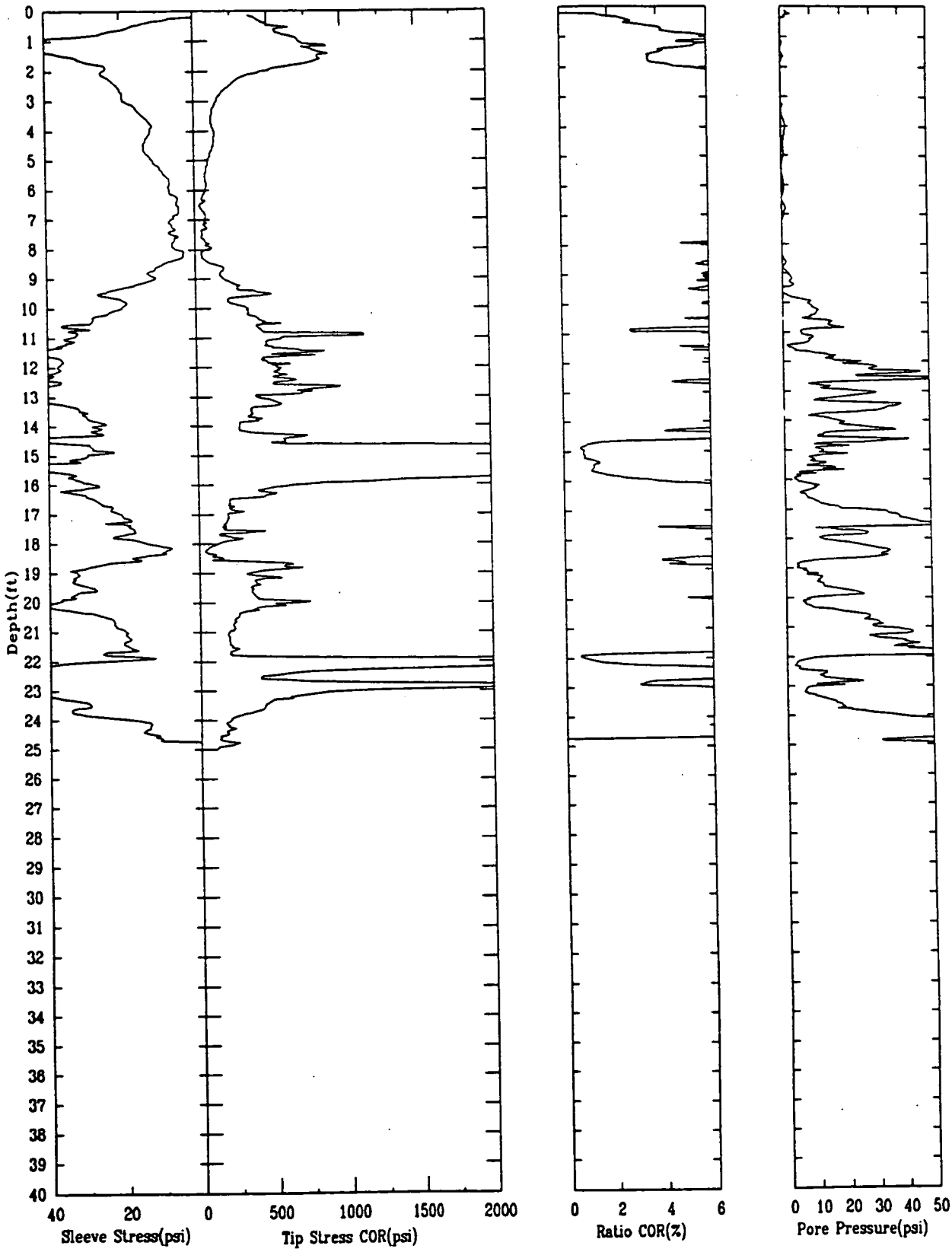

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

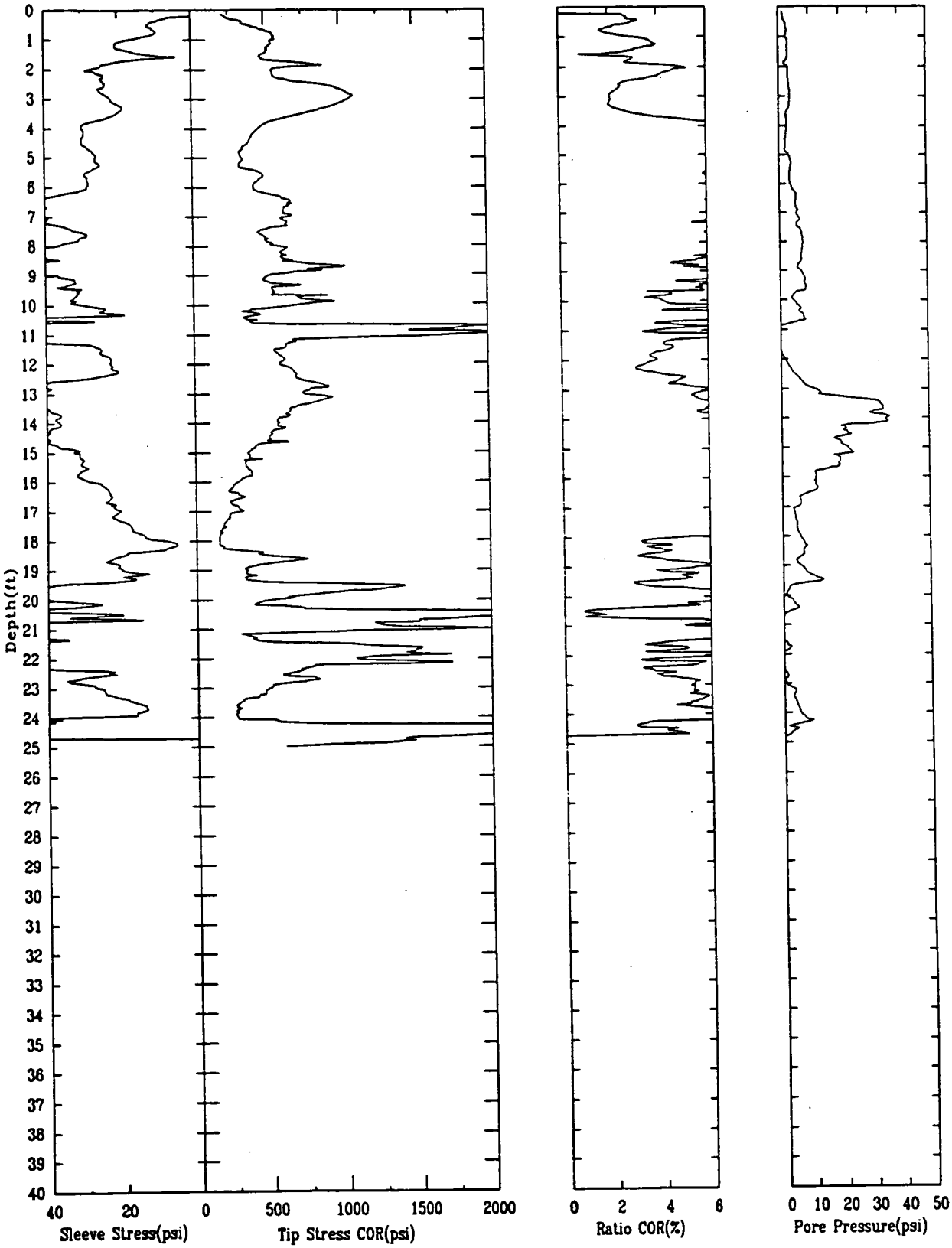

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

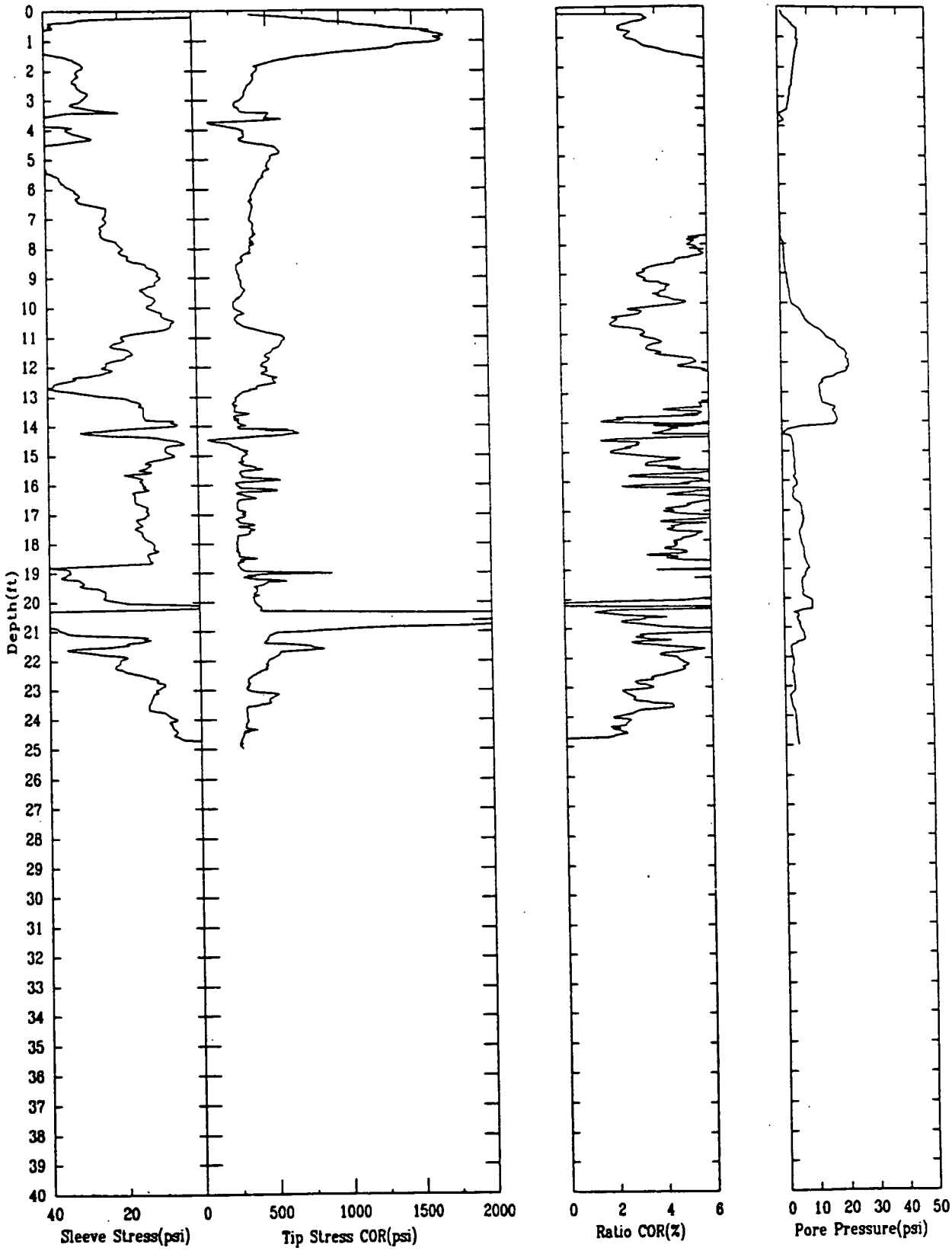

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

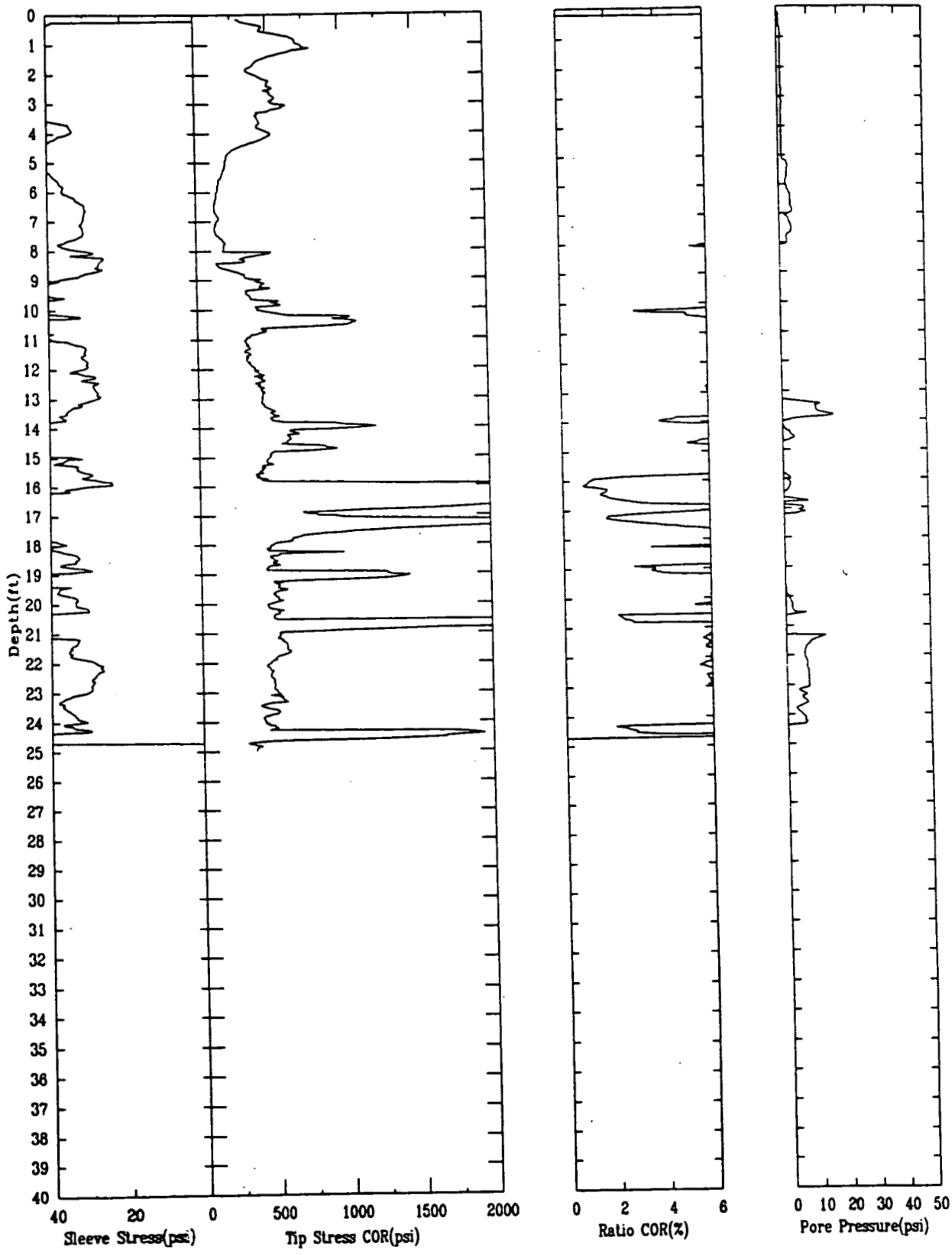

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

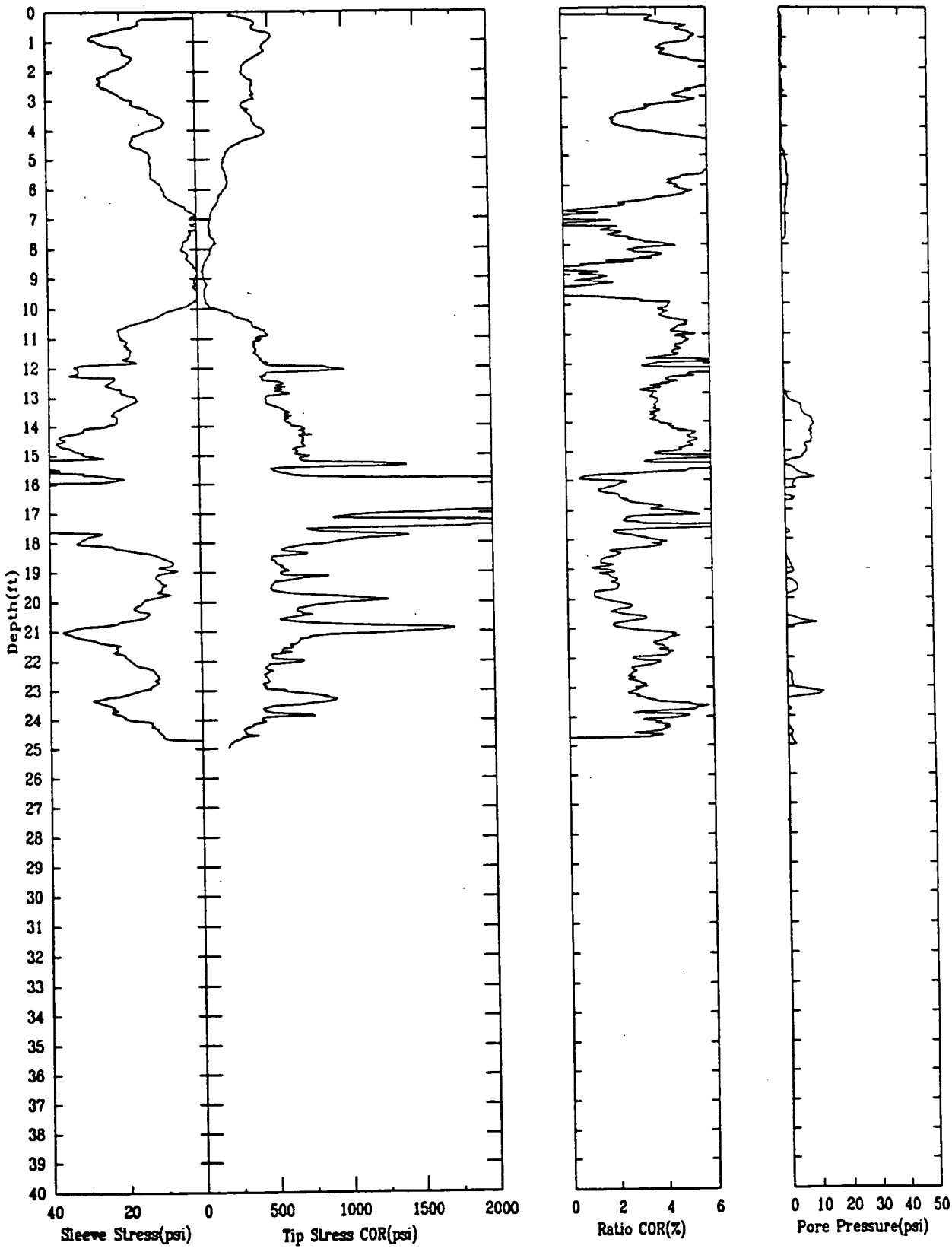
000329

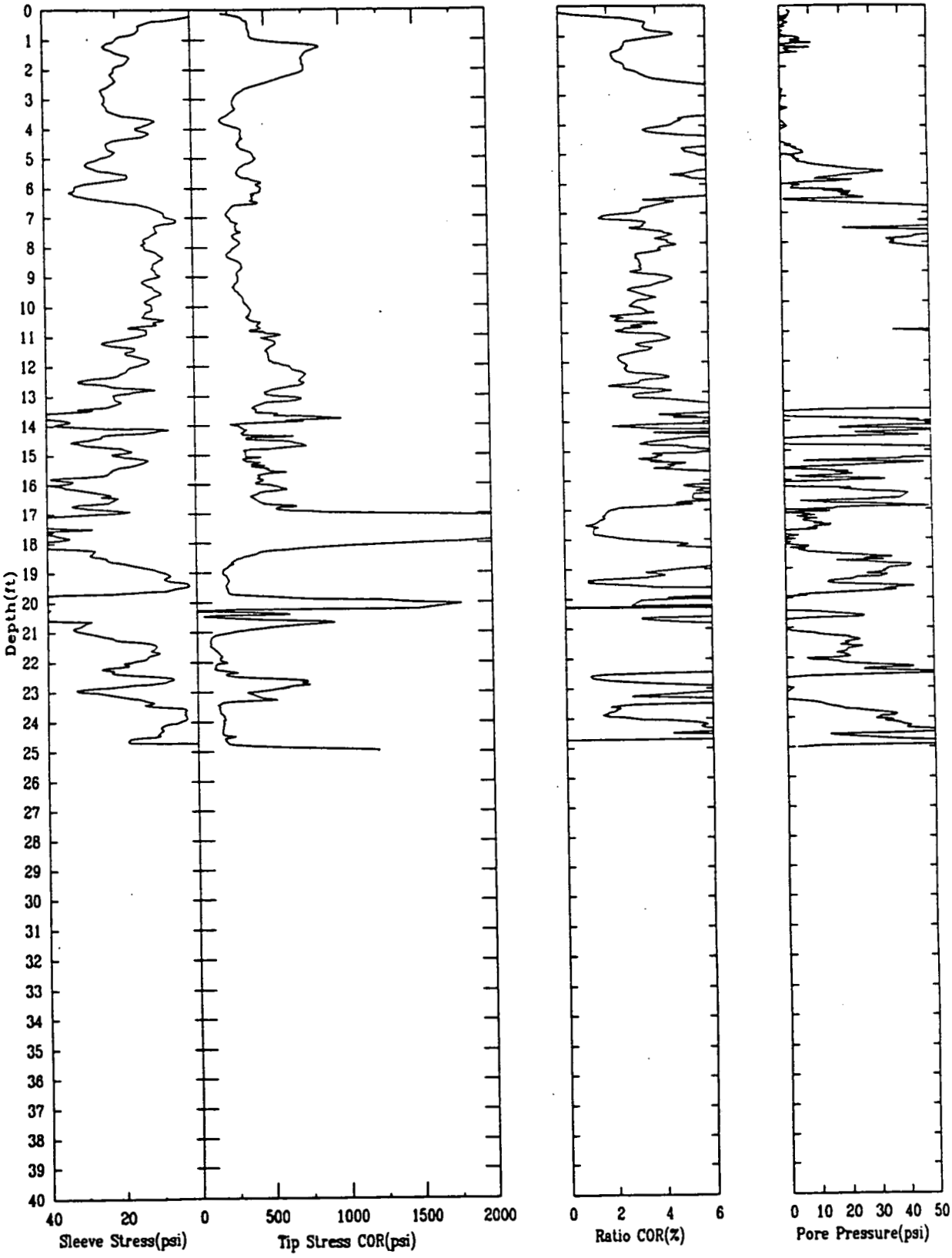

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

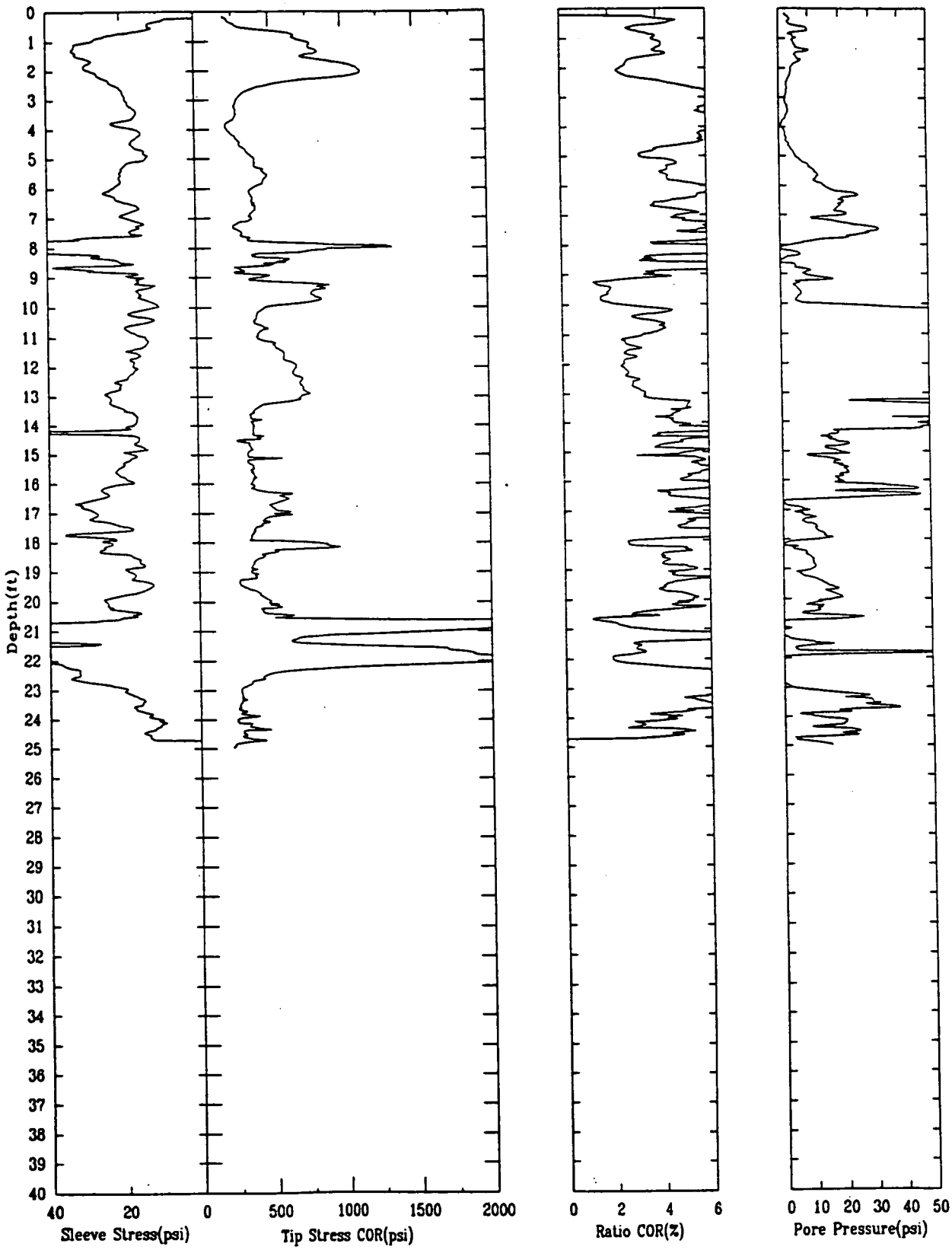

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
0 500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)

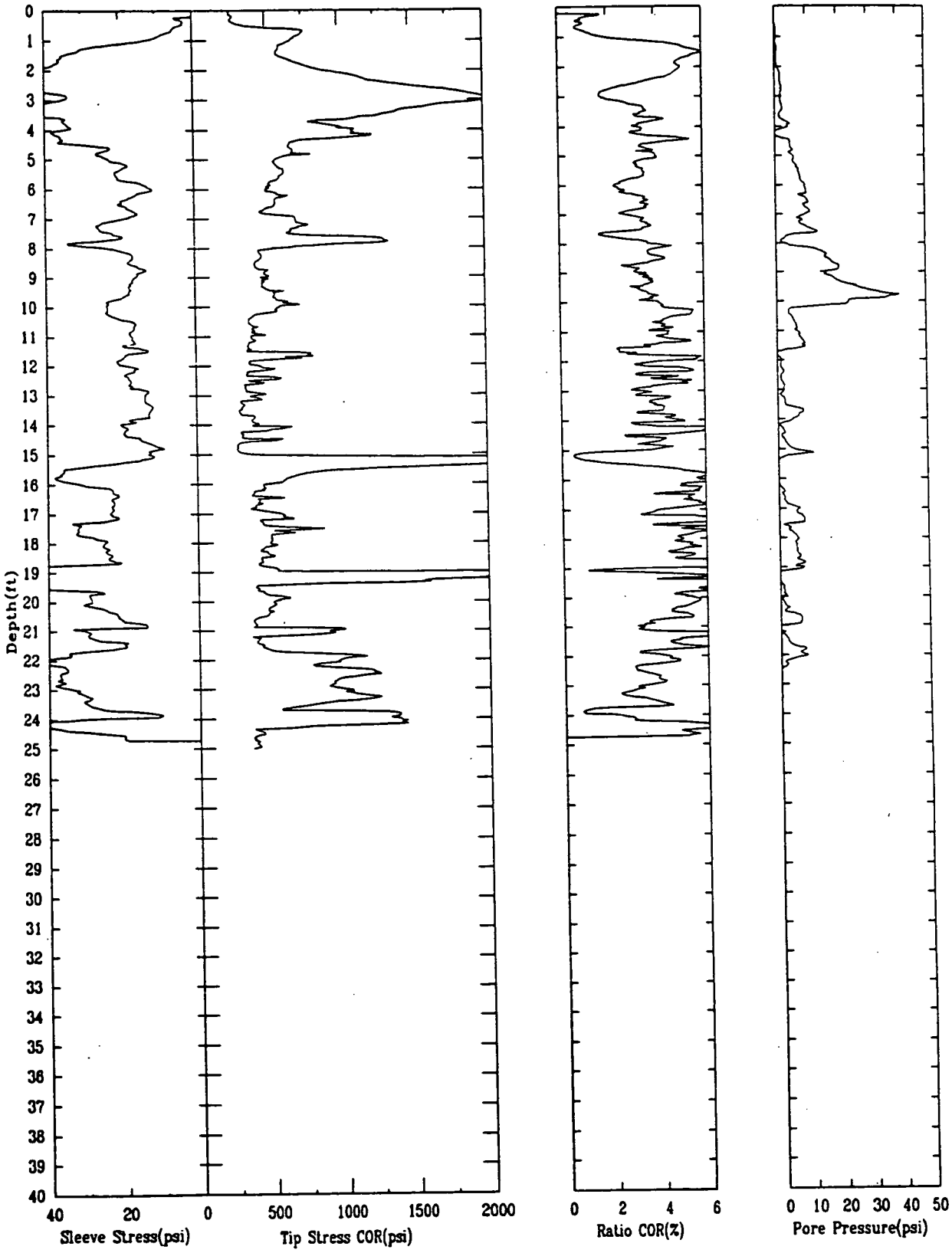
* Sleeve Friction data suspect

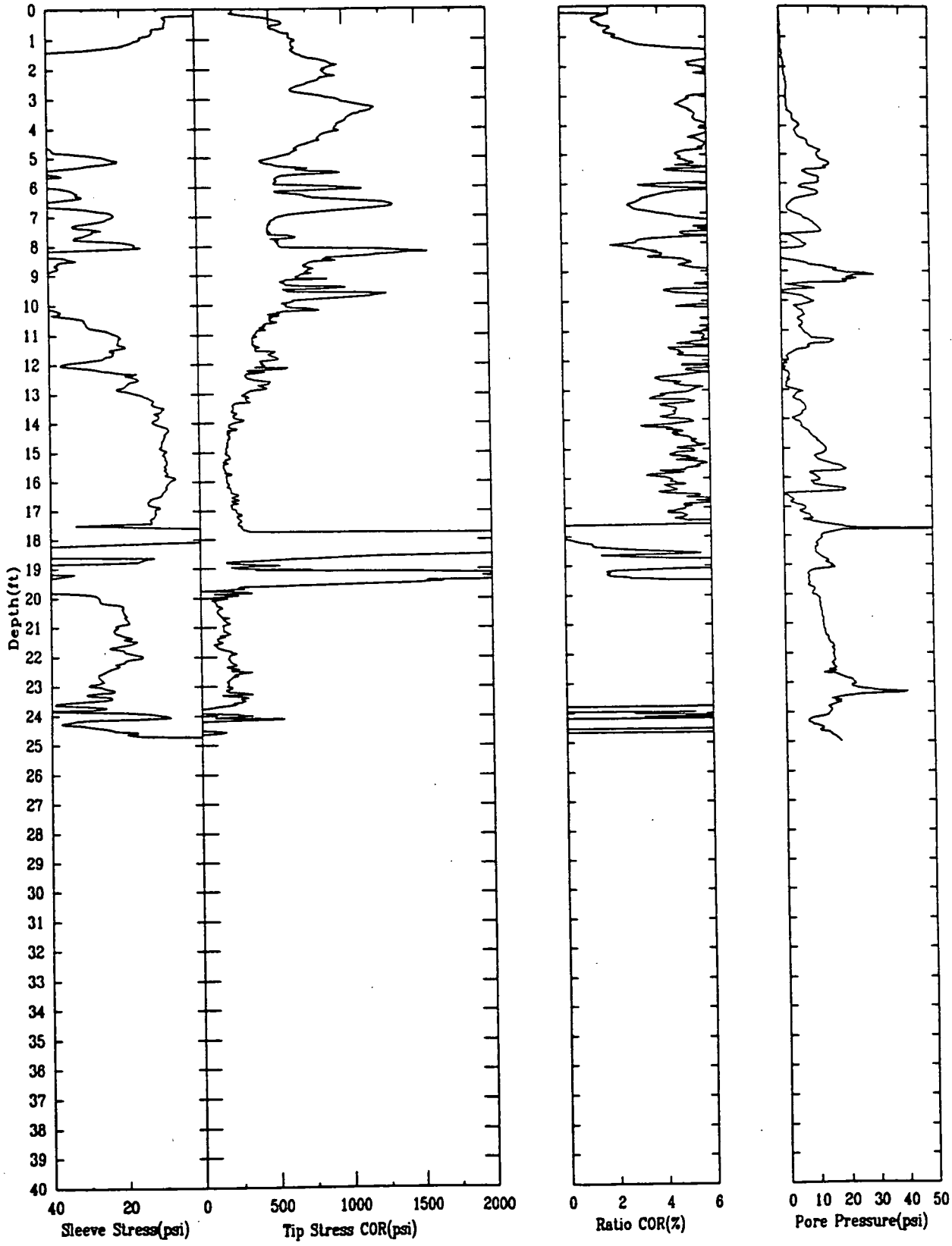


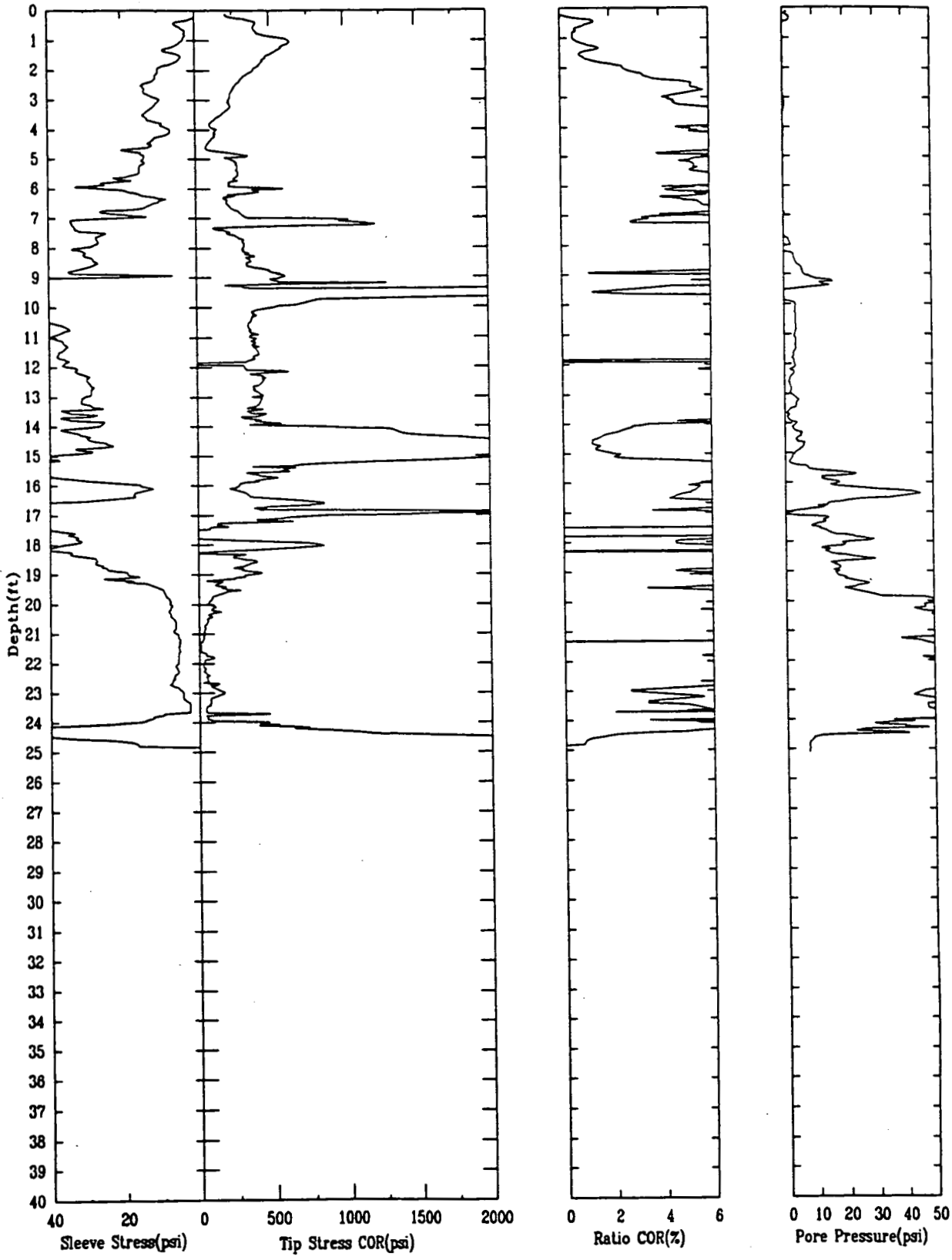

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

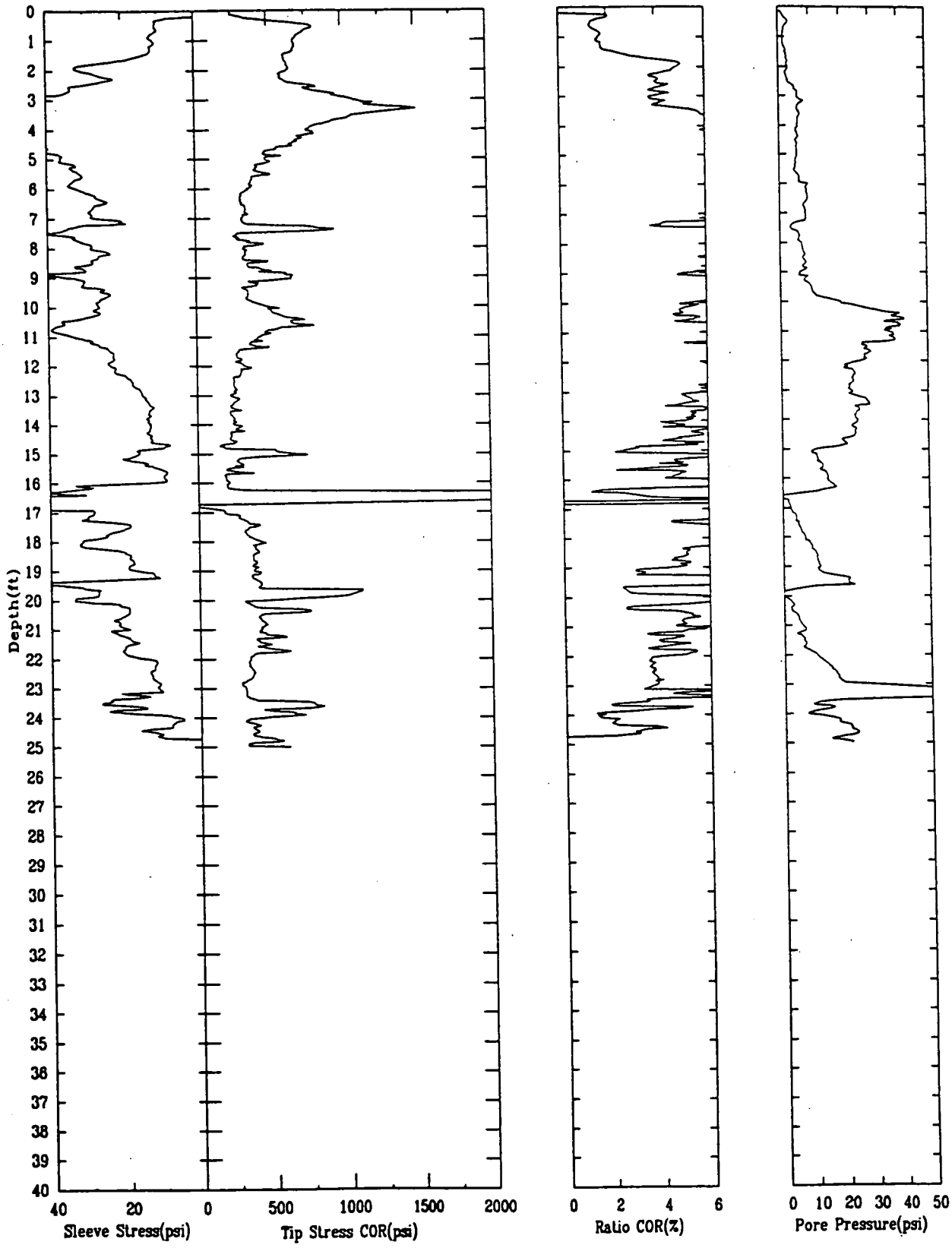

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

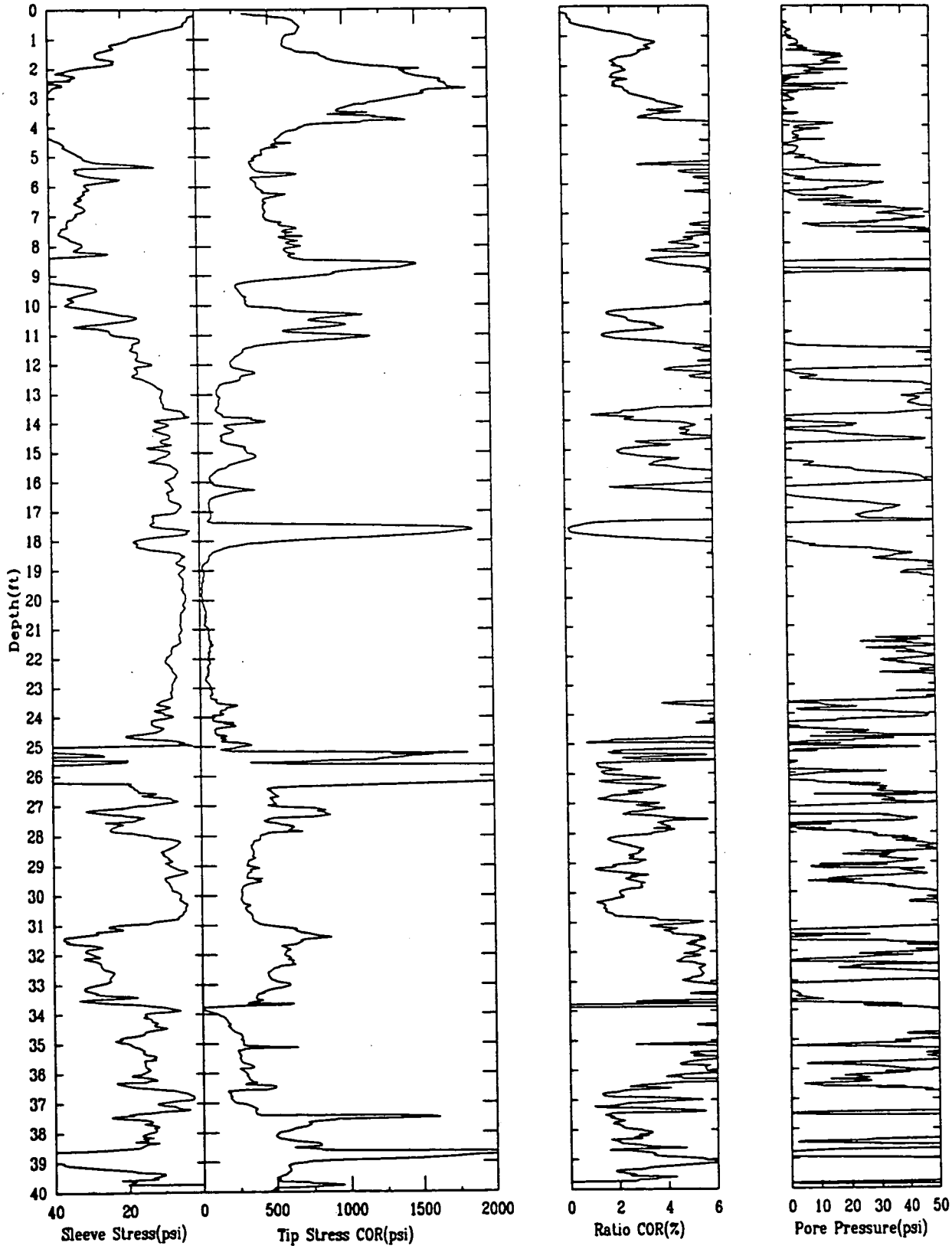

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

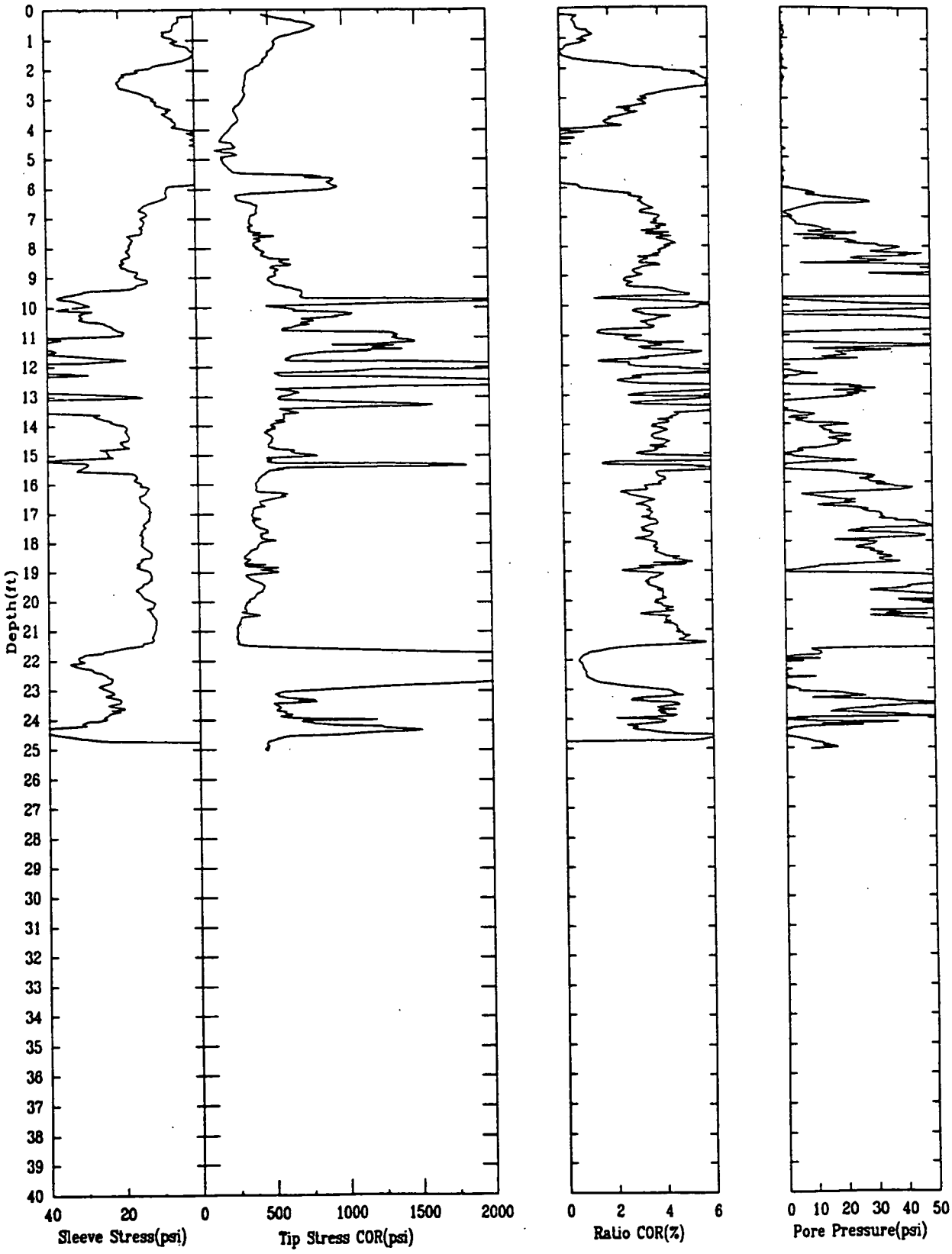

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40 20 0
Sleeve Stress(psi)
0 500 1000 1500 2000
Tip Stress COR(psi)
0 2 4 6
Ratio COR(%)
0 10 20 30 40 50
Pore Pressure(psi)


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

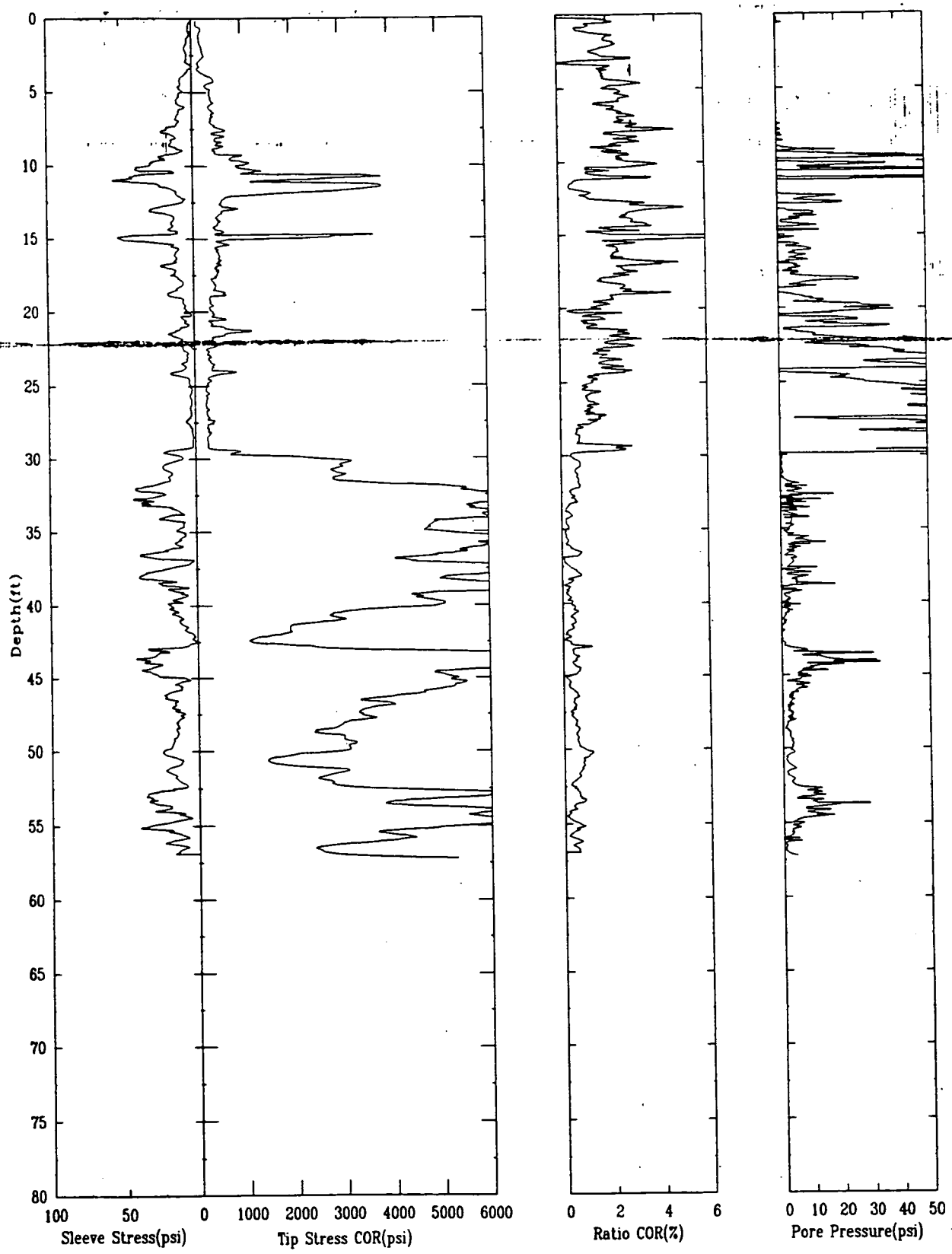

Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)


Depth(ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
40
20
0
Sleeve Stress(psi)
0
500
1000
1500
2000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
10
20
30
40
50
Pore Pressure(psi)

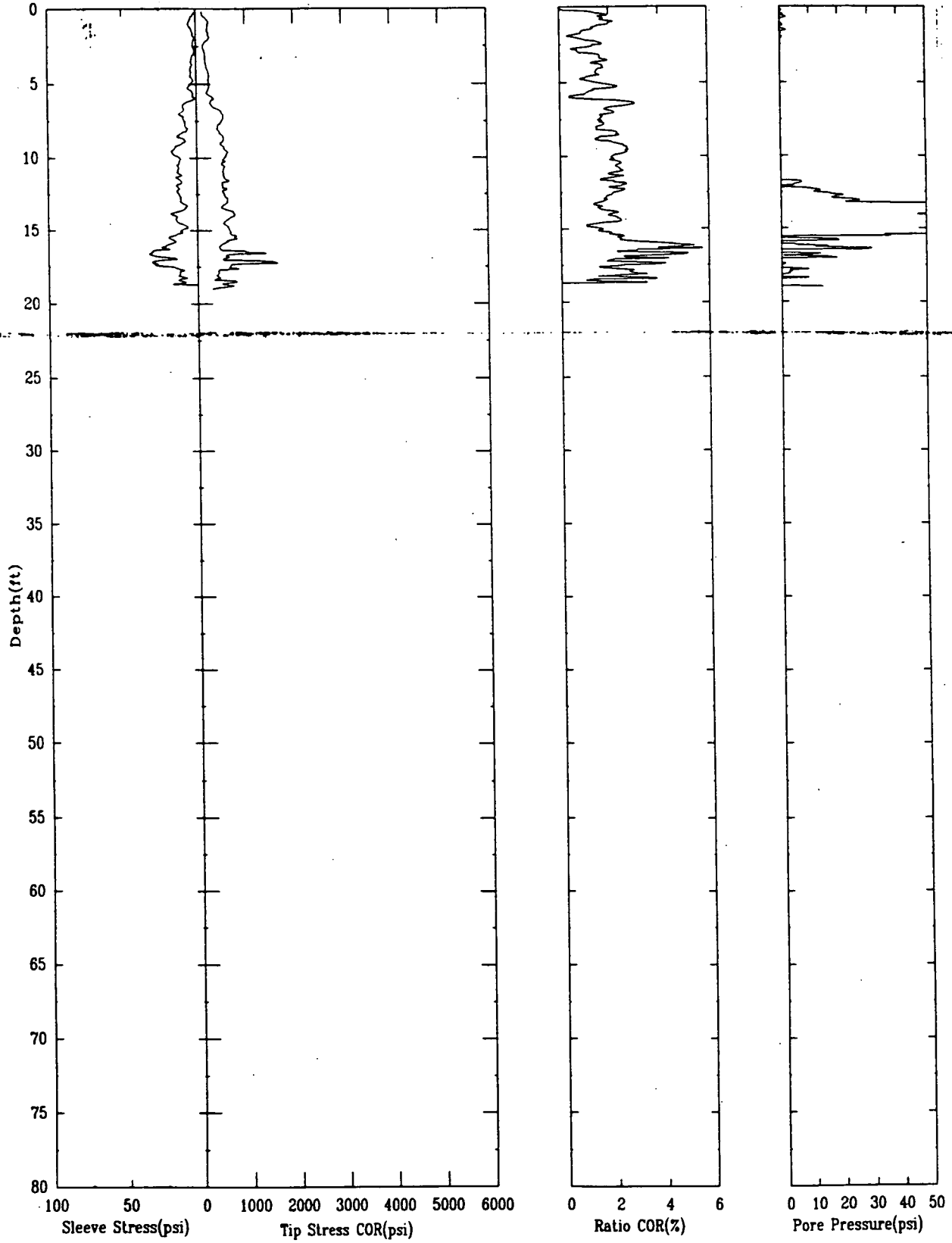
CPT-503 APPLIED RESEARCH ASSOCIATES, INC. 03/29/95

SOUTH END OF FIELD



CPT-509 APPLIED RESEARCH ASSOCIATES, INC. 03/29/95

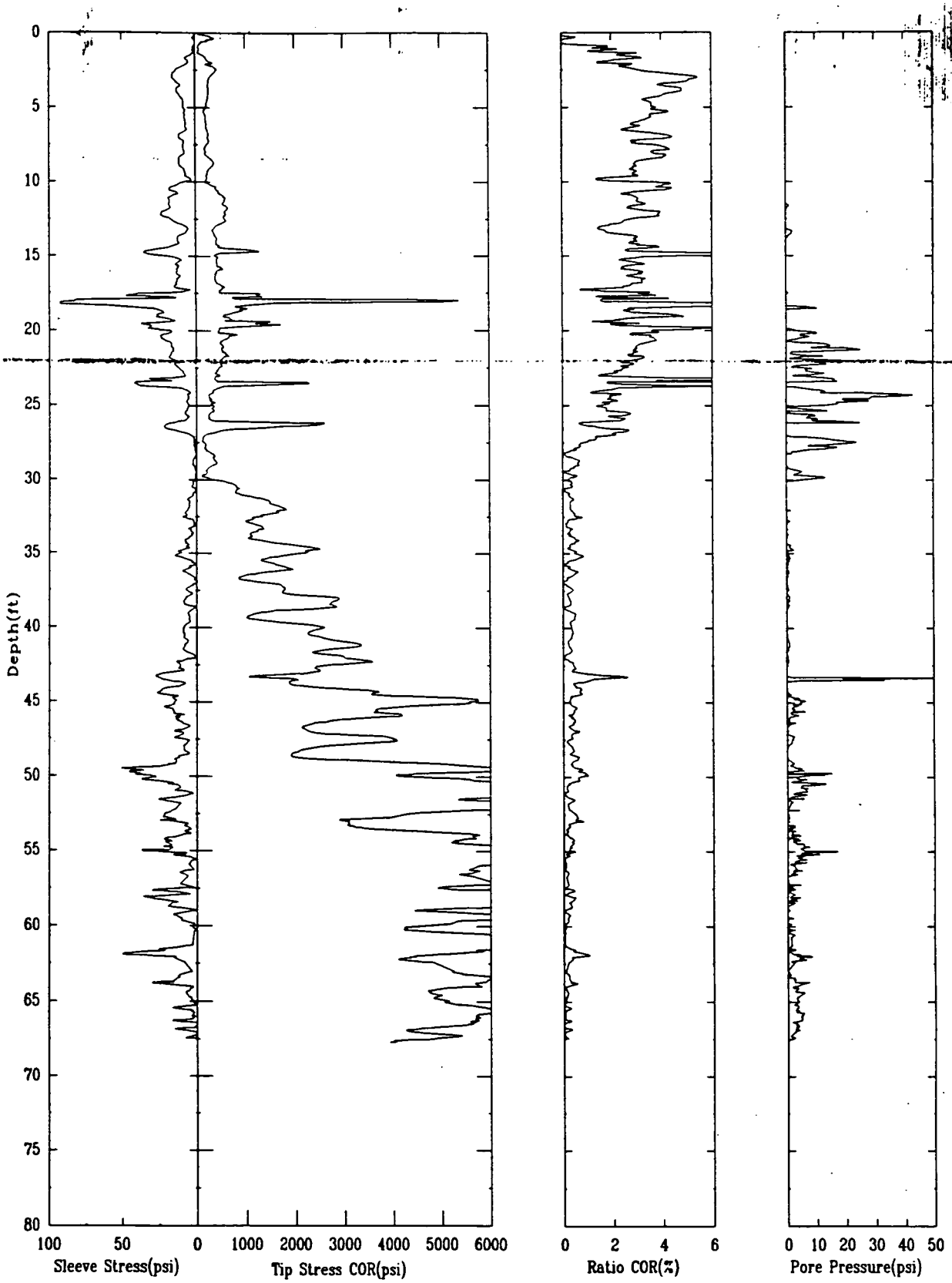
INSIDE FENCE BY RIMIA



000343

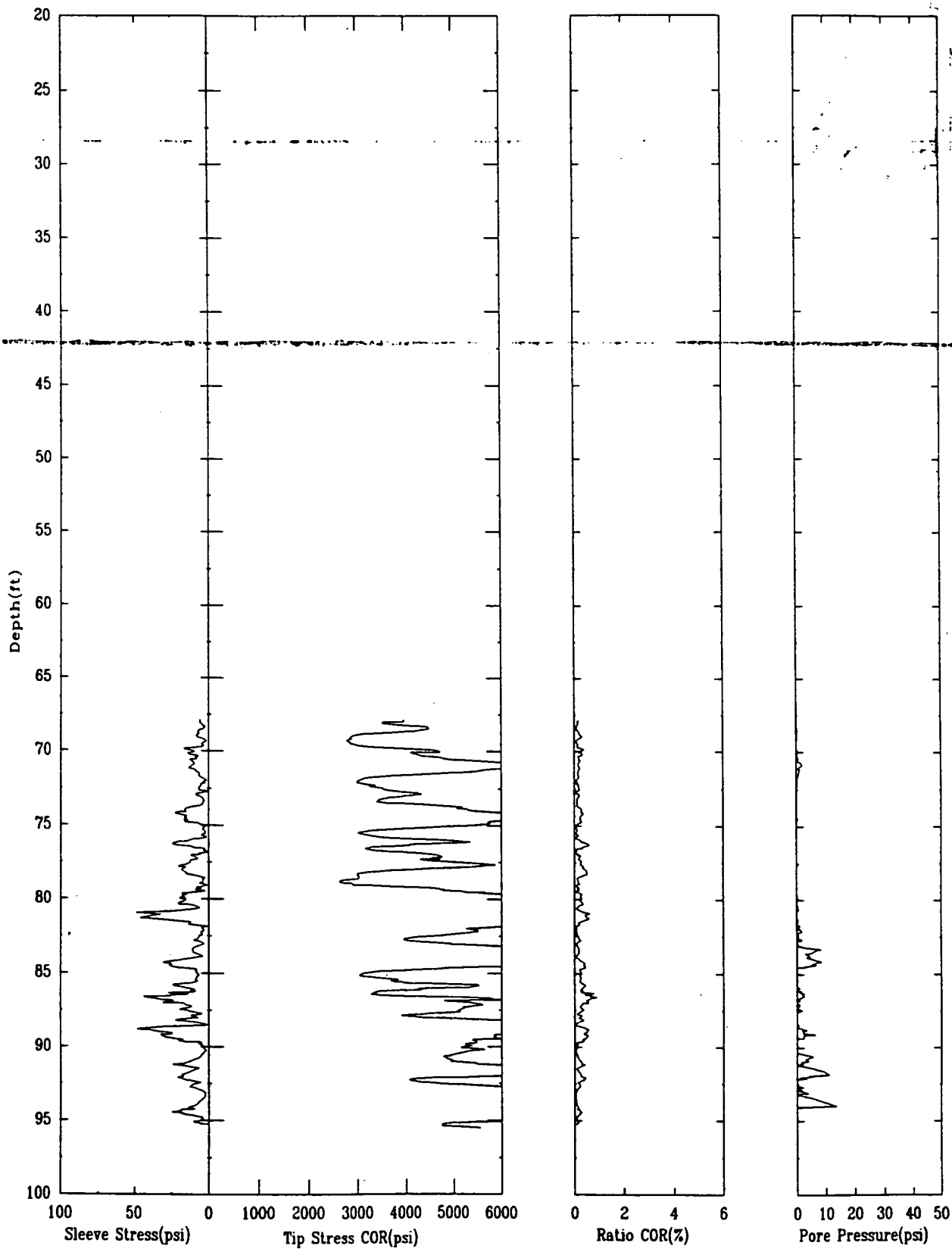
CPT-512 APPLIED RESEARCH ASSOCIATES, INC. 03/29/95

INSIDE FENCE BY RIMIA



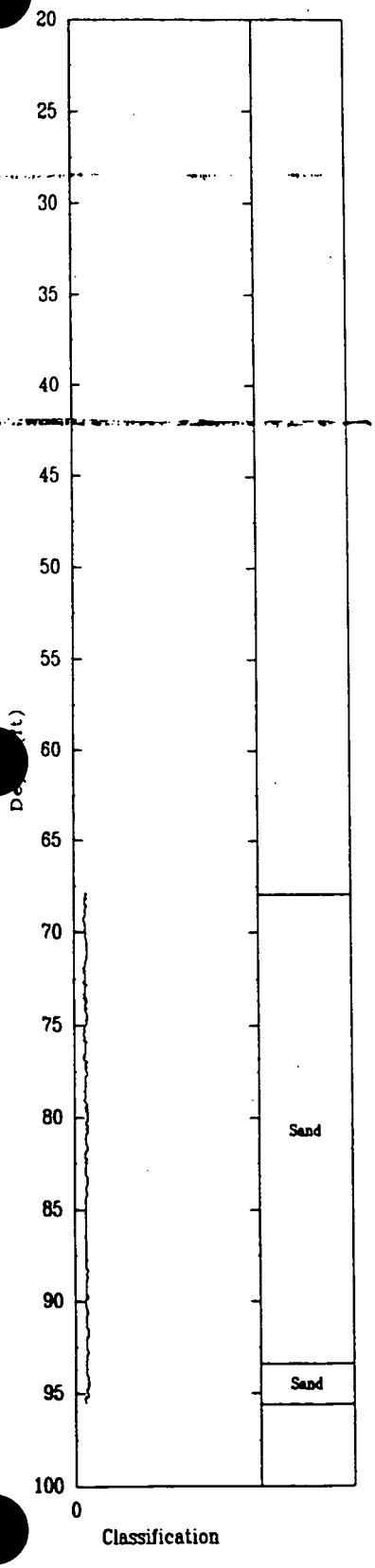
CPT-512 APPLIED RESEARCH ASSOCIATES, INC. 03/29/95

INSIDE FENCE BY RIMIA



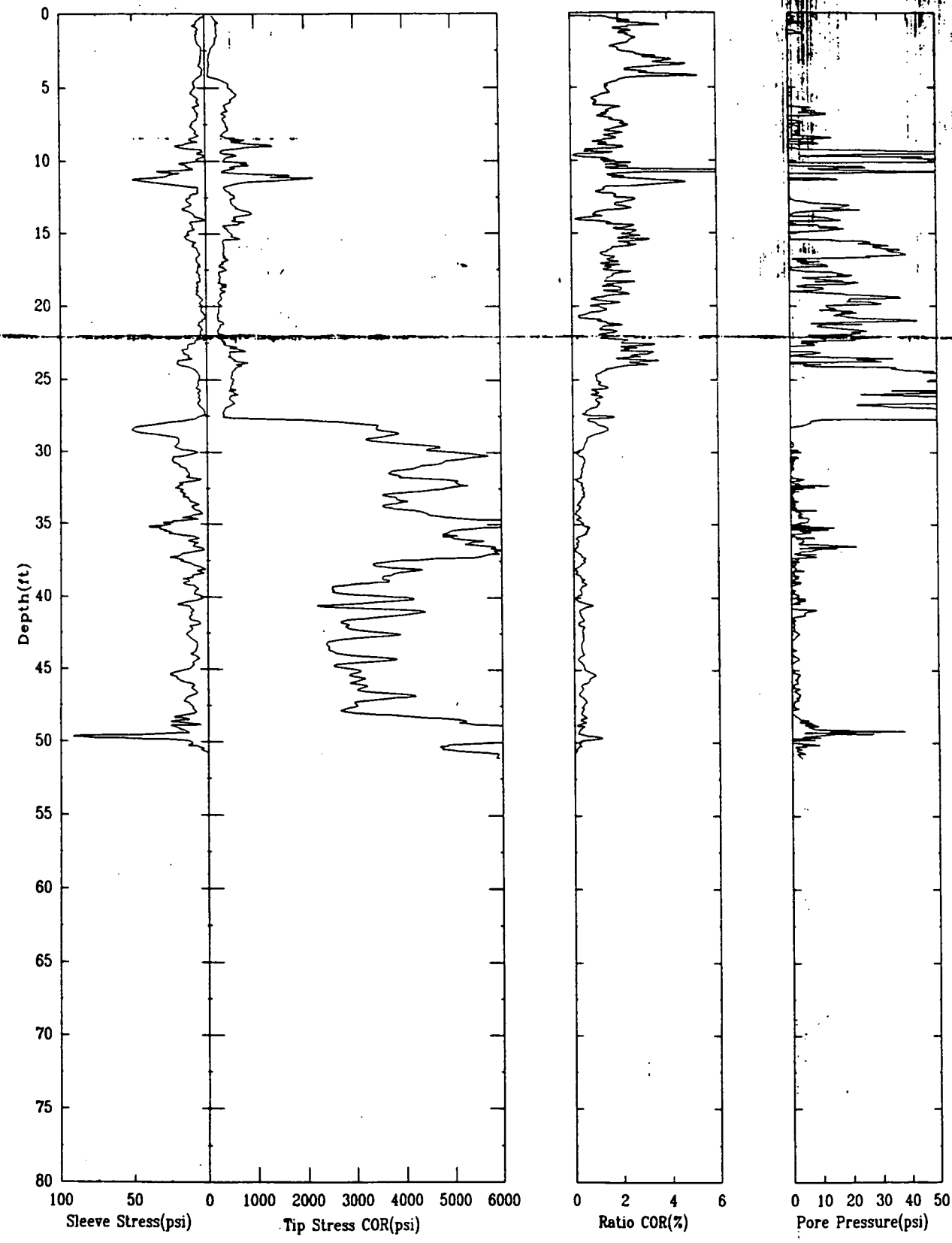
CPT-512 APPLIED RESEARCH ASSOCIATES, INC. 03/29/95

INSIDE FENCE BY RIMIA



CPT-515 APPLIED RESEARCH ASSOCIATES, INC. 03/28/95

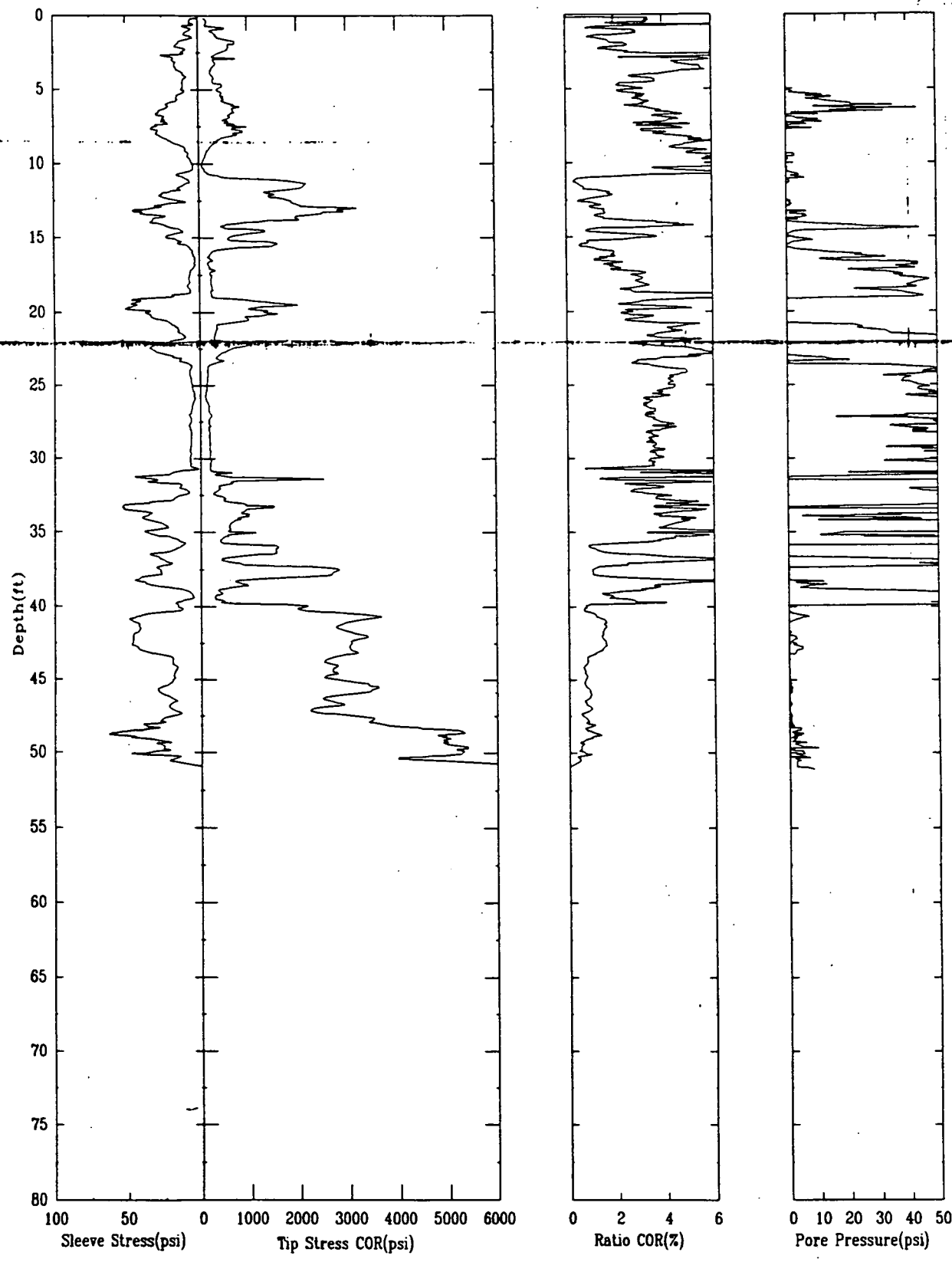
BUFFER ZONE BETWEEN FENCES



000347

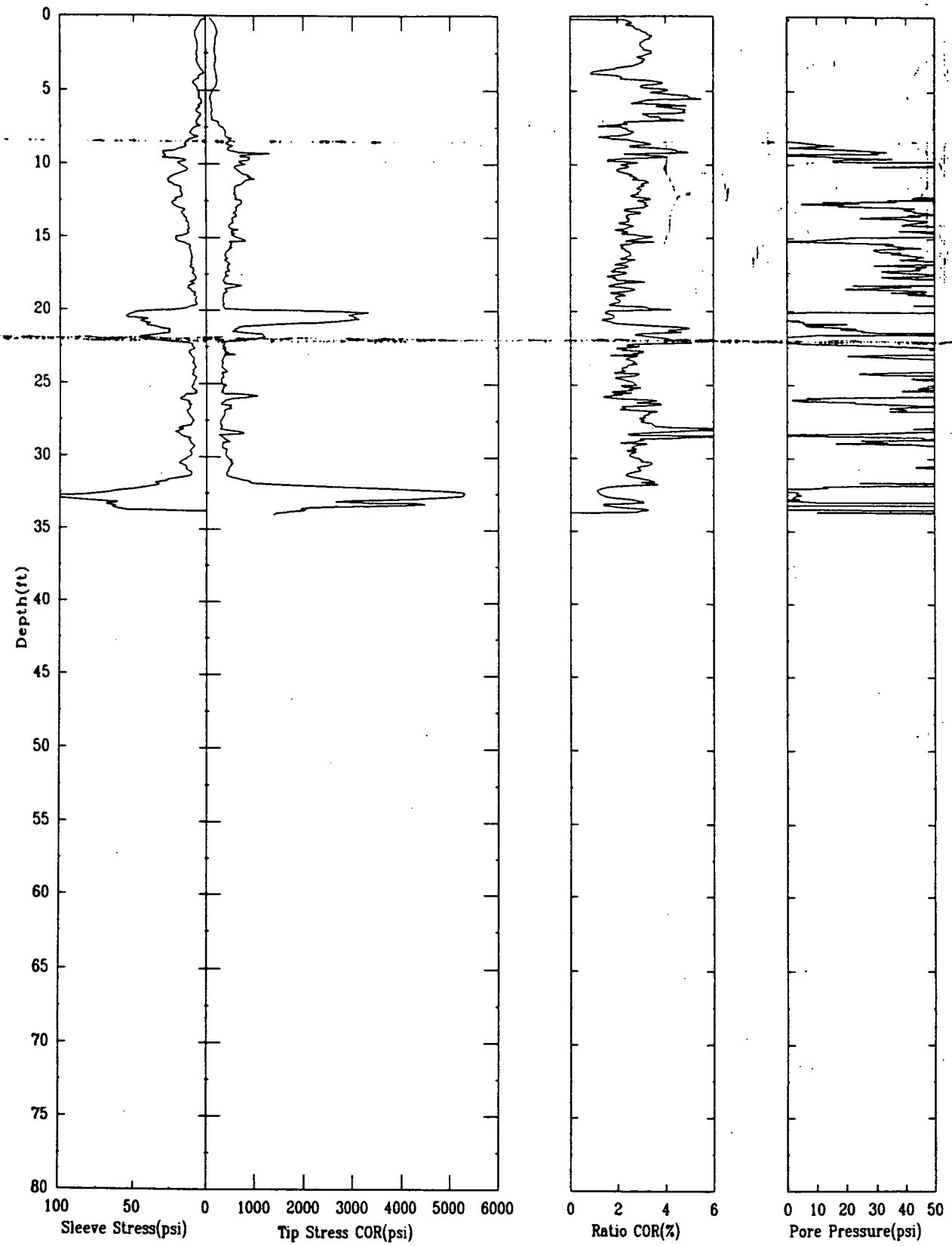
CPT-542 APPLIED RESEARCH ASSOCIATES, INC. 03/28/95

BUFFER ZONE BETWEEN FENCES



CPT-547 APPLIED RESEARCH ASSOCIATES, INC. 03/28/95

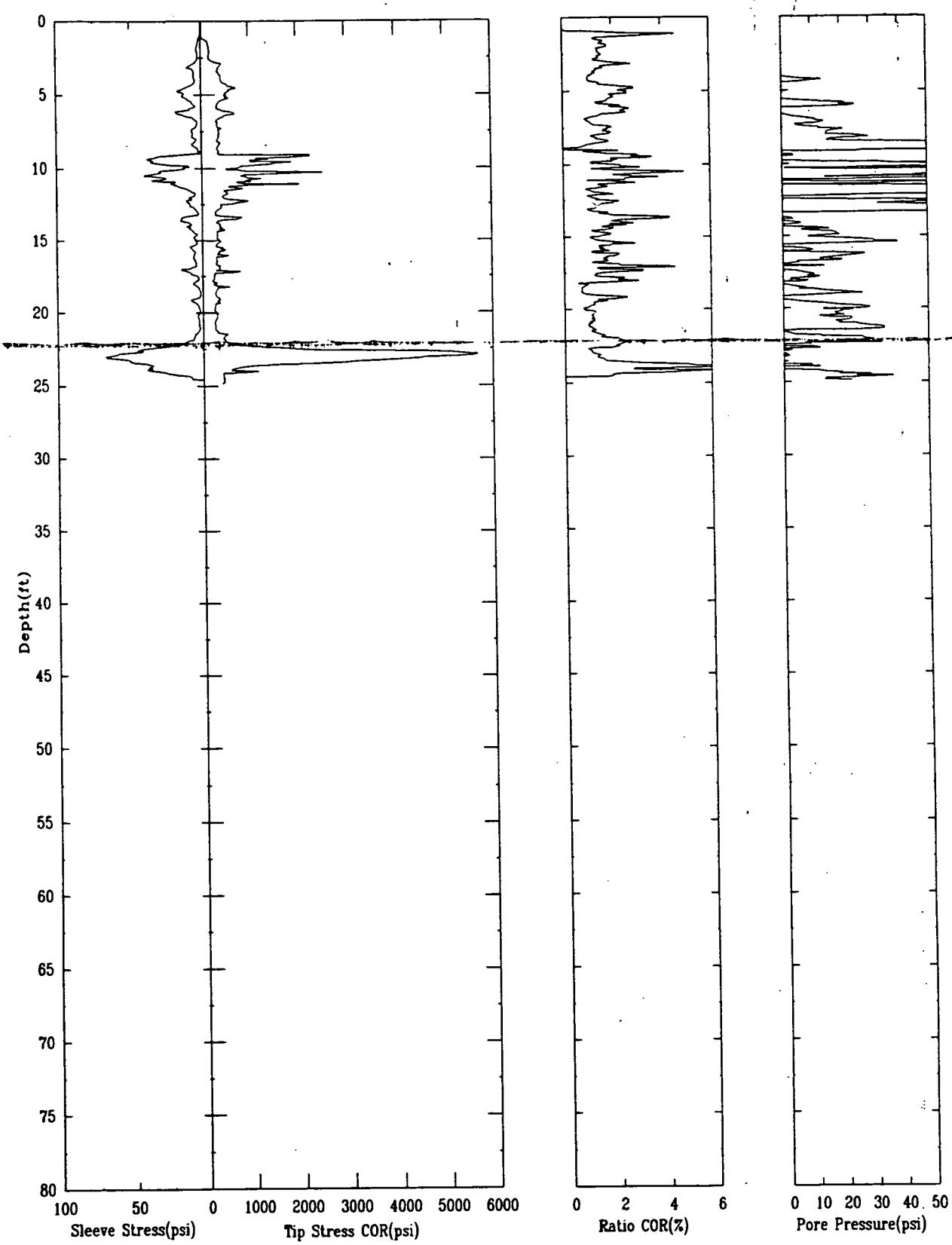
BUFFER ZONE BETWEEN FENCES



000349

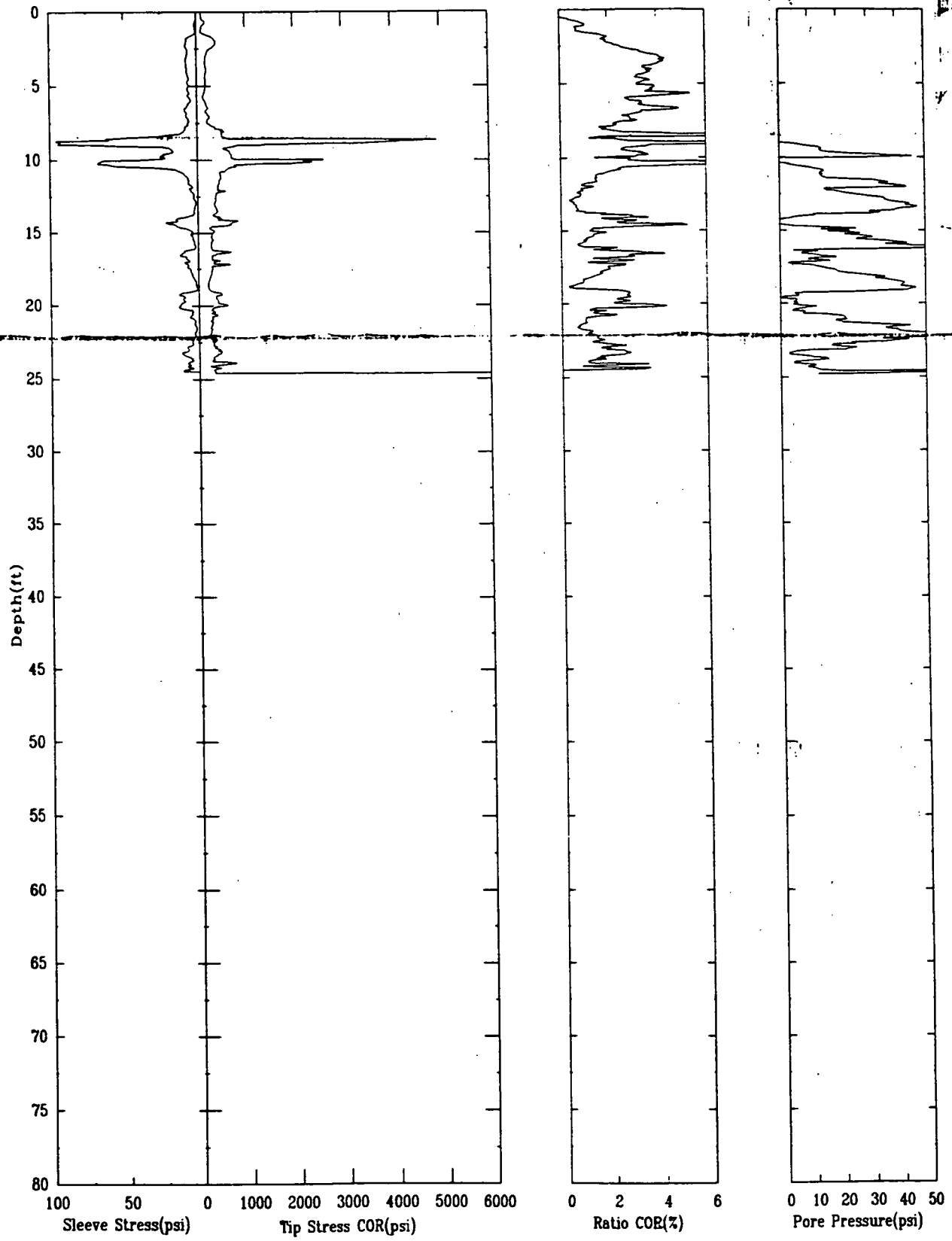
CPT-511 APPLIED RESEARCH ASSOCIATES, INC. 03/28/95

WEST OF SEWERAGE PLANT



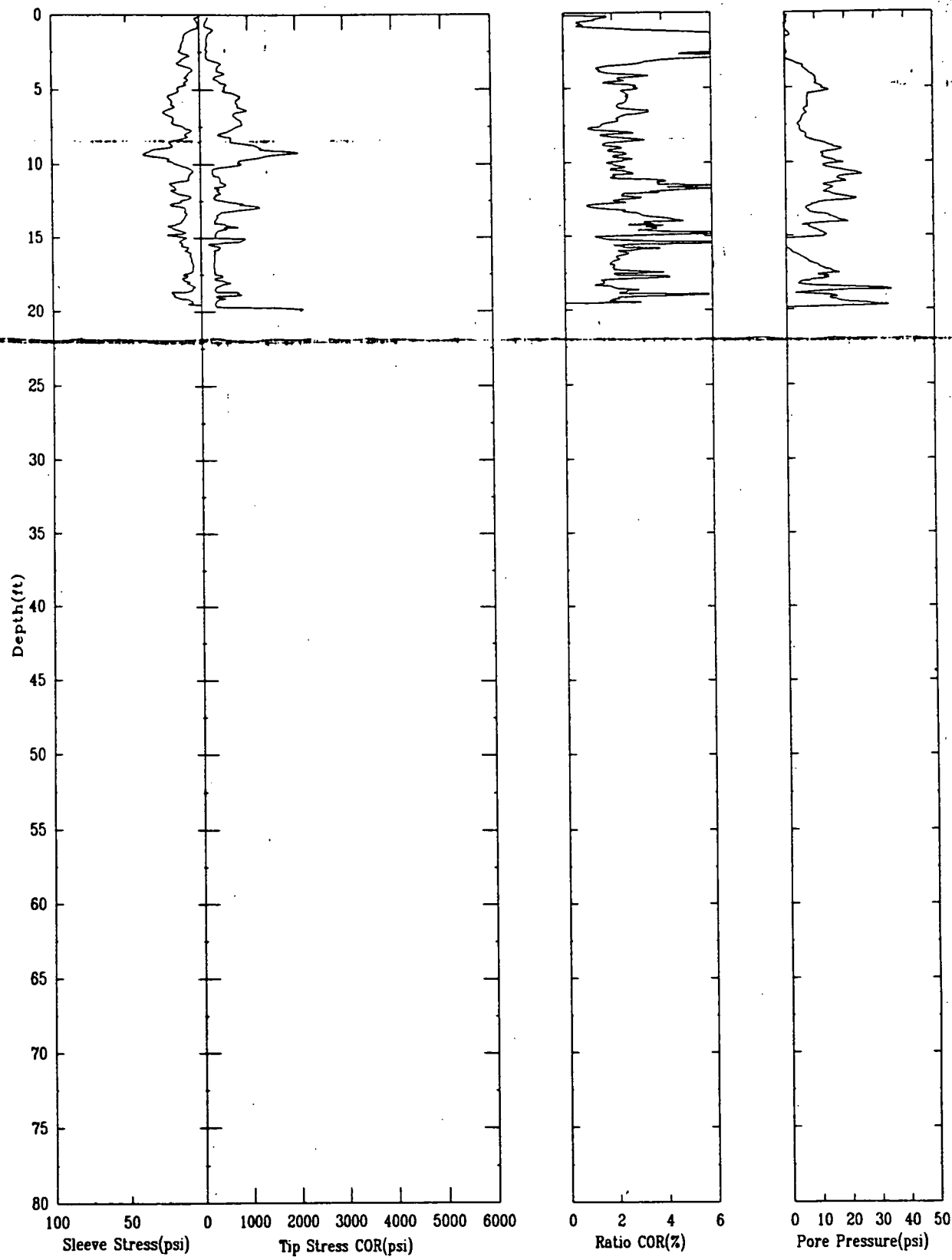
CPT-508 APPLIED RESEARCH ASSOCIATES, INC. 03/28/95

WEST OF SEWERAGE PLANT



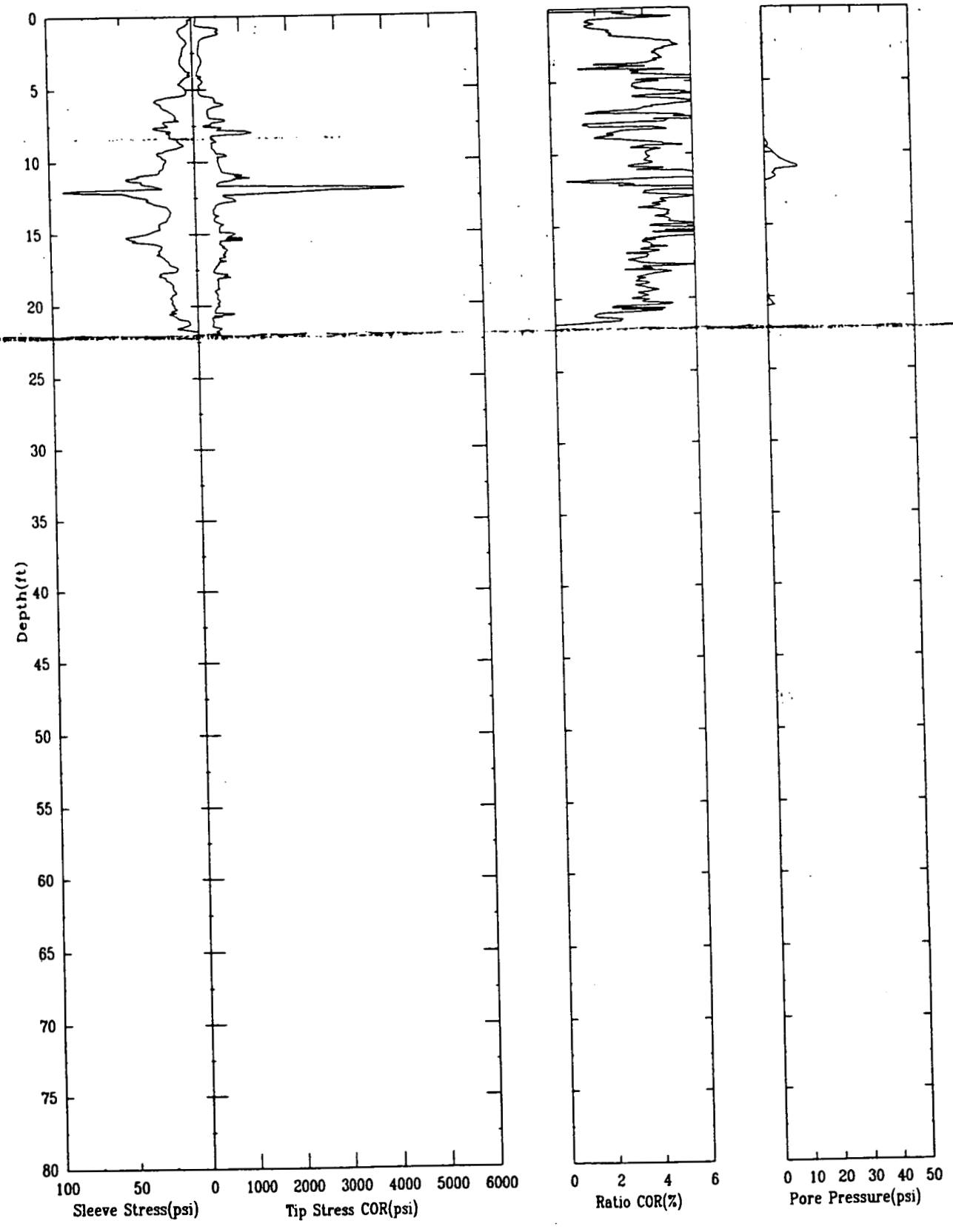
CPT-502B APPLIED RESEARCH ASSOCIATES, INC. 03/28/95

3



CPT-504 APPLIED RESEARCH ASSOCIATES, INC. 03/28/95

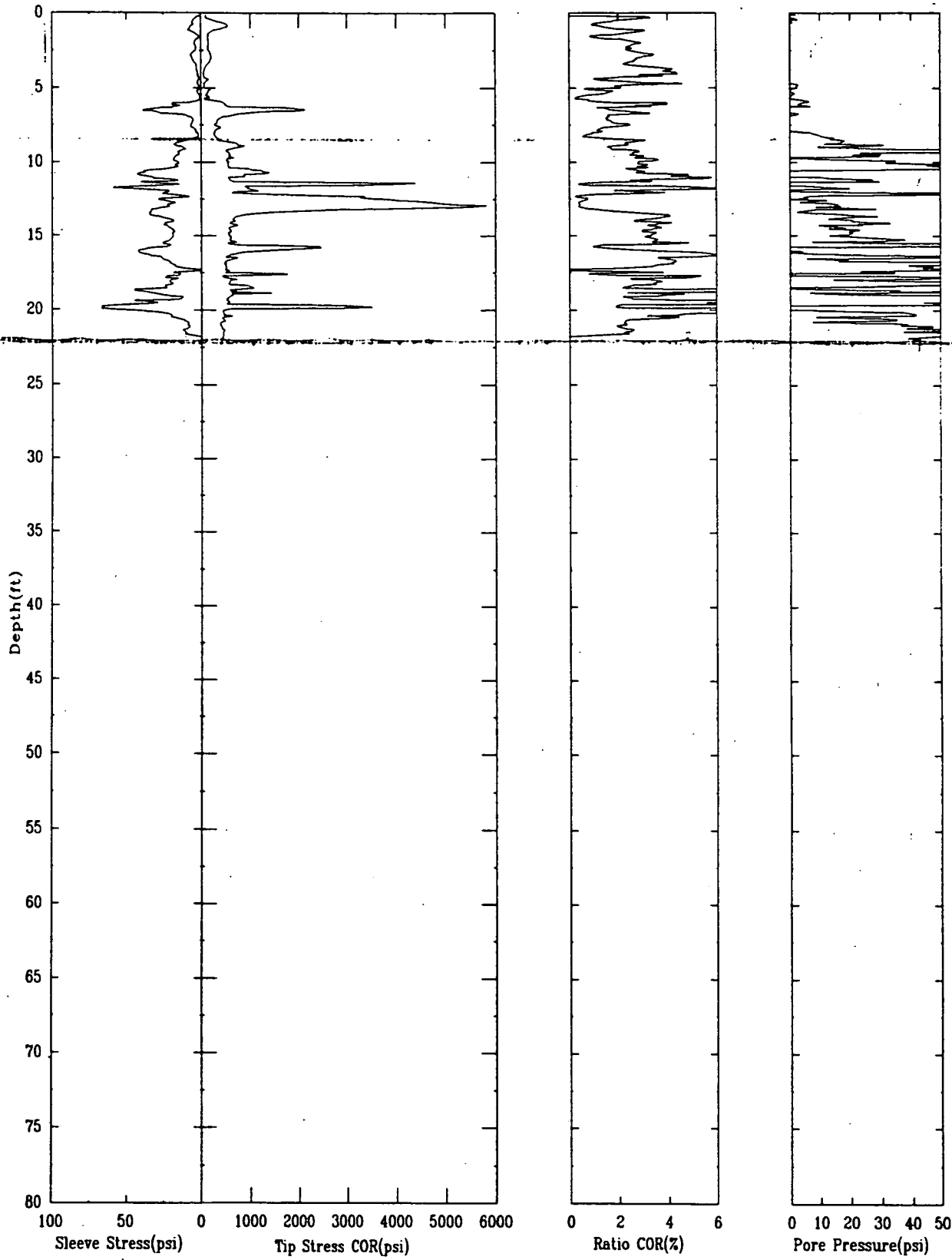
SOUTH END OF SITE



000353

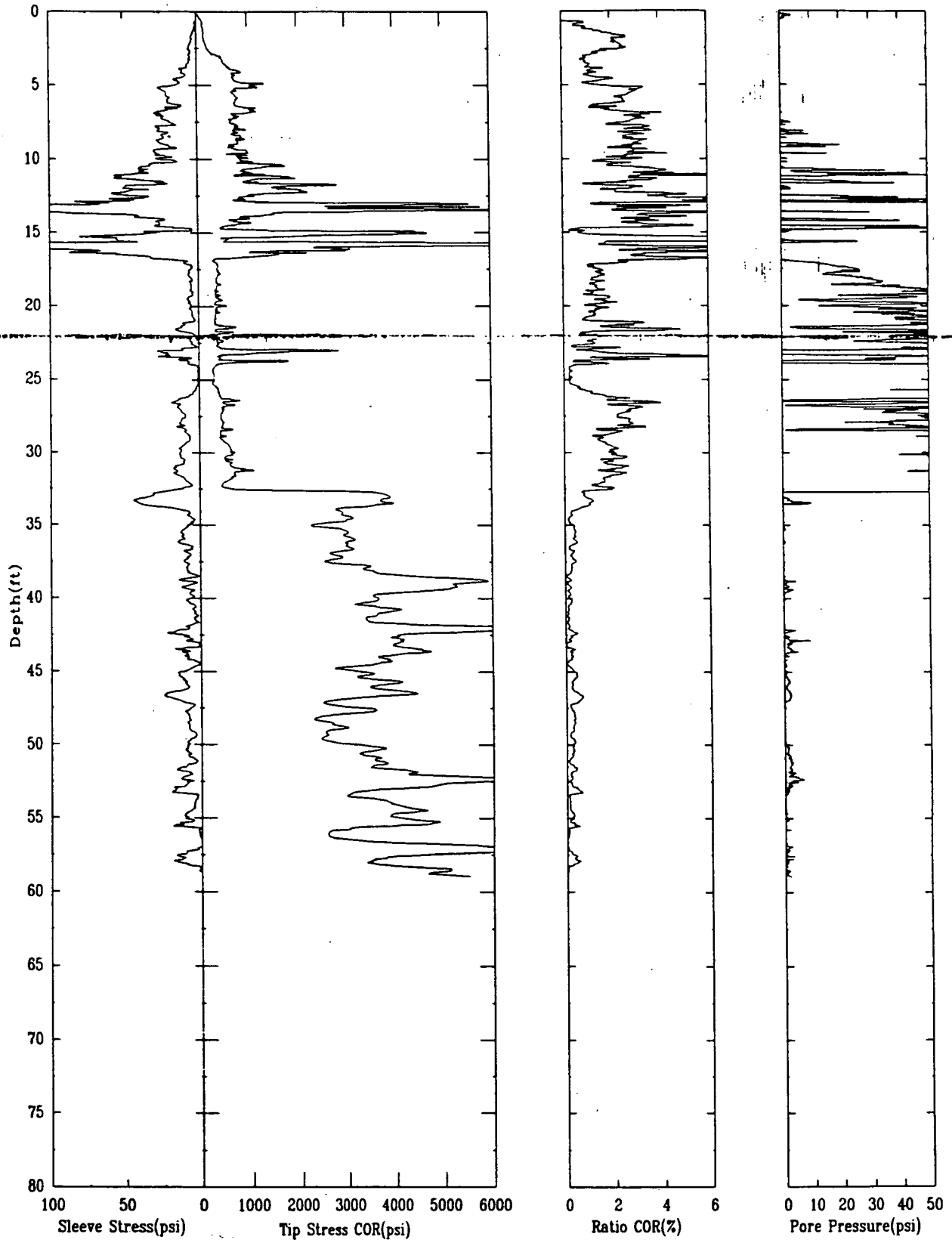
CPT-504B APPLIED RESEARCH ASSOCIATES, INC. 03/28/95

3



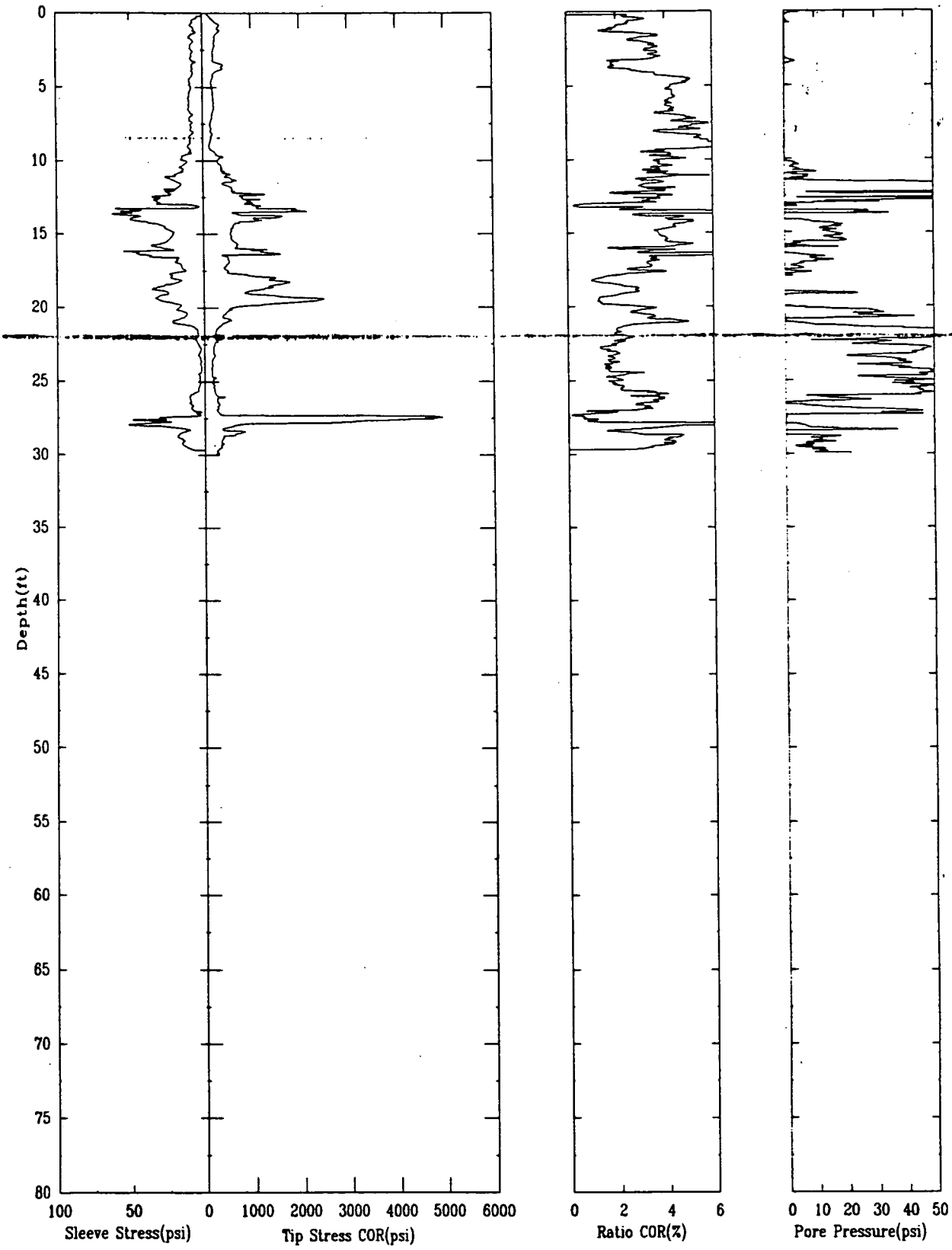
CPT-524 APPLIED RESEARCH ASSOCIATES, INC. 03/27/95

INSIDE SECURITY FENCE



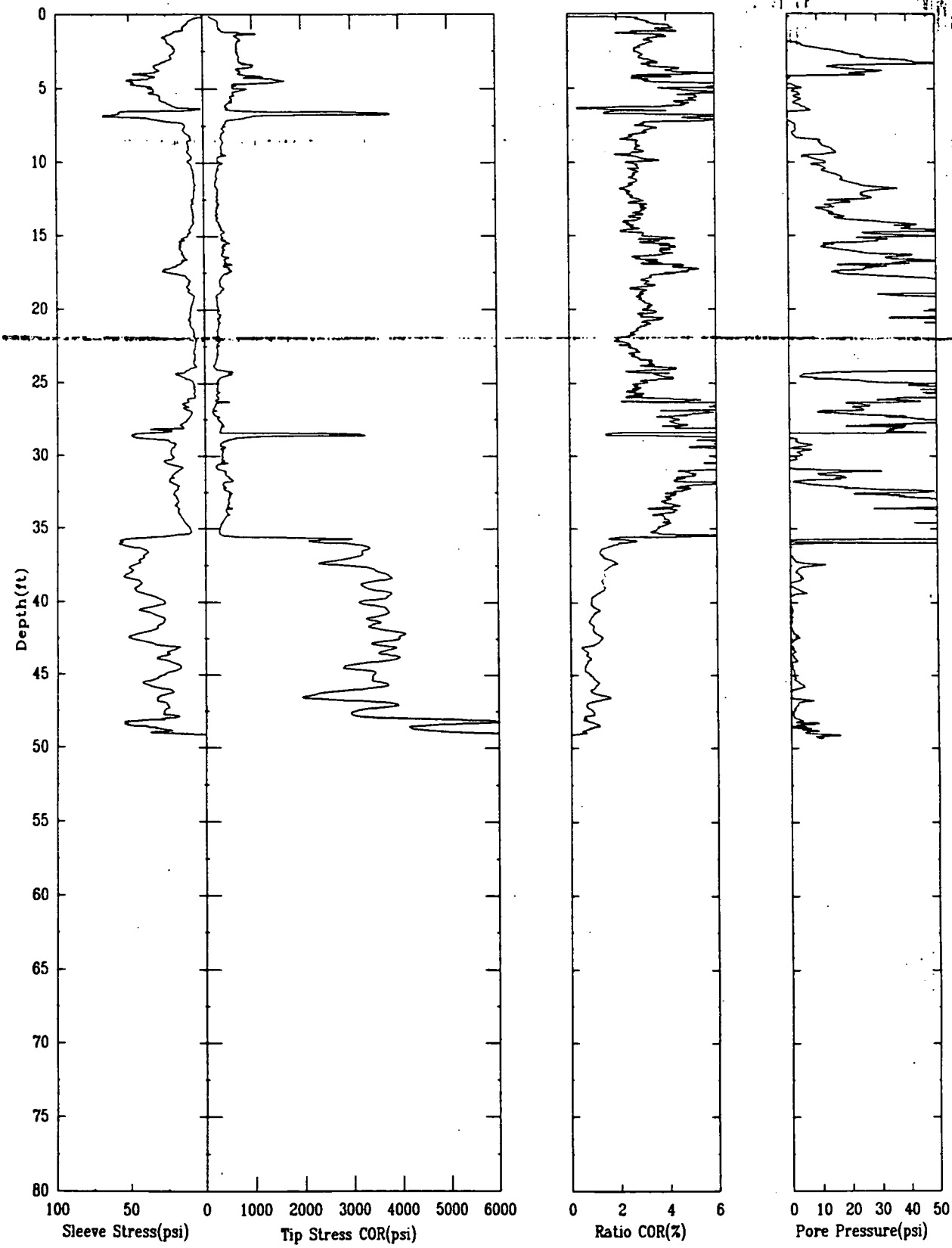
CPT-528 APPLIED RESEARCH ASSOCIATES, INC. 03/27/95

INSIDE SECURITY FENCE



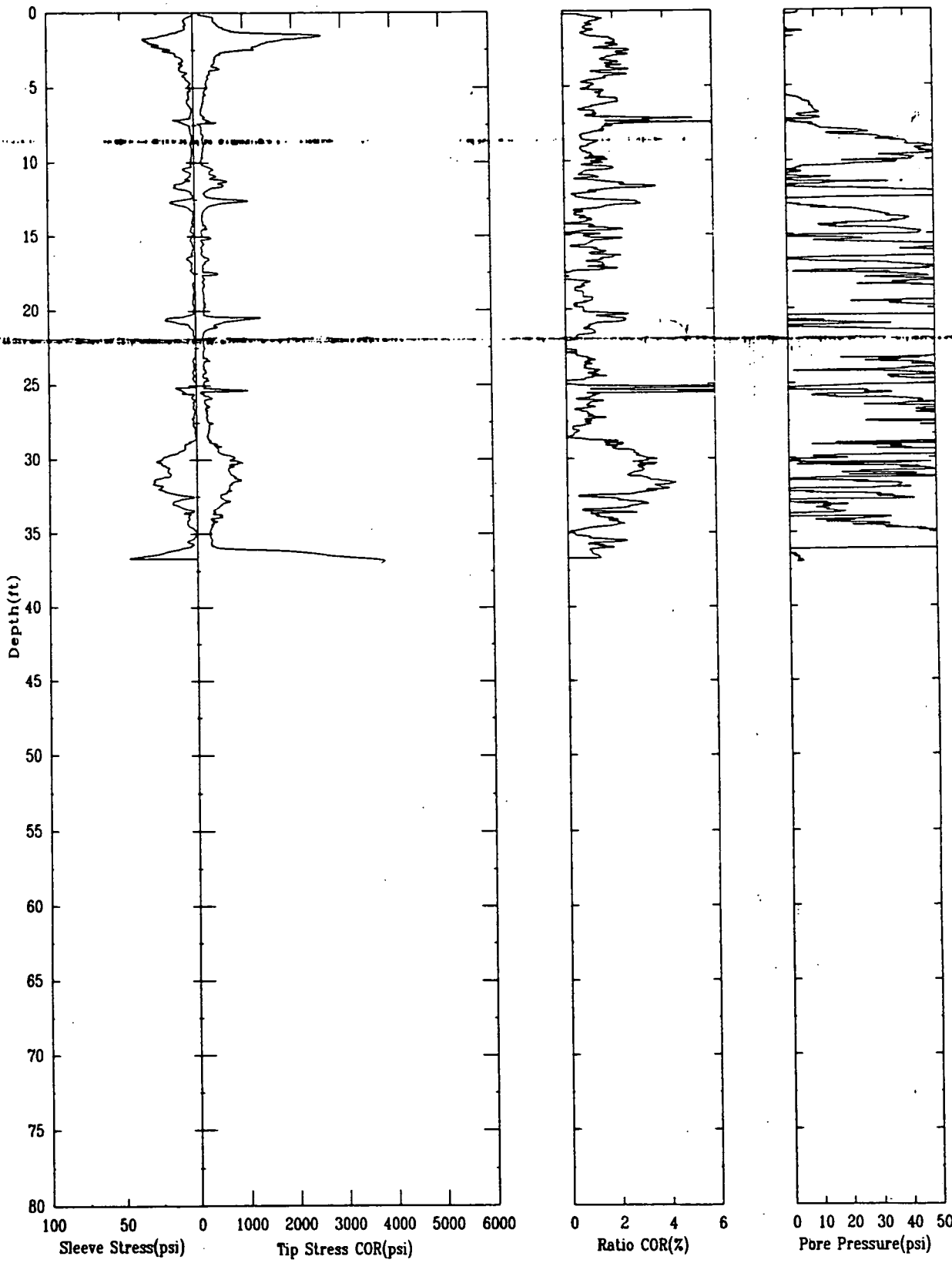
CPT-530 APPLIED RESEARCH ASSOCIATES, INC. 03/27/95

INSIDE SECURITY FENCE



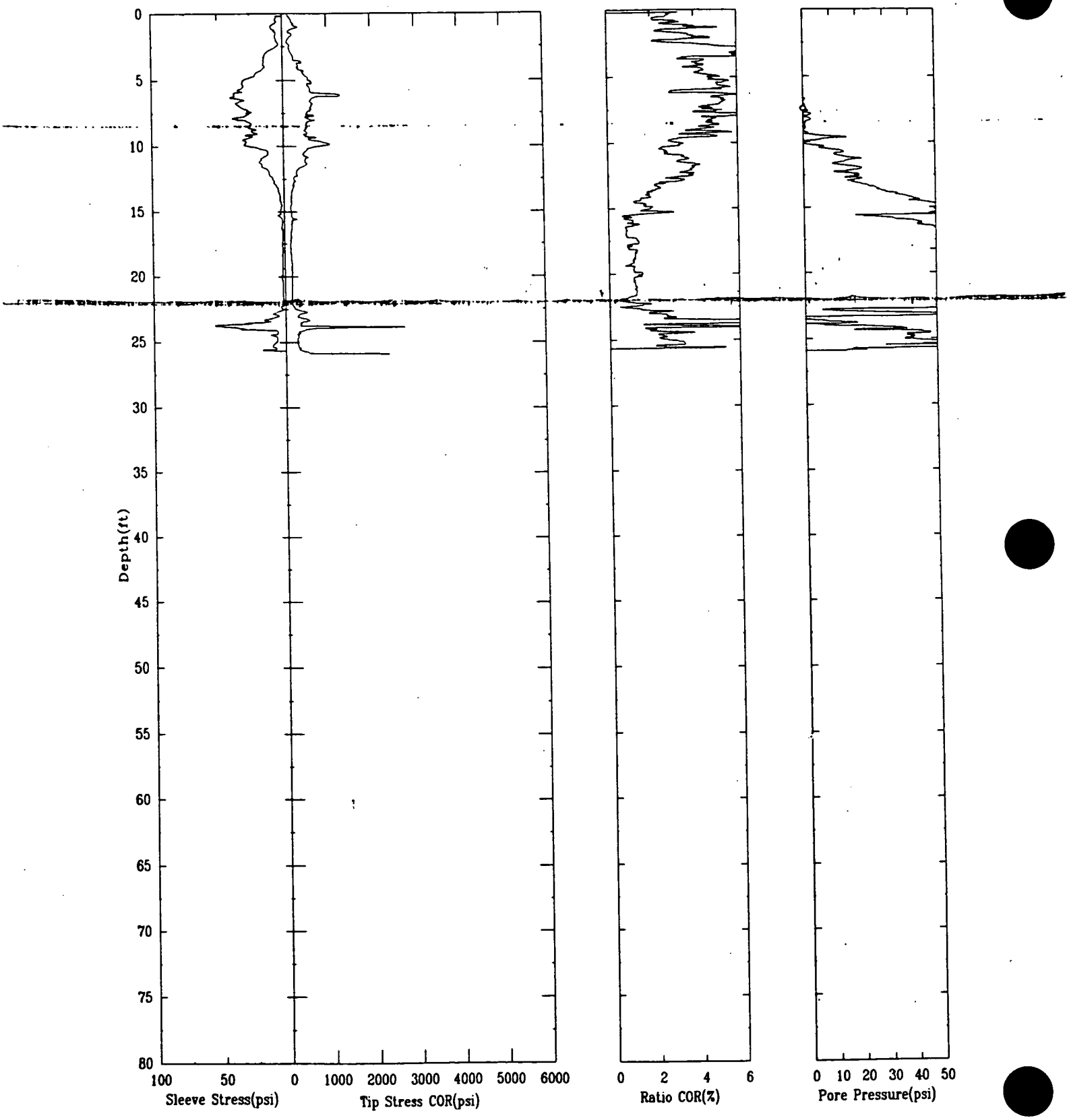
CPT-538B APPLIED RESEARCH ASSOCIATES, INC. 03/27/95

3



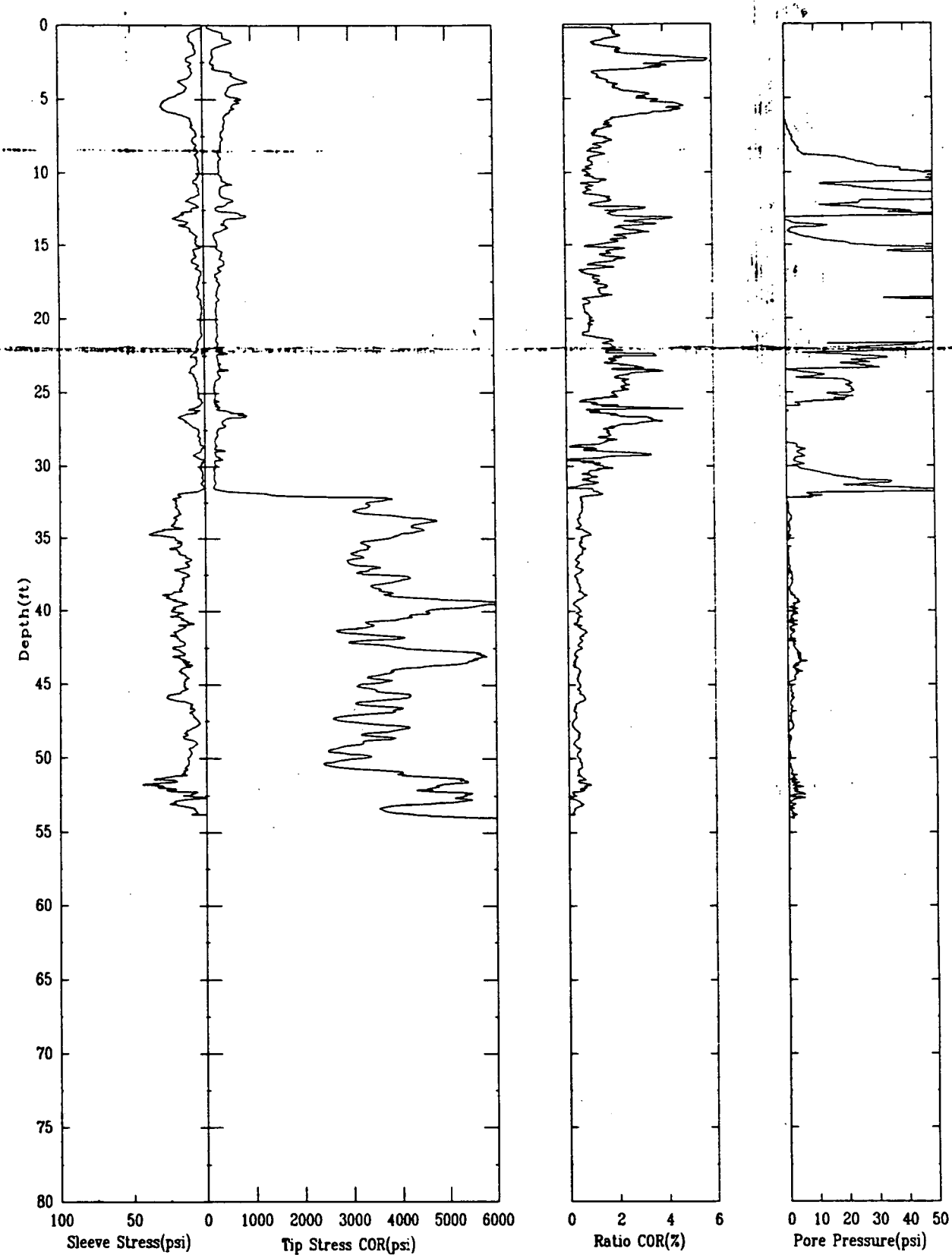
CPT-521 APPLIED RESEARCH ASSOCIATES, INC. 03/27/95

BETWEEN SECURITY FENCES



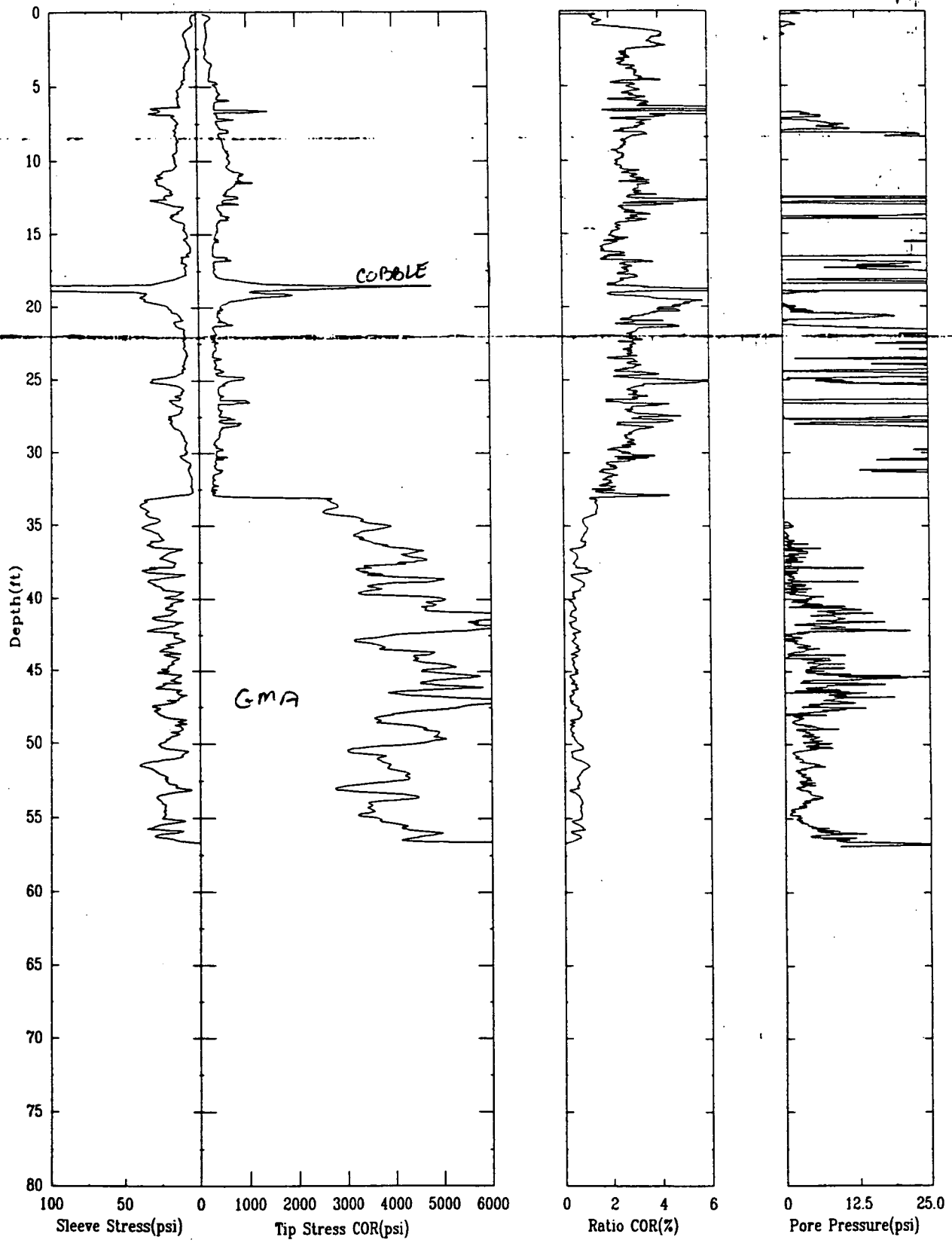
CPT-517 APPLIED RESEARCH ASSOCIATES, INC. 03/27/95

BETWEEN SECURITY FENCES



CPT-513 APPLIED RESEARCH ASSOCIATES, INC. 03/22/95

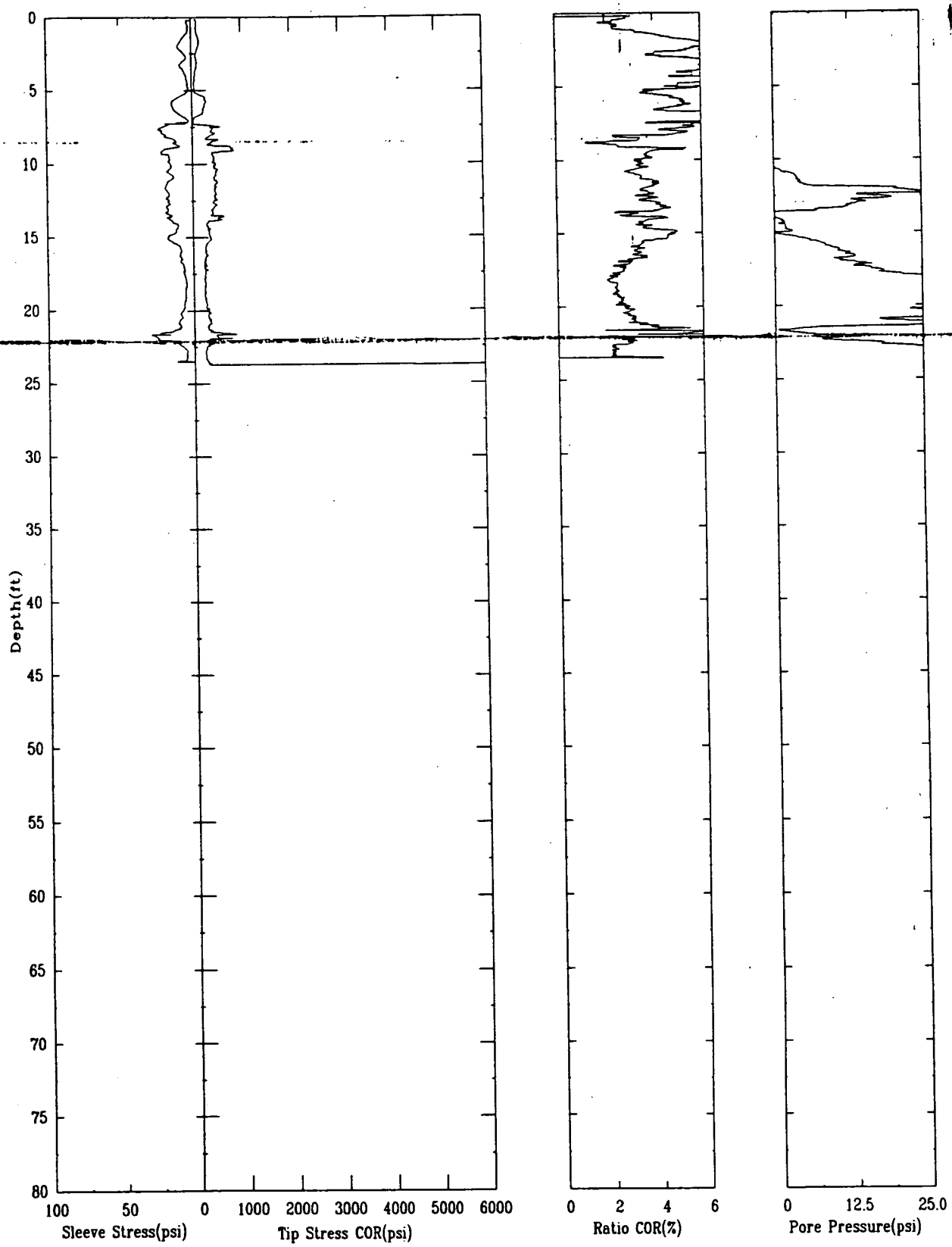
NORTH OF INCINERATOR



000361

CPT-514 APPLIED RESEARCH ASSOCIATES, INC. 03/22/95

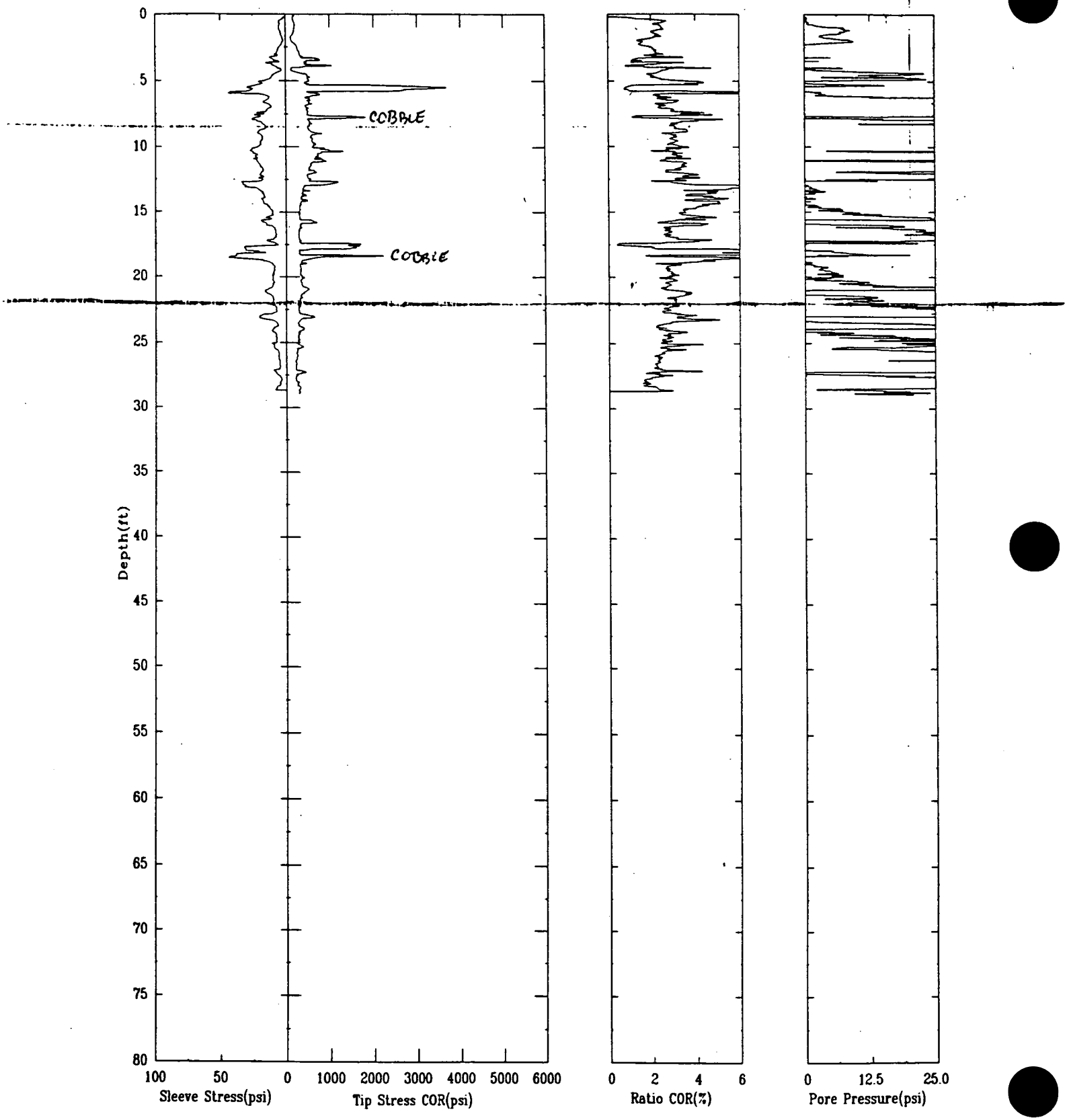
INSIDE RED FENCED AREA



000362

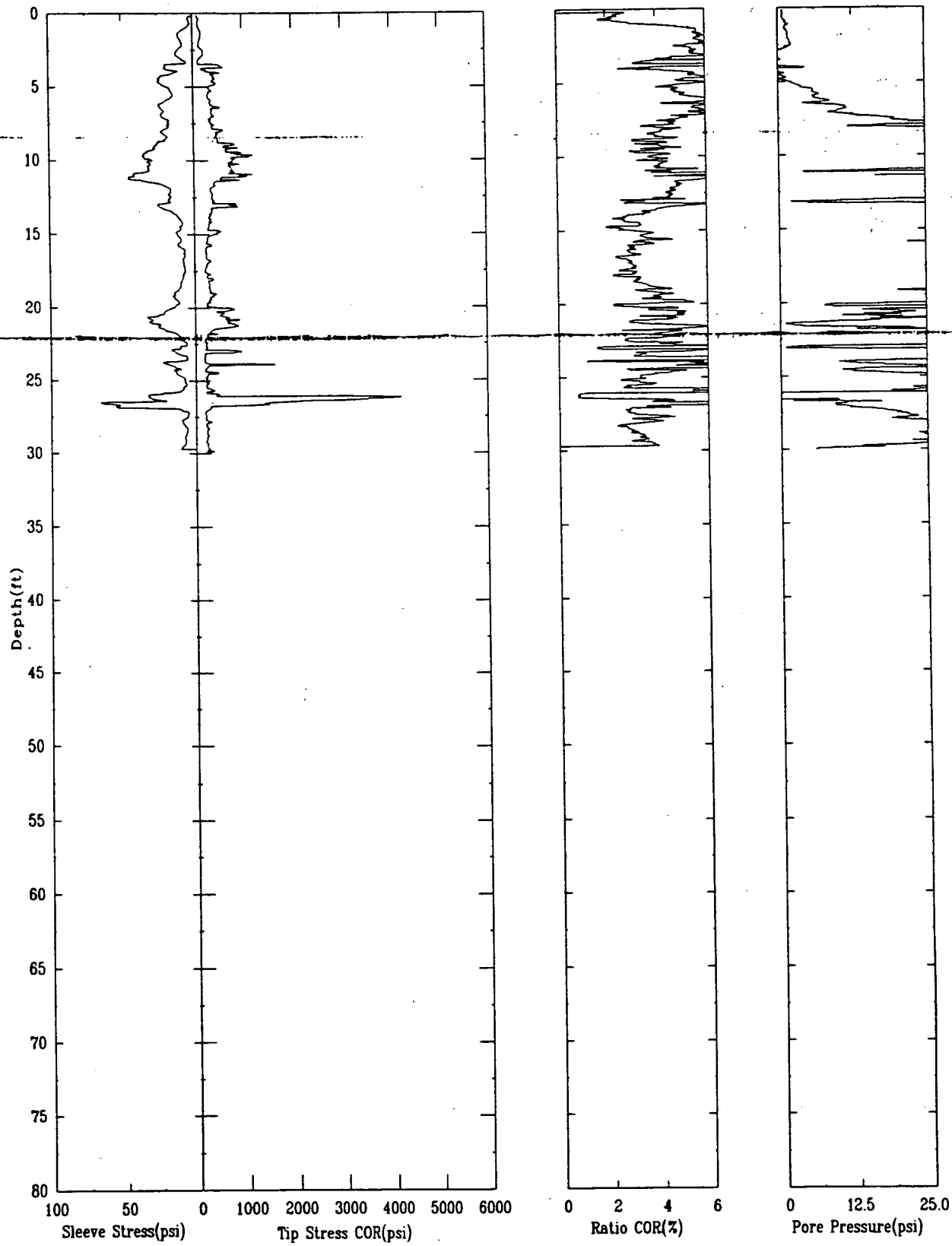
CPT-516 APPLIED RESEARCH ASSOCIATES, INC. 03/22/95

INSIDE RED FENCED AREA



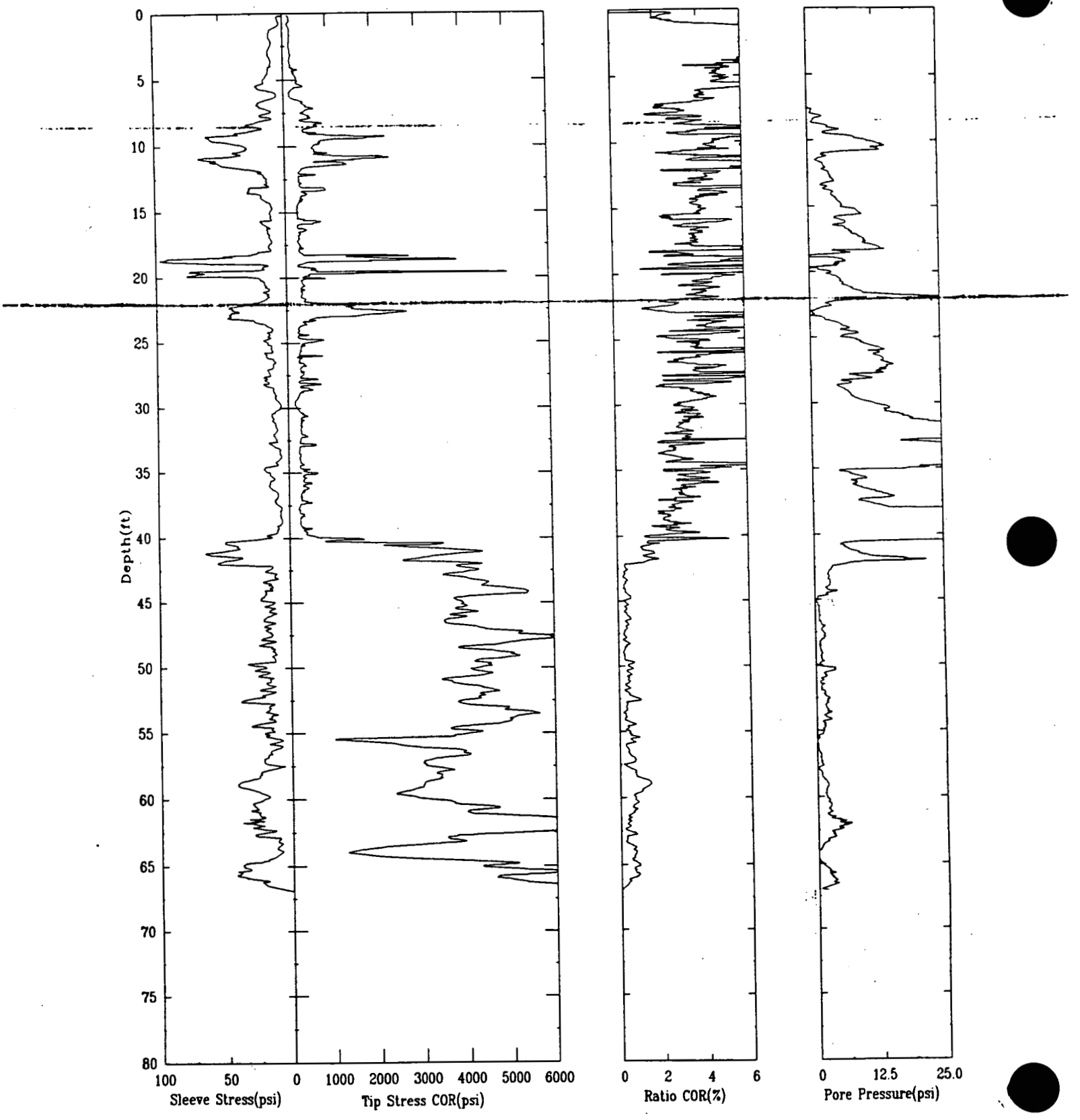
CPT-518 APPLIED RESEARCH ASSOCIATES, INC. 03/22/95

JUST NORTH OF RED FENCE ENCLOSURE



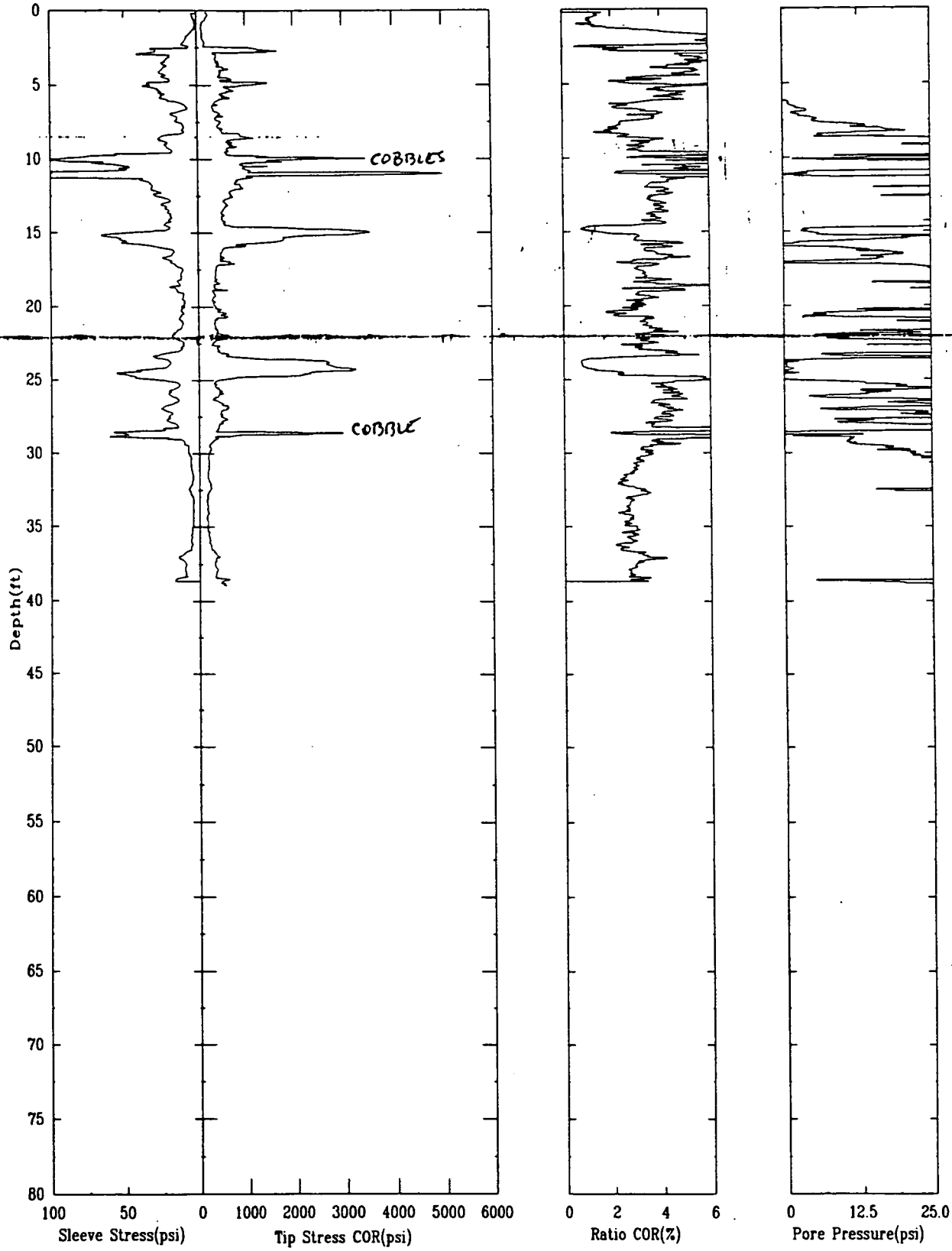
CPT-522 APPLIED RESEARCH ASSOCIATES, INC. 03/22/95

DUE WEST OF POWER TOWER



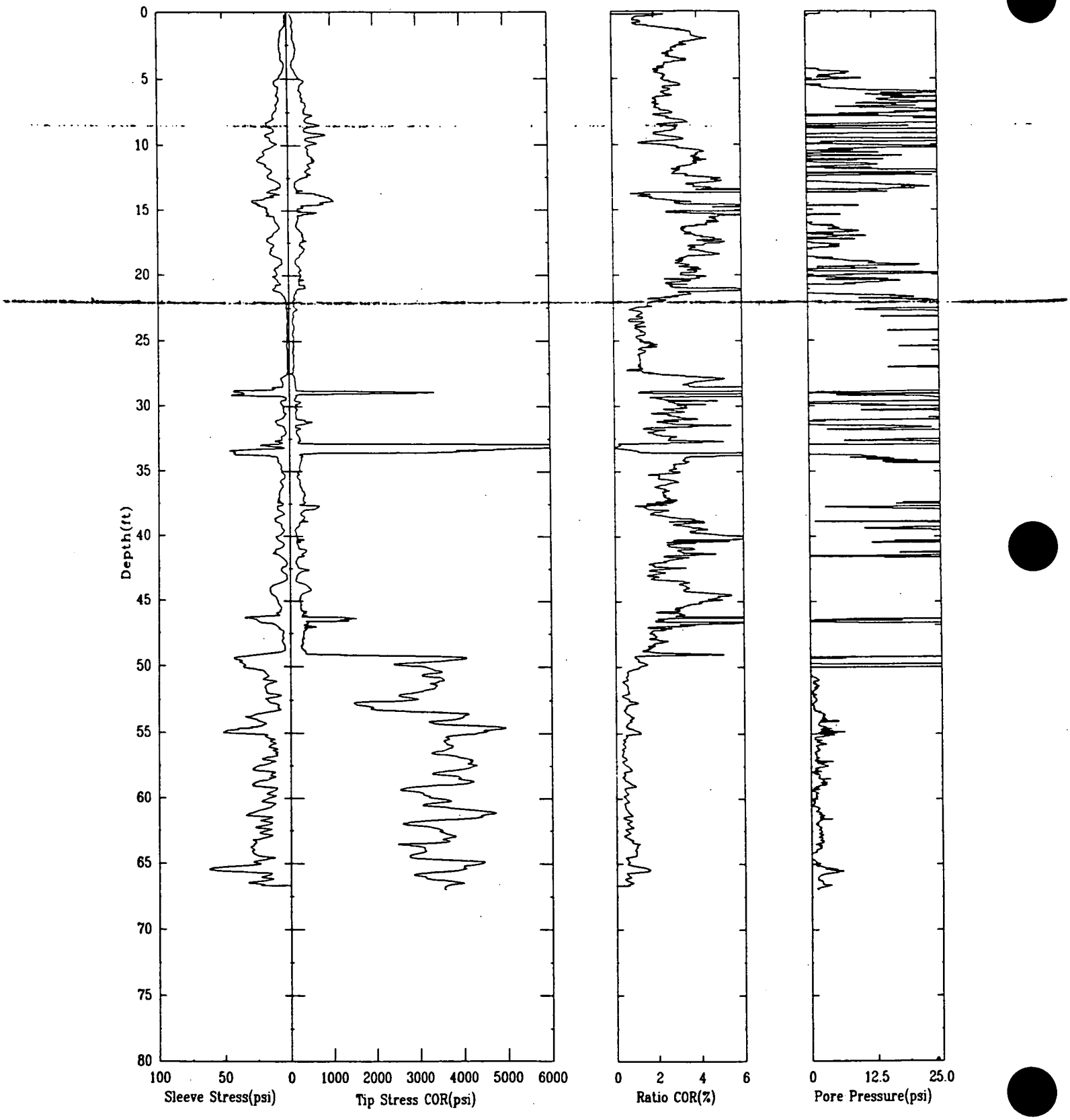
CPT-525 APPLIED RESEARCH ASSOCIATES, INC. 03/22/95

MID-FIELD IN TREE LINE



CPT-529 APPLIED RESEARCH ASSOCIATES, INC. 03/22/95

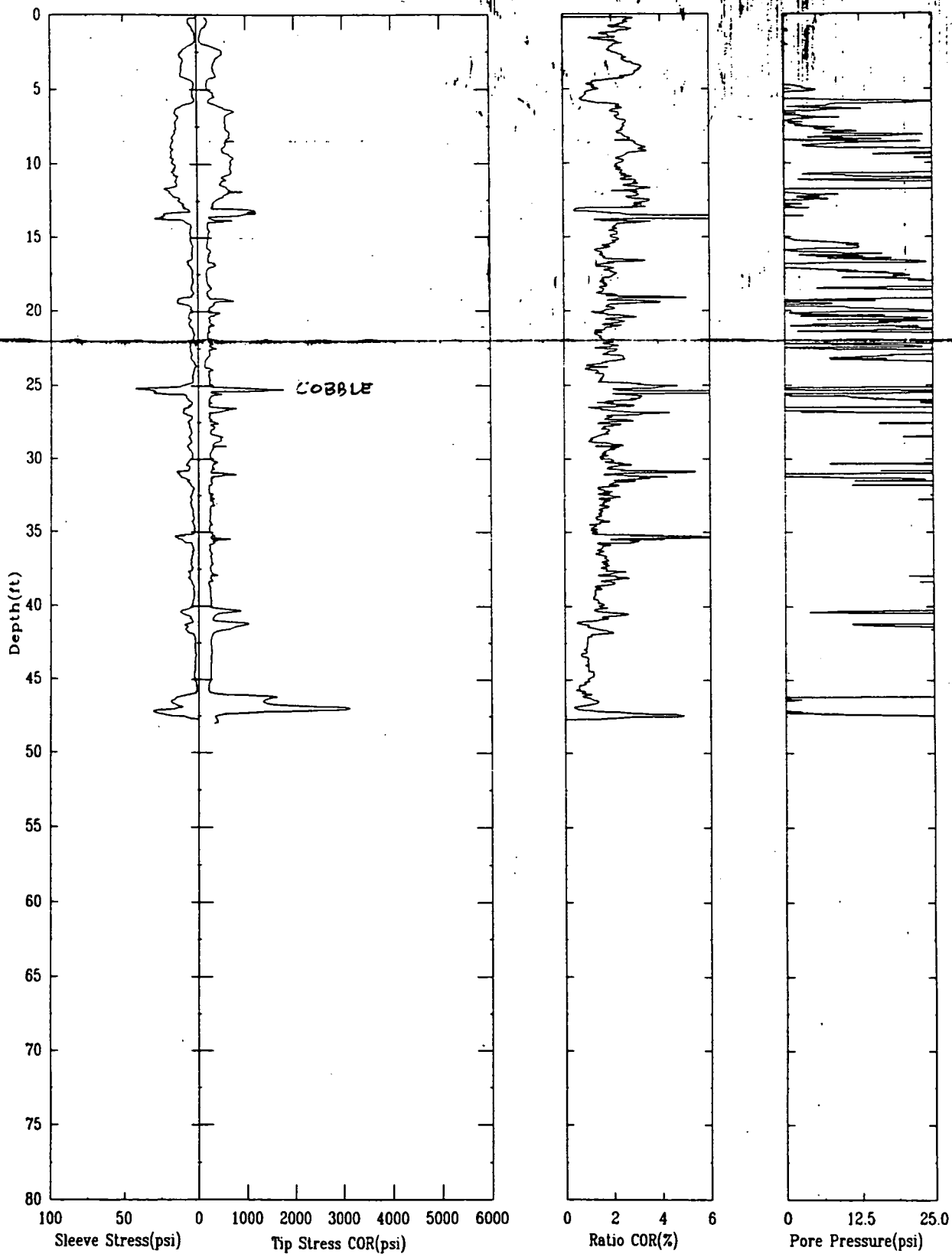
UP BY THE HILLS



000367

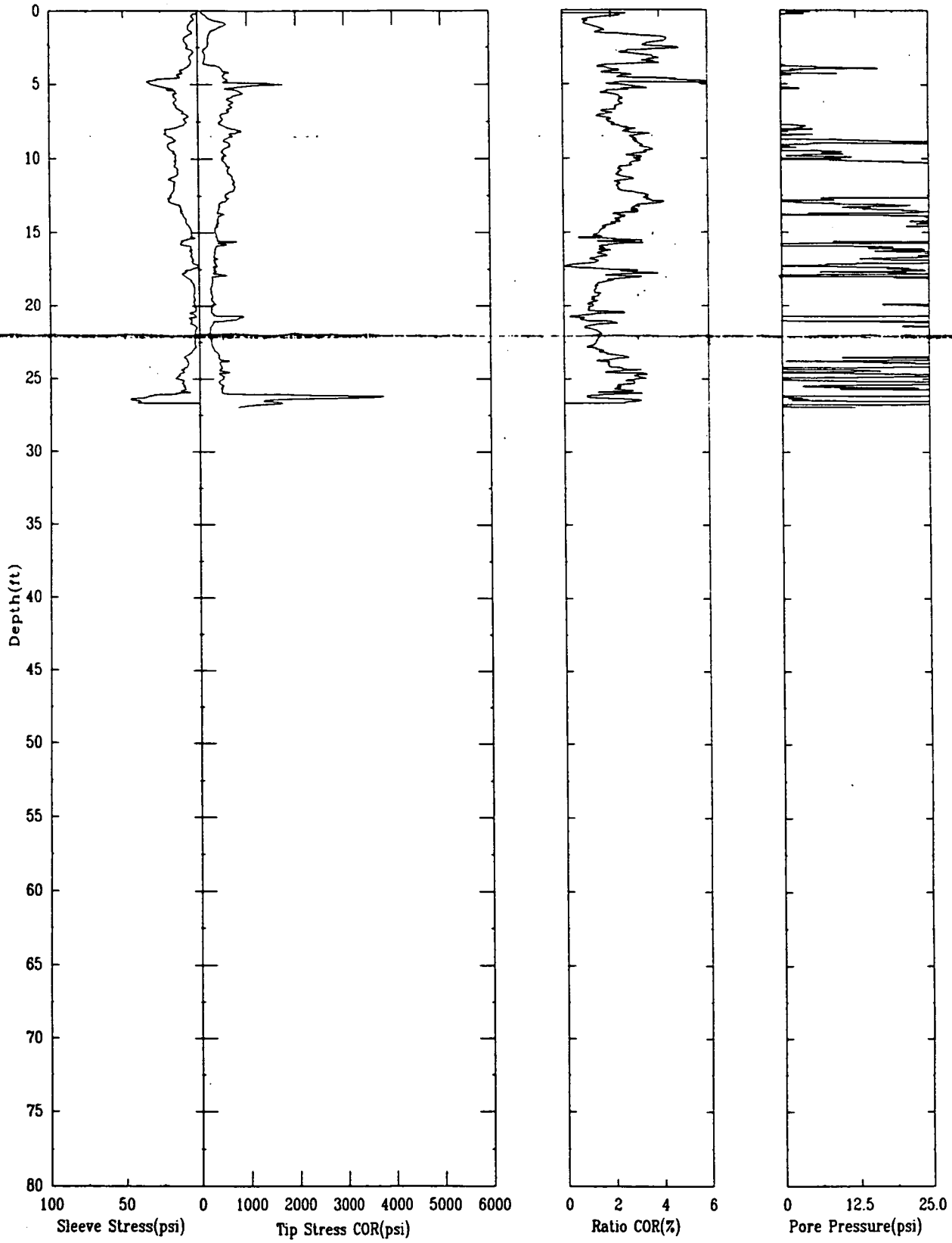
CPT-535 APPLIED RESEARCH ASSOCIATES, INC. 03/22/95

EXTREME NORTH END OF FIELD



CPT-520 APPLIED RESEARCH ASSOCIATES, INC. 03/24/95

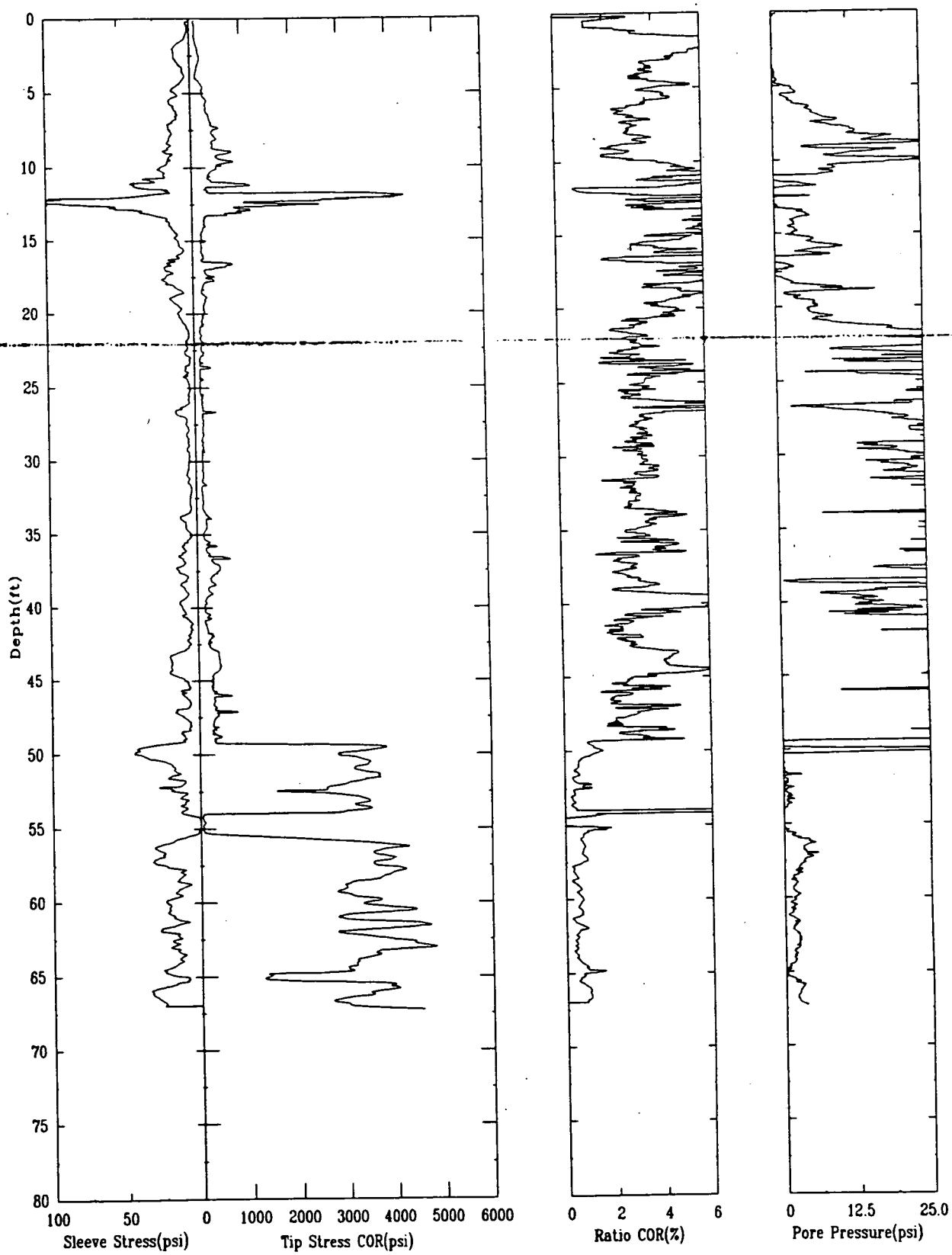
JUST NORTH OF BARBED FENCE

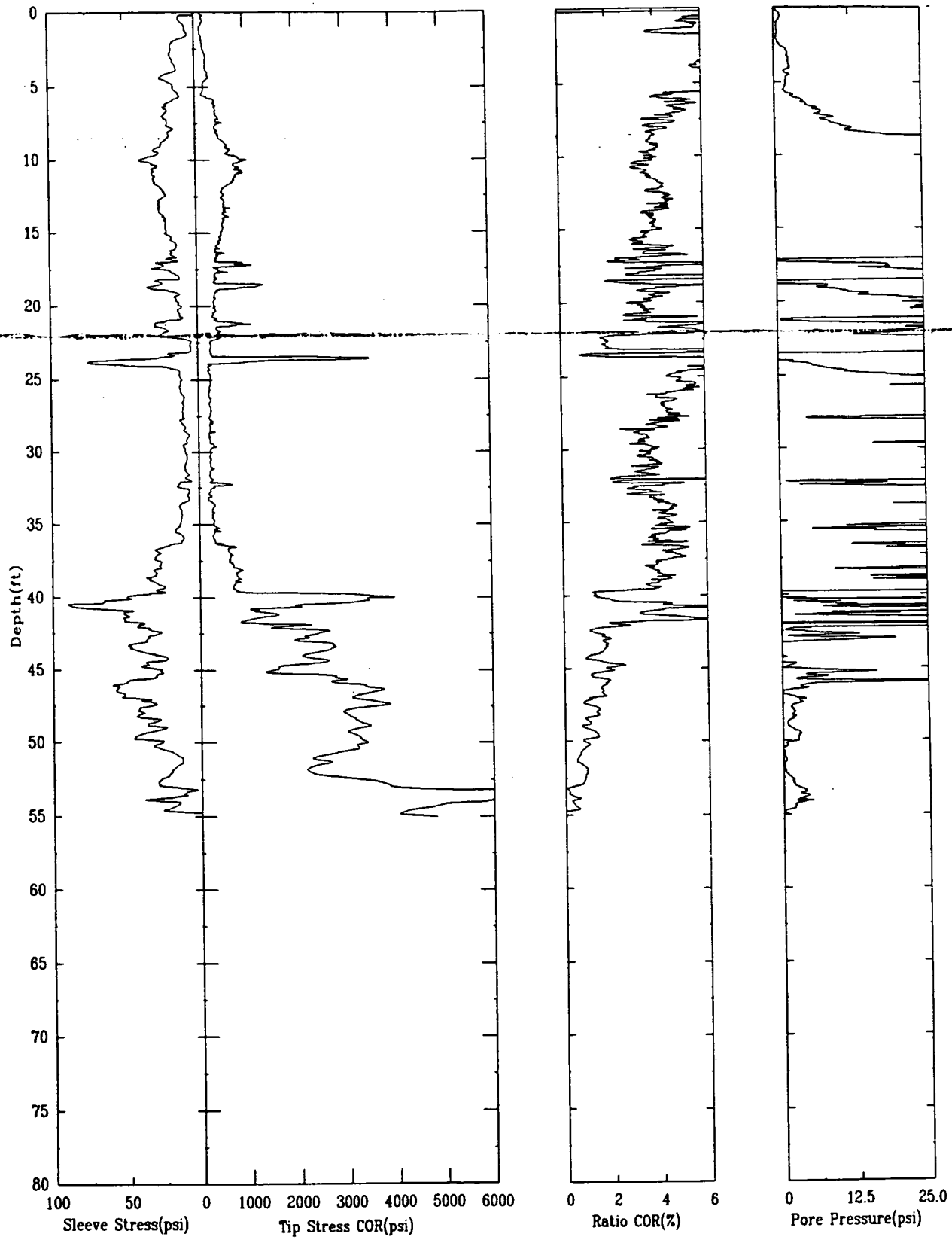


000369

CPT-529B APPLIED RESEARCH ASSOCIATES, INC. 03/24/95

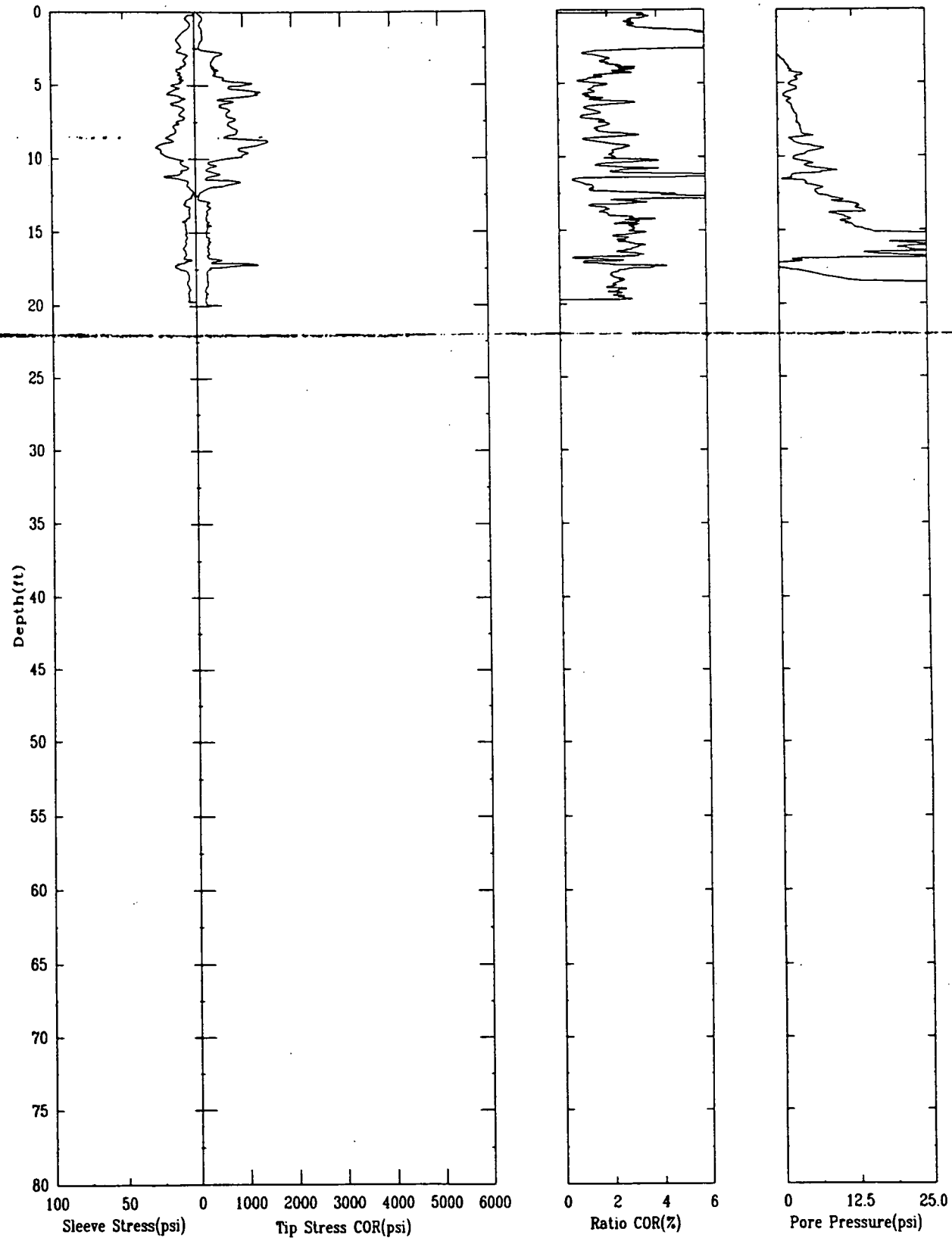
3




Depth(ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
100
50
0
Sleeve Stress(psi)
1000
2000
3000
4000
5000
6000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
12.5
25.0
Pore Pressure(psi)

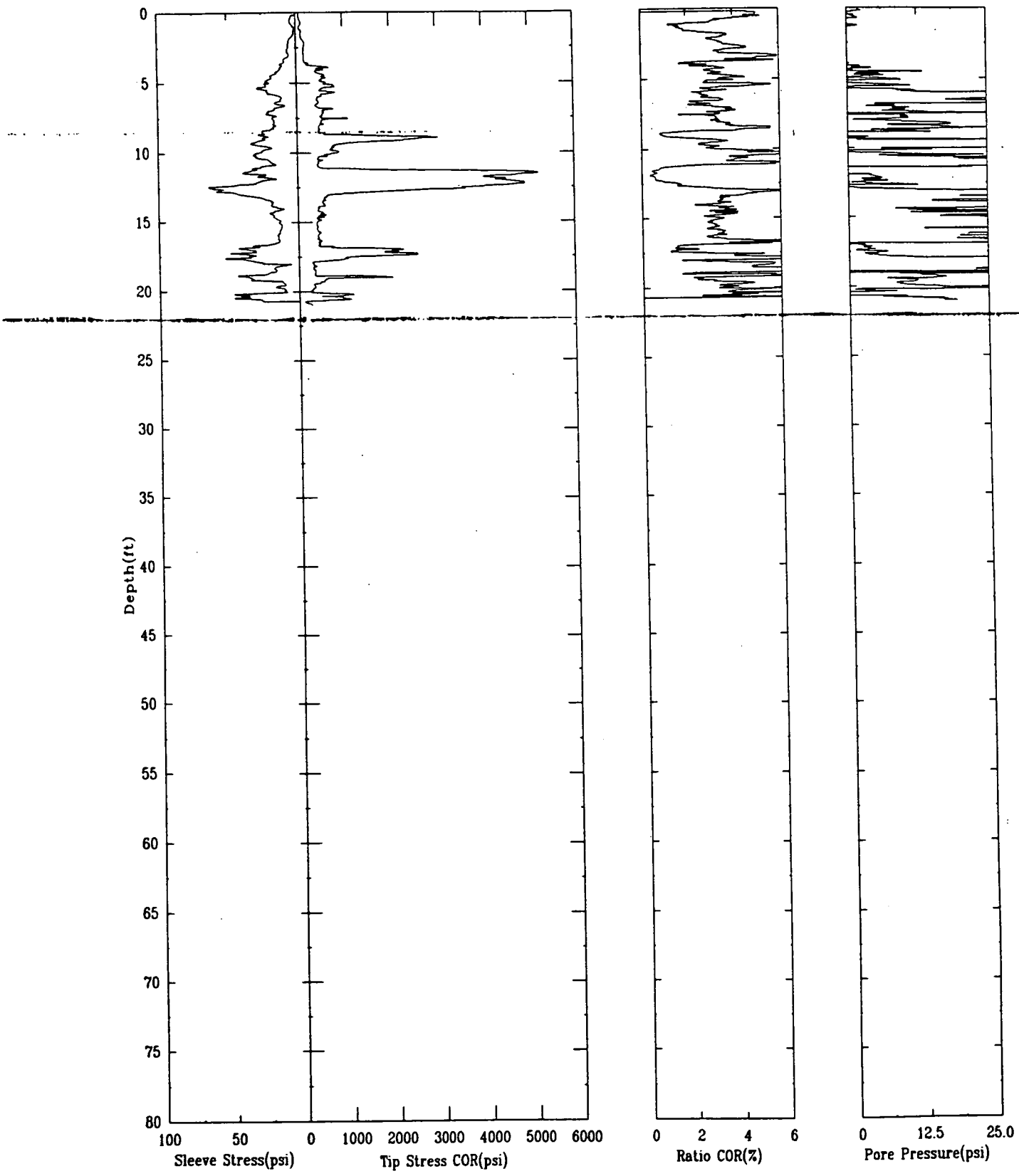
CPT-502 APPLIED RESEARCH ASSOCIATES, INC. 03/24/95

SOUTH OF SEWERAGE TREAT. PLT ROAD



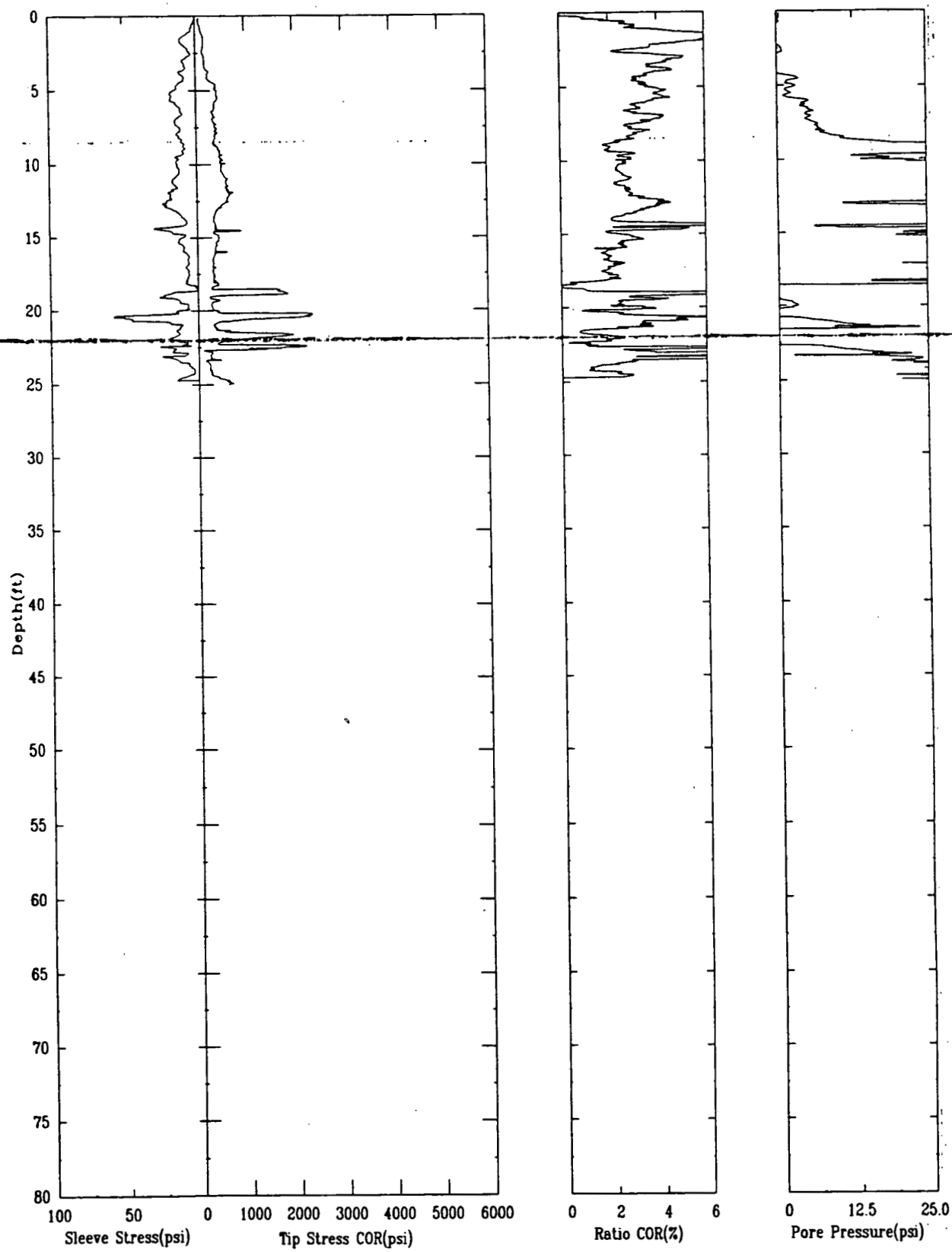
CPT-505 APPLIED RESEARCH ASSOCIATES, INC. 03/24/95

SOUTH OF SEWERAGE TREAT. PLT ROAD



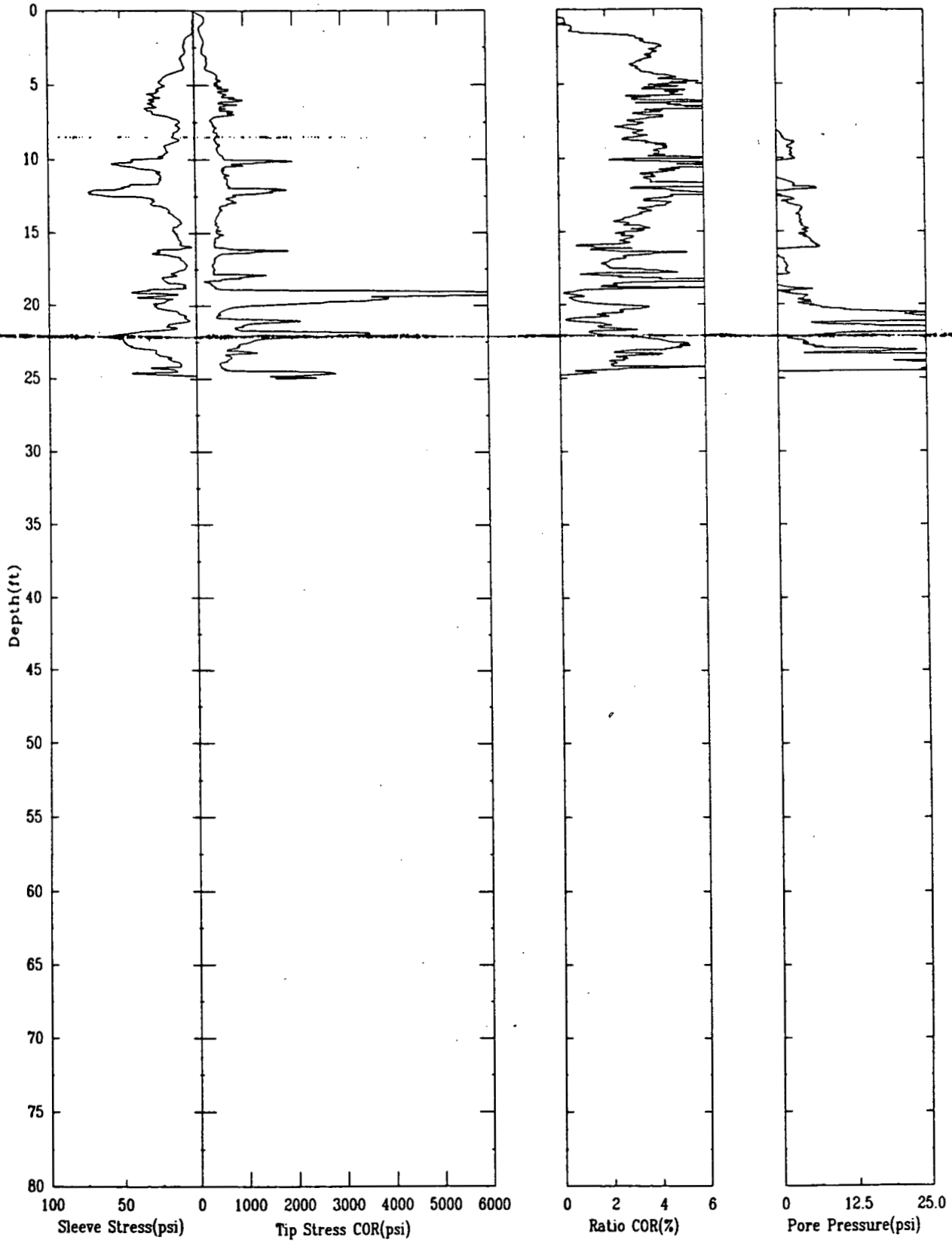
CPT-514B APPLIED RESEARCH ASSOCIATES, INC. 03/24/95

INSIDE RED FENCED AREA



CPT-510 APPLIED RESEARCH ASSOCIATES, INC. 03/24/95

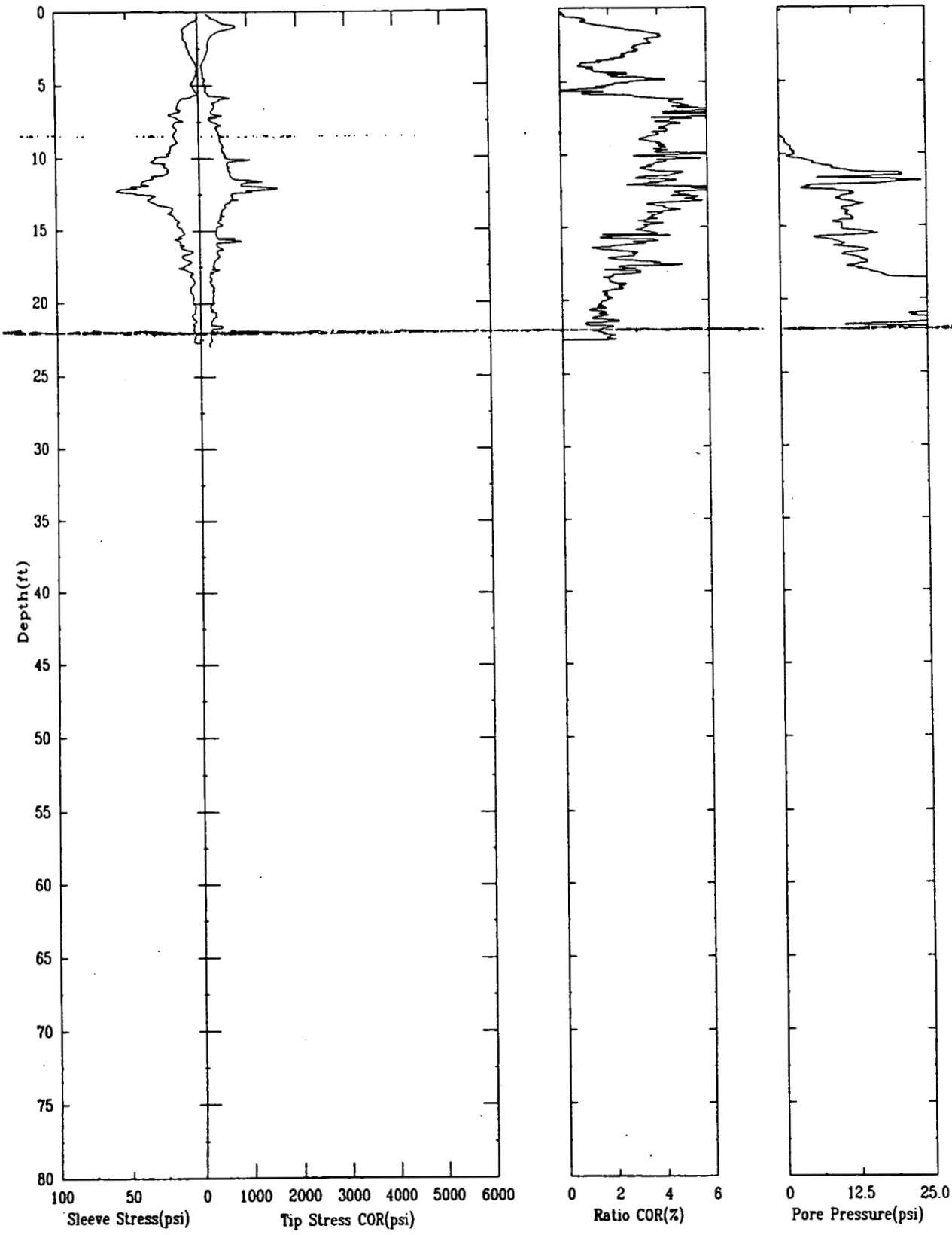
DUE WEST OF TREATMENT PLANT

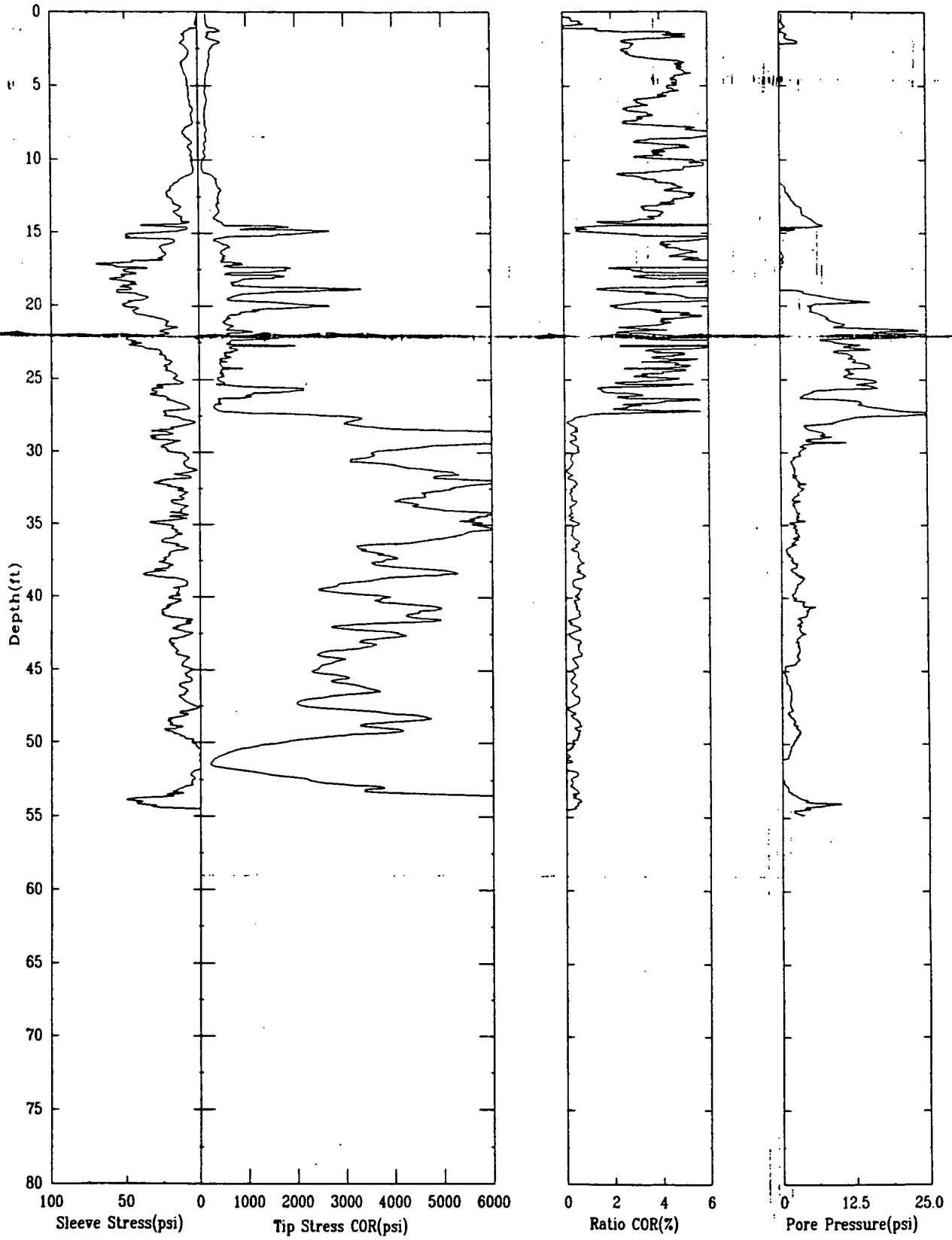


000375

CPT-507 APPLIED RESEARCH ASSOCIATES, INC. 03/24/95

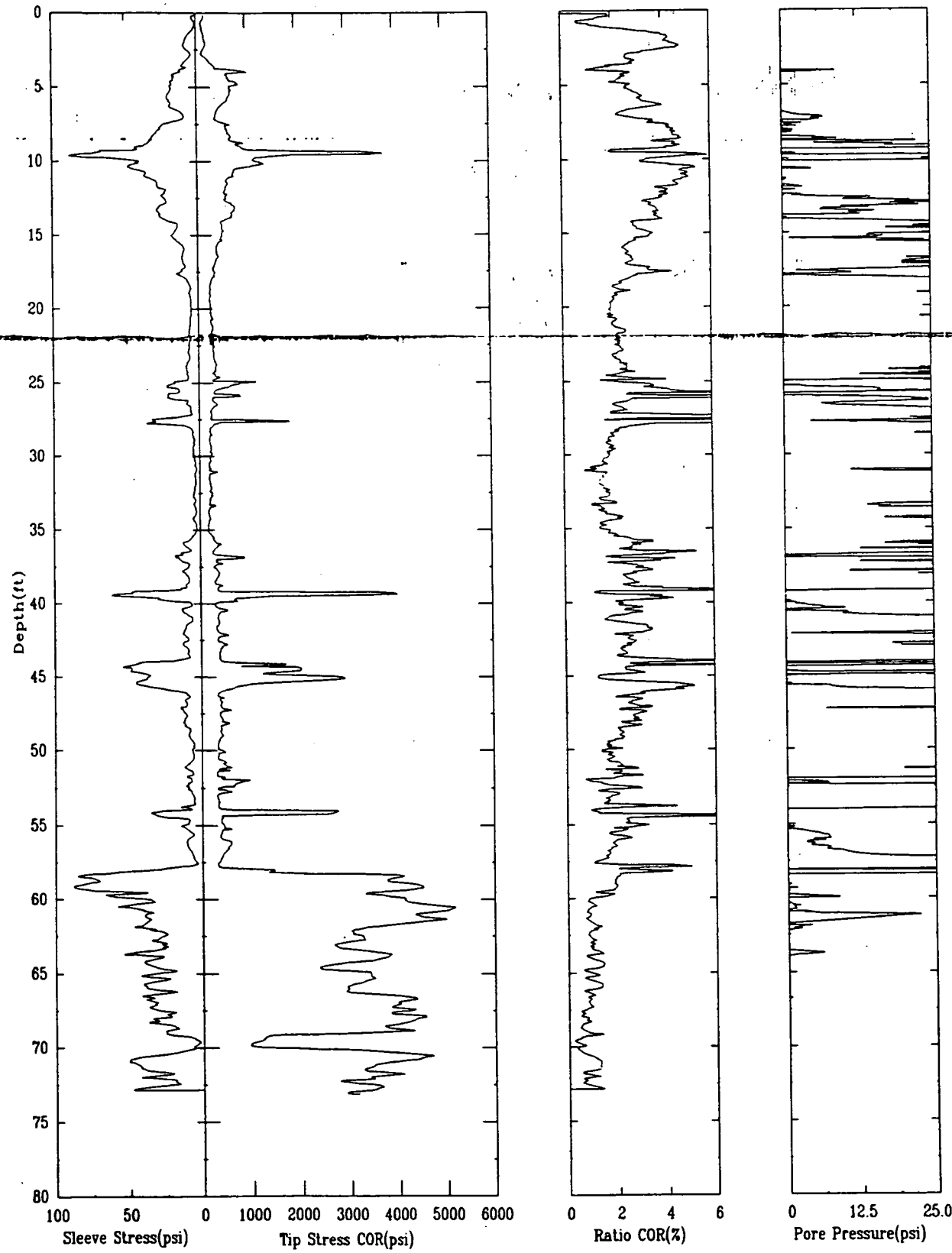
JUNCTION OF GRAVEL ROADS




Depth(ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
100
50
0
Sleeve Stress(psi)
1000
2000
3000
4000
5000
6000
Tip Stress COR(psi)
0
2
4
6
Ratio COR(%)
0
12.5
25.0
Pore Pressure(psi)

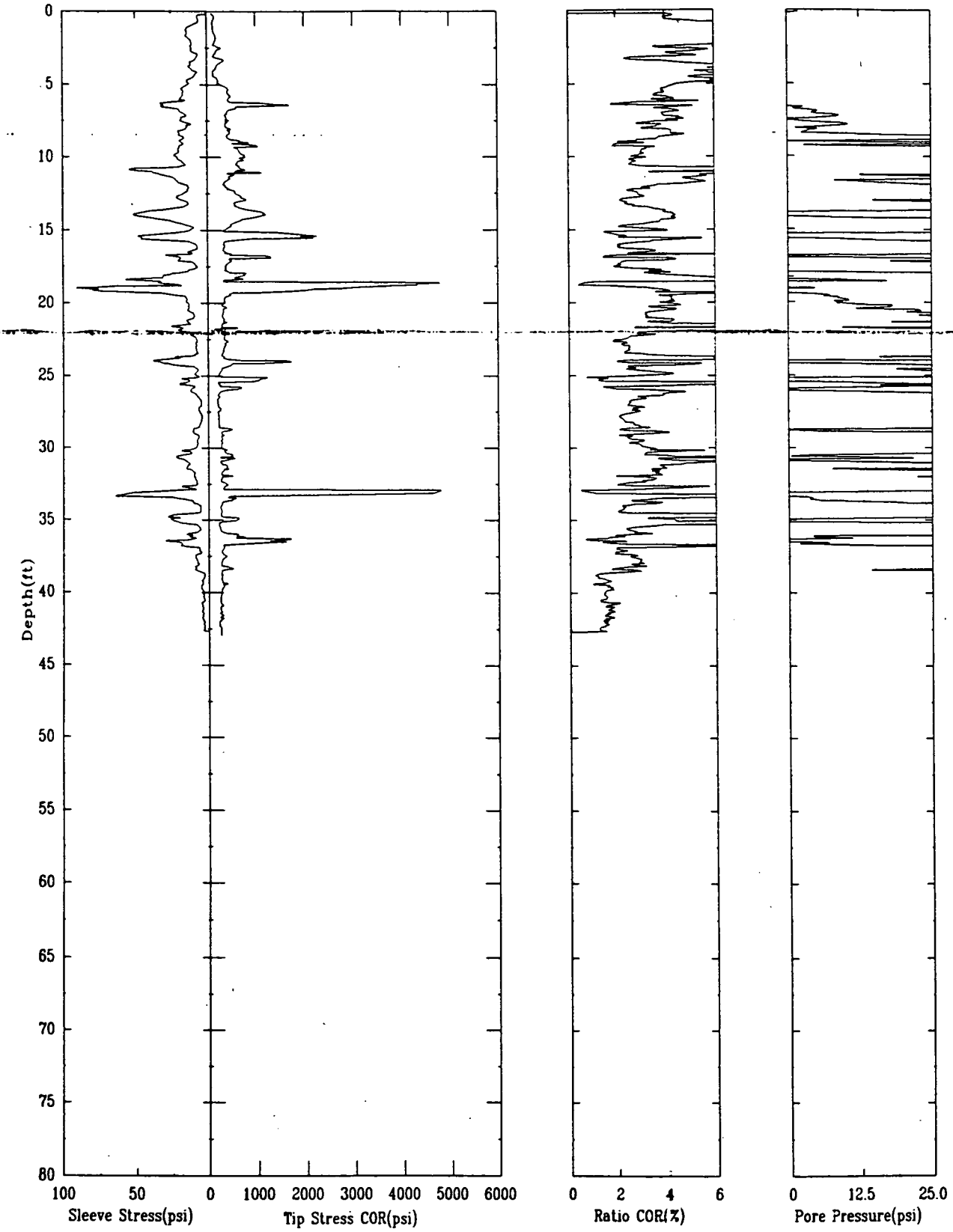
CPT-534 APPLIED RESEARCH ASSOCIATES, INC. 03/23/95

NORTH OF THE MOUNDS



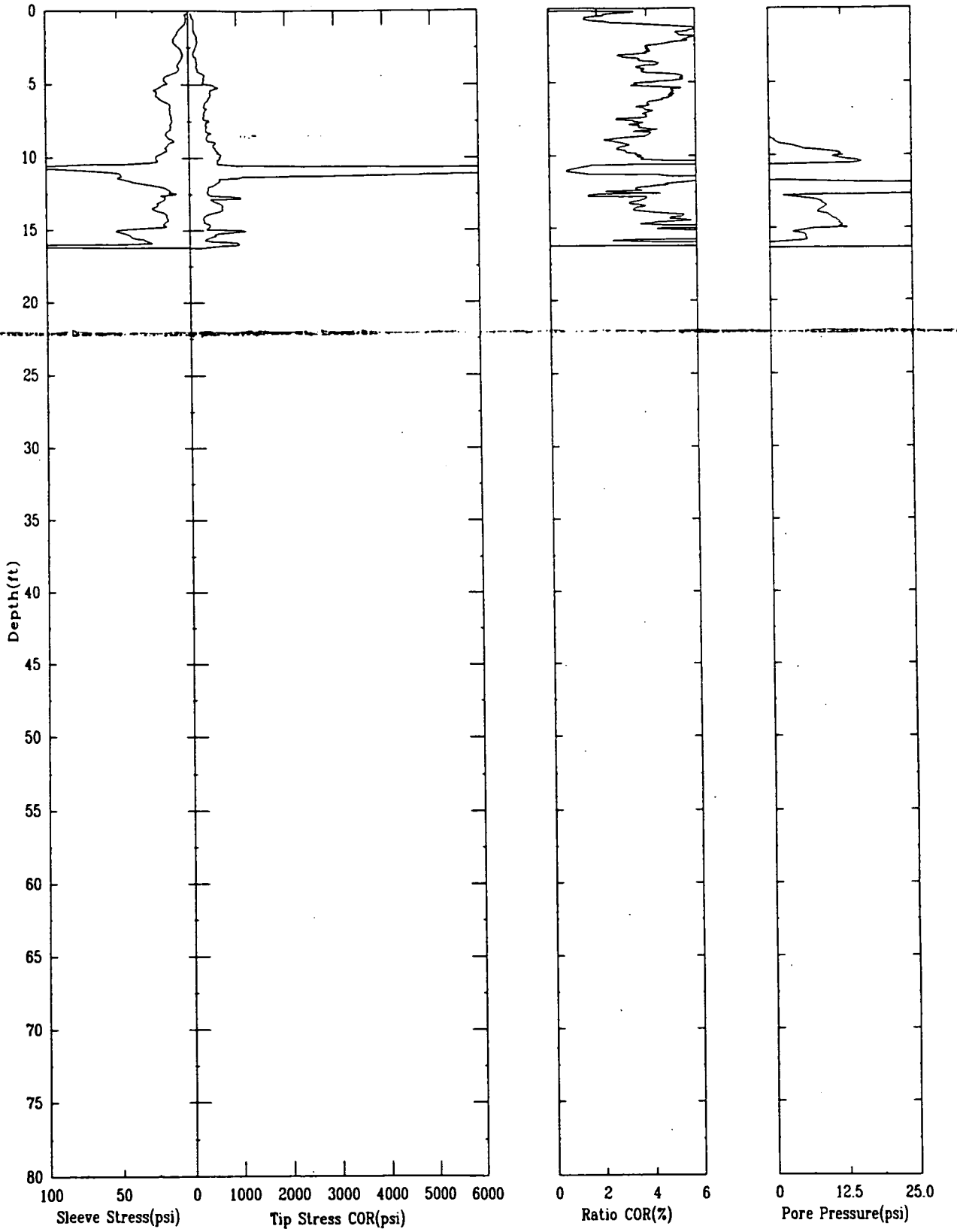
CPT-533A APPLIED RESEARCH ASSOCIATES, INC. 03/23/95

BEHIND GRAVEL PILES



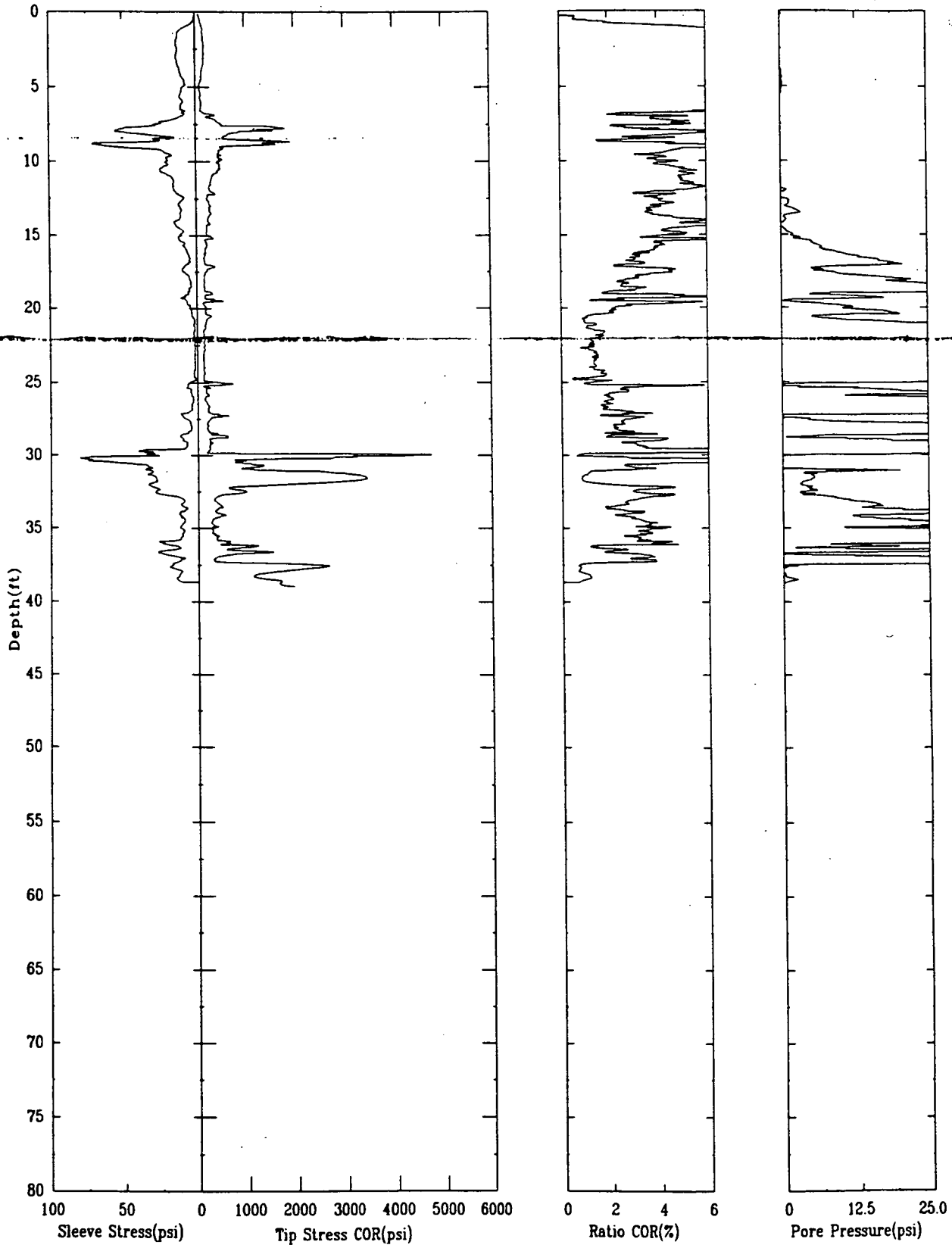
CPT-533 APPLIED RESEARCH ASSOCIATES, INC. 03/23/95

BEHIND GRAVEL PILES



CPT-540 APPLIED RESEARCH ASSOCIATES, INC. 03/23/95

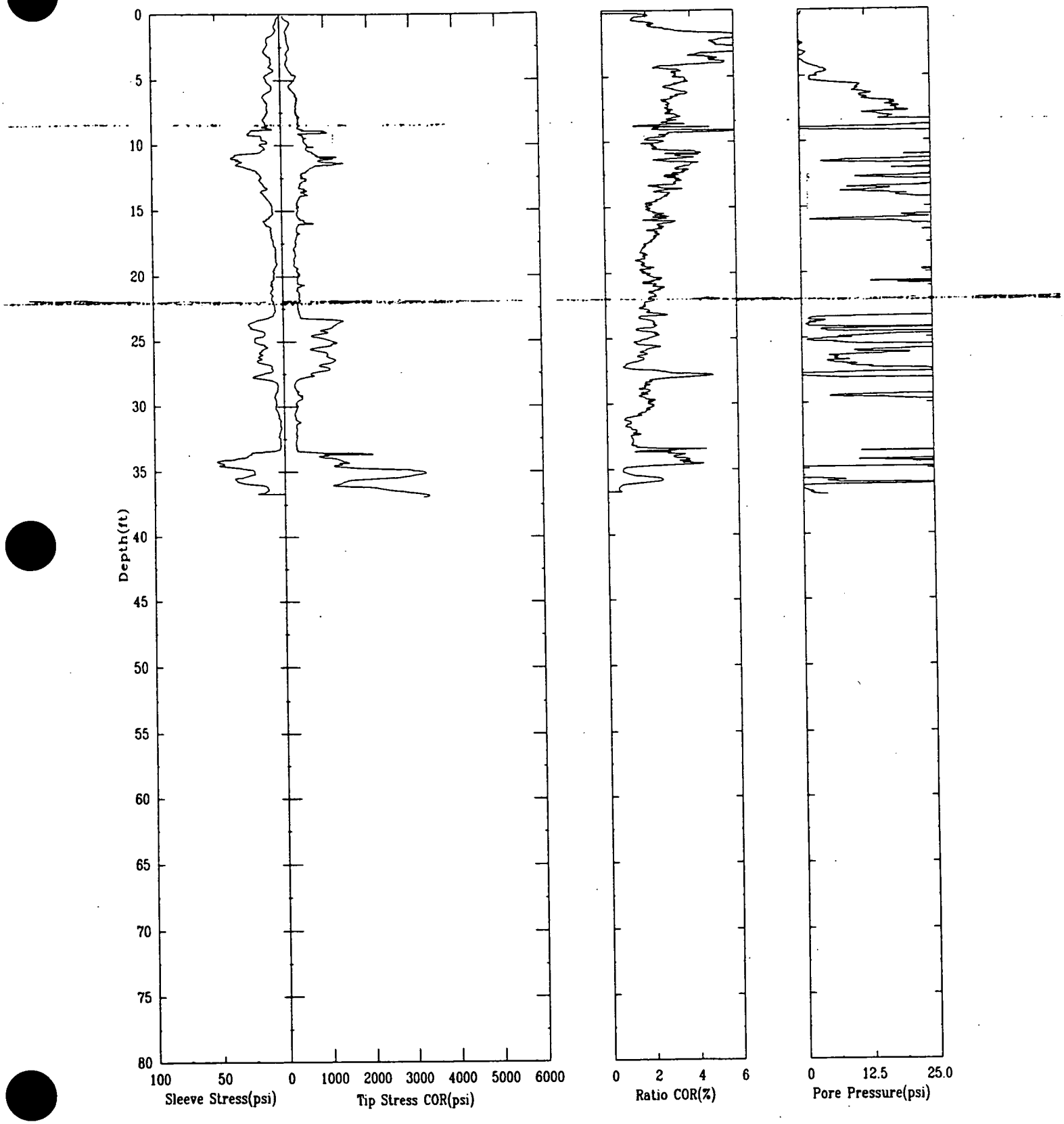
ALONG FENCE,OLD PARKING LOT



000031

CPT-544 APPLIED RESEARCH ASSOCIATES, INC. 03/23/95

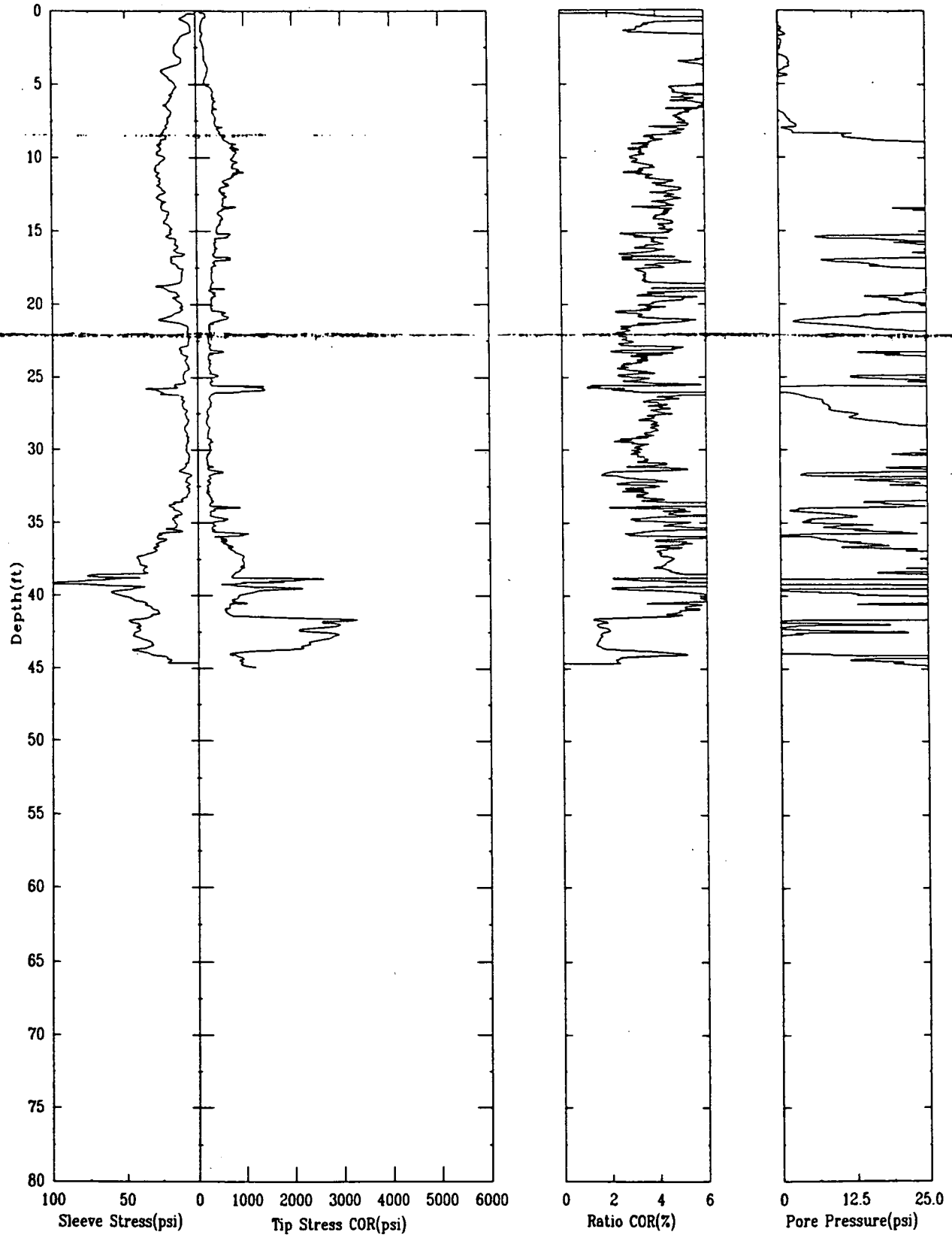
ALONG FENCE,OLD PARKING LOT



000082

CPT-545 APPLIED RESEARCH ASSOCIATES, INC. 03/23/95

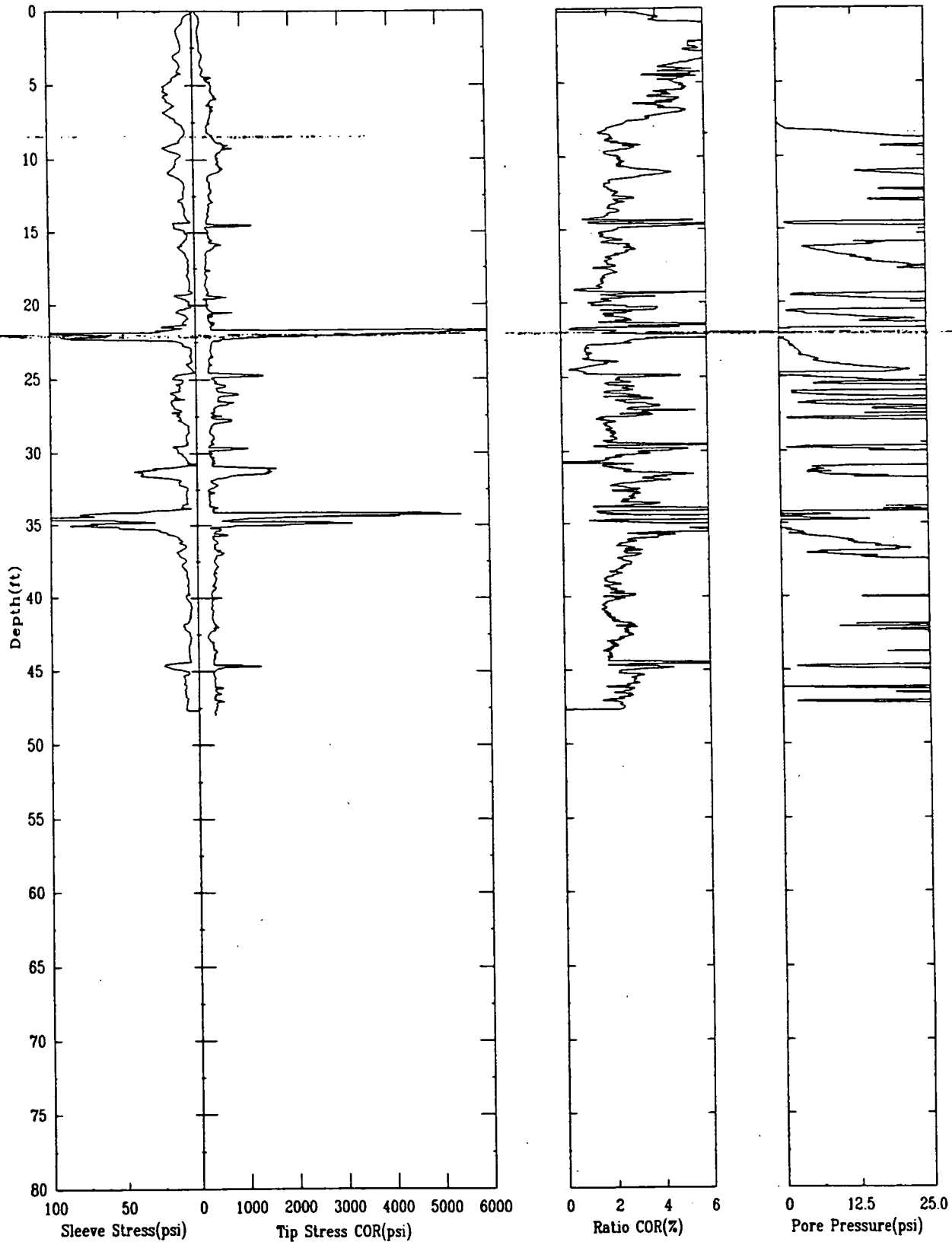
ALONG GRAVEL ROAD



000383

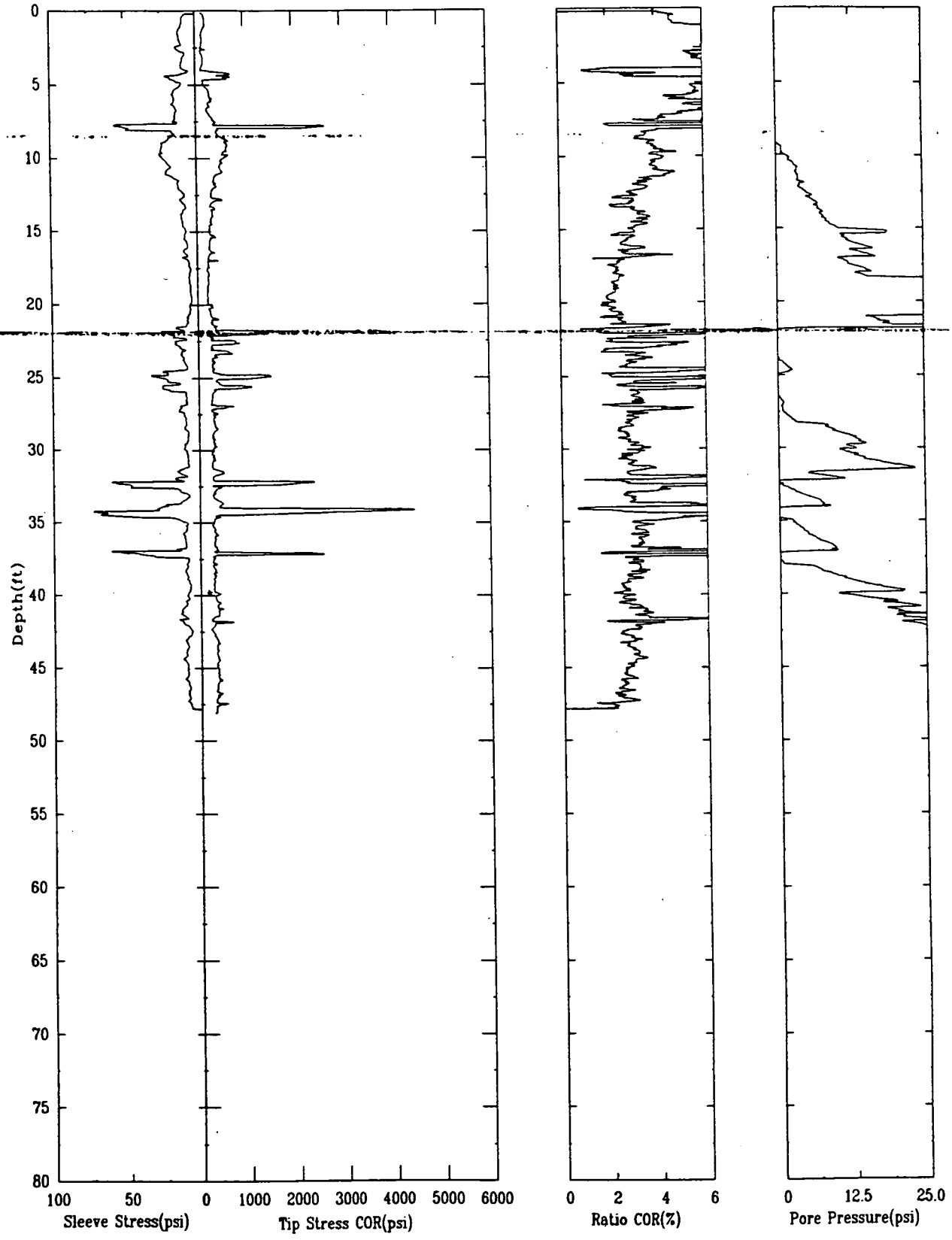
CPT-531B APPLIED RESEARCH ASSOCIATES, INC. 03/23/95

1.5



CPT-531 APPLIED RESEARCH ASSOCIATES, INC. 03/21/95

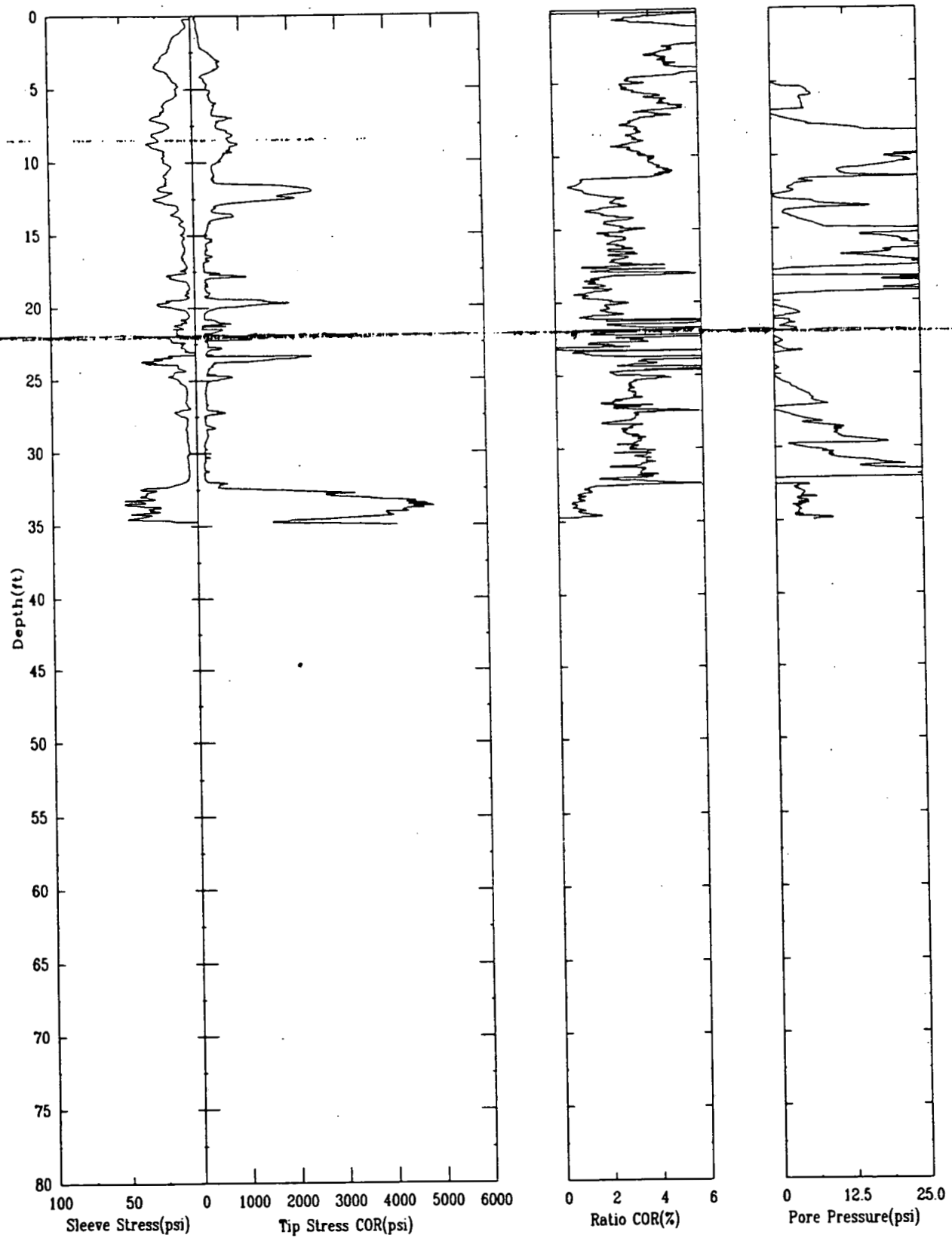
NORTH END OF FIELD

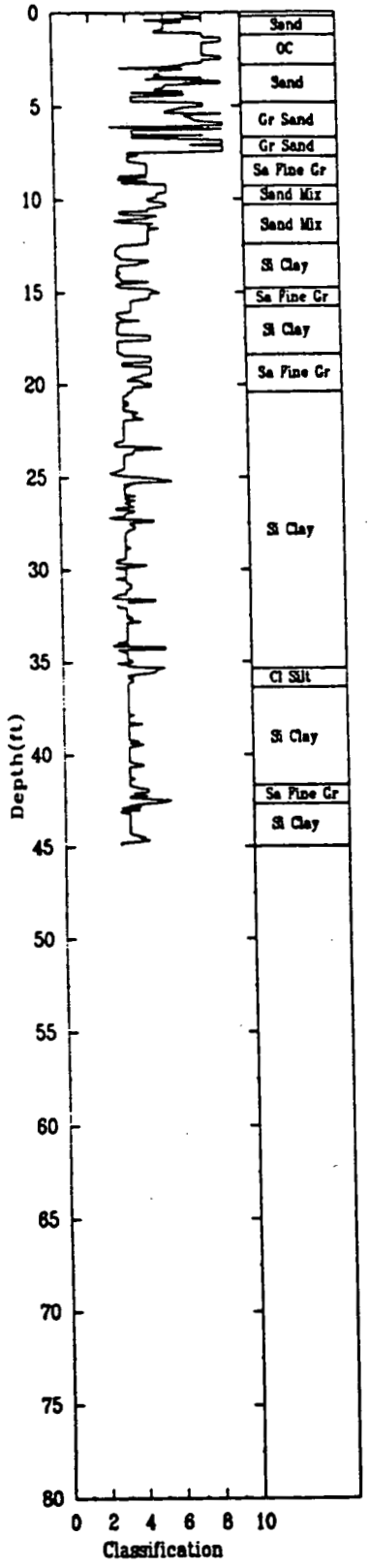


000385

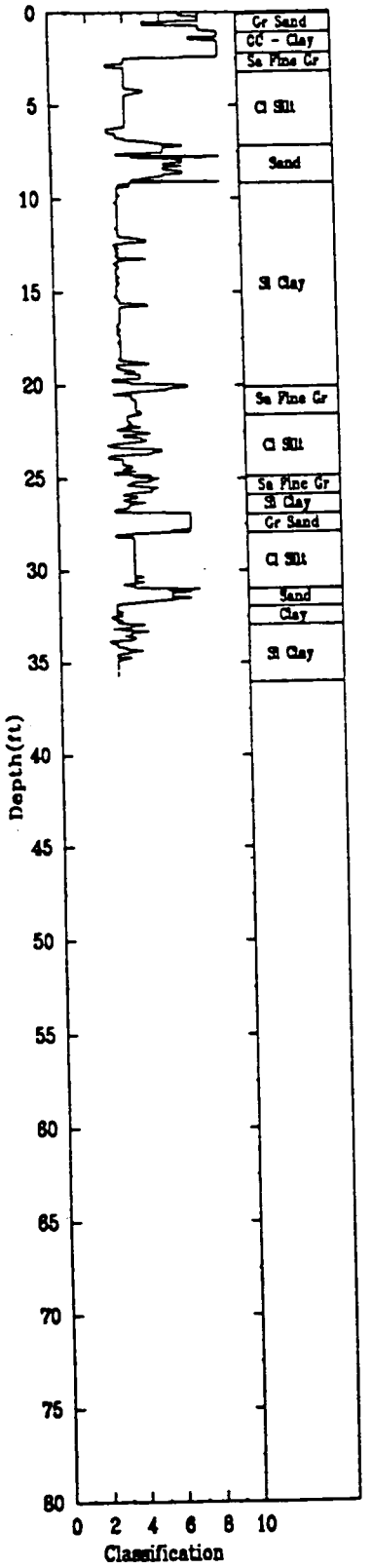
CPT-526 APPLIED RESEARCH ASSOCIATES, INC. 03/23/95

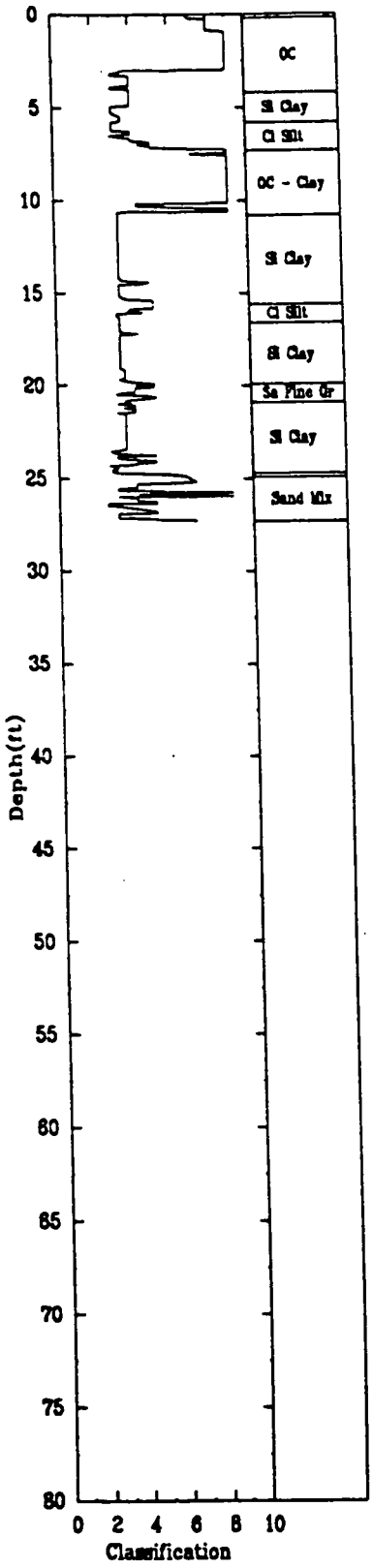
WEST END OF TREE LINE




Sand
OC
Sand
Gr Sand
Gr Sand
Sa Fine Gr
Sand Mix
Sand Mix
Si Clay
Sa Fine Gr
Si Clay
Sa Fine Gr
Si Clay
Cl Silt
Si Clay
Sa Fine Gr
Si Clay
Depth(ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
0 2 4 6 8 10
Classification

CPT-541 APPLIED RESEARCH ASSOCIATES, INC. 03/30/95





File s30m508.ECP 000389

Appendix F

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11468-007

PAGE 1 OF 14

PROJECT NAME: 04-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11468

COORDINATES: N483010.408 E1382487.023

RELATED FAL NO.s: 200307-11468-001 thru 200307-11468-006.

SURFACE ELEVATION: 610.04

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1-10-95

GEOLOGIST: A. Couch

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1-12-95

WATER USED DURING DRILLING: N/A

DRILLING CONTRACTOR: ALLIANCE ENV., INC.

DRILLING EQUIPMENT: HSA MOBILE DRILL B-59 (1993)

DRILLER / HELPER: Bob Erickson / Tim French

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1422 1-10-95 403070	6	Ø				2" O.D SPLIT SPOON
0.5		16	1	(10YR 4/3) BROWN SILTY CLAY, GRASS, ROOTS, FROZEN	CL	N/A	MT_B = 2.0 MT_S = 7.0 B_r = 50
1.0		9	6	STIFF (10YR 4/4) Dark Yellowish BROWN SILTY CLAY, FEW FINE (3/4") SUBANGULAR to SUBROUND GRAVEL, ROOTS, SLIGHT IRON STAINING, MED. PLASTICITY, MOIST	CL	1.5	#403070 is for FEMP Archive
1.5							AUGERED INTERVAL ONLY - NO SAMPLE
2.0	1428 1-10-95 403071		20+				3" OD SHELBY TUBE 20" PUSH @ 500PSI TUBE SLIGHTLY CRIMPED
2.5							MT_B = 11.5 MT_S = 12.2 B_r = 35
3.0	1428 1-10-95 403072			(2.5Y 4/4) olive BROWN GRAVELLY (FINE (1/2"), subangular) SILT, FEW FINE SAND, NO to LOW PLASTICITY, DRY	~~MH~~ ML	ML	DESCRIPTION FROM BOTTOM FACE OF SHELBY TUBE #403071 is for Geotech Lab
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	1-10-95	1420
ALPHA	N/A	N/A	N/A
BETA / GAMMA	50	1-10-95	1421

NOTES: COLORS IDENTIFIED USING MUNSELL COLOR CHART FOR SOILS. CONSISTENCY MEASURED USING POCKET PENETROMETER UNLESS OTHERWISE NOTED. DENSITY (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11468-008

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11468

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: SEE PAGE 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5							
4.0							AUGERED INTERVAL ONLY
4.5							NO SAMPLE #403072 is jar Archive sample from end of Shelby Tube
5.0	1445 1-10-95 403073	13	6	STIFF (10Y 4/4) Dark Yellowish Brown CLAYEY SILT, FEW FINE (1/4") GRAVEL, TRACE BLACK ORGANIC MATERIAL, LOW PLASTICITY, MOIST	ML	1.5	2" OD SPOON #403103 is bulk sample of auger cuttings (2-6.5') for
5.5	1445 1-10-95 403074	13	6	VERY STIFF (2.5Y 5/4) LIGHT OLIVE BROWN, GRAVELLY (FINE (3/4"), SUBANGULAR) SILT, MOTTLED, SLIGHT IRON STAINING, LOW PLASTICITY, DRY	ML	3.0	MTB = 7.9 Geotech Lab MTS = 10.1 BJ = 30
6.0	403105	19	6	SAA		3.25	~~SAM AC~~ ~~#403073~~ #403073 is for Envr. Lab #403074 is for Geotech Lab.
6.5							AUGERED INTERVAL ONLY - NO SAMPLE #403105 is for FEMP Archive
7.0	1504 1-10-95 403075		9				3" OD SHELBY TUBE 30" PUSH @ 6001

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: DESCRIBED BASED ON SPT BLOW COUNT. SOIL DESCRIPTIONS AND USCS SYMBOL PER ASTM D 2488 GUIDELINES. SAMPLES COLLECTED PER ASTM D 1586 (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

000391

G:/WPSC/94-776.DRW (11-23-94)

FEMP LA MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.:	200307-11468-009
PAGE	3 OF 14
PROJECT NAME:	04-2 PRE-DESIGN FIELD INVESTIGATION
PROJECT NO.:	20.03.07
BORING NUMBER:	11468
COORDINATES:	
RELATED FAL NO.:	
SURFACE ELEVATION:	
GROUNDWATER LEVEL:	
DATE:	
TIME:	
DATE STARTED:	
GEOLOGIST:	
GROUNDWATER LEVEL:	
DATE:	
TIME:	
DATE COMPLETED:	
WATER USED DURING DRILLING:	
DRILLING CONTRACTOR:	
DRILLING EQUIPMENT:	
DRILLER / HELPER:	

SEE PAGE 1

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5							TUBE END BADLY CRIMPED, TUBE FLATTENED ~1" OVER BOTTOM
8.0							20". #402075 and #402076 are for FEMP Archive
8.5							MTB = 11.5 MTS = 24.2 BM = 40
9.0	1504 1-10-95 403076			(2.5Y 5/4) LIGHT OLIVE BROWN CLAYEY SILT, FEW FINE (1/4") SUB-ANGULAR GRAVEL, SLIGHT IRON STAINING LOW PLASTICITY, DRY to SLIGHTLY MOIST	ML		DESCRIPTION FROM BOTTOM FACE OF SHELBY TUBE
9.5	1515 1-10-95 403077		27				3" OD SHELBY TUBE 18" PUSH @ 500PSI
10.0							12" PUSH @ 600PSI MTB = 12 MTS = 24.2 BM = 40
10.5							#403077 is for Geotech Lab #403078 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: AND D1587. SPLIT SPOON SAMPLERS EQUIPPED WITH BASKET RETAINERS (TRAPS). TWO-INCH O.D. STANDARD SPLIT BARREL (SPOON) USED. (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

CONTROL NO.: 200307-11468-000 KP 2-6-95

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11468

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

SEE PAGE 1

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5							
11.0							
11.5	1515 1-10-95 403078			(2.5Y 5/4) LIGHT OLIVE BROWN SILTY CLAY, FEW FINE (3/8") SUBROUND GRAVEL, LOW to MED. PLASTICITY SLIGHTLY MOIST	CL		DESCRIPTION FROM BOTTOM FACE OF TUBE
12.0	1530 1-10-95 403079	13	4	STIFF (2.5 5/6) LIGHT OLIVE BROWN SANDY CLAY, IRON STAINED, LOW PLASTICITY, MOIST ~~NOTE: FOUND~~ Med. Dense (2.5Y 5/4) LIGHT OLIVE BROWN SAND WITH CLAY (SAND - FINE, POORLY GRADED) WET	CL / SP-SC	1.5 / <.25	2" OD SPLIT SPOON SPOON VISIBLY WET.
12.5		18	6	Med. Dense (2.5Y 5/4) LIGHT OLIVE BROWN SANDY GRAVEL (FINE (3/4") TO COARSE (1.75"), SUBANGULAR, WITH CLAY, NO PLASTICITY, WET	GP-GC	NA	MT_B = 22.2 MT_S = 29.4 $B\gamma$ = 40
13.0		12	6	Very STIFF (2.5Y 5/3) LIGHT OLIVE BROWN SILTY CLAY, FEW FINE (1/4") SUBROUND GRAVEL, MED. PLASTICITY, MOIST	CL/ML	4.0	# 403079 is for FEMP Archive # 403079 is bulk sample of auger cuttings from 9-13' for Geotech Lab.
13.5	1538 1-10-95 403080	9	5	STIFF (2.5Y 5/3) LIGHT OLIVE BROWN SILTY CLAY WITH FINE (1/2") GRAVEL, LOW PLASTICITY, MOIST	CL	1.75	2" OD SPLIT SPOON
14.0		10	6	STIFF (10Y 5/1) GREENISH GRAY to (5Y 5/1) GRAY SILTY CLAY WITH FINE (3/8") SUBROUND GRAVEL, LOW PLASTICITY, MOIST	CL	2.0	MT_B = 23 MT_S = 34.8 $B\gamma$ = 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
MT_B = MICROTIP (PID) BACKGROUND READING (PPM)
MT_S = MICROTIP (PID) READING ON SAMPLE (PPM)
$B\gamma$ = Beta-Gamma (cpm)

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

S-F-3881

FEMP/WPSC / 94-776.DRW (11-23-94)

MAR 03 1995

000393

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11468-011	PAGE 5 OF 14
PROJECT NAME: 04-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11468	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

SEE PAGE 1

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.5		12	6	very STIFF (10 Y 5/1) GREENISH GRAY SILTY CLAY, FEW FINE (1/2") SUB-ROUND GRAVEL, TRACE FINE SAND, LOW PLASTICITY, MOIST	CL	2.25	
15.0							AUGERED INTERVAL ONLY -NO SAMPLE
15.5	1549 1-10-95 403081		23				3" OD SHELBY TUBE 18" PUSH @ 500PSI 12" PUSH @ 1,000 PSI
16.0							MT_B = 27.2 MT_S = 38.6 B_r = 50
16.5							#403081 is for Geotech. Lab #403082 is for FEMP Archive
17.0							BOTTOM OF TUBE BADLY CRIMPED
17.5	1549 1-10-95 403082			(10 Y 4/1) DARK GREENISH GRAY SILTY CLAY, FEW FINE (1/2") SUBROUND GRAVEL, TRACE FINE SAND, MED. PLASTICITY, MOIST	CL		DESCRIPTION FROM BOTTOM FACE OF TUBE

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
READING ON SAMPLE (CPM)
N/A = NOT Applicable
SAA = SAME AS ABOVE
O. D. = OUTER DIAMETER
HSA = HOLLOW STEM AUGER
(Cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP LA MAR 03 1995 000394

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11468-012

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11468

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

SEE PAGE 1

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0	1611 1-10-95 403083	4	6	Med. STIFF (10 Y 4/1) DARK GREENISH GRAY SILTY CLAY, FEW FINE (1/2") SUBROUND GRAVEL, MED to HIGH PLASTICITY, MOIST	CL	1.0	2" OD SPLIT SPOON
18.5		5	6	STIFF, SAA	CL	1.5	MT_B = 37 MT_S = 47.2 BP = 50
19.0		8	6	MED. STIFF, SAA	CL	0.75	# 403083 is for FEMP Archive
19.5							AUGERED INTERVAL ONLY – NO SAMPLE
20.0	1625 1-10-95 403084		19				3" OD SHELBY TUBE ~~30"~~ 18" PUSH @ 500 PSI
20.5							12 PUSH @ 700 PSI MT_B = 26.8 MT_S = 38.7 BP = 40
21.0							TUBE HAD FREE WATER IN TOP # 403084 is for Geotech Lab

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: PSI = POUNDS PER SQUARE INCH (Drilling Rig hydraulic Pressure)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

000395

MAR 13 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 7 OF 14
200307-11468-013	

PROJECT NAME:	PROJECT NO.:
4-2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11468		

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:

SEE PAGE 1

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0							BOTTOM OF TUBE SLIGATLY MASHED #403085 is for Temp Archive
21.5	1625 1-10-95 403085			(10Y 4/1) DARK GREENISH GRAY CLAYEY SAND (FINE to MEDIUM) WITH FINE (1/2") SUBROUND GRAVEL, MOIST	SC		DESCRIPTION FROM BOTTOM FACE OF TUBE
22.0	0946 1-11-95 403086	7	4.5	SOFT (5Y 4/1) Dark gray sandy (FINE) CLAY WITH FINE (1/4") SUBROUND GRAVEL, LOW PLASTICITY MOIST	CL	0.5	2" OD SPLIT SPOON SPOON WET #403086 is for Env. Lab
22.5		14	6	~~VERY STIFF~~ MED. DENSE (5Y 4/1) Dark gray CLAYEY SAND (FINE) WITH GRAVEL, MOIST — — — (5Y 4/1) Dark gray sandy (Fine) clay with fine (1/4") subrounded gravel, low plast. MOIST	SC	KP 2-4-95	MT_B - 58.2 MT_S = 59.5 BF = 70
23.0	0946 1-11-95 403087	20	6	very stiff (10Y 4/1) Dark greenish gray SILTY CLAY WITH FINE SUBROUND (1/4") Gravel, trace coarse sand, low to med plasticity, MOIST	CL/ML	2.5	SAND 22.5 to 22.7 Ft. #403087 is for Temp Archive
23.5	0952 1-11-95 403088	9	6	STIFF (10Y 5/1) Greenish GRAY, SAA	CL/ML	1.5	2" OD SPLIT SPOON SPOON WET
24.0		13	6	VERY STIFF (10Y 4/1) Dark greenish gray sandy (Fine, poorly graded) clay with Fine (3/4") subround to subangular gravel, low plasticity, moist	CL	2.75	MT_B = 43.7 MT_S = 54.5 BF = 40
24.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	51.2	1-11-95	0945
ALPHA	N/A	N/A	N/A
BETA / GAMMA	45	1-11-95	0945

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

000396

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11468-014

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11468

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

SEE PAGE 1

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 25.0		17	6	very stiff (5GY 4/1) Dark greenish gray sandy (v. fine) clay with fine (3/4") subround to subangular gravel, low plasticity, moist	CL	2.75	#403088 is for FEMP Archive
25.5	0959 1-11-95 403089,	5	6	Soft (10Y 4/1) Dark greenish gray sandy (fine to coarse) clay with fine (1/4") to coarse (1") subround gravel, low to med. plasticity, moist	CL	0.5	2" OD SPLIT SPOON MTB = 45 MTS = 64.9 BR = 50
26.0	403106	6	6	MED. STIFF, SAA	CL	1.0	Gravel appears to be fossiliferous limestone – SPOON – WET
26.5		35	6	STIFF, SAA	CL	1.25	GRAVEL ZONE AT BOTTOM OF SPOON 26.4 to 26.5 ft. Note 1.
27.0	1016 1-11-95 403090	8 26 26 AC	4	SOFT (5GY 4/1) Dark greenish gray sandy (v. fine) clay with fine (1/4") gravel, trace coarse sand, low to med plasticity, moist to wet	CL	0.25	2" OD SPLIT SPOON SPOON – wet – (FROM ABOVE)
27.5		11	6	SOFT (10Y 4/1) Dark greenish gray sandy (v. fine) clay with fine (1/4") to coarse, subround gravel, low to med. plasticity, moist	CL	0.25	MTB = 63 MTS = 75.1 BR = 70
28.0		16	6	STIFF (10Y 5/1) Greenish gray sandy (v. fine) clay with fine (1/4") to coarse (2") gravel, low plasticity moist	CL	1.25	Becomes less sandy at bottom #403090 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

Note 1. #403089 is for Geotech. Lab. #403106 is for FEMP Archive

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

000397

FEMP LA MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11468-015

PAGE 9 OF 14

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11468

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER

DATE

TIME:

DATE COMPLETED:

SEE PAGE 1

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0 – 28.5	1020 1-11-95 403091	6	6	SOFT (10Y 4/1) Dark greenish gray sandy (Fine to coarse, well graded) clay with fine (3/8") subround gravel, low plasticity, MOIST	CL	0.5	2" OD SPLIT SPOON SPOON wet
28.5 – 29.0		12	6	STIFF (10Y 5/1) Greenish gray sandy (fine) clay with fine (1/4"), subround gravel, trace coarse sand, low plasticity, MOIST	CL	1.5	MTB = 72 MTS = 101 BM = 40
29.0 – 29.5		18	6	STIFF (10Y 4/1) Dark greenish gray sandy (fine) clay with fine (1/4") to coarse (1.25") subround to subangular gravel, low plasticity, MOIST	CL	1.75	#403091 is for FEMP Archive
29.5 – 30.0	1027 1-11-95 403092	5	6	MED. STIFF (5GY 5/1) Greenish gray sandy (fine to med) clay with fine (1/2") subround gravel, low plasticity, MOIST	CL	1.0	2" OD SPLIT SPOON SPOON wet
30.0 – 30.5		10	6	hrd stiff (10Y 4/1) Dark greenish gray sandy (fine) clay few fine (1/4") gravel, low plasticity, MOIST	CL	2.5	MTB = 64.1 MTS = 82 BM = 50
30.5 – 31.0		16	6	SAA	CL	3.25	#403092 is for FEMP Archive
31.0 – 31.5	1039 1-11-95 403093	13	6	~~STIFF~~ MED. DENSE (10Y 4/1) Dark greenish gray clayey sand (fine, poorly graded) with fine (3/8") subround gravel, low to no plasticity, MOIST	SC	1.25	2" OD SPLIT SPOON SPOON WET

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G: / WPSC / 94-778.DRW (11-23-94)

FEMP LA MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 10 OF 14
200307-11468-016	

PROJECT NAME:	PROJECT NO.:
OU-2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11468		

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5 – 32.0		15	6	~~MED DENSE~~ ~~Very stiff~~ (10 Y 4/1) Dark greenish gray Sand (fine to medium) with gravel (fine (1/4"), subround) and clay, No plasticity, MOIST	SC/GC	2.5	MT_B = 72 MT_S = 80 $B\gamma$ = 60
32.0 – 32.5		16	6	Very Stiff (10 Y 4/1) Dark greenish gray sandy (fine to med) clay with fine (1/2") subround gravel, low plasticity, MOIST	CL	2.75	#403093 is for FEMP Archive
32.5 – 33.0	1044 1-11-95 403094	7	6	~~Med stiff~~ ~~LOOSE~~ (10 Y 4/1) Dark greenish gray clayey sand (fine to med), Few fine (1/4") subround gravel, low to No plasticity, moist to wet	SC	Ø.75	2" OD SPLIT SPOON SPOON WET
33.0 – 33.5		13	6	med stiff (10 Y 4/1) Dark greenish gray (3/8") sandy (fine) clay with fine subround gravel, mottled, slight iron staining, low plasticity, MOIST	CL	1.0	MT_B = 64.5 MT_S = 66.2 $B\gamma$ = 50
33.5 – 34.0		14	6	STIFF, SAA	CL	1.5	#403094 is for FEMP Archive
34.0 – 34.5	1053 1-11-95 403095	8	6	STIFF (10 Y 4/1) Dark Greenish gray sandy (fine to med) clay with fine (1/4") subround gravel, slightly mottled, low plasticity MOIST	CL	1.25	2" OD SPLIT SPOON SPOON WET
34.5 – 35.0		11	6	~~STIFF~~ ~~MED DENSE~~ (10 Y 4/1) Dark greenish gray clayey Sand (fine to med) with fine (1/4") subround gravel, low to No plasticity, MOIST	SC	1.5	MT_B = 65 MT_S = 68 $B\gamma$ = 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FEMP : / WPSC / 94-776.DRW (11-23-94)

000299

MAR 03 1995

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11468-017

PAGE 11 OF 14

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11468

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

SEE PAGE 1

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0 35.5		17	6	~~Very~~ stiff, SAA	SC	3.25	# 403095 is for FEMP Archive
36.0	1104 1-11-95 403096	6	6	Med stiff (10 Y 4/1) Dark greenish gray sandy (fine to coarse, well graded) clay with gravel (fine 3/8", subround) low plasticity, MOIST	CL	1.0	2" OD SPLIT SPOON SPOON wet
36.5		10	6	Stiff, SAA	CL	1.5	MTB=65 MTS=76.5 Bf=65
37.0		12	6	Stiff, SAA, SLIGHTLY MOTTLED	CL	1.75	#403096 is for FEMP Archive
37.5	1111 1-11-95 403097	7	6	Med. stiff (10 Y 3/1) Dark greenish gray sandy (fine to med) clay with fine (3/4") subround to round gravel, low plasticity, MOIST	CL	0.75	2" OD SPLIT SPOON SPOON wet
38.0		9	6	Soft (10 Y 4/1) Dark greenish gray sandy (fine) clay with fine (1/4") subround gravel, low plasticity, MOIST	CL	0.5	MTB=65 MTS=72.6 Bf=50
38.5		13	6	Soft (10 Y 4/1) Dark greenish gray sandy (fine to coarse) clay with fine (1/4") subround to subangular gravel, low plasticity, MOIST	CL	0.5	#403097 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP LA MAR 03 1995

CONTROL NO.: 200307-11468-018

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11468

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

SEE PAGE 1

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5 – 39.0	1138 1-11-95 403098	6	6	Soft (10Y4/1) Dark greenish gray sandy (fine) clay with fine (3/8") subround gravel, low plasticity, MOIST	CL	0.5	2" OD SPLIT SPOON SPOON WET
39.0 – 39.5		8	6	SAA, SLIGHTLY MOTTLED	CL	0.5	$MT_B = 0$ $MT_S = 0$ $BR = 60$
39.5 – 40.0		13	6	Med. stiff (10Y4/1) Dark greenish gray sandy (fine to med) clay with fine (3/4") subround gravel, low plasticity MOIST	CL	0.75	#403098 is for FEMP Archive
40.0 – 40.5	1239 1-11-95 403099	4	6	Stiff (10Y5/1) Greenish gray sandy (fine) clay with fine (1/2") to coarse (1.25") subround gravel, low plasticity, MOIST	CL	1.25	2" OD SPLIT SPOON SPOON WET
40.5 – 41.0		7	6	Stiff (10Y4/1) Dark greenish gray sandy (fine to med) clay with fine (3/8") subround gravel, low plasticity, MOIST, SLIGHT MOTTLING	CL	1.5	$MT_B = 0$ $MT_S = 0$ $BR = 45$
41.0 – 41.5		10	6	SAA	CL	1.75	#403099 is for FEMP Archive
41.5 – 42.0	1250 1-11-95 403100	medium dense	6	~~Med stiff~~ (10Y 4/1) Dark greenish gray clayey sand (fine to coarse, well graded), few fine (1/4") subround gravel, low to no plasticity, MOIST, SLIGHT MOTTLING	SC	1.0	2" OD SPLIT SPOON SPOON WET

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: AT 1250, microtip was replaced with HNU meter. Sample 403098 was scanned with the HNU. All subsequent samples were scanned with HNU.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FILE: /WPSC / 94-778.DRW (11-23-94)

000401

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 13 OF 14
200307-11468-019	

PROJECT NAME:	PROJECT NO.:
OU-2 PRE-DESIGN FIELD INVESTIGATION	20.03.07 ~~20.03.05AC~~

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11468		

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:

SEE PAGE 2

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
42.0 – 42.5		7	6	med. stiff (10Y 4/1) dark greenish gray sandy (fine to coarse, well graded) clay with fine (1/4") to coarse (1") subround gravel, low plasticity, moist	CL	1.0	MT_B = 0.9 MT_S = 0.9 Br = 55
43.0		9	6	med. stiff (10Y 4/1) dark greenish gray sandy (fine to coarse) clay with fine (1/2") subround gravel, low plasticity, moist	CL	Ø.75	#403100 is for FEMP Archive
43.5	1259 1-11-95 403101	11	Ø				2" OD SPLIT SPOON SPOON wet
44.0		9	6	med. stiff (10Y 3/1) Dark greenish gray sandy (fine to med) clay with fine (3/8") subround gravel, low plasticity, moist	CL	Ø.75	MT_B = 0.8 MT_S = 0.9 Br = 50
44.5		15	6	(10Y 3/1), SAA	CL	Ø.5	#403101 is for FEMP Archive
45.0	1307 1-11-95 403102	4	6	Stiff (10Y 4/1) Dark greenish gray sandy (fine to med) clay, few fine (1/4") subround to subangular gravel, low plasticity, moist	CL	1.25	2" OD SPLIT SPOON SPOON wet
45.5		8	6	stiff (10Y 4/1) Dark greenish gray sandy (fine to med.) clay, with fine (3/4") subround gravel, mottled, low plasticity, moist	CL	1.75	MT_B = 0.9 MT_S = 0.9 Br = 60

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

MAR 03 1995 000402

CONTROL NO.: 200307-11468-020

FEMP

LITHOLOGIC LOG

PAGE 14 OF 14

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11468

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

SEE PAGE 1

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
45.5		14	6	SAA	CL	1.25	#403102 is for FEMP Archive
46.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

000403

200307-11469-011

CONTROL NO.: ~~EFO 200307-EFO-0006~~ KP 2-7-95

FEMP LITHOLOGIC LOG

PROJECT NAME: 04-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11469	COORDINATES:
RELATED FAL NO.s: 200307-11469-07 thru 200307-11469-010	
SURFACE ELEVATION:	GROUNDWATER LEVEL: Dry; DATE: 12-21-94; TIME: 0758; DATE STARTED: 12-20-94
GEOLOGIST: A. Couch	GROUNDWATER LEVEL: ; DATE: 12 ; TIME: ; DATE COMPLETED: 12-21-94
WATER USED DURING DRILLING: NO	DRILLING CONTRACTOR: ALLIANCE ENV., INC. ; DRILLING EQUIPMENT: HSA MOBILE DRILL B-59 (1993) ; DRILLER / HELPER: BOB ERICKSON / DAVE [illegible]

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1033 12-20-94 402819	2					2" O.D. SPLIT-SPOON
0.5		4	3	STIFF, (10YR 3/2) VERY DARK GRAYISH BROWN SILTY CLAY, ROOTS AND GRASS, LOW PLASTICITY, SLIGHTLY MOIST	CL	1.5	MT_B = 4.7 PPM; MT_S = 5.3 PPM; BG_B = 70 CPM; BG_S = 80 CPM
1.0		4	6	VERY STIFF, (10YR 3/4) YELLOWISH BROWN SILTY CLAY, TRACE COARSE SAND, LOW PLASTICITY, SLIGHTLY MOIST, TRACE ORANGE NODULES (5YR 5/8) YELLOWISH RED, 1/8"	CL	2.25	#402819 is FEMP Archive Sample
1.5	1037 12-20-94 402820	1	3	MED STIFF, (7.5YR 4/2) BROWN CLAY, ROOTS, GRASS, TRACE FINE SAND, MEDIUM PLASTICITY, MOIST	CL	Ø.75	
2.0	402852	AC 2 6	5	VERY STIFF, (7.5 YR 4/2) BROWN CLAY WITH (7.5 YR 5/6) STONG BROWN SILT CLAY, TRACE BLACK CONCRETIONS (ORGANIC), ROOTS, MEDIUM PLASTICITY, MOIST	CL	2.0	MT_B = 4.4 PPM; MT_S = 5.4 PPM; BG_S = 60 CPM
2.5		6	5	SAA		2.5	#402852 is FEMP Archive Sample; #402820 is Geotech Lab Sample
3.0	1052 12-20-94 402821		33.5				3" O.D. SHELBY TUBE PUSH 800 PSI
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0 PPM	12-20-94	0855
ALPHA	N/A	N/A	N/A
BETA / GAMMA	50 CPM	12-20-94	0855

NOTES:
MT_B = Microtip background reading
MT_S = Microtip reading on sample
BG_S = Beta-gamma frisker reading on sample
Colors identified using (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-9

FEMP QA

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11469 — 012

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11469

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: SEE PAGE 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: SEE

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 9.0							MT_B = 4.1 PPM MT_S = 4.8 PPM BG_S = 70 CPM
9.0 – 4.5							BOTTOM OF TUBE SLIGHTY CRIMPED
4.5 – 5.0							SAMPLE 4[redacted]2 FOR FEMP ARCHIVE #402821 is Geotech Lab Sampl
5.0 – 5.5				(10 YR 5/4) YELLOWISH BROWN CLAYEY SILT, WITH SAND, TRACE FINE SUBROUND GRAVEL (1/2" MAX DIAMETER), LOW PLASTICITY, DRY	ML		DESCRIPTION FROM BOTTOM FACE OF SHELBY-TUBE
5.5 – 6.0				~~(10 YR 5/4) YELLOWISH BROWN CLAYEY SILT WITH SAND, TRACE FINE SUBROUND GRAVEL (1/2" MAX DIAMETER), LOW PLASTICITY, DRY~~			AUGERED INTERVAL ONLY - NO SAMPL
6.0 – 6.5	1104 122094 402823	8	6	HARD, (10YR 6/4) ~~SILTY CLAY~~ AC LIGHT Yellowish Brown SILTY CLAY, TRACE FINE SAND, MEDIUM PLASTICITY, MOIST	CL	4.5	2" O.D SPLIT-SPOON #402823 is FEMP Archive Sample
6.5 – 7.0		10	6	VERY STIFF, (10YR 5/4) Yellowish BROWN SILTY CLAY WITH FINE SUBROUNDED GRAVEL (1/2" MAX), TRACE FINE SAND, MEDIUM PLASTICITY, SLIGHTY MOIST	CL	3.75	MT_B = 4.9 PPM MT_S 6.5 PPM BG = 70 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Munsell® color chart for soils. Consistency measured using SoilTest® pocket penet[redacted] unless otherwise noted. Density from SPT blow count.

(cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000405

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11469-013	PAGE 3 OF 13
PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07

BORING NUMBER: 11469	COORDINATES:	RELATED FAL NO.s:		
SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 1	DATE:	TIME:	DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:	

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0	~~FFTO~~ AC	13	~~20~~ 6	SAA		2.0	BULK SAMPLE 3-7.5 FT 402824 for Geotech Lab
7.5	1109 12-20-94 402825	8	6	STIFF, (10 YR 5/4) Yellowish Brown SILTY CLAY WITH SUBANGULAR TO ANGULAR FINE (1/2" ~~[illegible]~~) TO COARSE (1 3/4") GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL	1.75	SPLIT SPOON 2" O.D. GRAVEL ZONE BOTTOM 1 INCH
8.0		12	6	VERY STIFF (10 YR 5/4) Yellowish Brown SILTY CLAY, MOTTLED, TRACE SUBANGULAR FINE (1/4") GRAVEL, IRON STAINING, LOW PLASTICITY, SLIGHTLY MOIST	CL	4.0	MT_B = 5.7 PPM MT_S 6.2 PPM BP_S = 60 CPM
8.5		15	6	VERY STIFF, (10 YR 5/4) Yellowish Brown SILTY CLAY, MOTTLED, SLIGHT IRON STAINING, TRACE FINE SUBANGULAR GRAVEL (1/8") LOW to MOD. PLASTICITY, SLIGHTLY MOIST	CL	3.5	#402825 is FEMP Archive Sample
9.0	1127 12-20-94 402926	10	6	VERY STIFF, (10 YR 5/3) Brown SILTY CLAY, SLIGHTLY MOTTLED, WITH SUBROUND FINE (3/4") GRAVEL, TRACE FINE SAND, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	2" OD SPLIT SPOON
9.5	402853	15	6	SAA MEDIUM DENSE,		AC ~~4.0~~ 4.5 AC	MT_B = 5.5 PPM MT_S = 7.5 PPM BP = 60 CPM
10.0		22	6	~~HARD~~ AC (10 YR 5/6) Yellowish Brown SILTY SAND, WITH CLAY, SAND - FINE, POORLY GRADED, NO to LOW PLASTICITY, SLIGHTLY MOIST	SM	4.5	#402826 is Geotech lab sample #402853 is FEMP Archive Sample
10.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Soil description and USCS symbol per ASTM D 2488 guidelines. Samples collected per ASTM D 1586 and D 1587 Split spoon samplers equipped (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

2-15-95

CONTROL NO.: 200307-11469-014	FEMP LITHOLOGIC LOG	PAGE 4 OF 13

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION		PROJECT NO.: 20.03.07
BORING NUMBER: 11469	COORDINATES:	RELATED FAL NO.s:
SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 1	DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	1135 12-20-94 402827	10	6	VERY STIFF, (10 YR 5/4) Yellowish Brown SANDY CLAY, MOTTLED, IRON STAINING, LOW PLASTICITY (SAND-FINE, POORLY GRADED, TRACE COARSE SUBANGULAR GRAVEL 3/4" DIAMETER), SLIGHTLY MOIST	CL	3.25	2" OD SPLIT SPOON MT_B = 7.0 PPM MT_S = 8.5 PPM BG_S = 68 CPM
11.0 – 11.5		14	6	VERY STIFF, (2.5 Y 5/3) LIGHT OLIVE BROWN GRAVELLY CLAY, GRAVEL-SUBANGULAR TO ANGULAR, COARSE (1.14") FINE (3/4") TRACE SAND, MOTTLED IRON STAINING, LOW PLASTICITY, SLIGHTLY MOIST	CL	3.5	BULK SAMPLE 402828 (7.5 to 12 ft) is for Geotech Lab GRAVEL IN BOTTOM 8 INCHES
11.5 – 12.0		15	6	VERY STIFF, (10 YR 4/4) DARK Yellowish Brown to (2.5 Y 5/1) GRAY SILTY CLAY WITH FINE (1/2") SUBANGULAR TO SUBROUND GRAVEL, TRACE FINE SAND LOW to MEDIUM PLASTICITY, MOIST	CL	3.5	BROWN/GRAY CLAY INTERFINGERING #402827 is PEMP Archive
12.0 – 12.5	1145 12-20-94 402829	5	6	VERY STIFF (2.5Y 5/1) GRAY SILTY CLAY WITH SUBROUND TO SUBANGULAR COARSE (1.25") GRAVEL, MOTTLED IRON STAINING LOW PLASTICITY, MOIST	CL	3.5	2" OD SPLIT SPOON BROWN/GRAY CLAY INTERFINGERING
12.5 – 13.0		14	6	VERY STIFF (2.5 Y 5/2) GRAYISH BROWN SILTY CLAY WITH SUBROUND FINE (1/4") GRAVEL, TRACE FINE SAND, MOTTLED IRON STAINING, LOW PLASTICITY, MOIST	CL	2.75	MT_B = 0 MT_S = 1.8 BG_S = 60
13.0 – 13.5		26	6	MEDIUM STIFF (2.5Y 5/3) LIGHT OLIVE BROWN SANDY CLAY, (SAND-FINE, POORLY SORTED), TRACE FINE (1/8") SUBANGULAR GRAVEL, MOTTLED IRON STAINING, LOW PLASTICITY, MOIST	CL	0.75	#402829 is PEMP Archive sample
13.5 – 14.0	1152 12-20-94 402830	11	0				SPLIT SPOON 2" O.D. #402830 is PEMP Archive Sample

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: with basket retainer, 2" O.D standard split barrel (spoon) samplers used for SPT. Barrels without liners. Additional general notes on Field operations (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

000607

2-15-95 118

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11469-015

PAGE 5 OF 13

PROJECT NAME: OU-2 PREDESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11469

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See PAGE DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5		9	6	MEDIUM DENSE (2.5 Y 5/4) LIGHT OLIVE BROWN SANDY GRAVEL WITH CLAY, GRAVEL - FINE (1/8") to COARSE (1") SUBROUND TO SUBANGULAR, SAND - FINE to MEDIUM, POORLY GRADED, LOW PLASTICITY WET	GP-GC	Ø.5	MTB = Ø.2 PPM MTS = 2.4 PPM WET GRAVEL ZONE
		13	6	STIFF, (2.5 Y 4/1) DARK GRAY CLAY, FEW FINE SUBROUND GRAVEL (1/4"), MEDIUM PLASTICITY, MOIST TO WET	CL	1.25	BB = 60 cpm BRYAZOAN FRAGMENTS
15.0 – 15.5							AUGERED INTERVAL ONLY - NO SAMPLE COLLECTED
15.5 – 16.0	1300 12-20-94 402831		23				3" OD Shelby-Tube 450 PSI PUSH
16.5							MTB = 0 PPM MTS = 0 PPM BB = 60 cpm #402831 = Geo. Lab Samp.
17.0							Shelby tube SLIGHTLY crimped at Bottom
17.5							SAMPLE 402832 FOR ARCHIVE (FROM Bottom)

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: contained in PARSONS Field Book PO132-1. Consistency, USCS symbol, sample assignments (i.e. archive or lab) performed by K. Ernst P.E. on 12-21-94. KE (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP OA 13 2-15-95

CONTROL NO.: 200307-11469-016

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.0

BORING NUMBER: 11469

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: SEE PAGE 2

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0				(2.5Y 4/1) DARK GRAY CLAY, TRACE COARSE SAND, TRACE FINE (1/8") SUBROUND GRAVEL, MEDIUM PLASTICITY, MOIST	CL		DESCRIPTION FROM BOTTOM FACE OF SHELBY-TUBE
18.5	1310 12-12-94 402833	5	5.5	STIFF, (2.5Y 4/1) DARK GRAY CLAYEY SILT, MOTTLED, SLIGHT IRON STAINING, TRACE SUBANGULAR FINE (1/8") GRAVEL, MEDIUM PLASTICITY, MOIST	ML		2" O.D. SPLIT SPOON see note ①
19.0	402834	10	6	STIFF, (5Y 5/1) GRAY SILTY CLAY WITH SUBANGULAR to SUBROUND FINE (3/4") to COARSE (1.5") GRAVEL, SLIGHTY MOTTLED, MEDIUM PLASTICITY, MOIST	CL		MT_B = 0 [redacted] MT_S = 0.6 [redacted] BG_S = 60 CPM
19.5		14	6	MED. DENSE, (5Y 4/1) DARK GRAY CLAYEY SAND, SAND - FINE GRAINED, POORLY SORTED, NO to LOW PLASTICITY, WET	SC		#402834 is FEMP Archive Sample #402833 is Geo. Lab Sample WET SAND ZONE
20.0							AUGERED INTERVAL ONLY NO SAMPLE COLLECTED
20.5	1320 12-20-94 ~~402834~~ 402835		18				3" OD Shelby-Tube UP TO 1200 PSI
21.0							Pushed ONLY 18 inches until hit hard zone - Bulge Crimpe

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

① Consistency of silt and/or clay estimated from SPT blowcount

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

000409

FEMP QA 13 2-15-95

CONTROL NO.: 200307-11469-017

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11469

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

~~GROUNDWATER LEVEL:~~ SEE YA GEL

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS MTB = 3 PPM MTS = 3.6 PPM BTS = 60 CPM
21.0 – 21.5				(5Y 5/1) GRAY SANDY GRAVEL, trace sandy clay, GRAVEL - SUBANGULAR COARSE (2") to FINE (3/4"), SAND - FINE poorly sorted, DRY	GP		DESCRIPTION FROM BOTTOM FACE OF Shelby TUBE. Archive #402836
22.0							AUGERED INTERVAL ONLY No Sample Collected
22.5							#402835 is a Geotech. Lab Sample
23.0	1330 12-20-94 402837	12	Ø				2" OD SPLIT SPOON
23.5		12	2	MED. STIFF, (5 Y 4/1) DARK GRAY SILTY CLAY, TRACE SUBROUND FINE (1/8") GRAVEL, Medium plasticity, MOIST to wet	CL	Ø.75	MTB = Ø.8 PPM MTS = 2.0 PPM BTS = 50 CPM
24.0		12	6	MED. DENSE, (5 Y 4/1) DARK GRAY SANDY GRAVEL WITH SILTY CLAY, GRAVEL SUBROUND COARSE (1.75"), SAND FINE to MEDIUM, poorly sorted, LOW PLASTICITY, MOIST.	GP-GC	Ø.75	
24.5	1338 12-20-94 402838	6	AC ~~Ø~~ 4.5	MED. STIFF (5 Y 5/1) GRAY ~~GRAVEL~~ AC SANDY CLAY, FEW FINE SUBROUND GRAVEL (1/4"), LOW to Medium plasticity, MOIST	CL	Ø.6	2" OD SPLIT SPOON

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
SAA = Same as Above
N/A = Not applicable
OD = Outer Diameter
SPT = Standard Penetration Test
# = number

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

000410

(FEMP)

2-15-95

CONTROL NO.: 200307-11469-018

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11469

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: SEE

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5	402855	6	6	SAA		1.0	MT_B = 1.1 PPM MT_S = 2.2 PPM BG_S = 50 CPM
25.0		7	~~6~~ AC	SAA, WET KD 2-7-95		Ø.25	#402855 is FEMP Archive sample wet sandy CLAY zone
25.5	1342 12-20-94 402839	3	4.25	~~MED. STIFF~~ SOFT, (5Y 4/1) DARK GRAY SILTY CLAY WITH FINE (1/4") SUBROUND GRAVEL, MEDIUM to HIGH PLASTICITY, WET	CL	Ø.25	2" OD SPLIT SPOON
26.0		6	6	MED STIFF, (5Y4/1) DARK GRAY SILTY CLAY WITH FINE (3/4") SUBROUND GRAVEL, TRACE FINE SAND, MEDIUM PLASTICITY, MOIST	CL	Ø.75	MT_B = 1.3 PPM MT_S = 1.7 PPM BG_S = 50 CPM
26.5		8	6	MED. STIFF, (5Y 4/1) DARK GRAY SILTY CLAY WITH FINE (1/4") SUBROUND GRAVEL, ~~WITH~~ ~~TRACE~~ FINE SAND, MEDIUM PLASTICITY, MOIST	CL	Ø.5	#402839 is a FEMP Archive sample
27.0	1350 12-20-94 402840	4	5	MED. STIFF, (5Y 4/1) DARK GRAY SILTY CLAY WITH FINE SUBROUND to SUBANGULAR GRAVEL (3/4"), MEDIUM PLASTICITY, MOIST TRACE FINE SAND	CL	Ø.25	2" OD SPLIT SPOON
27.5		6	6	(5Y 4/1) SAA		Ø.5	MT_B = 2 PPM MT_S = 2.3 PPM BG_S = 50 CPM
28.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000411

(FEMP QA 19) 2-14-95

CONTROL NO.: 200307-11469-019

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11469

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST: SEE PAGE 1

GROUNDWATER LEVEL: DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0		7	6	MED. STIFF, (5Y 3/1) VERY DARK GRAY SILTY CLAY, WITH FINE SUBANGULAR GRAVEL (1/2") AND FINE SAND, MEDIUM PLASTICITY, MOIST	CL	Ø.75	# 402840 is a FEMP Archive sample
28.5							
29.0	1357 12-20-94 402941	3	1.5	STIFF, ~~(5Y~~ AC (2.5Y 4/1) DARK GRAY SILTY CLAY, WITH SUBROUND FINE (1/8") GRAVEL, Trace FINE SAND, MEDIUM PLASTICITY, MOIST	CL		2" OD SPLIT SPOON SEE NOTE ①
29.5		5	6	STIFF, (~~1 GLEY 4/5GY~~ AC DARK Greenish gray) (5GY 4/1) SILTY CLAY WITH FINE (3/4") SUBANGULAR GRAVEL, TRACE FINE SAND, Medium Plasticity, MOIST	CL		MT_B = Ø.6 PPM MT_S = 1.0 PPM BG_S = 40 CPM
30.0		5	6	SAA, WET			# 402941 is a FEMP Archive Sample
30.5	1404 12-20-94 402842	3	6	MED. STIFF, (5GY 4/1) Dark Greenish gray SILTY CLAY WITH COARSE (1.25") to FINE (1/2") Subangular Gravel, Trace FINE SAND, Medium Plasticity MOIST	CL	Ø.5	2" OD SPLIT SPOON
31.0	402856	5	6	SAA		Ø.5	MT_B = Ø.3 PPM MT_S = 3.3 PPM BG_S = 60 CPM
31.5		6	6	SAA		Ø.75	# 402856 is FEMP Archive Sample # 402942 is a Geotech Lab sample

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP CA 13 9-15-95

CONTROL NO.: 200307-11469-020

FEMP LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11469	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5	1412 12-20-94 402843	3	6	STIFF, (10Y 4/1) DARK GREENISH GRAY SILTY CLAY WITH FINE (1/2") SUBANGULAR to SUBROUNDED GRAVEL, ~~FEMP~~ WITH SAND FINE TO COARSE MOIST POORLY GRADED, MEDIUM PLASTICITY, MOIST	CL		2" OD SPLIT SPOON SAND AT 31.8 ft WET
32.0							
32.5		4	6	STIFF, (5GY 4/1) DARK GREENISH GRAY SILTY CLAY WITH FINE SUBANGULAR to SUBROUNDED GRAVEL (3/4"), MEDIUM PLASTICITY, MOIST	CL		MT_H = 1.1 MT_S = 3.4 $3r$ = 90
33.0		9	6	SAA			#402843 is a FEMP Archive sample
33.5	1432 12-20-94 402844	21	0	SOFT, (10Y 4/1) DARK GREENISH GRAY SANDY CLAY WITH FINE (3/4") to COARSE (1.25") SUBANGULAR GRAVEL (SAND - FINE to COARSE, poorly graded) MEDIUM PLASTICITY, MOIST			2" OD SPLIT SPOON Note (2) #402844 = FEMP Arch.
34.0		37	0				1.25 inch diameter gravel imbedded in bottom of SPOON
34.5		11	5		CL	Ø.25	MT_B = 1.8 PPM MT_S = 4.3 PPM $3r$ = 60 CPM
35.0	1439 12-20-94 402845	6	1.5	SOFT, (10Y 5/1) GREENISH GRAY SILTY CLAY WITH FINE (1/4") SUBANGULAR GRAVEL, MEDIUM PLASTICITY, MOIST	CL	Ø.40	2" OD SPLIT SPOON

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: (2) Pocket Penetrometer reading on sample not consistent w/ consistency description from SPT blow count. Consistency by SPT blow count " " for 34 - 34.5' interval is ~ stiff

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

000113

FEMP QA 13 2-13-95

CONTROL NO.: 200307-11469-021

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11469	COORDINATES:
RELATED FAL NO.#:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 6
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0 – 35.5	402857	6	6	SAA		0.25	MT_B = 1.8 PPM MT_S = 4.5 PPM BG_S = 60 CPM Note (3)
35.5 – 36.0		10	6	MEDIUM STIFF, (5GY 4/1) DARK GREENISH gray CLAY WITH FINE (1/4") to coarse (1.25") SUBANGULAR GRAVEL, TRACE FINE SAND Medium to high plasticity, MOIST	CL/CH	0.75	#402857 is a FEMP Archive Sample #402845 is a Geotech Lab Sample
36.0 – 36.5	1448 12-20-94 402846	3	6	MED. STIFF, (10Y 4/1) Dark greenish gray sandy clay WITH FINE (1/2") SUBAROUND GRAVEL, (SAND-FINE, poorly sorted), medium plasticity, MOIST	CL	1.0	2" OD Split Spoon #402846 is a FEMP Archive Sample
36.5 – 37.0		5	6	MED. STIFF, (10GY 4/1) Dark greenish gray SILTY CLAY WITH GRAVEL SUBROUND, coarse (1.75"), Trace Med to coarse sand, Medium to high plasticity, MOIST	CL/CH	1.0	MT_B = 2.0 PPM MT_S = 3.7 PPM BG_S = 50 CPM
37.0 – 37.5		4	6	MED. STIFF, (5GY 4/1) Dark greenish gray sandy clay WITH coarse (1.25") Gravel, (sand Fine to coarse), medium plasticity, moist to wet	CL	0.75	wet sand
37.5 – 38.0	1754 12-20-94 402847	10	7	MED. STIFF, (10Y 4/1) Dark greenish gray sandy clay WITH FINE (1/4") SUBANGULAR GRAVEL, (SAND-FINE, POORLY SORTED) LOW Plasticity, MOIST	CL	0.5	2" OD SPLIT SPOON #402847 is a FEMP Archive Sample
38.0 – 38.5		11	6	SAA	CL	1.25	MT_B = 2.4 PPM MT_S = 6.2 PPM BG_S = 70 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
(3) Pocket Penetrometer reading on sample from interval 34.5-35.5' differs from consistency description by SPT blow count. Consistency by SPT blow count for 34.5-35.5 is approx. (~) stiff

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 13

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11469-022

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11469

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5		11	6	SAA, WITH FINE to COARSE (1.5") GRAVEL	GP	Ø.5	GRAVEL ZONE (1.5" LONG) at 38.5 ft.
39.0							
39.5	1451 12-20-94 402848	5	2.5	MED. STIFF, (10 Y 4/1) Dark greenish gray SILTY CLAY WITH FINE (1/4") SUBANGULAR GRAVEL, TRACE MEDIUM SAND, LOW to MEDIUM PLASTICITY MOIST TO WET	CL	0.5	3" OD SPLIT SPOON
40.0	402858	6	6	MED. STIFF, (5 GY 4/1) DARK Greenish gray SANDY CLAY WITH FINE (1/2") to COARSE (1.25") GRAVEL (Subangular) (SAND-FINE, poorly sorted) MED to LOW plasticity, wet to moist	CL	Ø.5	MTB = 3.1 ppm MTS = 4.5 ppm BTS = 60 CPM
40.5		9	6	SAA		Ø.5	#402858 is a FEMP Archive sample #402848 is a GeoTech Lab Sample
41.0	1512 12-20-94 402849	5	6	MED STIFF, (5GY4/1) Dark greenish gray sandy clay, with FINE (1/4") subrounded to subangular gravel (sand-FINE, poorly sorted) MEDIUM plasticity MOIST TO WET	CL	Ø.5	2" OD SPLIT SPOON
41.5		7	6	SAA	CL	Ø.5	MTB = 2.9 ppm MTS = 6.3 ppm BTS = 60 CPM
42.0		7	6	SAA	CL	Ø.5	#402849 is a FEMP Archive Sample

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

000425

118

CONTROL NO.: 200307-11469-023

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11469

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: SEE PAGE 1

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
42.0	1521 12-20-94 ~~402846~~ 402855	7 AC	0	(			2" OD SPLIT SPOON
42.5		12	6	STIFF, (5GY 5/1) greenish gray sand clay WITH FINE (1/2") SUB-ANGULAR GRAVEL, (SAND-FINE, Poorly sorted) low to medium plasticity, MOIST TO WET	CL		MT_B = 2.9 PPM MT_S = 6.3 PPM BG_S = 60 CPM
43.0		10	6	SAA, SUBANGULAR COARSE (1.25") GRAVEL, ...	CL		#402850 is a FEMP Archive Sample Note ③
43.5	1527 12-20-94 402857	5	6	V. STIFF, (10Y 4/1) DARK Greenish gray Sandy Clay WITH FINE (1/2") TO COARSE (1.25") SUBANGULAR to SUBROUND GRAVEL, (MEDIUM TO FINE SAND,	CL		2" OD SPLIT SPOON Note ③
44.5	402859	8	6	poorly sorted, medium plasticity, MOIST SAA			MT_B = 2.5 PPM MT_S = 4.2 PPM BG_S = 60 CPM
45.5		10	6	SAA			TOTAL DEPTH 45FT. #402859 is a FEMP Archive Sample
				BOTTOM OF BORING = 45.0'			#402859 is a Geotech Lab Sample

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Note ③ Consistency description from SPT blowcount

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

000416

FEMP QA 19

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11470-019

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11470 A

COORDINATES: N/A

RELATED FAL NO.s: 200307-11470-064

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 1-12-95

GEOLOGIST: K. Ernst

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 1-12-95

WATER USED DURING DRILLING: None

DRILLING CONTRACTOR: Alliance Environmental, Inc.

DRILLING EQUIPMENT: HSA Mobile B-59 (1993)

DRILLER / HELPER: B. Erickson / T. French

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0 1 0.5	1301, 12-95, #403120	1	6	Stiff, (10YR 4/2) dark grayish brown silt, grass (top 2"), roots, trace coarse sand, low plasticity, moist	ML	1.25	SPLIT-SPOON, 2" O.D. MTB = 1.0 ppm MTS = 1.0 ppm
1.0		4	6	Medium stiff, (10YR 5/4) yellowish brown silt, roots, trace coarse sand, trace iron staining, low plasticity, moist	ML	0.75	B-γ = 40 cpm
1.5		5	2	Stiff, SAA	ML	1.5	
2.0	1305, 1-12-95, #403121	5	—			~~2.0~~ KE	SPLIT-SPOON, 2" O.D. MTB = 1.0 ppm ~~MTS = 1.0 ppm~~ B-γ = 60 cpm
2.5		6	6	Stiff, (10YR 5/6) yellowish brown silty clay, roots, trace iron staining, trace black organic material, low plasticity, moist	CL	2.0	
3.0		9	6	Stiff (10YR 5/6) yellowish brown silty clay with (10YR 6/3) pale brown mottling, low plasticity, moist		2.0	
3.5							Augered 3 – 3.5'

INSTRUMENT	BACKGROUND	DATE	TIME
PID	1.0 ppm	1-12-95	1300
ALPHA		N/A	
BETA / GAMMA	50 cpm	1-12-95	1300

NOTES: Colors identified using Munsell Color Chart for Soils. Consistency measured using pocket penetrometer. Soil description and USCS Symbol per ASTM D 2488 guidelines. Sampling per ASTM D 1586 and D 1587. Two-inch std.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 2 OF 2
200307-11470-020	

PROJECT NAME:	PROJECT NO.:
OU-2 Pre-Design Field Investigation	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11470A		

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	1312, 1-12-95, 403022, 403023			Mottled (10 YR 5/6) yellowish brown and (10YR 6/3) pale brown clayey silt, trace fine (1/2" max.) gravel, low plasticity, moist	ML		Shelby Tube 3" O.D. 6" push @ 900 psi Note 1
				Bottom of Boring = 4.0 feet			Time 1315: Attempted split spoon — encountered
4.5							refusal. Hit underground obstruction or utility line.
5.0							
5.5							Terminated drilling and sampling at this location.
6.0							Plan to redrill and sample an off set boring designated
6.5							11470 B. No samples kept.
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: split barrel (spoon) samplers; no liners, basket retainers. MTB = Microtip (PID) reading background; MTS = Microtip reading on sample; B-γ = (Cont'd)

Note 1: MTB = 1.0 ppm MTS = 1.1 ppm, B-γ = 60 cpm

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881 Notes: (Cont'd) beta-gamma radiation reading on sample, N/A = Not Applicable, SAS = same as above, HSA = Hollow Stem Auger, O.D. = Outer Diameter; psi = pounds per square inch (rig hyd. press.), G:/WPSC/94-776.DRW (11-23-94)

200307-11471-010

CONTROL NO.: ~~200307EFO-0014~~ KP 2-8-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation					PROJECT NO.: 20.03.07
BORING NUMBER: 11471	COORDINATES: N481253.378; E1382445.242				RELATED FAL NO.: 200307-11471-004 thru 200307-11471-009
SURFACE ELEVATION: 589.14	GROUNDWATER LEVEL: 3' bls	DATE: 12-30-94	TIME: 1344		DATE STARTED: 12-30-94
GEOLOGIST: K. Ernst	GROUNDWATER LEVEL:	DATE:	TIME:		DATE COMPLETED: 12-30-94
WATER USED DURING DRILLING: None	DRILLING CONTRACTOR: Alliance, Env., Inc.	DRILLING EQUIPMENT: HSA Mobile Drill B-59			DRILLER / HELPER: B. Erickson / B. Montanye

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	0818, 12-30-94, #402961	3	6	Stiff, (10 YR 3/3) dark brown silt, roots and grass, low to no plasticity, moist	ML	1.75	SPLIT SPOON, 2" O.D. MTB = 2.0 ppm
0.5		5	–				MTS = 6.0 ppm B-γ = 70 cpm
1.0		9	–				#402961 is for FEMP Archive
1.5	0826, 12-30-94, #402962, #402984	5	–				SPLIT SPOON, 2" O.D. MTB = 2.0 ppm
2.0		9	–				MTS = 8.0 ppm B-γ = 80 cpm
2.5		10	4	Stiff (10YR 3/3) dark brown silt, trace fine sand, low to no plasticity, moist	ML	1.5	#402962 is Geotech Lab Sample #402984 is FEMP Archive Sample
3.0							Augered 3.0-3.5'
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	2.0 ppm	12-30-94	0818
ALPHA		N/A	
BETA / GAMMA	50-60 cpm	12-30-94	0818

NOTES: Colors identified using Munsell Color Chart for Soils. Consistency measured using pocket penetrometer unless otherwise noted. (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FEMP QA 21

G:/WPSC/94-778.DRA (11-23-94)

000429

FEB 15 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11471-011	PAGE 2 OF 10
PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11471	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST: E. Ernst	GROUNDWATER LEVEL: See Page 1
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	0835, 12-30-94, #402963, #402964		17				SHELBY TUBE, 3" O.D. 30" push 575 psi
4.0							MTB = 0.9 ppm MTS = 1.1 ppm B-γ = 70 cpm
4.5							
5.0							#402963 is for Geotech Lab #402964 is archive from bottom face of tube
5.5							
6.0				(10 YR 5/6) yellowish brown silty clay, medium plasticity, moist	CL		Description is from bottom face of tube
6.5	0845, 12-30-94, #402965	4	6	Stiff, (10 YR 5/6) yellowish brown silty clay, trace iron staining, medium plasticity, moist	CL	1.0	SPLIT SPOON, 2" O.D. MTB = 1.8 ppm
7.0		4	6	SAA	CL	0.75	MTS = 4.1 ppm B-γ = 70 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Density described based on SPT blow count. Soil descriptions and USCS symbol per ASTM D 2488 guidelines. Samples collected per ASTM (cont')

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G:/WPSC/94-778.DRW (11-23-94)

FEB 15 1995

000420

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11471-012

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11471

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5		7	6	SAA	CL	0.75	#402966 is a bulk sample of auger cuttings from 3 - 7.5'
8.0	0849, 12-30-94, #402967	3	–				SPLIT SPOON, 2" O.D. MT_B = 2.9 ppm
8.5		4	4	Stiff, (10 YR 5/6) yellowish brown silty clay, trace iron staining, medium plasticity, moist	CL	1.0	MT_S = 3.9 ppm B-γ = 50-70 cpm
9.0		4	6	Top 5" of this interval: SAA Bottom 1": (10 YR 5/6) yellowish brown fine to medium sand, wet	CL SC	1.0	#402967 is for FEMP Archive
9.5	0854, 12-30-94, #402968	2	–	clayey			SPLIT SPOON, 2" O.D. MT_B = 3.0 ppm MT_S = 5.0 ppm
10.0		3	3	Loose, (10 YR 5/6) yellowish brown clayey fine to coarse sand, wet	SC		B-γ = 50-100 cpm #402968 is for FEMP Archive
10.5		6	6	SAA	SC		#402978 is bulk sample of Auger cuttings from 7.5-10.5' for Geotech lab

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: D-1586 and D 1587 split spoon samplers equipped with basket retainers. Two-inch O.D. standard split-barrel (spoon) samplers used.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST

FS-F-3881 000431

FEMP QA FEB 15 1995

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11471-013

PAGE 4 OF 10

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11471

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 2 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	0903, 12-30-94, #402969, #402970	5	6	Medium Dense, (10 YR 5/6) yellowish brown clayey, fine to coarse sand, wet	SC		SPLIT SPOON, 2" O.D. MTB = 3.1 ppm MTS = 14 ppm B-γ = 50-60 cpm
11.5		6	6	SAA	SC		#402969 (10.5-11.5') is for Geotechlab #402970 (11.5-12') is for FEMP Archive
12.0		10	6	Very Stiff, (10 YR 5/1) gray silty clay, trace fine sand, moist	CL	3.0	
12.5	0912, 12-30-94, #402971	11	6	Stiff, (10YR 5/1)) gray ~~clayey~~ silty clay, trace fine to medium sand, low plasticity, moist	CL	1.25	SPLIT SPOON, 2" O.D. MTB = 4.9 ppm MTS = 7.0 ppm B-γ = 50-100 cpm
13.0		17	6	Stiff (10 YR 5/1) gray clayey silt, trace fine subrounded gravel, low to no plasticity, moist	ML	2.0	
13.5		17	6	Medium Stiff, (10 YR 5/1) gray clayey silt, low to no plasticity, moist	ML	0.75	#402971 is for FEMP Archive
14.0	0917, 12-30-94, #402972	7	3	V. Stiff, (10 YR 5/1) gray clayey silt, low to no plasticity, moist	ML	2.0	SPLIT SPOON, 2" O.D.

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
MTB = Microtip (PID) background reading (ppm)
MTS = Microtip (PID) reading on the sample (ppm)
B-γ = Beta-Gamma radiation (cpm)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G:/WPSC/94-778.DRW (11-23-94)

FEB 15 1995 000422

CONTROL NO.: 200307-11471-014

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER:

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5		11	6	SAA	ML	2.5	MTB = 4.3 ppm MTS = 12.9 ppm B-γ = 60-100 cpm
14.5 – 15.0		14	6	SAA	ML	2.5	#402972 is for FEMP Archive
15.0 – 15.5	0925, 12-30-94 #402973	15	6	Stiff, (10YR 5/1) gray clayey silt, low to no plasticity, moist, medium to rapid dilatancy	ML	1.5	SPLIT SPOON, 2" O.D. MTB = 4.4 ppm
15.5 – 16.0		16	6	SAA	ML	1.5	MTS = 8.0 ppm B-γ = 50-100 cpm #402973 is for ~~FEMP Archive~~ Lab
16.0 – 16.5		11	6	SAA	ML	1.5	
16.5 – 17.0							Augered 16.5 - 17'
17.0 – 17.5	1006, 12-30-94 #402974, #402975		20.5				SHELBY TUBE, 3" O.D.

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
reading on the sample (cpm)
N/A = Not Applicable
SAA = Same as Above
HSA = Hollow stem auger
bls = below land surface

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21 FEB 15 1995

CONTROL NO.: 200307-11471-015

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11471

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 2

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0							30° push 625 psi MTB = 3.5 ppm
18.5							MTS = 7.8 ppm B-γ = 80 cpm #402974 is Shelby Tube sample for
19.0							Geotech. Lab #402975 is Jar Archive sample from end of tube
19.5				(5 BG 5/1) greenish gray gravelly clay with fine to medium sand, medium plasticity, moist (Gravel is fine to coarse (1¼" max.), subangular to subrounded)	CL		Description is from bottom face of Shelby Tube end
20.0	1015, 12-30-94 #402976	2	4	Medium stiff, (5 BG 5/1) greenish gray silty clay, trace fine to coarse sand, trace fine (1/8" max.) gravel, medium to high plasticity, moist	CL	0.5	SPLIT SPOON, 2" O.D. MTB = 3.6 ppm MTS = 12.4 ppm ~~B-γ = 80-100 cpm~~
20.5		4	6	SAA	CL	0.5	Some brown sand on exterior of sample due to water in the borehole #402976 is for
21.0		6	6	SAA	CL	0.5	Geotech Lab #402985 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: O.D = outer diameter

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEB 15 1995

CONTROL NO.: 200307-11471-016

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11471

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0 – 21.5							Augered 21-21.5'
22.0	1027, 12-30-94, #402977		4	SAA, with 2 3/4" piece of subangular gravel in bottom of the tube	CL		Shelby Tube, 3" O.D. (See Note 1.)
22.5							Augered 22.0-22.5'
23.0	1041, 12-30-94			No Sample			Shelby Tube, 3" O.D. 500 - 1200 psi
23.5							variable press. 30" push. Lost tube in hole during
24.0							attempted wire line withdrawal. Overdrilled tube, removed augers
24.5							and recovered damaged tube. Advanced augers to 26' to recommence sampling

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
1. 6" push, 1200 psi for Shelby tube sample in 21.5-22.0' interval. MT_B = 8.2 ppm, MT_S = 10.4 ppm, B-γ = 70 cpm
402977 is a jar sample from (cont')

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

000425

FEMP QA 21 FEB 16 1995

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11471-017

PAGE 8 OF 10

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11471

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5							
25.0							
							Augered 25-26'
25.5							
26.0							
	1245, 12-30-94	20	-	No Recovery			SPLIT-SPOON, 2" O.D.
26.5							
		20	-				Spoon is wet from water in
27.0							
		20	-				borehole
27.5							
29.0	1250, 12-30-94, #402979, #402986	8	2	Very stiff, (5BG 6/1) greenish gray silty clay, trace medium to coarse sand, trace fine (3/8" max.) subangular to subrounded gravel, medium plasticity, moist	CL	2.5	SPLIT SPOON, 2" O.D.

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: (Note 1 cont'): the bottom of the Shelby tube.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G: / WPSC / 94-776.DRW (11-23-94)

FEB 15 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11471-018

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11471

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
29.0 – 29.5		10	6	SAA	CL	2.5	MT_B = 1.8 ppm MT_S = 4.2 ppm B-γ = 20-50 cpm
29.0 – 29.5		14	6	SAA	CL	2.5	#402979 is for the Geotech Lab #402986 is for FEMP Archive
29.5 – 30.0							~~SHELBY TUBE, 3" O.D.~~ Augered 29-29.5'
30.0 – 30.5	1306, 12-30-94 #402980		3				SHELBY TUBE, 3" O.D. 30" push 600 psi MT_B = 1.9 ppm MT_S = 2.3 ppm
30.5 – 31.0							B-γ = 50-70 cpm #402980 is a jar sample from
31.0 – 31.5							the bottom of the tube for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: N/A

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 21 FEB 15 1995

000427

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11471-019

PROJECT NAME: OU-2 Pre Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11471

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5 – 32.0				SAA, with a 3" subangular to subround cobble in the bottom end of the tube	CL		Description is from bottom face of tube
32.5	1321, 12-30-94, #402981,	11	6	Med. stiff to stiff, greenish gray (5 BG 5/1) silty clay, trace fine gravel, medium plasticity, moist	CL	0.75	SPLIT SPOON, 2" O.D. MT$_B$ = 1.8 ppm MT$_S$ = 2.1 ppm
33.0		9	6	SAA	CL	1.5	B-γ = 50-70 cpm #402981 (32-33.25') is FEMP Archive
33.5	33.25' #402992	38	6	SAA V. Dense, (10 YR 4/2) grayish brown, well graded, fine to coarse sand, trace fine (¼" max.) subround gravel, moist to dry	CL SW		#402992 (33.25-33.5') is FEMP Archive
34.0	1329, 12-30-94 #402993	40	2	Very Dense, (10 YR 4/2) grayish brown well graded, fine to coarse sand, trace fine (¼" max.) subround gravel, moist to dry	SW		SPLIT SPOON 2" O.D. MT$_B$ = 1.8 ppm MT$_S$ = 3.0 ppm
34.5		42	6	SAA	SW		B-γ = 50-70 cpm
35.0		50	6	SAA	SW		#402993 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEB 15 1995

000428

200307-11472-007

CONTROL NO.: ~~200307-EFO-0013~~ KP 2-9-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11472

COORDINATES: N479736.327, E1382408.669

RELATED FAL NO.: 200307-11472-004 thru 2000307-11472-006

SURFACE ELEVATION: 584.63 ft.

GROUNDWATER LEVEL: 13.7' bls | DATE: 12-29-94 | TIME: 1218

DATE STARTED: 12-29-94

GEOLOGIST: K. Ernst

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: None

DRILLING CONTRACTOR: Alliance Environmental

DRILLING EQUIPMENT: HSA Mobile Drill B-59

DRILLER / HELPER: B. Erickson/B. Montanye

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	0805, 12-29-94, #402938	1	6	Medium stiff, (10 YR 3/2) Very dark grayish brown silt, grass and roots, low to no plasticity, moist	ML	1.0	M_{TB} = 14.5 ppm, M_{TS} = 21.9 ppm, B-G = 80 cpm
0.5		2	4	Stiff, (10 YR 5/6) Yellowish brown silty clay, roots, low to no plasticity, moist	CL	1.5	SPLIT SPOON, 2" O.D.
1.0		3	-				#402938 is for FEMP Archive
1.5	0808, 12-29-94, #402939, #402960	5	6	Stiff, (10 YR 5/6) Yellowish brown silty clay, roots, trace iron staining, low to medium plasticity, moist	CL	1.75	SPLIT SPOON 2" O.D. M_{TB} = 15.0 ppm
2.0		7	6	Stiff, (10 YR 5/6) Yellowish brown silty clay, roots (2.0 - 2.3'), some black organic material (spots), low to medium plasticity, moist	CL	2.0	M_{TS} = 22.8 ppm, B-G = 80 cpm, #402939 is for Geotech Lab
2.5		8	3	Stiff, (10 YR 5/6) Yellowish brown silty clay, low to medium plasticity, moist	CL	1.5	#402938 is for FEMP Archive
3.0							Augered 3.0 - 3.5' - No Samples Collected
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	7.5 ppm	12-29-94	0807
ALPHA		N/A	
BETA / GAMMA	50 - 60 cpm	12-29-94	0807

NOTES: Colors identified using Munsell Color Chart for Soils. Consistency measured using pocket penetrometer unless otherwise noted. Density (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881 000429

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 2 OF 8
200307-11472-008	

PROJECT NAME:	PROJECT NO.:
OU-2 Pre-Design Field Investigation	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11472		

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:

GEOLOGIST:	GROUNDWATER LEVEL: See Page	DATE:	TIME:	DATE COMPLETED:

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	0820, 12-29-94 #402940, #402941		22.5				SHELBY TUBE, 3" O.D. 30 in. push 400 to 800 psi (variable)
4.0				(10 YR 5/6) yellowish brown silty clay, trace fine gravel (Note: Description from bottom face of tube)	CL		MT_D = 15.9 ppm MT_S = 29.4 ppm B-γ = 50 cpm
4.5							
5.0							
5.5							#402940 is for Geotechnical Lab #402941 is Archive Sample
6.0							from bottom face of tube
6.5	0830, 12-29-94 #402942, #402943	11	6	Hard (10 YR 5/4) yellowish brown silty clay, trace fine to medium sand, trace fine (1/4" max) gravel, low plasticity, moist	CL	4.5	SPLIT SPOON, 2" O.D. MT_D = 16.5 ppm
7.0		17	6	Very Stiff, (10 YR 5/4) yellowish brown silty clay, trace fine to medium sand, ~~(1/4" max.)~~ trace fine (1/4" max) gravel, low plasticity moist, trace iron staining	CL	3.5	MT_S = 19.7 ppm B-γ = 70 cpm #402958 is bulk sample of auger cuttings, 3.5 to 7.5'

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: described based on SPT blow count. Soil descriptions and USCS symbol per ASTM D 2488 guidelines. Samples collected per ASTM (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

FEB 15 1995 FEMP QA

811

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200-307-11472-009

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11472

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: see page DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5		21	6	Very stiff, (10 YR 5/4) yellowish brown silty clay, trace fine to medium sand, trace fine (1/2" max.) angular to subangular gravel, low to med. plasticity, moist	CL	3.0	#402942 is for Envr. Lab #402943 is for FEMP Archive
8.0	0837, 12-29-94, 402944	11	6	Stiff, (10 YR 5/6) yellowish brown silty clay, trace fine ~~to coarse~~ subangular 1/2" max.) gravel, medium plasticity, moist	CL	1.75	SPLIT SPOON, 2" O.D.
8.5		19	6	Very stiff, (10 YR 5/6) yellowish brown silty clay, trace fine to coarse gravel (3/4" max.) medium plasticity, moist.	CL	3.0	
9.0		20	6	Very stiff, (10 YR 5/6) yellowish brown silty clay, trace fine to med. sand, few fine (3/4" max) angular to subangular gravel, low plasticity,	CL	3.0	
9.5				moist, trace organic material (black), trace iron staining,			Augered 9.0 to 9.5' interval
10.0	0845, 12-29-94, #402945, #402946		12				SHELBY TUBE, 3" O.D. 30" push
10.5							625 psi M_{T_B} = 6.4 ppm M_{T_S} = 25.1 ppm B-γ = 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: D 1586 and D 1587 Split spoon samplers equipped with basket retainers. Two-inch O.D. standard split-barrel (spoon) (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000441

FEMP QA FEB 15 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 4 OF 8
200307-11472-010	

PROJECT NAME:	PROJECT NO.:
OU-2 Pre-Design Field Investigation	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11472		

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
	see Page 1			

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0							#402945 is for Geotech. Lab #402946 is for FEMP Archive (from bottom of tube)
11.5							Tube is damaged on cutting end (bent in) and there is a buckling depression 18" from bottom of tube.
12.0				(10 YR 5/6) yellowish brown silty clay with fine to coarse (1" max), subangular to subround gravel, low plasticity, moist	CL		Description is from bottom face of tube
12.5	0855, 12-29-94, #402947, #402948	15	6	Very stiff, (10 YR 5/6) yellowish brown silty clay, trace fine (1/8" max) gravel, medium plasticity moist	CL	2.5	#402959 is a bulk sample of auger cuttings from 9-12'.
13.0		12	6	Very stiff, (10 YR 5/6) yellowish brown silty clay, medium to low plasticity, moist	CL	3.5	SPLIT SPOON, 2" O.D. MTb = 5.3 ppm MTs = 20.5 ppm B-γ = 90 cpm
13.5		16	6	Very stiff, (10 YR 5/6) yellowish brown silty clay, trace fine (1/4" max), medium to low plasticity, moist	CL	3.5	#402947 is for Environ. Lab #402948 is for FEMP Archive
14.0	0903, 12-29-94, #402949	11	#22 —				SPLIT SPOON, 2" O.D.

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: used.

MTb = Microtip (PID) background reading (ppm)
MTs = Microtip (PID) reading
(cont'd on page 7)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21

FEB 15 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11472-011

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11472

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5		15	5	Stiff, (10 YR 5/6) yellowish brown silty clay, few fine (1/4" max.) subangular gravel, trace fine to medium sand, medium plasticity, moist	CL	1.25	Hg_B = 5.1 ppm; Hg_S = 23.0 ppm; B-γ = 70 cpm
14.5 – 15.0		19	6	Very stiff, (10 YR 5/6) yellowish brown silty clay, few fine (1/2" max.) subround to subangular gravel, low plasticity, moist. (Bottom 1 to 2" of this sample appears to be (10 YR 5/1) gray in color)	CL	3.5	#402949 is for FEMP Archive
15.0 – 15.5	0910, 12-29-94, #402950	21	–				SPLIT SPOON, 2" O.D. Hg_B = 3.1 ppm; Hg_S = 10.0 ppm
15.5 – 16.0		26	–				B-γ = 60 cpm; #402950 is for FEMP Archive
16.0 – 16.5		32	6	Medium stiff, (10 YR 5/6) yellowish brown silty clay (--- possibly drill slough). Bottom 1" of split spoon had coarse subangular gravel (1/2" max.)	CL ~~GP~~	1.0	Gravelly noise while augering through 15 – 16.5' interval
16.5 – 17.0	0922						Augered 16.5 to 17.0' interval
17.0 – 17.5	~~#402951~~, 12-29-94 #402951		4	(10 YR 5/6) yellowish brown clayey medium to coarse sand with fine subangular to subround gravel (1/4" max.), wet	SC		Shelby Tube, 3" O.D. 6" push 900 psi, See Note 1

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
1. Encountered resistance to pushing after 6" of push. Description is from bottom of tube. Material removed from bottom of tube and placed in Jar #402951 for (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G:/WPSC/94-778.DRW (11-23-94)

FEB 15

000433

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11472-012

PAGE 6 OF 8

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11472

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5							Augered 17.5 to 18'
18.0	0935, 12-29-94, #402952, ~~#402953~~	14	6	Very stiff, (10 GY 6/1) greenish gray silty clay, few fine (1/8" max.) subangular gravel, medium plasticity moist to wet	CL	2.0	SPLIT SPOON, 2" O.D. MT_B = ∅ ppm MT_S = ∅ ppm
18.5	#402953	21	6	Dense, (10 YR 5/4) yellowish brown clayey medium to coarse sand with fine (3/8" max) subangular to subround gravel, wet	SC		B-γ = 70 cpm #402952 (18-18.5') is FEMP Archive Sample
19.0		25	6	SAA	SC		#402953 (18.5-19.5') is for Geotechnical Lab.
19.5	0940, 12-29-94, #402954	14	–				SPLIT SPOON 2" O.D. MT_B = 0.0 ppm
20.0		7	–				MT_S = 0.0 ppm B-γ = 60 cpm
20.5		8	3	Top 1" of the 3" recovery: SAA Stiff, (10 GY 6/1) greenish gray silty clay, medium to high plasticity, wet. Subround coarse gravel fines (1/8") in bottom of spoon	SC CL	1.0	#402954 is for FEMP Archive
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: (Note 1. cont): FEMP Archive, MT_B = 0 ppm, MT_S = 0 ppm, B-γ = 70 cpm.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 21 FEB 15 1995 000434

CONTROL NO.: 200307-11472-013

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11472

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	0950, ~~12-29-94~~ 12-29-94, #402955	8	–				SPLIT SPOON, 2" O.D. M_{TB} = 0.0 M_{TS} = 0.0
31.5		8	–				B-γ = 60
32.0		12	6	Stiff, (5B 4/1), dark bluish gray, silty clay, trace fine to medium sand, trace fine (1/8" max.) subround gravel, medium to high plasticity, moist	CL	1.0	
22.5							Augered 22.5-23.0'
23.0	0958, 12-29-94, ~~#402956~~ #402957		30				SHELBY TUBE, 3" O.D. 30" push 600 psi
23.5							#402956 is for Geotechnical lab #402952 is for FEMP Archive
24.0							(from bottom face of tube)
24.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: (cont' from Page 4):
on sample
B-γ = Beta - gamma reading on sample cpm
N/A - Not Applicable
(cont')

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP QA FEB 15 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11472-014	PAGE 8 OF 8
PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11472	COORDINATES: / RELATED FAL NO.:
SURFACE ELEVATION:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1 / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5							M_{TB} = 0.0 ppm M_{TS} = 0.0 ppm B-γ = 80 cpm
25.0				(5 B 4/1) dark bluish gray silty clay, trace fine (¼" max.) subround to subangular gravel, medium plasticity, moist	CL		
25.5				Bottom of Boring = 25.5 feet			
26.0							
26.5							
27.0							
27.5							
28.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
SAA = Same as Above
O.D. = Outer Diameter
HSA = Hollow Stem Auger
psi = pounds per square inch (drill rig hyd. pressure)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FEMPG / WPSC / 94-776.DRW (11-23-94)

FEMP QA 21

000436

FEB 15 1995

200307-11473-006

CONTROL NO.: ~~200307EFO0008~~ KP 2-8-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION				PROJECT NO.: 20.03.07
BORING NUMBER: 11473	COORDINATES: N480166.772;E1382418.609		RELATED FAL NO.s: 200307-11473-004 and 200307-11473-005	
SURFACE ELEVATION: 585.61 ft.	GROUNDWATER LEVEL: DRY	DATE: 12-28-94	TIME: 1205	DATE STARTED: 12-28-94
GEOLOGIST: A. COUCH	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED: 12-28-94
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: ALLIANCE ENV., INC	DRILLING EQUIPMENT: HSA MOBILE DRILL B-59		DRILLER / HELPER: BOB ERICKSON / BILL MONTANYE

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	0904 12-28-94 402916	2	2	VERY SOFT (10YR 3/3) DARK BROWN ~~SILTY~~ AC CLAYEY SILT, GRASS, ROOTS, LOW PLASTICITY, MOIST	ML	<.25	2" OD SPLIT-SPOON
0.5	0904 12-28-94 402936	2	6	STIFF (10YR 5/3) BROWN SILTY CLAY, GRASS, ROOTS, SLIGHT IRON STAINING, TRACE FINE SAND, LOW PLASTICITY, SLIGHTLY MOIST	CL	1.25	MT_B = 4.5 ppm MT_S = 10.9 ppm $B\gamma$ = 100 cpm
1.0		5	6	STIFF (2.5Y 5/3) LIGHT OLIVE BROWN SILTY CLAY, GRASS, ROOTS, SLIGHTLY MOTTLED, SLIGHT IRON STAINING, LOW to MED PLASTICITY, MOIST	CL	1.75	402916-LAB 402936-A[illegible]E
1.5	0908 12-28-94 402917	3	0			1.25 AC	2" O.D. SPLIT SPOON
2.0		6	6	STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY, TRACE BLACK ORGANIC MATTER, ROOTS, IRON-STAINING, SLIGHTLY MOTTLED, LOW PLASTICITY, SLIGHTLY MOIST	CL	1.25	MT_B = 9.4 ppm MT_S = 11.4 ppm $B\gamma$ = 80 cpm
2.5		9	6	VERY STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY, TRACE FINE SAND, TRACE BLACK ORGANIC MATTER, ROOTS, SLIGHT IRON STAINING, SLIGHT MOTTLING, LOW PLAST., SLIGHTLY MOIST	CL	2.25	402917 - Archive
3.0							AUGERED INTERVAL ONLY - NO SAMPLE
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12-28-94	0844
ALPHA	N/A	N/A	N/A
BETA / GAMMA	70	12-28-94	0844

NOTES: COLORS IDENTIFIED USING MUNSELL COLOR CHART FOR SOILS. CONSISTENCY MEASURED USING POCKET PENETROMETER UNLESS OTHERWISE NOTED. DENSITY DETERMINED (Coal)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94

FEMP QA 21 FEB 15 1995

000437

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11473-007

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11473

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: SEE PAGE 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS 402918-LAB 402919-Archive
3.5 – 4.0	0941 12-28-94 402918		32				3" OD SHELBY-TUBE 24" PUSH @ 600 PS. 6" PUSH @ 900 PS
4.5							MTB = 6.9 ppm MTS = 11.2 ppm Cs = 80 ppm
5.0							~~DESCRIPTION FROM TUBE BOTTOM~~ PROBABLE DRILL SLOUGH IN TOP OF TUBE
5.5							TUBE BOLTS SHEARED UPON PULLING. TUBE RECOVERY
6.0	0941 12-28-94 402919			(2.5Y 5/4) LIGHT OLIVE BROWN SILTY CLAY, TRACE FINE SAND, SLIGHTLY MOTTLED, LOW PLASTICITY, DRY TO SLIGHTLY MOIST	CL		NOT POSSIBLE. ~~NO SAMPLE~~ OVERDRILLED FROM 3.5 to 6 FT.
6.5							AUGERED INTERVAL ONLY - NO SAMPLE
7.0	~~0941~~ AC 0958 12-28-94 402920		23.75				3" OD SHELBY-TUBE 24" @ 600 PSI

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: SPT BLOW COUNT. SOIL DESCRIPTIONS AND USCS SYMBOL PER ASTM-D-2488 GUIDELINES. SAMPLES COLLECTED PER ASTM D-1586 AND D-1587. SPLIT-SPOON SAMPLERS EQUIPPED WITH (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

FEMP QA 21

FEB 15 1995

000438

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11473-008

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11473

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 2 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
9.0	1000 12-28-94 402923						MTB = 6.3 ppm MTS = 9.1 ppm BG = 80 cpm
9.5							402920 - LAB 402921 - Archive 402923 - LAB #402923 is a bulk sample of auger cuttings
9.0	~~AC~~ 0950 12-28-94 402921			(2.5Y 6/4) LIGHT YELLOWISH BROWN SILTY CLAY, WITH SUBROUND FINE (1/2") GRAVEL, TRACE FINE SAND, LOW PLASTICITY, SLIGHTLY MOIST	CL		DESCRIPTION FROM BOTTOM OF TUBE 3.0-7.5'
9.5	AC ~~12-28-94~~ AC ~~402922~~						AUGERED INTERVAL ONLY - NO SAMPLE
9.0	1010 12-28-94 402922	16	6	VERY STIFF (2.5Y 6/4) LIGHT YELLOWISH BROWN SILTY CLAY WITH SUBANGULAR to SUBROUND FINE (3/4") GRAVEL, TRACE FINE SAND, LOW to MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.5	2" OD SPLIT SPOON GRAVEL ZONE 9.2 to 9.5 FT.
9.5		16	6	SAA, SLIGHT IRON STAINING.	CL	3.0	MTB = 2.7 ppm MTS = 9.2 ppm BG = 80 cpm
10.0		20	6	VERY STIFF (2.5Y 5/4) LIGHT OLIVE BROWN SANDY CLAY WITH SUBROUND FINE (3/8") GRAVEL, (SAND - FINE POORLY GRADED), LOW PLASTICITY, SLIGHTLY MOIST	CL	3.75	402922 - LAB
10.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: BASKET RETAINERS (TRAPS). 2" O.D. STANDARD SPLIT-BARREL (SPOON) SAMPLERS USED.

(Cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000439

FEMP QA 21

FEB 15 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11473-009

PAGE 4 OF 8

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11473

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	1018 12-28-94 402924	16	Ø				2" OD SPLIT SPOON
11.5		18	Ø				MT_B = 3.1 ppm MT_S = 5.6 ppm $B\gamma$ = 70 cpm
12.0	1025 12-28-94 402925	28	6	STIFF (2.5 Y 5/4) LIGHT OLIVE BROWN SANDY CLAY WITH SUBROUND FINE (3/8") TO COARSE (1") SUBANGULAR GRAVEL (SAND-FINE, POORLY GRADED), LOW PLASTICITY, SLIGHTLY MOIST	CL	1.5	402924-Archive 402925-LAB #402925 is a bulk sample of auger cuttings from 7.5-12.0'
12.5	1027 12-28-94 402926	11	6	VERY STIFF (2.5 Y 5/3) LIGHT OLIVE BROWN GRAVELLY CLAY WITH FINE SAND (GRAVEL-SUBROUND, FINE (1/4"), LOW TO MEDIUM PLASTICITY), MOIST	CL	2.75	2" OD SPLIT SPOON
13.0		18	6	HARD (2.5 Y 5/4) LIGHT OLIVE BROWN SILTY CLAY WITH FINE (1/4") SUBANGULAR TO SUBROUND GRAVEL, IRON STAINING, LOW PLASTICITY, SLIGHTLY MOIST	CL	>4.5	MT_B = 3.3 ppm MT_S = 7.0 ppm $B\gamma$ = 60 cpm
13.5		21	6	SAA	CL	>4.5	402926-Archive
14.0	1041 12-28-94 402927	9	6	VERY STIFF (10 Y 5/1) GREENISH GRAY SILTY CLAY, FEW SUBANGULAR COARSE (1.5") TO FINE (3/8") SUBROUND GRAVEL, TRACE FINE SAND, MOTTLED, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.5	2" O.D SPLIT SPOON TOP OF GRAY CLAY AT 13.5 FT

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
MT_B = MICROTIP BACKGROUND READING (PPM)
MT_S = MICROTIP READING ON SAMPLE (PPM)
$B\gamma$ = BETA-GAMMA READING ON SAMPLE (CPM)
N/A = Not applicable
(CONT.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP QA 21

FEB 15 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11473-010

PAGE 5 OF 8

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11473

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 3 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0		14	6	VERY STIFF (5GY5/1) GREENISH GRAY SANDY CLAY WITH FINE (1/2") SUBROUND GRAVEL, SAND-FINE, POORLY GRADED, MOTTLED IRON STAINING, LOW to MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.25	MTB = 3.0 ppm MTS = 19.4 ppm BH = 70 cpm
14.5		19	6	SAA	CL	2.75	402927 - ARCHIVE
15.0							AUGERED INTERVAL ONLY - NO SAMPLE
15.5	1055 12-28-94 402928		21				3" O.D. SHELBY-TUBE 30" PUSH @ 600 PSI
16.0							MTB = 4.2 ppm MTS = 6 ppm BH = 70 cpm
16.5							402928 - LAB 402929 - Archive
17.0							Bottom AS of 1" of TUBE CRIMPED IN.
17.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
SAA = SAME AS ABOVE
O.D. = OUTER DIAMETER
HSA = HOLLOW STEM AUGER
PSI = Pounds per SQUARE INCH

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3661

G:/WPSC/94-776.DRW (11-23-94)

000441

FEMP QA 21

FEB 15 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11473-011

PAGE 6 OF 8

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11473

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: see Page 1

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5	1055 12-28-94 402929			(10 Y 5/1) GREENISH GRAY SANDY CLAY WITH SUBROUND FINE (3/8") GRAVEL (SAND-FINE, POORLY GRADED) LOW PLASTICITY, MOIST	CL		Bottom FACE OF TUBE DESCRIBED
18.0							
18.5	1106 12-28-94 402930	14	Ø				2" OD SPLIT SPOON 1.75" LONG GRAVEL STUCK IN DRIVE SHOE
19.0		21	4	MED-STIFF (10Y 5/1) GREENISH GRAY SILTY CLAY WITH SUBANGULAR FINE (1/4") GRAVEL, TRACE FINE SAND, SLIGHTLY IRON STAINED, MEDIUM PLASTICITY, MOIST	CL	Ø.75	MT_B = 2.Ø ppm MT_S = 21.8 ppm BH = 60 cpm
19.5		29	6	MED-STIFF (10Y 4/1) DARK GREENISH GRAY SANDY CLAY WITH FINE (1/4") SUBROUND to COARSE (1.75") SUBANGULAR GRAVEL (SAND-FINE to COARSE) LOW to MED. PLASTICITY, MOIST	CL	Ø.75	402930-Archive
20.0							AUGERED INTERVAL ONLY - NO SAMPLE
20.5	1125 12-28-94 402931		21				3" O.D SHELBY TUBE-Pushed 24" 18" @ 600 PSI 6" @ 900 PSI
21.0							TUBE BADLY CRIMPED OVER BOTTOM 2". SLIGHTLY CRIMPED UP TO 20"

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: ALL "LAB" SAMPLES ARE FOR THE GEOTECHNICAL LABORATORY. NO ENVIRONMENTAL SAMPLES WERE REQUIRED FROM THIS BORE HOLE. ARCHIVE SAMPLES (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 21

000442

FEB 15 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307 - 11473 - 012

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11473

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 2 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0 – 21.5							MT_B = 0 ppm MT_S = 7.8 ppm Bq = 60 cpm
22.0	1125 12-28-94 402932			(5 Y 5/1) GRAY CLAYEY SAND (FINE, POORLY GRADED) WITH FINE (3/8") SUBANGULAR GRAVEL, NO to LOW PLASTICITY, MOIST TO WET	SP-SC		DESCRIPTION FROM BOTTOM OF TUBE 402931-LAB, 402932-ARCHIVE
22.5	1138 12-28-94 402933	16	6	MED DENSE (5 Y 5/1) GRAY CLAYEY SAND (FINE, POORLY GRADED) WITH COARSE (1.25") SUBANGULAR to ANGULAR GRAVEL, NO TO LOW PLASTICITY, MOIST	SP-SC	2.5	2" OD SPLIT-SPOON GRAVEL ZONE @ 22.3 FT
23.0		14	6	VERY STIFF (10 Y 5/1) GREENISH GRAY SANDY CLAY WITH FINE (1/2") SUB-ROUND TO SUBANGULAR GRAVEL (SAND - FINE TO COARSE) LOW PLASTICITY MOIST	CL	3.5	MT_B = 0 ppm MT_S = 7.0 ppm Bq = 60 cpm
23.5		18	6	HARD, SAA	CL	4.5	402933-Archive
24.0	1148 12-28-94 402934	21	6	STIFF (10 Y 5/1) GREENISH GRAY SILTY CLAY WITH FINE (3/4") SUB-ANGULAR GRAVEL, TRACE FINE SAND, LOW PLASTICITY, MOIST.	CL	1.5	2" OD SPLIT-SPOON GRAVEL ZONE (DRY) @ 24.0 FT.
24.5	1148 12-28-94 402935	16	6	VERY STIFF (10 Y 5/1) GREENISH GRAY SILTY CLAY WITH COARSE (1.25") to FINE (1/4") SUBANGULAR & SUBROUND GRAVEL, TRACE FINE SAND, LOW PLASTICITY MOIST	CL	2.5	MT_B = 0 ppm MT_S = 0 ppm Bq = 70 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: ARE FOR ARCHIVE @ FEMP SITE.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FEMP QA 21

FEB 15 1995

G: / WPSC / 94-776.DRW (11-23-94)

000443

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 8 OF 8
200307-11473-013	

PROJECT NAME:	PROJECT NO.:
OU-2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11473		

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 1	DATE:	TIME:	DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:	

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5	1148 12-28-94 402937	19	6	HARD (10 Y 5/1) GREENISH GRAY SANDY CLAY WITH FINE (¼") SUBROUND GRAVEL, LOW PLASTICITY, MOIST	CL	4.25	402934 - LAB 402935 - Archive 402937 - Archive
25.0				BOTTOM OF BORING 25FT.			
25.5							
26.0							
26.5							
27.0							
27.5							
28.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: N/A

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G: / WPSC / 94-778.DRW (11-23-94)

FEB 15 1995

CN 200307-11474-007

CONTROL NO.: ~~200307EFO-0009~~ JHW 2/9/95

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation			PROJECT NO.: 20.03.07
BORING NUMBER: 11474	COORDINATES: N480691.013; E1382724.552	RELATED FAL NO.:	
SURFACE ELEVATION: 591.94 ft.	GROUNDWATER LEVEL: Dry	DATE: 12-27-94	TIME: 1533	DATE STARTED: 12-27-94
GEOLOGIST: K. Ernst	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED: 12-27-94
WATER USED DURING DRILLING: None	DRILLING CONTRACTOR: Alliance Env. Inc	DRILLING EQUIPMENT: HSA Mobile Drill B-59 (1993)	DRILLER / HELPER: Bob Erickson / Bill Montayne	

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0 – 0.5	1245 12-27-94 #402990	3	6	Soft, (10 YR 4/2) Dark grayish brown silt with roots and grass, no to low plasticity, moist (Topsoil)	ML	0.5	MT_B = 0.0 ppm MT_S = 0.1 ppm B-γ = 80 cpm
0.5 – 1.0		4	6	Medium Stiff, (10 YR 4/2) Dark grayish brown silt, some roots, trace iron staining, no to low plasticity, moist	ML	0.75	SPLIT SPOON, 2" O.D.
1.0 – 1.5		5	6	Stiff, (10 YR 5/3) Brown silty clay, some roots, trace iron staining, low plasticity, moist	CL	1.5	#402890 is FEMP Archive Sample
1.5 – 2.0	1250 12-27-94 #402991	4	6	Stiff, (10 YR 5/3) Brown silty clay, some roots, iron staining, low to medium plasticity, moist	CL	2.0	SPLIT SPOON, 2" O.D. MT_B = 0.0 ppm MT_S = 2.9 ppm
2.0 – 2.5	#402894 #402912	5	6	Stiff, (10 YR 5/3) Brown silty clay, trace medium to coarse sand, low to medium plasticity, moist, iron staining	CL	2.0	B-γ = 80 cpm #402891 = Geotech. Lab Sample
2.5 – 3.0		9	3	Medium Stiff, (10 YR 5/6) Yellowish brown silty clay, few subrounded fine gravel (3/4" max.), low to medium plasticity, moist, iron staining	CL	0.5	#402894 = Env. Lab Sample #402912 = FEMP Archive Sample
3.0 – 3.5							Augered 3.0 – 3.5' – No Samples

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0 ppm	12-27-94	1250
ALPHA		N/A	
BETA / GAMMA	40-50 cpm		1250

NOTES: Colors identified using Munsell color chart for soils. Consistency measured using pocket penetrometer unless otherwise noted. Density determined from SPT blow

(cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000445

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11474-008

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11474

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	1300 12-27-94 #402892		18				SHELBY TUBE, 3" O.D. 30" push
4.0	#402893						600 psi M_{TB} = 0.0 ppm M_{TS} = 3.5 ppm
4.5							B-γ = 70 cpm
5.0							
5.5							#402892 is a Geotech Lab Sample #402893 is a FEMP Archive sample from end of Shelby Tube
6.0				(10 YR 5/6) Yellowish brown silty clay, trace subrounded fine gravel (½" max.) medium plasticity, moist	CL		Description from bottom of sample tube
6.5	1312 12-22-94 #402895	5	6	Very stiff (10YR 5/4) Yellowish-brown silty clay, trace fine to medium sand, trace fine subrounded gravel (½" max.) medium plasticity, moist	CL	2.0	SPLIT SPOON, 2" O.D. 1" sand layer located about 3" from top of this interval med. to coarse sand
7.0		8	6	Very stiff, (10 YR 5/4) yellowish brown silty clay with sand, trace fine subrounded gravel (½" max.), medium to low plasticity, moist	CL	2.0	M_{TB} = 0.0 ppm M_{TS} = 5.0 ppm B-γ = 90 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Const. Soil descriptions and USCS symbol per ASTM D-2488 Guidelines. Samples collected per ASTM D 1586 and D 1587 Split Spoon (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

CONTROL NO.: 200307-11474-009

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11474

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5		10	6	Stiff, (~~10~~ 10 YR 5/4) yellowish brown silty clay with sand, low to medium plasticity, moist	CL	1.5	#402896 is a Bulk Sample of Auger Cuttings from 3-7.5' for Geotech Lab.
8.0	1322 12-27-94 #402897	8	6	Very Stiff, (10 YR 5/6) yellowish brown silty clay, trace fine to medium sand, trace fine subrounded gravel (3/8" max) medium plasticity, moist	CL	2.0	MTB = 0.0 ppm MTS = 0.0 ppm B-γ = 80 cpm
8.5		16	6	SAA	CL	2.5	SPLIT SPOON 2" O.D
9.0		17	6	SAA	CL	2.5	#402897 is a FEMP Archive Sample
9.5	1326 12-22-94 #402898 #402913	9	6	Very Stiff, (10YR 5/6) yellowish brown silty clay, trace fine to coarse sand, trace fine subrounded gravel (1/4" max.) medium plasticity, moist, some iron staining	CL	2.5	SPLIT SPOON 2" O.D.
10.0		16	6	SAA	CL	2.5	MTB = 0.0 ppm MTS = 0.0 ppm B-γ = 60-80 cpm
10.5		22	6	SAA	CL	3.0	#402898 is a Geotech Lab Sample #402913 is a FEMP Archive Sample

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Samplers equipped with basket retainers (traps) 2" O.D. standard split barrel (spoon) samplers used.

(cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

000447

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11474-010

PAGE 4 OF 8

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11474

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	1330 12-27-94 #402899	6	6	Medium stiff, (10 YR 5/6) yellowish brown silty clay with fine to medium sand, trace subangular fine gravel (3/8" max), med. plasticity, moist	CL	0.75	SPLIT SPOON, 2" O.D. MTB = 0.0 ppm MTS = 0.0 ppm B-γ = 100 cpm
11.0	#402900	13	6	Top 3" of 11.0 to 11.5 interval: SAA. Bottom 3": Mottled yellowish brown (10YR 5/6) and greenish gray (5GY 5/1) silty clay, trace fine to medium sand, low plasticity, moist, very stiff.	CL - CL	— 3.0	#402899 = FEMP Archive Sample #402900 = FEMP Archive Sample 899 KE
11.5		21	6	Hard, (5GY 5/1) greenish gray silty clay, trace fine subangular gravel, low plasticity, moist	CL	4.5	#402901 = yellowish brown silty clay #402900 = greenish gray silty clay
12.0	1337 12-27-94 #402902	11	6	Very stiff, (5GY 5/1) greenish gray silty clay with fine to coarse (1" max.) angular to subrounded gravel, low plasticity, moist	CL	2.5	#402901 = Bulk sample of Auger cuttings: 7.5 - 12.0' for Geotech Lab
12.5	#402903	14	6	Very stiff, (5GY 5/1) greenish gray silty clay, trace fine to medium sand, trace subrounded to subangular fine (1/4" max.) gravel, low plasticity, moist	CL	2.5	SPLIT SPOON 2" O.D. MTB = 0.0 ppm MTS = 0.0 ppm
13.0		20	6	SAA	CL	2.5	B-γ = 60-70 cpm #402902 = FEMP Archive Sample #402903 = Env. Lab Sample
13.5							Augered 13.5 - 14.0' — No Samples
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
MTB = Microtip Background Reading
MTS = Microtip Reading on Sample
B-γ = Beta gamma reading on sample
N/A = Not Applicable
(cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

CONTROL NO.: 200307-11474-011

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11474

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	1400 12-27-94 #402904		19				SHELBY TUBE, 3" O.D. 30" push 700 psi
14.5 – 15.0	#402905						MT_B = 0.0 MT_S = 0.0 B,γ = 70-100 cpm
15.0 – 15.5							#402904 = Geo Lab sample #402905 = Fem Archive Sampler (from bottom of tube)
15.5 – 16.0							Bottom cutting edge of tube crimpped in-ward slightly (1/4")
16.0 – 16.5				(5 GY 5/1) greenish gray silty clay, trace fine to medium sand, trace subrounded to subangular fine (3/8" max.) gravel low plasticity, moist.	CL		Sample described from bottom of tube
16.5 – 17.0	1408 12-27-94 #402906	6	6	Stiff, (5GY 5/1) greenish gray silty clay, trace fine to medium sand, trace subrounded fine (1/8" max) gravel, low plasticity, moist	CL	2.0	SPLIT SPOON, 2" O.D.
17.0 – 17.5		10	6	SAA with thin (1/4") layer of coarse sand at 3" from the top of the 17.0 - 17.5' sample interval.	CL	1.75	MT_B = 0.0 ppm MT_S = 0.0 ppm B-γ = 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
SAA = Same as above
O.D = outer diameter
HSA = Hollow Stem Auger

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

000449

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11474-012

PROJECT NAME: OU-2 Pre Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11474

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: see Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0				Stiff, (5 GY 5/1) Greenish gray silty clay, trace fine to medium sand, trace subrounded fine (1/8" max) gravel, low to medium plasticity, moist	CL	2.0	#402906 = Geotech Lab Sample #402914 = FEMP Archive Sample
18.0 – 18.5							Augered 18.0 - 18.5' interval - No Samples
18.5 – 19.0	1413 12-27-94 #402907		20.5				SHELBY TUBE, 3" O.D. - 600 psi, push so (- 875 psi for last 6" of push)
19.0 – 19.5	#402908						MTB = 0.0 ppm MTS = 0.0 ppm B-γ = 60 cpm
19.5 – 20.0							Bottom 3" crimpped inward
20.0 – 20.5							#402907 = Geotech Lab Sample #402908 = FEMP Archive Sample (from bottom of tube)
20.5 – 21.0				(5 GY 5/1) Greenish gray silty clay, trace fine to medium sand, trace fine (1/8" max.) subrounded gravel, low plasticity, moist	CL		Description is from bottom of tube

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

CONTROL NO.: 200307-11474-013

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11474	COORDINATES:
RELATED FAL NO.:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	1436 12-27-94 #402909	50/4"	3	(5 GY 5/1) greenish gray silty clay, trace fine to medium sand, trace angular fine to coarse gravel (max. 1½" elongated, flat gravel fragment,) low to medium plasticity, moist	CL		SPLIT SPOON, 2" O.D. MTB = 0.0 ppm MTS = 4.8 ppm
21.5			–	Remarks: #402909 = FEMP Archive Sample			B-γ = 50 cpm Not enough sample for pocket pen. test.
22.0	1445 12-27-94 #402910	17	6	Very stiff to hard, (5GY 5/1) greenish gray silty clay with gravel (fine to coarse, 1" max.), ~~some~~ few fine to medium sand, low plasticity, moist	CL	3.0	SPLIT SPOON 2" O.D. MTB = 0.0 p MTS = 2.4
22.5		21	6	SAA		>4.5	B-γ = 80 cpm
23.0		31	6	SAA		>4.5	#402910 = FEMP Archive Sample
23.5	1449 12-27-94 #402911	20	6	Hard, (5 GY 5/1) greenish gray silty clay with fine to coarse (1" max.) gravel, low plasticity, moist, trace fine to medium sand	CL	>4.5	SPLIT SPOON 2" O.D.
24.0	#402915	17	6	Very stiff, (5 GY 5/1) greenish gray silty clay, trace fine to medium sand, trace fine (>1/8" max.) subrounded gravel, low plasticity, moist	CL	2.5	#402911 = Geotech Lab Sample #402915 = FEMP Archive Sample
24.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

000451

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11474-014	PAGE 8 OF 8
PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11474	COORDINATES: / RELATED FAL NO.s:
SURFACE ELEVATION:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1 / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 25.0		21		SAA		2.0	MTB = 0.0 ppm MTJ = 0.0 ppm β-γ = 40 cpm
				Bottom of boring = 25.0 feet			
25.5							
26.0							
26.5							
27.0							
27.5							
28.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11475-008

PAGE 1 OF 6

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11475

COORDINATES: N 479627.235, E 1382700.486

RELATED FAL NO.:

SURFACE ELEVATION: 594.38 ft

GROUNDWATER LEVEL: 16.0 ft bls | DATE: 1-18-95 | TIME: 0800 | DATE STARTED: 1-17-95

GEOLOGIST: K. Ernst

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1-17-95

WATER USED DURING DRILLING: None

DRILLING CONTRACTOR: Alliance Env., Inc

DRILLING EQUIPMENT: 1993 Mobile Drill B-59 (HSA)

DRILLER / HELPER: B. Erickson / T. French

DEPTH (FEET)	SAMPLE TYPE, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1459, 1-17-95, #403250	2	6	Stiff, (10YR 4/2) dark grayish brown silty clay, grass, roots, medium plasticity, moist	CL	1.5	SPLIT-SPOON, 2" O.D. MTB = 0.0 ppm MTS = 0.0 ppm
0.5		4	1	Medium stiff, (10 YR 5/4) yellowish brown silty clay, trace fine to coarse sand, trace fine (1/8" max.) subrounded gravel, low plasticity, moist [Fill]	CL	0.5	B-B = 40 cpm
1.0		6	—				#403250 is for FEMP Archive
1.5							Augered 1.5 - 2.0'
2.0	1510, 1-17-95, #403251, #403252		20				SHELBY-TUBE, 3" O.D, 36" Long 30" push @ 600 psi
2.5							MTB = 1.9 ppm MTS = 2.7 ppm B-B = 50 cpm
3.0							#403251 is for Geotech Lab. #403252 is for FEMP Archive
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0 ppm	1-17-95	1500
ALPHA		N/A	
BETA / GAMMA	40 cpm	1-17-95	1500

NOTES: Colors identified using Munsell Color Chart for Soils. Consistency measured using pocket penetrometer unless otherwise noted. Density of coarse grained soils described (cont'd)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP CA

FEB 13 1995

200307-11475-009

CONTROL NO.: ~~200307-11475-006~~ 2-9-95

FEMP

LITHOLOGIC LOG

PAGE 2 OF 6

PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11475	COORDINATES: See page 1
RELATED FAL NO.:	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: see page 2 / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0							
4.0 – 4.5				Mottled (10 YR 5/4) yellowish brown and (10 YR 6/3) pale brown silty clay with fine to medium sand, trace fine (1/2" max.) subangular gravel, medium plasticity, moist [Fill]	CL		Description is from bottom face of tube
4.5 – 5.0	1515, 1-17-95, #403253	3	6	Stiff, mottled (10 YR 5/4) yellowish brown and (10 YR 6/3) pale brown silty clay with fine to medium sand, trace fine (1/2" max.) angular gravel (including quartz), grass and organic material (mid interval), trace roots, low plasticity, moist [Fill]	CL	1.0	SPLIT-SPOON, 2" O.D. MT B = 1.9 ppm MT3 = 2.7 ppm B-1 = 30 cpm
5.0 – 5.5		7	6	Stiff, mottled (10 YR 5/4) yellowish brown and (10 YR 5/1) gray silty clay, roots and organic material, trace rounded gravel (fine, 1/4" max.), trace iron staining, low plasticity, moist [Fill]	CL	2.0	#403252 is for PEMP archive
5.5 – 6.0		13	6	Very stiff, mottled (10 YR 5/4) yellowish brown and (10 YR 7/2) light gray silty clay, trace fine to coarse sand, few fine (1/2" max.) round to subangular gravel, iron staining, low plasticity, moist [Fill]	CL	3.25	
6.0 – 6.5							Augered 6.0 - 6.5'
6.5 – 7.0	1535, 1-17-95, #403254, #403255		17				SHELBY TUBE, 3" O.D., 36" long, 30" push @ 400 psi

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Based on SPT blow count. Soil description and USCS symbol per ASTM D 2488 guidelines. Samples collected per ASTM D 1586 and D 1587. Split-(sed)

[1] SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3981

G:/WPSC/94-778.DRW (11-23-94)

FEB 13 1995

200307-11475-010

CONTROL NO. ~~200307-11475-007~~ 2-9-95

FEMP

LITHOLOGIC LOG

PAGE 3 OF 6

PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11475	COORDINATES: See Page 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1 / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5							MT_B = 2.5 ppm; MT_S = 8.8 ppm; B-γ = 50 cpm
7.5 – 8.0							Shelby Tube disconnected from sampler head during withdrawal.
8.0 – 8.5							Tube was over-drilled, augers pulled and tube retrieved. Tube in good condition.
8.5 – 9.0				Mottled, (2.5 Y 4/3) olive gray silty clay, trace fine to medium sand, trace black organic material (spots), trace iron staining, low plasticity, moist [Fill]	CL		#403264 → Geotech Lab; #403255 → FEMP Archive. Description is from bottom half of Note 1 tube.
9.0 – 9.5	1545, 1-17-95, #403256	5	4	Stiff, (10 YR 4/6) dark yellowish brown silty clay with (10 YR 4/1) dark gray mottling, trace coarse sand, low plasticity, moist [Fill]	CL	1.25	SPLIT-SPOON, 2" O.D. MT_B = 2.7 ppm; MT_S = 4.1 ppm
9.5 – 10.0		7	6	Very Stiff, (10 YR 5/4) yellowish brown mottled with (10 YR 6/1) gray silty clay, trace black organic material, trace iron staining, low to medium plasticity, moist [Fill]	CL	3.75	B-γ = 50 cpm
10.0 – 10.5		10	6	Stiff, SAA	CL	1.5	#403256 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Spoon (barrel) sampler equipped (cont'd)

Note 1: #403264 is a bulk sample of auger cuttings from 4.5 - 8.5' for Geotech Lab.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3981

G:/WPSC/94-776.DRW (11-23-94)

FEB 13 1995

200307-11475-011 KP
~~200307-11475-001~~ 2-7-95
CONTROL NO.: ~~200307-11475-008~~ KP 2-9-95

FEMP
LITHOLOGIC LOG

PAGE 4 OF 6

PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11475	COORDINATES: See Page 1
RELATED FAL NO.:	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0							Augered 10.5-11.0'
11.5	1555, 1-17-95 403259, 403257		33.5				SHELBY TUBE 3" o.D, 36" Long 30" push @
12.0							600 psi MT_B = 3.2 ppm MT_S = 4.3 ppm B-γ = 50 cpm
12.5							#403257 is jar sample from end of tube for Rama Analysis #403258 is
13.0							Shelby Tube for Geotech. Lab Bottom of tube face is wet
13.5				(10 YR 5/6) yellowish brown sandy clay (sand is fine to coarse), trace fine (1/2" max.) subrounded to subangular gravel, medium plasticity, moist to wet	CL		Description is from bottom face of tube
14.0	1600, 1-17-95, #403259	8	6	Very stiff, (10 YR 5/6) yellowish brown sandy clay (sand is fine to medium) trace fine to coarse (3/4") subrounded to subangular gravel, iron staining, low plasticity, moist	CL	2.75	SPLIT-SPOON, 2" O.D MT_B = 3.2 ppm MT_S = 4.7 ppm B-γ = 70 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: with plastic basket retainers
Two-inch O.D. standard split barrel samplers used (no ~~stainless~~ liners)
MT_B = Microtip (PID) reading - (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681 G:/WPSC/94-776.DRW (11-23-94)

FEB 13 1995

200307-11475-D12

CONTROL NO.: ~~200307-11475-009~~ 2-9-95

FEMP
LITHOLOGIC LOG

PAGE 5 OF 6

PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11475	COORDINATES: See Page 1
RELATED FAL NO.:	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0–14.5		11		SAA	CL	3.0	#403259 is for FEMP Archive
14.5–15.0		19		SAA	CL	2.25	Clayey Sand (SC) seam, ~1/2" thick at 14.5', fine to coarse sand
15.0–15.5							Augered 15.0-15.5'
15.5–16.0	1613, 1-17-95 #403260		20				SHELBY TUBE, 3" O.D., 36" Long 30" push @ 450 psi for first 1.5', 700 psi for last foot of push
16.0–16.5	#403261						
16.5–17.0							Tube comes from hole west MT$_B$ = 3.3 ppm MT$_S$ = 4.5 ppm
17.0–17.5							B-G = 50 cpm #403260 is for Geotech Lab #403261 is jar for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Background
MT$_S$ = Microship (PID) reading on sample
B-G = Beta-gamma radiation reading on sample
N/A - Not Applicable, O.D - Outer

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

200307-11475-013

CONTROL NO.: ~~200307-11475-010~~ KP 2-9-95

FEMP

LITHOLOGIC LOG

PAGE 6 OF 6

PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11475	COORDINATES: See Page 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: see page 1 / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5				(10 Y 4/1) dark greenish gray silty clay, trace fine to medium sand, trace fine to coarse (3/4" max) subrounded to subangular gravel, low plasticity, moist	CL		Description is from bottom face of core Note 2.
18.0	~~1625~~ 1623, 1-17-95, #403262	4	—				SPLIT-SPOON, 2" O.D. MTB = 3.2 ppm MTS = 5.9 ppm
18.5		10	4	v. stiff, (10 Y 4/1) dark greenish gray silty clay, trace coarse sand, trace fine (3/8" max) subrounded to subangular gravel, low to medium plasticity, moist	CL	2.25	B-γ = 80 cpm
19.0		10	6	stiff, SAA	CL	1.75	#403262 is for FEMP Archive
19.5	1625 1-17-95 #403263	5	3	Very stiff, (10 Y 4/1) dark greenish gray silty clay, trace fine to coarse (1½" max.) subrounded to subangular gravel, medium plasticity, moist	CL		SPLIT-SPOON 2" O.D MTB = 3.2 ppm MTS = 8.0 ppm
20.0	#403265	12	6	Very stiff, (10 Y 4/1) dark greenish gray silty clay, trace coarse sand, trace fine (3/8" max.) subrounded to subangular gravel, low plasticity, moist	CL		B-γ = 90 cpm Consistency description from SPT blow count
20.5		14	6	Very stiff, (10 Y 4/1) dark greenish gray silty clay, trace fine to coarse (1½" max) subrounded to subangular gravel, medium plasticity, moist	CL		#403263 is for Geotech Lab #403265 is for FEMP Archive
21.0				BOTTOM OF BORING = 21.0 FEET			

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
Diameter, HSA - Hollow stem auger, bls - Below land surface
Note 2: Water filled borehole to ~ 12' bls at 18' auger depth

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEB 13 1995

2-15-95

FEMP QA 19

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11476-008

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11476

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: 5' bls | DATE: 1-10-95 | TIME: 0836

DATE STARTED: 1-4-95

GEOLOGIST: A. COUCH

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1-6-95

WATER USED DURING DRILLING: NONE

DRILLING CONTRACTOR: ALLIANCE ENV., INC.

DRILLING EQUIPMENT: 1993 MOBILE DRILL B-59

DRILLER / HELPER: BOB ERICKSON / TIM FRENCH

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0 – 0.5	1200, 1-4-95, 402987	10	0				2" OD. SPLIT SPOON
0.5 – 1.0		12	0				MT_B = 3.4 ppm; MT_S = 2.3 ppm; GB_B = 110 cpm
1.0 – 1.5		13	3	HARD (2.5 Y 4/2) Dark grayish brown SILTY CLAY, GRASS, ROOTS, FROZEN,	CL	7 / 4.5	#402987 is for FEMP Archive
1.5 – 2.0	1210 1-4-95 402988,	9	Ø				2" OD SPLIT SPOON
2.0 – 2.5	403011	8	5.5	V. STIFF, (10YR 4/4) Dark Yellowish Brown SILTY CLAY, TRACE BLACK ORGANIC MATERIAL, SLIGHT IRON STAINING AND MOTTLING, ROOTS, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	MT_B = Ø.9 ppm; MT_S = 1.4 ppm; GB_B = 70 cpm
2.5 – 3.0		10	6	V. STIFF, (2.5 Y 4/3) OLIVE BROWN SILTY CLAY WITH FINE (3/4") TO COARSE (1.25") SUBANGULAR GRAVEL, SLIGHTLY MOTTLED, LOW PLASTICITY, DRY	CL	3.5	#402988 is for Geotech Lab. #403011 is for FEMP Archive
3.0 – 3.5							AUGERED INTERVAL ONLY NO SAMPLE

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0 PPM	1-4-95	0828
ALPHA	N/A	N/A	N/A
BETA / GAMMA	60 CPM	1-4-95	0828

NOTES: Colors identified using Munsell Color Chart for Soils. Consistency measured using pocket penetrometer unless otherwise noted. Density

(cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000459

FEMP

LITHOLOGIC LOG

CONTROL NO.: 000307-11476-009	PAGE 2 OF 8
PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11476	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 1
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	1241 1-4-95 402989		29				3" OD SHELBY-TUBE 18" PUSH @ 600 PSI 12" PUSH @ 1300 PSI
4.0	1246 1-4-95 402990						MT_B = 0.9 ppm MT_S = 1.2 ppm BK = 70 cpm
5.0							
5.5							SAMPLE 402989 - LAB (Geotech) SAMPLE 402990 - ARCHIVE (FROM 6')
6.0				(2.5Y 5/3) LIGHT OLIVE BROWN CLAY WITH FINE (1/4") SUBANGULAR GRAVEL, TRACE FINE SAND, SLIGHT IRON STAINING, LOW PLASTICITY, DRY	CL		DESCRIPTION FROM BOTTOM FACE OF SHELBY-TUBE
6.5	1400 1-4-95 402991	8	3.5	STIFF, (10YR 4/4) Dark Yellowish Brown SANDY CLAY WITH FINE (1/4") Gravel (subround), slightly MOTTLED, MED. PLASTICITY, SLIGHTLY MOIST	CL	1.75	2" OD ~~SHELBY TUBE~~ SPLIT SPOON AC
7.0	1400 1-4-95 402992	13	6	V. STIFF, (10 YR 5/4) Dark Yellowish Brown SILTY CLAY, TRACE FINE SAND, SLIGHT IRON STAINING, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.75	MT_B = 0.9 ppm MT_S = 1.9 ppm BK = 75 cpm SAMPLE 402991 -

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: of coarse-grained soil, described based upon SPT blow count. Soil description and USCS symbol per ASTM D 2488 guideline. Samples

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11476-010

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11476

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: SEE PAGE 1

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0		16	6	V. STIFF, (10 YR 5/6) Yellowish brown Sandy (Fine) clay, trace fine (1/4") subrounded gravel, slightly mottled, iron staining, low plastic, moist to wet	CL	2.5	ENVIRONMENTAL LAB SAMPLE 402992 - ARCHIVE. WET, SANDY ZONE 7.4 to 7.5 FT ~~see Note 1~~
7.5	0911 1-6-95 ~~402994~~	10	6	V. STIFF (2.5 Y 5/3) LIGHT OLIVE BROWN CLAY, TRACE FINE SAND, MED TO HIGH PLASTICITY, MOIST SLIGHTLY MOTTLED, IRON STAINING	CL	2.25	2" OD SPLIT-SPOON
8.0		19	6	V. STIFF, (2.5 Y 5/4) LIGHT OLIVE BROWN SILTY CLAY, FEW FINE (1/2") SUBANGULAR GRAVEL, TRACE FINE SAND, IRON STAINING, MED PLASTICITY, MOIST	CL	3.25	SPOON VISIBLY WET - FROM ABOVE? # 402994 ... is FEMP Archive sample
8.5		22	6	HARD, SAA	CL	4.25	MT_B = 0.7 ppm MT_S = 1.5 ppm BG = 60 CPM
9.0	~~0927~~ ~~1-6-95~~ AC						AUGERED INTERVAL ONLY - NO SAMPLE
9.5	0927 1-6-95 402995		AC ~~18~~ 30				3" OD SHELBY TUBE ~~30# PUSH @ 575 PSI~~
10.0							MT_B = 0.7 ppm MT_S = 1.9 ppm BG = 60 CPM
10.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.7 ppm	1-6-95	0909
ALPHA	N/A	N/A	N/A
BETA / GAMMA	55 CPM	1-6-95	0953

NOTES: collected per ASTM D 1586 and D 1587. Split-spoon (cont'd)

Note 1.: # 402993 is a bulk sample of auger cuttings fro 3.5 - 7.5'

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

2/15/95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11476-011

PAGE 4 OF 8

PROJECT NAME: OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11476

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: SEE PAGE DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)*	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5							#402995 is for Geotech Lab #402996 is for FEMP Archive
11.0							
11.5							
12.0	0927 1-6-95 402996			~~STIFFES~~ (2.5Y 5/1) GRAY SANDY (FINE) CLAY, LOW PLASTICITY, MOIST	CL		DESCRIPTION FROM BOTTOM FACE OF TUBE
12.5	0943 1-6-95 402997	6	6	STIFF, (2.5Y 5/1) GRAY SANDY (FINE) CLAY WITH FINE (1/4") SUBANGULAR TO SUBROUND GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.0	2" OD SPLIT SPOON
13.0		8	6	STIFF, (2.5Y 5/1) GRAY SANDY (FINE) CLAY FEW FINE (1/4") SUBROUND GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL	1.75	MT_B = MT_S = 1.8 ppm BK = 60 CPM
13.5		9	6	SAA	CL	1.5	#402997 is for FEMP Archive
14.0							AUGERED INTERVAL ONLY NO SAMPLE

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: (barrel) sampler equipped with basket retainer. Two in. O.D. standard split-barrel samplers used, (No liners) (cont')

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

000462

FEMP DA 3-15-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11476-012

PAGE 5 OF 8

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11476

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: SEE PAGE 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	1001 1-6-95 402998		27				3" OD SHELBY TUBE 30" PUSH @ 575 PSI
15.0							MT_B = 3.8 ppm MT_S = 4.4 ppm Bγ = 70 cpm
15.5							#403010 is a bulk sample of auger cuttings from ~ 12 to 15' for Geotech Lab
16.0				FINE to COARSE			#402998 is for Geotech Lab #402999 is for FEMP Archive
16.5	1001 1-6-95 402999			(2.5Y 5/1) GRAY SAND (WELL SORTED) WITH FINE (1/4") SUBROUND GRAVEL, NO PLASTICITY, MOIST TO WET	SW		DESCRIPTION FROM BOTTOM FACE OF TUBE
17.0	1023 1-6-95 403000	7	0				2" OD SPLIT SPOON 403000-LAB (ENVR.) 403001-Archive
17.5	1023 1-6-95 403001	9	0				MT_B = 3.8 ppm MT_S = 6.5 ppm Bγ = 70 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
MT_B = Microtip (PID) background reading (ppm)
MT_S = Microtip (PID) reading on sample
Bγ = Beta-gamma radiation (cpm)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000463

FEMP
DA 13
2/15/95

FEMP LITHOLOGIC LOG

CONTROL NO.: 200307-11476-013

PAGE 6 OF 8

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11476

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: SEE PAGE 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5		11	6	MED. DENSE, (2.5Y 5/1) GRAY NC LAYEY SAND WITH GRAVEL (COARSE, SUB-ANGULAR), NO PLASTICITY, WET SAND FINE, POORLY GRADED	SC	0.25	GRAVEL (1 3/4") LODGED IN BOTTOM OF SPOON
18.0				AUGERED INTERVAL ONLY - NO SAMPLE			3" OD AC ~~SHELBY TUBE 30" PUSH~~
18.5							~~@ 500 PSI.~~ 3" OD SHELBY TUBE 30" PUSH @ 500 PSI
19.0	1037 1-6-95 403002		30+				
19.5							MT_B = 3.9 ppm MT_S = 4.8 ppm BH = 70 cpm
20.0							# 403002 is for Geotech Lab #403003 is for FEMP Archive
20.5							
21.0	1037 1-6-95 403003			(10Y 5/4) GREENISH GRAY SILTY CLAY, TRACE SAND (COARSE) MEDIUM PLASTICITY, SLIGHTLY MOIST	CL		DESCRIPTION FROM BOTTOM FACE OF TUBE

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
readings on sample
N/A = Not Applicable
SAA = Same as Above
O.D. = Outer Diameter
HSA = Hollow Stem Auger
(CONT.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

000464

CONTROL NO. 200307-11476-014

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION			PROJECT NO.: 20.03.07
BORING NUMBER: 11476	COORDINATES:	RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED: 1-4-95
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 1	DATE:	TIME:	DATE COMPLETED: 1-6-95
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:	

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0 – 21.5	1047 1-6-95 403004	5	6	STIFF, (5Y 5/1) GRAY SANDY (FINE, POORLY GRADED) CLAY, FEW FINE (1/2") SUBROUND GRAVEL, LOW PLASTICITY, MOIST	CL	1.0	2" O.D. SPLIT SPOON
22.0		8	6	STIFF, (5Y 5/1) GRAY SILTY CLAY, FEW FINE (1/2") SUBROUND GRAVEL, LOW PLASTICITY, MOIST	CL	1.5	MT_B = 4.0 ppm MT_S = 5.2 ppm BP = 60 cpm
22.5		11	6	SAA	CL	1.0	#403004 is for FEMP Archive
23.0	1055 1-6-95 403005	6	6	MED. STIFF (10Y 5/1) GREENISH GRAY SANDY (FINE, POORLY GRADED) CLAY, FEW FINE (1/2") SUBROUND GRAVEL, LOW PLASTICITY, MOIST	CL	0.75	2" OD SPLIT SPOON
23.5		13	6	MED. STIFF, (5Y 5/1) GRAY SANDY (FINE) CLAY WITH FINE (1/4") SUBROUND GRAVEL, LOW PLASTICITY MOIST	CL	1.0	MT_B = 3.4 ppm MT_S = 5.3 ppm BP = 70 cpm
24.0		16	6	STIFF, SAA	CL	1.75	#403005 is for FEMP Archive
24.5	1101 1-6-95 403006	5	5	V. STIFF, (10Y 5/1) GREENISH GRAY SANDY (FINE) poorly graded) CLAY, TRACE FINE (1/8") SUBROUND GRAVEL, MED. PLASTICITY, MOIST	CL	2.0	2" O.D. SPLIT SPOON

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
psi = pounds per square in
SPT = Standard Penetration Test

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

000485

FEMP QA 13 3+6 45

118

FEMP

LITHOLOGIC LOG

CONTROL NO: 200307-11476-015	PAGE 8 OF 8
PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07

BORING NUMBER: 11476	COORDINATES:	RELATED FAL NO.s:

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 1	DATE:	TIME:	DATE COMPLETED:

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 25.0	403012	9	6	V. STIFF, (10Y 5/1) greenish gray SANDY (fine, poorly graded) Clay with fine (1/2") gravel, med. plasticity, moist	CL	2.0	MT_B = 2.7 ppm MT_S = 2.9 ppm B_γ = 120 cpm
25.5	~~1101 RE~~ ~~1-6-95~~ ~~403008~~	18	6	SAA	CL	3.0	#403006 is for Geotech Lab. #403012 is for FEMP Archive
26.0	1305 1-6-95 403007	22	6	~~HARD STIFF~~ (10Y 5/1) Greenish Gray Sandy Clay, Few gravel (fine - 1/2" subround), low plasticity, moist	CL		2" OD Split Spoon #403007 & 403008 are for FEMP Archive
26.5		25	6	DENSE, (10Y 5/1) Greenish gray clayey sand (fine, poorly graded) to gravelly (fine - 3/4" to coarse 1.6" subangular) SAND (FINE to Coarse, well graded), Low to No plasticity, Dry	SW-SC		MT_B = 5.7 ppm MT_S = 6.9 ppm B_γ = 70 cpm
27.0	1305 1-6-95 403008	24	6	SAA	SW-SC		SAND and Gravel 26.2 to 27ft (Dry)
27.5	1316 1-6-95 403009	50	6	V. DENSE, (10Y 5/1) Greenish gray Clayey Sand (fine, poorly graded) low to no plasticity, dry, trace fine (1/4") subrounded gravel	SC	2.0	2" OD SPLIT SPOON REFUSAL
28.0			0	BOTTOM OF BORING = 27.8 feet			AT 27.3' #403009 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

200307-11477-098
~~200307-EFO-0010~~ 2/8/95

FEMP OA 13

CONTROL NO.: ~~200307-EFO-000~~

FEMP LITHOLOGIC LOG

PAGE 1 OF 11

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11477	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL: 23.54 (bls) DATE: 12-22-94 TIME: 1317
DATE STARTED: 12-22-94	GEOLOGIST: A. COUCH, K. ERNST
GROUNDWATER LEVEL:	DATE: TIME:
DATE COMPLETED: 12-22-94	WATER USED DURING DRILLING: NONE
DRILLING CONTRACTOR: ALLIANCE ENV., INC.	DRILLING EQUIPMENT: HSA MOBILE-DRILL B-59 (1993)
DRILLER / HELPER: Bob Erikson / Dave Newman	

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	0824 12-22-94 402862	2	0				2" OD SPLIT SPOON
0.5		3	6	VERY STIFF, (10YR 4/6) Dark Yellowish Brown SILTY CLAY, GRASS, ROOTS MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.25	MT_B = 0 PPM MT_S = 0 PPM $B\gamma$ = 60 CPM
1.0		5	6	VERY STIFF, (10YR 5/4) Yellowish Brown SILTY CLAY, TRACE FINE (1/8") Subround gravel, Trace Black organic material, slightly mottled, roots, Low to medium Plasticity, Slightly moist	CL	2.0	#402862 = FEMP Archive Sample
1.5	0829 12-22-94 402863	6	6 1.5	MEDIUM STIFF (10YR 5/4) Yellowish Brown SILTY CLAY, Trace Fine (1/4") SUB-ANGULAR GRAVEL, roots, MED. PLASTICITY, SLIGHTLY MOIST	CL	0.75	2" OD SPLIT SPOON
2.0	402888	6	6	VERY STIFF, (10YR 4/3) Brown SILTY CLAY, SLIGHT IRONSTAINING, TRACE BLACK organic material, Low Plasticity, SLIGHTLY MOIST	CL	2.5	MT_B = 0 PPM MT_S = 0 PPM $B\gamma$ = 60-80 CPM
2.5		9	6	VE STIFF, (10YR 4/3) BROWN SILTY CLAY, IRON STAINING, TRACE BLACK ORGANIC MATTER, SLIGHTLY MOTTLED MED. Plasticity, SLIGHTLY MOIST	CL	2.0	#402 888 = FEMP Archive Sample #402 863 = Geotech Lab Sample
3.0							Augured interval only — No sample
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0 PPM	12-22-94	0824
ALPHA	N/A	N/A	N/A
BETA / GAMMA	60-80 CPM	12-22-94	0824

NOTES:
MT_B = MICROTIP BACKGROUND READING (PPM)
MT_S = MICROTIP SAMPLE READING (PPM)
$B\gamma$ = Beta-Gamma Fisher Reading from Sample (CPM)
Colors identified using (Cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

000467

FEMP OA 13

CONTROL NO.: 200307-11477-004

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11477	COORDINATES: / RELATED FAL NO.s:
SURFACE ELEVATION:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: SEE GEI / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	0925 12-22-94 402864		31.5				3" OD SHELBY-TUBE PUSHED 30" AT 600 PSI
4.0	402865						SHELBY-TUBE BOLTS sheared OFF FROM SAMPLING ROD. TUBE WAS PULLED USING
4.5							WINCH AND CABLE. Probable Drill slough in TOP OF tube SAMPLE 402865 for ANA
5.0							MTB = 0.0 PPM MTS = 0.0 PPM Br = 80 CPM
5.5							*402864 = Geotech Laboratory
				(10 YR 6/6) Brownish yellow CLAYEY SAND, (SAND-FINE GRAINED, POORLY sorted), LOW to NO plasticity, wet	SC		Description from Bottom face of Shelby-Tube wet at bottom
6.0	0940 12-22-94 402867	2	2	STIFF, (10YR 4/4) Dark yellowish Brown SANDY CLAY, TRACE FINE (1/8") Subround gravel, (SAND-FINE, poorly sorted), Low plasticity, wet	CL	1.5 1.5 NC	2" O.D SPLIT SPOON
6.5		4	6	LOOSE, (10 YR 5/6) Yellowish Brown clayey sand, slightly moisted low plasticity, wet	SC	0.5	MTB = 0 PPM MTS = 0 PPM Br = 80 CPM
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: MUNSELL COLOR CHART FOR SOILS. CONSISTENCY MEASURED USING POCKET PENETROMETER, UNLESS OTHERWISE NOTED. DENSITY DETERMINED FROM SPT BLOW COUNT. SOIL (Cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94

200307-11477-010

FEMP CA 13

CONTROL NO.: ~~200307-11477-005~~ RP 2995

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11477

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: SEE PAGE 2

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
							#402867 = FEMP Archive Sample
7.0 – 7.5		5	6	SAA, Trace Fine (1/4") Subroundgravel, wet Iron Staining		Ø.25	SANDY ZONE AC FREE WATER #402866 is Bulk Sample from 3.5-7.5'
7.5 – 8.0	0944 12-22-94 402870	3	6	SAA MEDIUM DENSE,		Ø.5	2" OD SPLIT SPOON #402870 = FEMP Archive #402868 = Geotech lab
8.0 – 8.5	0944 12-22-94 402868*	7	6	(10 YR 5/6) Yellowish Brown Clayey Sand ~~with~~ AC WITH GRAVEL Low to No Plasticity FINE (1/4") subangular to subround WET (SAND-FINE to coarse)	SC	0	Gravel zone 8.3-8.5 Free water MT1 = 0.0 PPM MT2 = 0.0 PPM BZ = 0.0 PPM
8.5 – 9.0	↓	7	6	SAA, Gravel throughout WET		0	Gravel zone Free water * SAMPLE 402868 is 8.3-9.0' interval
9.0 – 9.5	0949 12-22-94 402869	14	6	SAA		<Ø.25	2" OD SPLITSPOON MT1 = 0.0 MT2 = 0.0 BZ = 40
9.5 – 10.0		46	6	DENSE, (10 YR 5/4) Yellowish Brown CLAYEY GRAVEL WITH SAND (FINE to COARSE), LOW PLASTICITY, WET (GRAVEL-FINE (1/2") SUBANGULAR to SUBROUND)	GC	<Ø.25	GRAVEL ZONE FREE WATER
10.0 – 10.5		14	6	MED DENSE, (10 YR 5/4) Yellowish Brown CLAYEY SAND (FINE to medium) WITH FINE (1/4") to coarse (1 3/4") sub-angular to subround gravel, low plast. WET	SC	Ø.5	#402869 = FEMP Archive Sample FREE WATER

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: DESCRIPTIONS AND USCS SYMBOLS PER ASTM D-2488 GUIDELINES. SAMPLES COLLECTED PER ASTM D-1586 AND D-1587. SPLIT-SPOON SAMPLERS EQUIPPED WITH

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

200307-11477-011

CONTROL NO.: ~~200307-11477-006~~ KB 2-9-95

FEMP QA 13 5-15-95

FEMP LITHOLOGIC LOG

PAGE 4 OF 11

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11477	COORDINATES:
RELATED FAL NO.:	
SURFACE ELEVATION: ~~11477~~ AR	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 1
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	1001 12-22-94 402871	9	6	MED. DENSE, (10 YR 5/6) Yellowish Brown CLAYEY SAND (FINE to MED) WITH FINE (1/2") subangular to subround gravel low plasticity, wet	SC	Ø.5	2" OD SPLIT SPOON
11.0		12	6	MED. DENSE (2.5 Y 5/4) LIGHT OLIVE BROWN ~~SANDY~~ CLAYEY SAND (FINE) TRACE FINE (1/8") subround gravel, low plasticity, wet to MOIST	SC	1.5	0.0 ppm = MT_B 0.0 ppm = MT_S 60-100 = $B\gamma$
11.5		14	6	VERY STIFF (2.5 Y 5/1) gray SILTY CLAY WITH FINE (1/8") sub angular gravel, low to MED. plasticity, MOIST	CL	3.75	*402871 = FEMP Archive Sample
12.0	1009 12-22-94 402872	8	6	STIFF, (5 Y 4/1) Dark gray SANDY CLAY WITH FINE (1/2") Subround gravel (SAND-FINE), Low to MED plasticity MOIST	CL	1.0	2" OD SPLIT-SPOON
12.5		14	6	STIFF, (5Y 4/1) Dark gray SANDY CLAY WITH FINE (1/2") to Coarse (1 1/2") subangular gravel, Low plasticity SLIGHTLY MOIST	CL	1.75	MT_B = 0.0 ppm MT_S = 0.0 ppm $B\gamma$ = 60 cpm
13.0		17	6	VERY STIFF, (10Y 4/1) Dark gray SILTY CLAY WITH FINE SAND, TRACE FINE (1/4") subangular gravel, Med. Plasticity, SLIGHTLY MOIST	CL	2.5	*402872 = FEMP Archive Sample
13.5							AUGERED INTERVAL ONLY - NO SAMPLE COLLECTED
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: BASKET RETAINERS (TRAPS). 2" O.D. STANDARD SPLIT-BARREL (SPOON) SAMPLERS USED.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000170

200307-11477-012

CONTROL NO.: ~~200307-11477-007~~ FP 2995

FEMP

LITHOLOGIC LOG

PAGE 5 OF 11

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11477

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL 1 SEE PAGE 1

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	1033 12-22-94 402873		28				3" OD Shelby tube Pushed 30" At 600PSI
14.5	402875						Wet brown Clayey sand Drill slough IN top
15.0							MTD = 0.0 ppm MTS = 0.0 ppm B,γ = 60 cpm
15.5							# 402874 is bulk sample from 14-18' # 402875 is Fend Ammonia from bottom of shelby tube
16.0				(5Y 4/1) Dark GRAY SILTY CLAY, TRACE FINE (1/2") GRAVEL (subangular), MED Plasticity, SLIGHT moist	CL		DESCRIPTION FROM BOTTOM FACE of shelby Tube
16.5	1047 12-22-94 402876	10	1.5	STIFF, (5Y 4/1) Dark GRAY SANDY (FINE) CLAY WITH FINE (1/4") SUBANGULAR to SUBROUND GRAVEL, LOW to MED PLASTICITY, MOIST	CL	0.5	2" OD SPLIT SPOON INSIDE OF SPOON Wet - Free
17.0		10	6	SAA		1.25	WATER FROM ABOVE MTD = 0.0 ppm MTS = 0.0 ppm Bγ = 60 cpm
17.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

000471

200307-11477-013

118

CONTROL NO.: ~~200307-11477-008~~ 1-8-95

FEMP

LITHOLOGIC LOG

PAGE 6 OF 11

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.:

BORING NUMBER: 11477

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

SEE PAGE 1

GEOLOGIST:

GROUNDWATER LEVEL: DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0		16	6	SAA		1.75	#402876 = FEMP Archive Sample
18.0 – 18.5	1052 12-22-94 402877	6	6	STIFF, (5Y 4/1) DARK GRAY SANDY (FINE to MEDIUM) CLAY WITH FINE (1/2") SUBROUND to subangular gravel, LOW PLASTICITY, MOIST	CL	0.75	2" OD SPLIT SPOON
18.5 – 19.0		9	6	SAA		1.5	INSIDE OF SPOON contained Free water from above
19.0 – 19.5		12	6	STIFF, (5Y 4/1) DARK GRAY SANDY (FINE) CLAY, TRACE FINE (1/8") Subangular gravel, LOW PLASTICITY, MOIST	CL	1.5	# 402877 is FEMP Archive Sample
19.5 – 20.0							AUGERED INTERVAL ONLY - NO SAMPLE
20.0 – 20.5	1108 12-22-94			NO RECOVERY			3" OD SHELBY TUBE
20.5 – 21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

000472

200307-11477-014

FEMP QA 13 2-9-95

CONTROL NO.: ~~200307-11477-009~~ 2-9-95

FEMP
LITHOLOGIC LOG

PAGE 7 OF 11

PROJECT NAME: OU-2 PREDESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11477	COORDINATES: / RELATED FAL NO.s:
SURFACE ELEVATION:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 2 / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0							
21.5							
22.0							
22.5	1121 12-22-94 878 402~~780~~ 78	9	2.5	SOFT, (5Y 4/1) Dark gray SILTY CLAY, Trace FINE (1/8") subangular gravel, MED plasticity, MOIST	CL	0.25	2" OD SPLIT SPOON MTB = 0.0 ppm MTJ = 0.0 ppm BX = 50 cpm
23.0	1121 12-22-94 879 402~~784~~	12	6	MED. DENSE (5Y 4/1) Dark gray CLAYEY SAND (FINE to MEDIUM), Trace Subangular fine (1/8") gravel, NO to Low plasticity, MOIST TO WET	SC	1.25	* 402878 is sample from 22 to 22.5' for geotech lab 402879 is sample from 22.5 to 23.5'
23.5	*	8	6	MED. DENSE, (5Y 4/1) Dark gray SAND WITH CLAY (SAND-FINE, poorly sorted) NO to Low plasticity, WET	SP-SC	<0.25	SAMPLE for 402~~789~~ geotech lab SAND 879 WET SAND ZONE
24.0							Auscered interval ONLY - no sample COLLECTED
24.5	1130 12-22-94 880 402~~790~~		24				SHELBY-TUBE pushed 30" at 600 PSI

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881 G: / WPSC / 94-776.DRW (11-23-94)

200307-11477-015

FEMP OA 13 2-13-95

118

CONTROL NO.: ~~200307-11477-010~~ KP 2-9-95

FEMP
LITHOLOGIC LOG

PAGE 8 OF 11

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11477	COORDINATES: / RELATED FAL NO.s:
SURFACE ELEVATION:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 3 / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 25.0							Sample 881 402~~7~~ For Archive - bottom of tube
25.5							# 402890 Geotech Lab Sample
26.0							M_{TD}=0.0 ppm M_{TS}=0.0 ppm $B\gamma$=80 cpm
26.5				(5GY 4/1) Dark Greenish gray SILTY CLAY WITH FINE SAND, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	M ~~Ct~~	DESCRIPTION FROM BOTTOM FACE of SHELBY TUBE
27.0	1139 12-22-94 402882	6		STIFF (10Y 4/1) Dark greenish gray sandy (FINE) clay WITH FINE (1/8") subangular gravel, Low to MED. PLASTICITY, MOIST to WET	CL	L Ø.25	2" OD SPLITSPOON
27.5		10		SAA		1.5	M_{TD} = 0 ppm M_{TS} = 0 ppm $B\gamma$ = 80 cpm
28.0		14		SAA		2 '0	# 402882 is FEMP Archive Sample

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000474

FEMP QA 13

CONTROL NO.: 200307-11477-01b

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 Predesign Field Investigation			PROJECT NO.: 20.03.07
BORING NUMBER: 11477	COORDINATES:	RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1	DATE:	TIME:	DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:	

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0	1150 22 12-~~20~~-94 KE 402893	12	6	Stiff, silty (10 Y 4/1) Dark Greenish gray sandy clay with fine (1/8") subangular gravel, wet	CL	1.0	2" O.D. Split Spoon
28.5		15	6	SAA		1.0	M_{T_B}=0.0 ppm M_{T_L}=0.0 ppm B,γ=70 cpm
29.0		18	6	SAA		1.5	#402893 is FEMP Archive
29.5	~~11-5-92~~ 1155 KE 12-22-94 402884	8	0	Med Stiff, (10 Y 4/1) Dark greenish gray, silty, sandy clay with trace fine subangular gravel (sand is medium to fine grained), medium plasticity, wet		~~1.0~~ KE	SPLIT SPOON, 2" O.D. WATER IN TOP OF BARREL
30.0		11	6	— —	CL	0.5 ~~1.0~~ KE	#402884 is FEMP Archive M_{T_B}=0.0 ppm (sample) M_{T_L}=0.0 ppm Br 80 cpm
30.5		15	5	SAA		1.0	
31.0							AUGERED THIS INTERVAL NO SAMPLES
31.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

200307-11477-17

FEMP QA 19 2-15-95

118

CONTROL NO.: ~~200307-11477-012~~ KP 2-9-95

FEMP
LITHOLOGIC LOG

PAGE 10 OF 11

PROJECT NAME: OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11477	COORDINATES: / RELATED FAL NO.s:
SURFACE ELEVATION:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 1 / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS 3" OD
31.5	1209 12-22-94 402885		23.5				Shelby Tube 600 PSI 30" push
32.0	402886						Bottom of tube slightly crimped
32.5							0.0 0.0 70 # 402885 is Geotech Lab Sample
33.0							# 402886 is FEMP Archive from bottom of shelby tube
33.5	1209			~~Stiff~~ (10Y 4/1) Dark greenish gray, silty clay with trace of fine subangular gravel, moist to wet, few sand (sand is fine grained)	CL		Description from bottom of tube
34.0	1215 402887	7	6	STIFF, (10Y 4/1) Dark greenish gray, silty clay with trace fine to coarse sand, trace subangular fine gravel (1/4" max), medium plasticity, moist	CL	1.5	# 402887 is Geotech Lab Sample
34.5	402889	11	6	Stiff, (10Y 4) Dark greenish gray silty clay with trace fine to coarse sand, few subangular fine gravel (3/4" max) medium plasticity, moist	CL	1.25	# 402889 is FEMP Archive Sample
35.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

000476

FEMP QA 19 2/15/95

CONTROL NO.: 200307-11477-018

FEMP

LITHOLOGIC LOG

PAGE 11 OF 11

PROJECT NAME: OU-2 PREDESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11477	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL: SEE PAGE 2
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0		14	6	Stiff (10 Y 4/1) Dark greenish gray, silty clay with medium to fine sand, trace fine subangular gravel (½" max), medium plasticity, moist	CL	1.25	
35.5				BOTTOM OF BORING = 35.5'			
36.0							
36.5							
37.0							
37.5							
38.0							
38.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

000477

200307-11478-003

118

CONTROL NO.: ~~200307-EFO-0011~~ 2/8/95

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Predesign Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11478	COORDINATES: N482103.610 E1382760.688
RELATED FAL NO.s: 200307-11478-001 [-002 I-053 I-054	
SURFACE ELEVATION: 601.35	GROUNDWATER LEVEL: Dry
DATE: 12-19-94	TIME: 1300
DATE STARTED: 12-16-94	
GEOLOGIST: A. Couch (12-16-94)/K. Ernst (12-19-94)	GROUNDWATER LEVEL:
DATE:	TIME:
DATE COMPLETED: 12-19-94	
WATER USED DURING DRILLING: None	DRILLING CONTRACTOR: Alliance Environmental
DRILLING EQUIPMENT: Mobile B-59 / HSA	DRILLER / HELPER: B. Erickson/D. Newman

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	0917 12-16-94 #402789	3	6	Medium stiff, (10YR 4/3) brown silty clay, roots, grass, iron staining, low to medium plasticity, slighty moist	CL	1.0	Split Spoon MTB = 1.7ppm MTS = 1.6ppm B-γ = 80cpm
0.5		4	2.5	Medium stiff, (10YR 4/3) brown silty clay, iron staining, low to medium plasticity, slightly moist	CL	1.0	
1.0		4	–				#402789 = FEMP Archive Sample
1.5	0922 12-16-94 #402790 #402791	3	6	Stiff, (10YR 5/6) yallowish brown clay, trace coarse sand, roots and organic material, mottled, low plasticity, slightly moist	CL	1.5	Split Spoon MTB = 2.2 ppm MTS = 3.5 ppm B-γ = 80 cpm
2.0		4	6	SAA		1.5	
2.5		5	–				#402790 = Geotech Lab Sample #402791 = FEMP Archive Sample
3.0							Augered Interval only – No Samples collected
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	Fluctuating	12-16-94	0830
ALPHA	N/A	N/A	N/A
BETA/GAMMA	60-80 cpm	12-16-94	0830

NOTES:
MTB = Microtip background reading
MTS = Microtip sample reading
B-γ = Beta-gamma friskar reading from sample
Colors identified using (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP CA 21 FEB 24 1995

000478

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11478-004

PROJECT NAME: OU-2 Predesign Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11478	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

See Page 1

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	0949 12-16-94 #402792		30				Shelby Tube MT_B = 0.2 ppm MT_S = 1.3 ppm B-γ = 80 cpm
4.0							slough at top of tube, bottom of tube Dent slightly
4.5							3" O.D. shelby Tube - 30"
5.0							#402792 = Geotech Lab Sample
5.5				(2.5 Y 5/4) Light olive brown silty clay with fine subangular gravel, trace sand, low plasticity	CL		Bottom of Shelby Tube was described
6.0	1000 12-16-94 #402793 #402794	7	3	Stiff, dark yellowish brown silty clay, trace fine gravel, low plasticity, moist (10 YR 4/4)	CL	1.75	Split Spoon MT_B = 0.0 MT_S = 90ppm Peak B-γ = 60-80 cpm
6.5		11	6	Stiff (10 YR 4/4) dark yellowish brown silty clay with coarse angular gravel, low plasticity, moist	CL	1.75	#402793 = Environ Lab Sample #402794 = FEMP Archive Sample
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Page 1 of 10		
ALPHA			
BETA / GAMMA			

NOTES: Munsell color chart for soils. Consistency measured using pocket penetrometer, unless otherwise noted. Density determined from SPT blow (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST. (SPT)

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP CA 31

FEB 24 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11478-005

PAGE 3 OF 10

PROJECT NAME: OU-2 Predesign Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11478

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST: See Page 1

GROUNDWATER LEVEL: DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5		12	4	Stiff, (10 YR 4/4) dark yellowish brown silty clay, trace fine angular gravel, low plasticity, moist, red staining	CL	2.0	#402796 = Bulk Sample of Auger Cuttings from 3.5'-7.5' for Geotech Lab
7.5 – 8.0	1006 12-16-94 #402795	6	6	Very stiff (10YR 4/4) dark yellowish brown silty clay, trace fine angular gravel, low plasticity, moist	CL	2.0	Split Spoon MTB = 2.4 ppm MTS = 259 ppm B-γ = 60cpm
8.0 – 8.5		9	6	SAA		2.0	Shut down due to PID readings at 1016 Rain at 1025
8.5 – 9.0		20	6	SAA		2.0	#402795 = FEMP Archive Sample
9.0 – 9.5	1008 12-16-94 #402797	6	6	Very stiff (10 YR 4/4) dark yellowish brown silty clay, trace fine angular gravel, low plasticity, moist, some red staining	CL	2.0	Split Spoon MTB = 0.49 ppm MTS = 1.1 ppm B-γ = 60 cpm
9.5 – 10.0		8	6	SAA		2.0	
10.0 – 10.5		11	6	SAA		2.0	#402797 = FEMP Archive Sample

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.9 ppm	12-19-94	0800
ALPHA	—	—	—
BETA / GAMMA	50 cpm	12-19-94	0800

NOTES: count. Soil description and USCS symbol per ASTM D 2488 guidelines. Samples collected per ASTM D 1586 and D 1587. Split spoon sampler, equipped (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94

FEMP QA 21

FEB 24 1995

000480

CONTROL NO.: 200307-11478-006

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Predesign Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11478

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED:

GEOLOGIST: See Page 1

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	0821 12-19-94 #402798 #402814	7	6	Very stiff, (10 YR 4/4) dark yellowish brown clay, trace fine angular gravel, medium plasticity, moist	CL	2.25	Split Spoon MTb = 18.2 ppm MTs = 22.3 ppm B-γ = 80 cpm
11.0 – 11.5		12	6	SAA		2.25	
11.5 – 12.0		16	6	SAA		2.25	#402798 = G[illegible] Lab Sample #402814 = FEMP Archive Sample
12.0 – 12.5	0836 12-19-94 #402799	4	6	Very stiff, (10 YR 5/4) yellowish brown clay, medium plasticity, moist	CL	2.0	Split Spoon MTb = 15.9 ppm MTs = 16.2 ppm B-γ = 60 cpm
12.5 – 13.0		7	6	SAA		2.0	
13.0 – 13.5		12	4	very stiff, (10 YR 5/4) yellowish brown clay with sand, trace fine angular gravel, wet	CL	2.0	#402799 = FEMP Archive Sample
13.5 – 14.0	0845 12-19-94 #402800	4	6	Medium stiff, (10 YR 5/4) yellowish brown clay, some fine angular gravel, medium to high plasticity, wet	CL/CH	0.5	Split Spoon MTb = 23.6 ppm MTs = 24.8 ppm B-γ = 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: with basket retainers. 2" O.D standard split barrel (spoon) samplers used for SPT with[illegible] liners. Additional general notes on Field operations (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA FEB 24 1995

CONTROL NO.: 200307-11478-007

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 Predesign Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11478	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST: see Page 4	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5		30/2"	–				
14.5 – 15.0			–				# 402800 = FEMP Archive Sample
15.0 – 15.5	0855 12-19-94 ~~#402800~~ 402801	4 4 6	6	Medium stiff, (10 YR 5/6) yellowish brown clay, trace sand, trace fine angular gravel, low to medium plasticity, moist	CL	0.5	Split Spoon MT_D = 24.8 ppm MT_S = 25.0 ppm β-γ = 80 cpm
15.5 – 16.0		7	6	SAA		0.5	
16.0 – 16.5		10	3	Stiff, (2, 4/10B) dark bluish gray clay, medium plasticity, moist	CL	1.5	# 402801 = FEMP Archive Sample
16.5 – 17.0	0900 12-19-94 #402802	4	6	Stiff, (2, 5/5BG) greenish gray clay, medium plasticity, trace fine angular gravel, moist	CL	1.75	Split Spoon # 402802 MT_D = 28.4 ppm MT_S = 30.1 ppm β-γ = 60 cpm
17.0 – 17.5		7	6	SAA		1.75	

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: is contained in PARSONS Field Book (PO 132-1)

SAA = same as above

N/A = Not Applicable

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA FEB 24 1995

CONTROL NO.: 200307-11478-008

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Predesign Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11478	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR: / DRILLING EQUIPMENT: / DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5		9	6	SAA			#402802 = FEMP Archive Sample
18.0							Augered the 18.-18.5' interval
18.5	0920 12-19-94	50/2"	–	Bottom of attempted Shelby tube: (2, 5/5B) bluish gray clay, 2½" dia., subrounded piece of gravel, and few coarse gravel	CL GP		Pushed Shelby tube. After 2" of push, experiences resistance and rig began to lift
19.0							Attempted split spoon at depth 18.7' Blows were 50/2" No sample recovery
19.5				Augered from 18.8' to 20'			& inside of spoon was wet No samples this interval
20.0	0934 12-19-94 #402803 #402804	9	6	Stiff, (2, 6/5B) bluish gray clay with gravel, medium plasticity, moist		1.5	Angular gravel, Max dimension ~3/4"
20.5		13	6	V. Stiff (2, 5/5BG) greenish gray sandy clay, medium to high plasticity, moist	CL/CH		MTB = 0.9 ppm MTS = 2.0 ppm B-γ = 50 cpm
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

000483

FEB 24 1995

CONTROL NO.: 200307-11478-009

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11478	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21 – 21.5		16	6	SAA			Thin sliver of sample along bottom 12" of split spoon, not enough for pocket pen. test. Note ①
22.0	0947 12-19-94 #402805 #402815	15	6	Stiff, (2.5/5BG) greenish gray silty clay, trace fine angular gravel and fine sand, low to medium plasticity, moist	CL	1.5	Split Spoon MT_b = 7.3 ppm MT_s = 9.5 ppm B-γ = 60 cpm
22.5		14	6	Hard, (2,5/10G) greenish gray silty clay, trace coarse sand and fine gravel, low to medium plasticity, moist	CL	>4.5	
23.0		17	6	SAA			#402805 = Geotech Lab Sample #402815 = FEMP Archive Sample
23.5	1007 12-19-94 #402806	19	6	Medium Stiff, (2, 4/10G) dark greenish gray silty clay with sand, medium to high plasticity, wet	CL/CH	0.75	Split Spoon MT_b = 8.6 ppm MT_s = 8.8 ppm B-γ = 60 cpm
24.0		14	6	Hard (2,4/10G) dark greenish gray silty clay with sand and fine to coarse angular gravel, medium plasticity, ~~moist~~ wet (max. gravel size 1")	CL	>4.5	
24.5		17	6	Hard, (2,4/10G) dark greenish gray silty clay with sand, trace fine gravel, medium plasticity, moist	CL	>4.5	#402806 = FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
① #402803 = Environmental Lab Sample, #402804 is FEMP Archive Sample; consistency for bottom 12" of interval assigned by SPT blow count.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 31

FEB 24 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11478-010

PROJECT NAME: OU-2 Pre-design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11478

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: DATE: TIME: DATE COMPLETED:

See Page 1

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5							
25.0	1023 12-19-94 #402807 #402816	10	6	Very stiff, (2, 4/10G) dark greenish gray silty clay, trace to few coarse sand and fine gravel, low plasticity, wet	CL	4.0	Split Spoon $MT_b = 6.6$ $MT_s = 6.8$ B-γ = 60 cpm
25.5		10	6	Top 3" of this interval: SAA Bottom 3": Medium dense, (10YR 4/1) dark gray, clayey, fine to medium, ~~Munsell graded~~ sand, moist	SC		
26.0		17	-				#402307 = Geotech lab sample #402816 = FEMP Archive Sample #402808 = Rinse Sample
26.5	1040 12-19-94 #402809	17	6	Top 4" of interval: Hard, (10 YR 4/1) dark gray silt, trace fine gravel and coarse sand, no to low plasticity, moist Bottom 2": Hard, (10 YR 3/1) very dark gray silt with blotches of black, no to low plasticity, moist, trace fine to coarse gravel	ML	74.5	
27.0		15	6	Very stiff (10 YR 3/1) very dark gray silt with blotches of black, no to low plasticity, moist	ML	3.0	
27.5		15	6	SAA		2.75	#402809 = FEMP Archive Sample
28.0							Augered this interval

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881 000485

FEMP QA 21

G:/WPSC/94-778.DRW (11-23-94)

1995

FEMP

LITHOLOGIC LOG

PAGE 9 OF 10

NO.: 200307-11478-011

PROJECT NO.: 20.03.07

PROJECT NAME: OU-2 Pre-design Field Investigation

RELATED FAL NO.s:

BORING NUMBER: 11478

COORDINATES:

DATE STARTED:

GROUNDWATER LEVEL: DATE: TIME:

SURFACE ELEVATION:

DATE COMPLETED:

GROUNDWATER LEVEL: See Pg 5 DATE: TIME:

GEOLOGIST:

DRILLER / HELPER:

DRILLING EQUIPMENT:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28	1104 12-19-94						Shelby Tube (3" O.D) 30" push
28.5							MTb = 1.2 ppm MTS = 1.9 ppm B-γ = 60 cpm
29							Shelby tube flattened through entire length
29.5							pushed - No Sample
30.0							
30.5	1121 12-19-94 #402810 #402817	9	6	Top 3" of this interval: Medium stiff (10 YR 4/1) dark gray clayey silt with sand, low plasticity, moist. Bottom 3": Medium dense (10 YR 4/2) dark grayish brown clayey fine sand, moist	ML SC	0.5	Split Spoon MTb = 1.8 ppm MTS = 2.2 ppm B-γ = 60 cpm
31.0		10	6	SAA			
31.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TI

G:/WPSC/94-778.DRW (11-23-94)

FEMP CA 31 1995

000486

CONTROL NO.: 200307-11478-012

FEMP

LITHOLOGIC LOG

PAGE 10 of 10

PROJECT NAME:	OU-2 Pre-Design Field Investigation
PROJECT NO.:	20.03.07
BORING NUMBER:	11478
COORDINATES:	
RELATED FAL NO.:	
SURFACE ELEVATION:	
GROUNDWATER LEVEL:	
DATE:	
TIME:	
DATE STARTED:	
GEOLOGIST:	
GROUNDWATER LEVEL:	See page 5
DATE:	
TIME:	
DATE COMPLETED:	
WATER USED DURING DRILLING:	
DRILLING CONTRACTOR:	
DRILLING EQUIPMENT:	
DRILLER / HELPER:	

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5 – 32.0		11	6	SAA			#402810 = Geotech Lab Sample #402817 = FEMP Archive Sample
32.5	1132 12-19-94 #402811	11	6	Very stiff, (10 YR 4/1) dark gray sandy, silty clay, low plasticity, moist		2.5	Split Spoon MT_D = 0.0 MT_S = 1.6 B-γ = 60 cpm
33.0		14	6	SAA		2.5	
33.5	1145	18	6	SAA		2.5	#402811 = FEMP Archive Sample
34.0	1145 12-19-94 #402812 #402818	7	6	Very stiff (10 YR 4/1) dark gray sandy, silty clay, low plasticity, some iron staining, some mottled green areas, moist	CL	3.0	
34.5		10	6	SAA		2.0	
35.0		14	6	SAA BOTTOM OF BORING = 35.0'		2.5	#402812 = Geotech Lab Sample #402818 = FEMP Archive Sample

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000487

FEB 24 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11479-008	PAGE 1 OF 12
PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11479	COORDINATES: N482090.764 E1382464.703
RELATED FAL NO.: 200307-11479-004 thru 200307-11479-007	
SURFACE ELEVATION: 602.56	GROUNDWATER LEVEL: 25.7' bls; DATE: 1-9-95; TIME: 1600; DATE STARTED: 1-9-95
GEOLOGIST: K. Ernst	GROUNDWATER LEVEL: ; DATE: ; TIME: ; DATE COMPLETED: 1-9-95
WATER USED DURING DRILLING: None	DRILLING CONTRACTOR: Alliance Environmental; DRILLING EQUIPMENT: HSA Mobile Drill B-59 (1993); DRILLER/HELPER: B. Erickson/T. French

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	0928, 1-9-95, #403020	6	6	Hard, (10 YR 5/2) grayish brown silt, grass and roots, frozen	ML	>4.5	SPLIT-SPOON, 2" O.D. MTB = 2.9 ppm MTS = 3.8 ppm
0.5		6	6	Stiff, (10 YR 5/2) grayish brown silt, ~~gravel and~~ roots, low plasticity, moist	ML	1.0	B-γ = 50 cpm
1.0		7	1	Stiff, (10 YR 6/4) light yellowish brown silty clay, roots, trace iron staining, medium plasticity, moist	CL	2.0	# 403020 is for FEMP Archive
1.5	0930, 1-9-95, #403021, #403052,	5	6	Very stiff, (10 YR 5/4) yellowish brown silty clay, roots, trace iron staining, medium plasticity, moist, trace black organic material	CL	3.0	SPLIT-SPOON, 2" O.D. MTB = 2.0 ppm MTS = 4.4 ppm
2.0		6	6	SAA	CL	3.0	B-γ = 50 cpm
2.5		7	–				#403021 is for Geotech. Lab #403052 is for FEMP Archive
3.0							Augered 3-3.5'
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	2.4 ppm	1-9-95	0914
ALPHA		N/A	
BETA/GAMMA	50 cpm	1-9-95	0914

NOTES: Colors identified using Munsell Color chart for Soils (1994 Ed.). Consistency measured using pocket penetrometer unless other- (cont'd)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FEMP QA 21 FEB 21 1995

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11479-009

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11479

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0*	0952, 1-9-95 403022, 403023		30"				SHELBY TUBE, 3" O.D. 2.2' push @ 600 psi
4.5							MT_B = 1.0 ppm MT_S = 4.8 ppm B-γ = 50 cpm
5.0							#403022 is for Geotech Lab
5.5							#403023 is FEMP archive sample from end of tube (placed in jar)
6.0				(10 YR 5/4) yellowish brown silty clay, trace fine to medium sand, trace fine (3/8" max.) subangular gravel, low plasticity, moist	CL		Description is from bottom of tube
6.5	1006, 1-9-95, #403024	6	6	Med. Dense (10 YR 5/6) yellowish brown clayey silt, trace fine sand, trace fine (3/8" max.) subangular to subrounded gravel, low plasticity, moist	ML	4.0	SPLIT-SPOON, 2" O.D. MT_B = 1.4 ppm MT_S = 7.3 ppm
7.0		7	6	Med. dense, (10 YR 6/4) light yellowish brown clayey fine to coarse sand, trace fine (1/8" max.) subangular gravel, moist to wet	SC	0.5	B-γ = 50 cpm #403024 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Unless noted. Density of coarse-grained soils based upon SPT blow count. Soil description and USCS symbol per ASTM D (cont'd)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21 FEB 21 1995

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11479-010

PROJECT NAME: OU-2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11479	COORDINATES:
RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:
DATE:	TIME:
DATE STARTED:	
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1
DATE:	TIME:
DATE COMPLETED:	
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:
DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5		11	6	SAA	SC	0.5	#403048 is a bulk sample of auger cuttings from 3.5-7.5' for Geotech Lab
8.0	1009, 1-9-95, #403025	10	6	Very stiff, (10 YR 5/6) yellowish brown silty clay, trace fine (1/2" max.) subangular to subround gravel, trace iron staining, low plasticity, moist	CL	3.5	SPLIT-SPOON 2" O.D. MTB = 1.2 ppm MTS = 6.2 ppm
8.5		13	6	Very stiff (10 YR 5/6) yellowish brown silty clay, trace fine (1/8" max.) subround to subangular gravel, trace coarse sand, trace iron staining, low plasticity, moist	CL	3.0	B-γ = 50 cpm #403025 is for FEMP Archive
9.0		17	6	SAA	CL	4.0	
9.5	1020, 1-9-95, #403026	9	6	Very stiff, (10 YR 5/6) yellowish brown silty clay, trace fine (1/4" max.) subround to subangular gravel, trace medium sand, low plasticity, moist	CL	2.0	SPLIT-SPOON 2" O.D. MTB = 1.2 ppm MTS = 4.6
10.0		11	6	Very stiff, (10 YR 5/6) yellowish brown, grading in color to (5 GY 5/1) greenish gray silty clay, trace coarse sand, low plasticity, moist	CL	3.75	B-γ = 50 cpm #403026 is 9.5-10.5' portion of sample for FEMP Archive
10.5		13	6	Very stiff, (5 GY 5/1) greenish gray silty clay, trace fine (3/8" max.) fine subround gravel, low plasticity moist. (well graded, fine to med. sand at bottom 1/4" of interval).	CL	4.0	#403049 is bulk sample of auger cuttings from 7.5-10.5 for Geo. (Drum ~½ full) Lab

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: 248γ guidelines. Sampler collected per ASTM D 1586 and D 1587. Split-spoon (barrell) samplers equipped with basket retainers. Two (cont'd)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEB 21 1995 000490

CONTROL NO.: 200307-11479-011

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11479

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	1022, 1-9-95, #403027	8	3	Medium stiff, (10 YR 4/1) dark gray sandy clay (fine to medium sand) low plasticity, moist to wet	CL	0.75	SPLIT-SPOON, 2" O.D. MTB = 24 ppm MTS = 3.5 ppm
11.0		10	6	Top 3" of interval SAA — Medium dense, (10 YR 5/2) grayish brown sandy silt (fine to medium sand) low plasticity, moist	CL / ML	2.5	B-γ = 50 cpm #403027 is for FEMP Archive
11.5		13	6	SAA	ML	1.5	
12.0	1035, 1-9-95, #403028	7	6	Very stiff, (10 Y 5/1) greenish gray sandy clay (fine to coarse sand), trace fine (1/4" max.) subrounded gravel, low to med. plasticity, moist	CL	3.5	SPLIT-SPOON, 2" O.D. MTB = 3.2 ppm
12.5		10	6	Medium dense, (10 Y 4/1) dark greenish gray clayey silt, trace medium to coarse sand, trace fine subrounded to subangular gravel, low plasticity, moist	ML	2.0	MTS = 4.4 ppm B-γ = 50 cpm
13.0		12	6	Medium dense (10 Y 4/1) dark gray clayey fine to coarse sand, trace fine subround to subangular gravel, moist to wet	SC	0.5	#403028 is for FEMP Archive
13.5							Augered 13.5 - 14'
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: inch O.D. standard split-barrel samplers used, no liners.

MTB = Microtip (PID) reading on sample

(cont')

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11479-012

PAGE 5 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11479

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 3

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	1050, #403029, #403030, 1-9-95						SHELBY TUBE, 3" O.D. MTB = 2.4 ppm MTS = 4.6 ppm B-γ = 50cpm
14.5 – 15.0				(10 Y 4/1) Dark greenish gray clayey fine to coarse (1" max.) subangular to subround gravel with sand, wet	GC		12" push, 1200 psi See Note 1.
15.0 – 15.5	1053, 1-9-95, #403031	7	–				SPLIT-SPOON, 2" O.D. MTB = 2.9 ppm MTS = 3.5 ppm
15.5 – 16.0		16	4	Medium dense (10 Y 4/1) dark greenish gray clayey fine to coarse sand with fine (3/8" max) subround to subangular gravel, wet	SC		B-γ = 50cpm
16.0 – 16.5		11	6	SAA	SC		#403031 is for Pond Archive
16.5 – 17.0	1102, 1-9-95, #403032 #403033	8	6	Medium dense, (10 Y 4/1) dark greenish gray clayey fine to coarse sand, trace fine (1/8" max) subrounded to subangular gravel, wet	SC		SPLIT-SPOON 2" O.D. MTS = 2.7 ppm MTB = 3.8 ppm
17.0 – 17.5		4	6	Medium dense, (10 Y 4/1) dark greenish gray clayey fine to coarse sand, trace fine (3/4" max.) subround to subangular gravel, wet	SC		B-γ = 60cpm #403032 is from 16.5-17.5' for Geotech Lab

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: MTS = Microtip (PID) reading (ppb)

Note 1: Sample description is from soil extracted from bottom of tube (Jar # 403030). Shelby tube (cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

FEMP QA

G: / WPSC / 94-776.DRW (11-23-94)

FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11479-013

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.08.07

BORING NUMBER: 11479

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5		6	6	Stiff, (10Y 5/1) greenish gray silty clay, trace fine to coarse sand, trace fine (1/8" max.) subrounded gravel, low to med. plasticity, moist	CL	1.5	#403033 is from 17.5-18.0' for FEMP Archive
18.0							
							Augered 18-18.5'
18.5							
	1125, 1-9-95, #403034, #403035		20				SHELBY TUBE, 3" O.D.
19.0							30" push, 600 psi for 2.0', 650 psi last 0.5' of push
19.5							MTS = 3.5 ppm
20.0							MTS = 4.2 ppm B-γ = 50 cpm #403034 is for Geotech Lab, #403035 is for FEMP Archive
20.5							Tube creased inward about 3/8" on one side throughout length of push, bottom end bent inward ~3/4".
21.0				(5GY 5/1) greenish gray silty clay, trace fine (1/8" max.) subrounded gravel, low to medium plasticity, moist	CL		Description is from bottom of Shelby Tube

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: on sample (con'd)

Note 1 (cont'): #403033 not kept. Bottom (cutting edge) of tube bent over ~1.5", preventing sample (cont')

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11479-014

PAGE 7 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11479

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0 – 21.5	1138, 1-9-95, #403036	11		Medium stiff (10YR 5/1) greenish gray silty clay, trace fine to coarse sand, trace fine (3/8" max) subrounded to subangular gravel, medium plasticity, moist	CL	1.0	SPLIT-SPOON, 2" O.D. MTB = 3.3 ppm
22.0		9		SAA	CL	1.0	MTS = 4.6 ppm B-γ = 55 cpm
22.5		9		Medium stiff (10YR 5/1) greenish gray silty clay, trace fine to coarse sand, trace fine to coarse (1" max) subrounded to subangular gravel, medium plasticity, moist	CL	0.75	#403036 is for FEMP Archive
23.0							Augered 22.5-23'
23.5	1237, 1-9-95, #403037 ~~#403038~~		7.5				SHELBY TUBE, 3" O.D. 30" push @ 600 psi
24.0							MTB = 2.7 ppm MTS = 2.7 ppm B-γ = 90 cpm
24.5							#403037 is for Geotech Lab #403038 is jar from bottom of tube for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: B-γ = Beta-gamma radiation (Con'd)

Note 1 (con't): from entering tube.

#403030 is for FEMP Archive

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEB 21 1995

CONTROL NO.: 200307-11479-015

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation			PROJECT NO.: 20.03.07
BORING NUMBER: 11479	COORDINATES:	RELATED FAL NO.s:	
SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: see Page 2	DATE:	TIME:	DATE COMPLETED:
WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:	

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 35.0							
35.5				(5 GY 4/1) Dark greenish gray silty clay, trace fine (1/4" max.) subangular to subround gravel, low plasticity, moist	CL		Description is from bottom of Shelby Tube
36.0	1304, 1-9-95, #403039	7	6	Medium stiff (10 Y 4/1) dark greenish gray silty clay, trace coarse sand, trace fine (1/4" max.) subangular gravel, medium plasticity	CL	0.5	SPLIT-SPOON, 2" O.D. MTB = 2.7 ppm MTS = 4.3 ppm
36.5	#403053	11	6	Top 4" of interval: SAA. Bottom 2" of this interval: Med. stiff (10 Y 4/1) dark greenish gray silty clay, trace coarse sand with fine to coarse, subangular to subround gravel (1" max.)	CL	1.0	B-γ = 60 cpm
37.0		39	6	Med stiff, (10 Y 4/1) dark greenish gray silty clay, trace coarse sand, trace fine (1/2" max.) gravel, low plasticity, moist	CL	1.0	#403039 is for Geotech Lab #403053 is for FEMP Archive
37.5	1313, 1-9-95, #403040	6	6	Very stiff, (10 Y 4/1) dark greenish gray silty clay, trace coarse sand, trace fine gravel (1/2" max.) low plasticity, moist	CL	3.0	SPLIT-SPOON 2" O.D. MTB = 2.8 ppm MTS = 4.9 ppm
39.0		10	6	SAA	CL	2.0	B-γ = 50 cpm #403040 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
reading on sample
N/A = Not Applicable
SAA = Same as above
O.D. = Outer diameter
HSA = Hollow stem auger
(Cont'd)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 21

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 9 OF 12
200307-11479-016	

PROJECT NAME:	PROJECT NO.:
OU-2 Pre-Design Field Investigation	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11479		

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: See Page 1	DATE:	TIME:	DATE COMPLETED:

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0		13	6	SAA	CL	2.0	
28.5	1320, 1-9-95 #403041	6	6	Medium stiff, (10 Y 4/1) dark greenish gray silty clay, trace fine to medium sand, medium plasticity, moist to wet. medium dense,	CL	0.5	SPLIT-SPOON, 2" O.D. MT_B = 2.8 ppm
29.0		7	6	^ ~~stiff~~ (10 Y 4/1) dark greenish gray sandy silt, low to no plasticity, moist to wet	ML	2.0	MT_S = 4.6 ppm B-γ = 50 cpm
29.5		5	6	Medium dense, (10 Y 4/1) dark greenish gray clayey fine to coarse sand, low plasticity, wet	SC	0.5	#403041 is for FEMP Archive
30.0	1323, 1-9-95 #403042	2	–				SPLIT-SPOON, 2" O.D. MT_B = 2.7 MT_S = 4.4
30.5		5	–				B-γ = 60 cpm
31.0		2	6	Medium stiff, (10 Y 4/1) dark greenish gray clay, medium to high plasticity, moist to wet. 2" subrounded gravel piece in bottom of split spoon	CL	0.5	#403042 is for FEMP Archive
31.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
psi = pounds per square inch
SPT = Standard Penetration Test
bls = below land surface
(cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 21

FEB 21 1995

000496

CONTROL NO.: 200307-11479-017

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11479

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 2 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5 – 32.0	1336, 1-9-95, #403043	3	2	Soft, (10Y 4/1) dark greenish gray silty clay, medium to high plasticity, wet	CL	0.25	SPLIT-SPOON, 2" O.D. MT$_B$ = 3.0 ppm MT$_S$ = 5.3 ppm
32.0 – 37.5		3	6	Loose, (10Y 4/1) dark greenish gray clayey sand (fine to medium sand), wet	SC		B-γ = 70 cpm
37.5 – 33.0		6	6	Loose, (10Y 4/1) dark greenish gray clayey fine to coarse sand with fine (½" max) subround to subangular gravel, wet	SC		#403043 is for Geotech Lab #403054 is for FEMP Archive
33.5	1407, 1-9-95, #403044	6	6	Medium dense, (10Y 4/1) dark greenish gray clayey fine to coarse sand, wet	SC		SPLIT-SPOON 2" O.D. MT$_B$ = 3.0 ppm MT$_S$ = 17.5 ppm
34.0		12	6	Medium dense, (10Y 4/1) dark greenish gray clayey silt, trace fine (½" max.) subrounded gravel, low to no plasticity, moist	ML	4.0	B-γ = 55 cpm
34.5		17	6	Top 4" of interval: SAA Bottom 2" of interval: (10Y 4/1) dark greenish gray clayey fine to med. sand, trace fine subround to subangular gravel, moist	ML / SC	2.5	#403044 is for FEMP Archive
35.0	1415, 1-9-95, #403045, #403055	10	6	Top 2" of interval: SAA Dense (10Y 4/1) dark greenish gray clayey silt, trace fine to med sand, trace fine (½" max.) subrounded gravel, low to no plasticity, moist	SC / ML	1.5	SPLIT-SPOON 2" O.D. MT$_B$ = 5.0 ppm MT$_S$ = 41.1 ppm B-γ = 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
ppm = parts per million
cpm = counts per minute

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21

G: / WPSC / 94-776.DRW (11-23-94)

000497

FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11479-018

PAGE 11 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11479

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: see Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0 – 35.5		16	6	SAA	ML	2.5	#403045 is for Geotech. Lab
35.5 – 36.0		16	6	SAA	ML	2.5	#403055 is for FEMP Archive
36.0 – 36.5	1421, 1-9-95, #403046	5	6	Medium stiff, (10 Y 4/1) dark greenish gray sandy clay, trace fine (3/8") subrounded to sub-angular gravel, low plasticity, moist	CL	0.5	SPLIT-SPOON, 2" O.D. MTB = 8.2 ppm MTS = 42.5 ppm B-γ = 50 cpm
36.5 – 37.0		7	6	Stiff, SAA	CL	1.25	
37.0 – 37.5		11	6	Top 3" of interval: SAA. Bottom 3" of interval: (10 Y 4/1) dark greenish gray clayey sand (fine to med. sand) trace fine (1/8" max.) subrounded gravel, moist	CL / SC	1.0	#403046 is for FEMP Archive
37.5 – 38.0	1429 1-9-95, #403047	5	6	Medium stiff, (10 Y 4/1) dark greenish gray, sandy clay (fine to medium sand), low plasticity, moist	CL	0.75	SPLIT-SPOON, 2" O.D. MTB = 9.6 ppm
38.0 – 38.5		7	6	Medium stiff (10 Y 4/1) dark greenish gray silty clay, trace coarse sand, trace fine (3/8" max.) gravel, low plasticity, moist	CL	1.0	MTS = 48.3 ppm B-γ = 55 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

FEMP QA 21 FEB 21 1995

G: / WPSC / 94-776.DRW (11-23-94)

CONTROL NO.: 200307-11479-019

FEMP

LITHOLOGIC LOG

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11479

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5		12	6	SAA	CL	1.0	#403047 is for FEMP Archive
39.0				Bottom of Boring = 39.0'			
39.5							
40.0							
40.5							
41.0							
41.5							
42.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP 24 31

FEB 01 1995

000499

200307-11480-009

118

CONTROL NO.: RR 2-9-95 ~~200307-EFO-0012~~

FEMP

LITHOLOGIC LOG

PAGE 1 OF 9

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11480

COORDINATES: N 482418.600 E 1382766.707

RELATED FAL NO.: 200307-11480-004 thru 200307-11480-009 ~~20.03.07~~ KE

SURFACE ELEVATION: 606.28

GROUNDWATER LEVEL: DRY | DATE: 12-15-94 | TIME: 1339 | DATE STARTED: 12-14-94

GEOLOGIST: AMBER COUCH

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: NO

DRILLING CONTRACTOR: ALLIANCE ENV., INC.

DRILLING EQUIPMENT: 1993 MOBILE DRILL B-59

DRILLER / HELPER: 12-14-94 BOB ERICKSON / BARRY FORTH

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0							AUGERED INTERVAL ONLY NO SAMPLE COLLECTED
0.5	1406 12-14-94 402768		31				SHELBY TUBE (3" O.D.)
1.0							NT_3 = 0.0 PPM $\beta\gamma$ = 60 CPM
1.5							
2.0							
2.5				(7.5 YR 4/2) BROWN CLAY, MEDIUM PLASTICITY, MOIST	CL		DESCRIPTION FROM BOTTOM OF SHELBY TUBE
3.0	1420 12-14-94 402769	12	Ø				SPLIT SPOON BASKET TRAP MISSING
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0 PPM	12-14-94	1335
ALPHA	N/A	N/A	N/A
BETA / GAMMA	50 CPM	12-14-94	1335

NOTES: COLORS IDENTIFIED USING MUNSELL COLOR CHART FOR SOILS. CONSISTENCY MEASURED USING PENETROMETER. SOIL DESCRIPTION AND CLASSIFICATION PER ASTM D-2488. (CONT.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995 000500

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 2 OF 9
200307-11480-010	

PROJECT NAME:	PROJECT NO.:
OU-2 PREDESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11480		

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
GEOLOGIST:	GROUNDWATER LEVEL: See Page 2	DATE:	TIME:	DATE COMPLETED:

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5		14	0.7	VERY STIFF (10YR 6/6) BROWNISH YELLOW SILTY CLAY, TRACE SUBANGULAR TO ANGULAR FINE GRAVEL, MEDIUM PLASTICITY, MOIST	CL	2.75	MT_S = 0.0 PPM $B\gamma$ = 50 CPM
4.0		20	6.0	SAA			
4.5							AUGERED INTE ONLY NO SAMPLE COLLECTED
5.0			19				3" O.D. SHELBY TUBE
5.5							MT_S = 0.0 ppm $B\gamma$ = 40 CPM
6.0							SHELBY TUBE BOTTOM DAMAGED BY COBBLE OR GRAVEL, TUBE
6.5							CRIMPED. ASSIGNED SAMPLE # 402771 TO BULK AUGER CUTTINGS (3-7.5 ft)
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: SAMPLES COLLECTED PER ASTM D-1586 AND D-1587. GENERAL NOTES ON FIELD OPERATIONS CONTAINED IN PARSONS FIELD BOOK. (CONT.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881 000501

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11480-011

PROJECT NAME: OU-2 PREDESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11480

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: see Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5	1442 12-14-94 402770			(10 YR 6/4) LIGHT YELLOWISH BROWN CLAYEY SILT, TRACE FINE SAND, TRACE FINE SUBANGULAR GRAVEL, LOW PLASTICITY, MOIST	ML		DESCRIPTION FROM BOTTOM OF SHELBY TUBE
7.5 – 8.0	0805 12-15-94 402772	13	6	VERY STIFF (10 YR 5/6) YELLOWISH BROWN CLAY, TRACE SUBANGULAR TO ANGULAR FINE GRAVEL, MEDIUM PLASTICITY, MOIST	CL	2.75	SPLIT SPOON
8.0 – 8.5		10	6	VERY STIFF (10 YR 6/6) BROWNISH YELLOW CLAY, TRACE SUBANGULAR FINE GRAVEL, TRACE FINE SAND, MEDIUM PLASTICITY, MOIST	CL	1.75	MT_S = 0.0 PPM $B\gamma$ = 50-60 CPM
8.5 – 9.0		13	6	VERY STIFF (2.5 YR 5/4) LIGHT OLIVE BROWN CLAY, FEW SUBANGULAR FINE GRAVEL, MEDIUM PLASTICITY, MOIST (1 TO SUBROUND)	CL	2.5	SAMPLE 402772 FOR ARCHIVE
9.0 – 9.5							AUGERED INTERVAL ONLY NO SAMPLE COLLECTED
9.5 – 10.0			9				3" O.D. SHELBY TUBE
10.0 – 10.5							MT_S = 10.6 PPM MT_B = 7 PPM $B\gamma$ = 60 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12-15-94	0800
ALPHA	N/A	N/A	N/A
BETA / GAMMA	40.0 CPM	12-15-94	0800

NOTES:
12-15-94 - NEW HELPER DAVE NEWMAN
MT_B = MICROTIP (PID) BACKGROUND
MT_S = MICROTIP-SAMPLE READING
$B\gamma$ = BETA-GAMMA - SAMPLE READING (CONT.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995 000502

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11480-012

PROJECT NAME: OU-2 PREDESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11480

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5							
11.0	0903 12-15-94 402773						DESCRIPTION FROM BOTTOM FACE OF SHELBY TUBE
11.5	0915 12-15-94 402774			(10YR 5/6) YELLOWISH BROWN CLAY, TRACE COARSE SAND, MEDIUM TO HIGH PLASTICITY, MOIST	CL		BULK SAMPLE OF AUGER CUTTINGS SAMPLE 402774 25 to 12 ft.
12.0	0917 12-15-94 402775	6	5	MED. STIFF (10YR 5/4) YELLOWISH BROWN CLAY, TRACE SUBANGULAR FINE GRAVEL, MEDIUM PLASTICITY, MOIST	CL	Ø.75	SPLIT SPOON SAMPLE 402776 FOR ARCHIVE
12.5		8	6	VERY STIFF (5Y 4/1) DARK GRAY CLAY WITH SILT, TRACE SUBANGULAR FINE GRAVEL, LOW TO MEDIUM PLASTICITY, MOIST	CL	2.5	MT_B = 13.2 PPM MT_S = 13.4 PPM Cs^{137} = 60 CPM
13.0		13	6	VERY STIFF (5Y 5/1) GRAY SILTY CLAY, TRACE SUBANGULAR FINE GRAVEL, LOW PLASTICITY, MOIST	CL	2.75	BROWN CLAY/ GRAY CLAY INTERFACE AT ~12.5 FEET
13.5							AUGERED INTERVAL ONLY NO SAMPLE COLLECTED
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: SAA = SAME AS ABOVE. SPLIT SPOONS EQUIPPED WITH PLASTIC BASKET TRAPS.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST

FS-F-3681 000503

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11480-013

PAGE 5 OF 9

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11480

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: see Page

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	0938 12-15-94 402777		23, 25				3" O.D. SHELBY TUBE
15.0							MT_B = 11.4 PPM MT_S = 22.4 PPM $\beta\gamma$ = 60 CPM
15.5							
16.0							BOTTOM OF SHELBY TUBE DAMAGED
16.5				(10YR 5/1) GRAY CLAYEY SILT, LOW PLASTICITY, WET	ML		DESCRIPTION FROM BOTTOM OF SHELBY TUBE
17.0	0943 12-15-94 402778	6	2	VERY STIFF (10YR 5/1) GRAY CLAYEY SILT WITH SAND, LOW PLASTICITY, FINE MOIST	ML	2.0	SPLIT SPOON SAMPLE 402778 FOR ARCHIVE
17.5		9	6	STIFF (5Y4/1) DARK GRAY CLAYEY SILT WITH FINE SUBANGULAR GRAVEL, TRACE FINE SAND, LOW PLASTICITY, MOIST	ML	1.5	MT_B = 13.7 PPM MT_S = 14.8 PPM $\beta\gamma$ = 40 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995 000504

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11480-014

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11480

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0		50/4	4	STIFF (5Y 4/1) DARK GRAY CLAYEY SILT, TRACE SUBANGULAR FINE GRAVEL, TRACE FINE SAND, MOIST TO WET 1.5" DIAMETER GRAVEL AT BOTTOM	ML GP		HIT GRAVEL ONLY 4" DRIVEN
18.0 – 18.5	1051 12-15-94 402779	21	6	STIFF (10YR 5/2) GRAYISH BROWN SILTY CLAY, TRACE FINE SAND, WITH SUBROUND COARSE GRAVEL, LOW PLASTICITY, MOIST	CL	1.0	SPLIT SPOON
18.5 – 19.0	1059 12-15-94 402780	12	6	VERY STIFF (2.5 Y 5/1) GRAY SANDY CLAY WITH SUBROUND COARSE GRAVEL, LOW PLASTICITY, MOIST	CL	3.0	MTB=6.5 PPM MTS=10.4 PPM Bd=40 CPM
19.0 – 19.5		14	6	VERY STIFF (2.5 Y 5/1) ~~HEAVY~~ GRAY SANDY CLAY, TRACE SUBANGULAR FINE GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	SAMPLES 402779 AND 402780 COLLECTED OVER 24" INTERVAL.
19.5 – 20.0		18	6	STIFF (2.5 Y 4/1) DARK GRAY SILTY CLAY WITH FINE SAND, TRACE SUBANGULAR FINE GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL	1.25	SAMPLE 402779 FOR LAB SAMPLE 402780 FOR ARCHIVE
20.0 – 20.5	1113 12-15-94 402781						3" O.D. SHELBY-TUBE MTB= 10.8 PPM MTS= 11.4 PPM Bd= 60 CPM
20.5 – 21.0							DAMAGED, CRIMPED TUBE

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881 000505

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11480-015

PAGE 7 OF 9

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11480

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0							TUBE CONTENTS APPEAR TO BE DRILLING SLOUGH
21.5							NO LAB SAMPLE COLLECTED, SAMPLE 402781
22.0							FOR ARCHIVE
22.5	1127 12-15-94 402782	2	4	STIFF (2.5Y 5/1) GRAY SILTY CLAY WITH FINE TO COARSE SUB-ANGULAR TO SUBROUND GRAVEL, LOW PLASTICITY, MOIST	CL	1.5	SPLIT SPOON
23.0	1133 12-15-94 402783	3	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH FINE SUBANGULAR TO SUBROUND GRAVEL, LOW TO MEDIUM PLASTICITY, MOIST	CL	1.25	MTB = 10.2 PPM MTS = 11.1 PPM BG = 60 CPM
23.5		5	6	SAA		1.25	SAMPLE 402782 FOR ARCHIVE SAMPLE 402783 FOR LAB
24.0							AUGERED INTERVAL ONLY NO SAMPLE COLLECTED
24.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP 1995

000506

CONTROL NO.: 200307-11480-016

FEMP
LITHOLOGIC LOG

PROJECT NAME: OU-2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.

BORING NUMBER: 11480

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 25.0	1152 12-15-94 402784		12				3" O.D. SHELBY TUBE
25.5							MTB = 10.8 PPM MTS = 11.2 PPM BG = 40 CPM
26.0							
26.5							
27.0							TUBE BADLY DAMAGED CRIMPED OVER LOWER 4 INCHES, NO DESCRIPTION
27.5	1304 12-15-94 402785	3	Ø				SPLIT SPOON
28.0	1304 12-15-94 402786	24	6	STIFF (5 Y 4/1) DARK GRAY CLAY WITH ANGULAR to SUBROUND COARSE to FINE GRAVEL, TRACE FINE SAND, LOW PLASTICITY, MOIST	CL	1.5	MTB = 6.2 PPM MTS = 6.8 PPM BG = 40 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-9

000507

F-118

MAR 03 1995

200307-11480-017

CONTROL NO.: ~~200307-11480-018~~ KP 2-7-95

FEMP

LITHOLOGIC LOG

PAGE 9 OF 9

PROJECT NAME: OU-2 PREDESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11480

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0		9	5	~~SAA~~ AC DRY ZONE OF COARSE SUBANGULAR TO ANGULAR GRAVEL 2.5" THICK IN BOTTOM 4 INCHES	GP	1.5	SAMPLE 402785 FOR LAB SAMPLE 402786 FOR ARCHIVE
28.5							AUGERED INTERVAL ONLY NO SAMPLE COLLECTED
29.0	1331 12-15-94 402787		28				3" O.D. SHELBY TUBE
29.5							MTB = 10.2 PPM MTS = 10.8 PPM Bg = 60 CPM
30.0							SHELBY TUBE BADLY CRIMPED ON LOWER 16 INCHES
30.5							SAMPLE 402788 IS RINSE SAMPLE
31.0				(5 GY 5/1) GREENISH GRAY SILTY CLAY, ~~WITH~~ AC TRACE SUBANGULAR FINE GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL		DESCRIPTION FROM BOTTOM FACE OF SHELBY TUBE
31.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

FEMP

MAR 03 1995

000508

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307- 11481- 009

PAGE 1 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES: N482631.066 E138874.076

RELATED FAL NO.: 200307-11481-004 thru 200307-11481-008

SURFACE ELEVATION: 599.89

GROUNDWATER LEVEL: 4.1 ft bls

DATE: 1-18-95

TIME: 0940

DATE STARTED: 1-16-95

GEOLOGIST: K. Ernst

GROUNDWATER LEVEL:

DATE:

TIME:

DATE COMPLETED: 1-16-95

WATER USED DURING DRILLING: None

DRILLING CONTRACTOR: Alliance Environmental

DRILLING EQUIPMENT: 1993 Mobile Drill B-59 (HSA)

DRILLER / HELPER: B. Erickson / T. French

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	0922, 1-16-95, #403200	2	6	Top 3": Soft, (10YR 8/3) dark brown silt, trace coarse sand, roots, grass, low to no plasticity, moist	ML	0.25	SPLIT-SPOON, 2" O.D.
0.5				Medium stiff, (10 YR 4/4) dark yellowish brown silt, roots, low to no plasticity, moist	ML	0.5	MTB = 1.7 ppm MTS = 5.0 ppm
		4	6	Top 3": SAA	ML	0.5	B-8 = 60 cpm
1.0				Medium stiff, (10 YR 5/6) yellowish brown silty clay, roots, trace iron staining, low plasticity, moist	CL	0.5	#403200 is for FEMP Archive
1.5		4	—				
2.0	0925, 1-16-95, #403201	4	—				SPLIT-SPOON 2" O.D. MTB = 2.7 ppm MTS = 5.7 ppm
		5	6	Top 2": Medium stiff, (10 YR 5/6) yellowish brown silty clay, roots, trace iron staining, low plasticity, moist	CL	0.75	B-8 = 50 cpm
2.5				Bottom 4": Stiff, (10 YR 5/4) yellowish brown silty clay, roots, trace iron staining, trace black organic material, low to medium plasticity, moist	CL	1.75	#403201 is for FEMP Archive
		8	6	SAA	CL	1.25	
3.0							Augered 3.0-3.5'
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0 ppm	1-16-95	0920
ALPHA	—	N/A	—
BETA / GAMMA	70 cpm	1-16-95	0920

NOTES: Colors identified using Munsell Color Chart for Soils. Consistency measured using pocket penetrometer, unless otherwise noted. Density (cm³)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21 FEB 21 1995

000509

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-010

PAGE 2 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 2

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	1012, 1-16-95 #403202, #403203		19				SHELBY TUBE 3" O.D., 36" long 30" push, @ 500 psi first 1.5', 700 psi last 1'
4.0 – 4.5							Hr_B = 6.9 ppm Hr_S = 17.3 ppm B-γ = 40 cpm
4.5 – 5.0							Tube broke away from sampler head during wire line withdrawal. Tube recovered by overdrilling
5.0 – 5.5							and pulling augers. Sample condition very good upon recovery
5.5 – 6.0				(10 YR 5/6) yellowish brown silty clay, trace fine (3/4" max.) subangular to subrounded gravel, low plasticity, moist	CL		#403202 is for Geotech lab #403203 is for FEMP Archive Description is from bottom face of tube
6.0 – 6.5							Augered 6.0 - 6.5'
6.5 – 7.0	1031, 1-16-95 #403204, #403205		29				SHELBY TUBE, 3" O.D., 36" long 2.3' push, @ 900 psi for first 1' 700 psi for

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: of coarse grained soils described based on SPT blow count. Soil description and USCS symbol per ASTM D 2488 guidelines. (Cont.)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA

FEB 21 1995

000540

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-011

PAGE 3 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0							next ~0.8', 1000 psi for last ~0.5'.
7.5							MTB = 4.0 ppm MTS = 7.7 ppm B-γ = 70 cpm
8.0							
8.5							Cutting edge of tube is in good condition, only minor nicks
9.0				(10 YR 5/6) yellowish brown silty clay, trace fine to coarse sand, trace fine (1/8" max.) subangular to subrounded gravel, trace iron staining, low plasticity, moist	CL		Description is from bottom of tube face Note 1
9.5	1044, 1-16-95, #403206	13	6	Hard, (10 YR 6/4) light yellowish brown clayey silt with fine to coarse (1/2" max.) subangular to subround gravel, trace fine to medium sand, low to no plasticity, dry to moist	ML	>4.5	SPLIT-SPOON, 2" O.D. MTB = 4.0 ppm MTS = 4.7 ppm
10.0		24	6	SAA	ML	>4.5	B-γ = 40 cpm #403206 is for
10.5		30	6	SAA	ML	>4.5	FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: Samples collected per ASTM (cont)

Note 1: #403230 is a sample of auger cuttings from 3.5 – 7.5' for Geotech. Lab. #403204 is for (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-9

FEMP QA 21

FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-012

PAGE 4 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	1050, 1-16-95, #403207	15	6	Very stiff, (10 YR 5/6) yellowish brown silty clay, trace fine to medium sand, trace fine subrounded to subangular gravel (3/4" max.), trace iron staining, low plasticity, moist	CL	2.0	SPLIT-SPOON, 2" O.D. MTB = 3.6 ppm MTS = 4.7 ppm
11.5		19	6	Hard, (10 YR 5/6) yellowish brown silty clay, trace fine to medium sand, few fine (1/2" max.) gravel, iron staining, low plasticity, moist	CL	>4.5	B-8 = 50 cpm #403207 is for FEMP Archive
12.0		24	6	Hard, (10 YR 5/6) yellowish brown silty clay, trace fine to medium sand, iron staining, low plasticity, moist	CL	>4.5	
12.5	1101, 1-16-95, #403208 #403209	12	6	Very stiff, (10 YR 5/6) yellowish brown grading to (10 Y 4/1) dark greenish gray silty clay, trace fine to coarse sand, medium plasticity, moist	CL	2.5	SPLIT-SPOON, 2" O.D. MTB = 3.4 ppm MTS = 4.6 ppm
13.0		12	6	Very stiff, (10 Y 4/1) dark greenish gray silty clay, trace fine to coarse sand, trace fine (3/8" max.) subrounded to subangular gravel, low plasticity, moist	CL	2.25	B-8 = 50 cpm #403208 is from 12.0-12.5' for FEMP Archive
13.5		16	6	SAA	CL	3.0	#403209 is from 12.5-13.5' for FEMP Archive
14.0	1122, 1-16-95, #403210	10	—				SPLIT-SPOON, 2" O.D. MTB = 4.1 ppm MTS = 5.1 ppm B-8 = 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: D 1586 and D 1587 Split-spoon (barrel) sampler equipped (con't)

Note 1 (con't): Geotech Lab. # 403205 is for FEMP Archive

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3581

G:/WPSC/94-778.DRW (11-23-94)

000512 FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-013

PAGE 5 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: see Page 4

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0		12	6	Very stiff, (Var 4/1) dark greenish gray silty clay, trace fine to coarse sand, few fine to coarse subrounded to subangular gravel (1/2" max.) trace iron staining, low plasticity, moist	CL	3.5	
14.5		16	6	SAA, 1" max gravel size	CL	3.5	#403210 is for FEMP Archive
15.0							Augered 15-15.5'
15.5							
16.0	1132, 1-16-95, #403211, #403212		27				SHELBY TUBE, 3" O.D, 36" long; MT_B = 3.6 ppm
16.5							MT_S = 5.4 ppm; B-8 = 50 ppm; 36" push @ 500 psi
17.0							Bottom cutting edge of tube slightly crimped inward ½ to ¾"
17.5							#403211 is for Geotech Lab. #403212 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: with plastic basket retainers. Two-inch O.D. standard split barrel samplers used (no liners.) (East)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

FEMP DA 31 FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-014

PAGE 6 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL:

DATE:

TIME:

DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1

DATE:

TIME:

DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0				(10 Y 4/1) dark greenish gray silty clay, trace fine (1/8" max) subround to subangular gravel, low plasticity, moist			Description is from bottom face of tube
18.5	1141, 1-16-95 #403213	3	4	stiff, (10 Y 5/1) greenish gray silty clay, trace fine to coarse (1" max.) subrounded gravel, medium plasticity, moist to wet	CL	1.0	SPLIT-SPOON 2" O.D. MTB = 3.4 ppm MTS = 4.5 ppm
19.0		6	6	Stiff, (10 Y 5/1) greenish gray silty clay, medium plasticity, moist	CL	1.0	B-γ = 70 cpm #403231 is a sample of auger cuttings from 15.5 – 18.5'
19.5		10	6	stiff, (10 Y 5/1) greenish gray silty clay, trace fine to coarse sand, trace fine (1/4" max) subangular to subrounded gravel, medium plasticity, moist	CL	1.0	#403213 is for FEMP Archive
20.0							Augered 19.5 – 20'
20.5	1155, 1-16-95, #403214, #403215		26				SHELBY-TUBE, 3" O.D., 30" long 24" push @ 450 psi
21.0							MTB = 3.4 ppm MTS = 4.5 ppm B-γ = 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: MTB = Microtip (PID) background reading
MTS = Microtip (PID) reading on the sample
B-γ = Beta-gamma (cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21

000514

FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-015

PAGE 7 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0							Bottom cutting edge of tube is crimped in on one side ~ 1/4"
21.5							
22.0				(10 Y 4/1) dark greenish gray silty clay, trace fine (1/2" max.) subangular to subrounded gravel, low plasticity, moist	CL		Note 2. Description is from bottom of tube face
22.5	1205, 1-16-95 #403216	5	3	Stiff, (10 Y 4/1) dark greenish gray silty clay, trace fine to coarse sand, trace fine (1/4" max) subrounded to subangular gravel, medium to low plasticity, moist	CL	1.25	SPLIT-SPOON 2" O.D. MT$_B$ = 3.4 ppm
23.0		6	6	Med. Stiff, SAA.	CL	0.75	MT$_B$ = 4.7 ppm B-γ = 60 cpm
23.5		10	6	SAA, 1/8" max. gravel size	CL	0.75	#403216 is for FEMP Archive
24.0	1212, 1-16-95 #403217	6	—				SPLIT-SPOON 2" O.D. MT$_B$ = 3.7 ppm
24.5		9	—				MT$_B$ = 4.8 ppm B-γ = 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: radiation reading on the sample
N/A - Not Applicable
(cont)
Note 2: # 403214 is for Geotech Lab.
403215 is for FEMP Archive

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21

FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-016

PAGE 8 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page DATE TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 25.0		11	6	Soft, (10 Y 4/1) dark greenish gray silty clay with fine to coarse (1 1/2" max) subangular gravel, medium plasticity, wet	CL	0.25	#403218 is for FEMP Archive
25.0 – 25.5	1220, 1-16-95 #403218	5	—				SPLIT - SPOON, 2" O.D. MTB = 3.6 ppm MTS = 5.2 ppm
25.5 – 26.0		8	6	Soft, (10 Y 4/1) dark greenish gray silty clay with fine to coarse (1" max.) subangular to subrounded gravel, medium plasticity, moist to wet	CL	0.25	B-γ = 50 cpm #403218 is for FEMP Archive
26.0 – 26.5		11	6	SAA, 1 1/2" max. gravel size	CL	0.25	
26.5 – 27.0	1228, 1-16-95 #403219, #403232	8	4	Stiff, (10 Y 5/1) greenish gray silty clay, trace fine to coarse (2" max.) subangular to subrounded gravel, trace coarse sand, low plasticity, moist	CL	1.25	SPLIT - SPOON, 2" O.D. MTB = 2.6 ppm MTS = 5.4 ppm B-γ = 60 cpm
27.0 – 27.5		9	6	Stiff, greenish gray (10 Y 5/1) sandy clay (sand is fine to med.), trace fine (1/8" max.) subrounded to subangular gravel, low plasticity, moist.	CL	1.75	#403219 is for Geotech Lab.
27.5 – 28.0		11	6	SAA	CL	1.25	#403232 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:
O.D. - outer diameter
HSA - hollow stem auger
psi - pounds per square inch (rig hydraulic pressure)
(cont)

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3581

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 21

FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-017

PAGE 9 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: see page 2 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0	1235, 1-16-95, #403220	4	5	Medium stiff, (10 Y 5/1) greenish gray sandy clay, trace fine (1/4" max.) gravel, medium plasticity, moist (sand is fine to coarse)	CL	0.75	SPLIT-SPOON, 2" O.D. MTB = 3.8 ppm
28.5		8	6	SAA	CL	0.75	MTS = 5.7 ppm B-γ = 50 cpm #403220 is for FEMP Archive
29.0		9	6	Hard, (10 Y 5/1) greenish gray sandy clay (sand is fine to medium) low plasticity, moist	CL	4.25	
29.5	1400, 1-16-95, #403221	4	6	Stiff, (10 Y 5/1) greenish gray silty clay, trace coarse sand, trace fine (3/8" max.) subangular to subround gravel, medium plasticity, moist	CL	1.5	SPLIT SPOON 2" O.D. MTB = 3.0 ppm MTS = 4.8 ppm B-γ = 50 cpm #403221 is for FEMP Archive
30.0		7	6	SAA	CL	1.25	
30.5		10	6	SAA	CL	1.0	
31.0	1414 1-16-95 #403222	5	—				SPLIT SPOON 2" O.D.
31.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES: SPT = Standard Penetration Test
bls - below land surface

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3691

G:/WPSC/94-776.DRW (11-23-9

FEMP QA 21

FEB 21 1995

000527

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-018

PAGE 10 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: see Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5		9	–				No recovery – 31.0 – 32.5' interval.
32.0		12	–				Basket retainer fingers completely sheared from retainer ring
32.5	1422 1-16-95 #403223	5	6	Stiff, (10 Y 5/1) greenish gray silty clay, trace fine (3/4" max.) subangular to subrounded gravel, medium plasticity, moist	CL	1.25	SPLIT-SPOON, 2" O.D. MTB = 3.4 ppm MTS = 4.6 ppm
33.0	#403233	10	6	SAA	CL	1.5	B-γ = 60 cpm #403223 is for Geotech Lab
33.5		19	6	Very stiff, (10 Y 5/1) greenish gray silty clay, trace coarse sand, trace fine to coarse (1" max.) subangular to subrounded gravel, low plasticity, moist	CL	2.25	#403233 is for FEMP Archive
34.0	1429, 1-16-95 #403224	8	6	Stiff, (10 Y 5/1) greenish gray silty clay, trace coarse sand, trace fine to coarse (3/4" max.) subangular to subrounded gravel, medium plasticity, moist	CL	1.25	SPLIT-SPOON, 2" O.D. MTB = 3.4 MTS = 4.8
34.5		9	6	SAA	CL	1.5	B-γ = 60 cpm
35.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 21 FEB 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-019

PAGE 11 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING: DRILLING CONTRACTOR: DRILLING EQUIPMENT: DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0 – 35.5		21	6	Very stiff, SAA	CL	2.75	#403224 is for FEMP Archive
36.0	1447, 1-16-95 #403225 #403226	8	6	Very stiff, (5 GY 4/1) dark greenish gray silty clay, trace fine to coarse sand, trace fine (1/4" max) subrounded to subangular gravel, low plasticity, moist	CL	2.25	SPLIT-SPOON, 2" O.D. MTB = 3.4 ppm MTS = 4.7 ppm
36.5		9	6	Very stiff, (10 G 5/1) greenish gray silty clay with wood fragments, trace fine to coarse sand, trace fine (1/8" max.) subangular gravel, low plasticity, moist to wet	CL	2.0	B-8 = 70 cpm Wood fragments
37.0		14	6	Very stiff (5 GY 4/1) dark greenish gray silty clay, trace fine to coarse sand, trace fine (1/8" max.) subangular to subrounded gravel, moist, low plasticity	CL	2.25	#403225 is from 35.5-36.0' for FEMP Archive #403226 is from 36.0-36.5' for FEMP Archive
37.5	1501, 1-16-95 #403227 #403234	7	6	Very stiff, (10 Y 4/1) dark greenish gray silty clay, ~~trace~~ fine to coarse (1/2" max.) subangular to subrounded gravel, low plasticity, moist	CL	2.0	SPLIT-SPOON 2" O.D. MTB = 3.6 MTS = 5.1
38.0		9	6	Very stiff, (10 Y 4/1) dark greenish gray silty clay, trace fine to coarse sand, trace fine (1/2" max) subangular to subrounded gravel ~~gravel~~, low plasticity, moist	CL	2.75	B-8 = 60 cpm #403227 is for Geotech Lab.
38.5		12	6	Stiff, SAA	CL	1.75	#403234 is for FEMP Archive

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP DA 21 FEB 1 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11481-020

PAGE 12 OF 12

PROJECT NAME: OU-2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11481

COORDINATES:

RELATED FAL NO.s:

SURFACE ELEVATION:

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED:

GEOLOGIST:

GROUNDWATER LEVEL: See Page 1 DATE: TIME: DATE COMPLETED:

WATER USED DURING DRILLING:

DRILLING CONTRACTOR:

DRILLING EQUIPMENT:

DRILLER / HELPER:

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5 – 39.0	1510, 1-16-95, #403228, #403229	4	6	Medium stiff, (10 Y 4/1) dark greenish gray clay, trace fine (1/8" max.) subangular gravel, low plasticity, moist	CL	1.0	SPLIT-SPOON, 2" O.D.
39.5		5	6	SAA	CL	0.75	#403228 is from 38.5 - 39.7' for FEMP Archive #403229 is from
40.0		21	6	SAA 39.7' (10 YR5/1) gray, poorly graded fine to coarse sand, dry to moist	CL / SP	1.0	39.7 - 40.0' for FEMP Archive
40.5				BOTTOM OF BORING = 40.0 FEET			
41.0							
41.5							
42.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID			
ALPHA			
BETA / GAMMA			

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21 FEB 21 1995

FEMP QA 3-7-95

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11482-~~016~~ 015 (2-14-95)

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11482

COORDINATES: N 483014.270 E 1382496.750

RELATED F&L NO.s:

SURFACE ELEVATION: 610.37 ft.

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/9/95

GEOLOGIST: Collins / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/9/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.5	1-9-95 403416 15:10	NA	6	10yr 3/4 Very stiff, Dark Yellowish brown silty clay with grass roots, with trace of fine gravel (<5%), subangular to subrounded.	CL	2.5	PID 5.0 ppm; BY 50 cpm
1.0	1-9-95 403416 15:10	NA	6	10yr 4/4 stiff, Dark Yellowish brown silty clay, with manganese stains, less than 3% subangular fine gravel. 1-2% subrounded coarse sand. Moist, medium plasticity	CL	1.25	PID 5.0 ppm; BY 50 cpm
1.5	1-9-95 403416 15:10	NA	6	10yr 4/6 Dark Yellowish brown silty clay with manganese and iron staining, medium plasticity, moist. Stiff.	CL	2.0	PID 5.0 ppm; BY 50 cpm
2.0	1-9-95 403416 15:10	NA	6	10yr 4/6 Dark Yellowish brown silty clay with manganese staining, medium plasticity, moist. Very stiff.	CL	2.5	PID 5.0 ppm; BY 50 cpm
2.5	1-9-95 403415 1510	NA	6	10yr 4/4 Dark Yellowish brown silty clay with manganese stains, with 5% subangular coarse sand, 1-2% fine subangular gravel. Moist, medium plasticity. Very stiff.	CL	2.5	PID 5.0 ppm; BY 50 cpm
3.0	1-9-95 403415 1510	NA	6	10yr 4/4 Dark Yellowish brown silty clay with subrounded coarse sand (<2%) and approximately 1% subrounded fine gravel. Moist, medium plasticity. Stiff.	CL	1.5	PID 5.0 ppm; BY 50 cpm
3.5	1-9-95 403415 1510	NA	6	10yr 5/4 Yellowish brown silty clay with 2% subangular to angular coarse gravel, <3% subangular coarse sand, with 1% of these clasts subrounded. 1% subangular fine gravel. Medium stiff.	CL	1.0	PID 5.0 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	9.0	1/09/95	0920
ALPHA	NA	NA	NA
BETA / GAMMA	40-50	1/09/95	0920

NOTES: JC 2-7-95 ~~NONE~~
This Lithologic Log was updated using Archived Cores by Geologist Kevin Collins on 02/01/95

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 1/9/95

FS-F-3581

000571

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

3-7-95

CONTROL NO.: 200307-11482-014	PAGE 2 OF 2

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07

BORING NUMBER: 11482	COORDINATES: See Pg. 1	RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED: 1/9/95
GEOLOGIST: Collins / GEIGER / RILEY	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED: 1/9/95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL	DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	1/9/95 1510 403415	NA	6	10yr 5/4 Yellowish brown, medium to very stiff silty clay with iron stains, 1-3% subrounded fine gravel, <2% subangular coarse sand. Medium plasticity, moist.	CL	2.75	PID 4.0 ppm; BY 50 cpm
4.0	1/9/95 1510 403415	NA	6	10yr 5/4 Yellowish brown, stiff silty clay with iron stains, subangular fine gravel (<5%), <2% subangular coarse sand. Medium plasticity, moist. Off-white and dark orange mottling.	CL	1.5	PID 4.0 ppm; BY 50 cpm
4.5	1/9/95 1510 403415	NA	6	Same as above, except it is very stiff, with <1% fine subangular gravel. ~~and~~ <1% subangular coarse sand.	CL	3.5	PID 4.0 ppm; BY 50 cpm
5.0	1/9/95 1510 403415	NA	6	10yr 5/4 Yellowish brown, very stiff, silty clay with 1-2% subrounded fine gravel, <2% subrounded coarse sand. Medium plasticity, slightly moist.	CL	4.0	PID 4.0 ppm; BY 50 cpm
5.5	1/9/95 1510 403415	NA	6	Very Stiff Yellowish brown (10yr 5/4) silty clay with <10% subangular fine gravel, approximately 7-10% subangular to subround coarse sand. Medium plasticity, slightly moist. Fine gravel is flat in subangular clasts. Dark orange mottling.	CL	3.25	PID 4.0 ppm; BY 50 cpm
6.0	1/9/95 1510 403415	NA	6	Very stiff Yellowish brown (10yr 5/4) silty clay with ~~flat~~ angular fine gravel (10%), 2-5% subrounded coarse sand. Very little dark orange mottling, with more off-white mottling.	CL	3.75	PID 4.0 ppm; BY 50 cpm
6.5	1/9/95 1510 403415	NA	6	Same as above.	CL	3.75	PID 4.0 ppm; BY 50 cpm; Silica Tot U. Iso 403412; TCLP 403413; Tot. U/Iso 403414
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	9.0	1/09/95	0920
ALPHA	NA	/NA/	NA
BETA / GAMMA	40-50	1/09/95	0920

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLA 1/9/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000522

CONTROL NO.: 200307 - 11483 - 005

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: N483025.664 E1382500.455

RELATED FAL NO.s: N/A

SURFACE ELEVATION: 613.45 ft.

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.25	1-9-95 0950 403400	NA	3	Very Stiff 10YR 3/3 Dark Brown silty Clay w/Roots; Trace of fine Sand, Trace of med. Sub-Angular gravel 1%; Low plast. Moist.	CL	NA	PID 8.8 ppm; BY 50 cpm
0.5	1-9-95 0950 403400	NA	3	Soft. 10YR 4/3 Brown Silty Clay w/ <1% Fine Sand; Roots, Low Plast. Slightly Moist	CL	.5	PID 8.8 ppm; BY 50 cpm
0.75	1-9-95 0950 403400	NA	3	Very stiff 10YR 5/4 Yellowish Brown, silty Clay w/root; 5-10% Coarse Sand, Trace of med. Sub Angular gravel Low Plast. Slightly Moist.	CL	2.5	PID 8.8 ppm; BY 50 cpm
1.0	1-9-95 0950 403400	NA	3	Same As 0.5 — 0.75	CL	2.5	PID 8.8 ppm; BY 50 cpm
1.25	1-9-95 0950 403400	NA	3	Stiff 10YR 5/4 Yellowish Brown, silty Clay w/fine Rootlets; 5-10% Coarse Sand, Low to med. Plast. Slightly Moist.	CL	1.5	PID 8.8 ppm; BY 50 cpm
1.5	1-9-95 0950 403400	NA	3	Stiff 10YR 4/4 Dark Yellowish Brown, silty Clay w/fine Rootlets; 5-10% Coarse Sand; Low-med. Plast. Slightly Moist.	CL	1.75	PID 8.8 ppm; BY cpm
1.75	1-9-95 0950 403400	NA	3	Stiff Same As above 1.25" — 1.5"	CL	1.5	PID 8.8 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	8.8	01/09/95	0920
ALPHA	NA	(NA)	NA
BETA / GAMMA	40-50	01/09/95	0920

NOTES: This Lithologic Log was updated using Archived Cores by Geologist Pat Riley on 01/21/95

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/11/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

000583

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-006

PAGE 2 OF 23

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 01-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: Estimate 0. D GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.75 – 2.0	1-9-95 0950 403400	NA	3	Same As Above 1.5 — 1.75	CL	1.5	PID 8.8 ppm; BY 50 cpm
2.0 – 2.25	1-9-95 0950 403400	NA	3	Soft 10YR 4/2 Dark Grayish Brown, Silty Clay w/5% Coarse Sand, fine Roots, Low Plast. Slightly Moist.	CL	.5	PID 8.8 ppm; BY 50 cpm
2.25 – 2.5	1-9-95 0950 403400	NA	3	Same As Above 2.0 – 2.25 w/one piece of Rounded gravel; End of Root zone.	CL	.5	PID 8.8 ppm; BY 50 cpm
2.5 – 2.75	1-9-95 0950 403400	NA	3	Very stiff 10YR 5/4 Yellowish Brown Silty Clay w/10YR 6/3 Pale Brown Mottling; <1% Sand; Low Plast. Slightly Moist.	CL	2.25	PID 8.8 ppm; BY 50 cpm
2.75 – 3.0	1-9-95 0950 403400	NA	3	Very stiff 10YR 5/4 Yellowish Brown, Silty Clay w/10YR 6/3 Pale Brown Mottling; Fe staining <1% sand; Low Plast. slightly Moist.	CL	3.25	PID 8.8 ppm; BY 50 cpm
3.0 – 3.25	1-9-95 0950 403400	NA	3	Same As Above 2'.75" — 3'.0"	CL	3.25	PID 8.8 ppm; BY 50 cpm
3.25 – 3.50	1-9-95 0950 403400	NA	3	Same As Above 3'.0" — 3'.25"	CL	3.25	PID 8.8 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	8.8	01/09/95	0920
ALPHA	NA	/ NA	NA
BETA / GAMMA	40–50	/ /	0920

NOTES: JG 2-7-95 ~~Done~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/9/95

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

MAR 03 1995

000524

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-007

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: See Page 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.75	1-9-95 0950 JCB ~~1000~~ 2/14/95 403400	NA	3	Stiff 10YR 5/6 Yellowish Brown, silty Clay; slightly Mottled, 10YR 6/3 Pale Brown, Manganenese Staining; 5% Coarse Sand; Low Plast. slightly Moist.	CL	1.5	PID 9.8 ppm BY 50 cpm
4.0	1-9-95 0950 JCB ~~1000~~ 2/14/95 403400	NA	3	Stiff 10YR 5/4 Yellowish Brown, Silty Clay w/10-15% Coarse sand; 5% fine-Med. Angular gravel; Fe staining slightly moist Low Plast.	CL	1.5	PID 10.0 ppm BY 50 cpm
4.25	1-9-95 1000 403401	NA	3	Same As Above 3.75"— 4.0"	CL	1.75	PID 10.0 ppm BY 50 cpm
4.5	1-9-95 1000 403401	NA	3	Stiff 10YR 5/4 Yellowish Brown, gravelly clay; 10% Coarse sand; Irregularly oriented Limestone gravels, Low plast. moist	CL	1.0	PID 10.0 ppm BY 50 cpm
4.75	1-9-95 1000 403401	NA	3	Same As Above 4.25"— 4.50"	CL	1.5	PID 10.0 ppm BY 50 cpm
5.0	1-9-95 1000 403401	NA	3	Same As Above 4.5"— 4.75"	CL	1.5	PID 10.0 ppm BY 50 cpm
5.25	1-9-95 1000 403401	NA	3	very ~~stiff~~ 10YR 5/4 Yellowish Brown, Silty Clay Slightly Mottled w/10YR 6/3 Pale Brown, Fe Staining; 10% coarse sand; 10% fine Angular gravel; Low Plast. Slightly Moist.	CL	2.25	PID 10.0 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Page 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Page 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/9/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

MAR 03 1995

CONTROL NO.: 200307- 11483-008

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11483	COORDINATES: SEE PAGE 1
RELATED FAL NO.s: N/A	
SURFACE ELEVATION: SEE PAGE 1	GROUNDWATER LEVEL: N/A — DATE: — TIME: →
DATE STARTED: 1-9-95	
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: N/A — DATE: — TIME: →
DATE COMPLETED: 1-9-95	
WATER USED DURING DRILLING: Estimate 0.0 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5.5	1-9-95 1000 403401	NA	3	very stiff 10YR 5/4 Yellowish Brown, Silty Clay 1mm Lamination (Horizontal) 10YR 2/2 very Dark Brown fine sand (clay); Clay is slightly mottled 10YR 6/3 Pale Brown; 10% coarse sand, Trace of Fine Gravel. Low Plast. Slightly Moist	CL	2.25	PID 10.0 ppm BY 50 cpm
5.75 ~~6.0~~	1-9-95 1000 403401	NA	3	very stiff 10YR 5/4 Yellowish Brown; Silty Clay mottled w/ 10YR 6/3 Pale Brown; 5% coarse sand; 5mm x 3mm x 4mm Vertically Oriented Limestone Cobble. Slight-Low Plast. Slightly Moist.	CL	3.75	PID 10.0 ppm BY 50 cpm
6.0	1-9-95 1000 403401	NA	3	very stiff 10YR 5/4 Yellowish Brown, Silty Clay mottled w/ 10YR 6/3 Pale Brown, 5% coarse sand; 5% med. Angular gravel; Slightly Low Plast. Slightly Moist.	CL	3.5	PID 10.0 ppm BY 50 cpm
6.25	1-9-95 1000 403401	NA	3	Same As Above 5'75" — 6'.0"	CL	3.5	PID 10.0 ppm BY 50 cpm
6.5	1-9-95 1000 403401	NA	3	Same As Above 6'.0" — 6.25"	CL	3.5	PID 10.0 ppm BY 50 cpm
6.75	1-9-95 1000 403401	NA	3	very stiff 10YR 5/4 Yellowish Brown, Clay silty, w/15% fine sand, 5% fine Angular gravel; Non-Plastic slightly Moist.	ML	3.0	PID 10.0 ppm BY 50 cpm
7.0	1-9-95 1000 403401	NA	3	Same As Above 6'.5" — 6'.75"	ML	2.5	PID 10.5 ppm BY 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See page 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Page 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/9/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 09 1995

000526

CONTROL NO.: 200307-11483-009

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0							
7.25	1-9-95 1005 403402	NA	3	Stiff 10YR 3/4 Dark Yellowish Brown Silty Clay, Mn Staining; Trace of Coarse sand and fine Angular gravel Low-Med Plast. Slightly Moist	CL	2.0	PID 10.5 ppm BY 50 cpm
7.5	1-9-95 1005 403402	NA	3	Stiff Same As Above 7.0"— 7.25"	CL	2.0	PID 10.5 ppm BY 50 cpm
7.75	1-9-95 1005 403402	NA	3	Stiff 10YR 4/4 Dark Yellowish Brown, Silty Clay, Mn staining, Trace of wood Fragments, Trace Coarse Sand and fine Angular gravel, Low-Med Plast. Slightly Moist.	CL	1.5	PID 10.5 ppm BY 50 cpm
8.0	1-9-95 1005 403402	NA	3	Stiff Same As Above 7.5"— 7.75"	CL	2.0	PID 10.5 ppm BY 50 cpm
8.25	1-9-95 1005 403402	NA	3	Stiff Same As Above 7.75-8.0" Tree Roots; 10% fine-Med Angular gravel, Irregular orrientation	CL	2.0	PID 10.5 ppm BY 50 cpm
8.5	1-9-95 1005 403402	NA	3	Stiff 10YR 4/4 Dark Yellowish Brown, Silty Clay; 5% Coarse Sand; Trace of Med. Angular gravel; Med. Plast. Slightly Moist.	CL	1.5	PID 10.5 ppm BY 50 cpm
8.75	1-9-95 1005 403402	NA	3	Stiff 10YR 5/4 Yellowish Brown, Silty Clay; 10% Coarse Sand; 10% Irregular orrientated fine-Med Angular gravel; Med. Plast. Slightly Moist.	CL	1.5	PID 10.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	N/A	N/A	N/A
BETA / GAMMA	See pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/4/94

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-010

PAGE 6 OF 23

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8.75							
9.0	1-9-95 1005 403402	NA	3	Stiff Same As Above 8'.5" – 8'.75"	CL	1.75	PID 10.5 ppm BY 50 cpm
9.25	1-9-95 1005 403402	NA	3	Very Stiff Same As Above 8'.75" – 9'.0" 10YR 7/1 Lite Gray Clay Inclusion Med. Plast. PR 1-21-95	CL	2.25	PID 10.5 ppm BY 50 cpm
9.5	1-9-95 1005 403402	NA	3	Stiff 10YR 5/4 ~~Dark~~ Yellowish Brown, Silty Clay; 10% Coarse Sand; 5% fine Angular gravel; 6mm x 2mm x 3mm Vertically Orrienta Limestone Cobble (striated); Low-Med. Plast. Slightly Moist.	CL	1.5	PID 10.5 ppm BY 50 cpm
9.75	1-9-95 1005 403402	NA	3	very stiff 10YR 5/4 Yellowish Brown, silty Clay, 5% Coarse Sand; 10% Med Angular Irregular orrienta gravel. 7mm X 3mm X 5mm. Vertically orrienta Limestone Cobble. Low Plast. slightly Moist.	CL	2.25	PID 10.5 ppm BY 50 cpm
10.0	1-9-95 1005 403402	NA	3	Very Stiff 10YR 5/4 Yellowish Brown, Silty Clay, 5% Coarse Sand; Mottled w/ 10YR 6/3 Pale Brown; Low Plast. Slightly Moist.	CL	3.75	PID 10.5 ppm BY 50 cpm
10.25	1-9-95 1005 403402	NA	3	Same As Above 9'.75' – 10'.0" Trace of <5% Med. Angular Gravel Irregular orrientation	CL	3.75	PID 10.5 ppm BY 50 cpm
10.5	1-9-95 1005 403402	NA	3	Hard Same As Above 10'.0" – 10'.25"	CL	4.0	PID 10.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ /	
BETA / GAMMA	See Pg. 1	/ /	

NOTES: TC 2-7-95 ~~None~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLR 12/4/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-011

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: → | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: → | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.75	1-9-95 1015 403402	NA	3	very stiff Same As Above 10.25"–10.5" 2 sub angular vertically oriented gravels.	CL	3.5	PID 10.5 ppm; BY 50 cpm
11.0	1-9-95 1015 403402	NA	3	Very stiff 10YR 5/6 Yellowish Brown, gravelly Clay; Gravel is fine to Coarse Sub Angular to Angular, Slight-Low Plast. Slightly Moist.	CL	2.5	PID 10.5 ppm; BY 50 cpm
11.25	1-9-95 1015 403403	NA	3	Very stiff 10YR 5/6 Yellowish Brown, gravelly Clay; Gravel is fine to Coarse Sub Angular to Angular, Slight-Low Plast. Slightly Moist	CL	2.5	PID 10.5 ppm; BY 50 cpm
11.50	1-9-95 1015 403403	NA	3	Very stiff 10YR 5/3 Brown silty clay w/10% Coarse Sand 10% Fine-Med Angular Gravel w/ Irregular orientation; Fe staining Low Plast. Slightly Moist. Same As Above	CL	2.0	PID 10.5 ppm; BY 50 cpm
11.75	1-9-95 1015 403403	NA	3	Very stiff ~~Same As~~ 10YR 5/3 Brown; Silty Clay; 10% Coarse Sand; 15% Med-Coarse Angular gravel; Irregular orientation.	CL	2.0	PID 10.5 ppm; BY 50 cpm
12.0	1-9-95 1015 403403	NA	3	Stiff 10YR 5/2 Grayish Brown; Silty Clay Inclusion; 5-10% fine Sand; 5-10% fine-Med Angular Gravel; Irregular orientation. Low Plast. Slightly Moist. Interface is 4-5 cm Thick; Hummocky Horizontal Surface; consist of 10YR 5/4 Yellowish Brown Sandy Clay; very fine sand ~~very~~ ~~Fe stained~~ ~~Fe stained~~ ~~Fe stained~~ Fe stained Laminations within 30 cm of the Interface * Notes	CL	2.0	PID 10.5 ppm; BY 50 cpm Fe staining.
12.25	1-9-95 1015 403403	NA	3	Stiff 2.5Y 5/1 Gray; Silty Clay w/5% fine Sand, 5% fine-Med. Sub Angular gravel. Irregular orientation; Faint Dessication Fractures filled w/ Fe staining; Low Plast. Slightly Moist.	CL	2.5	PID 10.5 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ /	
BETA / GAMMA	See Pg. 1	/ /	

NOTES: *Fe staining Fills Dessication Cracks 2-3 cm into the gray. Interface occurs at 11'11"; A/30 See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/4/94

FS-F-3681 000529

F-140

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-012

PAGE 8 OF 23

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A DATE: TIME: →

DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A DATE: TIME: →

DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
12.25							
12.5	1-9-95 1015 403403	NA	3	5Y 5/1 Gray Silty Clay w/5% fine sand; 5% Fine-Med. Sub Angular gravel, Irregular orientation; Low Plast. Slightly Moist.	CL	3.0	PID 10.5 ppm BY 50 cpm
12.75	1-9-95 1015 403403	NA	3	Same As Above 12'.25"— 12'.50"	CL	3.0	PID 10.5 ppm BY 50 cpm
13.0	1-9-95 1015 403403	NA	3	Same As Above 12'.5"— 12'.75"	CL	3.0	PID 10.5 ppm BY 50 cpm
13.25	1-9-95 1015 403403	NA	3	Same As Above 12'.75"— 13'.0"	CL	3.0	PID 10.5 ppm BY 50 cpm
13.5	1-9-95 1015 403403	NA	3	5Y 5/1 Gray; Silty Clay w/10% fine sand; 10% Fine-Med. Sub Angular gravel; Irregular orientation; Low Plast. Slightly Moist.	CL	3.0	PID 10.5 ppm BY 50 cpm
13.75	1-9-95 1015 403403	NA	3	Same As Above 13'.25"— 13'.50"	CL	3.0	PID 10.5 ppm BY 50 cpm
14.0	1-9-95 1015 403403	NA	3	Same As Above 13'.5"— 13'.75"	CL	3.0	PID 10.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/9/95

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307 - 11483 - 013

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: See Page 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0							
14.25	1-9-95 10:15 JCH ~~1025~~ 2/14/96 403403	NA	3	Same As Above 13'.75" — 14.0"	CL	3.0	PID 10.5 ppm BY 50 cpm
14.5	1-9-95 10:15 JCH ~~1025~~ 2/14/96 403403	NA	3	VERY SOFT 5Y 5/1 Gray; Silty Clay w/10% fine Sand; 10% fine-Med. Sub Angular gravel; Irregular orientation; Low Plast. Slightly Moist.; Diagonally oriented fracture 3cm wide; 10YR 5/4 Yellowish Brown; Silty Clay w/coarse sand; Extends 6cm in length.	CL	3.0	PID 10.5 ppm BY 50 cpm
14.75	1-9-95 10:15 JCH ~~1025~~ 2/14/96 403403	NA	3	VERY SOFT 5Y 5/1 Gray; Silty Clay w/10% fine Sand; 10% fine-Med. Sub Angular gravel; Irregular orientation; Low Plast. Slightly Moist.	CL	3.0	PID 10.5 ppm BY 50 cpm
15.0	1-9-95 10:15 JCH ~~1025~~ 2/14/96 403403	NA	3	VERY SOFT 5Y 5/1 Gray; Silty Clay w/10% fine Sand; 10% fine-Med. Sub Angular gravel; Irregular orientation; Low Plast. Slightly Moist.	CL	3.0	PID 10.5 ppm BY 50 cpm
15.25	1-9-95 10:15 JCH ~~1025~~ 2/14/95 403403	NA	3	Same As Above 14'.75" — 15'.0"	CL	3.0	PID 10.5 ppm BY 50 cpm
15.5	1-9-95 10:15 JCH ~~1025~~ 2/14/96 403403	NA	3	Same As Above 15'.0" — 15'.25"	CL	3.0	PID 10.5 ppm BY 50 cpm
15.75	1-9-95 10:15 JCH ~~1025~~ 2/14/96 403403	NA	3	VERY SOFT 5Y 5/1 Gray; Silty Clay w/10% fine Sand; 10% fine-Med. Sub Angular gravel, Irregular orientation; Low Plast. Slightly Moist.	CL	3.0	PID 10.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~ PER 12/4/94

FS-F-3681

000521

G: / WPSC / 94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-014

PAGE 10 OF 23

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 Inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15.75	1-9-95 10:15 ~~10:25~~ 2/14/95 403403	NA	3	VERY STIFF 5Y 4/1 Dark Gray; Silty Clay 5% fine sand 5-10% fine ~~sand~~ PEBBLES Angular gravel; irregular orrientation; Low Plast. Slightly Moist.	CL	3.0	PID 10.5 ppm BY 50 cpm
16.0	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
16.25	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
16.5	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
16.75	1-9-95 ~~403403~~ PB 1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
17.0	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
17.25	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
17.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGB 1/4/94

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

MAR 13 1995

000532

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-015

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: → | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: → | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.75	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
19.0	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
19.25	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
18.5	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
18.75	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
19.0	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
19.25	1-9-95	NA	0	NR	NA	NA	PID NA ppm BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg. 1	/ /	
ALPHA	NA	/ /	
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

000533

F-144

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

CONTROL NO.: 200307-11483-016

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
19.5	1-9-95	NA	0	NR	NA	NA	PID ppm BY cpm
19.75	1-9-95	NA	0	NR	NA	NA	PID ppm BY cpm
20.0	1-9-95	NA	0	NR	NA		PID ppm BY cpm
20.25	1-9-95 1035 403404	NA	3	Stiff 5Y 4/1 Dark Gray; Mottled w/10YR 5/4 Yellowish Brown; Trace of fine Sand; fine-Med. Angular gravel; Irregular orientated; slightly Moist Low Plast.	CL	2.0	PID 10.5 ppm BY 50 cpm
20.5	1-9-95 1035 403404	NA	3	Same As Above 20:0" — 20:25" w/a few pieces of Coarse Angular gravel; Irregular orientation	CL	2.75	PID 10.5 ppm BY 50 cpm
20.75	1-9-95 1035 403404	NA	3	Same As Above 20:25" — 20:5"	CL	3.25	PID 10.5 ppm BY 50 cpm
21.0	1-9-95 1035 403404	NA	3	Very Stiff 5Y 4/1 Dark gray; Faintly Mottled w/10YR 5/4 Yellowish Brown; Trace of fine Sand; Fine-Med. Angular Gravel; Irregular orientated; Low Plast. Slightly Moist.	CL	2.5	PID 10.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 Alone

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995 000534

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307 - 11483 - 017

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0							
21.25	1-9-95 10:35 ~~1045~~ 2/14/96 403404	NA	3	Same As Above 20.75" — 21.0"	CL	3.0	PID 10.5 ppm BY 50 cpm
21.5	1-9-95 10:35 ~~1045~~ 2/14/96 403404	NA	3	Same As Above 21.0" — 21.25	CL	3.75	PID 10.5 ppm BY 50 cpm
21.75	1-9-95 10:35 ~~1045~~ 2/14/96 403404	NA	3	VERY STIFF 5Y 4/1 DARK GRAY; TRACE OF FINE SAND; FINE-MED. ANGULAR GRAVEL; IRREGULAR ORIENTATION; LOW PLASTICITY, SLIGHTLY MOIST. CL		3.25	PID 10.5 ppm BY 50 cpm
22.0	1-9-95 10:35 ~~1045~~ 2/14/96 403404	NA	3	Same As Above 21.5" - 21.75"	CL	1.5	PID 10.5 ppm BY 50 cpm
22.25	1-9-95 1045 403405	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, < 5% FINE SAND, 1-2% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, 10YR 5/6 IRON STAINING (FAINT), LOW PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 10.5 ppm BY 40 cpm
22.5	1-9-95 1045 403405	NA	3	SAME AS ABOVE 22.0 - 22.25	CL	1.5	PID 10.5 ppm BY 40 cpm
22.75	1-9-95 1045 403405	NA	3	VERY STIFF (5Y/4/1) DARK GRAY SILTY CLAY, 5% FINE SAND, < 1% FINE SUBANGULAR GRAVEL, 10YR 5/6 YELLOWISH BROWN MOTTLING, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	2.25	PID 10.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLR 12/4/96

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 14 OF 23
200307-11483-018	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11483	SEE PAGE 1	N/A

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
SEE PAGE 1	N/A			1-9-95

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
GEIGER / RILEY	N/A			1-9-95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
Estimate 0.0 GALLONS	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
23.0	1-9-95 1045 403405	NA	3	VERY STIFF (5Y/4/1) DARK GRAY SILTY CLAY WITH 3-4% FINE SAND, 5% MED-COARSE SUBANGULAR GRAVEL, IRREGULARLY ORIENTATED 10YR 5/6 YELLOWISH BROWN MOTTLING, SLIGHTLY MOIST, MEDIUM PLASTICITY	CL	2.0	PID 10.0 ppm BY 40. CPM
23.25	1-9-95 1045 403405	NA	3	SAME AS ABOVE 23.25 - 23.0	CL	2.25	PID 10.0 ppm BY 40 CPM
23.5	1-9-95 1045 403405	NA	3	SAME AS ABOVE ~~23.25~~ 23.0 - 23.25 AR 112585	CL	2.0	PID 10.0 ppm BY 40 CPM
23.75	1-9-95 1045 403405	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 5% FINE SAND, 5-7% FINE - MED. SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST (NO MOTTLING)	CL	1.5	PID 10.0 ppm BY 40 CPM
24.0	1-9-95 1045 403405	NA	3	SAME AS ABOVE 23.5 - 23.75	CL	1.75	PID 10.0 ppm BY 40 CPM
24.25	1-9-95 1045 403405	NA	3	SAME AS ABOVE 23.75 - 24.0	CL	1.5	PID 10.0 ppm BY 40 CPM
24.5	1-9-95 1045 403405	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 2-3% FINE SAND, 3% FINE-MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, (1) 6x5x3 cm LIMESTONE COBBLE, VERTICALLY ORIENTATED, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 10.0 ppm BY 40 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995 000536

CONTROL NO.: 200307-11483-019	FEMP **LITHOLOGIC LOG**	PAGE 15 OF 23

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07

BORING NUMBER: 11483	COORDINATES: SEE PAGE 1	RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1	GROUNDWATER LEVEL: N/A	DATE:	TIME:	DATE STARTED: 1-9-95
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: N/A	DATE:	TIME:	DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS (Estimate)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL	DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.75	1-9-95 10:45 ~~1050~~ 403405	NA	3	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 3% FINE SAND, 3% FINE SUBANGULAR GRAVEL IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST.	CL	2.0	PID 10.0 ppm BY 40 cpm
25.0	1-9-95 10:45 ~~1050~~ 403405	NA	3	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 2-3% FINE SAND, 2% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, 10 X 9 X 3 cm LIMESTONE COBBLE, HORIZONTAL ORIENTATION, 5Y 5/4 OLIVE SANDY CLAY LAMINATION UNDERNEATH COBBLE 1 cm THICK, LOW PLASTICITY SLIGHTLY MOIST	CL	2.5	PID 10.0 ppm BY 40 cpm
25.25	1-9-95 10:45 ~~1050~~ 403405	NA	3	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 4-5% FINE SAND, 7-8% - MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, SLIGHTLY MOIST, LOW PLASTICITY.	CL	2.5	PID 10.0 BY 40 cpm
25.5	1-9-95 10:45 ~~1050~~ 403405	NA	3	SAME AS ABOVE 25.0 - 25.25	CL	3.0	PID 10.0 ppm BY 40 cpm
25.75	1-9-95 10:45 ~~1050~~ 403405	NA	3	SAME AS ABOVE 25.25 - 25.5	CL	3.5	PID 10.0 ppm BY 40 cpm
26.0	1-9-95 10:45 ~~1050~~ 403405	NA	3	SAME AS ABOVE ~~SAME~~ PG 1/23/95 25.5 - 25.75	CL	3.0	PID 10.0 ppm BY 40 cpm
26.25	1-9-95 10:45 ~~1050~~ 403405	NA	3	SAME AS ABOVE 25.75 - 26.0	CL	2.75	PID 10.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/24/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000537

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307 - 11483 - 020

PAGE 16 OF 23

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A → DATE: TIME:

DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A → DATE: TIME:

DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
26.5	1-9-95 JC 2/14/95 ~~1050~~ 10:45 403405	NA	3	SAME AS ABOVE 26.0 - 26.25	CL	3.0	PID 10.0 ppm BY 40 cpm
26.75	1-9-95 JC 2/14/95 ~~1050~~ 10:45 403405	NA	3	VERY STIFF (5Y 4/1) DARK GRAY SANDY CLAY WITH 10% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, SMALL WOOD FRAGMENTS (2cm), LOW TO SLIGHT PLASTICITY, SLIGHTLY MOIST	CL	3.25	PID 10.0 ppm BY 40 cpm
~~27.0~~	1-9-95 JC 2/14/95 ~~1050~~ 10:45 403405	NA	3	SAME AS ABOVE 26.5 - 26.75 WITHOUT WOOD FRAGMENTS	CL	3.0	PID 10.0 ppm BY 40 cpm
27.25	1-9-95 1050 403406	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 1-2% FINE SAND, 1 LARGE ANGULAR GRAVEL 5x4x2 cm VERTICAL ORIENTATION. MEDIUM PLASTICITY, SLIGHTLY MOIST.	CL	1.5	PID 9.5 ppm BY 50 cpm
27.5	1-9-95 1050 403406	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY. 1-2% FINE SAND, 2% MEDIUM ANGULAR GRAVEL IRREGULAR ORIENTATION, 1 LARGE ANGULAR LIMESTONE GRAVEL 5x3x2 cm, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 9.5 ppm BY 50 cpm
27.75	1-9-95 1050 403406	NA	3	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 1-2% FINE SAND, 2% FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION, SLIGHTLY MOIST, MEDIUM TO LOW PLASTICITY	CL	2.0	PID 9.5 ppm BY 50 cpm
28.0	1-9-95 1050 403406	NA	3	SAME AS ABOVE 27.5 - 27.75	CL	2.25	PID 9.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 12/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

000538

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307 - 11483 - 021

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.25	1-9-95 1055 403406	NA	3	SAME AS ABOVE 27.75 - 28.0	CL	2.0	PID 9.5 ppm BY 50 cpm
28.5	1-9-95 1055 403406	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 2% FINE SAND, 1% FINE ANGULAR GRAVEL, 1 LARGE LIMESTONE GRAVEL 8 x 5 x 3 cm, HORIZONTAL ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.25	PID 9.5 ppm BY 50 cpm
28.75	1-9-95 1055 403406	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 2% FINE SAND, 2% FINE - MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM - LOW PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 9.5 ppm BY 50 cpm
29.0	1-9-95 1055 403406	NA	3	SAME AS ABOVE 28.5 - 28.75	CL	1.5	PID 9.5 ppm BY 50 cpm
29.25	1-9-95 1055 403406	NA	3	STIFF (5Y/4/1) DARK GRAY SILTY CLAY, 4% FINE SAND, 5% FINE - MEDIUM SUBANGULAR GRAVEL, 1 LARGE LIMESTONE ANGULAR GRAVEL 5x3x3 cm, VERTICAL ORIENTATION, SLIGHTLY MOIST, MEDIUM PLASTICITY	CL	2.0	PID 9.5 ppm BY 50 cpm
29.5	1-9-95 1055 403406	NA	3	SAME AS ABOVE 1 LARGE LIMESTONE ANGULAR GRAVEL 5 x 3 x 3 cm, VERTICAL ORIENTATION	CL	1.75	PID 9.5 ppm BY 50 cpm
29.75	1-9-95 1055 403406	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 1-2% FINE SAND, 2% FINE - MED SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 9.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~ALONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 1/4/95

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-022	PAGE 18 OF 23

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07

BORING NUMBER: 11483	COORDINATES: SEE PAGE 1	RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1	GROUNDWATER LEVEL: N/A	DATE:	TIME:	DATE STARTED: 1-9-95
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: N/A	DATE:	TIME:	DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: D. 0GALLONS Estimated	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL	DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30.0	1-9-95 1055 403406	NA	3	SAME AS ABOVE 29.5-29.75	CL	1.5	PID 9.5 ppm BY 50 cpm
30.25	1-9-95 1055 403406	NA	3	SAME AS ABOVE 29.75-30.0	CL	1.5	PID 9.5 ppm BY 50 cpm
30.5	1-9-95 1055 403406	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 3% FINE SAND, 4-5% FINE-MED SUBANGULAR GRAVEL, 2 cm BELOW TOP OF INTERVAL, A 10YR 5/6 YELLOWISH BROWN SILTY CLAY INCLUSION (1x1x2 cm), LARGE 8x7x2.5 cm SHALE COBBLE, VERTICAL ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 9.5 ppm BY 50 cpm
30.75	1-9-95 1055 403406	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2% FINE SAND, 5% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, 1 LARGE 5x3x3 cm LIMESTONE SUBANGULAR GRAVEL, VERTICAL ORIENTATION, 10YR 5/6 YELLOWISH BROWN SILTY CLAY INCLUSIONS, MED. PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 9.5 ppm BY 50 cpm
31.0	1-9-95 1055 403406	NA	3	SAME AS ABOVE (30.5-30.75) NO LARGE GRAVEL	CL	1.5	PID 9.5 ppm BY 50 cpm
31.25	1-9-95 1055 403406	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 1-2% FINE SAND 2% SUBANGULAR (FINE-MED) IRREGULAR ORIENTATION, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST (NO 10YR 5/6 INCLUSIONS)	CL	1.75	PID 9.5 ppm BY 50 cpm
31.5	1-9-95 1055 403406	NA	3	SAME AS ABOVE	CL	1.5	PID 9.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg.	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/14/94

FS-F-3881

MAR 03 1995

G:/WPSC/94-776.DRW (11-23-94)

000540

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-023

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5							
31.75	1-9-95 10:55 ~~1100~~ 403406	JCM 2/14/95 NA	3	SAME AS ABOVE 31.25 - 31.5	CL	1.75	PID 9.5 ppm; BY 50 cpm
32.0	1-9-95 10:55 ~~1100~~ 403406	JCM 2/14/95 NA	3	SAME AS ABOVE 31.5 - 31.75	CL	1.5	PID 9.5 ppm; BY 50 cpm
32.25	1-9-95 1100 403407	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY 3% FINE SAND, 5-6% MED. ANGULAR GRAVEL IRREGULAR ORIENTATION, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 9.5; BY 50 cpm
32.5	1-9-95 1100 403407	NA	3	SAME AS ABOVE 32.0 - 32.25	CL	1.75	PID 9.5 ppm; BY 50 cpm
32.75	1-9-95 1100 403407	NA	3	SAME AS ABOVE 32.25 - 32.5	CL	1.75	PID 9.5 ppm; BY 50 cpm
33.0	1-9-95 1100 403407	NA	3	SAME AS ABOVE 32.5 - 32.75	CL	1.5	PID 9.5 ppm; BY 50 cpm
33.25	1-9-95 1100 403407	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 1-2% FINE SAND, 1% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 9.5 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~ALONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-024

PAGE 20 OF 23

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
33.5	1-9-95 1100 403407	NA	3	SAME AS ABOVE (33.0 - 33.25)	CL	1.5	PID 9.5 ppm BY 50 cpm
33.75	1-9-95 1100 403407	NA	3	SAME AS ABOVE (33.25 - 33.5)	CL	1.75	PID 9.5 ppm BY 50 cpm
34.0	1-9-95 1100 403407	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 2% FINE SAND, 5% MED SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY LARGE 11x7x3 cm DOLOMITE COBBLE (ROUNDED) VERTICAL ORIENTATION SLIGHTLY MOIST, SMALL WOOD FRAGMENTS (1 mm WIDE)	CL	1.5	PID 9.5 ppm BY 50 cpm
34.25	1-9-95 1100 403407	NA	3	SAME AS ABOVE NO COBBLES (33.75 - 34.0) WOOD FRAGMENTS 1 mm WIDE	CL	1.75	PID 9.5 ppm BY 50 cpm
34.5	1-9-95 1100 403407	NA	3	STIFF (5Y 4/1) DARK GRAY SANDY CLAY WITH 5-6% MEDIUM ANGULAR GRAVEL, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST TO MOIST.	CL	1.25	PID 9.5 ppm BY 50 cpm
34.75	1-9-95 1100 403407	NA	3	LOOSE (5Y 4/1) DARK GRAY CLAYEY SAND, 10% MEDIUM ANGULAR TO SUBANGULAR GRAVEL IRREGULAR ORIENTATION, NON-PLASTIC, MOIST. / SOFT 5GY 5/1 GREENISH GRAY CLAY, WITH 10% 5Y 5/2 DARK GRAYISH BROWN SILT INCLUSIONS, WOOD FRAGMENTS	SC / CL	NA / 0.5	PID 9.5 ppm BY 50 cpm
35.0	1-9-95 1100 403407	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 5GY 5/1 GREENISH GRAY CLAY INCLUSIONS, 1-2% FINE SAND, 2% MEDIUM SUBANGULAR TO ANGULAR GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.25	PID 9.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/1/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP LIBRARY MAR 13 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-025

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0							
35.25	1-9-95 1110 403408	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 1-2% FINE SAND 2% MED SUBANGULAR GRAVEL, IRREGULAR ORIENTATION; MEDIUM PLASTICITY, SLIGHTLY MOIST, SMALL YELLOW WOOD FRAGMENTS	CL	1.0	PID 9.5 ppm BY 50 cpm
35.5	1-9-95 1110 403408	NA	3	SAME AS ABOVE (35.0 - 35.25)	CL	1.25	PID 9.5 ppm BY 50 cpm
35.75	1-9-95 1110 403408	NA	3	SAME AS ABOVE (35.25 - 35.5)	CL	1.5	PID 9.5 BY 50 cpm
36.0	1-9-95 1110 403408	NA	3	SAME AS ABOVE (35.5 - 35.75)	CL	1.5	PID 9.5 ppm BY 50 cpm
36.25	1-9-95 1110 403408	NA	3	SAME AS ABOVE (35.75 - 36.0)	CL	1.25	PID 9.5 ppm BY 50 cpm
36.5	1-9-95 1110 403408	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH 3% FINE SAND, 3% FINE ANGULAR GRAVEL, 15% LARGE ANGULAR GRAVEL VERTICALLY ORIENTED, 10.5% 10YR 5/6 YELLOWISH BROWN SILTY CLAY INCLUSIONS, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 9.5 ppm BY 50 cpm
36.75	1-9-95 1110 403408	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2-3% FINE SAND, 3% FINE - MED ANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST.	CL	1.75	PID 9.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 1/4/1995

FS-F-3681

000543

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-026

PAGE 22 OF 23

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-9-95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-9-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
36.75							
37.0	1-9-95 1110 403408	NA	3	SAME AS ABOVE (36.5 - 36.75)	CL	1.5	PID 9.5 ppm; BY 50 cpm
37.25	1-9-95 1110 403409	NA	3	SAME AS ABOVE (36.75 - 37.0)	CL	1.5	PID 10.0 ppm; BY 50 cpm
37.5	1-9-95 1110 403409	NA	3	SAME AS ABOVE (37.0 - 37.25)	CL	1.75	PID 10.0 ppm; BY 50 cpm
37.75	1-9-95 1110 403409	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2% FINE SAND, 1% FINE ANGULAR GRAVEL, (1) 6x4x3 cm SUBANGULAR COBBLE, TILTED ORIENTATION, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 10.0 ppm; BY 50 cpm
38.0	1-9-95 1110 403409	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2% FINE SAND, 5% SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 10.0 ppm; BY 50 cpm
38.25	1-9-95 1110 403409	NA	3	SAME AS ABOVE (37.75 - 38.0)	CL	1.5	PID 10.0 ppm; BY 50 cpm
38.5	1-9-95 1110 403409	NA	3	SAME AS ABOVE (38.0 - 38.25)	CL	1.25	PID 10.0 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11483-027

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11483

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/9/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/9/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.75	1-9-95 11 15 ~~1120~~ 403409	JCHLP 2/14/95 NA	3	SAME AS ABOVE	CL	1.25	PID 10.0 ppm BY 50 cpm
39.0	1-9-95 11 15 ~~1120~~ 403409	JCHLP 2/14/95 NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 4% FINE SAND, 3% FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION, NO LAMINATIONS OR INCLUSIONS OF SILT, SAND, OR GRAVEL, MEDIUM TO LOW PLASTICITY SLIGHTLY MOIST	CL	1.75	PID 10.0 ppm BY 50 cpm
39.25	1-9-95 11 15 ~~1120~~ 403409	JCHLP 2/14/95 NA	3	SAME AS ABOVE	CL	2.0	PID 10.0 BY 50 cpm
39.5	1-9-95 11 15 ~~1120~~ 403409	JCHLP 2/14/95 NA	3	SAME AS ABOVE	CL	2.0	PID 10.0 ppm BY 50 cpm
39.75	1-9-95 11 15 ~~1120~~ 403409	JCHLP 2/14/95 NA	3	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2-3% FINE SAND, 7% FINE-MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, NO LAMINATIONS OR INCLUSIONS OF SILT, SAND, OR GRAVEL PRESENT, LOW PLASTICITY, SLIGHTLY MOIST.	CL	2.5	PID 10.0 ppm BY 50 cpm TCLP 403410 Tot U/ESOU 403411
40.0	1-9-95 11 15 ~~1120~~ 403409	JCHLP 2/14/95 NA	3	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 5% FINE SAND, 4% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, 2.5% FINE WOOD FRAGMENTS, NO LAMINATIONS INCLUSIONS OF SILT, SAND, OR GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.75	PID 10.0 ppm BY 50 cpm
	NA	NA	NA	BOTTOM OF BORING 40.0 FEET	NA	NA	PID NA ppm BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11484-006

PAGE 1 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: N 481816.792 E 1382765.734

RELATED FAL NO.s: N/A

SURFACE ELEVATION: 601.52 ft.

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.5	1/5/95 1025 403382	NA	6	STIFF (10YR 4/4) DARK YELLOWISH BROWN SILTY CLAY, 10% COARSE SAND, 10% MEDIUM ANGULAR GRAVEL, ROOTS, LOW TO MEDIUM PLASTICITY, MOIST	CL	2.0	PID .9 ppm; BY 40 cpm
1.0	1/5/95 1025 403382	NA	6	SAME AS ABOVE (0.0 - 0.5 FEET)	CL	2.0	PID .9 ppm; BY 40 cpm
1.5	1/5/95 1025 403382	NA	6	STIFF (10YR 3/3) DARK BROWN VERY SILTY CLAY, NO SAND OR GRAVEL, ROOTS, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID .9 ppm; BY 40 cpm
2.0	1/5/95 1025 403382	NA	6	SAME AS ABOVE (1.0 - 1.5 FEET)	CL	1.75	PID .9 ppm; BY 40 cpm
2.5	1/5/95 1025 403382	NA	6	STIFF (10YR 4/3) BROWN SILTY CLAY, <1% FINE SAND, NO GRAVEL, SLIGHT IRON STAINING, ROOTS, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID .9 ppm; BY 40 cpm
3.0	1/5/95 1025 403382	NA	6	SAME AS ABOVE (2.0 - 2.5 FEET)	CL	1.5	PID .9 ppm; BY 40 cpm
3.5	NA	NA	~~6~~ 0	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm

MAR 03 1995

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	1/5/95	1020
ALPHA	NA	/NA/	NA
BETA / GAMMA	50	1/5/95	1020

NOTES: JC 2-7-95 ~~None~~ This Lithologic Boring Log was updated using Archived Cores by Geologist Pat Riley on 01/30/95

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-0581

G:/WPSC/94-778.DRW (11-23-94)

CONTROL NO.: 200307-11484-007

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	NA	NA	0	NO RECOVERY	NA	NA	PID NA PPM BY NA CPM
4.0 – 4.5	1/5/95 1150 403383	NA	6	VERY STIFF (10YR 4/6) DARK YELLOWISH BROWN, SILTY CLAY, 5% MEDIUM SAND, 7% MEDIUM SUB-ANGULAR GRAVEL, SLIGHT 10YR 6/2 LIGHT BROWNISH GRAY, MOTTLING, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	3.0	PID .5 PPM BY 40 CPM
4.5 – 5.0	1/5/95 1150 403383	NA	6	SAME AS ABOVE (4.0 - 4.5 FEET)	CL	3.0	PID .5 PPM BY 40 CPM
5.0 – 5.5	1/5/95 1150 403384	NA	6	SAME AS ABOVE (4.5 - 5.0 FEET)	CL	3.0	PID .5 PPM BY 40 CPM
5.5 – 6.0	1/5/95 1150 403384	NA	6	VERY STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY, (10YR 6/2) LIGHT BROWNISH GRAY MOTTLING, 5% COARSE SAND, 7% MEDIUM TO LARGE SUBANGULAR GRAVEL, INTERGRANULAR DISTRIBUTION, MEDIUM PLASTICITY SLIGHTLY MOIST	CL	3.0	PID .5 PPM BY 40 CPM
6.0 – 6.5	1/5/95 1150 403384	NA	6	SAME AS ABOVE (5.5 - 6.0 FEET)	CL	2.75	PID .5 PPM BY 40 CPM
6.5 – 7.0	1/5/95 1150 403384	NA	6	SAME AS ABOVE (6.0 - 6.5 FEET)	CL	3.25	PID .5 PPM BY 40 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

MAR 03 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES~~

FS-F-3681

000547

G:/WPSC/94-776 DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11484-008

PAGE 3 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5	1/5/95 1200 403385	NA	6	STIFF (10YR 5/4) YELLOWISH BROWN, SILTY CLAY 6% COARSE SAND, 10% MEDIUM TO FINE ANGULAR GRAVEL, NO MOTTLING, IRREGULAR ORIENTATION OF GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 4.0 ppm; BY 40 cpm
8.0	1/5/95 1200 403385	NA	6	VERY STIFF SAME AS ABOVE (7.0 - 7.5 FEET)	CL	2.25	PID 4.0 ppm; BY 40 cpm
9.5	1/5/95 1200 403386	NA	6	VERY STIFF (10YR 5/4) YELLOWISH BROWN, SILTY CLAY, 7% COARSE SAND, 9-10% MEDIUM TO FINE GRAVEL, IRREGULAR ORIENTATION, (1) 7x5x3 cm ANGULAR LIMESTONE COBBLE, VERTICAL ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.75	PID 7.0 ppm; BY 50 cpm
9.0	1/5/95 1200 403386	NA	6	SAME AS ABOVE (8.0 - 8.5 FEET) NO COBBLES	CL	2.5	PID 7.0 ppm; BY 50 cpm
9.5	1/5/95 1200 403386	NA	6	SAME AS ABOVE (8.5 - 9.0 FEET)	CL	2.75	PID 7.0 ppm; BY 50 cpm
10.0	1/5/95 1200 403386	NA	6	SAME AS ABOVE (9.0 - 5.5 FEET)	CL	2.75	PID 7.0 ppm; BY 50 cpm
10.5	1/5/95 1200 403386	NA	6	VERY STIFF (10YR 5/4) YELLOWISH BROWN, SILTY CLAY, 7% COARSE SAND, 10-11% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, (10YR 5/6) YELLOWISH BROWN FINE SAND INCLUSIONS, LOW PLASTICITY, SLIGHTLY ~~PLASTICITY~~ MOIST, (1) 6x6x3 SUBANGULAR STRIATED DOLOMITE COBBLE (VERTICAL ORIENTATION)	CL	2.5	PID 7.0 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 None

See Pg. 1

MAR 03 1995

000748

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11484-009

PAGE 4 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

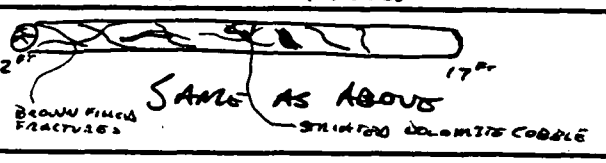
GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
~~11.0~~ 10.5	PR 1/5/95 1210 403386	NA	6	SAME AS ABOVE NO SAND INCLUSIONS (1) LARGE STRIATED DOLOMITE GRAVEL, IRREGULAR ORIENTATION	CL	2.25	PID 7.0 ppm BY 50 cpm
11.0	1/5/95 1210 403386	NA	6	VERY STIFF (10YR 5/4) SILTY CLAY 8-9% COARSE SAND, 10% FINE ANGULAR GRAVEL, LAMINATION OF 10YR 8/6 WITH 7x5x3cm COBBLE HORIZONTAL ORIENTATION (LIMESTONE) OVERLYING GRAY CLAY. VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 4-5% FINE SAND, 1-2% FINE ANGULAR GRAVEL (IRREGULAR), NO LAMINATIONS OR INCLUSIONS OF SILT, SAND, OR GRAVEL, LOW PLASTICITY SLIGHTLY MOIST TO DRY, DESSICATION	CL / CL	3.5 BR / 2.5 BR	PID 7.0 ppm BY 50 cpm
12.0	1/5/95 1210 403386	NA	6	FRACTURES EXTEND OVER THE NEXT ~~[illegible]~~ 2 FEET. THE FRACTURES ARE FILLED WITH (10YR 5/4) YELLOWISH BROWN SANDY CLAY, 9-10% FINE ANGULAR GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 7.0 ppm BY 50 cpm
12.5	1/5/95 1210 403387	NA	6	 SAME AS ABOVE	CL	2.5	PID 7.0 ppm BY 50 cpm
13.0	1/5/95 1210 403387	NA	6	SAME AS ABOVE	CL	2.5	PID 7.0 ppm BY 50 cpm
13.5	1/5/95 1210 403387	NA	6	SAME AS ABOVE (1) 7x5x3cm SUBANGULAR STRIATED DOLOMITE COBBLE VERTICAL	CL	2.5	PID 7.0 ppm BY 50 cpm
14.0	1/5/95 1210 403387	NA	6	SAME AS ABOVE NO COBBLES	CL	2.5	PID 7.0 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

MAR 03 1995

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681 000549

G: / WPSC / 94-776.DRW (11-23-94)

CONTROL NO.: 200307-11484-010

FEMP
LITHOLOGIC LOG

PAGE 5 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	1/5/95 1215 403387	NA	6	SAME AS ABOVE (13.5-14.0 FEET)	CL	2.5	PID 7.0 ppm BY 50 cpm
14.5	1/5/95 1215 403387	NA	6	SAME AS ABOVE (14.0-14.5 FEET)	CL	2.5	PID 7.0 ppm BY 50 cpm
15.0	1/5/95 1215 403387	NA	6	SAME AS ABOVE (14.5-15.0 FEET)	CL	2.5	PID 7.0 ppm BY 50 cpm
15.5	1/5/95 1215 403387	NA	6	VERY STIFF (5Y 4/1) DARK GRAY, 2% FINE SAND, 1% FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION SMALL DESSICATION CRACKS FILLED WITH BROWN SANDY CLAY AND, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.75	PID 7.0 ppm BY 50 cpm
16.0	1/5/95 1215 403387	NA	6	VERY STIFF (5Y 4/1) DARK GRAY, 1-2% FINE SAND, 1-2% FINE ANGULAR TO SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, (1) 6 x 5 x 4 cm DOLOMITE SUBANGULAR COBBLE, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 7.0 PPM BY 50 cpm
16.5	1/5/95 1215 403387	NA	6	SAME AS ABOVE NO COBBLES (16.0-16.5 FEET) 3% WOOD FRAGMENTS	CL	2.75	PID 7.0 ppm BY 50 cpm
17.0	1/5/95 1215 403388	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY 1% FINE SAND, 10% LARGE GRAVEL, (1) 7 x 4 x 3 cm ANGULAR LIMESTONE COBBLE, VERTICAL ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 7.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

MAR 03 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

000550 G:/WPSC/94-776.DRW (11-23-94)

3 1

CONTROL NO.: 200307-11484-~~010~~ 011 (19-14-95)

FEMP
LITHOLOGIC LOG

PAGE 6 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A — DATE: — TIME: →

DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A — DATE: — TIME: →

DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5	1/5/95 1220 403388	NA	6	SAME AS ABOVE (17.0-17.5) (1) 9x5x4 cm ANGULAR LIMESTONE COBBLE IRREGULAR ORIENTATION	CL	2.5	PID 7.5 ppm BY 50 cpm
18.0	1/5/95 1220 403388	NA	6	SAME AS ABOVE (17.5-18.0) (1) 9x4x4 SUBANGULAR DOLOMITE COBBLE TILTED ORIENTATION	CL	2.5	PID 7.5 ppm BY 50 cpm
18.5	1/5/95 1220 403388	NA	6	SAME AS ABOVE (18.0-18.5) 15% LARGE ANGULAR GRAVEL, IRREGULAR ORIENTATION	CL	2.25	PID 7.5 ppm BY 50 cpm
19.0	1/5/95 1220 403388	NA	6	SAME AS ABOVE (18.5-19.0 FEET)	CL	2.5	PID 7.5 ppm BY 50 cpm
19.5	1/5/95 1220 403388	NA	6	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 1% FINE SAND, 3% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, (1) 9x5x3 cm SUBANGULAR LIMESTONE COBBLE, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.75	PID 7.5 ppm BY 50 cpm
20.0	1/5/95 1220 403388	NA	6	SAME AS ABOVE (19.5-20.0) NO COBBLE	CL	3.0	PID 7.5 ppm BY 50 cpm
20.5	1/5/95 1220 403388	NA	6	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 3% FINE SAND, 5% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, LOW TO MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	3.0	PID 7.5 ppm BY 50 cpm
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-10-95 ~~NONE~~

See Pg. 1

MAR 03 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 12/4/94

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

000551

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11484-017

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimated

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0 – 21.5	1/5/95 1225 403388	NA	6	SAME AS ABOVE (20.5 - 21.0 FEET)	CL	2.5	PID 7.5 ppm; BY 50 cpm
21.5 – 22.0	1/5/95 1225 403388	NA	6	SAME AS ABOVE (21.0 - 21.5 FEET)	CL	2.75	PID 7.5 ppm; BY 40 cpm
22.0 – 22.5	1/5/95 1225 403389	NA	10	SAME AS ABOVE (<1%) TRACE OF WOOD FRAGMENTS (1) 8x7x3 cm SUBANGULAR LIMESTONE COBBLE IRREGULAR ORIENTATION	CL	2.5	PID 7.5 ppm; BY 40 cpm
22.5 – 23.0	1/5/95 1225 403389	NA	6	VERY STIFF (ST 4/1) DARK GRAY SILTY CLAY 3% FINE SAND, 5% FINE TO MEDIUM ANGULAR TO SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.75	PID 7.5 ppm; BY 40 cpm
23.0 – 23.5	1/5/95 1225 403389	NA	6	SAME AS ABOVE (22.5 - 23.0 FEET)	CL	2.75	PID 7.5 ppm; BY 40 cpm
23.5 – 24.0	1/5/95 1225 403389	NA	6	SAME AS ABOVE (23.0 - 23.5 FEET) (1) LARGE 5x3x2 cm ANGULAR LIMESTONE GRAVEL HORIZONTAL ORIENTATION	CL	2.5	PID 7.5 ppm; BY 40 cpm
24.0 – 24.5	1/5/95 1225 403389	NA	6	SAME AS ABOVE (23.5 - 24.0 FEET) NO LARGE GRAVEL	CL	3.0	PID 7.5 ppm; BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

MAR 03 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/4/95

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

CONTROL NO.: 200307-11484-013

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5	1/5/95 1230 403389	NA	6	SAME AS ABOVE (24.0-24.5 FEET)	CL	2.75	PID 8.0 ppm BY 40 CPM
25.0	1/5/95 1230 403389	NA	6	SAME AS ABOVE (24.5-25.0 FEET)	CL	2.5	PID 8.0 ppm BY 40 CPM
25.5	1/5/95 1230 403389	NA	6	SAME AS ABOVE (25.0-25.5 FEET)	CL	3.0	PID 8.0 ppm BY 40 CPM
26.0	1/5/95 1230 403389	NA	6	SAME AS ABOVE (25.5-26.0 FEET)	CL	2.5	PID 8.0 ppm BY 40 CPM
26.5	1/5/95 1230 403389	NA	6	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2-3% FINE SAND, 2% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION (1) LARGE 5x4x2cm ANGULAR LIMESTONE GRAVEL, HORIZONTAL ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.75	PID 8.0 ppm BY 40 CPM
27.0	1/5/95 1230 403389	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 1% FINE SAND, < 1% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY MOIST	CL	1.5	PID 6.5 ppm BY 40 CPM
27.5	1/5/95 1230 403390	NA	6	SAME AS ABOVE (27.0-27.5 FEET)	CL	1.75	PID 6.5 ppm BY 40 CPM
28.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

MAR 03 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 1/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000553

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11484-014

PAGE 9 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0 – 28.5	1/5/95 1235 403390	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 3% FINE SAND, 8% MEDIUM SUBANGULAR TO SUBROUNDED GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.25	PID 6.5 ppm BY 40 cpm
28.5 – 29.0	1/5/95 1235 403390	NA	6	SAME AS ABOVE (28.0 - 28.5 FEET) TILTED ORIENTATION (1) 10 x 6 x 4 cm SUBROUNDED LIMESTONE COBBLE	CL	2.0	PID 6.5 ppm BY 40 cpm
29.5	1/5/95 1235 403390	NA	6	STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 5% FINE TO MEDIUM SAND, 8% FINE TO MEDIUM GRAVEL, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST.	CL	2.0	PID 6.5 ppm BY 40 cpm
30.0	1/5/95 1235 403390	NA	6	VERY STIFF SAME AS ABOVE (29.0 - 29.5 FEET)	CL	2.5	PID 6.5 ppm BY 40 cpm
30.5	1/5/95 1235 403390	NA	6	STIFF (5GY 4/1) DARK GREENISH GRAY, SILTY CLAY, 1% - 2% FINE SAND, 1-2% FINE SUBANGULAR GRAVEL, (1) 7 x 5 x 3 cm ANGULAR LIMESTONE COBBLE, VERTICAL ORIENTATION, MEDIUM PLASTICITY, MOIST	CL	1.75	PID 6.5 ppm BY 40 cpm
31.0	1/5/95 1235 403390	NA	6	SAME AS ABOVE (30.0 - 30.5 FEET) (1) 8 x 4 x 2 cm ANGULAR LIMESTONE COBBLE, IRREGULAR ORIENTATION	CL	1.75	PID 6.5 ppm BY 40 cpm
31.5	1/5/95 1235 403391	NA	6	SAME AS ABOVE 30.5 - 31.0 FEET	CL	1.75	PID 6.0 ppm BY 30 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

MAR 09 1995

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 1/4/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11484-015

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/5/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/5/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5	1/5/95 1240	NA	6	SAME AS ABOVE (1) 6x4x2cm ANGULAR LIMESTONE COBBLE HORIZONTAL	CL	2.0	PID 6.0 ppm BY 30 cpm
32.0	403391						
32.5	1/5/95 1240 403391	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2% FINE SAND, 15% MEDIUM TO LARGE SUBANGULAR TO SUBROUNDED GRAVEL, IRREGULAR ORIENTATION (1) 12 x 5x7cm ANGULAR LIMESTONE COBBLE, VERTICAL ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 6.0 ppm BY 30 cpm
33.0	1/5/95 1240 403391	NA	6	STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 2% FINE SAND, 5% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MOTTLED WITH (5GY 4/1) DARK GREENISH GRAY SILTY CLAY, MEDIUM TO HIGH PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 6.0 ppm BY 30 cpm
33.5	1/5/95 1240 403391	NA	6	SAME AS ABOVE (32.5 - 33.0 FEET)	CL	1.75	PID 6.0 ppm BY 30 cpm
34.0	1/5/95 1240 403391	NA	6	SAME AS ABOVE (33.0 - 33.5 FEET) (1) 5x4x2cm LARGE LIMESTONE GRAVEL, VERTICAL ORIENTATION	CL	1.5	PID 6.0 ppm BY 30 cpm
34.5	1/5/95 1240 403391	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 3% FINE SAND 2% FINE TO MEDIUM SUBANGULAR GRAVEL IRREGULAR ORIENTATION, (1) 8x5x4cm SUBROUNDED LIMESTONE COBBLE, TILTED ORIENTATION, NO INCLUSIONS OR LAMINATIONS OF SILT, SAND, OR GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 6.0 ppm BY 30 cpm
35.0	1/5/95 1240 403391	NA	6	SAME AS ABOVE (34.0 - 34.5 FEET) NO COBBLE(s)	CL	1.75	PID 6.0 ppm BY 30 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

MAR 03 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 1/4/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000555

CONTROL NO.: 200307-11484-016

FEMP
LITHOLOGIC LOG

PAGE 11 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11484	COORDINATES: SEE PAGE 1
RELATED FAL NO.s: N/A	
SURFACE ELEVATION: SEE PAGE 1	GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE STARTED: 1/5/95
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE COMPLETED: 1/5/95
WATER USED DURING DRILLING: 0.0 GALLONS Estimate	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0	1/5/95 1300 403391	NA	6	SAME AS ABOVE (34.5 - 35.0 FEET)	CL	2.0	PID 6.0 PPM BY 30 CPM
36.0	1/5/95 1300 403391	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 5% ~~SILT~~ FINE SAND, 4-10% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM TO LOW PLASTICITY, NO INCLUSIONS OF SILT, SAND, OR GRAVEL, SLIGHTLY MOIST	CL	1.75	PID 6.0 PPM Silica - 403395 BY 30 CPM TCL (AND) TOH U/ESOU TCL 403392, 403394 403393
36.5	NA	NA	NA	NO RECOVERY	NA	NA	PID NA PPM BY NA CPM
37.0	NA	NA	NA	NO RECOVERY	NA	NA	PID NA PPM BY NA CPM
		NA		DESCRIPTION ~~BOTTOM OF BORING 37.0~~ PR 2/8/95 ENDS AT 37.0 FEET. BORING HAD TO BE CLEANED OUT TO 40.0 FEET, FOR REINSTALLATION, THIS INTERVAL			PID PPM BY CPM
		NA		(37.0 - 40.0 FEET) WAS NOT DESCRIBED OR SAMPLED. PR 2/8/95			PID PPM BY CPM
		NA					PID PPM BY CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

MAR 03 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PR 1/4/95

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 20@307-11485-~~000~~ 005

PAGE 1 OF 3

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11485

COORDINATES: N 481818.371 · E1382740.340

RELATED FAL NO.s: N/A

SURFACE ELEVATION: 598.08 ft.

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/6/95

GEOLOGIST: GEIGER / RILEY / MULLER

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/6/95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	1/6/95 1200 403396	NA	6	0-2 VERY STIFF (2.5Y, 3/2) VERY DARK GREYISH BROWN CLAYEY SILT, 50% ORGANICS, 5% SAND MEDIUM PLASTICITY, MOIST 2-6 VERY STIFF (2.5Y, 5/4) LIGHT OLIVE BROWN CLAYEY SILT, 15% SAND, MEDIUM PLASTICITY TRACE FINE GRAVEL, ROOTS MOIST	ML	2.5	PID 0.0 ppm BY 50 cpm
0.5	1/6/95 1200 403396	NA	6	SAA	ML	2.5	PID 0.0 ppm BY 50 cpm
1	1/6/95 1200 403396	NA	6	STIFF (2.5Y, 4/3) OLIVE BROWN SILTY CLAY, TRACE SAND, ORGANICS (ROOTS), ORANGE MOTTLES, OBVIOUS THIN BEDDING PLANES HIGH PLASTICITY, MOIST	CL	1.0	PID 0.0 BY 50 cpm
1.5	1/6/95 1200 403396	NA	6	SAA	CL	2.0	PID 0.0 ppm BY 50 cpm
2.0	1/6/95 1200 403396	NA	6	STIFF (2.5Y, 4/4) OLIVE BROWN SILTY CLAY TRACE FINE SAND, ORGANICS, ORANGE MOTTLES, MEDIUM PLASTICITY, MOIST	CL	2.0	PID 0.0 ppm BY 50 cpm
2.5	1/6/95 1200 403396	NA	6	STIFF (2.5Y, 4/4) OLIVE BROWN SILTY CLAY 5% MEDIUM-COARSE ROUNDED SAND, 3% ORGANICS, TRACE ORANGE AND BLACK MOTTLES, MEDIUM PLASTICITY, MOIST	CL	2.0	PID 0.0 ppm BY 50 cpm
3	1/6/95 1200 403397	NA	6	SAA	CL	2.0	PID 0.0 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	1/6/95	0730
ALPHA	NA	NA	NA
BETA / GAMMA	50	1/6/95	0730

NOTES: SAA = SAME AS ABOVE. ALSO This Lithologic Log was updated using Archived Cores by Geologists Barry Mueller and Kevin Collins on 2/01 and 2/02/95.

BEM

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681 000557

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 2 OF 3
200307-11485-~~0006~~ 006 JC 2-14-95	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11485	See Pg. 1	N/A

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg. 1	N/A			1/6/95

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
COLLINS / GEIGER / RILEY	N/A			1/6/95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
0.0 GALLONS Estimate	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	1/6/95 1205 403397	NA	6	Stiff Light olive brown (2.5y 5/6) silty clay with < 2% angular gravel, 7-10% subrounded coarse sand, light orange stains throughout with very little manganese stains and a trace of rootlets. medium plasticity, moist	CL	2.0	PID 0.0 ppm BY 50 cpm
4.5	1/6/95 1205 403397	NA	6	Same as above, except some gray mottling near 4.5 feet.	CL	2.0	PID 0.0 ppm BY 50 cpm
5.0	1/6/95 1205 403397	NA	6	Stiff Light olive brown (2.5yr 5/6) silty clay with < 2% subangular gravel, 5-7% subangular fine gravel, 2% subangular medium sand. Slight orange mottling, off-white mottling. Medium plasticity, moist.	CL	2.0	PID 0.0 ppm BY 50 cpm
5.5	1/6/95 1205 403397	NA	6	Same as above.	CL	2.0	PID 0.0 ppm BY 50 cpm
6.0	1/6/95 1205 403397	NA	6	Stiff Olive brown (2.5yr 4/6) silty clay with 5-7% subrounded fine gravel, <2% subangular coarse sand Gray mottling, iron stains (orange). medium plasticity, moist.	CL	2.0	PID 0.0 ppm BY 50 cpm
6.5	1/6/95 1205 403397	NA	6	Very stiff Olive brown (2.5yr 4/6) silty clay with 5% subrounded fine gravel, 5-7% subrounded coarse gravel; A cobble at bottom 3", with the following dimensions: 3x6x 7mm, irregular tilted orientation. Silty clay is medium plasticity, moist, with gray mottling and dark orange mottling.	CL	2.5	PID 0.0 ppm BY 50 cpm
7.0	1/6/95 1205 403397	NA	6	Very stiff. Light olive brown (2.5yr 5/6) silty clay with 10% subangular fine gravel, < 5% subangular coarse sand, with iron/orange stains, gray mottling, medium plasticity, moist.	CL	2.5	PID 0.0 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

MAR 13 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 12/4/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000558

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11485-~~0007~~ 007 JC 2-14-95

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11485

COORDINATES: See Pg.1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg.1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1/6/95

GEOLOGIST: COLLINS / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1/6/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0	1/6/95			Very stiff Light olive brown (2.5yr 5/4) silty clay with 3-5% subrounded fine gravel, <5% rounded to subangular coarse sand. Gray mottling, dark orange stains present. Medium plasticity, moist.			PID 0.0 ppm
	1205	NA	6		CL	2.5	BY 50 cpm
7.5	403397						
	1/6/95			Same as above; except two borderline gravel/cobble sized clasts (70mm x 30mm x 30mm) irregular orientation.			PID 0.0 ppm
	1205	NA	6		CL	2.5	BY 50 cpm
8.0	403397						TCLP 403398 TOT. 403399
		NA		Bottom of Boring 8.0'			PID ppm BY cpm
		NA					PID ppm BY cpm
		NA					PID ppm BY cpm
		NA					PID ppm BY cpm
		NA					PID ppm BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg.1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg.1	/ /	

NOTES: JC 2-7-95 None

See Pg.1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 1/4/94

FS-F-3681

000559

F-170

G:/WPSC/94-776.DRW (11-23-94)

MAR 13 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11486-005	PAGE 1 OF 12
PROJECT NAME: Phase I+II of The OU2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11486	COORDINATES: N482104.788; E1332424.031
RELATED FAL NO.s: N/A	
SURFACE ELEVATION: 605.00 ft.	GROUNDWATER LEVEL: N/A / DATE: / TIME: / DATE STARTED: 1/10/95
GEOLOGIST: Geiger / Riley	GROUNDWATER LEVEL: N/A / DATE: / TIME: / DATE COMPLETED: 1/10/95
WATER USED DURING DRILLING (Est): 0.0 gallons	DRILLING CONTRACTOR: Alliance / DRILLING EQUIPMENT: Rotosonic / DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0 – .5	1/10/95 845 403418	NA	6	STIFF 10YR 4/3 Dark Brown Silty Clay with Roots med Plast. slightly moist some mg + Fe staining	CI	2.0	PID 0.0 By GO
.5 – 1.0	1/10/95 845 403418	NA	6	SAA	CI	2.0	PID 0.0 By GO
1.0 – 1.5	1/10/95 845 403418	NA	6	SAA	CI	2.0	PID 0.0 By GO
1.5 – 2.0	1/10/95 845 403418	NA	6	SAA	CI	2.0	PID 0.0 By GO
2.0 – 2.5	1/10/95 845 403418	NA	6	STIFF 10YR 4/3 Dark Brown Silty Clay with Trace of Gravel with Fe mg stain ~ Gray mottling med. Plasticity slightly moist	CI	2.0	PID 0.0 By GO
2.5 – 3.0	1/10/95 845 403418	NA	6	SAA	CI	2.0	PID 0.0 By GO
3.0 – 3.5	1/10/95 845 403419	NA	6	STIFF 10YR 4/4 Dark Yellowish Brown, Silty Clay with a trace of gravel Fe mg stains, med. plast slightly moist		1.5	PID 0.0 By GO

FEMP CA 21 FEB 23 199

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	1/10/95	800
ALPHA	NA	NA	NA
BETA / GAMMA	40-50	1/10/95	800

NOTES: JC 2-8-96 ~~Done~~ Page 5 of This Lithologic Log was updated using Archived Soil Cores by Geologist Thea Layne on 02/7/95.

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

811

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11486-006

PROJECT NAME: Phase I+II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11484

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/10/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	1/10/95 850 403419	NA	6	STIFF 10YR 4/6 DARK YELLOWISH BROWN WITH GRAY MOTTLING SILTY CLAY WITH SOME SAND AND GRAVEL, MED. PLAST SLIGHTLY MOIST	CI	1.5	PID 0 BY 60
4.5	1/10/95 850 403419	NA	6	SAA	CI	1.5	PID 0 BY 60
5.0	1/10/95 850 403419	NA	6	SAA	CI	1.5	PID 0 BY 60
5.5	1/10/95 850 403419	NA	6	SAA	CI	1.5	PID 0 BY 60
6.0	1/10/95 850 403419	NA	6	SAA	CI	1.5	PID 0 BY 60
6.5	1/10/95 850 403419	NA	6	SAA	CI	1.5	PID 0 BY 60
7.0	1/10/95 850 403419	NA	6	SAA	CI	1.5	PID 0 BY 60

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA
BETA / GAMMA	See pg 1		

NOTES: JC 2-8-95 NAW

See Pg. 1

FEMP QA FEB 23 1995

000561

F-172

BLOWS COLLECTED PER ASTM STANDARD PENETRATION TEST

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11486-007

PAGE 3 OF 12

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1/10/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 2.5	1/10/95 900 ~~403420~~	NA	0	NR	NA	NA	PID 0 BY 50
5.0	1/10/95 900	NA	0	NR	NA	NA	PID 0 BY 50
5.5	1/10/95 900	NA	0	NR	NA	NA	PID 0 BY 50
9.0	1/10/95 900 403420	NA	6	MED STIFF 10YR 5/4 YELLOWISH BROWN WITH GRAY MOTTLING; SILTY CLAY WITH A TRACE OF GRAVEL MED. PLAST. SLIGHTLY MOIST	CI	1.0	PID 0 BY 50
9.5	1/10/95 900 403420	NA	6	SAA	CI	1.0	PID 0 BY 50
10.0	1/10/95 900 403420	NA	6	SAA	CI	1.0	PID 0 BY 50
10.5	1/10/95 900 403421	NA	6	SAA - WITH MORE GRAVEL	CI	1.0	PID 0 BY 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA
BETA / GAMMA	See pg 1		

NOTES: JC 2-8-95

See Pg. 1

FEMP QA 21 FEB 23 1995

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11486-004

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/10/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	1/10/95 910 403421	NA	6	SAA	CL	1.0	PID 0 BY 50
11.5	1/10/95 910 403421	NA	6	SAA	CL	1.0	PID 0 BY 50
12.0	1/10/95 910 403421	NA	6	SAA	CL	1.0	PID 0 BY 50
12.5	1/10/95 910 403421	NA	6	SAA	CL	1.0	PID 0 BY 50
13.0	1/10/95 910 403421	NA	6	SAA	CL	1.0	PID 0 BY 50
13.5	1/10/95 910 403421	NA	6	SAA	CL	1.0	PID 0 BY 50
14.0	1/10/95 910 403421	NA	6	~~SAA~~ R 2-7-95 (2.5Y 5/4) Lt Olive Brown Clayey, Sandy, Gravel, 50-60% Coarse angular gravel, 15-25% Coarse sand and fine gravel, 35%-15% Clay	~~CL~~ R 2-7-95 GC	~~1.0~~ R 2-7-95 NA	PID 0 BY 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See	pg 1	
ALPHA	NA	NA	NA
BETA / GAMMA	See	pg 1	

NOTES: JC 2-8-95 ~~None~~

See Pg. 1

FEMP QA 31 FEB 23 1995

000563

F-174

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST

CONTROL NO.: 200307-11486-009

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.(s): N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1/10/95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0 0GALLONS (Est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
4.0							
14.5	1/10/95 0920 403421	NA	6	same as 13.5-14.0' except a cobble 80x60x30mm thick less clay (10-15%)	GC	N/A	PID Ø ppm; BY 50 cpm
15.0	1/10/95 0920 403421	NA	6	same as 13.5-14.0' except less clay (10-15%)	GC	N/A	PID Ø ppm; BY 50 cpm
15.5	1/10/95 0920 403421	NA		NO RECOVERY			PID Ø ppm; BY 50 cpm
16.0	1/10/95 0920 403421	NA		NO RECOVERY			PID Ø ppm; BY 50 cpm
16.5	1/10/95 0920 403421	NA		NO RECOVERY			PID Ø ppm; BY 50 cpm
17.0	1/10/95 0920 403421	NA		NO RECOVERY			PID Ø ppm; BY 50 cpm
7.5	1/10/95 0920 403422	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY W/ 3% fine to med sand; 1-2% coarse sand; 20% "smaller" coarse gravel (angular) (20-25mm) 2-3% very fine gravel (2-3mm) LOW PLASTICITY Slightly moist	CL	1.0	PID Ø ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE FIRST PAGE	/ /	
ALPHA		/ /	
BETA / GAMMA		/ /	

NOTES: 17.0 - 19.5 Archive Core shows a brown fine/med grain sand interspersed throughout - difficult to assess interface and where the sand came from - a sand seam is noted at 19.5-20.0 and is clearly discernable but rest of sand could have migrated by post drilling procedure otherwise the deduction would be fractured gray clay w/ extensive structure and brown sand

~~* SAMPLES COLLECTED PER ASTM STANDA~~

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 21 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11486-010

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1/10/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal. (EST)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0	1/10/95 930 403422	NA	6	SAA	CI	1.0	PID 0 BY 50
18.0 – 18.5	1/10/95 930 403422	NA	6	SAA	CI	1.0	PID 0 BY 50
18.5 – 19.0	1/10/95 930 403422	NA	6	SAA	CI	1.0	PID 0 BY 50
19.0 – 19.5	1/10/95 930 403422	NA	6	SAA	CI	1.0	PID 0 BY 50
19.5 – 20.0	1/10/95 930 403422	NA	6	MED STIFF SAA - WITH 2" SANDY CLAY SEAM	CI	.5	PID 0 BY 50
20.0 – 20.5	1/10/95 930 403423	NA	6	SOFT 5Y - 4/1 DARK GRAY SANDY CLAY WITH GRAVEL. MED. PLAST. SLIGHTLY MOIST	CI	.25	PID 0 BY 50
20.5 – 21.0	1/10/95 930 403423	NA	6	MED STIFF 5Y 4/1 DARK GRAY SILTY CLAY, WITH SAND + GRAVEL MED. PLAST SLIGHTLY MOIST	CI	1.0	PID 0 BY 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA
BETA / GAMMA	See pg 1		

NOTES: JC 3-8-95 ~~NONE~~

See Pg. 1

DEVIC QA

FEB 23 1995

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11486-011

PAGE 7 OF 12

PROJECT NAME: Phase I + II of The OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/10/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal. (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0 – 22.5	1/10/95 935 403423	NA	6	SAA	CI	1.0	PID 0 BY 50
22.5 – 24.0	1/10/95 935 403423	NA	6	SAA	CI	1.0	PID 0 BY 50
24.0 – 25.5	1/10/95 935 403423	NA	6	SAA	CI	1.0	PID 0 BY 50
25.5 – 27.0	1/10/95 935 403423	NA	6	SAA	CI	1.0	PID 0 BY 50
27.0 – 28.5	1/10/95 935 403423	NA	6	SAA	CI	1.0	PID 0 BY 50
28.5 – 30.0	1/10/95 935 403423	NA	6	SAA	CI	1.0	PID 0 BY 50
30.0 – 31.5	1/10/95 935 403424	NA	6	SAA	CI	1.0	PID 0 BY 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA
BETA / GAMMA	See pg 1		

NOTES: JC 2-8-95 ~~Hours~~

See Pg. 1

FEB 23 1995

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

CONTROL NO.: 200307-11486-012

FEMP
LITHOLOGIC LOG

PROJECT NAME: Phase I+II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1/10/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 25.0	1/10/95 945 403424	NA	6	SAA	CL	1.0	PID 0 BY 50
25.0 – 25.5	1/10/95 945 403424	NA	6	SAA	CL	1.0	PID 0 BY 50
25.5 – 26.0	1/10/95 945 403424	NA	6	SAA	CL	1.0	PID 0 BY 50
26.0 – 26.5	1/10/95 945 403424	NA	6	SAA	CL	1.0	PID 0 BY 50
26.5 – 27.0	1/10/95 945 403424	NA	6	SAA - WITH 1"-2" GRAVEL	CL	1.0	PID 0 BY 50
27.0 – 27.5	1/10/95 945 403425	NA	6	SOFT 5Y 4/1 DARK GRAY SANDY CLAY WITH GRAVEL, LOW TO MED PLAST. SLIGHTLY MOIST TO MOIST	CL	.25	PID 0 BY 60
27.5 – 28.0	1/10/95 945 403425	NA	6	SAA	CL	.25	PID 0 BY 60

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg 1		
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg 1		

NOTES: TC 2-8-95 ~~Work~~

See Pg. 1

FEMP 24

FEB 23 1995

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES

FEMP

LITHOLOGIC LOG

CONTROL NO.: 203077-11486-013

PAGE 9 OF 12

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE STARTED: 1/10/95

GEOLOGIST: Gregor / Riley

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
25.0 – 25.5	1/10/95 950 403425	NA	6	STIFF 5Y 4/1 DARK GRAY SILTY CLAY WITH SOME SAND + GRAVEL, MED. PLAST. SLIGHTLY MOIST	CI	2.0	PID 0 BY >0
25.5 – 26.0	1/10/95 950 403425	NA	6	SAA	CI	2.0	PID 0 BY >0
26.0 – 26.5	1/10/95 950 403425	NA	6	SAA	CI	2.0	PID 0 BY >0
26.5 – 30.0	1/10/95 950 403425	NA	6	SAA	CI	2.0	PID 0 BY >0
30.0 – 30.5	1/10/95 950 403425	NA	6	SAA	CI	2.0	PID 0 BY >0
30.5 – 31.0	1/10/95 950 403425	NA	6	SAA - WITH COBBLE 3 X 3 X 1	CI	2.0	PID 0 BY >0
31.0 – 31.5	1/10/95 950 403425	NA	6	VERY STIFF SAA - TRE 30' - 30.5' FT.	CI	3.5	PID 0 BY >0

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA
BETA / GAMMA	See pg 1		

NOTES: JC 2-8-95 NAME

See Pg. 1

000568

FEB 23 1995

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11486-014

PROJECT NAME: Phase I + II of The OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/10/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal (EST.)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5	1/10/95 955 403425	NA	6	SAA	CI	3.5	PID 0 BY >0
32.0	1/10/95 955 403426	NA	6	SAA	CI	3.5	PID 0 BY >0
32.5	1/10/95 955 403426	NA	6	SAA	CI	2.0	PID 0 BY >0
33.0	1/10/95 955 403426	NA	6	SAA	CI	2.0	PID 0 BY >0
33.5	1/10/95 955 403426	NA	6	SAA	CI	2.0	PID 0 BY >0
34.0	1/10/95 955 403426	NA	6	SAA	CI	2.0	PID 0 BY >0
34.5	1/10/95 955 403426	NA	6	STIFF ~~SAA~~ TL 2-7-95 (5Y 4/1) DARK GRAY Silty CLAY w/ 3-5% fine to med grain sand, 2-3% coarse sand, 3-5% fine gravel, 5% Coarse angular gravel (2-3), 10-15 twig fragments LOW PLASTICITY Slightly Moist	CI	2.0	PID 0 BY >0
35.0	1/10/95 955 403426	NA	6	SAA	CI	2.0	PID 0 BY >0

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA
BETA / GAMMA	See pg 1		

NOTES: 2-7-95 I WENT TO THE ARCHIVE CORE ~~BOXE~~ 32-37' and checked screened interval - All the same as 34.0-34.5 (I updated description) except for cobble where noted @ 35.0-35.5'. Basically screened interval is a VERY STIFF Silty CLAY w/ About 10-15% poorly sorted gravel (angular to subangular) scattered throughout and 5-10% [illegible]

000569

F-180

UP A

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION [illegible] 2-7-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11486-015

PAGE 11 OF 12

PROJECT NAME: Phase I+II of The OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1/10/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0	1/10/95 1000	NA	6	SAA - with cobbel 2x4x1	Cl	2.0	PID 0 BY >0
35.5	403426						
	1/10/95 1000	NA	6	SAA - 34.5' to 35' ft.	Cl	2.0	PID 0 BY >0
36.0	403426						
	1/10/95 1000	NA	6	SAA	Cl	2.0	PID 0 BY >0
36.5	403426						
	1/10/95 1000	NA	6	SAA	Cl	2.0	PID 0 BY >0
37.0	403426						
	1/10/95 1000	NA	6	MED STIFF SAA	Cl	1.0	PID 0 BY >0
37.5	403427						
	1/10/95 1000	NA	6	MED STIFF SAA	Cl	1.0	PID 0 BY >0
38.0	403427						
	1/10/95 1000	NA	6	MED STIFF SAA	Cl	1.0	PID 0 BY >0
38.5	403427						

SCREENED & [illegible]

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA
BETA / GAMMA	See pg 1		

NOTES: JC 2-8-95 ~~[illegible]~~ See Pg. 1

FEMP QA 21

FEB 2 1995

000570

F-181

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11486-016

PROJECT NAME: Phase I+II of The OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11486

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1/10/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5	1/10/95 1000	NA		Stiff SAA		1.5	PID 0 403429 TCLP 403428 By 70 Tot 4 Iso 4
39.0	403427						TCLP 403428
39.5		NA		Bottom of Boring			PID By
40.0		NA					PID By
		NA					PID By
		NA					PID By
		NA					PID By
		NA					PID By

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA
BETA / GAMMA	See pg 1		

NOTES: JC 2-8-95 ~~Wonk~~

See Pg. 1

FEMP QA 21

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES

FS-F-3681

000571

F-182

FEB 23 1995

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307 - 11487 - 005	PAGE 1 OF 9
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11487	COORDINATES: N479740.977 E1382409.743
RELATED FAL NO.s: 200307 - 11487 - 004	
SURFACE ELEVATION: 587.78 ft.	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 1/10/95
GEOLOGIST: LEE / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 1/10/95
WATER USED DURING DRILLING: 0.0 Estimated GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTHEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1/10/95 403430 13:05	NA	6	BROWN (10YR 4/3) CLAY, V SOFT, SILTY & LOAMY, BROKEN W/ SURFACE VEGETATION & ROOTS, V. MOIST, MED → HI PLASTICITY: CLAY (>90% of MASS) W/ V. MINOR (<5%) FINE GRAVEL/COARSE SAND	CL	0.5	PID 0 ppm BY 80 cpm
0.5	1/10/95 403430 13:05	NA	6	BROWN (10YR 4/3) AND OLIVE BROWN (2.5Y 5/6) CLAY, MARBLED TOGETHER, V. SOFT, SILTY & LOAMY SL. MOTTLED W/ FE STAIN, W/ V. FINE ROOTLETS & 5-10% FINE TO COARSE SUBANGULAR GRVL, Trace SAND	CL	0.5	PID 0 ppm BY 80 cpm
1.0	1/10/95 403430 13:05	NA	6	LIGHT OLIVE BROWN (2.5Y 5/6) CLAY, TL 2-8-95 ~~SOFT TO~~ TL 2-2-95 ~~MEDIUM~~ STIFF, MOIST, SILTY, W/ V. FINE ROOTLETS & <5% FINE SUBANGULAR GRAVEL MED. PLASTICITY	CL	1.5	PID 0 ppm BY 80 cpm
1.5	1/10/95 403430 13:05	NA	6	LIGHT OLIVE BROWN (2.5Y 5/6 TO 2.5Y 5/4) SILTY CLAY, TL 2-8-95 ~~MEDIUM~~ STIFF, MOIST TO SL. MOIST, MED. PLASTICITY, W/ V. FINE ROOTLETS & ONLY 1-2% of MASS AS COARSE SAND	CL	1.5	PID 0 ppm BY 80 cpm
2.0	1/10/95 403430 13:05	NA	6	SAME AS ABOVE, WITH FE-STAIN & SPECKS ISOLATED IN CLAY MATRIX ~5% COARSE SAND / FINE SUBANGULAR GRVL.	CL	1.5	PID 0 ppm BY 80 cpm
2.5	1/10/95 403430 13:05	NA	6	SAME AS ABOVE, WITH INCREASING FE SPECKS (TO 15% OF MASS), FE STAIN IN CLAY PERVASIVE. V. MINOR (<<5%) light gray (10YR 7/2) SPECKS ISOLATED IN CLAY	CL	1.5	PID 0 ppm BY 80 cpm
3.0	1/10/95 403430 13:05	NA	6	SAME AS ABOVE, WITH FEW OR NO FE SPECKS & LIGHT FE STAIN, LITTLE OR NO SD/GRVL. & 5-10% LIGHT GRAY (weathered) (10YR 7/2) SPECKS (SUBANGULAR) CLASTS: ISOLATED	CL	1.5	PID 0 ppm BY 80 cpm
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	1/10/95	13:00
ALPHA	NA	NA	NA
BETA / GAMMA	50	1/10/95	13:00

NOTES: JC 2-8-95 ~~ALONE~~
This Lithologic Log was updated using Archived Soil Cores by Geologists Cliff Lee on 02-7-95.

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEB 23 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11487-006

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11487

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11487-004

SURFACE ELEVATION: See Pg 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 1/10/95

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 Estimated GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	1/10/95 403430 13:15	NA	6	LIGHT OLIVE BROWN (2.5Y 5/6) CLAY, ~~SOFT TO~~ TC 2-8-95 ~~MEDIUM~~ STIFF, MOIST, SILTY, W/ MINOR FE-STAIN LITTLE OR NO SD./GRVL. (FINE IF ANY GRVL) ≈5-10% LIGHT GRAY (WEATHERED) (10YR 7/2) CLASTS: ISOLATED	CL	1.5	PID 0 ppm BY 80 cpm
4.0 – 4.5	1/10/95 403431	NA	6+ FLUFF	YELLOWISH BROWN (~~2.5~~ 10 YR 5/4) CLAY, VERY STIFF, V. SL. MOIST, MEDIUM PLASTICITY, SILTY, W/ FE-STAIN (LOCALIZED), & 15-20% FINE SUBANGULAR GRAVEL ISOLATED TO CLUSTERED IN CLAY MATRIX - NO GRAIN ORIENTATION	CL	3.0	PID 0 ppm BY 60 cpm
4.5 – 5.0	1/10/95 403431	NA	6+ FLUFF	LIGHT OLIVE BROWN (2.5Y 5/4) CLAY, VERY STIFF, V. SL. MOIST, SL. PLASTICITY, SILTY, W/ 15-20% FINE SUBANGULAR GRAVEL (ISOLATED) & <5% LIGHT GRAY (2.5Y 7/2) SPLOTCHES/MOTTLES IN CLAY MATRIX	CL	3.0	PID 0 BY 60 cpm
5.0 – 5.5	1/10/95 403431	NA	6+ FLUFF	CLAY VERY STIFF TO V. STIFF(?) AS ABOVE, W/ INCREASING FINE SUBANGULAR GRAVEL ~8 cm FROM TOP OF INTERVAL (MOSTLY CHERTY); SOME (<5%) LIGHT GRAY (2.5Y 7/2) SILTY CLAYSTONE CLASTS	CL	3.0	PID 0 ppm BY 60 cpm
5.5 – 6.0	1/10/95 403431	NA	6+ FLUFF	SAME AS ABOVE, WITH ISOLATED OR CLUSTERED FINE TO COARSE, V. POORLY SORTED CHERTY GRAVEL INCREASING TO 20-25%: NO ORIENTATION - MAX. SIZE TO 1.5 cm DIAM.	CL	3.5	PID 0 ppm BY 60 cpm
6.0 – 6.5	1/10/95 403431	NA	6+ FLUFF	LIGHT OLIVE BROWN (2.5Y 5/4) CLAY, VERY SOFT, MOIST, MI. PLASTICITY TO PLASTIC, LITTLE OR NO (<5%) COARSE SAND OR FINE GRAVEL	CL	<.25	PID 0 ppm BY 60 cpm
6.5 – 7.0	1/10/95 403431	NA	6+ FLUFF	SAME AS ABOVE, GRAVEL (NOW 5-10%) ISOLATED, SUBROUNDED 1-2 cm MAX. CLASTS IN CLAY MATRIX	CL	0.75	PID 0 ppm BY 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: JC 2-8-95 ~~NONE~~

See Pg. 1

FEB 23 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FEMP

LITHOLOGIC LOG

CONTROL NO.:	200307-11487-007
PAGE	3 OF 9
PROJECT NAME:	PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION
PROJECT NO.:	20.03.07
BORING NUMBER:	11487
COORDINATES:	See Pg. 1
RELATED FAL NO.s:	200307-11487-004
SURFACE ELEVATION:	See Pg. 1
GROUNDWATER LEVEL: / DATE: / TIME:	
DATE STARTED:	1/10/95
GEOLOGIST:	LEE / GEIGER / RILEY
GROUNDWATER LEVEL: / DATE: / TIME:	
DATE COMPLETED:	1/10/95
WATER USED DURING DRILLING:	0.0 Estimated GALLONS
DRILLING CONTRACTOR:	ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT:	ROTASONIC
DRILLER / HELPER:	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5	1-10-95 403432 13:20	NA	6+ FLUFF	LIGHT OLIVE BROWN CLAY (2.5Y 5/4 TO 5/6), SILTY, MOIST, ~~SOFT~~ VERY STIFF TO 2.5 TSF, HI PLASTICITY, WITH LITTLE (<5%) OR NO GRAVEL IN TOP 10-12CM W/ 20-25% COARSE & FINE SUBANGULAR NO ORIENTATION GRAVEL TO COBBLES 12-15 CM DOWN - CLOSELY PACKED @ BASE	CL	2.5	PID 0 ppm BY 70 cpm
7.5 – 8.0	1-10-95 403432 13:20	NA	6+ FLUFF	CLAY AS ABOVE, SILTY, ~~MED.~~ VERY STIFF 2.5 TSF, PLASTIC, SL. MOIST, WITH 15-20% (or greater) GRAVEL THROUGHOUT, ISOLATED, MOSTLY F. TO C. (AVG. 2-3CM) SUBANGULAR NO ORIENTATION - SOME LENSES W/ UP TO 30% GRAVEL (THIN)	CL	2.5	PID 0 ppm BY 70 cpm
8.0 – 8.5	1-10-95 403432 13:20	NA	6+ FLUFF	CLAY AS ABOVE W/ GRAVEL, CLOSELY PACKED IN 1st 7CM AND LAST 5-10 CM (up to 25%) ONE TILTED LS. CLAST MEASURES 9×10×2 CM IN TOP 7CM	CL	2.5	PID 0 ppm BY 70 cpm
8.5 – 9.0	1-10-95 403432 13:20	NA	6+ FLUFF	CLAY W/ GRAVEL AS ABOVE, GRAVEL TO 30%, MOSTLY FINE SUBANGULAR, WITH A FEW COARSER CLASTS, SOME (5-10%) COARSE SUBANGULAR QUARTZ SAND ALSO	CL	2.5	PID 0 ppm BY 70 cpm
9.0 – 9.5	1-10-95 403432 13:20	NA	6+ FLUFF	CLAY W/ GRAVEL AS ABOVE, GRAVEL CLOSELY PACKED - STILL 30% of MASS, VERY POORLY SORTED, SUBROUNDED CHERT (4CM DIA./SOME BROKEN) + FINE SUBANGULAR CLASTS	CL	2.5	PID 0 ppm BY 70 cpm
9.5 – 10.0	1-10-95 403432 13:20	NA	6+ FLUFF	CLAY W/ 20-25% GRAVEL, SUBANGULAR CLASTS TO 5 CM ON FLAT SIDE, TILTED MOST CLASTS IN 2-4 CM DIAMETER RANGE SOME MED. → COARSE SUBANGULAR SAND IN LENS COBBLE: 7×5×2CM W/ DARK OLIVE BRN. (2.5Y 3/3) HEMATITE(?)	CL	2.5	PID 0 ppm BY 70 cpm
10.0 – 10.5	1-10-95 403433 13:30	NA	6	LIGHT OLIVE BROWN (2.5Y 5/4) CLAY, SILTY, PLASTIC, SL. MOIST, WITH 15-20% FINE TO COARSE SUBANGULAR GRAVEL & 1 SUBROUNDED MICROCRYSTALLINE COBBLE 10×10×5CM SITUATED FLAT ACCROSS CORE IN TOP 10CM / 1 TILTED 5×3×8CM @ BASE	CL	2.5	PID 0 ppm BY 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: JC 2-8-95 ~~AGAIN~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FEMP QA 21 23 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307 - 11487 - 008

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11487

COORDINATES: See Pg. 1

RELATED FAL NO.(s): 200307 - 11487 - 004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/10/95

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 Estimated GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	1/10/95 403433 13:30	NA	6	LIGHT OLIVE BROWN CLAY (2.5Y5/4), SILTY VERY STIFF, V.SL.MOIST, MOD. PLASTICITY, WITH FINE TO COARSE SUBANGULAR GRAVEL (15%) ISOLATED, WITH COARSEST CLAST TILTED OBLIQUELY ON LONG AXIS, 6 (FOSSIL LS CLAST) MEASURING 7 x 5 x 2.5 cm NO OTHER CLASTS ORIENTAT'N.	CL	2.5	PID 0 ppm BY 60 cpm
11.0	1/10/95 403433 13:30	NA	6	CLAY AS ABOVE, STIFF TO V. STIFF, V.SL. MOIST, WITH 15-20% MOSTLY FINE, SUBANGULAR CHERTY & FOSSIL. LS. GRAVEL, FE PARTINGS & SPLOTCHES IN CLAY MATRIX [ISOLATED & NO ORIENTATION]	CL	3.0	PID 0 ppm BY 60 cpm
11.5	1/10/95 403433 13:30	NA	6	SAME AS ABOVE, 15-20% GRAVEL IN CLAY MATRIX: INCREASED FE-STAIN, PARTING & SPLOTCHES - V. MINOR (1-2%) WOOD FIBERS IN CLAY 'HINT' OF GRAYISH-BRN (2.5Y5/2) CLAY @ BASE	CL	3.0	PID 0 BY 60 cpm
12.0	1/10/95 403433 13:30	NA	6	GRAY (2.5Y5/1) AND LIGHT OLIVE BROWN (2.5Y5/3) CLAY MIXTURE, MARBLED & SWIRLED THROUGHOUT INTERVAL VERY STIFF, V.SL.MOIST, SL. PLASTICITY, WITH FINE TO COARSE SUBANGULAR, CHERTY & FOSSIL. LS. GRAVEL: ISOLATED & NO ORIENTATION MAX. SIZE: 4 x 3 x 1.5 cm	CL	3.0	PID 0 ppm BY 60 cpm
12.5	1/10/95 403433 13:30	NA	6	CLAY MIXTURE W/ GRAVEL PERSISTS THROUGH THIS INTERVAL POSSIBLE BROWN "FILL" INTO GRAY MAT'L. - RED HEMATITIC SAND (QTZ.): MED-COARSE IN PATCH (V. POORLY SORTED)	CL	3.0	PID 0 ppm BY 60 cpm
13.0	1/10/95 403433 13:30	NA	6	MARBLED CLAY MIXTURE CONTINUES - DISTINCT TO SLIGHTLY SWIRLED CONTACTS BETWEEN GRAY & BROWN CLAYS DEVELOPING - GRAVELS AS ABOVE (? FRACTURE/ DESICATION CRACK FILL?)	CL	3.0	PID 0 ppm BY 60 cpm
13.5	1/10/95 403433 13:30	NA	6	FE-RICH PARTINGS IN MARBLED BROWN/GRAY CLAY MIXTURE TOP 7.5 cm, OVER FE-RICH PARTINGS/SEAMS IN DARK GRAY (2.5Y4/1) CLAY, CONCENTRATED AROUND 5.5 x 5.5 x 3 cm TILTED LS. CLAST [NOTE: SOME SMEARING @ EDGES INTO NEXT 6"]	CL	3.0	PID 0 ppm BY 60 cpm
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: JC 2-8-95 ~~A/GALE~~

See Pg. 1

FEMP QA 21

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

000575

G:/WPSC/94-778.DRW (11-23-94)

FEB 23 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11487-009

PAGE 5 OF 9

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11487

COORDINATES: See Pg. 1

RELATED FAL NO.: 200307-11487-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 1/10/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 Estimated GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	1/10/95 403433 13:35	NA	6	DARK GRAY (2.5Y 4/1) CLAY, STIFF, V.SL. MOIST, MOD. PLASTICITY, SILTY, WITH FINE TO COARSE SUBANGULAR TO SUBROUNDED GRAVEL (15-20%) CHERTY & FOSSILIFEROUS, ISOLATED & NOT ORIENTED IN GRAY CLAY MATRIX - AVG. 2 cm DIAMETERS	CL	3.0	PID 0 ppm BY 60 cpm
14.5	1/10/95 13:35	NA	0	NO RECOVERY (NR)	NA	NA	PID NA ppm BY NA cpm
15.0	1/10/95 13:35	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
15.5	1/10/95 13:35	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
16.0	1/10/95 13:35	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
16.5	1/10/95 13:35	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
17.0	1/10/95 403434 13:45	NA	6	DISTURBED SECTION: BROWN CLAY AS ABOVE MIXED WITH DARK GRAY CLAY AS ABOVE - PROBABLE SLOUGH	CL(?)	NA	PID NA ppm BY NA cpm
17.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: ~~NONE~~ See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 1/31/94

FEMP QA 21

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEB 23 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11487-010

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11487

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11487-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/10/95

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 Estimated GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5	1/10/95 403434 13:46	NA	6	DARK GRAY (2.5Y 4/1) GRAY VERY STIFF, V. SL. MOIST MOD. PLASTICITY, SILTY W/ F. TO COARSE SUBANGULAR TO SUBROUNDED GRAVEL (15-20%) MOSTLY CHERTY GRAVEL - ISOLATED, NO ORIENTATIN AVG. SIZE: 1-2 cm	CL	2.5	PID 0 ppm BY 60 cpm
18.0	1/10/95 403434 13:46	NA	6	SAME AS ABOVE IN ALL ASPECTS	CL	2.5	PID 0 ppm BY 60 cpm
18.5	1/10/95 403434 13:45	NA	6	DARK GRAY SILTY CLAY, AS ABOVE, MARBLED WITH GREEN (? MUNSELL) TO GREENISH GRAY (5G 5/1) CLAY - WITH SUBANGULAR TO SUBROUNDED, ISOLATED CHERT/LS. GRAVEL 10-15% COARSEST CLAST 4x4x4 cm	CL	2.5	PID 0 BY 60 cpm
19.0	1/10/95 403434 13:45	NA	6	DARK GRAY, NOW VERY SILTY CLAY, MARBLED WITH GREEN CLAY AS ABOVE, 15-20% GRAVEL NO ORIENTATION, GRAVELS SUBANGULAR, MOSTLY FINE & ISOLATED MAX SIZE: 3.5x3x2 cm	CL	1.5	PID 0 ppm BY 60 cpm
19.5	1/10/95 403434 13:45	NA	6	DARK GRAY CLAY W/ GRAVEL, V. SILTY, W/ 5% FINE Qtz. SAND	CL	1.0	PID 0 PPM BY 60 cpm
20.0	1/10/95 403434 13:46	NA	6	DARK GRAY (2.5Y 4/1) CLAYEY SILT, SL. PLASTICITY, SL. MOIST MED. STIFF TO SOFT, CRUMBLY, WITH LENSES OF DARK GRAY CLAY AS ABOVE AND F. → C. GRAVEL (5-10%) AS ABOVE	ML	1.0	PID 0 ppm BY 60 cpm
20.5	1/10/95 403434 13:46	NA	6	DARK GRAY (2.5Y 4/1) CLAYEY SILT AS ABOVE	ML	1.0	PID 0 ppm BY 60 cpm
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: JC 2-8-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PC

FEMP QA 21

FS-F-3681 000577

G:/WPSC/94-776.DRW (11-23-94)

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11487-011

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11487

COORDINATES: See Pg. 1

RELATED FAL NO.: 200307-11487-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/10/95

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/10/95

WATER USED DURING DRILLING: 0.0 Estimated GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	1/10/95 403434 13:45	NA	6	GRAY (2.5Y 4/1) CLAY, VERY SOFT, SL. MOIST, SILTY, WITH GRAY SILT (SAME COLOR), CRUMBLY, CONTAINING VARIABLE AMT. OF CLAY (0 → 50%) WITH OLIVE BROWN (2.5Y 4/4) SAND, SUBANGULAR FINE TO MEDIUM GRAINED LOW PLASTICITY	CL ML SM	<.25	PID 0 ppm BY 60 cpm
21.5	1/10/95 403434 13:45	NA	6	CLAY, SILT w/ LESSER GRAVEL AS ABOVE ONE COARSE GRAVEL CLAST TO 4-6 cm DIAMETER	CL	.25	PID 0 ppm BY 60 cpm
22.0	1/10/95 403435 13:55	NA	6	DARK GRAY CLAY (2.5Y 4/1) ~SOFT TO MEDIUM STIFF, SILTY, MOD. PLASTICITY, W/ FINE TO COARSE SUBANGULAR GRAVEL, IN NO ORIENTATION & ISOLATED (MAX. SIZE: 1-2 cm)	CL	1.0	PID 0 ppm BY 60 cpm
22.5	1/10/95 403435 13:55	NA	6	SAME AS 22-22.5 (CLAY W/ GRAVEL) ISOLATED, SUBANGULAR → AVG GRAVEL SIZE: 1-2 cm	CL	1.0	PID 0 ppm BY 60 cpm
23.0	1/10/95 403435 13:55	NA	6	SAME AS 22-22.5 (CLAY W/ GRAVEL) ISOLATED CLASTS, TILTED MAXIMUM GRAVEL CLAST SIZE: 6x4.5x3 cm	CL	1.0	PID 0 ppm BY 60 cpm
23.5	1/10/95 403435 13:55	NA	6	SAME AS 22-22.5 (CLAY W/ GRAVEL) SL. MOISTER CLAY THIS INTERVAL MAX. CLAST SIZE: 5x3x3 cm ISOLATED	CL	1.0	PID 0 ppm BY 60 cpm
24.0	1/10/95 403435 13:55	NA	6	SAME AS 22-22.5 (CLAY W/ GRAVEL) MAX. CLAST SIZE: 7x3.5x2 cm, FOSSILIFEROUS LS.	CL	1.0	PID 0 ppm BY 60 cpm
24.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: JC 2-8-95 ~~NONE~~
See Pg. 1

FEMP QA 21 FEB 23 1995

~~*-SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER INSTRUCT

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 8 OF 9
200307 - 11487 - 012	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11487	See Pg. 1	200307 - 11487 - 004

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg. 1				1/10/95

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
LEE / GEIGER / RILEY				1/10/95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
0.0 GALLONS Estimated	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5	1/10/95 403436 13:45	NA	6	D. GRAY (2.5Y 4/1) CLAY, ~~SOFT~~ MED STIFF, SL. MOIST, SLIGHTLY SILTY, WITH BROWN (2.5Y 5/6) PARTINGS: W 10-15% FINE SUBANGULAR GRAVEL - NO COARSE GRAVEL FRACTION	CL	1.0	PID 0 ppm; BY 60 cpm
25.0	1/10/95 403435 13:45	NA	6	SAME AS ABOVE W/ COARSE GRAVEL TO MAX. DIMENSIONS 6 x 7 x 3 cm (MICROXTALLINE LS.)	CL	1.0	PID 0 ppm; BY 60 cpm
25.5	1/10/95 403435 13:45	NA	6	GRAY (2.5Y 4/1) CLAY SOFT TO MED. STIFF SLIGHTLY TO MODERATELY SILTY, MED. TO LOW PLASTICITY, WITH 15-20% MOSTLY FINE (W/ SOME 5% COARSE) SUBANGULAR GRAVEL	CL	1.0	PID 0; BY 60 cpm
26.0	1/10/95 403435 13:45	NA	6	GRAY (2.5Y 4/1) CLAY, MED. STIFF, V.SL. MOIST, MED. PLASTICITY, SILTY, WITH 5-10% MOSTLY FINE SUBANGULAR GRAVEL IN NO DISTINCT ORIENTATION & ISOLATED; MINOR (5%) COARSE GRAVEL TO 1 CM DIAMETER	CL	1.0	PID 0 ppm; BY 60 cpm
26.5	1/10/95 403435 13:45	NA	* 6	OLIVE BROWN (2.5Y 4/4) TO DARK YELLOWISH BROWN (10YR 3/4) FINE-GRAINED TO MEDIUM GRAINED QUARTZ SAND, SUBANGULAR TO SUBROUNDED, (>75%) SPARSELY POPULATED W/ SILTY CLAY CLUMPS (SAME COLOR) = 15-20% → ABUNDANT HEAVY MINERALS OLIVE BRN.	SP (TO SC)	N/A	PID OTCLP 403437 ppm; BY 60 cpm; TOTAL 403437; TOTAL 403438 Duplicate
27.0		NA		BOTTOM OF BORING @ 27 FEET			PID ppm; BY cpm
		NA					PID ppm; BY cpm

FEMP QA 21 FEB 23 1995

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: FOR THE INTERVAL (26.5-27, SAND),
* SAMPLE NUMBERS ASSIGNED FOR:
TCLP 150 TOTAL = SN 403436
TOTAL U = SN 403437
TOTAL U (DUPLICATE) = SN 403438;
Also See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FEMP QA 3-6-95

118

FEMP

LITHOLOGIC LOG

PAGE 1 OF 3

CONTROL NO.: 200307-11488-005	PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION
PROJECT NO.: 20.03.07	
BORING NUMBER: 11488	COORDINATES: N482819.924, E1375993.837
RELATED FAL NO.: 200307-11488-004	
SURFACE ELEVATION: 581.70 ft.	GROUNDWATER LEVEL: / DATE: / TIME:
DATE STARTED: 1/11/95	
GEOLOGIST: LEE / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME:
DATE COMPLETED: 1/11/95	
WATER USED DURING DRILLING: 0.0 GALLONS Estimate	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0 – 0.5	1/11/95 403463 16:35	NA	6	Surface vegetation w/grass roots, v.soft, v.dark grayish brown clay (10YR 3/2) (>90% of total mass), moist, mod. plastic v.slightly silty (<5%), ~1-2% subangular 2mm med. sand grains	CL	0.01	PID 10 ppm BY 50 CPM
0.5 – 1.0	1/11/95 403463 16:35	NA	6	v.soft, v.dark grayish brown clay (10YR 3/2) (>95% of total mass) moist, mod. plastic. v.slightly silty ~5% med. to coarse sand, subangular, cinders / fill v.sl. rooted	CL	0.01	PID 10 ppm BY 50 CPM
1.0 – 1.5	1/11/95 403463 16:35	NA	6	v.soft, v.dark grayish brown clay (10YR 3/2) (>95% of total mass) moist, mod. plastic <5% silt, v.few (<1%) med. to coarse SAND-SIZED, subangular to subrounded cinders	CL	0.10	PID 10 ppm BY 50 CPM
1.5 – 2.0	1/11/95 403463 16:35	NA	6	v.soft v.dark grayish brown clay (10YR 3/2) (~90%), sl. silty, moist mod. plastic, s. rooted No particular orientation of SAND TO COARSE CHERTY GRAVEL TO S. COBBLE MAT'L. (~10%) 1cm x 80mm near bottom of 6" interval	CL	0.25	PID 10 ppm BY 50 CPM
2.0 – 2.5	1/11/95 403463 16:35	NA	6	~~Med.~~ 1-12-95 stiff v.dark GRAYISH BROWN (2.5Y 3/2) sl. silty clay. sl. plastic, sl. Fe mottled (>90% of Total mass), WITH 2-5% med.-SRS. SAND SIZED SUBANGULAR GRAINS & ≤5% CRS. SAND to FINE GRAVEL (1cm x 50mm x 20cm) LS. DRY @ BOTTOM	CL	1.75	PID 10 ppm BY 50 CPM
2.5 – 3.0	↑ 1/11/95 COLOR Δ Transition ↓ 403463 16:35	NA	6	~~Med.~~ 1-12-95 Stiff. v.dark GRAYISH BROWN (2.5Y 3/2) RANGING TO OLIVE BROWN CLAY (2.5Y 4/3) TO SILTY CLAY (95% OF TOTAL), Fe-STAINED & MOTTLED, POSSIBLE ORIENTATION OF FINE Fe-FILLED FRACTURES (≈Vertical)	CL	1.75	PID 10 ppm BY 50 CPM
3.0 – 3.5	1/11/95 403463 16:35	NA	6	med. Stiff OLIVE BROWN (2.5Y 4/3) SILTY CLAY (85-90% of Total) w/ MED. TO COARSE SUB-ROUNDED CHERTY GRAVEL - NO ORIENTATION v.sl. MOIST TO DRY THROUGHOUT	CL	0.75	PID 10 ppm BY 50 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	10.0	1/11/95	09:20
ALPHA	NA	N/A	N/A
BETA / GAMMA	50	1/11/95	09:20

NOTES: LOG GENERATED 1-26-95 (07:30 - 11:30) W/ SPECIAL ATTENTION PAID TO BOTTOM 1' - INCLUDING LATER DISCUSSIONS; This Lithologic Log was updated using Archive Soil Cores by Geologist Cliff Lee ON 01/26/95

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ 1/4/1995

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000580

FEMP CA 12 3

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11488-006

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11488

COORDINATES: See Page 1

RELATED FAL NO.(s):

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/11/95

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/11/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	1/11/95 403463 16:35	NA	6	MOD. STIFF LIGHT OLIVE BROWN (2.5Y 5/4) CLAY & SILTY CLAY (>90%), HEAVILY MOTTLED W/ FE STAIN & SPECKS (2.5Y 5/6 TO 2.5Y 6/6), SOME FE SPECKS DARK REDDISH BRN (5YR 3/2), W/ 5-10% FINE CHERTY GRAVEL (SUBANGULAR) - NO ORIENTATION	CL	1.25	PID 10 ppm BY 50 cpm
4.0	1/11/95 403464 16:45	NA	6	MOD. STIFF LIGHT OLIVE BROWN (2.5Y 5/4) CLAY, SL. SILTY, HEAVILY MOTTLED W/ FE STAIN & INCLUDED W/ SPECKS (GENERALLY 2.5Y 5/6) FE-SPECKS IN CRS. SAND TO F. GRAVEL SIZE (5YR 2.5/1) NO ORIENTATION	CL	1.20	PID 10 ppm BY 50 cpm
4.5	1/11/95 403464 16:45	NA	6	SOFT, MOD PLASTIC OLIVE BROWN (2.5Y 5/4) SILTY CLAY (>90%) MOTTLED W/ FE STAIN (2.5Y 5/6), 5-10% CRS. SUBANGULAR SAND TO FINE SUBANGULAR GRAVEL - NO ORIENTATION OF CLASTS	CL	0.25	PID 10 ppm BY 50 cpm
5.0	1/11/95 403464 16:45	NA	6	VERY SOFT, V. MOIST, MOD. PLASTIC LIGHT OLIVE BROWN (2.5Y 5/4) SILTY CLAY (>90%) MOTTLED W/ FE STAIN, WITH 5-10% PLATEY CHERT GRAVEL (COARSE), NOT ORIENTED IN CORE	CL	<0.25	PID 10 ppm BY 50 cpm
5.5	1/11/95 403464 16:45	NA	6	VERY SOFT V. MOIST MOD. PLASTIC OLIVE BROWN (2.5Y 5/4) SL. SILTY CLAY (85+%), W/ SPLOTCHES OF SL. WET PALE BROWN (10YR 6/3) - INTERMIXED W/ DARK GRAYISH BROWN (10YR 4/2) CLAY W/ OLIVE BRN. SPLOTCHES & 0.5 mm PORES (SUBHORIZONTAL	CL	<0.25	PID 10 ppm BY 50 cpm (<5% COARSE SUBRD. GRAVEL)
6.0	1/11/95 403464 16:45	NA	6	GRAY SL. SILTY CLAY (2.5Y 5/1) V. SOFT & MOIST INTERMINGLED W/ LIGHT OLIVE-BROWN SILTY CLAY (2.5Y 5/4) IN A SWIRLED & CONTORTED INTERFACE: SOME (5-10%) COARSE SUBANGULAR CHERTY GRAVEL - NO ORIENTATION	CL	0.25 to 1.5	PID 10 ppm BY 50 cpm
6.5	1/11/95 403464 16:45	NA	6	SHARP BUT CONTORTED CONTACT TOP 1" OF GRAY OVERLYING BROWN CLAY, AS ABOVE. BOTTOM 4" OF CORE: DK. GRAYISH BRN. (2.5Y 4/2) CLAY W/ FINE GRVL. (5%) & COARSE GRVL. (10-15%), DRY, VERY STIFF → NO ORIENTATION BOTTOM OF BORING	CL	>4.5 (off scale)	PID 10 ppm BY 50 cpm TCLP 403465 Tot. U/ISO U 403466
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE	PAGE # 1	—
ALPHA	N/A	N/A	N/A
BETA / GAMMA	SEE	PAGE # 1	—

NOTES: SN: 403465 (TCLP Total U / ISO U) & 403466 (Total U / ISO U) Taken in The 6.5'-7' interval, Also see Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 12/19/94

FS-F-3681

000581

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11489-004

PAGE 1 OF 12

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: N482819.813 ; E1375991.776

RELATED FAL NO.s: 200307-11487-004

SURFACE ELEVATION: 581.79 ft.

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-11-95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1/11/95 403452 1435	NA	6	VERY SOFT (10 YR 3/2) VERY DARK GRAYISH BROWN Silty Clay ROOT MATERIAL LOW PLASTICITY VERY MOIST	CL	0.0 to .25	PID 10.0 ppm BY 50 cpm
0.5	1/11/95 403452 1435	NA	6	SAME as 0.0-0.5	CL	.25	PID 10.0 ppm BY 50 cpm
1.0	1/11/95 403452 1435	NA	6	SAME as 0.0-0.5	CL	~~.25~~ 1.0 (1-27-95)	PID 10.0 ppm BY 50 cpm
1.5	1/11/95 403452 1435	NA	6	SAME as 0.0-0.5	CL	1.0	PID 10.0 ppm BY 50 cpm
				SAME as 0.0-0.5 w/ mottling of (2.5Y 4/4) OLIVE BROWN Silty clay - smooth texture	CL	1.0	
2.0	1/11/95 403452 1435	NA	6	Same as above 1.75-2.0'	CL	1.0	PID 10.0 ppm BY 50 cpm
				↑	CL	~~1.5~~ 1.00 (1-27-95)	
2.5	1/11/95 403452 1435	NA	6	Same as above but increased clay content	CL	1.0	PID 10.0 ppm BY 50 cpm
3.0	1/11/95 403452 1435	NA	6	Same as above w/ increased clay content (1.75-2.0')	CL	~~2.0~~ 1.0 (1-27-95)	PID 10.0 ppm BY 50 cpm
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	10.0	01/11/95	0920
ALPHA	NA	(NA)	NA
BETA / GAMMA	50	01/11/95	0920

NOTES: This Lithologic Log was updated using Archived Soil Cores by Geologist Thea Layne 01/27/95.

MAR 08 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000582

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11489-005

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: See Page 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE STARTED: 1-11-95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: 0. GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	1/11/95 403452 1440	NA	6	Same as 1.75-2.0 w/ increased clay content	CL	1.0	PID 10.0 ppm BY 50 cpm
4.0				SAME as 1.75-2.0 w/ increased clay content also mottling but with (2.5Y 4/4) OLIVE BROWN Silty clay has become predominant MOIST - LOW PLASTICITY	CL	1.0	
4.5	1/11/95 403453 1440	NA	6	STIFF (2.5Y 5/6) LT. OLIVE BROWN Silty Clay w/ DARK BROWN MOTTLING AND Silt-size iron oxide particles throughout - 10YR 5/6 yellowish brown in color. 1-2% fine SAND VERY MOIST	CL	1.5	PID 9.5 ppm BY 40 cpm
5.0	1/11/95 403453 1440	NA	6	MED STIFF 2.5Y 4/4 olive Brown, Silty Clay matrix, w/Fe oxide particles throughout, Low Plasticity Moist, 1-2% fine grain sand and 2-3% medi. grain sand Sub rounded	CL	1.0	PID 9.5 ppm BY 40 cpm
5.5	1/11/95 403453 1440	NA	6	Same As Above 4.5'-5.0'	CL	1.5	PID 9.5 ppm BY 40 cpm
6.0	1/11/95 403453 1440	NA	6	Same as above 4.5-5.0	CL	1.5	PID 9.5 ppm BY 40 cpm
6.5	1/11/95 403453 1440	NA	6	Same as above 4.5-5.0	CL	2.0	PID 9.5 ppm BY 40 cpm
7.0	1/11/95 403453 1440	NA	6	Same as above 4.5-5.0 and 1-2% fine gravel subangular and subrounded	CL	1.5	PID 9.5 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

MAR 06 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PCR 12/4/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000583

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11489-006

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: See Page 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1-11-95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0	1/11/95 403453 1440	NA	6	MED STIFF Same as 4.5-5.0' and 1-2% fine gravel (3-8mm) subangular and subrounded. LOW PLASTICITY INCREASED MOISTURE	CL	1.0	PID 9.0 ppm; BY 40 cpm
7.5	1/11/95 403453 1440	NA	6 (7.5-8.0)	SOFT Same as 4.5-5.0' and 1-2% fine gravel (3-8mm) subangular and subrounded. LOW PLASTICITY VERY MOIST	CL	.5	PID 9.0 ppm; BY 40 cpm
8.0	1/11/95 403454 1450	NA	6 (8.0-8.5)	(2.5Y 5/6) LT OLIVE BROWN CLAYEY SAND AND GRAVEL mixture, 15% coarse gravel WET. Subangular to subrounded, 5% fine gravel subangular to subrounded, 10% coarse sand-rounded to sub-rounded, 20% med grain sand subangular, 20% fine grain sand subangular, 20% FINES (2.5 inches of (2.5Y 5/6) LT OLIVE BROWN sandy, gravelly clay, 25% FINES, 15% coarse subangular gravel, 40% fine subangular gravel, 5% FINE GRAIN SAND, 5% MED GRAIN SAND, 10% coarse grain sand	CL / CL	N/A / 2.00	PID 9.0 ppm; BY 40 cpm; VERY MOIST, LOW PLAS.
8.5	1/11/95 403454 1450	NA	6 (8.0-8.5)	3.5 inches of (2.5Y 5/6 LT OLIVE BROWN Silty CLAY w/ 35-40% silt, 40-45% clay, 3-5% FINE SUBANGULAR GRAVEL, 3-5% coarse subangular-subrounded gravel, 5% fine grain sand, 5% med-coarse grain sand subangular — mottled w/ 2.5Y N6/ GRAY CLAY 10-15% surface area — pocket of fine grained sand 20mm wide area. LOW PLASTICITY Slightly MOIST	CL	3.75	PID 9.0 ppm; BY 40 cpm
9.0	1/11/95 403454 1450	NA	6 (8.5-9.0')	Same as above 8.0-8.5' w/ sand pocket also approx 20 mm IRON OXIDE STAINING SEEMS TO FOLLOW A FRACTURE PATTERN in lower 4 inches of this interval — fine sand grains present on staining area. ALSO: FINE SAND INCREASES TO 15-20%. VERY LITTLE PLASTICITY TO NONE Slightly Moist	CL	3.5	PID 9.0 ppm; BY 40 cpm
9.5	1/11/95 403454 1450	NA	6 (9.0-9.5')	VERY STIFF (5Y 5/1) GRAY w/ mottling of (5GY 5/1) GREENISH GRAY Clayey Silt/Silty Clay w/ color becoming (5Y 5/1) DARK GRAY last 3 inches of this interval. FRACTURE w/ HEAVY IRON STAINING IN FIRST 2½ inches of this interval. 1-2% COARSE SUBROUNDED SAND AND 1-2% FINE SUBANGULAR GRAVEL, 1 or 2 COARSE GRAVEL. NO PLASTICITY Slightly MOIST	CL	3.5	PID 9.0 ppm; BY 40 cpm; FRACTURE; OVER
10.0	1/11/95 403454 1450	NA	6 (9.5-10.0')	VERY STIFF (5Y 5/2) OLIVE GRAY ~~clayey silt~~ Silty CLAY 5% FINE SAND GRAINS, 1-2% coarse subangular sand grains, 2-5% FINE SUBANGULAR GRAVEL, 1 coarse angular gravel. "Wavy IRON staining pattern in lateral orientation just like previous interval. NO PLASTICITY Slightly MOIST	CL	4.0	PID 9.0 ppm; BY 40 cpm
10.5							

Permeability Interface

Clay Contact

Interface Boundary

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Page 1	/ /	
ALPHA	NA	/ /	
BETA / GAMMA	See Pg. 1	/ /	

NOTES: INTERFACE BETWEEN BROWN AND GRAY Clay begins @ 7.75' and extends to 9.5' ~~8.20'~~ (~~Approx. 5½ inches~~ 1.75 FT 5½) Consists of HIGH PERMEABILITY interspersed clayey sand and gravel and ~~gravelly~~ sandy, gravelly clay. Also See Pg. 9

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PCR 12/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP LA

MAR 06 1995 000584

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11489-007	PAGE 4 OF 12
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11489	COORDINATES: See Page 1
RELATED FAL NO.: N/A	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: N/A DATE: TIME:
DATE STARTED: 1-11-95	
GEOLOGIST: Layne / GEIGER / RILEY	GROUNDWATER LEVEL: N/A DATE: TIME:
DATE COMPLETED: 1-11-95	
WATER USED DURING DRILLING: 0.0 GALLONS Estimate	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
~~10.5~~ 10.0	1/11/95 403454 1450	NA	6	VERY STIFF (5Y 5/2) OLIVE GREEN Silty Clay w/ 5-10% fine subangular and subrounded gravel, 1-5% coarse sand (subangular), 1-2% med grain sand, 1-5% fine sand, 25-30% silt, 45-50% clay low plasticity Slightly Moist - Dry	CL	3.5 ~~4.0~~ TL 1-25-95	PID 9.0 ppm BY 40 cpm
10.5	1/11/95 403454 1450	NA	6	Same as above 10.0-10.5' except (30-40%) increased silt particles and (5%) increased fine sand grains	CL	~~4.0~~ 3.5 TL 1-25-95	PID 9.0 ppm BY 40 cpm
11.0	1/11/95 403454 1450	NA	6	Same as 10.0-10.5' except increased silt (30-40%) increased fine sand (5%) LOW PLASTICITY MOIST ~~Slightly Moist Dry~~ TL 1-25-95	CL	1.5	PID 9.0 BY 40 cpm
11.5	1/11/95 403454 1450	NA	6	Same as 10.0-10.5' except MOIST AND increased coarse grain SAND (5-10%) increased med grain SAND (2-4%) LOW PLASTICITY MOIST	CL	~~2.0~~ 1.0	PID 9.0 ppm BY 40 cpm
12.0	1/11/95 403454 1450	NA	6	Same as 10.0-10.5 except overall finer material 1-2% fine gravel angular less than 1% med and coarse sand Increased silt 40-60% MOIST	CL	1.0	PID 9.0 ppm BY 40 cpm
12.5	1/11/95 403454 1450	NA	6	Same as 10.0-10.5 except OVERALL finer material 1-2% fine angular gravel less than 1% med and coarse sand Increased silt 40-60% MOIST	CL	1.0	PID 9.0 ppm BY 40 cpm
13.0	NA	NA	0	NO RECOVERY			PID ppm BY cpm
~~14.0~~ 13.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

MAR 06 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/1/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000585

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11489-008

PAGE 5 OF 12

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: See Page 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1-11-95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
13.5 – 14.0	N/A	NA		NO RECOVERY			PID ppm; BY cpm
14.0 – 14.5		NA		NO RECOVERY			PID ppm; BY cpm
14.5 – 15.0		NA		NO RECOVERY			PID ppm; BY cpm
15.0 – 15.5		NA		NO RECOVERY			PID ppm; BY cpm
15.5 – 16.0		NA		NO RECOVERY			PID ppm; BY cpm
16.0 – 16.5		NA		NO RECOVERY			PID ppm; BY cpm
16.5 – 17.0		NA		NO RECOVERY			PID ppm; BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE Page	/ /	
ALPHA		/ /	
BETA / GAMMA		/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 12/14/95

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

MAR 06 1995

CONTROL NO.: 200307-11489-009

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: See Page 1

RELATED FAL NO.(s): N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1-11-95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.0	1/11/95 1500 403455	NA	6	MED STIFF (5Y 5/2) OLIVE GRAY Gravelly Silty Clay w/ 5-10% fine subangular and rounded gravel, 20-25% coarse subangular gravel, 10% cobble size fragments LOW PLASTICITY Slightly Moist TO MOIST ~~WET~~ TL 1-25-95	CL	.5	PID 9.5 ppm BY 40 cpm
17.5	1/11/95 1500 403455	NA	6	MED STIFF (5Y 5/2) OLIVE GRAY Silty Clay w/ 10% coarse subangular gravel, 5% fine subangular gravel, 10% coarse sand that is sub-rounded MED PLASTICITY Moist	CL	.5	PID 9.5 ppm BY 40 cpm
18.0	1/11/95 1500 403455	NA	6	Same as 17.5-18.0	CL	.5	PID 9.5 ppm BY 40 cpm
18.5	1/11/95 1500 403455	NA	6	Same as 17.5-18.0	CL	.5	PID 9.5 ppm BY 40 cpm
19.0	1/11/95 1500 403455	NA	6	Same as above 17.5"-18.0" except 5% subangular cobbles 5% coarse sand 5% fine gravel	CL	.5	PID 9.5 ppm BY 40 cpm
19.5	1/11/95 1500 403455	NA	6	Same as 17.5-18.0' except 5% subangular cobbles 50% coarse sand 5% fine gravel	CL	.5	PID 9.5 ppm BY 40 cpm
20.0	1/11/95 1505 403456	NA	6	STIFF 5Y 5/2 olive gray, Silty Clay. 15-20% sub Angular coarse gravel, 1-2% fine sub Angular gravel. 5% Coarse sub rounded sand. Low Plast. Moist. 1-2% fine grain sand to med grain	CL	1.0	PID 9.5 ppm BY 40 cpm
20.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	INA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~ See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 12/4/94

FS-F-3681

000587

F-198

G:/WPSC/94-776.DRW (11-23-94)

MAR 16 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11489-010

PAGE 7 OF 12

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: See Page 1

RELATED FAL NO.(s): N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE STARTED: 1-11-95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
20.5							
21.0	1/11/95 1505 403456	NA	6	STIFF (5Y 5/2) OLIVE GRAY Silty Clay w 120 x 70 mm angular limestone fragment and 40 x 55 mm coarse gravel fragment resting against each other in a vertical orientation Moist	CL	1.0	PID 9.5 ppm BY 40 cpm w/ layer on top
21.5	1/11/95 1505 403456	NA	6	STIFF (5Y 5/2) OLIVE GRAY Silty Clay w/ 2-5% coarse subrounded sand grains and scattered 15-20% fine subangular gravel, scattered med sand grains 1% low to med plasticity Moist	CL	1.0	PID 9.5 ppm BY 40 cpm
22.0	1/11/95 1505 403456	NA	6	same as 21.-21.5'	CL	1.0	PID 9.5 ppm BY 40 cpm
22.5	1/11/95 1505 403456	NA	6	same as 21.0-21.5' except some coarse subangular gravel 10-15%	CL	1.0	PID 9.5 ppm BY 40 cpm
23.0	1/11/95 1505 403456	NA	6	same as 21.0-21.5' except some coarse subangular/angular gravel size limestone fragment w/ fossils standing on end vertical position + decreased fine gravel 2-3%	CL	1.0	PID 9.5 ppm BY 40 cpm
23.5		NA		NO RECOVERY			PID ppm BY cpm
24.0	TL 1-30-95 ~~403456~~	NA		NO RECOVERY			PID ppm BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	N/A	/ NA /	N/A
ALPHA		/ /	
BETA / GAMMA		/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

MAR 06 1995 000588

8 1

CONTROL NO.: 200307-11489-011	FEMP **LITHOLOGIC LOG**	PAGE 8 OF 12

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION		PROJECT NO.: 20.03.07
BORING NUMBER: 11489	COORDINATES: See Page 1	RELATED FAL NO.s: NA
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: N/A DATE: TIME:	DATE STARTED: 1-11-95
GEOLOGIST: Layne / GEIGER / RILEY	GROUNDWATER LEVEL: N/A DATE: TIME:	DATE COMPLETED: 1-11-95
WATER USED DURING DRILLING: 0.0 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL	DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.0	1/11/95 1515 403457	NA	6	STIFF (5Y 4/1) Dark Gray Silty Clay w/ 1-2% fine sand grains, 5% med sand grains - subangular to subrounded 1-2% coarse subrounded sand, 10% fine subangular gravel LOW TO MED PLASTICITY MOIST	CL	1.0	PID 9.5 ppm BY 40 cpm
24.5	1/11/95 1515 403457	NA	6	Same as 24.0-24.5 except 2-5% coarse subangular gravel	CL	2.5	PID 9.5 ppm BY 40 cpm
25.0	1/11/95 1515 403457	NA	6	Same as 24.0-24.5 except angular cobble 80 x 40 x 20 mm oriented vertical and slightly tilted and 2-5% coarse angular gravel	thick	2.5	PID 9.5 ppm BY 40 cpm
25.5	1/11/95 1515 403457	NA	6	GRAVEL, (5Y 5/2) OLIVE GRAY CLAYEY SANDY 60-70% coarse angular gravel, 20-25% COARSE SUBROUNDED SAND, 5-10% clay MOIST		N/A	PID 10.0 ppm BY 40 cpm
26.0	1/11/95 1515 403457	NA	6	Same as 24.0-24.5 except less fine gravel 5%	CL	3.0	
26.5	1/11/95 1515 403457	NA	6	Same as 24.0-24.5 except 5% coarse angular gravel increase fine angular gravel to 15-20%	CL	3.0	PID 10.0 ppm BY 40 cpm
27.0	1/11/95 1525 403458	NA	6	Same as 24.0-25.5 except 5% coarse angular gravel added increase fine angular gravel to 15-20%	CL	3.0	PID 10.0 ppm BY 40 cpm
27.5				(5Y 4/1) DARK GRAY Silty Clay w/ 10-15% fine sand, 5% med sand, 10% fine gravel 1-2% coarse sand, 5% coarse gravel MOIST	CL	N/A	PID N/A ppm 10.0
				VERY STIFF (5Y 4/1) DARK GRAY Silty Clay w/ 1-2% fine to coarse sand, 20-25% fine angular gravel ~~5%~~ to 15%-25% coarse angular gravel MOIST	CL	2.0	BY TOO WET FROM DRILL cpm 40 MED PLAS.

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 None

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLR 1/14/94

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

000589

F-200

MAR 06 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11489-012

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: See Page 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 1-11-95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
27.5	1/11/95 1525 403458	NA	6	Same as 27.25—27.50'	CL	2.0	PID 10.0 ppm; BY 40 cpm
28.0	1/11/95 1525 403458	NA	6	Same as 27.25-27.50'	CL	2.0	PID 9.5 ppm; BY 40 cpm
28.5	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
29.0	1/11/95 1530 403459	NA	6	VERY STIFF (5Y 4/1) DARK GRAY Silty Clay w/ 1% fine sand grains, 1% med sand grains 10% fine gravel both subangular and subrounded LOW TO MED PLASTICITY Slightly Moist	CL	2.5	PID 9.5 ppm; BY 40 cpm
29.5	1/11/95 1530 403459	NA	6	Same as above @ 29.0 - 29.5' except limestone (fossilized) concretion 75mm x 40mm x 40mm thick, 2-3% coarse sand, subangular	CL	2.5	PID 9.5 ppm; BY 50 cpm
30.0	1/11/95 1530 403459	NA	6	Same as 29.0 - 29.5'	CL	2.5	PID 9.0 ppm; BY 50 cpm
30.5	1/11/95 1530 403459	NA	6	Same as 29.0-29.5 except a few subangular coarse gravel 60x30 mm	CL	2.5	PID 9.0 ppm; BY 50 cpm
31.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ per 1/11/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 06 1995

CONTROL NO.: 200307-11489-013

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: See Page 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-11-95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.0	1/11/95 1530 403459	NA	6	same as 29.0-29.5 except increased fine gravel, subangular and fairly well sorted (approx 5mm) scattered throughout 12-15% low plasticity slightly moist	CL	3.0	PID 9.0 ppm BY 50 cpm
31.5	1/11/95 1530 403459	NA	6	same as 29.0-29.5 except increased fine gravel, subangular and subrounded and rounded poorly sorted 12-15% low plasticity - piece of twig - slightly moist	CL	3.0	PID 9.0 ppm BY 50 cpm
32.0	1/11/95 1530 403459	NA	6	same as 29.0-29.5 except 2-5% coarse sand subangular scattered throughout	CL	3.0	PID 9.0 ppm BY 50 cpm
32.5	1/11/95 1530 403459	NA	6	same as 29.0-29.5 except 5-10% large coarse gravel subangular and increased sand grains fine to coarse overall 4-8% low plasticity slightly moist	CL	3.5	PID 9.0 ppm BY 50 cpm
33.0	1/11/95 1530 403459	NA	6	same as 29.0-29.5 except 5-10% large coarse gravel subangular to subrounded low to med plasticity slightly moist	CL	3.5	PID 9.5 ppm BY 50 cpm
33.5	1/11/95 1530 403459	NA	6	same as 29.0-29.5' except less fine gravel - 5% subangular to angular increased silt low to med plasticity slightly moist	CL	3.5	PID 9.0 ppm BY 50 cpm
34.0	1/11/95 1535 403460	NA	9	VERY STIFF (5Y 4/1) dark gray silty clay w/ 2-3% coarse subrounded sand grains, a 5-10 mm "pocket" of fine grain sand, (surface area) a 50x40x40mm thick coarse limestone fragment LOW TO MED PLASTICITY SLIGHTLY moist	CL	2.5	PID 9.0 ppm BY 50 cpm
34.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Page 1	/ N/A /	N/A
ALPHA		/ N/A /	
BETA / GAMMA	See Page 1	/ N/A /	

NOTES: Increased recovery on 34.0-34.5 due to sloughing (2 inches) and 1 inch expansion of clay due to released pressure and fluffing; Also See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 12/4/94

FS-F-3681

000591

G:/WPSC/94-776.DRW (11-23-94)

MAR 06 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11489-014

PAGE 11 OF 12

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: See Page 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-11-95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
34.5	1/11/95 1535	NA	7	VERY STIFF (5Y 4/1) Dark Gray Silty Clay w/ 1-2% coarse sand grains - subrounded, 1-2% fine gravel angular to subangular,	CL	2.5	PID 9.0 ppm; BY 50 cpm
35.0	403460	NA		trace of fine sand "pockets" or deposition along weak fracture planes low to med plasticity slightly moist	CL	2.5	PID 9.0 ppm; BY 50 cpm
	1/11/95 1535	NA	7	same as 34.5-35.0' except increased med coarse gravel 10x20 mm average subangular to angular Also	CL	3.0	PID 9.0 ppm; BY 40 cpm
35.5	403460	NA		some fine grain sand trace 20-30 grains here and there - evidence of fracturing. transport?	CL	3.0	PID 9.0 ppm; BY 40 cpm
	1/11/95 1535	NA	7	same as 34.5-35.0' except 2 med. coarse subangular gravels 20x40 mm a few pockets of fine gravel size that contain particles from mixed "breakdown" and there are fine sand and	CL	2.5	PID 9.0 ppm; BY 40 cpm
36.0	403460	NA		silt size grains in the annular spaces around the embedded larger gravels, some evidence of water transport where clay is slightly lighter color in a water infiltration type pattern	CL	2.5	PID 9.0 ppm; BY 40 cpm
36.25	1/11/95 1535 403460	NA	.25	(5Y 4/1) Dark Gray Silty Clay w/ 1% fine angular gravel, 1% med to coarse sand grains Evidence of fracture - brown clay "staining" seemed to include from interval below	CL	2.5	PID 9.0 ppm; BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: 36'-36.5 — TCLP 403461 Tot U/ISOU 403462

Also See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ per 12/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP LA MAR 06 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11489-015

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11489

COORDINATES: See Page 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 1-11-95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 1-11-95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
36.25	1/11/95 1535 403460	NA	7	Staining extends length of core interval (6 inches) is located 5mm deep from outer outside diameter of core. A large cobble is in this interval (the edge of which rests in a "fold" of clay, cobble is 70x85x50mm thick — definate impact on clay staining. Also could be clay fill — a depositional feature	CL	2.5	PID 9.0 BY 40 PPM CPM YELLOW CLAY COBBLE (FOLD (LOCATED WITHIN STAINING)
36.5	1/11/95 1535 403460 CLAY	NA	6	LAMINATED FOLD W/ 5Y 4/1 DARK GRAY CLAY and (2.5Y 6/6) OLIVE YELLOW interspersed in 1mm layers formed by cobble during deposition. Fold measures 100mm through center. Fold is located in this interval. INTERFACE	CL	1.0	PID 9.0 BY 40 PPM CPM
37.0	SAND 1/11/95 1535 403460	NA	6	BOTTOM OF FOLD FORMS CONTACT INTERFACE FOR TOP OF SAND (2.5Y 5/6) LT OLIVE BROWN SAND, 15% silt, 15-20% fine subangular to subrounded gravel, 10% coarse SAND, 60% fine subrounded to rounded SAND DRY — BOTTOM OF BORING —	CL	1.0	PID 9.0 BY 40 PPM CPM
		NA					PID BY PPM CPM
		NA					PID BY PPM CPM
		NA					PID BY PPM CPM
		NA					PID BY PPM CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: INTERFACE BETWEEN GRAY CLAY AND SAND consists of APPROX 100mm of thinly laminated (1mm) alternating layers of gray and yellow clay located between 36.5-36.75, APPROX. Also see Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP LA

MAR 06 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11490-005	
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11490	COORDINATES: N482820.019 ; E1375989.038 / RELATED FAL NO.s:
SURFACE ELEVATION: 581.81 ft.	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 1/11/95
GEOLOGIST: Layne / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 1/11/95
WATER USED DURING DRILLING: 0.0 GALLONS Estimate	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1/11/95 0925 403441	NA	6"	very soft (10YR 3/3) DARK BROWN Silty clay w/ root material and surface vegetation, trace of 1-2mm subangular mineral fragments & ~~[illegible]~~ fragments 1mm of Shale n Magnesse MED PLASTICITY MOIST	CL	0.0	PID 10.0 ppm BY 50.0 CPM
0.5	1/11/95 0925 403441	NA	6"	Soft (10YR 3/3) DARK BROWN Silty Clay w/ root material, 1-2mm (trace) of black ~~fl shale~~ ~~[illegible]~~ trace of 1-2mm size subangular mineral fragments, ~~trace of~~ MED PLASTICITY ~~[illegible]~~ 1-23-95 MOIST	CL	.25	PID 10.0 ppm BY 50 CPM
1.0	1/11/95 0925 403441	NA	6"	Soft (10YR 3/3) DARK BROWN Silty Clay w/ increased silt content and root material trace of fine sand .08-.43 mm, trace of 1-2mm size mineral fragments homogeneous throughout trace of (speckles) hematitic breakdown MOIST LOW PLASTICITY	CL	.50	PID 10.0 ppm BY 50 CPM
1.5	1/11/95 0925 403441	NA	6"	Stiff 10YR 3/3 Dark Brown Silty Clay w/ increasing silt content, trace of fine sand .08-.43 mm, homogeneous (traces) finely powdered weathered hematitic material LOW PLASTICITY MOIST	CL	1.0	PID 10.0 ppm BY 50 CPM
2.0	1/11/95 0925 403441	NA	6"	Stiff (10YR 3/3) DARK BROWN Silty Clay w/ increased silt content, trace of fine sand .08-.43 mm, powdery hematitic breakdown homogeneous and increasing content in last two inches MOIST LOW PLASTICITY	CL	1.5	PID 10.0 ppm BY 50 CPM
2.5	1/11/95 0925 403441	NA	6"	Stiff 2.5Y 4/4 olive Brown; silty Clay; w/ increased silt content; abundent powder hematitic Breakdown; homogeneous throughout Trace Sand .08-.43 mm, Rounded Column of 10YR 3/3 Dark Brown Silty Clay (3-4 cm) to within 1" of Interval Bottom Low plast. Moist	CL	2.0	PID 10.0 ppm BY 50 CPM
3.0	1/14/95 0925 403441	NA	6"	Stiff 2.5Y 4/4 olive Brown; Silty Clay; w/ abundent hematitic breakdown; homogeneous throughout, vertical Column w/ Irregular orientation. Begins at 3.1'-3.5'. 10YR 3/3 Dark Brown Low Plast. moist.	CL	1.5	PID 10.0 ppm BY 50.0 CPM
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	10.0	1/11/95	0920
ALPHA	NA	(NA)	NA
BETA / GAMMA	50	1/11/95	0920

NOTES: JC 2-7-95 ~~None~~

This Lithologic Log was updat using Archived Soil Cores by Geologi Thea Layne ON 01/23/95 and 01/24/9

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11490-006

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11490

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/11/95

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/11/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	1/11/95 0930 403441	NA	6"	very stiff Same As Above 3.0 - 3.5 Including vertical Column which extends whole 6" interval; DECreasing in size from 2½ - 1" diameter and Depth.	CL	2.25	PID 10.0 ppm BY 50 CPM
4.0	1/11/95 0930 403442	NA	6"	Stiff 2.5Y 4/3 olive Brown; Silty Clay w/ homogeneous hematotic Breakdown; w/ 1mm mineral fragments (TRACE) Mottled w/ 2.5Y N5/ Gray Extending in diameter to Bottom of interval. Low Plast. Moist. Trace of fine Sand grains.	CL	1.5	PID 10.0 ppm BY 50 CPM
4.5	1/11/95 0930 403442	NA	6"	Stiff Same As Above 4.0" — 4.5" w/ vertical mottling of gray (hematitic Breakdown homogeneous) The ~~hematitic~~ fracturing (horizontal) dessication	CL	1.0	PID 10.0 ppm BY 50 CPM
5.0	1/11/95 0930 403442	NA	6"	Stiff Same As Above 4.5" — 5.0" w/ increased plasticity. IN LAST INCH OF INTERVAL, VERTICAL COLUMN OF DK GRAY CLAY STARTS (1 in Diameter)	CL	1.5	PID 10.0 ppm BY 50 CPM
5.5	1/11/95 0930 403442	NA	6"	Stiff (2.5Y 4/3 OLIVE BROWN) Silty Clay w/ dessicated fracturing vertical & horizontal, powdery, hematite breakdown homogeneous throughout, nodule like manganese deposits, irregular vertical direction (irregular DK GRAY COLUMN PINCHES OUT IN FIRST 2 INCHES OF THIS INTERVAL)	CL	1.0	PID 10.4 ppm BY 50 CPM
6.0	1/11/95 0930 403442	NA	6	STIFF (10YR 5/1) GRAY Silty Clay and (10YR 5/8) YELLOWISH BROWN Silty Clay? w hematitic precipitate, increased Silt Content LOW-MED PLASTICITY ~~INCREASED MOISTURE~~ PL 1-23-95 PL 1-23-95	CL	1.0	PID 10.4 ppm BY 50 CPM
6.5	1/11/95 0930 403442	NA	6	MED STIFF (10YR 5/1) GRAY Silty Clay w/ homogenous (10YR 5/8) YELLOWISH BROWN Silt/ hematitic precipitate, trace of fine .08-.43 mm sand LOW PLASTICITY MOIST	CL	.75	PID 10.4 ppm BY 50 CPM
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID See Pg. 1		/ /	
ALPHA	NA	/ / NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: all 2.5Y olive Brown Description on this page actually reflect the mixture of 10YR 5/1 Gray Clay and 5/8 Yellowish Brown Hemotetic Precipit. ?? See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681 000595 F-206 WPSC / 94-776.DRW (11-23-94)

MAR 13 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11490-007

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11490

COORDINATES: See Page 1

RELATED FAL NO.(s):

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/11/95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/11/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0	1/11/95 0935 403442	NA	6	med. stiff (10YR 4/6) DARK YELLOWISH BROWN Clayey Sand, fine grain .08-.43 mm, w/ vertical positioned pocket of (10YR 5/1) GRAY Silty clay ½ inch diameter and pinches out at depth NO PLASTICITY, trace of fine to med subangular GRAVEL + 1-2 ANGULAR GRAVEL (LIMESTONE) MOIST	CL	.75	PID 10.4 ppm BX 50 cpm
7.5	1/11/95 0935 403442	NA	6	very soft (10YR 4/6) DARK YELLOWISH BROWN Sandy Clay (w/ fine grain .08-.43 mm SAND) w/ fine to med subangular to angular gravel, trace of Shale NO-LOW PLASTICITY MOIST	CL	0.0	PID 10.4 ppm BX 50 cpm
8.0	1/11/95 0935 403443	NA	6	Soft (2.5Y 4/4) OLIVE BROWN Clayey SAND .08-.43mm fine grain w/ ~~[illegible]~~ TL 1-24-95 trace poorly sorted fine gravel 5-15mm - angular to subangular homogenous throughout, very fine MINERAL fragments black - ~~[illegible]~~ soft & angular INCREASING PER TRACE OF MED TO COARSE SAND GRAINS ~~[illegible]~~ TL 1/24/95 WET	CL	.5	PID 10.4 ppm BX 50 cpm GRADE OF MED GRAIN SIZE TO BOTTOM OF INTERVAL - increased ant. gravel
8.5	1/11/95 0935 403443	NA	6	Soft (2.5Y 4/4) OLIVE BROWN Silty SAND, fine to med grain coarsening downward, to fine/med/coarse sand mix, w/ fine gravel 4.8-9mm angular to subangular homogenous throughout increasing downward, 20-30% coarse 19-75mm subangular to subrounded GRAVEL throughout WET	CL	.5	PID 10.6 ppm BX 50 cpm
9.0	INTERFACE SAND CLAY			Abundant Coarse 19-75 mm ANGULAR LIMESTONE GRAVEL AT CONTACT to clayey sand + gravel poorly sorted			
	1/11/95 0935 403443	NA	6	very stiff 10YR 5/1 Gray Silty Clay w/ Trace of coarse sand 2.0-4.8 mm and some Angular - Subangular fine gravel (4.8-19mm) Low Plast. slightly moist.	CL	2.5	to 1/2-1" olive brown w/ Trace of Sand PID - 10.6 ppm BX - 50 cpm
9.5	1/11/95 0935 403443	NA	6	very stiff 10YR 5/1 Dark Gray Silty Clay w/ poorly sorted fine (1-5MM) angular to subangular gravel homogeneous throughout and trace of subrounded ~~to subangular~~ coarse (20 mm) gravel low plasticity slightly moist	CL	3.25	PID 10.6 ppm BX 50 cpm
10.0	1/11/95 0935 403443	NA	6	very stiff (10YR 4/1) DARK GRAY Silty Clay w/ trace of very fine to fine (subangular) 1-5 mm to coarse (subrounded) 10-20 mm AND subrounded fragment of limestone 60 mm low plasticity w/ fossils embedded slightly moist	CL gravel	3.50	PID 10.6 ppm BX 50 cpm trace of rounded gravel 10 mm
10.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: (10YR 4/1) DARK GRAY COLOR OF CLAY Also could be comparable to (5Y 4/1) DARK GRAY - GREEN tint See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

MAR 13 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.:	200307-11490-008
PAGE	4 OF 14
PROJECT NAME:	PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION
PROJECT NO.:	20.03.07
BORING NUMBER:	11490
COORDINATES:	See Page 1
RELATED FAL NO.s:	
SURFACE ELEVATION:	See Page 1
GROUNDWATER LEVEL: / DATE: / TIME:	
DATE STARTED:	1/11/95
GEOLOGIST:	Layne / GEIGER / RILEY
GROUNDWATER LEVEL: / DATE: / TIME:	
DATE COMPLETED:	1/11/95
WATER USED DURING DRILLING:	0.0 GALLONS estimate
DRILLING CONTRACTOR:	ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT:	ROTASONIC
DRILLER / HELPER:	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	1/11/95 0940 403443	NA	6	very stiff (10YR 4/1) DARK GRAY Silty Clay w/ trace of coarse sand and some poorly sorted subangular to subrounded fine 5-10mm gravel homogeneous Small pocket 1-2 inches of fine to med grain sand Low plasticity trace of angular coarse gravel-limestone slightly moist	CL	3.0	PID 10.6 ppm BY 50 CPM
11.0	1/11/95 0940 403444	NA	6	Very stiff (10YR 4/1) DARK GRAY Clayey Silt w/ trace of coarse sand (2.0-4.8mm) and 20-30% med-coarse (10-20mm) gravel both subrounded to subangular NO PLASTICITY (disintegrated limestone fragment) slightly moist	CL	3.5	PID 10.6 ppm BY 50 CPM
11.5	1/11/95 0940 403444	NA	6	very stiff (10YR 4/1) DARK GRAY Clayey Silt Same basically as 11.0-11.5	CL	3.5	PID 10.6 ppm BY 50 CPM
12.0	1/11/95 0940 403444	NA	6	Very stiff (10YR 4/1) DARK GRAY Clayey Silt w/ trace of coarse sand and trace of poorly sorted fine to coarse (4.0-30mm) gravel angular to subrounded NO PLASTICITY Slightly moist	CL	3.0	PID 10.6 ppm BY 50 CPM
12.5	1/11/95 0940 403444	NA	6	Very stiff (10YR 4/1) DARK GRAY Clayey Silt w/ trace of med to coarse subangular to subrounded sand (.43-3.0mm), a few subrounded-subangular fine gravels (10mm) NO PLASTICITY Slightly moist	CL	3.0	PID 10.8 ppm BY 50 CPM
13.0	1/11/95 0940 403444	NA	6	Very stiff (10YR 4/1) DARK GRAY Clayey Silt w/ trace of subangular coarse (1.0-3.0mm) sand NO PLASTICITY Slightly moist	CL	3.0-3.5	PID 10.8 ppm BY 50 CPM
13.5	1/11/95 0940 403444	NA	6	Very stiff (10YR 4/1) DARK GRAY Clayey Silt w/ trace of med-coarse subangular sand and some fine 5.0-8.0mm subangular gravel NO PLASTICITY moist	CL	2.75	PID 10.8 ppm BY 50 CPM
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 None

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681 000597

F-208

MAR 03 1995

G:/WPSC / 94-776.DRW (11-23-94

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 5 OF 14
200307-11490-009	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11490	See Page 1	

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Page 1				1/11/95
GEOLOGIST:	**GROUNDWATER LEVEL:**	**DATE:**	**TIME:**	**DATE COMPLETED:**
Layne / GEIGER / RILEY				1/11/95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
0.0 GALLONS Estimate	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	1/11/95 0945 403444	NA	6	Stiff (10YR 4/1) DARK GRAY VERY Silty Clay, trace of coarse (2.0-4.0 mm) SAND trace of angular fine (10mm) gravel, a few subangular limestone fragments (40mm) coarse gravel low plasticity MOIST	CL	2.0	PID 10.8 ppm BY 50 cpm
14.5 – 15.0	1/11/95 0945 403444	NA	6	MED STIFF (10YR 4/1) DARK GRAY Silty Clay W a few scattered coarse sand grains, and trace of fine to med (~~of 5~~ 2-2mm) gravel (5-18 mm) throughout - Subangular to rounded MED PLASTICITY (STRONG ORGANIC ODOR) MOIST	CL	.50	PID 10.8 ppm BY 50 cpm
15.0 – 15.5	1/11/95 0945 403444	NA	6	SOFT (10YR 4/1) DARK GRAY Silty Clay w/ trace of med to coarse sand (subangular), some scattered fine gravel (5.0-10.0 mm) rounded and subangular, a large coarse gravel (30.0 X 60.0 mm) subrounded limestone fragment MED PLASTICITY MOIST	CL	.25	PID 11.0 ppm BY 50 cpm
15.5 – 16.0	1/11/95 0945 403444	NA	6	Same as 15.0-15.5	CL	.25	PID 11.0 ppm BY 50 cpm
16.0 – 16.5	1/11/95 0945 403444	NA	6	Same as 15.0-15.5	CL	.25	PID 11.0 ppm BY 50 cpm
16.5 – 17.0	1/11/95 0945 403444	NA	6	Same as 15.0-15.5	CL	.25	PID 11.0 ppm BY 50 cpm
17.0 – 17.5	1/11/95 0945 403445	NA	6	SOFT (5Y 4/1) DARK GRAY Silty CLAY (STICKY) w/ angular coarse gravel (limestone) (Approx 30.0-75.0 mm) throughout and a limestone subangular cobble (90.0 X 50.0 mm) MED-HIGH PLASTICITY trace med-coarse SAND WET	CL	.25	PID 12.0 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 NONE

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES~~

FS-F-3681

MAR 03 1995

PSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11490-010

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11490

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/11/95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/11/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5	1/11/95 0950 403445	NA	6	Soft (5Y 4/1) DARK GRAY Silty Clay w/ some fine to coarse (4.8-75mm) gravel scattered throughout → angular limestone trace med to coarse grain SAND MED-HIGH PLASTICITY WET	CL	.25 to 0.0	PID 12.0 ppm BY 60 cpm
18.0	1/11/95 0950 403445	NA	6	very soft (5Y 4/1) DARK GRAY Silty Clay w/ some fine (4.8-19 mm) GRAVEL scattered throughout that is angular - a few rounded, trace of med to coarse sand grains (.43-2.0mm) PLAST LIMIT WET	CL	0.0	PID 12.0 ppm BY 60 cpm
18.5	1/11/95 0950 403445	NA	6	~~Stiff-very stiff~~ very soft (5Y 4/1) DARK GRAY Silty Clay w trace of med to coarse (.43-2.0) sand grains and a few fine (to 19mm) angular gravel MED TO HIGH PLASTICITY WET	CL	0.0	PID 12.0 ppm BY 60 cpm
19.0	1/11/95 0950 403446	NA	6	Stiff-very stiff (5Y 4/1) DARK GRAY Silty Clay w/ trace of med to coarse sand grains and some fine subangular to subrounded gravels (4.8-15mm) throughout. A subangular 40mm limestone gravel LOW TO MED PLASTICITY MOIST	CL	1.5 ↓ 2.5	PID 16.0 ppm BY 50 cpm
19.5	1/11/95 0950 403446	NA	6	very stiff (5Y 4/1) DARK GRAY Silty Clay w/ trace of med to coarse sand grains homogeneous throughout, trace of very fine gravel (11.40mm x 40mm rounded gravel low plasticity MOIST	CL	2.25	PID 16.0 ppm BY 50 cpm
20.0	1/11/95 0950 403446	NA	6	very stiff (5Y 4/1) DARK GRAY Silty Clay w/ ~~scattered~~ pocket of (20mm) "teal" color clay forming into shale, A 30mm Claystone (angular) NO-LOW PLASTICITY A 70mm x 55mm rock fragment subangular MOIST	CL	3.0	PID trace of fine gravel and fine-MED-COARSE SAND ppm BY cpm
20.5	1/11/95 0950 403446	NA	6	very stiff (5Y 4/1) DARK GRAY Silty Clay increased silt content and increased fine to MED GRAIN SAND GRAINS, SMALL piece of root material - Appears charred, several large 30mm-40mm GRAVEL LIMESTONE SUB-ANGULAR NO-LOW PLASTICITY (A few fine gravel) MOIST	CL	3.0 ↓ 2.5	PID 15.5 ppm BY 50 cpm

21.0

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681 000599

MAR 03 1995 / WPSC / 94-776.DRW (11-23-9

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11490-011

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11490

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/11/95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/11/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	1/11/95 0955 403446	NA	6	very stiff Same as 20.5-21.0 but increased fine gravel (4.0-5.0 mm) subangular and various mineralogies. No to Low Plasticity Moist	CL	2.75 ↓ 3.25	PID 15.5 ppm BY 50 cpm
21.5	1/11/95 0955 403446	NA	6	very stiff (5Y 4/1) DARK GRAY VERY SILTY CLAY w/ poorly sorted sand and gravel scattered homogeneously throughout - angular to subangular. NO PLASTICITY Slightly Moist	CL	3.0	PID 15.5 ppm BY 50 cpm
22.0	1/11/95 0955 403446	NA	6	very stiff (5Y 4/1) DARK GRAY VERY SILTY CLAY → Clayey Silt w/ poorly sorted sand and gravel homogeneously scattered throughout matrix w/ a few coarse subangular limestone gravel 60mm. No Plasticity Slightly Moist	CL	4.0	PID 15.5 ppm BY 50 cpm
22.5	1/11/95 0955 403446	NA	6	very stiff (5Y 4/1) DARK GRAY VERY SILTY CLAY ↔ Clayey Silt increased fine sand grain content, also small (10 mm) deposit of sand fine grain w/ some med grains, VERY FINE TO FINE GRAVEL homogeneous throughout. No Plasticity Slightly Moist some rounded gravel broken within	CL	3.5	PID 15.5 ppm BY 50 cpm
23.0	1/11/95 0955 403446	NA	6	very stiff 5Y 4/1 Dark Gray; very silty Clay No Plast. Slightly moist. ↔ Clayey Silt w/ poorly sorted fine sub angular - sub round gravel and some fine grain sand; Homogeneous throughout; very fine Roots (in-situ?) and additional large diameter decomposing Root material 50x90mm cobble of Brachiopod Fossil (OKRE)	CL	2.25 ↓ 3.0	PID 15.5 ppm BY 50 cpm
23.5	1/11/95 0955 403447	NA	6	Soft 5Y 4/1 Dark Gray; silty Clay w/ poorly sorted gravel; fine to coarse, Angular to sub Angular sand fine grain sand throughout; med-High Plast; wet.	CL	.25	PID 15.5 ppm BY 50 cpm
24.0	1/11/95 0955 403447	NA	6	Same As Above 23'5" — 24'0"	CL	NA	PID 15.5 ppm BY 50 cpm
24.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~ALONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

MAR 03 1995

000600

CONTROL NO.: 200307-11490-012

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11490

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/11/95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/11/95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5							
25.0	1/11/95 1000 403447	NA	6	Soft Same As Above 24.0'— 24.5' Increased Med. grain Sand. no Plast. (Past Limit) – High Past; wet	CL	0.25	PID 15.5 ppm BY 50 cpm
25.5	1/11/95 1000 403447	NA	6	Med. Stiff 5Y 4/1 Dark Gray; Silty Clay w/some fine Grain Sand Homogeneous throughout; Some Sub Angular Poorly Sorted fine Gravel throughout Trace of Coarse gravel 40 x 30mm, Sub Angular Med–High Plast. Moist.	CL	.75	PID 15.5 ppm BY ~~150~~ 50 cpm TL 1-31-95
26.0	1/11/95 1000 403447	NA	6	Stiff 5Y 4/1 Dark Gray, Silty Clay w/coarse grain sand (Trace); Trace of fine Gravel; overall finer Material; 90 x 150mm Rock; ~~Thin~~ Flat interface TL 1-31-95 Between Rock and Clay; Bright green Algea Traces. Med–High Plast; Moist.	CL	1.5	PID 15.5 BY 50 cpm
26.5	1/11/95 1000 403447	NA	6	Stiff 5Y 4/1 Dark Gray; Same As Above 25.5'– 26.0" W/Trace fine Gravel and Trace fine Sand. High Plast. Moist; overall finer Material (.1) 70 x 30mm Limestone w/Fossils Fragment	CL	1.5	PID 15.5 ppm BY 50 cpm
27.0	1/11/95 1000 403447	NA	6	Stiff 5Y 4/1 Dark Gray; Silty Clay w/some fine–Med grain sand; and Trace of Sub Angular fine gravel; and Some Coarse Limestone Fragment w/ Fossils. (30mm) Low–Med Plast; Moist	CL	1.5	PID 15.5 ppm BY 50 cpm
TL 1-27-95 28.0	1/11/95 1000 403447	NA	6	Stiff 5Y 4/1, Dark Gray; Silty Clay w/some Coarse grain Sand; fine Sub Angular gravel homogeneous Throughout. Low–Med. Plast.; Moist; Trace of Coarse Limestone Fragment.	CL	2.0	PID 15.5 ppm BY 50 cpm
28.5	1/11/95 1000 403447	NA	6	Very Stiff 5Y 4/1, Dark Gray; Same As Above 27.0'— 27.5' Low Plast. Moist. w/overall increased finer Material and less gravel	CL	2.5	PID 15.5 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681 000601

MAR 03 1995

GL / WPSC / 94-776.DRW (11-23-94

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 9 OF 14
200307-11490-013	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11490	See Page 1	

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Page 1				1/11/95

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
Lagyre / GEIGER / RILEY				1/11/95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
Estimate 0.0 GALLONS	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				traces of Flat to tilted miniscule "bedding planes" less than 1mm As sample breaks or fracturing from dessication			
28.0	1/11/95 1005 403448	NA	6	very stiff (5Y 4/1) DARK GRAY Silty Clay w/ traces of coarse angular sand grains / fine subangular gravel (to 3mm) scattered homogeneously (embedded) in clay matrix 1.50x40 mm angular fragment of limestone, several rounded "pebbles" 10-15 mm MOIST - low plasticity	CL	2.75	PID 15.5 ppm; 13 > 50 cpm
28.5	1/11/95 1005 403448	NA	6	very stiff Same silty clay matrix as above with less coarse sand (2.0-4.8mm) and fewer fine gravel, No large fragments, traces of broken roots throughout - 1x15mm and 4x15mm No-low plasticity MOIST	CL	3.5	PID 16.5 ppm; B > 50 cpm
29.0	1/11/95 1005 403448	NA	6	very stiff Same as above 28.5-29.0 also has root fragments embedded in clay - sizes indicated above tiny fragment of bryozoan	CL	3.75	PID 15.0 ppm; B > 50 cpm
29.5	1/11/95 1005 403448	NA	6	Same silty clay matrix as above 28.5-29.0 small scattered traces of med grain sand (.43-2.0mm) scattered traces of angular coarse grain sand (2.0-4.8mm) Found 30x20 mm x 6mm thick flat "squared" Claystone exhibiting very fine lamination approx .25 mm thick / flat horizontal	CL	3.5	PID 15.0 ppm; B > 50 cpm
30.0	1/11/95 1005 403448	NA	6	29.5-30.0 Also: ROOT FRAGMENTS; TINY BRYOZOAN FRAGMENT Also: LIMESTONE FRAGMENT 30x40x30mm thick Exhibiting Contact plane between CARBONATE DEPOSITIONAL ENVIRONMENT & FINE MATRIX LIMESTONE FLOOR (FOSSILS) BEDDING	CL		PID 15.0 ppm; B > 50 cpm
30.5	1/11/95 1005 403448	NA	6	Same CLAY MATRIX AS ABOVE w/ just a few coarse grains of sand, a few fine angular gravel a few rounded pebbles, a few coarse gravel size fragments - one of them 70x30x40 mm thick Siltstone showing bedding laminations & carbonates settled on top		3.0	
31.0	1/11/95 1005 403448	NA	6	Same as above Silty clay matrix w/ A few scattered coarse sand grains & fine small angular gravels - A few rounded pebbles NO LARGE FRAGMENTS LOW PLASTICITY MOIST	CL	3.0	PID 15.0 ppm; B > 50 cpm
31.5	1/11/95 1005 403448	NA	6	very stiff Same as above 30.5-31.0 except 60x30x25mm thick fragment of fossil concretion LOW PLASTICITY MOIST	CL	3.5	PID 15.0 ppm; B > 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681

G:/WRSC/94-778.DRW (11-23-94

000602

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11490-014

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11490

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/11/95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/11/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5	1/11/95 1010 403449	NA		Same as above w/ fossilized limestone fragment 50x35mm Stiff	CL	2.0	PID 15.0 ppm; BY 50 cpm
32.0	1/11/95 1010 TL 1-31-95 ~~403449~~	NA		NO RECOVERY			PID ppm; BY cpm
32.5	1/11/95 1010 TL 1-31-95 ~~403449~~	NA		NO RECOVERY			PID ppm; BY cpm
33.0	1/11/95 1010 TL-1-31-95 ~~403449~~	NA		NO RECOVERY			PID ppm; BY cpm
33.5	1/11/95 1010 TL 1-31-95 ~~403449~~	NA		NO RECOVERY			PID ppm; BY cpm
34.0	1/11/95 1010 TL 1-31-95 ~~403449~~	NA		NO RECOVERY			PID ppm; BY cpm
34.5	1/11/95 1010 403449	NA		Hard (1-5%)(5Y 4/1) DARK GRAY Silty Clay w/ traces (scattered) of med to coarse grain subangular sand, a few subangular fine gravels and coarse size gravel LOW PLASTICITY Slightly moist		4.5	PID 15.0 ppm; BY 50 cpm
35.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PCR 1/11/95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11490-015

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11490

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 1/11/95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 1/11/95

WATER USED DURING DRILLING: Estimate 0.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0	1/11/95 1015 403449	NA	6	Same as 34.5-35.0 Stiff	CL	2.0	PID 15.0 ppm; BY 50 cpm
35.5	1/11/95 1015 403449	NA	6	Same as 34.5-35.0 Stiff includes a 15x20mm subrounded igneous fragment	CL	2.0	PID 15.0 ppm; BY 50 cpm
36.0	INTERFACE 1/11/95 1015 403449 INTERFACE	NA	6	Stiff (5Y 4/1) DARK GRAY Silty Clay (same as 34.5-35.0) matrix w/ intrusional column of (2.5Y 4/4) OLIVE BROWN VERY SILTY CLAY w/ NO (smooth texture) granular material, VERTICAL column measures 40mm x 60m And tilts slighty 20-30° degrees, column is irregular in shape. And extends Approx 5 inches DOWNWARD INTO GRAY MATRIX OF core space. Also: (2.5Y 4/4) OLIVE BROWN FINE TO MED GRAIN SAND Fills 1/4 to 1/2 of core space. BROWN CLAY INCLUSION	CL	20	PID / BY; CROSS SECTION: BROWN CLAY, GRAY CLAY; 36.0-36.5 INTERVAL
36.5	1/11/95 1015 403449	NA	6	(2.5Y 4/4) OLIVE BROWN SAND 75% FINE Angular to Subangular, 15% Coarse rounded, 5% silt, 5% MED Subrounded grains DRY	SP	NA	PID 15.0 ppm; BY 50 cpm
37.0	1/11/95 1015 403449	NA	6 15%	(2.5Y 4/4) OLIVE BROWN SAND and GRAVEL, 44% FINE grain SAND angular to subangular, 1% MED GRAIN SAND, 5% coarse grain sand subangular to rounded, 30% FINE GRAVEL angular to subangular, COARSE GRAVEL, 5% clumps of Clayey Silt DRY	SW	NA	PID 15.0 ppm; BY 50 cpm
37.5	1/11/95 1015 403449	NA	6	Same as 37.0-37.5	SW	NA	PID 15.0 ppm; BY 50 cpm
38.0	1/11/95 1015 403449	NA	6	Same as 37.0-37.5	SW	NA	PID 15.0 ppm; BY 50 cpm
38.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681

MAR 03 1995

WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11490-016

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11490

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/11/95

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/11/95

WATER USED DURING DRILLING: 0.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5							
39.0		NA		NO RECOVERY			PID ppm BY cpm
39.5		NA		NO RECOVERY			PID ppm BY cpm
40.0		NA		NO RECOVERY			PID ppm BY cpm
40.5		NA		NO RECOVERY			PID ppm BY cpm
41.0		NA		NO RECOVERY			PID ppm BY cpm
41.5		NA		NO RECOVERY			PID ppm BY cpm
42.0		NA		NO RECOVERY			PID ppm BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES~~

FS-F-3681 000605

MAR 03 1995

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11490-017	PAGE 13 OF 14
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11490	COORDINATES: See Page 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: DATE: TIME:
DATE STARTED: 1/11/95	
GEOLOGIST: Layne / GEIGER / RILEY	GROUNDWATER LEVEL: DATE: TIME:
DATE COMPLETED: 1/11/95	
WATER USED DURING DRILLING: Estimate 0.0 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
2.0 – 42.5		NA		NO RECOVERY			PID ppm; BY cpm
42.5 – 43.0		NA		NO RECOVERY			PID ppm; BY cpm
43.0 – 43.5		NA		NO RECOVERY			PID ppm; BY cpm
43.5 – 44.0		NA		NO RECOVERY			PID ppm; BY cpm
44.0 – 44.5		NA		NO RECOVERY			PID ppm; BY cpm
44.5 – 45.0		NA		NO RECOVERY			PID ppm; BY cpm
45.0 – 5.5		NA		NO RECOVERY			PID ppm; BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES~~

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

000606

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 14 OF 14
200307-11490-018	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11490	See Page 1	

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Page 1				1/11/95

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
Layne / GEIGER / RILEY				1/11/95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
0.0 GALLONS Estimate	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
45.5		NA		NO Recovery			PID ppm BY cpm
46.0		NA		NO Recovery			PID ppm BY cpm
46.5	1/11/95 1030 403449	NA	6	(2.5Y 4/4) OLIVE BROWN Sandy Silt, 55-60% silt, 10-15% fine sand, 20-25% sandy silt "clumps" that are the size of fine to med size gravel and they have subangular shape and break under finger pressure (Slightly MOIST — DAMP)	SP	NA	PID 15.0 ppm BY 50 cpm
47.0	1/11/95 1030 403449	NA	6	SAA	SP	NA	PID 15.0 ppm BY 50 cpm
47.5	1/11/95 1030 403449	NA	6	SAA	SP	NA	PID 15.0 ppm BY 50 cpm TCLP 403450 TOTU ESO.U 403451
48.0		NA		Bottom of Boring at 48'			PID ppm BY cpm
48.5		NA					PID ppm BY cpm
49.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681 000607

G:/WPSC/94-776.DRW (11-23-94)

MAR 03 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11491-006	PAGE 1 OF 17
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11491	COORDINATES: N483027.452 E1382494.442
RELATED FAL NO.s: 200307-11491-004	
SURFACE ELEVATION: 613.51	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-14-94
GEOLOGIST: LAYNE / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-15-94
WATER USED DURING DRILLING: Estimated 34 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	12-14-94 1315 402619	NA	6	STIFF (10YR 4/4) DARK YELLOWISH BROWN Silty CLAY / Clayey Silt w/ surface vegetation and organic root matter, 2-5% fine gravel LOW PLASTICITY Slightly Moist	CL/ML	1.5	PID 6.6 ppm BY 60 cpm
0.5	12-14-94 1315 402619	NA	6	Same as 0.0-0.5'	CL/ML	1.5	PID 6.8 ppm BY 60 cpm
1.0	12-14-94 1315 402619	NA	6	VERY STIFF (10 YR 5/6) YELLOWISH BROWN SILTY CLAY / Clayey SILT w/ 10% to 20% Coarse (angular to subangular) gravel NO TO LOW PLASTICITY Slightly Moist	ML/CL	2.5	PID 7.4 ppm BY 50 cpm
1.5	12-14-94 1315 402619	NA	6	Same as 1.0-1.5' except reduced Coarse gravels (2-5%)	ML/CL	1.0	PID 7.7 ppm BY 60 cpm
2.0	12-14-94 1315 402619	NA	6	STIFF (10 YR 4/6) DARK YELLOWISH BROWN VERY SILTY CLAY / CLAYEY SILT w/ 2-5% fine (poorly sorted) gravel and 2-3% Coarse gravel LOW PLASTICITY Slightly Moist	ML/CL	1.0	PID 7.7 ppm BY 80 cpm
2.5	12-14-94 1315 402619	NA	6	Same as 2.0-2.5'	ML/CL	1.0	PID 7.7 ppm BY 70 cpm
3.0	12-14-94 1330 402619	NA	6	Same as 2.0-2.5'	ML/CL	1.0	PID 7.2 ppm BY 10 cpm
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	4.9 ppm	12/14/94	0740
ALPHA	NA	INAI	NA
BETA / GAMMA	40 cpm	12/14/94	0740

NOTES: This Lithologic Log was updated using Archived Soil Cores by Geologist Thea Layne on 02/07/95

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

000608

G:/WPSC/94776.DRW (11-23-94)

S I I

9-17-95 FEMP QA 19

CONTROL NO.: 200307-11491-007

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: Estimated 34 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	12-14-94 1330 402619	NA	6	same as 2.0-2.5'	CL	2.0	PID 7.4 ppm; BY 5 cpm
4.0	12-14-94 1330 402619	NA	6	same as 2.0-2.5'	CL	2.25	PID 7.4 ppm; BY 15 cpm
4.5	12-14-94 1330 402619	NA	6	same as 2.0-2.5'	CL	2.5	PID 8.1 ppm; BY 25 cpm
5.0	12-14-94 1330 402620	NA	6	same as 2.0-2.5'	CL	2.5	PID 8.4 ppm; BY 40 cpm
5.5	12-14-94 1340 402620	NA	6	same as 2.0-2.5'	CL	2.5	PID 8.3 ppm; BY 35 cpm
6.0	12-14-94 1340 402620	NA	6	same as 2.0-2.5' w/ gray mottling	CL	2.5	PID 8.1 ppm; BY 30 cpm
6.5	12-14-94 1340 402620	NA	6	same as 2.0-2.5'	CL	2.5	PID 8.0 ppm; BY 5 cpm
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

000609

G:/WPSC/94-778 DRW (11-23-94)

FEMP QA 18

CONTROL NO.: 200307-11491-008

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: 34 GALLONS Estimated

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0	12-14-94 1345 402620	NA	6	VERY STIFF (10YR 4/4) DARK YELLOWISH BROWN Silty CLAY w/ 10% gravel (15-25mm), trace of sand MED PLASTICITY MOIST	CL	3.0	PID 7.2 ppm; BZ 5 cpm
7.5	12-14-94 1345 402620	NA	6	same as 7.0-7.5'	CL	3.0	PID 7.2 ppm; BZ 10 cpm
8.0	12-14-94 1355 402620	NA	6	same as 7.0-7.5'	CL	3.0	PID 7.3 ppm; BZ 10 cpm
8.5	12-14-94 1355 402621	NA	6	same as 7.0-7.5'	CL	3.0	PID 7.4 ppm; BZ 10 cpm
9.0	12-14-94 1355 402621	NA	6 (9.0-9.5)	STIFF (2.5Y 5/4) LT OLIVE BROWN Silty CLAY w/ 5-10% fine gravel (poorly sorted) subangular to subrounded), 5% fine to med sand, 5% coarse sand, and a "pocket" containing pure iron oxide particles — could be mineral breakdown 15x15mm (2.5YR 4/4 RED), a coarse subangular/subrounded gravel 40mm, trace of gray mottling MOIST/MED PLASTICITY	CL	1.5	PID 8.9 ppm; BZ 5 cpm
9.5	12-14-94 1355 402621	NA	6	STIFF (2.5Y 5/4) LT OLIVE BROWN Silty CLAY w/ 5% fine (poorly sorted) gravel (subangular), w/ 5% fine to med sand, 1%-2% coarse sand, evidence of vertical irregular fracturing outlined by gray clay mottling MOIST - MED PLASTICITY	CL	1.0	PID 8.2 ppm; BZ 5 cpm LOW TO MOIST - MED PLASTICITY
10.0	12-14-94 1355 402621	NA	6	same as 9.5-10.0' fracture line gray mottling continues downward outlined by reddish iron oxide staining	CL	1.5	PID 7.8 ppm; BZ 10 cpm

0.5

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES~~

G:/WPSC/94-776.DRW (11-23-94)

FS-F-3681

FEMP QA 18 2-17-95

FEMP LITHOLOGIC LOG

CONTROL NO.: 200307-11491-009

PAGE 4 OF 136

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: Estimated 34 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
9.5							
11.0	12-14-94 1400 402621	NA	6	same as 9.5-10.0' faint mottling of gray but no distinct pattern (because of increased moisture?) → less than 1-3% surface area	CL	1.5	PID 7.9 ppm; BY 5 CPM
11.5	12-14-94 1400 402621	NA	6	NO RECOVERY IN CORE ARCHIVE BUT ORIGINAL FIELD LOG SAYS: STIFF (10YR 4/6) DARK YELLOWISH BROWN SILTY CLAY w/ DARK GRAY MOTTLING, some larger gravel, trace of sand, MED PLASTICITY moist	CL	1.5	PID 8.0 ppm; BY 15 CPM
12.0	~~12-14-94 JC 2-7-95 1400 NA 402621~~	NA	0	NO RECOVERY IN CORE ARCHIVE BUT ORIGINAL FIELD LOG SAYS: Same as 11.0-11.5 but, VERY STIFF	CL	3.0	PID ~~JC 2-7-95 9.5~~ NA ppm; BY ~~JC 2-7-95 25~~ NA CPM
12.5	~~12-14-94 JC 2-7-95 1405 NA 402621~~	NA	0	NO RECOVERY			PID ~~JC 2-7-95 9.8~~ NA ppm; BY ~~JC 2-7-95 20~~ NA CPM
13.0	~~12-14-94 JC 2-7-95 1405 NA 402621~~	NA	0	NO RECOVERY			PID ~~JC 2-7-95 10.0~~ NA ppm; BY ~~JC 2-7-95 40~~ NA CPM
13.5	12-14-94 1410 402622	NA	6	STIFF (2.5Y 6/6) OLIVE YELLOW SILTY CLAY w/ 1-2% very fine gravel (2-4mm) and 5-10% fine to med sand, evidence of iron oxide staining, some gray mottling - cannot distinguish pattern LOW PLASTICITY Slightly moist	CL	1.0	PID 14.4 ppm; BY 25 CPM; TCLP 402633; Kd 402639
14.0	12-14-94 1415 402622	Gray Brown NA CONTACT	3 / 3	Same as 13.0-13.5 / PREDOMINANTLY (5Y 4/1) DARK GRAY SILTY CLAY w/ 1-2% coarse sand (subangular); 5% fine gravel (subangular) poorly sorted; 5-15% fine to med sand - dependent on area - SAND POCKETS (MED STIFF)	CL / CL	1.0 / 0.5	PID 14.0 ppm; BY 25 CPM; TCLP 402635; Kd 402638; ? LOW PLAS. S. MOIST

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: 13-17' Core very disturbed - difficult to assess pattern of interface. Also, See Pg. 1

* ~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

000611

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11491-010	PAGE 5 OF 13
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11491	COORDINATES: See Pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-14-94
GEOLOGIST: LAYNE / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-15-94
WATER USED DURING DRILLING: Estimated 34 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	12-14-94 1415 402622	NA	6	STIFF (5Y 4/1) DARK GRAY Silty CLAY w/ 1-2% coarse sand, 3-5% fine subangular gravel (5mm) 20-30% coarse subangular gravel (3-4) (40-50 mm) 5-10% fine to med sand - ALSO areas of silty/clayey coarse sand and gravel (fine) COULD BE A ~~SILTY SAND~~ GRAVEL / COARSE SAND SEAM OR STRINGER HERE LOW PLASTICITY - COARSE & FINE - Slightly moist	CL	1.0	PID 14.0 ppm BY 25 CPM
14.5	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA CPM
15	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA CPM
15.5	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA CPM
16.0	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA CPM
16.5	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA CPM
17.0	12-14-94 1430 ~~NA~~ 402623	NA	6	STIFF (5Y 4/1) DARK GRAY Silty CLAY w/ 3% coarse sand (subangular), 10% fine to med sand, 20% coarse (angular to subangular) gravel, 10% fine (angular to subangular) gravel. LOW PLASTICITY Slightly moist	CL	1.0	PID ~~30~~ 9.6 ppm BY ~~JC 12-27-94~~ 30 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST

811

FEMP CA 13

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11491-011	PAGE 6 OF 13
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER:	COORDINATES: See Pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME:
DATE STARTED: 12-14-94	
GEOLOGIST: Layne / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME:
DATE COMPLETED: 12-15-94	
WATER USED DURING DRILLING: Estimated 34 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5	12-14-94 1430 402623	NA	6	Same as 17.0-17.5'	CL	1.0	PID 14.4 ppm; BY 35 cpm
18.0	12-14-94 1430 402623	NA	6	Same as 17.0-17.5 except decreased fine to med. sand (3-5%)	CL	1.0	PID 16.0 ppm; BY 30 cpm
18.5	12-14-94 1430 402623	NA	4	Same as 17.0-17.5 except decreased fine to Med. Sand (3-5%)	CL	1.0	PID 14.0 ppm; BY 30 cpm
19.0	12-14-94 1440 402623	NA	6	VERY SOFT (5y 4/1) Dark Gray silty, Sandy, Gravelly Clay w/ 60x75x40 mm thick Cobble limestone fragment, and increased fine gravel 20-30% and increased Coarse Sand 10%; No Plast.-Low Plast. Slightly Moist.	CL/GL	0.10-0.25	PID 13.0 ppm; BY 35 cpm
19.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
20.0	NA	NA	0	NO Recovery	NA	NA	PID NA ppm; BY NA cpm
20.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST

Q:/WPSC/94-778 DRW (11-23-94

FEMP OA 18

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11491-012

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: Estimated 34 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.5	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
22.5	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
23.0	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
23.5	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
24.0	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST

FEMP QA 15 8-17-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11491-013

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: Estimated 34 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
25.0	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
25.5	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
26.0	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
26.5	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
27.0	NA	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
27.5	12-14-94 1500 402624	NA	6	SOFT (5Y 4/1) DARK GRAY Silty CLAY w/ 3% fine sand, 10-15% med grain sand, 5% coarse subangular sand, 3-5% coarse angular gravel, 5% fine subangular gravel MED PLASTICITY MOIST-WET	CL	.25	PID 15.6 ppm BY 20 cpm TCLP 402637 TOTAL/SOL 402636
28.0	12-14-94 1500 402624	NA	6	same as 27.0-27.5' except increased fine gravel (10%)	CL	.25	PID 14.8 ppm BY 20 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST

FEMP QA 19

CONTROL NO.: 200307-11491-014

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: Estimated 34 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8.0	12-14-94 1500 402624	NA	6	same as 27.0-27.5 except increased sand — fine sand to 15%	CL	.25	PID 15.2 ppm; BZ 20 cpm
28.5	12-14-94 1500 402624	NA	6	SOFT (5Y 4/1) DARK GRAY SILTY CLAY w/ 5% subangular gravel, 15% coarse gravel-cobble 75x50x10mm 5-10% coarse sand and 10-15% fine to med sand "SAND POCKETS" w/ poorly sorted sand MED PLASTICITY MOIST	CL	.25	PID 14.9 ppm; SHALE 25 cpm; BZ; LATERAL — TILTED
29.5	12-14-94 1510 402624	NA	6	SOFT (5Y 4/1) DARK GRAY SILTY CLAY w/ 5% (subangular to angular) fine gravel; 5-10% fine to med sand, 2-5% coarse sand; "AREAS OF POORLY SORTED SAND w/ SILT & CLAY" NO DISTINCT PATTERN PROBABLY DUE TO MOISTURE CONTENT & VERY MOIST	CL	.25	PID 14.6 ppm; BZ 30 cpm; COMPRESSION from DRILLING
30.0	12-14-94 1510 402624	NA	6	5% SOFT (5Y 4/1) DARK GRAY SILTY CLAY w/ 15% 2.7-9.5 Very fine subangular gravel, 10% subangular smaller coarse gravel (20mm), 3-5% coarse sand 5-10% fine to med sand; Some areas have more sand (20-30%) MED PLASTICITY MOIST	CL	.25	PID 16.2 ppm; BZ 20 cpm
30.5	12-14-94 1510 402624	NA	6	same as 29.5-30.0' except increased fine gravel (15%) (subrounded to subangular), a few coarse (subrounded) (subangular) gravel (20mm) (5%)	CL	.25	PID 16.2 ppm; BZ 30 cpm
31.0	NA	NA	0	NO RECOVERY	NA	NA	PID ppm; BZ N/A cpm
	NA	NA	0	NO RECOVERY	NA	NA	PID ppm; BZ N/A cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

G:/WPSC/94-778 DRW (11-23-9

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11491-015

PAGE 10 OF 14

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.(s):

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: Estimated 34 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5	NA	NA	N/A	NO RECOVERY	NA	NA	PID PPM BY NA CPM
32.0	12-14-94 1520 402625	NA	6	MED STIFF (5Y 4/1) DARK GRAY SILTY CLAY w/ 10% fine to med (subangular) sand; 2-3% coarse (subangular) sand; 5% very fine (2-5mm) gravel; 2-3% larger fine gravel (15-18mm) MED PLASTICITY Slightly MOIST	CL	.5	PID 15 PPM BY 35 CPM
32.5	12-14-94 1520 402625	NA	6	Same as 32.0-32.5' except STIFF & increased coarse sand (5%) increased fine gravel (10%) Cobble-limestone-fragment (poorly sorted) → 75x50x35mm thick	CL	1.5	PID 15.8 PPM BY 35 CPM
33.0	12-14-94 1520 402625	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY w/ 10% fine to med (subangular) sand; 5% coarse subangular sand; 10% fine subangular poorly sorted gravel LOW PLASTICITY Slightly MOIST	CL	2.0	PID 15.8 PPM BY 35 CPM
33.5	12-14-94 1520 402625	NA	6	Same as 33.0-33.5' except increased very fine gravel (2-5mm) to 15%	CL	.5	PID 16.2 PPM BY 30 CPM
34.0	12-14-94 1530 402625	NA	6	SOFT (5Y 4/1) DARK GRAY SILTY CLAY w/ 5-10% fine (subangular) poorly sorted gravel (2-15mm) and 1% coarse sand; 5-10% fine to med sand fragment of wood LOW PLASTICITY Slightly MOIST	CL	.5	PID 18.2 PPM BY 35 CPM
34.5	12-14-94 1530 402625	NA	6	SOFT (5Y 4/1)) DARK GRAY SILTY CLAY w/ 5% fine to med sand, 2% coarse sand, 5-10% fine poorly sorted gravel and 3-5% coarse subangular gravel LOW PLASTICITY - Slightly MOIST	CL	.5	PID 18.8 PPM BY 30 CPM
35.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 1/4/95

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000617

FEMP QA 19

FEMP LITHOLOGIC LOG

CONTROL NO.: 200307-11491-016

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: Estimated 34 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0	12-14-94 1530 402625	NA	6	STIFF (5Y 4/1) DARK GRAY Silty CLAY w/ 5-10% fine to med sand; 2-3% coarse subangular sand; 2-3% coarse subangular gravel (2-3 gravel); 1-2% fine gravel LOW TO MED PLASTICITY Slightly MOIST	CL	1.0	PID 25.0 ppm BY 30 cpm
35.5	12-14-94 1530 402625	NA	6	SOFT (5Y 4/1) DARK GRAY SILTY CLAY w/ 5-10% fine to med sand; 1-3% coarse sand; 2-3% fine gravel; LOW TO MED PLASTICITY Slightly MOIST	CL	.5	PID 18.6 ppm BY 25 cpm
36.0	12-14-94 1530 402625	NA	6	Same as 35.5-36.0 except Cobble 110x100x40mm thick Crystalline Limestone fragment (Caught by ROTO CUTTER HEAD)	CL	.5	PID 20.2 ppm BY 35 cpm
36.5	~~12-14-94~~ JC 2-7-95 ~~1530~~ NA ~~402625~~	NA	NA	NO RECOVERY	NA	NA	PID ppm BY NA cpm
37.0	12-14-94 1535 402626	NA	6	SOFT (5Y 4/1) DARK GRAY Silty CLAY w/ 10% fine subangular gravel; 5-10% coarse subangular gravel (2-3)(20-30mm) 3% fine to med sand, 1% coarse sand SOME POORLY SORTED CLAYEY/SILTY SAND IN BAG-COULD BE SLOUGH OR INDICATION OF SAND/GRAVEL SEAM	CL	.25	PID 8.5 ppm BY 35 cpm
37.5	12-14-94 1535 402626	NA	6	Same as 37.0-37.5' except, increased Coarse Sand (subangular) NO COARSE GRAVEL SEEN - (4-5%) NO SAND CONCENTRATIONS	CL	.25	PID 8.0 ppm BY 35 cpm
38.0	12-14-94 1535 402627	NA	6	SOFT (5Y 4/1) DARK GRAY SILTY CLAY w/ 3-5% fine to med sand, 1-2% coarse sand, 2-3% fine gravel, 5-10% coarse gravel LOW PLASTICITY Slightly MOIST	CL	.25	PID 9.6 ppm BY 35 cpm
38.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 18

CONTROL NO.: 200307-11491-017

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: Estimated 34 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5	12-14-94 1535 402627	NA	6	same as 38.0-38.5 except increased sand-med to coarse (5-10%)	CL	1.0	PID 6.6 ppm BY 30 cpm
39.0	12-14-94 1540 402627	NA	6	same as 38.0-38.5 except increased coarse sand 5% no coarse gravel and a brachiopod and a wood fragment	CL	1.5	PID 7.7 ppm BY 35 cpm
39.5	12-14-94 1540 402627	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY w/ 5% fine to med sand, 3-5% coarse sand, 5% fine gravel, and 5-10% coarse gravel LOW PLASTICITY Slightly MOIST	CL	1.0	PID 7.6 ppm BY 40 cpm
40.0	12-14-94 1540 402627	NA	6	same as 39.5-40.0'	CL	1.0	PID 8.8 ppm BY 30 cpm
40.5	12-14-94 1540 402627	NA	6	same as 39.5-40.0'	CL	1.0	PID 8.4 ppm BY 35 cpm
41.0	12-14-94 1550 402627	NA	6	same as 39.5-40.0'	CL	1.0	PID 8.2 ppm BY 30 cpm
41.5	12-14-94 1550 402627	NA	6	same as 39.5-40.0' except, Cobble (limestone fragment) 80x70x30mm thick and increased fine gravel 15-20% LOW PLASTICITY Slightly MOIST	CL	1.0	PID 7.2 ppm BY 30 cpm
42.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	INAI	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP CA 13

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11491-018

PAGE 13 OF 14

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11491

COORDINATES: See Pg. 1

RELATED FAL NO.(s):

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-14-94

GEOLOGIST: LAYNE / GEIGER / RYLEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-15-94

WATER USED DURING DRILLING: Estimated 34 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
42.0 – 42.5	12-14-94 1550 402627	NA	6	STIFF (5Y 4/1) DARK GRAY Silty CLAY w/ 2-3% fine (angular to subrounded) gravel, 5-10% Coarse (subrounded to sub ~~rounded~~ angular) gravel, 3-5% fine to med sand, 3% Coarse ~~gravel~~ sand LOW PLASTICITY SLIGHTLY MOIST	CL	1.0	PID 7.8 ppm; BY 20 cpm
42.5 – 43.0	12-14-94 1550 402627	NA	6	Same as above except less coarse gravel (3-5%)	CL	1.0	PID 7.6 ppm; BY 20 cpm
43.0 – 43.5	12-14-94 1550 402628	NA	6	STIFF (5Y 4/1) DARK GRAY Silty CLAY w/ 3-5% fine to med sand; 1-2% coarse sand 5% Coarse angular gravel; 2-3% fine gravel (subangular) LOW PLASTICITY SLIGHTLY MOIST	CL	1.5	PID 6.8 ppm; BY 20 cpm
43.5 – 44.0	12-14-94 1550 402628	NA	6	Same as 43.0-43.5' except increased coarse gravel (10-15%)	CL	1.5	PID 5.7 ppm; BY 20 cpm
44.0 – 44.5	12-14-94 1550 402628	NA	6	Same as 43.0-43.5' except increased coarse sand (3-5%) increased coarse gravel (15-20%)	CL	1.0	PID 8.0 ppm; BY 20 cpm
44.5 – 45.0	12-14-94 1600 402628	NA	6	STIFF (5Y 4/1) DARK GRAY Silty CLAY w/ 5-10% fine to med grain sand; 3% coarse sand; 2-5% coarse gravel; A Large Cobble - maybe Dolomite (microcrystalline) 150 X 120 X 100 mm thick 10-15% fine gravel (subangular) LOW PLASTICITY SLIGHTLY MOIST	CL	1.0	PID 7.0 ppm; BY 20 cpm
45.0 – 45.5	12-14-90 1600 402628	NA	6	Same as ~~44.0-44.5~~ 44.5-45.0' except no cobble (rounded coarse gravel)	CL	1.0	PID 6.5 ppm; BY 25 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ 12/9/94

FS-F-3681

000620

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11491-019	PAGE 14 OF 14
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11491	COORDINATES: See Pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME:
DATE STARTED: 12-14-94	
GEOLOGIST: LAYNE / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME:
DATE COMPLETED: 12-15-94	
WATER USED DURING DRILLING: Estimated 34 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
45.5	12-14-94 1600 402628	NA	6	Same as 44.5-45.0' No Cobble (rounded coarse gravel and subangular) reduced fine gravel (3-5%)	CL	1.6	PID 6.7 ppm BY 20 cpm
46.0	12-14-94 1600 402628	NA	6	STIFF (5Y 4/1) DARK GRAY Silty CLAY w/ 5-10% fine to med Sand; 1-2% coarse sand 3-5% fine (angular to subangular) gravel, 5% Coarse angular gravel LOW PLASTICITY - SLIGHTLY moist	CL	1.5	PID 4.7 ppm BY 25 cpm
46.5	12-14-94 1600 402628	NA		same as 46.0-46.5'	CL	1.5	PID 4.9 ppm BY 20 cpm
47.0				- BOTTOM OF BORING - @ 47.0'			
		NA					PID ppm BY cpm
47.5		NA					PID ppm BY cpm
48.0		NA					PID ppm BY cpm
48.5		NA					PID ppm BY cpm
49.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000621

200307 - 11492-007

118

CONTROL NO.: ~~300307-11492-016~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 1 OF 7

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11492

COORDINATES: N483015.820 E1382490.096

RELATED FAL NO.s: 200307-11492-004

SURFACE ELEVATION: 612.86

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-15-94

GEOLOGIST: Collins / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-16-94

WATER USED DURING DRILLING: 9.0 ~~GALLONS~~ JC 2-13-95 Estimated

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0 – 0.5	12-15-94 1435 402629	NA	6	Very soft, Dark yellowish brown (10YR 4/4) silty clay, with <1% rounded medium to coarse sand, roots. medium plasticity, very moist. Clay is fractured and breaks apart easily.	CL	0.25	PID 8.4 ppm; BY 30 cpm
0.5 – 1.0	12-15-94 1435 402629	NA	6	Very soft, Dark yellowish brown (10YR 4/6) silty clay with 1% rounded coarse gravel, 3% subrounded to rounded medium to coarse sand. Clay is highly fractured. Medium plasticity, moist. Roots present.	CL	0.25	PID 9.2 ppm; BY 35 cpm
1.0 – 1.5	12-15-94 1435 402629	NA	6	Same as above, except slightly less fracturing in the clay.	CL	0.25	PID 9.8 ppm; BY 35 cpm
1.5 – 2.0	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
2.0 – 2.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
2.5 – 3.0	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
3.0 – 3.5	12-15-94 1442 402629	NA	6	Very soft, dark yellowish brown (10YR 3/4) silty clay. Highly fractured with 1% subrounded coarse sand. White to off-white soft bentonite material at 3.0-3.4 feet. Roots and grass blades present at 3.0 feet.	CL	0.25	PID 13.0 ppm; BY 30 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	5.1 – 7.8*	12/15/94	1430
ALPHA	NA	NA	NA
BETA / GAMMA	40	12/15/94	1440

NOTES: Lithologic log was updated by Kevin Collins on 2-6-95, from archived cores.

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 12/14/94

FS-F-3681

*Truck running

G:/WPSC/94-776.DRW (11-23-94)

000622

200307-11492-008

CONTROL NO.: ~~200307-11492-017~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

FEMP QA 19

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11492

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 12-15-94

GEOLOGIST: COLLINS / GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 12-16-94

WATER USED DURING DRILLING: 9.0 ~~8.5~~ GALLONS Estimated JCC 2-14-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	12-15-94 1447 402629	NA	6	Very stiff, Dark yellowish brown (10yr 3/4) silty clay with 1-2% rounded to subangular coarse sand with <1% subrounded coarse gravel. Manganese nodules, low plasticity, moist. Clay is fractured.	CL	3.5	PID ~~8.4~~ 11.0 PPM BY 30 CPM
4.0 – 4.5	12-15-94 1447 402629	NA	6	Same as above.	CL	2.0	PID 10.2 PPM BY ~~30~~ CPM
4.5 – 5.0	12-15-94 1447 402629	NA	6	Very stiff, Olive brown (2.5YR 4/4) silty clay with <1% subangular fine to coarse gravel, 7% subrounded coarse sand <2% subrounded medium to fine sand. Iron stains, manganese nodules. Low plasticity, slightly moist.	CL	2.5	PID 15.1 PPM BY 50 CPM
5.0 – 5.5	12-15-94 1452 402629	NA	6	Same as above, except Vary stiff	CL	3.5	PID 12.3 PPM BY 20 CPM
5.5 – 6.0	12-15-94 1452 402629	NA	6	Same as above.	CL	3.5	PID 12.3 PPM BY 20 CPM
6.0 – 6.5	NA	NA	0	No Recovery	NA	NA	PID NA PPM BY NA CPM
6.5 – 7.0	NA	NA	0	No Recovery	NA	NA	PID NA PPM BY NA CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681

000623

G: / WPSC / 94-776.DRW (11-23-94)

200307-11492-009

118

FEMP

CONTROL NO.: ~~200307-11492-008~~ KP 2-14-95

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11492

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-15-94

GEOLOGIST: COLLINS / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-16-94

WATER USED DURING DRILLING: 9.0 ~~8.5~~ GALLONS Estimated JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5	12-15-94 1459 402630	NA	6	Very Soft, Dark yellowish brown (10yr 4/4) Very sandy clay, with 1-3% subrounded coarse gravel. Sand content decreases with depth.	CL	0.25	PID 11.0 ppm; BY 35 cpm
7.5 – 8.0	12-15-94 1459 402630	NA	6	Stiff, Brownish yellow (10yr 6/6) silty clay with <4% subrounded to angular fine gravel, 3% subrounded to subangular coarse sand, 1-2% angular to subrounded medium to fine sand. Low-medium plasticity, moist. Iron stains.	CL	1.5	PID 16.2 ppm; BY 50 cpm
8.0 – 8.5	12-15-94 1510 402630	NA	6	Stiff, Dark yellowish brown (10yr 4/4) silty clay with 1-2% subrounded fine gravel, 3% subrounded to subangular coarse sand, 1-2% angular to subrounded medium to fine sand. Medium plasticity, moist. Iron stains. Flat, vertically tilted cobble (150 x 110 x 50 mm) Gray mottling from 8.4-8.5 feet.	CL	1.5	PID 13.4 ppm; BY 30 cpm
8.5 – 9.0	12-15-94 1510 402630	NA	6	Very Stiff, Dark yellowish brown (10yr 4/4) silty clay with 1-2% subangular fine gravel, 3% angular to subangular coarse sand, 3% subangular medium to fine sand. Medium plasticity, moist. Heavy gray mottling.	CL	2.5	PID 16.0 ppm; BY 60 cpm
				From 8.9 – 9.0 feet – Sandy clay, 1% angular coarse sand			
9.0 – 9.5	12-15-94 1510 402630	NA	6	Very Stiff, Gray (5y 4/1) silty clay with 1% subrounded fine gravel, 3-5% subangular coarse sand, <2% subangular to subrounded medium to fine sand. Brown mottling, medium plasticity, moist.	CL	3.5	PID 14.2 ppm; BY 60 cpm
9.5 – 10.0	12-15-94 1510 402630	NA	6	Very stiff, Dark gray (5y 4/1) silty clay with <4% subangular coarse sand, 1-2% subangular medium to fine sand. Some small brown mottling. Medium plasticity.	CL	3.0	PID 14.8 ppm; BY 70 cpm
				Cobble (95 x 50 x 50 mm) at 9.7 – 10 feet. Subangular, tilted.			
10.0 – 10.5	12-15-94 1510 402630	NA	6	Very stiff, Olive gray (5y 4/2) Silty clay with <1% subrounded fine gravel. 1-2% subangular to angular medium to coarse sand. Medium plasticity, moist.	CL	3.0	PID 14.6 ppm; BY 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ JCR 12/14/94

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

000624

2-17-95

200307-11492-010

CONTROL NO.: ~~200307-11492-019~~ CP 2-14-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11492

COORDINATES: See Pg.1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg.1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-15-94

GEOLOGIST: COLLINS / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-16-94

WATER USED DURING DRILLING: 9.0 ~~8.5~~ GALLONS JC 2-13-95 Estimated

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	NA	NA	0	No Recovery.	NA	NA	PID NA ppm; BY NA cpm
11.0 – 11.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
11.5 – 12.0	NA	NA	0	No Recovery	NA	NA	PID NA; BY NA cpm
12.0 – 12.5	NA	NA	0	No Recovery	NA	NA	PID NA NA ppm; BY cpm
12.5 – 13.0	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
13.0 – 13.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
13.5 – 14.0	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg.1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg.1	/ /	

NOTES: See Pg.1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

200307-11492-011

CONTROL NO.: ~~200307-11492-020~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 5 OF 7

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11492	COORDINATES: See Pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-15-94
GEOLOGIST: Collins / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-16-94
WATER USED DURING DRILLING: 9.0 ~~3.5~~ GALLONS Estimated JC 2-13-95	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	NA	NA		~~Medium~~ K.C. 2-7-95 No Recovery			PID NA ppm; BY NA cpm
15.0	NA	NA		No Recovery			PID NA ppm; BY NA cpm
15.5	NA	NA		No Recovery			PID NA ppm; BY NA cpm
16.0	NA	NA		No Recovery			PID NA ppm; BY NA cpm
16.5	NA	NA		No Recovery			PID NA ppm; BY NA cpm
17.0	NA	NA		No Recovery			PID NA ppm; BY NA cpm
17.5	12-15-94 1530 402631	NA		Medium Stiff, Dark gray (5Y 4/1) silty clay with <1% subangular fine gravel, 1-3% subangular to subrounded coarse sand, <1% fine sand. Dark greenish gray (5GY 4/1) mottling. Medium plasticity, moist.	CL	1.0	PID 12.1 ppm; BY 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

200307-11492-012

CONTROL NO.: ~~200307-11492-021~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 6 OF 7

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11492

COORDINATES: See Pg.1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg.1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 12-15-94

GEOLOGIST: Collins / GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 12-16-94

WATER USED DURING DRILLING: 9.0 GALLONS (ESA)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0	12-15-94 1530 402631	NA	6	Stiff, Dark gray (5y 4/1) silty clay with 1-2% subangular to subrounded fine gravel, 4% subangular coarse sand, 1-2% subangular medium to fine sand. Very silty clay at 17.7 feet. Medium plasticity, moist Some iron stains and fracturing.	CL	1.5	PID 17.5 ppm; BY 60 cpm
18.5	12-15-94 1530 402631	NA	6	Stiff, Dark gray (5y 4/1) Silty Clay with 1% subrounded fine gravel, 2-4% subrounded to angular coarse sand, <1% angular to subangular medium sand. Medium plasticity, moist.	CL	1.5	PID 13.1 ppm; BY 50 cpm
19.0	12-15-94 1543 402631	NA	6	Same as above.	CL	1.5	PID 13.5; BY 50 cpm
19.5	12-15-94 1543 402631	NA	6	Same as above, except black lignite material present.	CL	1.5	PID 14.5 ppm; BY 50 cpm
20.0	12-15-94 1543 402631	NA	6	Stiff, Dark gray (5y 4/1) Silty sandy clay with 1% subangular fine gravel, 1-2% subangular coarse sand, 5-10% fine sand. Low plasticity, slightly moist. Silt/fine sand content increases from 19.8 to 20.0 feet.	CL	1.5	PID 14.2 ppm; BY 50 cpm
20.5	12-15-94 1543 402631	NA	6	Soft, Olive (5y 4/2) Silty clay with 1-2% subangular coarse sand, 3% subangular to subrounded medium to fine sand. Low plasticity, slightly moist.	CL	0.5	PID 12.6 ppm; BY 60 cpm; TCLP 402640; Total/Isotope 402641
21.0	12-15-94 1543 402631	NA	6	Stiff, Olive (5y 4/2) Silty clay with 1-2% subrounded coarse gravel, 1-2% subangular fine gravel, 1-2% subrounded coarse sand, 2% subangular to subrounded medium to fine sand. Medium plasticity, moist. Cobble, flat (80 x 55 x 20 mm), tilted at 20.8-21.0	CL	1.0	PID 13.1 ppm; BY 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg.1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg.1	/ /	

NOTES: See Pg.1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

000627

G:/WPSC/94-778.DRW (11-23-94)

200307-11492-013

2-17-95 FEMP SA 14

CONTROL NO.: ~~200307-11492-022~~ KP 21495

FEMP

LITHOLOGIC LOG

PAGE 7 OF 7

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11492	COORDINATES: See Pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME:
DATE STARTED: 12-15-94	
GEOLOGIST: COLLINS / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME:
DATE COMPLETED: 12-16-94	
WATER USED DURING DRILLING: 9.0 ~~8.5~~ GALLONS JCE-12-15 Estimated	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0 – 21.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
21.5 – 22.0	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
		NA		BOTTOM OF BORING 22.0 FEET			PID ppm; BY cpm
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: Bottom of boring at 22 feet.

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

200307 - 11493 - 006

CONTROL NO.: ~~200302-11493-021~~ 4P 2-14-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: N:482418.791 E:1382473.018

RELATED FAL NO.s: 200307-11493-004 & 200307-11493-005

SURFACE ELEVATION: 6016.06

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~12.8~~ 2-15-95 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	12/21/95 0930 402704	NA	6	Stiff (10YR 3/2) VERY DARK GRAYISH BROWN MOTTLED w/ (2.5Y 5/6) LT OLIVE BROWN Silty Clay w 1-2% fine to med grain sand root material LOW PLASTICITY MOIST	CL	1.5	PID 17.0 ppm BY 50 cpm
0.5	12/21/95 0930 402704	NA	6	Stiff Same as 0.0-0.5 except 15% fine gravel subangular	CL	1.5	PID 17.0 ppm BY 50 cpm
1.0	12/21/95 0930 402704	NA	6	Stiff (10YR 3/2) VERY DARK GRAYISH BROWN silty clay w/ 1-2% fine gravel subangular to angular Low plasticity MOIST	CL	1.5	PID 17.0 ppm BY 50 cpm
1.5	12/21/95 0930 402704	NA	6	Very stiff (10YR 2/2) VERY DARK BROWN Silty clay LOW PLASTICITY MOIST	CL	2.5	PID 17.0 ppm BY 50 cpm
2.0	12/21/95 0930 402704	NA	6	Very stiff (10YR 2/2) VERY DARK BROWN MOTTLED w/ (10YR 5/8) YELLOWISH BROWN Silty Clay	CL	2.5	PID 17.0 ppm BY 50 cpm
2.5	12/21/95 0930 402704	NA	6	Very stiff Same as 2.0-2.5	CL	2.5	PID 17.0 ppm BY 50 cpm
3.0	12/21/95 0930 402704	NA	6	Very stiff (10YR 2/2) VERY DARK BROWN MOTTLED w/ iron oxide particles irregular fracturing - traces of fine sand on surface (not embedded) 30-40 grains per square LOW PLASTICITY MOIST	CL	2.5	PID 17.0 ppm BY 50 cpm
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	2.9	12/21/94	N/A
ALPHA	NA	(NA)	NA
BETA / GAMMA	50	12/21/94	N/A

NOTES: RE 2-15-95 ~~NONE~~ Lithologic logs were updated by Layne from archived cores on 1-30-95

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~ PER 12/14/94

FEMP QA 21 FEB 17 1995

200307-11493-007

CONTROL NO.: ~~200307-11493-022~~ 15P 2-14-95

FEMP
LITHOLOGIC LOG

PAGE 2 OF 13

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: page 1

RELATED FAL NO.s: 200307-11493-004 & 200307-11493-005

SURFACE ELEVATION: page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~12.8~~ 2-13-95 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	12/21/94 0940 402705	NA	6	Very Stiff (2.5Y 4/4) OLIVE BROWN MOTTLED W/ (10YR 3/2) VERY DARK GRAYISH BROWN Silty Clay w/ iron oxide speckling sand traces in irregular fracturing, evidence of lamination LOW PLASTICITY MOIST	CL	2.5	PID 17.0 ppm BY 50 CPM
4.0	12/21/94 0940 402705	NA	6	Very Stiff same as above except (3.5-4.0) trace of coarse rounded grain sand (1%) LOW PLASTICITY MOIST	CL	2.5	PID 17.0 ppm BY 50 CPM
4.5	12/21/94 0940 402705	NA	6	very stiff Same as above except (3.5-4.0) trace of Coarse rounded grains of sand (1%) LOW PLASTICITY MOIST	CL	2.5	PID 17.0 ppm BY 50 CPM
5.0	12/21/94 0940 402705	NA	6	very stiff same as 3.5-4.0 except decreased mottling (predominantly (2.5Y 4/4) OLIVE BROWN, irregular fracturing - no lamination traces) LOW PLASTICITY MOIST	CL	2.5	PID 30.0 ppm BY 60 CPM
5.5	12/21/94 0940 402705	NA	6	Very stiff (2.5Y 4/4) OLIVE BROWN MOTTLED W/ (2.5Y N5/) GRAY silty clay w/ abundant iron oxide "speckling" in fracture planes (irregular) 1% fine angular gravel and trace, LOW PLASTICITY MOIST	CL	2.5	PID 30.0 PPM BY 60 CPM 1% of sand
6.0	12/21/94 0940 402705	NA	6	same as 5.5-6.0'	CL	2.5	PID 30.0 ppm BY 60 CPM
6.5	12/21/94 0940 402705	NA	6	Same as 5.5-6.0'	CL	2.5	PID 30.0 ppm BY 60. CPM
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	Nd	(NA)	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES: NONE

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP CA 31

FEB 17 1995

CONTROL NO.: 200307-11493-OQ8

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See pg. 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: LAYNE / GEIGER & RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~12.8~~ JC 2-13-95 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0–7.5	12/21/94 0940 402703	NA	6	Layerally (2.5Y) 5/6 LT OLIVE BROWN Slightly sandy, silty clay w/ 15-20% very fine (5mm) gravel, 3% coarse sand subangular, 1 in 2 coarse gravel 30mm, GRAY MOTTLING (2.5Y N/5) that travels in an irregular vertical direction into next interval (100-125mm)	CL	2.5 angular to subrounded	PID 32.0 ppm; BY 60 cpm; GRAY CLAY TRACE
8.0	12/21/94 0940 402703	NA	6	5% fine to med grain sand; same as 7.0-7.5 except cobble 90mm x 40mm x 20mm thick angular limestone fragment	CL	2.5	PID 32.0 ppm; BY 60 cpm
8.5	12/21/94 0940 402703	NA	6	Layerally (2.5Y) 5/6 LT OLIVE BROWN Slightly sandy, silty clay w/ 15% fine gravel very poorly sorted - angular to subangular 2-5% coarse sand, 5% fine to med grain sand trace of gray mottling	CL	2.5	PID 32.0 ppm; BY 60 cpm
9.0	12/21/94 0940 402703	NA	6	same as 8.0-8.5 except no gray mottling	CL	2.5	PID 32.0 ppm; BY 60 cpm
9.5	12/21/94 0940 402703	NA	6	same as 8.0-8.5 except no gray mottling and 5% coarse rounded gravel	CL	2.5	PID 32.0 ppm; BY 60 cpm
10.0	12/21/94 0940 402703	NA	6	same as 8.0-8.5 except no gray mottling and a cobble extends into interval below 120mm x 70mm x 35mm thick - subangular limestone fragment	CL	2.5	PID 32.0 ppm; BY 60 cpm
10.5	12/21/94 0940 402703	NA	6	same as 8.0-8.5 except no gray mottling, pocket of black "sand" (desiccated fragments) SQUARE 80mm x 60mm x 30mm angular limestone fragment oriented vertically, cobble is covered w/ iron oxide staining	CL	2.5	PID 32.0 ppm; BY 60 cpm; cobble

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES: NONE

See page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWA 12/14/94

FS-F-3881

000621

F-242

FEMP QA FEB 17 1995

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11493-029

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See page 1

RELATED FAL NO.s: See p 1

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~42.8~~ GALLONS (est) JC 2-15-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
9.5	12/21/94 0945 402703	NA	6	very stiff (2.5Y 5/6) LT OLIVE BROWN Silty Gravelly Clay, w/ 25% poorly sorted fine gravel - angular to subangular 10% coarse sand (angular to subangular), 5% fine to med sand grains, iron oxide staining	CL	2.5	PID 32.0 ppm BY 60 CPM
11.0	12/21/94 0945 402703	NA	6	very stiff same as 10.5-11.0'	CL	2.5	PID 32.0 ppm BY 60.0 CPM
11.5	12/21/94 0945 402703	NA	6	very stiff same as 10.5-11.0' except 5% coarse subangular gravel	CL	3.5	PID 36.0 ppm BY 60 CPM
12.0	12/21/94 0945 402699	NA	6	very stiff (2.5Y 5/6) LT OLIVE BROWN Silty Clay w/ 20% coarse gravel (40mm x 30 mm) 5% fine gravel angular to subangular (3-5mm) 2-3% fine to coarse sand grains iron oxide staining pattern indicates fracturing (and fine sand deposits around gravels)	CL	3.5	PID 36.0 ppm BY 60 CPM
12.5	12/21/94 0945 402699	NA	6	very stiff (2.5Y 5/6) LT OLIVE BROWN Silty Clay w/ 5% fine angular gravel and 3% coarse sand (2.5 N 5/1) GRAY MOTTLING but core was too disturbed to assess a pattern	CL	3.5	PID 36.0 PPM BY 60 CPM
13.0	12/21/94 0945 402699	NA	6	very stiff (2.5Y 5/6) LT OLIVE BROWN Silty Clay w/ 5-10% fine angular gravel, 1-2% coarse sand 1-2% fine to med sand 5% coarse subangular gravel MOTTLING OF (5Y 5/1) GRAY CLAY - Core too disturbed to assess pattern	CL	3.5	PID 36.0 PPM BY 60 CPM KD-403345 TCLP-403346
13.5	12/21/94 0945 402699	NA	6	very stiff (2.5Y 5/6) LT OLIVE BROWN Slightly Sandy, Silty Clay w/ 5% fine gravel (angular) 2-5% coarse subangular gravel, 5% coarse subangular sand, 5% fine to med sand 80 mm x 40 mm x 10 mm thick limestone fragment cobble	CL	3.5	PID 36.0 PPM BY 60 CPM KD-403346 TCLP-403342
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES: NONE

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 1/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21

FEB 17 1995

200307 11493-010

CONTROL NO.: ~~200307-11493-025~~ KP 2-14-95

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See page 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER & RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~[illegible]~~ GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	12/21/94 0945 402699 CONTACT	NA	6	very stiff (2.5Y 4/5) LT OLIVE BROWN Silty Clay w/ 2-5% fine gravel, 5% coarse sand (subangular) 5% coarse angular gravel no mottling	CL	3.5	PID 36.0 ppm; BY 60 cpm
CONTACT 14.5	12/21/94 0950 402699	NA	15.0 / 6	very stiff (2.5Y 4/5) LT OLIVE BROWN AND (5Y 5/1) GRAY MOTTLED Silty Clay w/ (PREDOMINANT GRAY) Cobble - 150x90x40mm thick limestone fragment - subrounded 5-10% poorly sorted fine angular gravel Also 50x85x20mm thick cobble positioned laterally	CL	3.5	PID 36.0 ppm; BY 60 cpm; MOTTLED CLAY; flat cobble; LARGE COBBLE
15.0	NA	NA	14.5	LOOKS LIKE BOTTOM OF INTERVAL WAS UNCONSOLIDATED MATERIAL AND FELL OUT - remnants are CLAY "Clumps" w/ rock powder, 3 or 4 angular gravels (coarse) 20% fine to med to coarse sand NO RECOVERY FROM 15.0-15.5			PID ppm; BY cpm
15.5	NA	NA		NO RECOVERY			PID ppm; BY cpm
16.0	NA	NA		NO RECOVERY			PID ppm; BY cpm
16.5	NA	NA		NO RECOVERY			PID ppm; BY cpm
17.0	12/21/94 0950 402698	NA	6	(5Y 4/1) DARK GRAY Silty Clay w/ 5% angular gravel (fine), 15% med to coarse sand trace of brown clay mottling, 3 or 4 coarse subangular gravel	CL	1.5	PID 42.0 ppm; BY 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES:
BROWN/GRAY CLAY INTERFACE
CONTACT AT 14.25 to 14.75
See page 2
Core for 12.0'-17.0 feet was very disturbed and difficult to assess interface trends (laminations, fractures, etc.)
Contact boundary seemed divided by large cobbles

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 12/14/94

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

000633

200307-11493-011

CONTROL NO.: ~~200307-11493-026~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See page 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER & RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~42.8~~ GALLONS (est) KC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.5							
18.0	12/21/94 0950 402698	NA	6	Stiff (5Y 4/1) DARK GRAY silty clay w/ 5-10% subangular fine gravel, 5% coarse subangular sand, twig fragments, evidence of blown clay mottling (trace)	CL	1.5	PID 42.0 ppm; BY 60 cpm
18.5	12/21/94 0955 402698	NA	6	Stiff (5Y 4/1) DARK GRAY ~~sandy~~, silty CLAY w/ 10-15% fine poorly sorted angular to subangular gravel, 5% coarse angular/subangular sand, ~~5%~~ fine to med sand (3-5%), 5-10% coarse subangular gravel	CL	1.5	PID 42.0 ppm; BY 60 cpm
19.0	12/21/94 0955 402698	NA	6	Stiff same as 18.0 - 18.5'	CL	1.5	PID 42.0 ppm; BY 60 cpm
19.5	12/21/94 0955 402698	NA	6	Stiff same as 18.0 - 18.5'	CL	1.5	PID 42.0 ppm; BY 60 cpm
20.0	12/21/94 0955 402698	NA	6	Stiff (5Y 4/1) DARK GRAY, Gravelly, Silty Clay w/ 25% coarse subangular gravel, 15% fine subangular gravel, 2% coarse subangular sand, 5% fine to med grain sand	CL	1.5	PID 42.0 ppm; BY 60 cpm
20.5	12/21/94 0955 402698	NA	6	Stiff same as 19.5 - 20.0' except includes some subrounded med gravel	CL	1.5	PID 42.0 ppm; BY 60 cpm
1.0	12/21/94 0955 402698	NA	6	Stiff same as 19.5 - 20.0' except increased coarse angular gravel (25% - 35%)	CL	1.5	PID 42.0 ppm; BY 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES: NONE

See page 1

FEMP QA 31 FEB 17 1995

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/14/94

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

200307-11493-012

CONTROL NO.: ~~200307-11493-027~~ KP 2-14-95

FEMP LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See pg. 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~12.8~~ 2-13-95 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	12/21/94 0955 402698	NA	6	Stiff same as 19.5-20.01 except decreased coarse gravel 5-10%	CL	1.5	PID 42.0 ppm BY 60 cpm TCLP-403544 Tot.V./ISO.S.-403342
21.5	12/21/94 1000 402701	NA	6	Stiff (5Y 4/1) DARK GRAY SANDY Silty Clay w/ fine gravels and a cobble 110mm X 90mm X 50mm thick, limestone fragment w/ Brachiopod fossils and some smaller coarse gravel size fragments	CL	1.5	PID 42.0 ppm BY 60 cpm
22.0	12/21/94 1000 402701	NA	6	Stiff (5Y 4/1) DARK GRAY Silty Clay w/ 15% coarse angular gravel, 5-10% fine to med grain subangular sand grains, 5% coarse subangular sand, 10-15% fine gravel both rounded + subangular to angular	CL	1.5	PID 42.0 BY 60 cpm
22.5	12/21/94 1000 402701	NA	6	Same as 22.0-22.5	CL	1.5	PID 42.0 ppm BY 60 cpm
23.0	12/21/94 1000 402701	NA	6	Stiff same as 22.0-22.5 except increased fine gravel (20-25%) and decreased coarse gravel (5%) and (5Y 7/3) Pale yellow dessicated material (pockets) (silt size grains)	CL	1.5	PID 42.0 ppm BY 60 cpm
23.5	12/21/94 1000 402701	NA	6	Stiff same as 22.0-22.5 except increased fine gravel (20-25.0%) and decreased coarse gravel (5%) and (5-10mm) (5Y 7/3) Pale yellow dessicated material (pockets) (silt size grains)	CL	1.5	PID 42.0 ppm BY 60 cpm
24.0	12/21/94 1000 402701	NA	6	Same as 22.0-22.5	CL	1.5	PID 42.0 ppm BY 60 cpm
4.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES: NONE

See pg. 1

FEMP 24 21 FEB 17 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES~~

FS-F-3681 000635 F-246 G:/WPSC/94-776.DRW (11-23-94)

200307-11493-013

118

CONTROL NO.: ~~200307-11493-028~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 8 OF 13

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See Pg. 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~42.0~~ GALLONS (est) KP 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE - TIME, DATE, AND NUMBER	BLOWS (per 6 Inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5	12/21/94 1000 402701	NA	6	Same as 22.0-22.5'	CL	1.5	PID 42.0 ppm BY 60 cpm
25.0	NA	NA	0	NO RECOVERY	N/A	N/A	PID NA ppm BY N/A cpm
25.5	NA	NA	0	NO RECOVERY	N/A	N/A	PID NA ppm BY N/A cpm
26.0	NA	NA	0	NO RECOVERY	N/A	N/A	PID NA ppm BY N/A cpm
26.5	NA	NA	0	NO RECOVERY	N/A	N/A	PID NA ppm BY N/A cpm
27.0	12/21/94 1010 402700	NA	6	Stiff (5Y 4/1) DARK GRAY Gravelly, Silty Clay w/ 10-20% fine angular gravel (5mm Average), 25% Coarse angular gravel, 1 cobble 135mm x 90mm x 15mm Thick (angular and squared off - oriented vertically in core) 5-10% Coarse angular sand, LOW TO MED PLASTICITY, Slightly moist	CL	1.5	PID 13.0 ppm BY 50 cpm
27.5	12/21/94 1010 402700	NA	6	Stiff Same as 27.0-27.5 except No large cobble, and only 2 coarse angular gravel	CL	1.5	PID 13.0 ppm BY 50 cpm
28.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES: NONE

See Pg. 1

FEMP QA

FEB 17 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ KP 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000636

200307 - 11493 - 014

CONTROL NO.: ~~200307 - 11493 - 029~~ KD 2-14-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See pg. 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: ~~12-13-95~~ 12-8 13.0 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8.0							
28.5	12/21/94 1010 402700	NA	6	Stiff Same as 27.0 - 27.5' except no large cobble and only 1 coarse gravel	CL	1.5	PID 13.0 ppm BY 50 cpm
29.0	12/21/94 1015 402700	NA	6	Same as 27.0-27.5' except no large cobble and decreased (15%) coarse gravel	CL	1.5	PID 13.0 ppm BY 50 cpm
29.5	12/21/94 1015 402700	NA	6	Same as 27.0-27.5' except no large cobble and several coarse angular-subangular gravels (3-4), and fine gravel is increasing in size to 10mm and includes rounded shapes (gravel is still poorly sorted)	CL	1.5	PID 13.0 ppm BY 50 cpm
30.0	12/21/94 1015 402700	NA	6	Same as 27.0-27.5 except no large cobble, 2 large coarse gravels 30mm - 40mm diameter, fine gravel is angular to subangular and poorly sorted	CL	1.5	PID 13.0 ppm BY 50 cpm
30.5	12/21/94 1015 402696	NA	6	Stiff (5Y 4/1) DARK GRAY Gravelly, Silty Clay w/ 15-20% coarse subangular to angular gravel (one subrounded), 10-15% fine angular gravel, 2-5% coarse subangular sand and 2-5% fine to med sand grains, BRYOZOAN, ROOT-TWIG FRAGMENT,	CL	1.5	PID 13.0 ppm BY 50 cpm
31.0	12/21/94 1015 402696	NA	6	Same as 30.0-30.5' except no bryozoan or root fragment and less coarse gravel	CL	1.5	PID 13.0 ppm BY 50 cpm
	12/21/94 1015 402696	NA	6	Same as 30.0-30.5 except no bryozoan or root fragment	CL	1.5	PID 13.0 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg. 1	12/21/94	N/A
ALPHA	NA	NA	NA
BETA / GAMMA	See pg. 1	12/21/94	N/A

NOTES: None

See pg. 1

FEMP QA FEB 17 1995

~~*-SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAA 12/14/94

FS-F-3681

000637

G:/WPSC/94-776.DRW (11-23-94)

200307-11493-015

118

CONTROL NO.: ~~200307-11493-030~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 10 OF 13

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See pg. 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~12.8~~ 2-3-95 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.5							
32.0	12/21/94 1015 402696	NA	6	Same as 30.0 to 30.5' except no bryozoan or twig fragment	CL	1.5	PID 13.0 ppm; BY 50 cpm
32.5	12/21/94 1020 402696	NA	6	Same as 30.0 to 30.5' except has cobble 80mm x 30mm, limestone fragment	CL	1.5	PID 13.0 ppm; BY 50 cpm
33.0	12/21/94 1020 402696	NA	6	Same as 30.0 to 30.5' except no cobble, no bryozoan — twig fragment measures 30mm x 8mm diameter	CL	1.5	PID 13.0 ppm; BY 50 cpm
33.5	12/21/94 1020 402696	NA	6	Same as 30.0 - 30.5' except no cobble, no bryozoan, no twig fragments visible and increased coarse subangular/angular sand (5-10%)	CL	1.5	PID 13.0 ppm; BY 50 cpm
34.0	12/21/94 1020 402696	NA	6	Same as 30.0 - 30.5' except no cobble, no visible bryozoan, and increased coarse subangular/angular sand (5-10%)	CL	1.5	PID 13.0 ppm; BY 50 cpm
34.5	12/21/94 1020 402702	NA	6	~~STIFF~~ (5Y 4/1) DARK GRAY Gravelly, Silty Clay w/ 15% fine gravel (angular to subangular), 15-20% coarse gravel (subrounded), 2-5% coarse subangular sand, 5-10% fine to mid sand	CL	1.5	PID 13.0 ppm; BY 50 cpm
35.0	12/21/94 1020 402702	NA	6	Same as 34.0 - 34.5 except some fine gravel is subrounded to rounded	CL	1.5	PID 13.0 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES: None

See Pg. 1

FEMP OM 21 FEB 17 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 12/14/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

200307-11493-016

CONTROL NO.: ~~200307-11493-031~~ KD 8-14-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See pg. 1

RELATED FAL NO.: see p. 1

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: ~~12.8~~ 13.0 GALLONS (est) 5-2-3-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.5	12/21/94 1020 402702	NA	6	same as 34.0 to 34.5 except smaller coarse gravel and less of it (5-10%) and 20-30 mm	CL	1.5	PID 9.0 ppm BY 50 cpm
36.0	12/21/94 1030 402702	NA	6	same as 34.0 to 34.5 except coarse gravel is smaller in size approx. 20-25 mm	CL	1.5	PID 9.0 ppm BY 50 cpm
36.5	12/21/94 1030 402702	NA	6	same as 34.0 to 34.5 except coarse gravel is smaller in size 20-25 mm	CL	1.5	PID 9.0 ppm BY 50 cpm
37.0	12/21/94 1030 402702	NA	6	same as 34.0 to 34.5 except coarse gravel is smaller in size 20-25 mm	CL	1.5	PID 9.0 ppm BY 50 cpm
37.5	12/21/94 1030 402706	NA	6	Stiff (5Y 4/1) DARK GRAY Gravelly Silty Clay w/ 2% fine to med sand, 5% coarse subangular sand, and 30% subangular coarse gravel - very poorly sorted 3-5% fine gravel angular to subangular	CL	1.5	PID 9.0 ppm BY 50 cpm
38.0	12/21/94 1030 402706	NA	6	same as above with increased fine gravel (15%) angular to subangular, Twig fragment 40 mm x 10 mm diameter piece of "blue slate"	CL	1.5	PID 9.0 ppm BY 50 cpm
	12/21/94 1030 402706	NA	4 / 2	same as 37.0 - 37.5' with increased fine gravel (15%) angular to subangular / (5Y 3/1) VERY DARK GRAY Gravelly Silty Clay w/ 5% angular coarse gravel 20-30 mm,	Continued into next interval		PID 9.0 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	12/21/94	N/A
BETA / GAMMA	See Pg 1	12/21/94	N/A

NOTES: NONE

See pg. 1

FEMP QA 21 FEB 17 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAA 12/21/94

FS-F-3881

G:/WPSC/94-778.DRW (11-23-94)

000639

200307-11493-017

CONTROL NO.: ~~200307-11493-032~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 12 OF 13

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11493

COORDINATES: See pg. 1

RELATED FAL NO.s: See pg. 1

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~12.5~~ 12-13-95 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5							
39.0	12/21/94 1030 402706	NA	6	Stiff description continued from 38.0-38.5 — also 5-10% fine gravel angular to subangular 10-15% Twigs and organic material, 2-3% fine to med sand, 1% coarse sand (organics may account for darker clay color)	CL	1.5	PID 9.0 ppm BY 50 cpm
39.5	12/21/94 1040 402697	NA	6	Stiff (5Y 4/1) DARK GRAY Gravelly Silty Clay w/ 5% coarse angular gravel, 10-15% fine subangular gravel, 5-10% coarse sand (subangular) 1-3% fine to med grain sand, sand pocket w/ fine grain sand just dirty covering surface area 60x40mm	CL	1.5	PID 9.0 ppm BY 50 cpm in clay "parting"
40.0	12/21/94 1040 402697	NA	6	same as 39.0-39.5' w/ increased coarse gravel (10-15%)	CL	1.5	PID 9.0 ppm BY 50 cpm
40.5	12/21/94 1040 402697	NA	6	same as 39.0-39.5' except decreased coarse sand (3-4%)	CL	1.5	PID 9.0 ppm BY 50 cpm
41.0	12/21/94 1040 402697	NA	6	same as 39.0-39.5' except decreased coarse sand (3-4%)	CL	1.5	PID 9.0 ppm BY 50 cpm
41.5	12/21/94 1040 402697	NA	6	same as 39.0-39.5 except decreased coarse sand (3-4%)	CL	1.5	PID 9.0 ppm BY 50 cpm
20	12/21/94 1040 402697	NA	6	same as 39.0-39.5 except decreased coarse sand (3-4%) and increased coarse angular gravel (10-15%)	CL	1.5	PID 9.0 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES: NONE

~~See pg. 1~~

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PMA 12/19/94

FS-F-3681

FEMP QA 21 FEB 17 1995

G:/WPSC/94-776.DRW (11-23-94)

000640

S I I

CONTROL NO.: 200307-11493-038	FEMP LITHOLOGIC LOG	PAGE 13 OF 13

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION
PROJECT NO.: 20.03.07

BORING NUMBER: 11493
COORDINATES: See pg. 1
RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: See pg. 1
GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/21/94

GEOLOGIST: Layne / GEIGER / RILEY
GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/21/94

WATER USED DURING DRILLING: 13.0 ~~12.5~~ GALLONS (est)
DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC
DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
2.0							
42.5	12/21/94 1040 402697	NA	6	same as 39.0-39.5	CL	1.5	PID 9.0 ppm; BY 50 cpm
42.5	12/21/94 1040 402697	NA	3	same as 39.0-39.5 except has a cobble 75mm x 40mm subrounded to subangular aligned at a vertical tilt to core	CL	1.5	PID 9.0 ppm; BY 50 cpm
43.0	12/21/94 1040 402697	NA	3	same as 39.0-39.5 except increased fine gravel (angular). ~~and increased coarse sand~~ R 1-31-95	CL	1.5	PID 9.0 ppm; BY 50 cpm
				— BOTTOM OF BORING — @ 43.0			
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/21/94	N/A
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	12/21/94	N/A

NOTES: NONE
~~See pg. 1~~

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 1/4/95

FS-F-3681

FEMP QA 21

G:/WPSC/94-778.DRW (11-23-94)

000641

FEB 17 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11494-005

PAGE 1 OF 5

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11494

COORDINATES: N 482418.883 E 1382462.873

RELATED FAL NO.s:

SURFACE ELEVATION: 606.05

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-22-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 25.0 GALLONS (est.)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	12-22-94 0830 402671	NA	6	STIFF (2.5Y 4/4) OLIVE BROWN Silty CLAY w/ 2-3% coarse sand, 1-3% fine gravel, root material, surface vegetation. Low to med plasticity. Slightly moist	CL	1.5	PID 5.3 ppm; BY 50 cpm
0.5	12-22-94 0830 402671	NA	6	STIFF (2.5Y 4/4) OLIVE BROWN Silty CLAY w/ 2-3% coarse sand, 1-3% fine gravel, root material. Low to med plasticity. Slightly moist	CL	1.5	PID 5.3 ppm; BY 50 cpm
1.0	12-22-94 0830 402671	NA	6	STIFF (2.5Y 4/2) DARK GRAYISH BROWN Silty CLAY w/ root material. Low plasticity. Slightly moist	CL	1.5	PID 5.4 ppm; BY 50 cpm
1.5	12-22-94 0830 402671	NA	6	Same as 1.0-1.5	CL	1.5	PID 5.5 ppm; BY 50 cpm
2.0	12-22-94 0830 402671	NA	6	STIFF (2.5Y 3/1) VERY DARK GRAY Silty CLAY. Low to med plasticity. Slightly moist	CL	1.5	PID 5.5 ppm; BY 50 cpm
2.5	12-22-94 0830 402671	NA	6	VERY STIFF (2.5Y 5/4) LT OLIVE BROWN Silty CLAY. IRON OXIDE PRECIPITATES. Low to med plasticity. Slightly moist	CL	3.5	PID 5.5 ppm; BY 50 cpm
3.0	12-22-94 0830 402671	NA	6	Same as 2.5-3.0	CL	3.5	PID 5.5 ppm; BY 50 cpm
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	5.2	12/22/94	0830
ALPHA	NA	(NA)	NA
BETA / GAMMA	50	12/22/94	0830

NOTES: KT 2-2-95 ~~None~~

Lithologic Log ~~were~~ updated by Layne from archived cores on 2-6-95. TL 2-8-95

FEMP QA 21

FEB 16 1995

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-2681

WPSC / 94-776.DRW (11-23-9

CONTROL NO.: 200307-11494-006

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11494

COORDINATES: See pg. 1

RELATED FAL NO.(s):

SURFACE ELEVATION: See pg 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-22-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 25 GALLONS (est.)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
.5	12-22-94 0830 402671	NA	6	same as 2.5-3.0'	CL	1.5	PID 6.5 ppm; BY 50 cpm
4.0	12-22-94 0835 402670	NA	6	same as 2.5-3.0' except VERY STIFF w/ iron oxide precipitates - homogenous throughout low to med plasticity Slightly MOIST	CL	2.75	PID 6.5 ppm; BY 50 cpm
4.5	12-22-94 0835 402670	NA	6	STIFF (2.5Y 5/4) LT OLIVE BROWN Silty CLAY w/ evidence of layering of dark grayish brown clay and olive brown low to med plasticity Slightly MOIST	CL	2.0	PID 6.5 ppm; BY 50 cpm
5.0	12-22-94 0835 402670	NA	6	STIFF (2.5Y)(5/4) LT OLIVE BROWN Silty CLAY w/ 2-3% coarse sand, 2-3% fine poorly sorted gravel LOW PLASTICITY Slightly MOIST	CL	2.0	PID 6.5 ppm; BY 50 cpm
5.5	12-22-94 0835 402670	NA	6	same as 5.0-5.5	CL	2.0	PID 6.5 ppm; BY 50 cpm
6.0	NA JC2-6-95 ~~402670~~	NA	NA	NO RECOVERY	N/A		PID NA ppm; BY NA cpm
6.5	NA	NA	NA	NO RECOVERY	N/A		PID NA ppm; BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See pg. 1	/ /	

NOTES: NONE

See pg. 1

FEMP QA 21 FEB 16 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

G:/WPSC/94776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11494-007

PAGE 3 OF 5

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11494

COORDINATES: See pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-22-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 25.0 GALLONS (EST)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.0	12-22-94 0845 402668	NA	6	VERY STIFF (2.5Y 5/4) LT OLIVE BROWN GRAVELLY Silty CLAY w/ a cobble 85x60x20 mm thick and several (4 to 5) (25%) coarse gravel (25-50 mm in size) - subangular to angular 3-5% coarse sand, 5% fine gravel - subangular 15% fine to med SAND LOW PLASTICITY Slightly MOIST	CL	2.5	PID 6.5 ppm BY 50 cpm
7.5	12-22-94 0845 402668	NA	6	Same as 7.0-7.5 except increased fine angular gravel (10%) and a pocket of (2.5Y 3/3) DARK OLIVE BROWN SAND (fine grain) → MINERAL BREAKDOWN LOW PLASTICITY Slightly MOIST	CL	2.5	PID 6.5 ppm BY 50 cpm
8.0	12-22-94 0845 402668	NA	6	Same as 7.0-7.5 except increased coarse sand (10%) and increased fine gravel (10%)	CL	2.5	PID 6.5 ppm BY 50 cpm
8.5	12-22-94 0845 402668	NA	6	VERY STIFF (2.5Y 5/4) LT OLIVE BROWN VERY SILTY CLAY w/ 5-10% subangular to angular poorly sorted fine gravel, 1-2% coarse sand, 10% fine to med sand, 25% coarse subangular to angular gravel (50 mm) VERY LOW PLASTICITY Slightly MOIST	CL	2.5	PID 6.5 ppm BY 50 cpm
9.0	12-22-94 0845 402668	NA	6	VERY STIFF Same as 8.5-9.0 ~~except~~ ~~same + 25-30% coarse gravel (2-3) about 50 mm (subangular to angular)~~ except decreased coarse gravel (5%) LOW PLASTICITY DRY TL 2-6-95	CL	4.0	PID 6.5 ppm BY 50 cpm
9.5	12-22-94 0845 402668	NA	6	VERY STIFF (2.5Y 5/4) LT OLIVE BROWN VERY Silty CLAY w/ 5-10% Coarse subangular sand and 5% fine to med grain sand, 10-15% fine gravel (poorly sorted), some (2.5Y 5/2) GRAYISH BROWN CLAY MOTTLED IN BROWN CLAY DUE TO DISTURBANCE OF CORE BUT NO DISCERNABLE PATTERN DRY — LOW PLASTICITY	CL	4.0	PID 7.2 ppm BY 50 cpm
10.0	12-22-94 0845 402668	NA	6	VERY STIFF (2.5Y 5/4) LT OLIVE BROWN VERY SILTY CLAY w/ 2-3% coarse sand, 5-10% fine to med sand, 20-30% fine poorly sorted subangular gravel w/ irregular intrusions of (5Y 5/1) GRAY SILTY CLAY w/ 5-10% fine to med SAND, 5-10% fine to subangular gravel GRAY EXTENDS 70-80 mm ACROSS CORE — IT SEEMS CONTACT SHOULD BE HERE? DRY - LOW PLASTICITY	CL	4.0	PID 6.5 ppm BY 50 cpm

GRAVELLY CLAY-SAND MIXTURE

INTERFACE JUMPED

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See pg. 1	/ /	

NOTES: The 7.0-11.5 CORE WAS VERY DISTURBED AND CLEAR PATTERNS IN THE INTERFACE COULD NOT BE ASSESSED. TL SAMPLE FROM 11.0-11.5 See page 1

FEMP QA 21 FEB 16 1995

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681

000644

G:/WPSC/94-776.DRW (11-23-94)

841

CONTROL NO.: 200307-11494-008

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11494

COORDINATES: See pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-22-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 25.0 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	12-22-94 0845 402668	NA	6	VERY STIFF (2.5Y)(5/4) LT OLIVE BROWN AND (5Y 5/1) GRAY Silty CLAY mixed w/ brown fine grain sand and fine gravel (rounded to angular) some "pockets" of black sand (from mineral breakdown) MED PLASTICITY SLIGHTLY MOIST	CL	2.75	PID 27.0 ppm; BY 50 cpm
11.0	12-22-94 0845 402668	NA	6	~~SAMPLE TAKEN FROM THIS INTERVAL~~ — ORIGINAL LOG SAYS: VERY SOFT (5Y 5/1) GRAY Silty Sandy CLAY w/ some brown sand seams (fine, poorly graded) MED PLASTICITY Slightly MOIST TO MOIST	CL	~~2.25~~ <.25	PID 25.0 ppm; BY 50 cpm; TCLP DUP 403492; TCLP TOT 403493
11.5	12-22-94 0850 ~~0850~~ TC 2-6-95 402669	NA	6 (2-6-95)	VERY SOFT (2.5Y 5/4) LT OLIVE BROWN Silty, Sandy CLAY w/ pockets/areas of clayey sand — sand is fine, 40% and rounded to sub-rounded; ~~50%~~ coarse sand (3-5%) subangular; poorly sorted fine gravel 5-10% subangular to angular; Cohesive — slightly moist — LOW PLASTICITY	CL/SC	<.25	PID 25.0 ppm; BY 50 cpm
12.0	12-22-94 0850 402669	NA	6	same as 11.5-12.0 According to original log and evidence of core — although a sample was taken in this interval so material in interval is not complete —	CL/SC	<.25	PID 25.0 ppm; BY 50 cpm; MOIST. CONTENT 402658 ~~402~~ JCHE 2-14-95
12.5	12-22-94 0850 402669	NA	6	same as 11.5-12.0	CL/SC	<.25	PID 25.0 ppm; BY 50 cpm
13.0	12-22-94 0850 402669	NA	6	same as 11.5-12.0	CL/SC	<.25	PID 25.0 ppm; BY 50 cpm
13.5	12-22-94 0850 402669	NA	6	same as 11.5-12.0 except increased coarse and fine gravel (10% fine gravel) (20% coarse gravel)	CL/SC	.25	PID 25.0 ppm; BY 50 cpm
40							

INTERFACE?

FEMP QA 21 FEB 10 1995

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES:
10.5-11.0 CORE is very disturbed difficult to assess any pattern T See pg. 1
11.5-15.0 Intervals are disturbed and difficult to assess specific sand seam depths

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681 000645 G:/WPSC/94-778 DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307- 11494 - 009

PAGE 5 OF 5

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11494

COORDINATES: See pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12-22-94

GEOLOGIST: LAYNE / GEIGER / RILEY

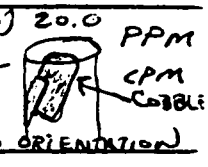
GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 25.0 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
4.0	12-22-94 0850 402669 ~~402699~~	NA	6	~~same as 11.5-12.0~~ 2-6-95 413 2-6-95	CL/GC	.25	PID 20.0 ppm BY 50 cpm
14.5	12-22-94 0850 402669 ~~402699~~ 2-8-95	NA	6	(2.5Y ~~5/4~~) ~~of~~ OLIVE BROWN Silty, SANDY, Clayey GRAVEL and Silty, sandy, gravelly CLAY (A silt-gravel-sand-clay mixture) 25%-35% fine poorly sorted subrounded-subangular gravel 15-20% coarse subangular (4-6) gravel (40mm), 30-40% fine sand 10% med to coarse sand (subangular); Cohesive, slightly moist	CL/GC	.25	PID 20.0 ppm BY 50 cpm
15.0	12-22-94 0850 402669 CLEAR	NA	6	same as 14.5 to 15.0 except, increased clay and a large microcrystalline limestone fragment cobble size - 90x80x50mm thick	CL/GC	.25	PID 25.0 ppm BY 50 cpm
15.5	CONTACT GRAY 12-22-94 0850 402669 ~~402699~~ 2-8-95	NA	6	2.5Y 4/1 DARK GRAY Silty CLAY 2-6-95 w/ 2-3% fine subangular gravel, 3-5% coarse angular gravel, 1-2% coarse subangular sand, 5-10% fine to med sand LOW PLASTICITY - SLIGHTLY MOIST	CL	2.5	PID 25.0 ppm BY 50 cpm
16.0	12-22-94 0850 402669	NA	6	same as 15.5 to 16.0 except a cobble of shale/claystone that is (5GY 5/1) GREENISH GRAY 75x40x18 thick (mm) next to limestone cobble 90x60x10mm (squared off shape) LOW PLASTICITY SLIGHTLY MOIST	CL	2.5	PID 20.0 ppm BY 50 cpm 
16.5	12-22-94 0850 402689	NA	6	same as 15.5-16.0' except increased coarse gravel (1 large 60x40x25mm) (overall smaller) (20-25%) LOW PLASTICITY Slightly moist	CL	2.5	PID 20.0 ppm BY 50. cpm Moist. 402656
17.0		NA		— BOTTOM OF BORING @ 17.0' —			PID ppm BY cpm
7.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See pg. 1	/ /	

NOTES: NONE

See pg. 1

FEMP QA 21 FEB 16 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

000646

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11495-005

PAGE 1 OF 24

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: N 482428.053 E 1387468.649

RELATED FAL NO.s:

SURFACE ELEVATION: 606.71

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~15.6~~ GALLONS (est) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0 – 0.25	12-22-94 1030 402695	NA	3	STIFF (10YR 3/2) VERY DARK GRAYISH BROWN SILTY CLAY, < 1% FINE SAND, NO GRAVEL, ABUNDANT ROOTS, SLIGHTLY MOIST, SLIGHT TO LOW PLASTICITY	CL	1.75	PID 7.2 ppm; BY 50 cpm
0.25 – 0.5	12-22-94 1030 402695	NA	3	VERY STIFF (10YR 3/3) DARK BROWN, SILTY CLAY 1-2% FINE TO MEDIUM SAND, NO GRAVEL PRESENT, ABUNDANT ROOTS, LOW PLASTICITY, SLIGHTLY MOIST, IRON/MANGANESE STAINING	CL	2.25	PID 7.2 ppm; BY 50 cpm
0.5 – 0.75	12-22-94 1030 402695	NA	3	SAME AS ABOVE (0.25 - 0.5 FEET)	CL	2.0	PID 7.2 ppm; BY 50 cpm
0.75 – 1.0	12-22-94 1030 402695	NA	3	SAME AS ABOVE (0.5 - 0.75 FEET)	CL	2.5	PID 7.2 ppm; BY 50 cpm
1.0 – 1.25	12-22-94 1030 402695	NA	3	VERY STIFF (10YR 3/3) DARK BROWN SILTY CLAY, 2% FINE SAND, 4% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, IRON/MANGANESE STAINING, FINE ROOTS, LOW PLASTICITY, SLIGHTLY MOIST TO DRY	CL	2.75	PID 7.2 ppm; BY 50 cpm
1.25 – 1.5	12-22-94 1030 402695	NA	3	VERY STIFF (10YR 4/4) DARK YELLOWISH BROWN, SILTY CLAY WITH 3% COARSE SAND, 5% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, IRON/MANGANESE STAINING, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 7.2 ppm; BY 50 cpm
1.5 – 1.75	12-22-94 1030 402695	NA	3	STIFF (10YR 2/2) VERY DARK BROWN, CLAYEY SILT, 1% FINE SAND, NO GRAVEL PRESENT, IRON STAINING, FINE ROOTS, NON PLASTIC, SLIGHTLY MOIST TO SLIGHT PLASTICITY	~~CL~~ ML	1.5	PID 7.2 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	50	12/22/94	08:30
ALPHA	NA	(NA)	NA
BETA / GAMMA	5.2	12/22/94	08 30

NOTES: ~~ALPHA~~ RT 2-27-95

Lithologic log updated by Riley from archive cores on 2/3/95. JCMS 2/14/95

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/4/94

FS-F-3681

000647

F-258

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 19 95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11495-006

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See pg 1

RELATED FAL NO.s:

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~13.6~~ GALLONS JC 2-13-95 est

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.75 – 2.0	12-22-94 1030 402695	NA	3	SAME AS ABOVE (1.5 - 1.75 FEET)	ML	1.5	PID 7.2 ppm; BY 50 cpm
2.0 – 2.25	12-22-94 1030 402695	NA	3	SAME AS ABOVE (1.75 - 2.0 FEET)	ML	1.75	PID 7.2 ppm; BY 50 cpm
2.25 – 2.5	12-22-94 1030 402695	NA	3	SAME AS ABOVE (2.0 - 2.25 FEET)	ML	1.5	PID 7.2 ppm; BY 50 cpm
2.5 – 2.75	1030 402695	NA	3	SAME AS ABOVE	ML	1.0	PID 7.2 ppm; BY 50 cpm
2.75 – 3.0	1030 402695	NA	3	SAME AS ABOVE	ML	1.5	PID 7.2 ppm; BY 50 cpm
3.0 – 3.25	NA	NA	0	NO RECOVERY (SLUFF)	NA	NA	PID NA ppm; BY NA cpm
3.25 – 3.5	NA	NA	0	NO RECOVERY (SLUFF)	NA	NA	PID NA ppm; BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~ABOVE~~

See pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681

000648

G: / WPSC / 94-776.DRW (11-23-94)

311

FEMP QA 18 2-14-95

CONTROL NO.: 200307-11495-007

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~13.0~~ GALLONS (est) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 3.75	12-22-94 1035 402690	NA	3	STIFF (10YR 5/4) YELLOWISH BROWN, SILTY CLAY 1% FINE TO MEDIUM SAND, <1% FINE GRAVEL, IRON/MANGANESE STAINING, 10YR 3/2 VERY DARK GRAYISH BROWN MOTTLING, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 8.2 ppm BY 50 cpm
4.0	12-22-94 1035 402690	NA	3	SAME AS ABOVE (3.5 - 3.75 FEET)	CL	1.75	PID 8.2 ppm BY 50 cpm
4.25	12-22-94 1035 402690	NA	3	STIFF (10YR 3/1) VERY DARK GRAY SILTY CLAY, 1-2% FINE SAND, <1% FINE SUBANGULAR GRAVEL, IRON STAINING, MANGANESE STAINING, MEDIUM PLASTICITY SLIGHTLY MOIST	CL	1.5	PID 8.2 ppm BY 50 cpm
4.5	12-22-94 1035 402690	NA	3	SAME AS ABOVE (4.0 - 4.25 FEET)	CL	1.25	PID 8.2 ppm BY 50 cpm
4.75	12-22-94 1035 402690	NA	3	SAME AS ABOVE / STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY WITH 1-2% FINE, <1% FINE GRAVEL, IRON STAINING, MANGANESE STAINING, 10YR 6/2 LIGHT BROWNISH GRAY MOTTLING, MEDIUM PLASTICITY SLIGHTLY MOIST	CL / CL	1.5 / 1.5	PID 8.2 ppm BY 50 cpm
5.0	12-22-94 1035 402690	NA	3	SAME AS ABOVE (4.5 - 4.75 FEET)	CL	1.25	PID 8.2 ppm BY 50 cpm
5.25	12-22-94 1035 402690	NA	3	SAME AS ABOVE (4.75 - 5.0 FEET)	CL	1.25	PID 8.2 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000649

CONTROL NO.: 200307-11495-008

FEMP
LITHOLOGIC LOG

2-16-95

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See pg 1

RELATED FAL NO.s:

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~15.0~~ JC 2-13-95 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5.26	12-22-94 1035 402690	NA	3	STIFF (10YR 5/4) ~~DARK~~ YELLOWISH BROWN SILTY CLAY, 2-3% PA (-3%) COARSE TO MEDIUM SAND, 3% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, (10YR 6/2) LIGHT BROWNISH GRAY MOTTLING. 10YR 3/4 VERY DARK GRAY SILTY CLAY INCLUSION, MATRIX HAS MEDIUM PLASTICITY, SLIGHTLY MOIST IRON/MANGANESE STAINING	CL	1.25	PID 8.2 ppm BY 50 cpm
5.5	12-22-94 1035 402690	NA	3	SAME AS ABOVE (5.25 - 5.5 FEET)	CL	1.5	PID 8.2 ppm BY 50 cpm
5.75	12-22-94 1035 402690	NA	3	SAME AS ABOVE (5.5 - 5.25 FEET) DOES NOT CONTAIN (10YR 3/1) VERY INCLUSION	CL	1.5	PID 8.2 ppm BY 50 cpm
6.0	12-22-94 1035 402690	NA	3	STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY 4-5% COARSE SAND, 5% MEDIUM TO FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, 10YR 6/2 LIGHT BROWNISH GRAY MOTTLING, IRON/MANGANESE STAINING, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.25	PID 8.2 ppm BY 50 cpm
6.25	12-22-94 1035 402690	NA	3	SAME AS ABOVE (6.0 - 6.25 FEET)	CL	1.5	PID 8.2 ppm BY 50 cpm
6.5	12-22-94 1035 402690	NA	3	SAME AS ABOVE (6.25 - 6.5 FEET)	CL	1.75	PID 8.2 ppm BY 50 cpm
6.75	12-22-94 1035 402690	NA	3	VERY STIFF SAME AS ABOVE (6.5 - 6.75 FEET)	CL	2.5	PID 8.2 ppm BY 50 cpm
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP
LITHOLOGIC LOG

FEMP OA 13 2-7-95

CONTROL NO.: 200307 - 11495 - 009	PAGE 5 OF 24

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07

BORING NUMBER: 11495	COORDINATES: See pg. 1	RELATED FAL NO.s:

SURFACE ELEVATION: See pg. 1	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED: 12-22-94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~13.6~~ 12-23-95 GALLONS (est)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL	DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.25	12-22-94 1040 402691	NA	3	SOFT (10 YR 3/1) VERY DARK GRAY ~~SILTY~~ CLAYEY SILT, ALMOST PEATY, NO SAND OR GRAVEL PRESENT, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST TO MOIST	ML	.25	PID 22 ppm BY 20 cpm
7.5	12-22-94 1040 402691	NA	3	STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY, 10% FINE SAND, 7% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, SLIGHT 10YR 6/2 LIGHT BROWNISH GRAY MOTTLING, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 22 ppm BY 20 cpm
7.75	NA	NA	0	NO RECOVERY SLUFF	NA	NA	PID NA ppm BY NA cpm
8.0	NA	NA	0	NO RECOVERY SLUFF	NA	NA	PID NA ppm BY NA cpm
8.25	12-22-94 1040 402689	NA	3	VERY STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY, 5% COARSE SAND, 10% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, IRON STAINING, LOW PLASTICITY, SLIGHTLY MOIST	CL	3.25	PID 22 ppm BY 20 cpm
8.5	12-22-94 1040 402689	NA	3	SAME AS ABOVE (8.0 - 8.25 FEET)	CL	3.5	PID 22 ppm BY 20 cpm
8.75	12-22-94 1040 402689	NA	3	SAME AS ABOVE (2) SUBROUNDED LIMESTONE COBBLES, IRREGULAR ORIENTATION, 9x8x5 cm, AND 7x5x3 cm	CL	3.5	PID 22 ppm BY 20 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~ALONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/4/96

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

000651

FEMP QA 19 2-16-95

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307 - 11495 - 010

PAGE 6 OF 24

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: JC 2-13-95 14.0 ~~[illegible]~~ GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8.75 – 9.0	12-22-94 1040 402689	NA	3	VERY STIFF (10YR 5/3) BROWN SILTY CLAY, 4-5% COARSE SAND, 10-12% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.25	PID 22 ppm; BY 20 cpm
9.0 – 9.25	12-22-94 1040 402689	NA	3	SAME AS ABOVE (8.75 – 9.0 FEET)	CL	2.5	PID 22 ppm; BY 20 cpm
9.25 – 9.5	12-22-94 1040 402689	NA	3	SAME AS ABOVE (9.0 – 9.25 FEET) (1) 9x6x3 cm ANGULAR LIMESTONE COBBLE, VERTICAL ORIENTATION	CL	2.5	PID 22 ppm; BY 20 cpm
9.5 – 9.75	12-22-95 1040 402689	NA	3	VERY STIFF (10YR 5/3) BROWN SILTY CLAY, 5% COARSE SAND, 8-9% MEDIUM TO FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, IRON STAINING, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	2.25	PID 22 ppm; BY 20 cpm
9.75 – 10.0	12-22-94 1040 402689	NA	3	VERY STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY, 5% COARSE SAND, 9-10% MEDIUM TO FINE SUBANGULAR TO ANGULAR GRAVEL, INTERMIXED WITH (5Y 4/1) DARK GRAY SILTY CLAY, MEDIUM PLASTICITY, SLIGHTLY MOIST R 70/30 – B/G	CL	3.0	PID 22 ppm; BY 20 cpm
10.0 – 10.25	12-22-94 1040 402689	NA	3	SAME AS ABOVE (9.75 – 10.0 FEET)	CL	3.75	PID 22 ppm; BY 20 cpm
10.25 – 10.5	12-22-94 1040 402689	NA	3	HARD (5Y 4/1) DARK GRAY SILTY CLAY, 5% FINE SAND, 7-8% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, DESICATION CRACKS FILLED WITH 10YR 5/4 YELLOWISH BROWN SILTY CLAY, NO LAMINATIONS OR GRADING PRESENT IN MATRIX, LOW PLASTICITY, SLIGHTLY MOIST	CL	4.0	PID 22 ppm; BY 20 cpm

B → G

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/6/94

FS-F-3681

000652

G:/WPSC/94-776.DRW (11-23-94)

CONTROL NO.: 200307-11495-011

FEMP
LITHOLOGIC LOG

PAGE 7 OF 24

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER & RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~13.6~~ GALLONS (CSA) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 10.75	12-22-94 1040 ~~1050~~ JC 2/14/94 402689	NA	3	VERY STIFF SAME AS ABOVE (10.25 - 10.5 FEET)	CL	3.75	PID 22 ppm; BY 20 cpm
10.75 – 11.0	12-22-94 1040 ~~1050~~ JC 2/14/95 402689	NA	3	VERY STIFF SAME AS ABOVE (10.5 - 10.75 FEET)	CL	3.5	PID 22 ppm; BY 20 cpm
11.0 – 11.25	12-22-94 1050 402673	NA	3	VERY STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 7% FINE SAND, 5-6% FINE SUBANGULAR GRAVEL IRREGULAR ORIENTATION, DESSICATION FRACTURES ARE FAINT TO NON-EXISTANT. 1% WOOD FRAGMENTS, LOW PLASTICITY SLIGHTLY MOIST	CL	3.75	PID 22 ppm; BY 20 cpm
11.25 – 11.5	12-22-94 1050 402673	NA	3	SAME AS ABOVE (11.0 - 11.25 FEET)	CL	3.75	PID 22 ppm; BY 20 cpm
11.5 – 11.75	12-22-94 1050 402673	NA	3	VERY STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 1-2% FINE SAND, 7-8% FINE TO MEDIUM SUBANGULAR GRAVEL, (1) 5x4x4 cm LARGE SUBROUNDED DOLOMITE COBBLE, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 22 ppm; BY 20 cpm
11.75 – 12.0	12-22-94 1050 402673	NA	3	SAME AS ABOVE (11.5 - 11.75 FEET) (2) ANGULAR LIMESTONE COBBLES, IRREGULAR ORIENTATION 7x4x3 cm, AND 7x5x2 cm	CL	2.25	PID 22 ppm; BY 20 cpm
12.0 – 12.25	12-22-94 1050 402673	NA	3	SAME AS ABOVE (11.75 - 12.0 FEET) (1) ANGULAR LIMESTONE COBBLE GRAVEL, 4x4x4 cm	CL	2.5	PID 22 ppm; BY 20 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP DA 18 2-16-95

CONTROL NO.: 200307-11495-012

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~10.6~~ GALLONS (est) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
12.25 – 12.5	12-22-94 1050 402673	NA	3	SAME AS ABOVE NO COBBLES (12.0 - 12.25 FEET)	CL	2.0	PID 22 ppm BY 20 cpm
12.5 – 12.75	12-22-94 1050 402673	NA	3	SAME AS ABOVE (12.25 - 12.5 FEET)	CL	2.0	PID 22 ppm BY 20 cpm
12.75 – 13.0	12-22-94 1050 402673	NA	3	SAME AS ABOVE (12.5 - 12.75 FEET)	CL	2.0	PID 22 ppm BY 20 cpm
13.0 – 13.25	12-22-94 1050 402673	NA	3	SAME AS ABOVE (12.75 - 13.0 FEET)	CL	2.0	PID 22 ppm BY 20 cpm
13.25 – 13.5	12-22-94 1050 402673	NA	3	SAME AS ABOVE (13.0 - 13.25 FEET)	CL	2.5	PID 22 ppm BY 20 cpm
13.5 – 13.75	12-22-94 1050 402673	NA	3	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 5% FINE SAND, 10% MEDIUM TO FINE GRAVEL, IRREGULAR ORIENTATION, (1) 10 x 4 x 2 cm SUBANGULAR LIMESTONE COBBLE, HORIZONTAL ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.25	PID 22 ppm BY 20 cpm
13.75 – 14.0	12-22-94 1050 402673	NA	3	SAME AS ABOVE (13.5 - 13.75 FEET) (1) 11 x 7 x 4 cm ANGULAR LIMESTONE COBBLE, IRREGULAR ORIENTATION	CL	2.75	PID 22 ppm BY 20 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~HOLE~~

See page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/6/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307- 11495- 013

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: JC 2-7-95 14.0 ~~15.6~~ GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	12-22-94 1050 ~~1055~~ JC 2/14/95 402673	NA	3	SAME AS ABOVE NO COBBLES	CL	2.5	PID 22 ppm BY 20 cpm
14.25	12-22-94 1050 ~~1055~~ JC 2/14/95 402673	NA	3	SAME AS ABOVE	CL	2.0	PID 22 ppm BY 20 cpm
14.5	12-22-94 1050 ~~1055~~ JC 2/14/95 402673	NA	3	SAME AS ABOVE	CL	2.0	PID 22 ppm BY 20 cpm
14.75	12-22-94 1050 ~~1055~~ JC 2/14/95 402673	NA	3	SAME AS ABOVE	CL	2.5	PID 22 ppm BY 20 cpm
15.0	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
15.25	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
15.5	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
15.75							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLR 12/14/94

FS-F-3681

000655

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11495-014	PAGE 10 OF 24
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11495	COORDINATES: See pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-22-94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-22-94
WATER USED DURING DRILLING: 14.0 ~~13.6~~ GALLONS (est) SC 2-13-95	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15.75 – 16.0	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
16.0 – 16.25	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
16.25 – 16.5	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
16.5 – 16.75	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
16.75 – 17.0	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
17.0 – 17.25	12-22-94 1100 ~~1055~~ 402692 JCH 2/14/96	NA	3	STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 1-2% FINE SAND, < 1% FINE ANGULAR GRAVEL, NO LAMINATIONS OR INCLUSIONS, MEDIUM PLASTICITY, MOIST	CL	1.75	PID 22 ppm; BY 20 cpm
17.25 – 17.5	12-22-94 1100 ~~1055~~ 402692 JCH 2/14/96	NA	3	SAME AS ABOVE (17.0-17.25 FEET)	CL	1.5	PID 22 ppm; BY 20 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: SC 2-7-95 ~~Hole~~

See Page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 1/4/96

FS-F-3681

000656 G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11495-015

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~[illegible]~~ GALLONS (est) JG 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 17.75	12-22-94 1100 402692	NA	3	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 4% FINE SAND, 5-6% MEDIUM TO FINE SUB-ANGULAR GRAVEL, IRREGULAR ORIENTATION, TRACES OF WOOD FRAGMENTS, MEDIUM PLASTICITY, MOIST	CL	1.75	PID 16 ppm BY 10 cpm
17.75 – 18.0	12-22-94 1100 402692	NA	3	SAME AS ABOVE (17.5 - 17.75 FEET)	CL	1.5	PID 16 ppm BY 10 cpm
18.0 – 18.25	12-22-94 1100 402692	NA	3	SAME AS ABOVE (17.75 - 18.0 FEET)	CL	1.5	PID 16 ppm BY 10 cpm
18.25 – 18.5	12-22-94 1100 402692	NA	3	SAME AS ABOVE (18.0 - 18.25 FEET)	CL	1.5	PID 16 ppm BY 10 cpm
18.5 – 18.75	12-22-94 1100 402692	NA	3	SAME AS ABOVE (18.25 - 18.5 FEET)	CL	1.5	PID 16 ppm BY 10 cpm
18.75 – 19.0	12-22-94 1100 402692	NA	3	SAME AS ABOVE (18.5 - 18.75 FEET)	CL	1.75	PID 16 ppm BY 10 cpm
19.0 – 19.25	12-22-94 1100 402692	NA	3	STIFF (10YR 2/1) BLACK VERY SILTY CLAY, < 1% FINE SAND, NO GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST → (CONTORTED LAMINATION 1.5 in / 4 cm THICK, ENDS ABRUPTLY, THEN BACK TO STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 5% FINE SAND, 7-8% MEDIUM SUBANGULAR GRAVEL	CL	1.0	PID 16 ppm BY 10 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/12/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP OA 13

CONTROL NO.: 200307-11495-016

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11495	COORDINATES: See page 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See page 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-22-94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-22-94
WATER USED DURING DRILLING: 14.0 ~~13.0~~ GALLONS (est) JC 2-13-95	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
19.25 – 19.5	12-22-94 1100 402692	NA	3	STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 5% FINE SAND, 3% FINE TO MEDIUM ANGULAR GRAVEL, IRREGULAR ORIENTATION, (1) 7x4x4 cm ANGULAR LIMESTONE COBBLE HORIZONTAL ORIENTATION, MEDIUM PLASTICITY SLIGHTLY MOIST	CL	1.0	PID 16 ppm BY 10 cpm
19.5 – 19.75	12-22-94 1100 402692	NA	3	SAME AS ABOVE (19.25 - 19.5 FEET)	CL	1.5	PID 16 ppm BY 10 cpm
19.75 – 20.0	12-22-94 1100 402692	NA	3	STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, WITH 2% FINE, 50% LARGE SUBANGULAR LIMESTONE GRAVEL AND COBBLES, IRREGULAR ORIENTATION, GRAVEL AND COBBLES ARE SURROUNDED/COVERED WITH 5GY 5/1 GREENISH GRAY CLAY, HIGH PLASTICITY (GREEN), MEDIUM (GRAY) PLASTICITY, MOIST, TRACE OF WOOD/TWIGS	CL	1.5	PID 16 ppm BY 10 cpm
20.0 – 20.25	12-22-94 1100 402692	NA	3	SAME AS ABOVE (19.75 - 20.0 FEET)	CL	1.25	PID 16 ppm BY 10 cpm
20.25 – 20.5	12-22-94 1100 402692	NA	3	STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 1-2% FINE SAND, 10% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	2.0	PID 16 ppm BY 10 cpm
20.5 – 20.75	12-22-94 1100 402692	NA	3	SAME AS ABOVE (20.25 - 20.5 FEET) (1) 6x4x4 cm SUBANGULAR LIMESTONE COBBLE, IRREGULAR ORIENTATION	CL	1.75	PID 16 ppm BY 10 cpm
20.75 – 21.0	12-22-94 1100 402692	NA	3	SAME AS ABOVE (20.5 - 20.75 FEET) NO COBBLES	CL	1.75	PID 16 ppm BY 10 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11495-017

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

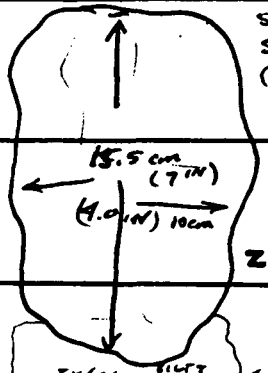
GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~[illegible]~~ GALLONS (est) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	12-22-94 1100 402692	NA	3	SAME AS ABOVE (20.75 - 21.0 FEET)	CL	1.5	PID 16 ppm; BY 10 cpm
21.5	12-22-94 1100 402692	NA	3	 STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2% FINE SAND, (1) HUGE LIMESTONE COBBLE HAS BEEN CORED BY RIG, AND ~~[illegible]~~ RESULTED IN THE FIVE FEET OF NO RECOVERY. Z = 6 cm	CL	2.0	PID 16 ppm; BY 10 cpm
21.75	12-22-94 1100 402692	NA	3	15.5 cm (7 IN); (4.0 IN) 10 cm	CL	2.0	PID 16 ppm; BY 10 cpm
22.0	12-22-94 1100 402692	NA	3	5Y/4/1 SILTY CLAY ← SAME AS ABOVE	CL	1.5	PID 16 ppm; BY 10 cpm
22.25	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
22.5	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
22.75	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

(See pg. 1)

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/4/95

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307- 11495-018	PAGE 14 OF 24
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11495	COORDINATES: See Pg 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-22-94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-22-94
WATER USED DURING DRILLING: 14.0 ~~15.6~~ GALLONS (est) JC 2-13-95	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
22.75 – 23.0	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
23.0 – 23.25	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
23.25 – 23.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
23.5 – 23.75	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
23.75 – 24.0	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
24.0 – 24.25	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
24.25 – 24.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

~~See Page 1~~

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC / 94-778.DRW (11-23-94)

FEMP QA 19 3/16/95

CONTROL NO.: 200307-11495-019

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11495	COORDINATES: See page 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See page 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-22-94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-22-94
WATER USED DURING DRILLING: 14.0 ~~12.6~~ GALLONS (est) JC 2-13-95	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 24.75	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
24.75 – 25.0	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
25.0 – 25.25	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
25.25 – 25.5	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
25.5 – 25.75	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
25.75 – 26.0	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
26.0 – 26.25	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP QA 13 45

CONTROL NO.: 200307-11495-020

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11495	COORDINATES: See Page 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-22-94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-22-94
WATER USED DURING DRILLING: 14.0 ~~BC~~ 2-13-95 GALLONS (est)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
26.25 – 26.5	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
26.5 – 26.75	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
26.75 – 27.0	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
27.0 – 27.25	12-22-94 1105 JCH ~~1105~~ OK 402688	NA	3	STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 5% FINE SAND, 10% FINE TO MEDIUM SUBANGULAR, GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, MOIST (1) 10 x 8 x 5 cm SUBANGULAR LIMESTONE COBBLE VERTICAL ORIENTATION	CL	1.5	PID 8.0 ppm; BY 10 cpm
27.25 – 27.5	12-22-94 1105 JCH ~~1105~~ OK 402688	NA	3	SAME AS ABOVE COBBLE EXTENDS 1.5 INCHES INTO INTERVAL	CL	1.75	PID 8.0 ppm; BY 10 cpm
27.5 – 27.75	12-22-94 1105 JCH ~~1105~~ OK 402688	NA	3	STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 2% FINE SAND, 5% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, NO COBBLES, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 8.0 ppm; BY 10 cpm
27.75 – 28.0	12-22-94 1105 JCH ~~1105~~ OK 402688	NA	3	SAME AS ABOVE (27.5 - 27.75 FEET)	CL	1.25	PID 8.0 ppm; BY 10 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: ~~SC 2-7-95~~ ~~None~~

See Page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/4/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11495-021

PAGE 17 OF 24

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~13.6~~ GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0 – 28.5	12-22-94 1105 JCH 2/14/95 ~~1110~~ 402688	NA	3	SAME AS ABOVE (27.75 - 28.0 FEET)	CL	1.75	PID 8.0 ppm BY 10 cpm
28.5	12-22-94 1105 JCH 2/14/95 ~~1110~~ 402688	NA	3	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY 2-3% FINE SAND, 7% MEDIUM TO FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, WOOD FRAGMENTS, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 8.0 ppm BY 10 cpm
28.75	12-22-94 1105 JCH 2/14/95 ~~1110~~ 402688	NA	3	STIFF SAME AS ABOVE (28.25 - 28.5 FEET)	CL	1.75	PID 8.0 ppm BY 10 cpm
29.0	12-22-94 1105 JCH 2/14/95 ~~1110~~ 402688	NA	3	SAME AS ABOVE (28.5 - 28.75 FEET)	CL	2.0	PID 8.0 ppm BY 10 cpm
29.25	12-22-94 1110 402694	NA	3	~~STIFF~~ SOFT (5Y 4/1) DARK GRAY, SILTY CLAY, 5% FINE SAND, 5-6% MEDIUM SUBANGULAR GRAVEL IRREGULAR ORIENTATION, MEDIUM PLASTICITY, MOIST	CL	0.5 ~~2.0~~	PID 8.0 ppm BY 10 cpm
29.5	12-22-94 1110 402694	NA	3	SAME AS ABOVE (29.0 - 29.25 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm
29.75	12-22-94 1110 402694	NA	3	SAME AS ABOVE (29.25 - 29.5 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 See Page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP QA 18

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11495-022	PAGE 18 OF 24
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11495	COORDINATES: See Pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-22-94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-22-94
WATER USED DURING DRILLING: 14.0 GALLONS (est)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
29.75 – 30.0	12-22-94 1110 402694	NA	3	SAME AS ABOVE (29.5 - 29.75 FEET) (1) 3x3x3cm LARGE SUBROUNDED GRAVEL, CHERT	CL	.5	PID 8.0 ppm BY 10 cpm
30.0 – 30.25	12-22-94 1110 402694	NA	3	SAME AS ABOVE (29.75 - 30.0 FEET) (1) 3x4x3cm LARGE SUBROUNDED	CL	.5	PID 8.0 ppm BY 10 cpm
30.25 – 30.5	12-22-94 1110 402694	NA	3	SAME AS ABOVE (30.0 - 30.25 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm
30.5 – 30.75	12-22-94 1110 402694	NA	3	SAME AS ABOVE (30.25 - 30.5 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm
30.75 – 31.0	12-22-94 1110 402694	NA	3	SAME AS ABOVE (30.5 - 30.75 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm
31.0 – 31.25	12-22-94 1110 402694	NA	3	SAME AS ABOVE (30.75 - 31.0 FEET) (1) 10x6x3 cm NODULAR LIMESTONE COBBLE, VERTICAL ORIENTATION	CL	.5	PID 8.0 ppm BY 10 cpm
31.25 – 31.5	12-22-94 1110 402694	NA	3	SAME AS ABOVE (31.0 - 31.25 FEET) ↑ COBBLE EXTENDS INTO THIS INTERVAL	CL	.5	PID 8.0 ppm BY 10 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

000664

G:/WPSC/94-776.DRW (11-23-94)

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11495-023

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: JC 2-13-95 14.0 ~~15.6~~ GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5	12-22-94 1110 JC 2/14/95 ~~1115~~ 402694	NA	3	SOFT (5Y 4/1) DARK GRAY, SILTY CLAY, 2-3% FINE SAND, 10% MEDIUM TO FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 8.0 ppm BY 10 cpm Moist. 402655
31.75	12-22-94 1110 JC 2/14/95 ~~1115~~ 402694	NA	3	SAME AS ABOVE (31.5 - 31.75 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm
32.0	12-22-94 1110 JC 2/14/95 ~~1115~~ 402694	NA	3	SAME AS ABOVE (31.75 - 32.0 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm
32.25	12-22-94 1110 JC 2/14/95 ~~1115~~ 402694	NA	3	SOFT (5Y 4/1) DARK GRAY SILTY CLAY, 4-5% FINE SAND, 2% MEDIUM SAND, 10-12% MEDIUM TO FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, SMALL WOOD FRAGMENTS, LOW PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 8.0 ppm BY 10 cpm
32.5	12-22-94 1110 JC 2/14/95 ~~1115~~ 402694	NA	3	SAME AS ABOVE (32.25 - 32.5 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm Moist. 402653
32.75	12-22-94 1110 JC 2/14/95 ~~1115~~ 402694	NA	3	SOFT (5Y 4/1) DARK GRAY SILTY CLAY, 2% FINE TO MEDIUM SAND, 5% ANGULAR FINE GRAVEL, IRREGULAR ORIENTATION, 2% WOOD FRAGMENTS, LOW PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 8.0 ppm BY 10 cpm
33.0	12-22-94 1115 402693	NA	3	SAME AS ABOVE (32.75 - 33.0 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm TCLP 402486 Tot. 4/200 403487

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLR 12/9/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000665

FEMP QA 19

CONTROL NO.: 200307-11495-024

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See Page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~13.0~~ GALLONS (est) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
33.25	12-22-94 1115 402693	NA	3	SAME AS ABOVE (33.0 - 33.25 FEET)	CL	.5	PID 8.0 ppm; BY 10 cpm
33.5	12-22-94 1115 402693	NA	3	SOFT (5Y 4/1) DARK GRAY, SILTY CLAY, 4-5% FINE SAND, 10% FINE TO MEDIUM ANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 8.0 ppm; BY 10 cpm
33.75	12-22-94 1115 402693	NA	3	SAME AS ABOVE (33.5 - 33.75 FEET)	CL	.5	PID 8.0 ppm; BY 10 cpm
34.0	12-22-94 1115 402693	NA	3	SAME AS ABOVE (33.75 - 34.0 FEET)	CL	.5	PID 8.0 ppm; BY 10 cpm
34.25	12-22-94 1115 402693	NA	3	SAME AS ABOVE (34.0 - 34.25 FEET)	CL	.5	PID 8.0 ppm; BY 10 cpm
34.5	12-22-94 1115 402693	NA	3	SOFT (5GY 5/1) GREENISH GRAY, SILTY CLAY 3% FINE SAND, 7-8% MEDIUM TO FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 8.0 ppm; BY 10 cpm
34.75	12-22-94 1115 402693	NA	3	SAME AS ABOVE (34.5 - 34.75 FEET)	CL	.5	PID 8.0 ppm; BY 10 cpm
35.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP QA 13

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11495-025

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See PG 1

RELATED FAL NO.s:

SURFACE ELEVATION: SEE PG 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~13.0~~ GALLONS (EST) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0 – 35.25	12-22-94 1115 402693	NA	3	SOFT (5Y 4/1) DARK GRAY, SILTY CLAY, 1-2% FINE TO MEDIUM SAND, 10% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 8.0 ppm BY 10 cpm
35.25 – 35.5	12-22-94 1115 402693	NA	3	SAME AS ABOVE (35.0 - 35.25 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm
35.5 – 35.75	12-22-94 1115 402693	NA	3	SAME AS ABOVE (35.25 - 35.5 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm
35.75 – 36.0	12-22-94 1115 402693	NA	3	SOFT (5Y 4/1) DARK GRAY SILTY CLAY, 3% FINE TO MEDIUM SAND, 10% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, (1) 3 x 3 x 2 cm CHUNK OF LIGNITE, MEDIUM PLASTICITY, SLIGHTLY MOIST, SLIGHT IRON STAINING	CL	.5	PID 8.0 ppm BY 10 cpm
36.0 – 36.25	12-22-94 1115 402693	NA	3	SAME AS ABOVE (35.75 - 36.0 FEET) WITH A (5Y 5/3) OLIVE FINE SAND, (POORLY SORTED) LAMINATION, APPROX 1CM THICK	CL	.5	PID 8.0 ppm BY 10 cpm
36.25 – 36.5	12-22-94 1115 402693	NA	3	SOFT (5Y 4/1) DARK GRAY SILTY CLAY, 5% FINE SAND, 10-12% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, NO LAMINATIONS, OF SILT, SAND, OR GRAVEL, MEDIUM PLASTICITY, MOIST	CL	.5	PID 8.0 ppm BY 10 cpm
36.5 – 36.75	12-22-94 1115 402693	NA	3	SAME AS ABOVE (36.25 - 36.5 FEET)	CL	.5	PID 8.0 ppm BY 10 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

SEE PAGE 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000667

FEMP CA 18

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307- 11495- 026

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See Pg 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: 14.0 ~~15.6~~ 32.2 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
36.75	12-22-94 1115 402693	NA	3	SAME AS ABOVE (36.5 - 36.75 FEET) SLIGHTLY MOIST	CL	.5	PID 8.0 ppm BY 10 cpm
37.0	12-22-94 1115 402693	NA	3	SOFT (5Y 4/1) DARK GRAY, SILTY CLAY, 5% FINE TO MEDIUM, 15% MEDIUM TO FINE SUBANGULAR TO ANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST TO MOIST	CL	.5	PID 7.5 ppm BY 10 cpm Moist. 402654
37.25	12-22-94 1115 402693	NA	3	SAME AS ABOVE (37.0 - 37.25 FEET) SLIGHTLY MOIST	CL	.5	PID 7.5 ppm BY 10 cpm
37.5	12-22-94 1115 402693	NA	3	SAME AS ABOVE (37.25 - 37.5 FEET)	CL	.5	PID 7.5 ppm BY 10 cpm
37.75	12-22-94 1115 402693	NA	3	SAME AS ABOVE (37.5 - 37.75 FEET)	CL	.5	PID 7.5 ppm BY 10 cpm
38.0	12-22-94 1115 402693	NA	3	SOFT (5Y 4/1) DARK GRAY, SILTY CLAY, 2% FINE SAND, 10% MEDIUM TO FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION, SLIGHT IRON STAINING, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 7.5 ppm BY 10 cpm
38.25	12-22-94 1115 402693	NA	3	SAME AS ABOVE (38.0 - 38.25 FEET)	CL	.5	PID 7.5 ppm BY 10 cpm
38.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~ABOVE~~ See Pg 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 18

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11495-027

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: JC 2-13-95 14.0 ~~13.6~~ GALLONS (CS)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5	12-22-94 1115 402693	NA	3	SAME AS ABOVE (38.25 - 38.5 FEET)	CL	.5	PID 7.5 ppm; BY 10 cpm
38.75	12-22-94 1115 402693	NA	3	SAME AS ABOVE (38.75 - 39.0 FEET) (<1%) TRACE OF FINE WOOD FRAGMENTS	CL	.5	PID 7.5 ppm; BY 10 cpm
39.0	12-22-94 1115 402672	NA	3	SOFT (5Y 4/1) DARK GRAY SILTY CLAY, 5% FINE SAND, 10-12% FINE ANGULAR TO SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, NO LAMINATIONS OF SILT, SAND, OR GRAVEL, TRACE OF FINE WOOD FRAGMENTS, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 7.5 ppm; BY 10 cpm
39.25	12-22-94 1115 402672	NA	3	SAME AS ABOVE (39.0 - 39.25 FEET)	CL	.5	PID 7.5 ppm; BY 10 cpm
39.5	12-22-94 1115 402672	NA	3	SAME AS ABOVE (39.25 - 39.5 FEET)	CL	.5	PID 7.5 ppm; BY 10 cpm
39.75	12-22-94 1115 402672	NA	3	SAME AS ABOVE (39.5 - 39.75 FEET)	CL	.5	PID 7.5 ppm; BY 10 cpm
40.0	12-22-94 1115 402672	NA	3	SAME AS ABOVE (39.75 - 40.0 FEET)	CL	.5	PID 7.5 ppm; BY 10 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~ALPHA~~ See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

000669

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 19

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11495-028

PAGE 24 OF 24

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11495

COORDINATES: See Pg 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 12-22-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 12-22-94

WATER USED DURING DRILLING: H_2O ~~13.6~~ GALLONS (est) SC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
40.25	12-22-94 1115 402672	NA	3	SOFT (5Y 4/1) DARK GRAY, SILTY CLAY, 5% FINE TO MEDIUM SAND, 3% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 7.5 ppm BY 10 cpm
40.5	12-22-94 1115 402672	NA	3	SAME AS ABOVE (40.25 - 40.5 FEET)	CL	.5	PID 7.5 ppm BY 10 cpm
40.75	12-22-94 1115 402672	NA	3	SAME AS ABOVE (40.75 - 41.0 FEET)	CL	.5	PID 7.5 ppm BY 10 cpm
41.0	12-22-94 1115 402672	NA	3	SAME AS ABOVE (40.75 - 41.0 FEET)	CL	.5	PID 7.5 ppm BY 10 cpm
41.25	12-22-94 1115 402672	NA	3	SOFT (5Y 4/1) DARK GRAY SILTY CLAY, 5-7% FINE SAND, 1-2% MEDIUM SAND, 5-6% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, NO INCLUSIONS OR LAMINATIONS PRESENT, TRACE OF FINE WOOD FRAGMENTS, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 7.5 ppm BY 10 cpm
41.5	12-22-94 1115 402672	NA	3	SAME AS ABOVE (41.25 - 41.5 FEET)	CL	.5	PID 7.5 ppm BY 10 cpm
41.75	12-22-94 1115 402672	NA	3	SAME AS ABOVE (41.5 - 41.75 FEET)	CL	.5	PID 7.5 ppm BY 10 cpm
42.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: ~~Borehole Bottom 42.0 feet~~ SC 2-7-95 ~~Above~~

See Page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

G:/WPSC/94-776.DRW (11-23-94)

2-17-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11497-005	PAGE 1 OF
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11497	COORDINATES: N482096.702 ; E1382475.224
RELATED FAL NO.s:	
SURFACE ELEVATION: 604.79 ft.	GROUNDWATER LEVEL: / DATE: / TIME:
DATE STARTED: 27 DEC 94	
GEOLOGIST: LEE / GEIGER / RILEY MULLER	GROUNDWATER LEVEL: / DATE: / TIME:
DATE COMPLETED: 27 DEC 94	
WATER USED DURING DRILLING: ~~12.8~~ 13.6 GALLONS (Est) SC 2-13-95	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / F

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	12-27-94 402684 13:05	NA	6	MEDIUM STIFF (2.5Y, 4/3) OLIVE BROWN SILTY CLAY, 20% ORGANICS (ROOTS) TRACE FINE SAND, MEDIUM - HIGH PLASTICITY MOIST	CL	0.75	PID 6.3 PP; BY 70 CPM
0.5	12-27-94 402684 13:05	NA	6	MEDIUM STIFF (2.5Y, 4/3) OLIVE BROWN SILTY CLAY, TRACE SAND, ORGANICS, BLACK AND ORANGE MOTTLES, HIGHLY PLASTIC, MOIST	CL	0.75	PID 6.3 ppm; BY 70 CPM
1.0	12-27-94 402684 13:05	NA	6	SAA	CL	0.75	PID 6.3; BY 70 CPM
1.5	12-27-94 402684 13:05	NA	6	STIFF (2.5Y, 4/4) OLIVE BROWN, SILTY CLAY, 5% MEDIUM SAND, TRACE BLACK MOTTLES, ORGANICS	CL	2.0	PID 6.3 ppm; BY 70 cpm
2.0	12-27-94 402684 13:05	NA	6	STIFF (2.5Y, 5/4) LIGHT OLIVE BROWN SILTY CLAY, ~~TRACE~~ 15% MEDIUM - COARSE SUBANGULAR - SUB ROUNDED SAND HIGH PLASTICITY, MOIST	CL	1.75	PID 6.3 PPM; BY 70 CPM
2.5	12-27-94 402684 13:05	NA	6	VERY STIFF (2.5Y, 4/3) OLIVE BROWN SILTY CLAY, 10% SUB ANGULAR MEDIUM - COARSE SAND, TRACE FINE GRAVEL, ORGANICS, ORANGE MOTTLES, MEDIUM PLASTICITY MOIST	CL	2.75	PID 6.3 ppm; BY 70 CPM
3.0	12-27-94 402687 13:15	NA	6	HARD (2.5Y, 5/4) LIGHT OLIVE BROWN SILTY CLAY, 25% SUBANGULAR MEDIUM SAND, 5% SUBANGULAR COARSE SAND TRACE ORGANICS, MEDIUM PLASTICITY MOIST	CL	4.25	PID 7.5 ppm; BY 55 CPM
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	5.9	12/27/94	10:00
ALPHA	NA	NA	NA
BETA / GAMMA	60	12/27/94	10:00

NOTES: SAA = SAME AS ABOVE Also This Lithologic Log was updated using Archived Soil Cores by Geologists Barry Muller and Cliff Lee ON 02/02/95 and 02/03/95

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 1/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000671

FEMP OA 19 2-17-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11497-006	PAGE 2 OF 12
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11497	COORDINATES: See Pg.1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg.1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-27-94
GEOLOGIST: LEE / GEIGER / RILEY / MULLER	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-27-94
WATER USED DURING DRILLING: ~~42.8~~ 130 GALLONS (Est)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	12-27-94 402687 13:15	NA	6	VERY STIFF (2.5Y, 5/4) LIGHT OLIVE BROWN SILTY CLAY, 25% MEDIUM - COARSE SUB ANGULAR SAND, TRACE SUBANGULAR COARSE GRAVEL, ORANGE MOTTLES, MEDIUM PLASTICITY, MOIST	CL	2.0	PID 7.5 ppm BY 55 CPM
4.0	12-27-94 402687 13:15	NA	6	SAA	CL	2.0	PID 7.5 ppm BY 55 CPM
4.5	12-27-94 402687 13:15	NA	6	0-5 SAA 5-6 VERY STIFF (2.5Y, 5/4) LIGHT OLIVE BROWN SILTY CLAY, 50% ROUNDED MEDIUM - COARSE GRAVEL, LOW PLASTICITY, MOIST	CL	2.0	PID 7.5 ppm BY 55 CPM
5.0	12-27-94 402687 13:15	NA	6	VERY STIFF (2.5Y, 5/4) LIGHT OLIVE BROWN SILTY CLAY, 15% MEDIUM SUB ANGULAR SAND, 5% COARSE SUBANGULAR COARSE SAND, ORANGE AND GRAY MOTTLES HIGH PLASTICITY, MOIST	CL	2.0	PID 7.5 ppm BY 55 CPM
5.5	12-27-94 402687 13:15	NA	6	VERY STIFF (2.5Y, 5/6) LIGHT OLIVE BROWN SILTY CLAY, 20% SUB ROUNDED MEDIUM SAND, 5% SUB ROUNDED COARSE SAND MEDIUM PLASTICITY, MOIST PRONOUNCED BEDDING	CL	2.0	PID 7.5 ppm BY 55 CPM
6.0	12-27-94 402687 13:15	NA	6	0-2 SAA 2-6 STIFF (2.5Y, 4/4) OLIVE BROWN, SILTY CLAY, 5% SUBANGULAR COARSE SAND TRACE ORANGE MOTTLES, LOW PLASTICITY, MOIST	CL	2.0	PID 7.5 ppm BY 55 CPM
6.5	12-27-94 402687 13:15	NA	6	STIFF (2.5Y, 5/4) LIGHT OLIVE BROWN SILTY CLAY, 5% MEDIUM ROUNDED SAND, <3% ROUNDED COARSE SAND, HIGH PLASTICITY MOIST	CL	2.0	PID 7.5 ppm BY 55 CPM
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: SAA = SAME AS ABOVE Also; See Pg.1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11497-007	PAGE 3 OF 12
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11497	COORDINATES: See Pg.1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg.1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-27-94
GEOLOGIST: LEE / GEIGER / RILEY MULLER	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-27-94
WATER USED DURING DRILLING: ~~[illegible]~~ 130 GALLONS (EST)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0	12-27-94 402686 13:25	NA	6	VERY STIFF (2.5Y, 5/4) LIGHT OLIVE BROWN VERY SILTY CLAY, 5% SUBANGULAR - SUB ROUNDED COARSE SANDS, 10% SUB-ANGULAR MEDIUM SANDS, HIGH PLASTICITY, MOIST	CL	2.5	PID 8.5 ppm BY 50 CPM
7.5	12-27-94 402686 13:25	NA	6	SAA 02FEB95 BEM	CL	2.5	PID 8.5 ppm BY 50 CPM
8.0	12-27-94 402686 13:25	NA	6	SOFT (2.5Y, 4/4) OLIVE BROWN, ~~SANDY SILTY CLAY~~ 50% SUB ANGULAR MEDIUM SAND, 10% SUBANGULAR COARSE SAND MEDIUM ANGULAR GRAVEL, LOW PLASTICITY, VERY MOIST - WET SILTY CLAY SAND	SC	2.25	PID 8.5 ppm BY 50 CPM
8.5	12-27-94 402686 13:25	NA	6	STIFF (2.5Y, 5/4) LIGHT OLIVE BROWN SILTY CLAY, 10% MEDIUM ROUNDED SAND, 5% COARSE ROUNDED SAND, HIGH PLASTICITY, MOIST	CL	2.0	PID 8.5 ppm BY 50 CPM
9.0	12-27-94 402686 13:25	NA	6	VERY STIFF (5Y, 4/2) OLIVE GRAY, SILTY CLAY, 3% COARSE SUB ANGULAR SAND, TRACE COARSE GRAVEL, YELLOW SILTY MOTTLES, MEDIUM - HIGH PLASTICITY, MOIST	CL	3.0	PID 8.5 PPM BY 50 CPM
9.5	12-27-94 402686 13:25	NA	6	VERY STIFF VERTICALLY MARBLED (2.5Y, 5/4) LIGHT OLIVE BROWN AND (2.5, 5/1) GRAY CLAYEY SILT, 25% MEDIUM - COARSE SUBANGULAR SAND, LOW PLASTICITY, VERY MOIST	ML	3.0	PID 8.5 ppm BY 50 CPM
10	12-27-94 402681 13:25	NA	6	OLIVE BROWN (2.5Y 4/4) CLAY, SILTY, SL. MOIST WITH 20-25% Med.-coarse sand, plastic, marbled WITH DARK GRAYISH BROWN (2.5Y 4/2) CLAY, STIFF, LOW PLASTICITY, AND GRAVEL - FINE to COARSE SUBANGULAR (15-20%), MOSTLY @ BASE of 6" interval	ML	0.25	PID 8.5 ppm BY 50 CPM (6 cm MAX. SIZE)
10.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: SAA = SAME AS ABOVE Also; See Pg.1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLR 1/4/95

FS-F-3681

000673

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 4 OF 12
200307-11497-008	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11497	See Pg. 1	

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg. 1				12-27-94

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
LEE / GEIGER / RILEY / MULLER				12-27-94

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
12-13-96 13.0 GALLONS (EST)	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	12-27-94 402681 13:30	NA	6	LIGHT OLIVE BROWN (2.5Y 5/4) CLAY, V. SILTY SL. MOIST, LOW PLASTICITY; WITH GRAVEL (20-25%) FINE TO COARSE, SUBANGULAR; AND SAND (COARSE, SUBANGULAR) (5-10%) NO GRAIN ORIENTATION: COARSEST CLASTS TO 4 CM MAX.	CL	0.25	PID 8.5 ppm BY 50 cpm
11.0	12-27-94 402681 13:30	NA	6	OLIVE BROWN (2.5Y 4/4) CLAY, SILTY, SL. MOIST, LOW PLASTICITY, W/ 20-25% MED.-COARSE SAND, MARBLED WITH DARK GRAYISH BROWN (2.5Y 4/2) CLAY, V. STIFF LOW PLASTICITY, V. SL. MOIST - ALL W/ GRAVEL (15-20%) FINE TO COARSE, SUBANGULAR: MAX. GRVL. SIZE - 5-7 cm	CL / ML	0.25 / 275	PID 8.5 ppm BY 50 cpm
11.5	12-27-94 402681 13:30	NA	6	GRAYISH BROWN (2.5Y 5/2) CLAY, V. STIFF, MED. PLASTICITY, V. SL. MOIST, SL. SILTY, WITH GRAVEL, FINE (TO COARSE) SUBANGULAR (5-10% MAX.) - MAX. SIZE OF GRAVEL CLASTS: 1-2 cm	CL	1.0	PID 8.5 ppm BY 50 cpm
12.0	12-27-94 402681 13:30	NA	6	COBBLE - GRAVEL ZONE: MAX. 9x6x4 cm SIZED SUBANGULAR, MOSTLY MICROCRYSTALLINE LIMESTONE CLASTS & MECHANICALLY PRODUCED LIMESTONE "FLOUR" W/ V. MINOR (<5%) ANGULAR TO SUBANGULAR SILICA (SILT-SIZE)	NA	NA	PID 8.5 ppm BY 50 cpm
12.5	12-27-94 402681 13:30	NA	6	OLIVE BROWN (2.5Y 4/3) CLAY, MOD. PLASTICITY, TO GREENISH GRAY (5GY 5/1), MEDIUM STIFF TO STIFF SL. MOIST, WITH FINE GRAVEL (10-15%) COARSE (SUBANGULAR & SUBRDED), CHERTY & MICROXTALLINE, MAX. SIZE TO 1.5 cm	CL	1.0	PID 8.5 ppm BY 50 cpm
13.0	12-27-94 13:30	NA	0	NO RECOVERY (NR)	NA	NA	PID NA ppm BY NA cpm
13.5	12-27-94 13:30	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

811

CONTROL NO.: 200307-11497-009

FEMP
LITHOLOGIC LOG

PAGE 5 OF 12

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11497

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-27-94

GEOLOGIST: LEE GEIGER / RILEY / MULLER

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-27-94

WATER USED DURING DRILLING: 2-13-95 ~~22.8~~ 32 (Est) GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	12-27-94 13:40	NA	0	NO RECOVERY (NR)	NA	NA	PID 8.5 ppm BY 70 CPM
14.5	12-27-94 13:40	NA	0	NR	NA	NA	PID 8.5 ppm BY 70 CPM
15.0	12-27-94 13:40	NA	0	NR	NA	NA	PID 8.5 PP BY 70 CPM
15.5	12-27-94 13:40	NA	0	NR	NA	NA	PID 8.5 ppm BY 70 CPM
16.0	12-27-94 13:40	NA	0	NR	NA	NA	PID 8.5 PPM BY 70 CPM
16.5	12-27-94 13:40	NA	0	NR	NA	NA	PID 8.5 ppm BY 70 CPM
17.0	12-27-94 402680 13:40	NA	6	OLIVE GRAY (5Y 4/2) CLAY, SL. SILTY, SL. MOIST, MEDIUM PLASTICITY, MEDIUM STIFF, WITH GRAVEL, FOSSILIFEROUS LS. & MICROXTALLINE LS, SUBANGULAR, FINE TO COARSE, MAX. SIZE 4x3x2 CM, SOME PLATY LS. FRAGS, VERTICALLY ORIENTED ON EDGE	CL	1.0	PID 8.5 PPM BY 50 CPM
17.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 1/4/95

FS-F-3681

000675

F-286

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

2-17-95

CONTROL NO.: 200307-11497-010	PAGE 6 OF 12
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11497	COORDINATES: See Pg. 1	RELATED FAL NO.(s):
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED: 12-27-94
GEOLOGIST: LEE GEIGER / RILEY / MULLER	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED: 12-27-94
WATER USED DURING DRILLING: SC 2-13-95 ~~128~~ 138 GALLONS (EST.)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL	DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5	12-27-94 402680 13:45	NA	6	OLIVE GRAY (5Y 4/2) CLAY, SL. SILTY, SL. MOIST, MEDIUM PLASTICITY, MEDIUM STIFF, V.SL. (≈5%) ORGANICS, WITH GRAVEL: MOSTLY CHERTY SUB-ANGULAR AND SUBROUNDED, FINE TO COARSE (15-20% OF MASS) 2-3 cm MAX. SIZE; V.P. SORTED	CL	1.0	PID 8.5 ppm BY 50 CPM
18.0	12-27-94 402680 13:45	NA	6	SAME CLAY AS ABOVE: W/ GRAVEL, MOSTLY FOSSILIFEROUS, FINE TO COARSE, SUBANGULAR (15-20% OF MASS) MAX. SIZE ~~4 cm~~ 2-8 cm, FINE > COARSE, V. POORLY SORTED NO ORIENTATION 2/6/95	CL	1.0	PID 8.5 ppm BY 50 CPM
18.5	12-27-94 402680 13:45	NA	6	SAME AS ABOVE: GRAVEL FINE TO COARSE (15-20%), COMPOSED OF MUDSTONE, CHERT & FOSSILIF. LS. CLASTS, ROUNDED TO SUBANGULAR [V. POORLY SORTED] CLASTS ISOLATED, NO ORIENTATION, MAX. CLAST SIZE 4x3x2 cm (5G 4/1)	CL	1.0	PID 8.5 ppm BY 50 CPM
19.0	12-27-94 402680 13:45	NA	6	SAME AS ABOVE: SLIGHT INCREASE IN FINE GRAVEL FRACTION (TO 15% of 20% TOTAL OF MASS) MAX. SIZED CLAST ORIENTED SUB VOR. 6x4.5x2 cm	CL	1.0	PID 8.5 ppm BY 50 CPM
19.5	12-27-94 402680 13:45	NA	6	SAME AS ABOVE: GRAVELS (NOW 20-25% OF MASS) MOSTLY COARSE, SUBANGULAR TO SUBROUNDED W/ CHERT & LS. FRAGMENTS COARSEST CLAST 8x7x5 cm V. POORLY SORTED, GRAVELS FAIRLY DENSLY PACKED TOGETHER IN CLAY	CL TO GC	1.0	PID 8.5 ppm BY 50 CPM
20.0	12-27-94 402680 13:46	NA	6	SAME AS ABOVE: GRAVEL (20-25% OF MASS) V. POORLY SORTED: LS & CHERT, F. to COARSE GRVL. LARGEST CLAST MICROXTALLINE LS., ORIENTED ON EDGE: ↕ 7cm (WIDTH 3cm & LENGTH 10cm) FINES ISOLATED	CL	1.0	PID 8.5 ppm BY 50 CPM
20.5	12-27-94 13:45	NA	0	NO RECOVERY (NR)	NA	NA	PID ~~8.5~~ SC 2-8-95 NA ppm BY ~~50~~ SC 2-8-95 NA CPM
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11497-011

PAGE 7 OF 12

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11497

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-27-94

GEOLOGIST: LEE GEIGER / RILEY / MILLER

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-27-94

WATER USED DURING DRILLING: 13.0 GALLONS (est) | DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL | DRILLING EQUIPMENT: ROTASONIC | DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	12-27-94 13:50	NA	0	NO RECOVERY (NR)	NA	NA	NA PID ~~8.5~~ JC 2-8-95 PPM; BY NA ~~50~~ JC 2-8-95 CPM
21.6	12-27-94 13:50	NA	0	NR	NA	NA	PID NA ~~8.5~~ JC 2-8-95 PPM; BY NA ~~50~~ JC 2-8-95 CPM
22.0	12-27-94 13:50	NA	0	NR	NA	NA	PID NA ~~8.5~~ JC 2-8-95 PPM; BY NA ~~50~~ JC 2-8-95 CPM
22.5	12-27-94 13:50	NA	0	NR	NA	NA	PID NA ~~8.5~~ JC 2-8-95 PPM; BY NA ~~50~~ JC 2-8-95 CPM
23.0	12-27-94 402683 13:50	NA	6	OLIVE GRAY (5Y 4/2) CLAY, SL. SILTY, SL. MOIST, MEDIUM PLASTICITY, MEDIUM STIFF, WITH FINE TO COARSE GRAVEL (15-20%) SUBROUNDED & SUBANGULAR CLASTS ISOLATED IN CLAY MATRIX MAX. GRAVEL SIZE: 5 X 4 X 3.5 CM W/ NO ORIENTATION	CL	1.0	PID 8.5 PPM; BY 50 CPM
23.5	12-29-94 402683 13:50	NA	6	SAME BLOCKY CLAY AS ABOVE, WITH FINE TO COARSE CHERTY GRAVEL (15-20%). ISOLATED IN MATRIX, W/ NO ORIENTATION IN BOTTOM 4CM <5% FOSSIL FRAGMENTS MAX. & SUBANGULAR CLAST SIZE: 3 X 3 X 3 CM	CL	1.0	PID 8.5 PPM; BY 50 CPM
24.0	12-27-94 402683 13:50	NA	6	SAME AS ABOVE, SL. LESS GRAVEL (10-15% OF MASS) COARSEST CLAST SUBHORIZONTALLY ORIENTED, SUBROUNDED GREENISH GRAY TO DARK GRNSH. GRAY (5GY5/1 TO 5G 4/1) MNDSTN. MEASURING 4 X 3 X 1.5 CM	CL	1.0	PID 8.5 PPM; BY 50 CPM
24.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/14/10

FS-F-3681

000677

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11497-012	PAGE 8 OF 12
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11497	COORDINATES: See Pg.1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg.1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-27-94
GEOLOGIST: LEE / GEIGER / RILEY / MULLER	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-27-94
WATER USED DURING DRILLING: 5-13-94 ~~8~~ 13.0 GALLONS (EGI)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTHEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5	12-27-94 402683 1350	NA	6	OLIVE GRAY (5Y 4/2) TO GRAY (5Y 5/1) CLAY, SL. MOIST, MEDIUM PLASTICITY, MED. STIFF, SL. SILTY, WITH MOSTLY FINE (>15%) TO COARSE (<5%) GRAVEL, SUBANGULAR TO SUBROUNDED, MOSTLY CHERTY, ISOLATED CLASTS TO 1 CM IN NO ORIENTATION	CL	1.0	PID 8.5 ppm BY 50 cpm
25.0	12-27-94 402683 1350	NA	6	CLAY AS ABOVE, WITH MUDSTONE-CHERT & LS. CLASTS, FINE TO COARSE GRAVEL AS ABOVE; LARGEST CLAST MICROXTALLINE LS. FRAG. OBLIQUELY ORIENTED @ 45° ALONG LONGEST AXIS: DIMENSIONS: 6 x 4 x 2 cm COARSEST CLASTS IN TOP 5 CM	CL	1.0	PID 8.5 ppm BY 50 cpm
25.5	12-27-94 402683 1350	NA	6	CLAY & GRAVEL AS ABOVE, COARSEST CLAST(S) IN BOTTOM 4 CM, MOSTLY SUBANGULAR, MAX. SIZE: 5.5 x 3 x 2 cm	CL	1.0	PID 8.5 ppm BY 50 cpm
26.0	12-27-94 402683 1350	NA	6	OLIVE TO GRAY CLAY AS ABOVE, MOIST, GRAY MED. PLASTICITY, MED. STIFF, SL. SILTY, WITH GRAVEL AS ABOVE, ISOLATED & NO ORIENTATION. OBLIQUELY ORIENTED WOOD FRAGS. 6-7 cm OFF BOTTOM	CL	1.0	PID 8.5 ppm BY 50 cpm Moist. 403467
26.5	12-27-94 13:50	NA	0	NO RECOVERY (NR)	NA	NA	PID NA ppm BY NA cpm
27.0	12-27-94 13:50	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
27.5	12-27-94 13:50	NA	0	NR	NA	NA	PID NA ppm BY NA cpm
28.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg.1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11497-013

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11497

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-27-94

GEOLOGIST: LEE / GEIGER / RILEY / MULLER

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-27-94

WATER USED DURING DRILLING: JC 2-15-95 ~~12.0~~ 13.0 GALLONS (EST)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0 – 28.6	12-27-94 402682 14:00	NA	6	GRAY (5Y 5/1) CLAY, V. MOIST TO MOIST, SL. SILTY, SOFT TO MEDIUM STIFF, V. SL. SANDY (<3%) MODERATELY PLASTIC, WITH GRAVEL FINE TO COARSE (15-20%), W/ NO ORIENTATION, SUBANGULAR MAX. SIZE 3x3.5x2 CM : CLASTS ISOLATED	CL	1.0	PID 8.5 ppm BY 50 CPM
28.6 – 29.0	12-27-94 402682 14:00	NA	6	MOIST CLAY & GRAVEL AS ABOVE · MOSTLY SUBANGULAR ISOLATED CHERTY & MICRO-XTALLINE LS. GRAVEL (15-20%) - V.P. SORTED MAX. CLASTS 2-3 CM IN DIAMETER	CL	1.0	PID 8.5 ppm BY 50 CPM MOISTURE CONTENT: SN 403468
29.0 – 29.6	12-27-94 402682 14:00	NA	6	GRAY (5Y 5/1) CLAY, MOIST TO SL. MOIST, SL. SOFT TO MEDIUM STIFF, V.SL. SANDY, SILTY, IN PART MOD. PLASTICITY, WITH OBLIQUELY-(MID- 6-8 CM) ORIENTED PLANAR LS. FRAGS. & CHERTY GRAVEL (MOSTLY ISOLATED) MAX. SIZE: 1 X 3 X 4 CM	CL	1.0	PID 8.5 ppm BY 50 CPM
29.6 – 30.0	12-27-94 402682 14:00	NA	6	SAME AS ABOVE, WITH GRAVELS TO 20-25%, INCLUDING CHERT, LS., & MUDSTONE - MATRIX SL. MORE SANDY (SUBANGULAR, MED-GRAINED) ALL GRAVELS < 2CM SUBANGULAR	CL	1.0	PID 8.5 ppm BY 50 CPM
30.0 – 30.6	12-27-94 402682 14:00	NA	6	SAME AS ABOVE, WITH INCREASED FINE GRAVEL CONTENT (RELATIVE TO COARSE) W/A 20-25% GRAVELS (BY MASS) (CLAYS STILL MOIST) MAX. LS. CLAST SIZE: 5x4x1.5 CM	CL	1.0	PID 8.5 ppm BY 50 CPM TCLP : 402767 TOTAL U : 403488 DUP TOTAL: 403489
30.6 – 31.0	12-27-94 402682 14:00	NA	6	SAME CLAY AS ABOVE: INTERVAL MOIST TO VERY MOIST, BUT GROSSLY DISTURBED WHEN OBSERVED IN LABORATORY STILL ~ 15-20% GRAVEL IN LOOSE MATRIX	CL	1.0	PID 8.5 ppm BY 50 CPM
31.0 – 31.5	12-27-94 14:00	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 1/11/95

FS-F-3661

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

3-17-95

CONTROL NO.: 200307-11497-014	PAGE 10 OF 12
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11497	COORDINATES: See Pg. 1	RELATED FAL NO.s:
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED: 12-27-94
GEOLOGIST: LEE / GEIGER / RILEY / MULLER	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED: 12-27-94
WATER USED DURING DRILLING: JC 2-13-95 ~~12.0~~ 13.0 GALLONS (Est)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL	DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5 – 32.0	12-27-94 14:00	NA	0	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
32.0 – 32.5	12-27-94 402685 14:00	NA	6	GRAY (5Y 5/1) CLAY, STIFF TO V. STIFF, V. SL. MOIST, MODERATE PLASTICITY, SL. SILTY TO SILTY WITH GRAVEL (20-25%) FINE TO V. COARSE, MOSTLY SUBANGULAR, ISOLATED TO MOD. CONCENTRATION, SOME TILTED, MAX SIZE: 6 x 5.5 x 3 cm	CL	2.5+	PID 8.5 ppm; BY 50 cpm; moist. 403469
32.5 – 33.0	12-27-94 402685 14:00	NA	6	CLAY (5Y 5/1) MOD. STIFF V. SL. MOIST, MOD. PLASTICITY, SILTY W/ GRAVEL (20-25%) FINE TO COARSE (MAX. SIZE 5.5 x 3 x 3 cm) V. POORLY SORTED, ISOLATED, MOSTLY SUBANGULAR	CL	2.0	PID 8.5 ppm; BY 50 cpm
33.0 – 33.5	12-27-94 402685 14:00	NA	6	SAME AS ABOVE, GRAVELS MOSTLY COARSE TO FINE SUBANGULAR TO SUBROUNDED, ISOLATED CHERTS & LS. FRAGMENTS W/ NO ORIENTATION	CL	2.0	PID 8.5 ppm; BY 50 cpm
33.5 – 34.0	12-27-94 402685 14:00	NA	6	SAME AS ABOVE, W/ SEVERAL SUB-ANGULAR TILTED MUDSTONE CLASTS (DARK GREENISH GRAY - 5G 4/1): GRAVELS (20-25% ABOVE, 15-20% BOTTOM 5 cm) V. poorly SORTED	CL	2.0	PID 8.5 ppm; BY 50 cpm
34.0 – 34.5	12-27-94 402685 14:00	NA	6	SAME AS ABOVE, NO COARSE GRAVEL IN BOTTOM 5 cm, STILL HAS TILTED MUDSTONE CLASTS AS ABOVE	CL	2.0	PID 8.5 ppm; BY 50 cpm
34.5 – 35.0	12-27-94 402685 14:00	NA	6	SAME AS ABOVE, W/ COARSEST SUB-ANGULAR GRAVEL CLAST @ 8 x 7 x 5 cm (TILTED): GRAVEL (15-20%) ISOLATED & V. P. SORTED CLAY SOFT TO MOD. STIFF & SL. MOIST	CL	1.0	PID 8.5 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLA 12/9/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

FEMP QA 19

CONTROL NO.: 200307-11497-015

PAGE 11 OF 12

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11497

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 12-27-94

GEOLOGIST: LEE / GEIGER / RILEY / MULLER

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 12-27-94

WATER USED DURING DRILLING: JC 2-13-96 ~~12.8~~ 13.0 GALLONS (EST)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
33.0 – 35.5	12-27-94 402686 14:00	NA	6	GRAY (5Y 5/1) CLAY, SOFT TO MOD. STIFF, SILTY MOIST, MODERATE PLASTICITY, VARYING TO A DARK BROWN (7.5YR 3/2) CLAY 'STAIN' AT ONE GRAVEL CLUSTER, W/ F. TO COARSE GRAVEL (15-20%) ISOLATED, MOSTLY SUBANGULAR, AVG. SIZE 2-3 cm	CL	1.0 TO 2.0	PID 8.5 ppm BY 50 cpm
35.5 – 36.0	12-27-94 402685 14:00	NA	6	GRAY CLAY AS ABOVE, SILTY, W/ F. TO C. GRAVEL, SUBANGULAR, ISOLATED AVG SIZE 2-4 cm) & 5-10% COARSE SUBANGULAR SAND IN V. THIN LENSES; GRAVELS INCLUDE MUDSTONE (A.A.), LS. & CHERT	CL	1.0 TO 1.5	PID 8.5 ppm BY 50 cpm
36.0 – 36.5	12-27-94 402685 14:00	NA	5	GRAY CLAY AS ABOVE, SILTY, SOFT TO MOD. STIFF W/ GRAVEL AS ABOVE: COARSEST ISOLATED SUBANGULAR CLAST MEASURES 3 X 2.5 X 2.5 cm (TILTED)	CL	1.0 TO 2.0	PID 8.5 ppm BY 50 cpm
36.5 – 37.0	12-27-94	NA	0	NO RECOVERY	NA	NA	PID NA ppm BY NA cpm
37.0	12-27-94 14:00	NA		TOTAL DEPTH OF BORING @ 37'			PID ppm BY cpm
		NA					PID ppm BY cpm
		NA					PID ppm BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

000681

FEMP QA 1.95 3/16

118

CONTROL NO.: 200307 - 11496 - 005

FEMP
LITHOLOGIC LOG

PAGE 1 OF 7

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11496	COORDINATES: N482096.758 E1382464.205 / RELATED FAL NO.s:
SURFACE ELEVATION: 605.10	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-27-94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-27-94
WATER USED DURING DRILLING: 8.0 ~~GALLONS~~ JCR 2-4-95 Estimated	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0							
0.5	12-27-94 1010 402675	NA	6	VERY SOFT (10YR 4/4) DARK YELLOWISH BROWN SILTY CLAY, ABUNDANT ROOTS, < 1% FINE SAND, NO GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	.25	PID 8.0 ppm BY 75 cpm
1.0	12-27-94 1010 402675	NA	6	SAME AS ABOVE (0.0 - 0.5 FEET)	CL	.25	PID 8.0 ppm BY 75 cpm
1.5	12-27-94 1010 402675	NA	6	SOFT (10YR 4/6) DARK YELLOWISH BROWN, SILTY CLAY, ABUNDANT ROOTS, < 1% FINE SAND, NO GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	.5	PID 8.0 ppm BY 75 cpm
2.0	12-27-94 1010 402675	NA	6	STIFF (10YR 4/6) DARK YELLOWISH BROWN, SILTY CLAY, 5% COARSE SAND, NO GRAVEL, IRON/MANGANESE STAINING, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 8.0 ppm BY 75 cpm
2.5	12-27-94 1010 402675	NA	6	SAME AS ABOVE (1.5 - 2.0 FEET)	CL	1.0	PID 8.0 ppm BY 75 cpm
3.0	12-27-94 1010 402675	NA	6	SAME AS ABOVE (2.0 - 2.5 FEET)	CL	2.0	PID 8.0 ppm BY 75 cpm
3.5	12-27-94 1010 402677	NA	6	STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY, 5-6% COARSE SAND, 1-2% FINE SUBANGULAR GRAVEL, IRREGULAR STRATIFICATION, IRON/MANGANESE STAINS, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST, (1) SYSTEM LARGE SUBANGULAR GRAVEL	CL	2.0	PID 9.4 ppm BY 65 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	5.9	12/27/94	1000
ALPHA	NA	INH	NA
BETA / GAMMA	60	12/27/94	1000

NOTES: This Lithologic Log was update using Archived Soil Cores by Geologist Pat Riley on 02/6/95.

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PCR 1/4/1995

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 18 2.16.95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307 - 11496 - 006

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11496

COORDINATES: See Pg. 1

RELATED FAL NO.s: See Pg. 1

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-27-94

GEOLOGIST: GEIGER / RYLEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-27-94

WATER USED DURING DRILLING: 8.0 ~~7.7~~ GALLONS (SC-2-3 Estimated)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	12-27-94 1016 402677	NA	6	VERY STIFF. NO LARGE GRAVEL. SAME AS ABOVE (3.0 - 3.5 FEET)	CL	3.25	PID 9.4 ppm; BY 65 cpm
4.0 – 4.5	12-27-94 1015 402677	NA	6	VERY STIFF (10YR 5/4) YELLOWISH BROWN, SILTY CLAY, 3-4% COARSE SAND, 5% FINE ANGULAR, GRAVEL, (10YR 4/2) LIGHT BROWNISH GRAY MOTTLING, LOW PLASTICITY, SLIGHTLY MOIST	CL	3.5	PID 9.4 ppm; BY 65 cpm
4.5 – 5.0	12-27-94 1015 402677	NA	6	SAME AS ABOVE (4.0 - 4.5 FEET)	CL	3.5	PID 9.4 ppm; BY 65 cpm
5.0 – 5.5	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
5.5 – 6.0	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
6.0 – 6.5	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm
6.5 – 7.0	NA	NA	NA	NO RECOVERY	NA	NA	PID NA ppm; BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/4/1995

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP OA 13 .95

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11496-007	PAGE 3 OF 7
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11496	COORDINATES: See Pg. 1
RELATED FAL NO.s: See pg. 1	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-27-94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-27-94
WATER USED DURING DRILLING: 8.0 ~~7.5~~ GALLONS ESTIMATED	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5	12-27-94 1030 402674	NA	6	STIFF (10YR 4/4) DARK YELLOWISH BROWN SILTY CLAY 7% COARSE SAND, 5% SUBANGULAR MEDIUM GRAVEL, (1) 8x7x6 cm SUBROUNDED LIMESTONE COBBLE, IMBRICULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	1.0	PID 9.4 ppm BY 60 cpm
7.5 – 8.0	12-27-94 1030 402674	NA	6	SAME AS ABOVE (7.0-7.5 FEET) NO COBBLES	CL	2.0	PID 9.4 ppm BY 60 cpm
8.0 – 8.5	12-27-94 1030 402674	NA	6	SAME AS ABOVE (7.5-8.0 FEET) (GONE, HAS BEEN SAMPLED)	CL	2.0	PID 9.4 ppm BY 60 cpm TCLP 402759 KD 402761
8.5 – 9.0	12-27-94 1030 402674	NA	6	VERY STIFF (10 YR 4/2) DARK GRAYISH BROWN SILTY CLAY WITH SOME SAND AND GRAVEL, MEDIUM PLASTICITY SLIGHTLY MOIST (GONE, HAS BEEN SAMPLED)	CL	2.5	PID 9.4 ppm BY 60 cpm TCLP 402762 KD 402764
9.0 – 9.5	12-27-94 1030 402674	NA	6	SAME AS ABOVE (8.5-9.0 FEET) (GONE, HAS BEEN SAMPLED)	CL	2.5	PID 9.4 ppm BY 60 cpm
9.5 – 10.0	12-27-94 1030 402674	NA	6	VERY STIFF, (5Y 4/1) DARK GRAY SILTY CLAY, 3% FINE TO MEDIUM SAND, 5% MEDIUM TO FINE SUBANGULAR GRAVEL, IMBRICULAR ORIENTATION, NO LAMINATIONS OR INCLUSIONS PRESENT, INTERFACE IS 1cm THICK, WEATHERED (OXIDIZED SURFACE) — MEDIUM TO LOW PLASTICITY SLIGHTLY MOIST	CL	2.25	PID 9.4 ppm BY 60 cpm
10.0 – 10.5	12-27-94 1030 402674	NA	6	VERY SOFT (5Y 5/2) OLIVE GRAY, ~~SHIGOTSTEP~~ PK SANDY SILT, 25% FINE SAND, NO GRAVEL, 30% SILT, NO LAMINATIONS OR INCLUSIONS PRESENT, NON-PLASTIC SLIGHTLY MOIST	ML	.25	PID 9.4 ppm BY 60 cpm Moist 403472

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLR 1/24/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 18

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11496-008

PAGE 4 OF 7

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11496

COORDINATES: See Pg. 1

RELATED FAL NO.s: See Pg. 1

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-27-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-27-94

WATER USED DURING DRILLING: 8.0 ~~7.~~ GALLONS Estimated

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	NA	NA	NA	No Recovery	NA	NA	PID NA ppm BY NA cpm
11.0 – 11.5	NA	NA	NA	No Recovery	NA	NA	PID NA ppm BY NA cpm
11.5 – 12.0	NA	NA	NA	No Recovery	NA	NA	PID NA BY NA cpm
12.0 – 12.5	12-27-94 1040 402676	NA	6	~~Very soft~~ Loose (5Y 4/1) dark gray, clayey sand, 30% fine sand, 15% large subangular gravel, irregular orientation, well sorted sand, slightly to non-plastic, wet	SC	NA	PID 10.2 ppm BY 55 cpm
12.5 – 13.0	12-27-94 1040 402676	NA	6	Same as above	SC	NA	PID 10.2 ppm BY 55 cpm
13.0 – 13.5	12-27-94 1040 402676	NA	6	Very ~~soft~~ Loose (5Y 5/2) olive gray poorly sorted medium to coarse sand with 25% fine to coarse subrounded gravel, no gradational characteristics, non-plastic, some clay and silt, wet	SM	NA	PID 10.1 ppm BY 60 cpm TCLP Tot. 402765 / Tox 402766
13.5 – 14.0	12-27-94 1040 402678	NA	6	Same as above (13.0 - 13.5 feet)	SM	NA	PID 10.1 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000685

FEMP QA 19 JC 2-16-95

FEMP
LITHOLOGIC LOG

CONTROL NO.: 000307-11496-009

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11496

COORDINATES: See Pg. 1

RELATED FAL NO.s: See pg 1

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-27-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-27-94

WATER USED DURING DRILLING: 8.0 JC 2-16-95 Estimated GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	12-27-94 1050 402678	NA	6	VERY LOOSE (5Y 5/2) OLIVE GRAY POORLY SORTED WELL GRADED COARSE SAND WITH FINES, 15% MEDIUM TO COARSE (LARGE) GRAVEL, NO GRADATIONAL FEATURES PRESENT. WET	SM	NA	PID 10.3 ppm; BY 55 cpm; MOIST 403471
14.5 – 15.0	12-27-94 1050 402678	NA	6	SAME AS ABOVE (14.0 - 14.5 FEET)	SM	NA	PID 10.1 ppm; BY 60 cpm
15.0 – 15.5	12-27-94 1050 402678	NA	6	SAME AS ABOVE (14.5 - 15.0 FEET)	SM	NA	PID 9.9 ppm; BY 55 cpm
15.5 – 16.0	12-27-94 1050 402678	NA	6	VERY LOOSE (5Y 5/2) OLIVE GRAY POORLY SORTED, WELL GRADED COARSE SILTY SAND WITH FINES, 25% MEDIUM TO LARGE GRAVEL, GRADING INTO ZONE OF SILTY SAND CLASTS. (1) 7x6x2 cm ANGULAR LIMESTONE COBBLE, NON-PLASTIC, WET	SM	NA	PID 10.1 ppm; BY 50 cpm
16.0 – 16.5	12-27-94 1050 402678	NA	6	SAME AS ABOVE (15.5-16.0 FEET)	SM	NA	PID 10.2 ppm; BY 60 cpm
16.5 – 17.0	12-27-94 1050 402678	NA	6	STIFF (5Y 4/1) DARK GRAY VERY SILTY CLAY, 7% FINE SAND, 10% MEDIUM TO LARGE ANGULAR GRAVEL, NO LAMINATIONS PRESENT, MEDIUM PLASTICITY, SLIGHTLY MOIST TO MOIST, GRADING INTO LESS SILTY CLAY	CL	1.0	PID 10.2 ppm; BY 55 cpm
17.0 – 17.5	12-27-94 1050 402678	NA	6	SILTY CLAY NOT AS SAME AS ABOVE (16.5 - 17.0 FEET)	CL	1.0	PID 10.2 ppm; BY 55 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/4/1995

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

811

FEMP QA 18 2-10-95

CONTROL NO.: 200307 - 11496 - 010	FEMP LITHOLOGIC LOG	PAGE 6 OF 7

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11496	See Pg. 1	See pg. 1

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg. 1				12-27-94

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
GEIGER / RILEY				12-27-94

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
8.0 ~~7.7~~ GALLONS Estimated	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0	12-27-94 1100 402679	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 3-4% FINE SAND, 15% MEDIUM TO COARSE (LARGE) SUBANGULAR TO SUBROUNDED GRAVEL, IRREGULAR ORIENTATION, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	1.0	PID 10.2 ppm BY 55 cpm Moist. 403470
18.0 – 18.5	12-27-94 1100 402679	NA	6	SAME AS ABOVE (17.5 - 18.0 FEET)	CL	1.0	PID 10.0 ppm BY 60 cpm
18.5 – 19.0	12-27-94 1100 402679	NA	6	SAME AS ABOVE (18.0 - 18.5 FEET)	CL	1.0	PID 10.2 ppm BY 50 cpm
19.0 – 19.5	12-27-94 1100 402679	NA	6	SAME AS ABOVE (18.5 - 19.0 FEET)	CL	2.0	PID 10.1 ppm BY 55 cpm
19.5 – 20.0	12-27-94 1100 402679	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 5% FINE SAND, 10-12% MEDIUM TO FINE GRAVEL SUBANGULAR, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 10.2 ppm BY 55 cpm
20.0 – 20.5	12-27-94 1115 402679	NA	6	(1) 12x7x3cm SUBANGULAR COBBLE, VERTICAL ORIENTATION SAME AS ABOVE (19.5 - 20.0 FEET)	CL	1.5	PID 10.0 ppm BY 60 cpm
20.5 – 21.0	12-27-94 1115 402679	NA	6	(1) 9x6x3 cm SUBANGULAR COBBLE, VERTICAL ORIENTATION SAME AS ABOVE (20.0 - 20.5 FEET)	CL	1.5	PID 10.2 ppm BY 55 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~ 2.0 1M=10g

FEMP QA 19 .95 2.16

118

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307 - 11496 - 021

PAGE 7 OF 7

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11496

COORDINATES: See Pg. 1

RELATED FAL NO.s: See pg. 1

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-27-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-27-94

WATER USED DURING DRILLING: 8.0 ~~7.7~~ GALLONS Estimated

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	12-27-94 1115 402679	NA	6	SAME AS ABOVE (20.5 - 21.0 FEET)	CL	1.5	PID 10.3 ppm BY 55 cpm
21.5	12-27-94 1115 402679	NA	6	SAME AS ABOVE (21.0 - 21.5 FEET)	CL	1.5	PID 10.0 ppm BY 55 cpm
22.0		NA		BOTTOM OF BORING 22.0 FEET			PID ppm BY cpm
		NA					PID ppm BY cpm
		NA					PID ppm BY cpm
		NA					PID ppm BY cpm
		NA					PID ppm BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

000688

G:/WPSC/94-776.DRW (11-23-94)

200307-11498-005

CONTROL NO.: ~~200307-11498-016~~ KP 2-14-95

FEMP LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11498	COORDINATES: N481563.766 E1382449.995
RELATED FAL NO.: 200307-11498-004	
SURFACE ELEVATION: 597.08 ft	GROUNDWATER LEVEL: / DATE: / TIME:
DATE STARTED: 12-28-94	
GEOLOGIST: LEE / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME:
DATE COMPLETED: 12-28-94	
WATER USED DURING DRILLING: 12 GALLONS Estimate	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	12-28-94 402725 09:05	NA	6"	SOFT OLIVE BROWN (2.5Y 4/4) LOAMY CLAY, ROOTED, W/ SURFACE VEGETATION MEDIUM PLASTICITY, SLIGHTLY MOIST - V. SLIGHTLY SANDY	CL	0.25	PID 0.0 ppm BY 60 cpm
0.5	12-28-94 402725 09:05	NA	SOFT 6"	DARK YELLOWISH BROWN (10 YR 4/4) CLAY, ROOTED (V. FINE ROOTS), MEDIUM PLASTICITY, SLIGHTLY MOIST, SL. SANDY, WITH <5% FINE TO COARSE SUBANGULAR GRAVEL	CL	0.25	PID 0.0 ppm BY 60 cpm
1.0	12-28-94 402725 09:05	NA	6" + FLUFF	SAME AS ABOVE EXCEPT MED STIFF GRAVELS ALSO SUBROUNDED & CHERTY	CL	1.0	PID 0.0 ppm BY 60 cpm
1.5	12-28-94 402725 09:05	NA	6" + FLUFF	SAME AS ABOVE, - ROOTLETS DISAPPEAR - VERY STIFF COARSE GRAVEL TO 15% (OF MASS) FINE " " 10%	CL	2.5	PID 0.0 ppm BY 60 cpm
2.0	12-28-94 402725 09:05	NA	6" + FLUFF	SAME AS ABOVE COARSE GRAVEL 15-20% (OF MASS) FINE GRAVEL 5-10% "	CL	2.5	PID 0.0 ppm BY 60 cpm
2.5	12-28-94 402725 09:05	NA	6"	SAME AS ABOVE COARSE GRAVEL 10-15% (OF MASS) FINE " 5-10% " V. MINOR FE MOTTLING	CL	2.5	PID 0.0 ppm BY 60 cpm
3.0	12-28-94 402725 ~~402726~~ 09:05	KP 2-8-95 NA	BAS 6"	LIGHT OLIVE BROWN (2.5Y 5/4) SILTY CLAY, ~~EAST~~ MED STIFF MOIST TO SL. MOIST, WITH 5-10% SUBANGULAR CHERTY GRAVEL & COARSE SAND - NO ORIENTATION	CL	1.0	PID 0.0 ppm BY 60 cpm
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/28/94	09:00
ALPHA	NA	NA	NA
BETA / GAMMA	60 cpm	12/28/94	09:00

NOTES: This Lithologic Log was updated using Archived Cores by Geologist Cliff Lee on 01/31/95.

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/11/95

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

200307-11498-006

118

CONTROL NO.: ~~200307-11498-047~~

FEMP

LITHOLOGIC LOG

PAGE 2 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11498

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11498-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-28-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 12 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	12-28-94 402726 09:15	NA	6	OLIVE BROWN (2.5Y 4/4) SILTY CLAY STIFF TO MEDIUM STIFF, SLIGHTLY MOIST, WITH 20% SUBANGULAR CHERTY COARSE GRAVEL & COARSE SAND (FINE TO) NO GRAIN ORIENTATION	CL	1.0	PID 0.0 ppm β/γ 50 cpm
4.0 – 4.5	12-28-94 402726 09:15	NA	6	SAME AS ABOVE, ELONGATE GRAVELS STAND ON EDGE IN A SUBVERTICAL ORIENTATION (10-15%) GRVL. MAX. GRAVEL DIMENSION: 1"x1"x1/4"	CL	1.0	PID 0.0 ppm β/γ 50 cpm
4.5 – 5.0	12-28-94 402726 09:15	NA	6	SAME AS ABOVE, WITH BOTH (10-15%) SUBANGULAR & SUBROUNDED, F.→C. GRVLS. GRAVEL 10-15%: SOME CLASTS BRIGHT ORANGE, DEGRADED MAX. GRAVEL DIMENSION: 1.5"x1.0"x1/2"	CL	1.0	PID 0.0 ppm β/γ 50 cpm
5.0 – 5.5	12-28-94 402726 09:15	NA	6	LIGHT OLIVE BROWN (2.5Y 5/4) SILTY CLAY, SOFT TO MEDIUM STIFF SLIGHTLY MOIST, MOTTLED W/ PALE YELLOW (2.5Y 7/3) AND OLIVE YELLOW (2.5Y 6/8) FE-STAIN ALONG POSSIBLE FRACTURES (NO VERTICAL ORIENTATION: FINE TO COARSE GRAVEL	CL	1.0	PID 0.0 ppm β/γ 50 cpm
5.5 – 6.0	12-28-94 402726 09:15	NA	6	SAME AS ABOVE – PALE YELLOW CONSTITUENT IS MORE AT 2.5Y 7/1 LIGHT GRAY AS A 'FILL' MAT'L. IN THIS INTERVAL: COARSE GRAVEL (10%) & FINE GRAVEL (5%) IN MATRIX MAX SIZE 1"x1"x1/2"	CL	1.0	PID 0.0 ppm β/γ 50 cpm
6.0 – 6.5	12-28-94 402726 09:15	NA	6	SAME AS ABOVE – SUB VERTICAL FRACTURES WITH 2.5Y 7/1 L. GRAY FILL INTENSIFY – MOST GRAVEL COARSE & SUBANGULAR, STIFF	CL	2.0	PID 0.0 ppm β/γ 50 cpm
6.5 – 7.0	12-28-94 402726 09:15	NA	6	SAME L. OLIVE BRN CLAY AS ABOVE, V. SLIGHTLY MOIST, STIFF, GRAVEL (CRS.) DECREASES TO <5%: MOTTLING MORE GENERAL W/ NO VERTICAL ORIENTATION	CL	2.0	PID 0.0 ppm β/γ 10 cpm KD 403333 TCLP 403327

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/4/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000690

200307-11498-007

2-19-95

CONTROL NO.: ~~200307-11498-018~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11498

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11498-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-28-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 12 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.0	12-28-94 402727 09:30	NA	6	DARK GRAY (5Y 4/1) SILTY CLAY, VERY STIFF WITH UPPER & LOWER COARSE SAND (10%) & FINE GRAVEL (5%) - BOTH SUBANGULAR: MEDIUM PART OF SECTION SLIGHTLY MOIST	CL	2.5F 2.5L	PID 0.0 ppm BY 10 cpm Kd 403384 TCLP 403329
7.5	12-28-94 402727 09:30	NA	6	SAME AS ABOVE, STIFFENING AT BASE, CLAY CONTENT INCREASES TO 90% NOTE: CORE HEAVILY SAMPLED IN FIELD - INTERVAL MOSTLY MISSING	CL	2.5F 2.5L	PID 0.0 ppm BY 10 cpm
8.0	12-28-94 402727 09:30	NA	6	OLIVE GRAY (5Y 4/2) SL. SILTY CLAY, VERY STIFF, DENSE, V. SLIGHTLY MOIST, WITH FINE TO COARSE, V. POORLY SORTED SUBANGULAR TO SUBROUNDED CHERTY GRAVEL (15-20%) NO ORIENTATION	CL	2.5F 3.0L	PID 0.0 ppm BY 10 cpm
8.5	12-28-94 402727 09:30	NA	6	OLIVE GRAY CLAY AS ABOVE, V. SLIGHTLY MOIST, HARD, WITH FINE TO COARSE GRAVEL (10-15%): MOST CLASTS SUBANGULAR CHERT 1/8" to 1/2" IN DIAM.	CL	2.0F 4.5L	PID 0.0 ppm BY 10 cpm
9.0	12-28-94 402727 09:30	NA	6	OLIVE GRAY CLAY AS ABOVE, V. SLIGHTLY MOIST, VERY STIFF, WITH FINE TO COARSE SUBANGULAR AND SUBROUNDED DARK CHERTS (10-15%) NO ORIENTATION MAX. SIZE: 1" x 1/2" x 1/2"	CL	2.0F 2.5L	PID 0.0 ppm BY 10 cpm
9.5	12-28-94 402727 09:30	NA	6	OLIVE CLAY (5Y 4/3), SL. SILTY, V. SLIGHTLY MOIST, VERY STIFF, WITH FINE TO COARSE SUBANGULAR DARK TO LIGHT CHERTY GRAVEL (15-20%) - ONE ZONE OF SUBHORIZONTAL ORIENTATION	CL	2.5F 2.5L	PID 0.0 ppm BY 10 cpm
10.0	12-28-94 402727 09:30	NA	6	CLAY & GRAVEL AS ABOVE: GRAVELS HAVE NO ORIENTATION MAX. SIZE DIMENSION: 1" x 3/4" x 1/2"	CL	2.5F 2.0L	PID 0.0 ppm BY 10 cpm
10.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: WHEN APPLICABLE, NOTED MEASURED CONSISTENCY VALUES FROM FIELD (F) AND LAB (L) ARE INCLUDED AS OBSERVATIONS IN THIS LOG. Also See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 12/14/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

200307-11498-009

118

CONTROL NO.: ~~200307-11498-019~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 4 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11498

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11498-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-28-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 12 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	12-28-94 402727 09:45	NA	6	OLIVE GRAY TO OLIVE (5Y 4/2 → 5Y 4/3) SILTY CLAY, V. SL. MOIST, VERY STIFF, WITH FINE TO COARSE SUBANGULAR DARK TO LIGHT CHERTY GRAVEL (15-20%): GRVLS. HAVE NO ORIENTATION: WITH COBBLE 2"x3"x1".	CL	2.5	PID 0.0 ppm BY 10 cpm
11.0	12-28-94 402722 09:45	NA	6	1" OF OLIVE BROWN (2.5Y 4/3) MOTTLED SILTY CLAY SUBHORIZONTALLY & IRREGULARLY OVERLYING DARK GRAY (2.5Y 4/1) CLAY, V. STIFF, WITH FINE (10%) TO COARSE (5%) [5" Total] SUBANGULAR GRAVEL (NO ORIENTATION)	CL	2.5	PID 0.0 ppm BY 10 cpm
11.5	12-28-94 402722 09:45	NA	6	DARK GRAY (2.5Y 4/1) SL. SILTY CLAY, VERY STIFF, WITH MINOR COARSE SUBANGULAR CHERTY & FOSSILIFEROUS LIMESTONE GRAVEL (ONE CLAST 1½"x1"x½" SUBHORIZONTALLY ORIENTED ON FLAT SIDE)	CL	2.5	PID 0.0 ppm BY 10 cpm
12.0	12-28-94 402722 09:45	NA	6	DARK GRAY LT. CLAY AS ABOVE, WITH SOME MINOR OLIVE BROWN (2.5Y 5/4) MOTTLING ALONG PROBABLE SUBHORIZONTAL TO OBLIQUE, FEATHERY FRACTURES: FINE GRAVEL IN POCKETS/HORIZ. LENSES (15%)	CL	2.5	PID 0.0 ppm BY 10 cpm
12.5	12-28-94 402722 09:45	NA	6	SAME AS ABOVE FINE TO COARSE CHERTY GRAVEL (15-20%) IN NO PARTICULAR ORIENTATION	CL	2.5	PID 0.0 ppm BY 10 cpm
13.0	12-28-94 402723 09:45	NA	6	DARK GRAY CLAY (2.5Y 4/1) SILTY, MED. STIFF, V. SL. MOIST, WITH <5% FINE SUBANGULAR CHERTY GRAVEL NO GRAIN ORIENTATION CLAY PLASTIC	CL	1.0	PID 0.0 ppm BY 10 cpm
13.5	12-28-94 402723 09:45	NA	6	SAME AS ABOVE, MOSTLY CLEAN (NO GRAVEL) DARK GRAY, SOFT, PLASTIC CLAY	CL	1.0	PID 0.0 ppm BY 10 cpm
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PaR 12/14/94

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

000692

200307-11498-009

CONTROL NO.: ~~200307-11498-020~~

FEMP

LITHOLOGIC LOG

PAGE 5 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11498

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11498-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-28-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: Estimate 12 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 Inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	12-28-94 402723 10:00	NA	6	DARK GRAY CLAY (2.5Y 4/1) SILTY, MED. STIFF, V. SL. MOIST, WITH 10-10% FINE TO COARSE SUBANGULAR, CHERTY, DARK BLACK COLORED (2.5Y 2.5/1) GRAVEL, COARSER GVL. SUBROUNDED NO GRAIN ORIENTATION	CL	1.0	PID 0.0 ppm BY 10 cpm
14.5	12-28-94 402723 10:00	NA	6	CONTINUED SPARSE FINE TO COARSE GRAVEL IN DARK GRAY CLAY (SUBANGULAR) GRVL. IN <1/2" THICK SUBHORIZONTAL BANDS/LENSES (2 Total)	CL	1.0	PID 0.0 ppm BY 10 cpm
15.0	12-28-94 402723 10:00	NA	6	DARK GRAY CLAY (2.5Y 4/1) SILTY, MED. STIFF, V. SL. MOIST, WITH 15-20% FINE TO COARSE CHERTY & FOSSILIFEROUS SUBANGULAR TO SUBROUNDED GRAVEL IN NO ORIENTATION	CL	1.5	PID 0.0 ppm BY 10 cpm
15.5	12-28-94 402723 10:00	NA	6	SAME AS ABOVE, MOSTLY CHERTY GRAVEL CONTENT UP TO ~25-30%, IN SL. SANDY NO ORIENTATION VERY POORLY SORTED	CL (TO GC)	1.5	PID 0.0 ppm BY 10 cpm
16.0	12-28-94 402723 10:00	NA	6	SAME AS ABOVE, GRAVEL CONTENT @ 25-30%, WITH SOME COARSE, SUBANGULAR SAND: COARSEST GRAVEL CLAST (CHERT) MEASURES 2" x 2 1/4" x 1" @ 6" BASE	CL (TO GC)	1.5	PID 0.0 ppm BY 10 cpm
16.5	12-28-94 402723 10:00	NA	6	SAME AS ABOVE, VERY POORLY SORTED V. GRAVELY CLAY (TO 35% possibly), BECOMING SLIGHTLY LESS 'GRAVELY' IN BOTTOM 1-2"	CL (TO GC)	1.5	PID 0.0 ppm BY 10 cpm
17.0	12-28-94 402724 1015 ~~10:00~~ EP 2-17-95	NA	6" + CLUFF	SAME AS ABOVE, VERY POORLY SORTED CLAY W/ SUBANGULAR GRAVEL MAX. CLAST DIMENSIONS: 1" x 1" x 1 1/2" (IRREGULAR FORM) W/ NO CLAST ORIENTATION	CL (TO GC)	0.25	PID 0.0 ppm BY 10 cpm
17.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 12/14/94

FS-F-3681

000693

G:/WPSC/94-776.DRW (11-23-94)

200307-11498-010

CONTROL NO.: ~~200307-11498-021~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

118

PAGE 6 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11498

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11498-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-28-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 12 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5	12-28-94 402724 10:15	NA	6" + FLUFF	DARK GRAY CLAY (2.5Y 4/1), SL. SILTY, MED. STIFF TO SOFT, V.SL. MOIST, W/ SUBANGULAR TO SUBROUNDED, MOSTLY CHERTY, FINE TO COARSE GRAVEL - NO GRAIN ORIENTATION GRAVEL 15-20%	CL	.25 s → 1.0 L	PID 0.0 PPM BY 10 CPM
18.0	12-28-94 402724 10:15	NA	6" + FLUFF	SAME AS ABOVE, V. POORLY SORTED GRAVEL (10-15%) IN GRAY CLAY c: SANDY ZONE, MIDDLE MAX. CLAST DIMENSIONS: 1 1/2" x 1" x 3/4" NO ORIENTATION	CL	.25	PID 0.0 PPM BY 10 CPM
18.5	12-28-94 402724 10:15	NA	6" + FLUFF	SAME AS ABOVE, GRAVELS INCLUDE BOTH FOSSILIFEROUS LS. & CHERT CLASTS → MAX. DIMENSION 2 1/4" x 1 3/4" x 1 1/4" (NO ORIENTATION) SOME L. BROWN (2.5Y 5/4) PLANT ROOTS/TWIGS	CL	.25	PID 0.0 PPM BY 10 CPM
19.0	12-28-94 402719 10:15	NA	6	DARK GRAY CLAY (2.5Y 4/1), SL. SILTY, SOFT TO MED. STIFF, V.SL. MOIST, WITH SUBANGULAR TO SUBROUNDED FINE TO COARSE V. POORLY SORTED GRAVEL IN OPEN MATRIX - GRVL. 15-20% NO ORIENTATION	CL	.25 → 1.0 L	PID 0.0 PPM BY 0 CPM
19.5	12-28-94 402719 10:15	NA	6	SAME AS ABOVE (GRAVEL 15-20%) MAX. CLAST DIMENSIONS: 2 1/4" x 1" W x 3/4" T VERTICALLY ORIENTED ON LONG AXIS LOCATED @ BOTTOM of 6" INTERVAL	CL	.25	PID 0.0 PPM BY 0 CPM
20.0	12-28-94 402719 10:15	NA	6	SAME AS ABOVE GRAY CLAY W/ VERY POORLY SORTED GRAVEL, W/ HORIZONTAL LAYER OF V. COARSE GRAVEL 2-3" DOWN; LARGEST CLAST MEASURES 4 1/2" x 3 1/2" W x 1" H (SUBRDED LS. CLAST)	CL	.25	PID 0.0 PPM BY 0 CPM
20.5	12-28-94 402719 10:15	NA	6	SAME AS ABOVE IN ALL RESPECTS EXCEPT NO V. COARSE GRAVEL TO COBBLE PROPORTION	CL	.25	PID 0.0 PPM BY 0 CPM
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000694

200307-11498-011

CONTROL NO.: ~~200307-11498-021~~ KP 2-14-95

FEMP LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11498

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11498-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-28-94

GEOLOGIST: LEE/GEIGER/RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 12 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER/HELPER: BREWER/GRIM/FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	12-28-94 402719 10:25	NA	6	DARK GRAY (2.5Y 4/1) CLAY, SL. SILTY, MED. STIFF, V. SL. MOIST, W/ SUBANGULAR, MOSTLY CHERTY, FINE TO COARSE GRAVEL (15-20%)	CL	.25F 2.0L	PID 0.0 ppm BY 0 CPM
21.5	12-28-94 402719 10:25	NA	6	SAME AS ABOVE LARGEST CLAST OBLIQUELY ORIENTED, MEASURING 1 3/4" x 1" x 3/4"	CL	.25 2.5L	PID 0.0 ppm BY 0 CPM
22.0	12-28-94 402719 10:25	NA	6	SAME AS ABOVE, CHERT CLASTS ARE SUBROUNDED - LARGEST CLAST IS A SUBANGULAR MICROXTALLINE LIMESTONE COBBLE MEASURING 4"x3"x1" OBLIQUE ORIENTATION	CL	.25 2.0L	PID 0.0 PP BY 0 CPM
22.5	12-28-94 402719 10:25	NA	6	SAME AS ABOVE: LARGEST CLAST IS AN ELONGATE SUBROUNDED FOSSIL. MICROXTLN. LS FRAGMENT, VERTICALLY ORIENTED ON LONG AXIS, MEASURING 3 1/2" x 2" x 2"	CL	.25 2.5L	PID 0.0 ppm BY 0 CPM Moist. 402717
23.0	12-28-94	NA	X	NO RECOVERY (NR)		~~.25~~ JCHED 1/31/95	PID 0.0 PPM BY 0 CPM
23.5	12-24-94	NA	X	NR		~~2.5~~ JCHED 1/31/95	PID 0.0 ppm BY 0 CPM
24.0	12-24-94	NA	X	NR		~~2.5~~ JCHED 1/31/95	PID 0.0 ppm BY 0 CPM
24.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA/GAMMA	SEE PAGE 1	/ /	

NOTES: WHEN APPLICABLE, MEASURED CONSISTENCY VALUES FROM FIELD (F) AND LAB (L), IF DIFFERENT, ARE INCLUDED AS OBSERVATIONS IN THIS LOG. ~~JCHED~~ 1-31-95; also See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWA 1/31/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

200307-11498-012

118

CONTROL NO.: ~~200307-11498-023~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 8 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11498	COORDINATES: See Pg. 1
RELATED FAL NO.s: 200307-11498-004	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12-28-94
GEOLOGIST: LEE / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12-28-94
WATER USED DURING DRILLING: 12 GALLONS Estimate	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5 – 25.0	12-28-94	NA	X	NO RECOVERY (NR)			PID 0.0 ppm BY 0 cpm
25.0 – 25.5	12-28-94	NA	X	NR			PID 0.0 ppm BY 0 cpm
25.5 – 26.0	12-28-94	NA	X	NR			PID 0.0 ppm BY 0 cpm
26.0 – 26.5	12-28-94	NA	X	NR			PID 0.0 ppm BY 0 cpm
26.5 – 27.0	12-28-94	NA	X	NR			PID 0.0 ppm BY 0 cpm
27.0 – 27.5	12-28-94 402720 10:45	NA	6" + PLUFF	DARK GRAY CLAY (2.5Y 4/1), SILTY, SOFT, MOIST, WITH 15-20% FINE, SUBANGULAR CHERTY GRAVEL - BOTTOM 2" HAS HORIZONTALLY ORIENTED COBBLE WITH DIMENSIONS 2" ↕ x 5½" x 4"	CL ~~GC~~	.25F .25L	PID 0.0 ppm BY 0 cpm
27.5 – 28.0	12-28-94 402720 10:45	NA	6" + PLUFF	VERY STIFF TO HARD CLAY, AS ABOVE, W/ V. COARSE GRAVEL ABOVE AND FINE TO COARSE SUBANGULAR CLAYEY GRAVEL & COARSE SAND IN BOTTOM 2" (GRVL. > 50% OF COARSE FRACTION)	CL GC/SC	2.5F 2.5L >4.0L	PID 0.0 ppm BY 0 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: WHEN APPLICABLE, MEASURED CONSISTENCY DIFFERENCES BETWEEN FIELD (F) AND LAB (L) ARE NOTED IN THIS LOG.; ALSO SEE Pg. 1 TEXT

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLA 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

200307-11498-013

CONTROL NO.: ~~200307-11498-024~~ FP 2-14-95

FEMP LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION			PROJECT NO.: 20.03.07
BORING NUMBER: 11498	COORDINATES: See Pg. 1		RELATED FAL NO.s: 200307-11498-004
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED: 12-28-94
GEOLOGIST: LEE / GEIGER / RILEY	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED: 12-28-94
WATER USED DURING DRILLING: 12 GALLONS Estimate	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL	DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0 – 28.5	12-28-94 402720 11:00	NA	6" + FLUFF	DARK GRAY CLAY (2.5Y 4/1), SILTY, SOFT, MOIST, WITH V. POORLY SORTED SUBROUNDED TO SUBANGULAR CHERTY & FOSSILIFEROUS GRAVEL (15-20%), NO ORIENTATION - MAX. GRVL. SIZE: 2"x1½"x ¾" MOSTLY STIFF CLAY @ BASE	CL	2.5F 1.0L	PID 0.0 ppm BY 0 cpm
28.5 – 29.0	12-28-94 402720 11:00	NA	6" + FLUFF	STIFF TO VERY STIFF CLAY AS ABOVE, WITH V. POORLY SORTED GRAVEL (15-20%): MAX. SIZE IS 2½"x 2"x 1" <5% FINE SAND (SUBANGULAR) @ TOP 1" OF INTERVAL	CL	2.5F 1.0L	PID 0.0 ppm BY 0 cpm
29.0 – 29.5	12-28-94 402721 11:00	NA	6	STIFF TO HARD DARK GRAY CLAY, AS ABOVE, WITH 10% COARSE SAND (SUBANGULAR) AND 5-10% SUBROUNDED GRAVEL - CLAY STIFF & NO GRAIN ORIENTATION & MED. PLASTICITY	CL	2.5F 4.5L	PID 0.0 BY 0 Moist. 402716
29.5 – 30.0	12-28-94 402721 11:00	NA	6	VERY STIFF CLAY, AS ABOVE WITH FINE TO COARSE SUBANGULAR GRAVEL (15-20%), COARSEST CLAST, NOT ORIENTED, MEASURES 1.5"x 1"x ½" MOTTLED DARK GREENISH GRAY CLAY: AT BASE, (5G 4/1) DEFORMED AROUND LARGER CLASTS	CL	3.0F 3.0L-4.0L	PID 0.0 ppm BY 0 cpm
30.0 – 30.5	12-28-94 402721 11:00	NA	6	DARK GRAY CLAY, AS ABOVE, INCREASED SILT CONTENT (TO ~5-10%), WITH FINE TO COARSE SUBANGULAR GRAVEL 10-15% SL. SANDY ABOVE (TOP 2-3") ↳ FINE: 5%	CL	3.0F 3.0L	PID 0.0 ppm BY 0 cpm TCLP 403331 Tot. VOC 403332
30.5 – 31.0	12-28-94 402721 11:00	NA	6	STIFF TO VERY STIFF DARK GRAY CLAY (2.5Y 4/1) V.SL. SILTY & V.SL. MOIST, W/ FINE TO COARSE SUBANGULAR TO SUBRDED. GRAVEL (15-20%) LARGEST CLAST 2"x 2"x 1.5", FLAT SIDE HORIZONTALLY ORIENTED	CL	3.0F 2.0L	PID 0.0 ppm BY 0 cpm
31.0 – 31.5	12-28-94 402721 11:00	NA	6	STIFF TO VERY STIFF DARK GRAY CLAY (2.5Y 4/1), MED. PLASTICITY, WITH FINE TO COARSE SUB-ANGULAR TO SUBROUNDED GRAVEL (10-15%) LARGEST CLAST FLAT SHALE, VERTICALLY ORIENTED, MEASURES ¾" THICK x 3" x 3½"	CL	3.0F 2.5L	PID 0.0 ppm BY 0 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: WHEN APPLICABLE, MEASURED CONSISTENCY DIFFERENCES BETWEEN FIELD (F) AND LAB (L) ARE NOTED IN THIS LOG.; Also See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PLA 12/9/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

200307-11498-014

118

CONTROL NO.: ~~200307 11498-025~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

2-17-95

PAGE 10 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11498

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11498-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-28-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 12 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5	12-28-94 402721 11:00	NA	6	DARK GRAY CLAY (2.5Y 4/1), STIFF TO VERY STIFF V. SL. MOIST, MED. PLASTICITY, WITH FINE SUBANGULAR GRAVEL (15-20%) NO ORIENTATION OF CLASTS	CL	3.0F 2.0L	PID 0.0 ppm BY 0 cpm
32.0	12-28-94 402721 11:00	NA	6	CLAY, AS ABOVE, W/ V. COARSE TO FINE GRAVEL (15-20%), LARGER CLASTS ORIENTED SUBVERTICALLY - MEASURING 3"x2"x1" ON LARGEST CLAST	CL	0.25F 1.0L	PID 0.0 ppm BY 0 cpm moist. 402718
32.5	12-28-94 402721 11:00	NA	6	SAME AS ABOVE, GRAVELS BOTH SUBANGULAR & SUBROUNDED (15-20%): NO ORIENTATION. V. POORLY SORTED MAX CLAST (SUBVERTICAL) 1 1/4" x 1" x 3/8"	CL	0.25F 1.25L	PID 0.0 ppm BY 0 cpm
33.0		NA		BOTTOM OF BORING @ 33'			PID ppm BY cpm
		NA					PID ppm BY cpm
		NA					PID ppm BY cpm
		NA					PID ppm BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: WHEN APPLICABLE, MEASURED CONSISTENCY DIFFERENCES BETWEEN FIELD (F) AND LAB (L) VALUES ARE NOTED IN THIS LOG Also See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 12/4/94

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11499-005

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11499

COORDINATES: N481563.813 E1382460.031

RELATED FAL NO.s: N/A

SURFACE ELEVATION: 597.01 ft.

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-28-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 6.0 ~~GAL~~ GALLONS (EST) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0 – 0.5	12-28-94 1405 402753	NA	6	SOFT (10YR 3/2) DARK BROWN, SILTY CLAY WITH ABUNDANT ROOTS, 1-2% FINE SAND, NO GRAVEL, MEDIUM PLASTICITY. SLIGHTLY MOIST TO MOIST	CL	.25	PID 0.0 ppm BY 10 cpm
0.5 – 1.0	12-28-94 1405 402753	NA	6	STIFF (10YR 3/4) DARK YELLOWISH BROWN SILTY CLAY, IRON AND MANGANESE STAINING, 2-3% FINE SAND, NO GRAVEL, MEDIUM PLASTICITY SLIGHTLY MOIST	CL	1.5	PID 0.0 ppm BY 10 cpm
1.0 – 1.5	12-28-94 1405 402753	NA	6	SAME AS ABOVE (0.5 - 1.0 FEET) WITH 5% MED. TO FINE SUBANGULAR GRAVEL	CL	1.5	PID 0.0 BY 10 cpm
1.5 – 2.0	12-28-94 1405 402753	NA	6	SAME AS ABOVE (1.0 - 1.5 FEET)	CL	1.5	PID 0.0 ppm BY 10 cpm
2.0 – 2.5	12-28-94 1405 402753	NA	6	SAME AS ABOVE (1.5 - 2.0 FEET)	CL	1.5	PID 0.0 ppm BY 10 cpm
2.5 – 3.0	12-28-94 1405 402753	NA	6	SAME AS ABOVE (2.0 - 2.5 FEET)	CL	1.5	PID 0.0 ppm BY 10 cpm
3.0 – 3.5	12-28-94 1405 402752	NA	6	SAME AS ABOVE (2.5 - 3.0 FEET)	CL	2.25	PID 0.0 ppm BY 10 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/28/94	0900
ALPHA	NA	NA	NA
BETA / GAMMA	60	12/28/94	0900

NOTES: LITHOLOGIC LOG WAS UPDATED BY PATRICK RILEY, FROM ARCHIVED CORES ON 2/7/95. PR 2/7/95

FEMP QA 21

FEB 27 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681 000699 F-310 G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 2 OF 9
200307-11499-006	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11499	See Pg. 1	N/A

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg. 1	N/A			12-28-94

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
GEIGER / RILEY	N/A			12-28-94

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
6.0 ~~54~~ GALLONS (EST) JC 2-13-95	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	12-28-94 1410 402752	NA	6	VERY STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY 7-8% FINE TO MEDIUM SAND, 10% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 0.0 ppm BY 10 cpm
4.0 – 4.5	12-28-94 1410 402752	NA	6	VERY SOFT (10YR 5/4) YELLOWISH BROWN, SILTY CLAY, 10% MEDIUM TO COARSE SAND, 10% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, MOIST, SLIGHTLY MOTTLED WITH (10YR 6/2) LIGHT BROWNISH GRAY	CL	0.25	PID 0.0 ppm BY 10 cpm
4.5 – 5.0	12-28-94 1410 402752	NA	6	SOFT SAME AS ABOVE (4.0 - 4.5 FEET)	CL	0.5	PID 0.0 ppm BY 10 cpm
5.0 – 5.5	12-28-94 1410 402752	NA	6	SOFT SAME AS ABOVE (4.5 - 5.0 FEET)	CL	0.5	PID 0.0 ppm BY 10 cpm
5.5 – 6.0	12-28-94 1410 402752	NA	6	SOFT SAME AS ABOVE (5.0 - 5.5 FEET)	CL	0.5	PID 0.0 ppm BY 10 cpm
6.0 – 6.5	12-28-94 1410 402752	NA	6	SOFT SAME AS ABOVE (5.5 - 6.0 FEET)	CL	0.5	PID 0.0 ppm BY 10 cpm
6.5 – 7.0	12-28-94 1410 402752	NA	6	SOFT SAME AS ABOVE (6.0 - 6.5 FEET)	CL	0.5	PID 0.0 ppm BY 10 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: SEE PAGE 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FEMP 04 31

FEB 27 1995

FS-F-3681 F-311 /WPSC / 94-776.DRW (11-23-94)

000700

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11499-007

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11499

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-28-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 6.0 ~~5.0~~ GALLONS (EST) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5	12-28-94 1415 402755	NA	6	STIFF (10YR 5/4) YELLOWISH BROWN, SILTY CLAY, 10-12% COARSE SAND, 10% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.0	PID 0.0 ppm BY 0 cpm
7.5 – 8.0	12-28-94 1415 402755	NA	6	SAME AS ABOVE (7.0 - 7.5 FEET)	CL	2.0	PID 0.0 ppm BY 0 cpm
8.0 – 8.5	12-28-94 1415 402755	NA	6	STIFF (10YR 5/4) YELLOWISH BROWN, SILTY CLAY, 6-7% COARSE SAND, 15% FINE TO MEDIUM SUBANGULAR GRAVEL, 1) 8 x 6 x 2 cm ANGULAR LIMESTONE COBBLE, VERTICAL ORIENTATION, MEDIUM PLASTICITY, NO GRADATIONAL CHARACTERISTICS, SLIGHTLY MOIST	CL	2.0	PID 0.0 BY 0 cpm
8.5 – 9.0	12-28-94 1415 402755	NA	6	STIFF (10YR 5/4) YELLOWISH BROWN, SILTY CLAY, <1% SAND, NO GRAVEL, HIGH PLASTICITY, SLIGHTLY MOIST, GRADING INTO ZONE OF INTERMINGLED (SWIRLED) ZONE OF BROWN SILTY CLAY WITH 5% COARSE SAND, MIXED WITH (5Y 4/1) DARK GRAY SILTY CLAY 5% FINE SAND <1% FINE GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.0	PID 0.0 ppm BY 0 cpm
9.0 – 9.5	12-28-94 1415 402755	NA	6	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 7% FINE SAND, 5% MEDIUM TO FINE SUBANGULAR GRAVEL, NO GRADATIONAL FEATURES MIXED WITH (10YR 5/4) YELLOWISH BROWN SILTY CLAY, 5% COARSE TO MEDIUM SAND, 5% FINE GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 0.0 ppm BY 0 cpm
9.5 – 10.0	12-28-94 1415 402755	NA	6	VERY STIFF (5Y 4/1) DARK GRAY, SILTY CLAY, 3-4% FINE SAND, 5-6% MEDIUM TO FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 0.0 ppm BY 0 cpm
10.0 – 10.5	12-28-94 1415 402755	NA	6	SAME AS ABOVE (9.5 - 10.0 FEET)	CL	2.5	PID 0.0 ppm BY 0 cpm

MIXED ZONE

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: SEE PAGE 1

FEMP QA FEB 27 1995

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWB 12/14/94

FS-F-3681 000701 F-312 G:\WPSC / 94-776.DRW (11-23-94)

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11499-008

PAGE 4 OF 9

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11499

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12-28-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 6.0 ~~6.1~~ JC 2-13-95 GALLONS (EST.)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 Inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	12-28-94 1420 402755	NA	6	SAME AS ABOVE (10.0 - 10.5 FEET)	CL	2.5	PID 0.0 ppm; BY 0 cpm
11.0 – 11.5	12-28-94 1420 402755	NA	6	SAME AS ABOVE (10.5 - 11.0 FEET)	CL	2.5	PID 0.0 ppm; BY 0 cpm
11.5 – 12.0	12-28-94 1420 402754	NA	6	VERY STIFF (5Y 4/1) DARK GRAY VERY SILTY CLAY, 1-2% FINE, < 1% FINE GRAVEL SUBANGULAR, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 0.0 ppm; BY 0 cpm
12.0 – 12.5	12-28-94 1420 402754	NA	6	SOFT SAME AS ABOVE (11.5 - 12.0 FEET) VERY MOIST	CL	0.5	PID 0.0 ppm; BY 0 cpm
12.5 – 13.0	12-28-94 1420 402754	NA	6	SAME AS ABOVE (12.0 - 12.5 FEET)	CL	0.5	PID 0.0 ppm; BY 0 cpm
13.0 – 13.5	12-28-94 1420 402754	NA	6	SOFT (5Y 4/1) DARK GRAY SILTY/SANDY CLAY, 20% FINE SAND / 20%-25% SILT, < 1% FINE SUBANGULAR GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST TO MOIST, NO LAMINATION OR GRADATIONAL FEATURES PRESENT	CL	0.5	PID 0.0 ppm; BY 0 cpm
13.5 – 14.0	12-28-94 1420 402754	NA	6	SAME AS ABOVE (13.0 - 13.5 FEET)	CL	0.5	PID 0.0 ppm; BY 0 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: SEE PAGE 1

FEB 27 1995

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11499-009

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11499

COORDINATES: See Pg. 1

RELATED FAL NO.(s):

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-28-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 6.0 ~~5~~ GALLONS (EST) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	12-28-94 1425 402754	NA	6	SOFT (5Y 4/1) DARK GRAY, VERY SILTY CLAY, 20% FINE SAND, <1% FINE SUBANGULAR GRAVEL, LOW TO SLIGHT PLASTICITY, MOIST	CL	0.5	PID 0.0 ppm BY 0 cpm
14.5 – 15.0	12-28-94 1425 402754	NA	6	SAME AS ABOVE (14.0-14.5 FEET)	CL	0.5	PID 0.0 ppm BY 0 cpm
15.0 – 15.5	12-28-94 1425 402754	NA	6	SAME AS ABOVE (14.5-15.0 FEET)	CL	0.5	PID 0.0 BY 0 cpm
15.5 – 16.0	12-28-94 1425 402754	NA	6	SAME AS ABOVE (15.0-15.5 FEET)	CL	0.5	PID 0.0 ppm BY 0 cpm 402728 MOISTURE
16.0 – 16.5	~~12-28-94~~ JC 2-9-95 ~~1425~~ NA ~~402754~~	NA	NA	NO RECOVERY	NA	NA	PID 0.0 NA ppm BY 0 NA cpm
16.5 – 17.0	~~12-28-94~~ JC 2-9-95 ~~1425~~ NA ~~402754~~	NA	NA	NO RECOVERY	NA	NA	PID 0.0 NA ppm BY 0 NA cpm
17.0 – 17.5	12-28-94 1425 402756	NA	6	VERY SOFT (5Y 4/1) DARK GRAY, SANDY CLAY, 20-25% FINE TO MEDIUM SAND, <1% FINE GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST, NO GRADATIONAL FEATURES OR LAMINATIONS PRESENT	CL	0.25	PID 0.0 ppm BY 0 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

FEMP QA FEB 27 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11499-010

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11499

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-28-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 6.0 GALLONS (EST.) JC 2-13-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0	12-28-94 1430 402756	NA	6	SAME AS ABOVE (17.0 - 17.5 FEET)	CL	0.25	PID 0.0 ppm; BY 0 cpm
18.5	12-28-94 1430 402756	NA	6	SAME AS ABOVE	CL	0.25	PID 0.0 ppm; BY 0 cpm; TCLP - 402757; Tot.U/ISOU. - 402758
19.0	12-28-94 1430 402756	NA	6	VERY SOFT (5Y 4/1) DARK GRAY VERY SILTY CLAY WITH 15% FINE SAND, 7-8% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST TO MOIST. NO LAMANATIONS	CL	0.25	PID 0.0 ppm; BY 0 cpm
19.5	12-28-94 1430 402756	NA	6	VERY SOFT (5Y 4/1) DARK GRAY, SILTY CLAY WITH 10% FINE SAND, 7-8% MEDIUM SUBANGULAR GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST. VERY LOOSE (5Y 4/1) DARK GRAY CLAYEY SAND, POORLY	CL / SC	0.25 / NA	PID 0.0 ppm; BY 0 cpm; Moist. 402730
20.0	12-28-94 1430 402756	NA	6	~~SORTED COARSE SAND, <1% FINE SUBANGULAR GRAVEL, NON-PLASTIC, WET~~ VERY SOFT (5Y 4/1) DARK GRAY SILTY CLAY, 4-5% FINE SAND, 2-3% FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION, TRACE OF WOOD FRAGMENTS, MEDIUM PLASTICITY, SLIGHTLY MOIST	SC / CL	NA / 0.25	PID 0.0 ppm; BY 0 cpm
20.5	12-28-94 1430 402756	NA	6	SOFT SAME AS ABOVE (19.5 - 20.0 FEET)	CL	0.5	PID 0.0 ppm; BY 0 cpm; Moist. 402729
21.0	12-28-94 1430 402756	NA	6	SOFT (5Y 4/1) DARK GRAY, SILTY CLAY, 2-3% FINE SAND, 5% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, TRACE OF WOOD FRAGMENTS, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	0.5	PID 0.0 ppm; BY 0 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: SEE PAGE 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES~~

FS-F-3681

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEB 27 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11499-011

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11499

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-28-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-28-94

WATER USED DURING DRILLING: 6.0 GALLONS (EST.)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	12-28-94 1430 402756	NA	6	SAME AS ABOVE (20.5 - 21.0 FEET)	CL	0.5	PID 0.0 ppm; BY 0 cpm
21.5	12-28-94 1430 402756	NA	6	SAME AS ABOVE (21.0 - 21.5 FEET)	CL	0.5	PID 0.0 ppm; BY 0 cpm
22.0		NA		BOTTOM OF BORING 22.0 FEET			PID; BY cpm
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: SEE PAGE 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FEMP QA 31 FEB 27 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 1 OF 12
200307-11500-008	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11500	N 481810.697 ; E 1382753.323	

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
601.43 ft.	N/A			19 DEC 94

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
MULLER / GEIGER / RILEY / LEE	N/A			20 DEC 94

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
12 GALLONS (EST)	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
-0-	12/19/94 402708 09:40	NA	6	SOFT, (2.5Y, 4/4) OLIVE BROWN CLAYEY SILT, 15% SAND, 5% ROOTS, COARSE SAND SUBANGULAR, MEDIUM PLASTICITY, MOIST	ML	.25	PID 11.7 ppm BY 60 cpm
.5	12/19/94 402708 09:40	NA	6	0-4 INCH SOFT (2.5Y, 5/4) LIGHT OLIVE BROWN SILTY CLAYEY, 15% SUBROUNDED MEDIUM-COARSE SAND, < 3% ROOTS MEDIUM PLASTICITY; MOIST 4-6 INCH SOFT (2.5Y, 3/3) DARK OLIVE BROWN CLAYEY	CL	.25	PID 12.0 ppm BY 60 cpm
1.0	12/19/94 402708 09:40	NA	6	SILT, 5% ROUNDED SAND, MEDIUM PLASTICITY, MOIST 2-6 INCH STIFF (2.5Y, 5/4) LIGHT OLIVE BROWN SILTY CLAY, 25% MEDIUM-COARSE SAND (SUB-ANGULAR) 3-5% ORGANICS (ROOTS) LOW-MEDIUM PLASTICITY, MOIST	CL	1.5	PID 12.9 ppm BY 90 cpm
1.5	12/19/94 402708 09:40	NA	6	0-2 INCH SAA 2-4 INCH STIFF (2.5Y, 3/3) DARK OLIVE BROWN SILTY CLAY, 5% SUBANGULAR SAND, TRACE SUBROUNDED COARSE GRAVEL MEDIUM PLASTICITY MOIST 4-6 INCH STIFF (2.5Y, 4/4) OLIVE BROWN	CL	1.75	PID 12.4 ppm BY 60 cpm
2	12/19/94 402708 09:40	NA	6	SILTY CLAY, 3% SUBANGULAR SAND, TRACE GRAY AND ORANGE MOTTLES, ORGANICS, MEDIUM PLASTICITY, MOIST	CL	1.25	PID 12.7 ppm BY 70 cpm
2.5	12/19/94 402708 09:40	NA	6	STIFF (2.5Y, 4/4) OLIVE BROWN SILTY CLAY 3% FINE-MEDIUM SAND, TRACE DARK BROWN MOTTLES, ORGANICS, HIGH PLASTICITY, MOIST	CL	1.5	PID 12.9 ppm BY 70 cpm
3 3.5	12/19/94 402709 09:50	NA	6	OLIVE BROWN (2.5Y 4/4) CLAY, SILTY, SOFT TO MED. STIFF, PLASTIC, < 5% F.-M. SAND MODERATE FE STAIN & MOTTLING, SL. ROOTED (FINE ROOTLETS), TRACE ORGANICS	CL	1.5	PID 13.9 ppm BY 60 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	11.0 PPM	12/19/94	09:57
ALPHA	NA	NA	NA
BETA / GAMMA	30 CPM	12/19/94	09:37

NOTES: SAA = SAME AS ABOVE; ALSO This Lithologic Log was updated using Archived Soil Cores by Geologists Barry Muller and Cliff Lee, ON 02/03/95 and 02/05/95.

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/14/94

FS-F-3681

FEMP QA 31

FEB 07 1995

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11500-009

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11500

COORDINATES: See Pg.1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg.1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 19 DEC 94

GEOLOGIST: MULLER / GEIGER / RILEY / LEE

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 20 DEC 94

WATER USED DURING DRILLING: 12 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	12/19/94 402709 09:50	NA	6	OLIVE BROWN (2.5Y4/4) CLAY, SILTY, SOFT TO MED. STIFF, HIGHLY PLASTIC, MOIST MODERATE FE STAIN & MOTTLING MINOR FINE ROOTLETS & ORGANICS, <5% FINE SUBANGULAR GRAVEL	CL	2.0	PID 14.1 ppm BY 80 cpm
4.0 – 4.5	12/19/94 402709 09:50	NA	6	SAME AS ABOVE, CLAY TO SL. MOIST, MEDIUM STIFF & MODERATE PLASTICITY MODERATE FE STAIN & MOTTLING, VERY MINOR FINE ROOTLETS & ORGANICS IN CLUSTERS	CL	2.0	PID 14.2 ppm BY 60 cpm
4.5 – 5.0	12/19/94 402709 09:50	NA	6	SAME AS ABOVE (OLIVE BRN. SILTY CLAY): BOTTOM 5 CM SLIGHTLY MOIST FINE TO COARSE WEATHERED CLAYSTONE & CHERT GRAVEL (10-15%) (UP TO 1 CM DIAMETER) CLASTS ISOLATED	CL	2.0	PID 14.5 ppm BY 80 cpm
5.0 – 5.5	12/19/94 402709 09:50	NA	6	CLAY & FINE GRAVEL AS ABOVE, WITH THE ADDITION OF SUBANGULAR CHERTY GRAVEL (FINE): (10-15%)? LOOSELY BEDDED GRAVELS BOTTOM 5 CM	CL	2.5	PID 14.6 ppm BY 80 cpm
5.5 – 6.0	12/19/94 402709 09:50	NA	6	OLIVE BROWN (2.5Y4/4) CLAY, MOD. → VERY SILTY, MED. STIFF, SLIGHT PLASTICITY, V. SL. MOIST, WITH FINE TO ~ COARSE SUBANGULAR CHERT, CLAYSTONE & GRAY (2.5Y3/1) SHALE (WEATHERED) GRAVEL (~10%) NO (LOOSE) ORIENTATION	CL	2.75	PID 14.7 ppm BY 50 cpm
6.0 – 6.5	12/19/94 402709 09:50	NA	6	CLAY AS ABOVE, W/ WEATHERED IRON CLASTS IN UPPER 5-7 CM, & GRAVEL (10-15%) FINE, SUBANGULAR BOTTOM 7 CM W/ COARSE SUBROUNDED GRVL. (15-20%) ISOLATED, VERTICALLY ORIENTED MAX. DIM 4 CM x 4 CM x 2 CM	CL	2.5	PID 15.2 ppm BY 50 cpm
6.5 – 7.0	12/19/94 402709 09:50	NA	6	CLAY AS ABOVE, HEAVILY MOTTLED & 'FRACTURED', ABUNDANT FE STAIN, V. STIFF FINE TO COARSE SUBANGULAR GRAVEL MAX. 25% (AVG. 15-20%) IN BOTTOM TO MIDDLE OF INTERVAL	CL	4.0	PID 15.0 ppm BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	N/A	N/A	N/A
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg.1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEB 27 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 3 OF 12
200307-11500-010	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11500	See Pg.1	N/A

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg.1	N/A			19 DEC 94

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
MULLER/GEIGER / RILEY/LEE	N/A			20 DEC 94

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
12 GALLONS	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER/GRIM/FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5	12/19/94 402710 10:00	NA	6" + FLUFF	VERY STIFF LIGHT OLIVE BROWN (2.5Y 5/4) CLAY, SILTY, MOIST, W/ MEDIUM PLASTICITY, WITH 5-10% MEDIUM, SUBANGULAR SAND IN TOP 5 CM, AND FINE TO COARSE SUBANGULAR TO SUBROUNDED GRAVEL (10-15%) BOTTOM 10 CM	CL	2.25	PID 16.1 ppm BY 50 CPM
8.0 – 8.5	12/19/94 402710 10:00	NA	6" + FLUFF	COARSE GRAVEL CLASTS TO 10CM x 6CM x 4CM CLAY AS ABOVE, FINE TO COARSE GRAVEL PERCENTAGE DECLINES TO 5% (ISOLATED) MAX. CLAST SIZE 2.5CM x 2.5CM x 1CM CLAY BLOCKY & STIFF W/ SLIGHT PLASTICITY	CL	2.25	PID 16.2 ppm BY 55 CPM
8.5 – 9.0	12/19/94 402712 10:00	NA	6	STIFF OLIVE BROWN CLAY (2.5Y 4/4), SILTY, V. SLIGHTLY MOIST, W/ MEDIUM PLASTICITY, W/ COARSE SUBROUNDED GRAVELS IN TOP 7-8CM, FINER (15-20%) & 1.5CM BRACHIOPOD SUBANGULAR GRAVELS (10-15%) IN BOTTOM 7-8CM	CL	1.5	PID 16.3 ppm BY 55 CPM
9.0 – 9.5	12/19/94 402712 10:00	NA	6	SAME AS ABOVE, COARSEST CLASTS HORIZONTALLY ON FLAT SIDE ORIENTED @ ~7-8CM LEVEL - MAY. DIMENSIONS: 10CM x 6CM x 2CM THICK	CL	1.5	PID 16.9 ppm BY 55 CPM
9.5 – 10.0	12/19/94 402712 10:10	NA	6	SAME CLAY AS ABOVE, WITH COARSEST COARSE GRAVEL CLASTS (SUBANGULAR) IN ~2CM SIZE RANGE: ISOLATED W/ NO ORIENTATION	CL	1.5	PID 19.3 ppm BY 55 CPM
10.0 – 10.5	12/19/94 402712 10:10	NA	6	SAME CLAY AS ABOVE, WITH BOTH SUBANGULAR/SUBROUNDED CHERT & SUBROUNDED FOSSIL FRAGMENTS (PROB. ORDOVICIAN): FINE & COARSE CLASTS - ISOLATED W/ NO ORIENTATION	CL	2.0	PID 21.2 ppm BY 55 CPM
10.5	12/19/94 402712 10:10	NA	6	ONLY FIRST 7-10CM REMAIN (SAMPLE TAKEN IN FIELD → LITTLE MATERIAL REMAINS FOR LAB OBSERVATIONS): CLAY AS ABOVE: ONE COBBLE (MICROXTAL LS.) (SUBROUNDED) MEASURES 7CM x 5CM x 3.5CM	CL	2.0	PID 22.1 ppm BY 55 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg.1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

FEMP QA 21 FEB 1995

D:\WPSD\94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11500-011	PAGE 4 OF 12
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11500	COORDINATES: See Pg. 1
RELATED FAL NO.s: N/A	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: N/A — DATE: — TIME: →
DATE STARTED: 19 DEC 94	
GEOLOGIST: MULLER / GEIGER / RILEY / LEE	GROUNDWATER LEVEL: N/A — DATE: — TIME: →
DATE COMPLETED: 20 DEC 94	
WATER USED DURING DRILLING: 12 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	12/19/94 402712 10:20	NA	6	INTERVAL MISSING: DESCRIBED IN FIELD AS 10YR 5/4 YELLOWISH BROWN SILTY CLAY W/ TRACE OF SAND & ANGULAR GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.25	PID 18.5 ppm; BY 55 cpm; TCLP 402646 TAKEN IN FIELD
11.0	12/19/94 402712 10:20	NA	6	INTERVAL MISSING: DESCRIBED IN FIELD AS 10YR 5/4 YELLOWISH BROWN SILTY CLAY WITH A LARGER PERCENTAGE OF SAND 10-15% (ANGULAR). TRACE OF FINE → MED. GRVL MED. PLASTICITY, SLIGHTLY MOIST	CL	0.25F	PID 19.0 ppm; BY 55 cpm; Kd 402644
11.5	12/19/94 402712 10:20	NA	6	INTERVAL MISSING: (ALL BUT LAST 1-2 CM) CONTACT INTERVAL: DOLOMITE/MICROCRYSTALLINE LIMESTONE COBBLE COMPRESSED/SETTLED(?) INTO	CL	0.25F	PID 19.0; BY 55 cpm
12.0	12/19/94 402712 10:30	NA	6	TOP OF GRAY CLAY (2.5Y 4/1) - IRREGULAR CONTACT MARKED BY IRON (ORANGE) COATING & STAINING. GRAY CLAY: STIFF, V. SL. MOIST, MED. PLASTICITY, SL. SILTY W/ COARSE SUB-ANGULAR/SUBRNDED GRAVEL, ISOLATED TO BEDDED NEAR MID SECTION	CL	0.5	PID 19.5 ppm; BY 55 cpm; Kd 402643
12.5	12/19/94 402713 10:30	NA	6	GRAY CLAY (5Y 3/2) TO 5Y 5/1 GRAY CLAY, SILTY, V. SLIGHTLY MOIST, MEDIUM PLASTICITY, STIFF, WITH FINE SUBANGULAR CHERTY GRAVEL: CLASTS NOT ORIENTED & ISOLATED IN GRAY CLAY MATRIX.	CL	1.25	PID 16.0 ppm; BY 55 cpm; TCLP 402648
13.0	12/19/94 402713 10:40	NA	6	GRAY CLAY, AS ABOVE, W/ GRAVEL, " " (5-20%) SUBANGULAR, FINE TO COARSE, ISOLATED IN GRAY CLAY MATRIX. MAX. SIZE 4CM x 7CM x 2CM THICK OBLIQUELY ORIENTED	CL	1.25	PID 16.4 ppm; BY 55 cpm
13.5	12/19/94 402713 10:40	NA	6	SAME AS ABOVE, SOME 'WEATHERED' SUBANGULAR CLASTS OF MUDSTONE SUBROUNDED CLAYSTONE "TEAL"-COLORED (GREENISH GRAY) 5GY 5/1	CL	1.25	PID 16.2 ppm; BY 50 cpm
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681

F-320

000709

FEMP QA

G:/WPSC/94-778.DRW (11-23-94

FEB 27 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11500-012

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11500

COORDINATES: See Pg. 1

RELATED FAL NO.(s): N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 19 DEC 94

GEOLOGIST: MULLER / GEIGER / RILEY / LEE

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 20 DEC 94

WATER USED DURING DRILLING: 12 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	12/19/94 402713 10:50	NA	6	OLIVE (5Y5/3) TO OLIVE GRAY (5Y 4/2) CLAY, SL. MOIST, PLASTIC, MODERATELY STIFF, SILTY, WITH FINE TO COARSE, V. POORLY SORTED, SUBROUNDED CHERTY GRAVEL CONCENTRATED IN TOP 5-7 CM, SPARSELY ISOLATED BELOW NEAR BASE OF INTERVAL	CL	1.25	PID 17.3 ppm BY 55 CPM
14.5	12/19/94 402713 10:50	NA	6	SAME AS ABOVE, COARSEST CLAST 3cm x 2.5cm x 2cm, NO ORIENTATION ALL CLASTS ISOLATED	CL	1.25	PID 16.8 ppm BY 55 CPM
15.0	12/19/94 402713 10:50	NA	6	SAME AS ABOVE, CLAY EXHIBITS SUB-VERTICAL, GN ESCHALON GREENISH-GRAY (5GY 5/1) 'PARTINGS & 'SWIRL' - (PROBABLY RELATED TO SHALE CLASTS IN GRAY CLAY) MAX. GRVL. SIZE ~ 3CM	CL	1.25	PID 16.9 ppm BY 60 CPM
15.5	12/19/94 402713 10:50	NA	6	SAME AS ABOVE, WITH CHERT, MUDSTONE, & LIMESTONE GRAVEL IN GRAY CLAY: UNIQUE FEATURE: SUBVERTICAL PATTERN AS AT RIGHT 15cm ↕ x 7cm ↔ ①	CL	1.25	PID 16.5 ppm BY 60 CPM
16.0	12/19/94 402713 10:50	NA	6	① = 5Y 4/2 ② = 5GY 5/1 ③ = YELLOWISH GREEN COLOR NOT IN MUNSELL COLOR CHART WITH FINE SUBANGULAR CHERT & FOSSILIFEROUS GRAVEL	CL	1.25	PID 16.3 PPM BY 60 CPM
16.5	12/19/94 402713 10:50	NA	6	GRAY CLAY & GRAVEL AS ABOVE SUBHORIZONTAL WOOD FRAGMENTS LARGEST GRAVEL CLAST SUBROUNDED, MEASURING 5.5 CM x 4 CM 2.5 CM	CL	1.25	PID 15.9 ppm BY 60 CPM
17.0	12/19/94 402714 10:55	NA	6	Stiff Olive gray (5y 4/2) silty clay with 3-7% subangular coarse gravel, 3-5% subrounded to subangular coarse sand. Low plasticity, moist.	CL	1.0	PID 16.1 ppm BY 45 CPM
17.5				Limestone gravel clast, irregular tilted orientation at bottom 2 inches measuring 5x2.5x4 cm			

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

000710

FEB 27 1995

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11500-013	PAGE 6 OF 12
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11500	COORDINATES: See Pg.1
RELATED FAL NO.s: N/A	
SURFACE ELEVATION: See Pg.1	GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE STARTED: 19 DEC 94
GEOLOGIST: GEIGER / RILEY / LEE MULLER COLLINS	GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE COMPLETED: 20 DEC 94
WATER USED DURING DRILLING: 12 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5 – 18.0	12/19/94 1050 402714	NA	6	Stiff Olive gray (5Y 4/2) silty clay, low plasticity, moist. Contains < 2% subangular fine gravel, 5-10% subangular medium to coarse sand.	CL	1.5	PID 16.7 ppm; BY 40 cpm
18.0 – 18.5	12/19/94 1050 402714	NA	6	Medium stiff Olive (5Y 4/3) silt clay, low plasticity, moist. < 3% subangular coarse gravel. Olive (5Y 4/2) mottling. Bryozoan fragment at 18.3' Wood fragments 18.4'-18.5'	CL	0.75	PID 16.4 ppm; BY 40 cpm
18.5 – 19.0	12/19/94 1050 402714	NA	6	Soft dark greenish gray (5GY 4/1) slightly silty clay, medium plasticity, moist, with dark greenish gray (5BG 4/1) mottling. < 1% subrounded coarse sand, 1% subrounded gravel. One irregular, tilted subangular cobble (100mm x 60mm x 60mm) with wood fragments lodged against the top of the cobble. Wood fragments at 18.8'	CL	0.5	PID 16.8; BY 60 cpm
19.0 – 19.5	12/19/94 1105 402714	NA	6	Same as above, with very large wood fragment. High plasticity.	CH	0.25	PID 15.8 ppm; BY 40 cpm
19.5 – 20.0	12/19/94 1105 402714	NA	6	Soft dark greenish gray (5GY 4/1) silty clay, high plasticity, moist. Dark bluish gray (5B 4/1) mottling. 5-7% subrounded fine gravel, with 1% subangular coarse gravel.	CH	0.50	PID 16.4 ppm; BY 50 cpm
20.0 – 20.5	12/19/94 1105 402714	NA	6	Same as above, except cobble at 20.3-20.5 feet Cobble at 20.3 to 20.5 feet. Irregular, tilted (95x50x25mm)	CH	0.50	PID 16.4 ppm; BY 45 cpm
20.5 – 21.0	12/19/94 1110 402714	NA	6	Same as above from 20.5 through 20.6' Dark olive (2.5 3/2) very clayey fine sand, < 5% rounded coarse sand to fine gravel. Pockets of offwhite mottling or secondary cementation containing fine sand.	SC	N/A	PID 16.9 ppm; BY 50 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg.1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11500-014	PAGE 7 OF 12
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11500	COORDINATES: See Pg. 1
RELATED FAL NO.: N/A	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE STARTED: 19 DEC 94
GEOLOGIST: MULLER / GEIGER / RILEY / LEE / COLLINS	GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE COMPLETED: 20 DEC 94
WATER USED DURING DRILLING: 12 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0 – 21.5	12/19/94 1110 402714	NA	6	Dark olive (2.5 3/2) very clayey fine sand, 5-10% rounded coarse sand, < 3% fine sand. Subrounded cobble with vertical orientation, flat (105 x 25 x 50 mm)	SC	N/A	PID 16.9 ppm; BY 50 cpm; MOIST 402652; TCLP 402650; TOTH 402649
21.5 – 22.0	12/19/94 1110 402714	NA	6	Olive (5Y 4/2) clayey, silty very fine sand, < 1% subrounded fine gravel, 3% subrounded fine to medium sand. Hard, friable, slightly moist.	SC	N/A	PID 16.9 ppm; BY 50 cpm
22.0 – 22.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
22.5 – 23.0	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
23.0 – 23.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
23.5 – 24.0	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm
24.0 – 24.5	NA	NA	0	No Recovery	NA	NA	PID NA ppm; BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEB 27 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11500-015

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11500

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 19 DEC 94

GEOLOGIST: MULLER / GEIGER / RILEY / LEE / COZZINS

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 20 DEC 94

WATER USED DURING DRILLING: 12 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
25.0		NA	0	No Recovery	NA	NA	PID ppm; BY N/A CPM
25.5	12/19/94 1115 402707	NA	Soft 6	Olive Gray (5Y, 4/2) Silty clay with 5-10% coarse angular sand with 1% coarse ~~angular~~ sub rounded gravel, slightly moist, low-med plasticity	CL	.25	PID 16.0 ppm; BY ~~N/A~~ 50 CPM
26.0	12/19/94 1115 402707	NA	Soft 6	Olive Gray (5Y, 4/2) Silty clay with 5-10% coarse angular sand with 1% tilted sub rounded gravel, slightly moist, low-med plasticity	CL	.25	PID 16.2; BY 50 CPM
26.5	12/19/94 1115 402707	NA	Soft 6	Olive Gray (5Y, 4/2) Silty clay with 5-10% coarse angular sand with 2% sub rounded gravel, slightly moist, low-med plasticity	CL	.25	PID 16.3 ppm; BY 50 CPM
27.0	12/19/94 1115 402707	NA	Soft 6	Olive Gray (5Y, 4/2) silty clay with 5-10% coarse angular sand with 2% sub rounded gravel, slightly moist, low-med plasticity	CL	.25	PID 16.3 ppm; BY 50 CPM
27.5	12/19/94 1115 402707	NA	Soft 6	Olive Gray (5Y, 4/2) silty clay with 5-10% coarse angular sand with 2% sub rounded gravel, slightly moist less than 1% wood fragments, low-med plasticity	CL	.25	PID 16.3 ppm; BY 50 CPM
28.0	12/19/94 1115 402707	NA	Soft 6	Olive Gray (5Y, 4/2) silty clay with 5-10% coarse angular sand with 2% ~~sub rounded~~ angular gravel, slightly moist low-med plasticity	CL	.25	PID 16.3 ppm; BY 55 CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681

000713

FEMP QA ?!

G:/WPSC/94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11500-016

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11500

COORDINATES: See Pg. 1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE STARTED: 19 DEC 94

GEOLOGIST: MULLER / GEIGER / RILEY / LEE / COLLINS

GROUNDWATER LEVEL: N/A — DATE: — TIME: → DATE COMPLETED: 20 DEC 94

WATER USED DURING DRILLING: 12 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.5	12/19/94 1115 402707	NA	SOFT 6	Olive Gray (5Y, 4/2) silty clay with 5-10% coarse angular sand with 2% ~~subar~~ KP 2-8-95 subangular gravel, slightly moist, low-med plasticity	CL	.25	PID 16.3 ppm BY 50 cpm
29.0	12/19/94 1115 402707	NA	SOFT 6	Olive Gray (5Y, 4/2) silty clay with 5-10% coarse angular sand, slightly moist, low-med plasticity	CL	.25	PID 16.3 ppm BY 60 cpm
29.5	12/19/94 1120 402711	NA	6	Dark gray (5Y; 4/1) silty clay with 1-2% subrounded to subangular fine gravel, <3% subangular coarse sand, 5% fine sand. High plasticity, moist. Brown mottling from 29.0 - 29.3 feet. Medium siffness.	CL	1.0	PID 16.2 ppm BY 50 cpm
30.0	12/19/94 1120 402711	NA	6	Medium stiff Dark gray (5Y, 4/1) silty clay with 1-2% subrounded ~~coarse~~ fine gravel, 5% subangular medium sand, 1% fine sand. High silt content from 29.5 to 29.7 feet.	CL	0.75	PID 16.2 ppm BY 50 cpm
30.5	12/19/94 1120 402711	NA	6	Medium stiff, Olive gray (5Y, 4/2) silty clay with <1% coarse gravel, 5-7% angular coarse sand, 1% rounded to subrounded fine sand. Medium plasticity, moist. From 30.3 to 30.5 - Subrounded, vertically tilted cobble measuring 110 x 65 x 55 mm.	CL	0.75	PID 16.2 ppm BY 50 cpm
31.0	12/19/94 1120 402711	NA	6	Medium stiff, Dark Gray (5Y, 4/1) silty clay with 3-5% Angular coarse gravel, 3% subrounded fine gravel, 3% rounded course sand, 1% rounded medium sand. Medium plasticity, moist. Grayish green (5G 4/2) mottling from 30.7 to 31.0	CL	1.0	PID 16.3 ppm BY 50 cpm
31.5	12/19/94 1120 402711	NA	6	Same as above, except no mottling.	CL	1.0	PID 16.1 ppm BY 45 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TE~~

FS-F-3681

FEMP QA 21

FEB 27 1995

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11500-017

PAGE 10 OF 12

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11500

COORDINATES: See Pg. 1

RELATED FAL NO.: N/A

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 19 DEC 94

GEOLOGIST: MULLER / GEIGER / RILEY / LEE / COLLINS

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 20 DEC 94

WATER USED DURING DRILLING: 12 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5	12/19/94 1120 402711	NA	6	Flat, vertically oriented cobble 90 x 25 x 65 mm. Medium stiff. Dark greenish gray (5GY, 4/1) silty clay with 3% subangular fine gravel, 1-2% subangular coarse sand, 1% subangular medium to fine sand. Medium plasticity, moist.	CL	1.0	PID 16.2 ppm; BY 55 cpm
32.0	12/19/94 1120 402711	NA	6	Stiff, Dark greenish gray (5GY, 4/1) silty clay with 3% subangular coarse gravel, 3-4% subangular fine gravel, 10-12% subangular to subrounded coarse sand. Olive (5Y 4/4) mottling at 32.3 feet. Low plasticity, moist.	CL	1.25	PID 16.5 ppm; BY 40 cpm
33.0	12/19/94 1130 402711	NA	6	Very stiff, Dark grayish brown (2.5y 4/2) silty clay with <1% angular fine gravel, 2% subrounded fine gravel, 2-3% subrounded to subangular coarse sand, 1% subrounded medium sand. Low plasticity, moist. Olive (5Y 4/4) mottling approximately 1cm in diameter. Brown fragments.	CL	2.25	PID 16.5 ppm; BY 45 cpm
33.5	12/19/94 1130 402715	NA	6	Hard, Olive gray (5Y, 4/2) ~~silty clay~~ KC 2-5-95 clayey silt with <2% angular fine gravel to coarse sand. Slightly moist	SC ~~CL~~ KC 2-5-95	>4	PID 16.1 ppm; BY 45 cpm
34.0	12/19/94 1130 402715	NA	6	Hard, Olive gray (5Y, 4/2) silty clay with <1% subrounded fine gravel, 1-2% subrounded coarse sand, 1% subrounded to subangular medium sand. Low plasticity, slightly moist. Some dark orange staining at 33.8 feet.	CL	4.0	PID 16.8 ppm; BY 50 cpm
34.5	12/19/94 1130 402715	NA	6	Hard, Olive gray (5y, 4/2) silty clay with <3% subangular coarse gravel, 1-2% subrounded coarse sand, 5-7% subrounded medium sand, 5-6% fine sand. low-med plasticity	CL	>4	PID 16.9 ppm; BY 45 cpm
35.0	12/19/94 1130 402715	NA	6	Same as above.	CL	>4	PID 16.7 ppm; BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11500-018	PROJECT NO.: 20.03.07
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	
BORING NUMBER: 11500	COORDINATES: See Pg.1
RELATED FAL NO.s: N/A	
SURFACE ELEVATION: See Pg.1	GROUNDWATER LEVEL: N/A / DATE: / TIME: / DATE STARTED: 19 DEC 94
GEOLOGIST: MULLER / GEIGER / RILEY / LEE / COLLINS	GROUNDWATER LEVEL: N/A / DATE: / TIME: / DATE COMPLETED: 20 DEC 94
WATER USED DURING DRILLING: 12 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35.0 – 35.5	12/19/94 1130 402715	NA	6	Same as above, except <1% subrounded fine gravel 3-5% subrounded coarse sand	CL	>4	PID 16.7 ppm BY 40 cpm
35.5 – 36.0	12/19/94 1130 402715	NA	6	Hard olive gray (5y 4/2) silty clay with 3-5% subrounded coarse sand, 5-7% subrounded medium sand, 5% fine sand. Low plasticity, slightly moist.	CL	>4	PID 16.9 ppm BY 45 cpm
36.0 – 36.5	12/19/94 1130 402715	NA	6	~~Hard~~ K.C. 2-5-95 Very Stiff, Olive gray (5y 4/2) silty clay with <1% subangular fine gravel, 2-3% subrounded coarse sand, 1% subrounded to subangular fine sand. Bryozoan fragments, low plasticity, slightly moist	CL	3.0	PID 16.9 ppm BY 40 cpm
36.5 – 37.0	12/19/94 1130 402715	NA	6	Very stiff, Olive (5y 4/4) silty clay with 1-2% subangular coarse gravel, <2% rounded coarse sand, <2% medium to fine sand, Low plasticity, slightly moist.	CL	2.5	PID 16.7 ppm BY 40 cpm
37.0 – 37.5	12/19/94 1135 402715	NA	6	Same as above.	CL	2.5	PID 16.5 ppm BY 40 cpm
37.5 – 38.0	12/19/94 1135 402715	NA	6	Cobble at 37.5-37.7 feet; subrounded, vertical 80x30x40 mm Hard, Dark gray (5y 4/1) silty clay with <2% subrounded fine gravel, 5% rounded coarse sand, <2% subrounded medium to fine sand. Low plasticity, slightly moist.	CL	4.0	PID 16.7 ppm BY 40 cpm
38.0 – 38.5	12/19/94 1135 402715	NA	6	Same as above.	CL	>4	PID 16.5 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: See Pg.1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/19/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21

FEB 27 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 20 0307-11500-019

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER:

COORDINATES: See Pg.1

RELATED FAL NO.s: N/A

SURFACE ELEVATION: See Pg.1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 19 Dec 94

GEOLOGIST: Muller / GEIGER / RILEY / COLLINS / Lee

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 20 Dec 94

WATER USED DURING DRILLING: GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
38.5	12/19/94 1135 N/A	NA	NA	NO RECOVERY	N/A	N/A	PID NA N/A ppm; BY cpm
39.0				BOTTOM OF BORING @ 39.0'			
		NA					PID ppm; BY cpm
39.5							
		NA					PID ppm; BY cpm
40.0							
		NA					PID ppm; BY cpm
40.5							
		NA					PID ppm; BY cpm
41.0							
		NA					PID ppm; BY cpm
41.5							
		NA					PID ppm; BY cpm
42.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg.1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg.1	/ /	

NOTES: See Pg.1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP QA 21 FEB 07 1995

200307 - 11501 - 005

118

CONTRC. NO.: ~~200307 - 11501 - 019~~ KD 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 1 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11501	COORDINATES: N 481823.995 E 1382754.175
RELATED FAL NO.: ~~200307-0~~ KP 11501	200307-11501-004
SURFACE ELEVATION: 601.47 ft.	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12/30/94
GEOLOGIST: GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12/30/94
WATER USED DURING DRILLING: Estimate 12.0 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.5	12-30-94 0855 403326	NA	6	SOFT (10YR 3/3) DARK BROWN SILTY CLAY WITH <1% FINE SAND, ABUNDANT ROOTS, LOW TO MEDIUM PLASTICITY, SLIGHTLY MOIST NO GRAVEL	CL	0.5	PID 0.0 ppm BY 40 cpm
1.0	12-30-94 0855 403326	NA	6	SOFT (10YR 4/4) DARK YELLOWISH BROWN, SILTY CLAY, 1-2% COARSE SAND, ABUNDANT ROOTS, MEDIUM PLASTICITY, SLIGHTLY MOIST TO MOIST NO GRAVEL	CL	0.5	PID 0.0 ppm BY 40 cpm
1.5	12-30-94 0855 403326	NA	6	SAME AS ABOVE (0.5 - 1.0 FEET)	CL	0.5	PID 0.0 ppm BY 40 cpm
2.0	12-30-94 0855 403326	NA	6	STIFF (10YR 3/3) DARK BROWN SILTY CLAY, <.5% COARSE SAND, ABUNDANT ROOTS, NO GRAVEL LOW PLASTICITY, SLIGHTLY MOIST TO DRY	CL	1.0	PID 0.0 ppm BY 40 cpm
2.5	12-30-94 0855 403326	NA	6	SAME AS ABOVE 1.5 - 2.0 FEET	CL	1.5	PID 0.0 ppm BY 40 cpm
3.0	12-30-94 0855 403326	NA	6	STIFF (10YR 4/4) DARK YELLOWISH BROWN SILTY CLAY, 1-2% FINE SAND, NO GRAVEL, IRON AND MANGANESE STAINING, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.0	PID 0.0 ppm BY 40 cpm
3.5	12-30-94 0855 403325 ~~403327~~ JC 2-8-95	NA	6	SAME AS ABOVE 2.5 - 3.0 FEET	CL	2.0	PID 0.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/30/94	0830
ALPHA	NA	NA	NA
BETA / GAMMA	40	12/30/94	0830

NOTES: JC 2-7-95 ~~NONE~~

This Lithologic Log was updated using Archived Cores by Geologist Pat Riley on 01/27/95

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FED 97 000718

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11501-006

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11501

COORDINATES: SEE PAGE 1

RELATED FAL NO.(s): See p. 1

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-30-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-30-94

WATER USED DURING DRILLING: 12.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
4.0	12-30-94 0905 403325	NA	6	SAME AS ABOVE 3.0-3.5 WITH 5% MEDIUM SUBANGULAR GRAVEL IRREGULAR ORIENTATION	CL	2.0	PID 0.0 ppm BY 40 cpm
4.5	12-30-94 0905 403324	NA	6	STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY WITH 2% COARSE SAND, 5% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, 10YR 6/1 GRAY ~~MOTTLING~~ MOTTLING, MEDIUM PLASTICITY, SLIGHTLY ~~DRY~~ MOIST	CL	1.5	PID 0.0 ppm BY 40 cpm
5.0	12-30-94 0905 403324	NA	6	SAME AS ABOVE (4.0-4.5 FEET)	CL	1.75	PID 0.0 ppm BY 40 cpm
5.5	12-30-94 0905 403324	NA	6	SAME AS ABOVE (4.5-5.0 FEET) IRREGULAR ORIENTATION WITH 10% MEDIUM SUBANGULAR GRAVEL	CL	1.5	PID 0.0 ppm BY 40 cpm
6.0	12-30-94 0905 403324	NA	6	SAME AS ABOVE (5.0-5.5 FEET) 15% MED. SUBANGULAR GRAVEL, IRREG. ORIENTATION	CL	1.25	PID 0.0 ppm BY 40 cpm
6.5	12-30-94 0905 403324	NA	6	SAME AS ABOVE (5.5-6.0 FEET)	CL	1.5	PID 0.0 ppm BY 40 cpm
7.0	12-30-94 0905 403324	NA	6	VERY STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY, 2-3% COARSE SAND, 10% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, 10YR 6/1 GRAY MOTTLING, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.25	PID 0.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

FEB 27 1995

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

G:/WPSC/94-778 DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.:	200307-11501-007
PAGE	3 OF 11
PROJECT NAME:	PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION
PROJECT NO.:	20.03.07
BORING NUMBER:	11501
COORDINATES:	SEE PAGE 1
RELATED FAL NO.s:	SEE P. 1
SURFACE ELEVATION:	SEE PAGE 1
GROUNDWATER LEVEL: / DATE: / TIME:	
DATE STARTED:	12-30-94
GEOLOGIST:	GEIGER / RILEY
GROUNDWATER LEVEL: / DATE: / TIME:	
DATE COMPLETED:	12-30-94
WATER USED DURING DRILLING:	Estimate 12.0 GALLONS
DRILLING CONTRACTOR:	ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT:	ROTASONIC
DRILLER / HELPER:	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.5	12-30-94 0915 403323	NA	6	VERY STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY 5% COARSE SAND, 10% MEDIUM SUBANGULAR AND ANGULAR GRAVEL, (1) 13 x 7 x 3 ANGULAR LIMESTONE COBBLE, MEDIUM PLASTICITY, SLIGHTLY MOIST (NO MOTTLING)	CL	2.25	PID 0.0 ppm BY 40 cpm
8.0	12-30-94 0915 403323	NA	6	VERY STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY, 6% COARSE SAND, 15% MEDIUM SUBANGULAR AND ANGULAR GRAVEL, SLIGHT 10YR 6/1 GRAY MOTTLING, SLIGHTLY MOIST, MEDIUM PLASTICITY	CL	2.5	PID 0.0 ppm BY 40 cpm
8.5	12-30-94 0915 403322	NA	6	SAME AS ABOVE (7.5-8.0 FEET)	CL	2.0	PID 0.0 ppm BY 40 cpm
9.0	12-30-94 0915 403322	NA	6	SAME AS ABOVE (8.0-8.5 FEET)	CL	2.0	PID 0.0 ppm BY 40 cpm
9.5	12-30-94 0915 403322	NA	6	VERY STIFF (10YR 4/3) BROWN SILTY CLAY 3-4% COARSE SAND, 10% MEDIUM TO FINE SUBANGULAR IRREGULAR ORIENTATION, 10YR 5/6 YELLOWISH BROWN IRON STAINING, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 0.0 ppm BY 40 cpm
10.0	12-30-94 0915 403322	NA	6	SAME AS ABOVE (9.0-9.5 FEET)	CL	2.25	PID 0.0 ppm BY 40 cpm
10.5	12-30-94 0915 403322	NA	6	SAME AS ABOVE (9.5-10.0 FEET)	CL	2.5	PID 0.0 ppm BY 40 cpm.

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-2691

G:/WPSC/94-778 DRW (11-23-94)

CONTROL NO.: 200307-11501-002

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11501

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: See p-1

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-30-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-30-94

WATER USED DURING DRILLING: 12.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
INTERFACE							
11.0	12-30-94 0915 403322	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, ~~FRAGM~~ FRACTURED WITH DESSICATION CRACKS, 5% FINE SAND, TRACE (1% OR LESS) COARSE SAND, 3% MEDIUM TO FINE SUBANGULAR GRAVEL (ONLY IN GRAY), 10 YR 5/6 YELLOWISH BROWN SILTY CLAY FILLS CRACKS, MEDIUM PLASTICITY, MOIST	CL	1.5	PID 0.0 ppm BY 40 cpm
11.5	12-30-94 0915 403322	NA	6	SAME AS ABOVE (1) 3x1x1cm WOOD FRAGMENT TILTED ORIENTATION (10.5 - 11.0 FEET) (2) ANGULAR LIMESTONE 4x2x2 cm GRAVEL (1) 9x4x3cm SUBANGULAR LIMESTONE COBBLE, HORIZONTAL ORIENTATION	CL	1.5	PID 0.0 ppm BY 40 cpm
12.0	12-30-94 0915 403322	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 3-4% FINE SAND, 15% SUBANGULAR GRAVEL (LARGE TO FINE) IRREGULAR ORIENTATION, NO DESSICATION CRACKS, LOW PLASTICITY, SLIGHTLY MOIST	CL	2.0	PID 0.0 ppm BY 40 cpm
12.5	12-30-94 0915 403321	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 3-4% FINE SAND, 3% FINE TO MEDIUM SUBANGULAR GRAVEL IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST.	CL	1.75	PID 0.0 ppm BY 40 cpm
13.0	12-30-94 0915 403321	NA	6	STIFF (5Y 4/1) DARK GRAY VERY SILTY CLAY, 2% FINE SAND, 2% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, LOW PLASTICITY, SLIGHTLY MOIST.	CL	2.0	PID 0.0 ppm BY 40 cpm
13.5	12-30-94 0915 403321	NA	6	STIFF (5Y 4/1) DARK GRAY VERY SILTY CLAY, 1-2% FINE SAND, 10% LARGE SUBANGULAR LIMESTONE GRAVEL (3x3x3cm) IRREGULAR ORIENTATION, (1) LARGE 6x4x3cm SUBANGULAR DOLOMITE COBBLE, TILTED ORIENTATION LOW PLASTICITY, SLIGHTLY MOIST	CL	1.75	PID 0.0 ppm BY 40 cpm
14.0	12-30-94 0915 403321	NA	6	SAME AS ABOVE (13.0 - 13.5 FEET) ~~(1) 6x6x3cm~~ SUBANGULAR LIMESTONE ~~COBBLE IRREGULAR ORIENTATION~~	CL	2.0	PID 0.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 PR 11/22/96 ~~None~~

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-2581

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 000307-11501-009

PAGE 5 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11501

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: see p. 1

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 12-30-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 12-30-94

WATER USED DURING DRILLING: Estimate 12.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.5	12-30-94 0915 403321	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2% FINE SAND, 10% FINE-MED SUBANGULAR GRAVEL, (1) 6x6x3 cm LIMESTONE COBBLE ANGULAR, IRREGULAR ORIENTATION, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 0.0 ppm BY 40 cpm
15.0	12-30-94 0915 403321	NA	6	SAME AS ABOVE (14.0 - 14.5 FEET) NO COBBLES	CL	1.75	PID 0.0 ppm BY 40 cpm
15.5	12-30-94 0915 403321	NA	6	SAME AS ABOVE (14.5 - 15.0 FEET) (1) 5x5x3 cm ANGULAR LIMESTONE COBBLE TILTED ORIENTATION	CL	1.5	PID 0.0 ppm BY 40 cpm
16.0	12-30-94 0915 403321	NA	6	SAME AS ABOVE (15.0 - 15.5 FEET) NO COBBLES	CL	1.75	PID 0.0 ppm BY 40 cpm
16.5	12-30-94 0915 403321	NA	6	SAME AS ABOVE (15.5 - 16.0 FEET) (NO COBBLES)	CL	1.75	PID 0.0 ppm BY 40 cpm
17.0	12-30-94 0915 403321	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2-3% FINE SAND, 2% FINE-MOD SUBANGULAR GRAVEL, TRACE OF IRON STAINING, NO COBBLES, MEDIUM PLASTICITY SLIGHTLY MOIST	CL	1.75	PID 0.0 ppm BY 40 cpm
17.5	12-30-94 0915 403317	NA	6	SAME AS ABOVE (16.5 - 17.0 FEET)	CL	2.0	PID 0.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

FEB 07 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

200307-11501-010

CONTROL NO.: ~~200307-11501-024~~ FP 2-14-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11501

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-30-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-30-94

WATER USED DURING DRILLING: Estimate 12.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
18.0	12-30-94 0930 403317	NA	6	(1) 9x6x3 cm SUBANGULAR LIMESTONE COBBLE, VERTICAL SAME AS ABOVE (17.0-17.5 FEET)	CL	1.75	PID 0.0 ppm BY 40 cpm
18.5	12-30-94 0930 403317	NA	6	SAME AS ABOVE (NO COBBLES) (17.5-18.0 FEET)	CL	1.75	PID 0.0 ppm BY 40 cpm
19.0	12-30-94 0930 403317	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2% FINE SAND, 2% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, (1) 7x3x4 cm LIMESTONE SUBANGULAR COBBLE, IRREGULAR ORIENTATION, MEDIUM PLASTICITY SLIGHTLY MOIST	CL	1.5	PID 0.0 ppm BY 40 cpm
19.5 ~~20.0~~ PR	403317	NA	6	SAME AS ABOVE NO COBBLES	CL	1.75	PID 0.0 ppm BY 40 cpm
20.0 ~~20.5~~ PR	12-30-94 0930 403317	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2-3% FINE SAND, 4% FINE-MOD. SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, 0.5-1% WOOD FRAGMENTS (PHOTO TAKEN) WELL PRESERVED, MEDIUM TO LOW PLASTICITY, SLIGHTLY MOIST, FINE (1cm) HORIZONTAL FINE SAND INCLUSION	CL	1.5	PID 0.0 ppm BY 40 cpm
20.5 ~~21.0~~ PR	12-30-94 0930 403317	NA	6	SAME AS ABOVE (19.5-20.0 FEET) NO WOOD, NO SAND INCLUSION	CL	1.5	PID 0.0 ppm BY 40 cpm
21.0 ~~21.5~~ PR	12-30-94 0930 403317	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 2-3% FINE SAND, 5% MEDIUM SUBANGULAR GRAVEL, (1) 7x6x4cm ANGULAR LIMESTONE COBBLE, (1) 5x5x3 SUBANGULAR QUARTZITE COBBLE, ALL IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.0	PID 0.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

FEB 27 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

G:/WPSC/94-776.DRW (11-23-94)

200307-11501-011

CONTROL NO.: ~~200307-11501-025~~ KP 2-14-95

FEMP
LITHOLOGIC LOG

PAGE 7 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11501

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: P. 1

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-30-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-30-94

WATER USED DURING DRILLING: Estimate 12.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0 – 21.5	12-30-94 0930 403317	NA	6	SAME AS ABOVE (20.5 - 21.0 FEET) *(1) 7x4x3 cm SUBANGULAR LIMESTONE COBBLE, IRREGULAR ORIENTATION	CL	1.5	PID 0.0 ppm; BY 40 cpm
22.0 – 22.5	12-30-94 0930 403317	NA	6	VERY STIFF SAME AS ABOVE (21.0 - 21.5 FEET) NO COBBLES	CL	2.5	PID 0.0 ppm; BY 40 cpm
22.5 – 23.0	12-30-94 0930 403318	NA	6	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 3% FINE SAND, 7% FINE TO MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 0.0 ppm; BY 40 cpm
23.0 – 23.5	12-30-94 0930 403318	NA	6	SAME AS ABOVE (22.0 - 22.5 FEET)	CL	2.25	PID 0.0 ppm; BY 40 cpm
23.5 – 24.0	12-30-94 0930 403318	NA	6	SAME AS ABOVE (22.5 - 23.0 FEET) (1) 5x5x3 cm LARGE GRAVEL, LIMESTONE, IRREGULAR ORIENTATION	CL	2.5	PID 0.0 ppm; BY 40 cpm
24.0 – 24.5	12-30-94 0930 403318	NA	6	SAME AS ABOVE (23.0 - 23.5 FEET) NO COBBLE	CL	2.5	PID 0.0 ppm; BY 40 cpm
24.5	12-30-94 0930 403318	NA	6	SAME AS ABOVE (23.5 - 24.0 FEET) NO COBBLE	CL	2.75	PID 0.0 ppm; BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~None~~

See Pg. 1

~~*SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FEB 27 1995

000724

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

200307-11501-012

CONTROL NO.: ~~200307-11501-026~~ 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 8 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11501

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-30-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-30-94

WATER USED DURING DRILLING: Estimate 12.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5	12-30-94 0930	NA	6	SAME AS ABOVE (24.0-24.5 FEET)	CL	2.5	PID 0.0 ppm; BY 40 cpm
25.0	403318						
	12-30-94 0930	NA	6	SAME AS ABOVE (24.5-25.0 FEET)	CL	2.25	PID 0.0 ppm; BY 40 cpm
25.5	403318						
	12-30-94 0930	NA	6	SAME AS ABOVE (25.0-25.5 FEET) (1) 6x4x2 cm ANGULAR LIMESTONE COBBLE, HORIZONTAL ORIENTATION	CL	2.25	PID 0.0 ppm; BY 40 cpm
26.0	403318						
	12-30-94 0930	NA	6	SAME AS ABOVE (1) 9x4x4 cm ANGULAR LIMESTONE COBBLE, HORIZONTAL ORIENTATION	CL	2.5	PID 0.0 ppm; BY 40 cpm
26.5	403318						
	12-30-94 0930	NA	6	SAME AS ABOVE NO COBBLES	CL	2.25	PID 0.0 ppm; BY 40 cpm
27.0	403318						
	12-30-94 0945	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 10% FINE SAND, 3% FINE SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, MOIST	CL	1.5	PID 0.0 ppm; BY 40 cpm
27.5	403319						
	12-30-94 0945	NA	6	SAME AS ABOVE 27.0-27.5	CL	1.0	PID 0.0 ppm; BY 40 cpm
28.0	403319						

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

FEB 27 1995

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3581

000725

G: / WPSC / 94-778.DRW (11-23-94)

200307-11501-013

CONTROL NO.: ~~200307-11501-027~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PAGE 9 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11501

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: SEE P. 1

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 12-30-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 12-30-94

WATER USED DURING DRILLING: 12.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0 – 28.5	12-30-94 0945 403319	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 3% FINE SAND, 10% MED TO LARGE SUBANGULAR GRAVEL IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.0	PID 0.0 ppm BY 40 cpm
28.5 – 29.0	12-30-94 0945 403319	NA	6	SAME AS ABOVE (28.0 - 28.5 FEET)	CL	2.0	PID 0.0 ppm BY 40 cpm
29.0 – 29.5	12-30-94 0945 403319	NA	6	VERY STIFF SAME AS ABOVE	CL	2.5	PID 0.0 ppm BY 40 cpm
29.5 – 30.0	12-30-94 0945 403319	NA	6	VERY STIFF SAME AS ABOVE	CL	2.25	PID 0.0 ppm BY 40 cpm
30.0 – 30.5	12-30-94 0945 403319	NA	6	STIFF (5Y 4/1) DARK GRAY ~~STIFF~~ SILTY CLAY, 5% FINE SAND, 7% FINE SUBANGULAR GRAVEL, 10% LARGE GRAVEL, (1) 7x6x2 ANGULAR LIMESTONE COBBLE ALL IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST.	CL	1.75	PID 0.0 ppm BY 40 cpm
30.5 – 31.0	12-30-94 0945 403319 ~~403319~~ 403349 12-30-94	NA	6	SAME AS ABOVE (1) 7 x 5 x 2 cm LIMESTONE ANGULAR COBBLE, IRREGULAR ORIENTATION	CL	1.75	PID 0.0 ppm BY 40 cpm
31.0 – 31.5	12-30-94 0945 403320	NA	6	SAME AS ABOVE (30.5 - 31.0 FEET)	CL	1.5	PID 0.0 ppm BY 40 cpm Moist 403350

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~NONE~~

See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

F-337

000726

FEB 27 1995

G:/WPSC/94-778.DRW (11-23-94)

200307 - 11501 - 014

CONTROL NO.: ~~200307-11501-028~~ KP 2-14-95

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11501

COORDINATES: SEE PAGE 1

RELATED FAL NO.s: SEE P. 1

SURFACE ELEVATION: SEE PAGE 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-30-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-30-94

WATER USED DURING DRILLING: 12.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (Inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5 – 32.0	12-30-94 0945 403320	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 5% FINE SAND, 2% MEDIUM SUBANGULAR GRAVEL, IRREGULAR ORIENTATION, (1) 6 x 4 x 2 cm ANGULAR LIMESTONE GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 0.0 ppm BY 40 cpm
32.5	12-30-94 0945 403320	NA	6	SAME AS ABOVE (1) 7 x 6 x 7 cm ANGULAR LIMESTONE COBBLE, IRREGULAR ORIENTATION, (1) 5 x 1 x 1 cm WOOD FRAG. (VERTICAL)	CL	1.75	PID 0.0 ppm BY 40 cpm
33.0	12-30-94 0945 403320	NA	6	SAME AS ABOVE NO COBBLES	CL	1.5	PID 0.0 ppm BY 40 cpm
33.5	12-30-94 0945 403320	NA	6	STIFF (5Y 4/1) DARK GRAY SANDY CLAY, HIGH SILT CONTENT, 2% FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION, 15% FINE SAND, <.5% WOOD FRAGMENTS MEDIUM TO LOW PLASTICITY, MOIST	CL	1.75	PID 0.0 ppm BY 40 cpm
34.0	12-30-94 0945 403320	NA	6	STIFF (5Y 4/1) DARK GRAY, SANDY CLAY, HIGH SILT CONTENT, 15% FINE SAND, 10% FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, MOIST.	CL	1.0	PID 0.0 ppm BY 40 cpm
34.5	12-30-94 0945 403320	NA	6	STIFF (5Y 4/1) DARK GRAY SANDY CLAY, 15% FINE SAND, 4% FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION, MEDIUM PLASTICITY, MOIST	CL	1.0	PID 0.0 ppm BY 40 cpm
35.0	12-30-94 0945 403320	NA	6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY, 10-12% FINE TO MEDIUM SAND, 1% FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION, NO LAMINATIONS, OR INCLUSIONS OF SILT, SAND, OR GRAVEL, NO FRACTURES, MEDIUM PLASTICITY, MOIST	CL	1.0	PID 0.0 ppm BY 40 cpm ~~moist~~ ~~403350~~ 12-30-94 35' TOX/ISOTOP 403350 TCLP-403353

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: JC 2-7-95 ~~ALONE~~ Moist: 403351

See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES~~

FS-F-3681

000727

FEB 27 1995

WPSC / 94-776.DRW (11-23-94)

200307-11501-015

CONTROL NO.: ~~200307-11501-029~~ KP 2-14-95

FEMP
LITHOLOGIC LOG

PAGE 11 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11501

COORDINATES: See Pg. 1

RELATED FAL NO.s: See p. 1

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12-30-94

GEOLOGIST: GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12-30-94

WATER USED DURING DRILLING: 12.0 GALLONS Estimate

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
36.0 – 36.5	NA	NA	NA	NO RECOVERY	NA	NA	PID ppm; BY cpm
36.5 – 36.0	NA	NA	NA	NO RECOVERY	NA	NA	PID ppm; BY cpm
36.0 – 36.5	NA	NA	NA	NO RECOVERY	NA	NA	PID ppm; BY cpm
36.5 – 37.0	NA	NA	NA	NO RECOVERY	NA	NA	PID ppm; BY cpm
37.0		NA		BOTTOM OF BORING ~~37.0~~ 37.25 FEET 37.0 – 37.25 WAS NOT SAMPLED OR DESCRIBED			PID ppm; BY cpm
		NA					PID ppm; BY cpm
		NA					PID ppm; BY cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

FEB 27 1995

* ~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

000728

G: / WPSC / 94-776.DRW (11-23-94)

CONTROL NO.: 200307-115028-005

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11502B

COORDINATES: N481288.131 E1382751.915

RELATED FAL NO.s: N/A

SURFACE ELEVATION: 596.33

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: 14.0 ~~12.6~~ GALLONS Estimated JC 2-9-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	12-29-94 0845 402748	NA	6	Soft (10YR 5/2) GRAYISH BROWN Silty CLAY w/ surface vegetation and root material, 1-3% fine to med sand grains, med-slightly plast., slightly moist (2.5Y 5/4) LT OLIVE	CL	.5	PID 0.0 ppm BY 60 cpm
0.5	12-29-94 0845 402748	NA	6	Stiff ~~(10YR 5/4) YELLOWISH~~ BROWN Silty CLAY w/ iron oxide precipitate covering 30-40% of surface area, 1mm size black nodules of manganese (trace - 1-2%) 1-2% fine to med sand; Med-slightly plast.; slightly moist TL 12-29-94	CL	1.0	PID 0.0 ppm BY 60 cpm
1.0	12-29-94 0845 402748	NA	6	same as 0.5-1.0	CL	1.0	PID 0.0 ppm BY 60 cpm
1.5	12-29-94 0845 402748	NA	6	same as 0.5-1.0	CL	1.75	PID 0.0 ppm BY 60 cpm
2.0	12-29-94 0845 402748	NA	6	same as 0.5-1.0	CL	2.0	PID 0.0 ppm BY 60 cpm
2.5	12-29-94 0845 402748	NA	6	Stiff same as 0.5-1.0 except increased iron oxide particles (50%) and begins to break like a silt Med. Plast. Slightly Moist.	CL	2.0	PID 0.0 ppm BY 60 cpm
3.0	12-29-94 0900 402747	NA	6	Stiff same as 0.5-1.0 except decreased iron oxide particles (25%) and 2-5% poorly sorted fine gravel-angular Med. Plast.; Slightly Moist	CL	2.0	PID 0.0 ppm BY 50 cpm
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	50	12/29/94	0800
ALPHA	NA	NA	NA
BETA / GAMMA	0.0	12/29/94	0800

NOTES: This Lithologic Log was updated using Archived Soil Co[illegible] by Geologist Thea Lane on 02/2/95

FEMP CA

FEB 23 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION~~

F-340 v/94

FS-F-3031

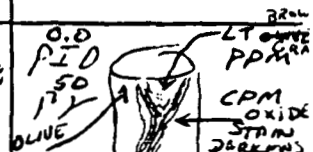
000729

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-115023-006	PAGE 2 OF 10
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 115023	COORDINATES: See Pg. 1
RELATED FAL NO.(s):	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: N/A; DATE: ; TIME: ; DATE STARTED: 12-29-94
GEOLOGIST: LAYNE / GEIGER / RILEY	GROUNDWATER LEVEL: N/A; DATE: ; TIME: ; DATE COMPLETED: 12-29-94
WATER USED DURING DRILLING: 14.0 ~~13.6~~ GALLONS (SC 2.13.95 Estimated)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL; DRILLING EQUIPMENT: ROTASONIC; DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5	12-29-94 0900 402747	NA	6	Stiff (2.5Y 5/4) LT OLIVE BROWN SILTY CLAY w/ iron oxide precipitate covering 25-35% of surface area throughout, 1-2% fine to med sand 2-3% poorly sorted fine gravel med Plast clay parting vertically and laterally slightly Moist	CL	2.0	PID 0.0 ppm BY 50 CPM
4.0	12-29-94 0900 402747	NA	6	same as 3.5-4.0	CL	2.0	PID 0.0 ppm BY 50 CPM
5	12-29-94 0900 402747	NA	6	same as 3.5-4.0 except some vertical mottling w/ Lt Olive Brown Clay without iron oxide particles	CL	2.0	PID 0.0 ppm BY 50 CPM
5.0	12-29-94 0910 402746	NA	6	Stiff (2.5Y 4/4) OLIVE Silty CLAY w/ 1-3% fine poorly sorted gravel and 1-3% fine to med sand (2.5Y 6/2) LT BROWNISH GRAY ~~(5/4) LT OLIVE BROWN~~ MOTTLING med Plast. Slightly Moist	CL	2.0	PID 0.0 ppm BY 50 CPM
5.5	12-29-94 0910 402746	NA	6	same as 5.0 - 5.5	CL	2.0	PID 0.0 PPM BY 50 CPM
6.0	12-29-94 0910 402746	NA	6	same as 5.0 - 5.5 EXCEPT INTERESTING MOTTLING PATTERN — irregular vertical "intrusion" of "post depositional groundwater development pattern" LT ~~OLIVE~~ BROWN (2.5Y 6/2) is outlined w/ a gradational color change that looks like water stain Med. Plast. slightly Moist	CL	2.0	0.0 PID 50 BY  PPM CPM
6.5	12-29-94 0910 402746	NA	6	same except LT ~~OLIVE BROWN~~ MOTTLING ~~(2.5Y 6/3)~~ (2.5Y 6/2) LT BROWNISH GRAY less infiltrated w/ iron oxide staining (in pattern disturbed by drilling) med Plast. slightly Moist. RL 2-2-94 ~~(THIS MOTTLING APPEARS GRAY IN SITU IN CONTRAST TO THE LT OLIVE BROWN~~	CL	2.0	PID 0.0 PPM BY 50 CPM FROM INS
.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/29/94	0800
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	12/29/94	0800

NOTES: ~~DUT IS~~ See Pg. 1

FEMP QA

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

000730

FEB 23 1995

G:/WPSC/94-776.DRW (11-23-94)

8 1 1

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11502B-007

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11502B

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: 14.0 ~~13~~ GALLONS (estimated)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (GRAY MOTTLING PATTERN IS CONTINUOUS FROM 6.0')
7.0	12-29-94 0910 402746	NA	6	Very stiff (2.5Y 5/4) LT OLIVE BROWN Clayey SILT, VERY SMOOTH SURFACE NO GRAVEL - VERY FAINT PATTERN OF (POST DEPOSITIONAL?) LT BROWNISH GRAY bordered by dark oxide staining like 6.0-6.5 NO-LOW PLASTICITY Slightly Moist	ML	3.0	PID PPM; BZ CPM;
7.5	12-29-94 0910 402746	NA	6	same as above 7.0-7.5	ML	3.0	PID 0.0 PPM; BZ 50 CPM
8.0	12-29-94 0910 402745	NA	6	Very stiff (2.5Y 5/4) LT OLIVE BROWN CLAYEY SILT/Silty CLAY w/ 2% fine gravel but still smooth streaky surface Slightly Moist NO-LOW PLASTICITY	CL/ML	2.25	PID 0.0 PPM; BZ 40 CPM
8.5	12-29-94 0910 402745	NA	6	same as 8.0-8.5 except no fine gravel and iron oxide post depositional pattern w/ imprints of nodules Slightly Moist NO-LOW PLASTICITY	CL/ML	2.25	PID 0.0 PPM; 40 CPM; BZ;
9.0	12-29-94 0910 402745	NA	6	same as 8.0-8.5' indicating fracture pattern	CL/ML	2.25	PID 0.0 PPM; BZ 40 CPM;
9.5	12-29-94 0910 402745	NA	6	Very stiff (2.5Y 5/4) LT OLIVE BROWN Silty CLAY w/ 1-3% fine subangular gravel, a (1) 30mm subangular gravel, 3-5% fine to med sand iron oxide stain pattern continues (20-25mm wide) Med. Plast. - Slightly Moist	CL	2.25	PID 0.0 PPM; BZ 40 CPM;
10.0	12-29-94 0910 402744	NA	6	Very stiff (2.5Y 5/4) LT OLIVE BROWN VERY Silty CLAY w/ 1-2% fine sand, 1% fine gravel, iron oxide vertical staining pattern continues - Darker and wider (80-90mm wide) (Color of stain 7.5YR 4/6 STRONG BROWN) Med. Plast. Slightly Moist	CL	3.25	PID 0.0 PPM; BZ 40 CPM;
0.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/29/94	0800
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	12/29/94	0800

NOTES: See Pg. 1

FEMP 94 31

FEB 23 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

000731

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-115023-008

PAGE 4 OF 10

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 115023

COORDINATES: See Pg. 1

RELATED FAL NO.(s):

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: 14.0 ~~43.6~~ Estimated GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNER

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	12-29-94 0910 402744	NA	6	Stiff (2.5Y 4/3) OLIVE BROWN Silty CLAY w/ 1% sand, a few fine gravel, iron oxide fracture staining pattern continues and pinches out med. plast.; slightly moist.	CL	2.0	PID 0.0 ppm; BY 40/3 cpm
11.0	12-29-94 CONTACT		3	Stiff Same as 10.5-11.0' iron oxide fracture pattern ends	CL	2.0	PID 0.0 ppm; BY 40 cpm; SOFT MOTTLE
11.5	0910 402744	NA	3	Stiff (5Y 4/1) DARK GRAY CLAY (Silty) w/ OLIVE BROWN SILT DEPOSITION along parting planes AND IRON OXIDE STAINING ALSO COND. OR MAY BE "SWIRLED" INDICATE SOME FRACTURES med. Plast. slightly moist.	CL	2.0	
	12-29-94 0910 402744	NA	6	Same as above 11.25-11.50'	CL	2.0	PID 0.0 ppm; BY 40 cpm
12.0	12-29-94 0910 402744	NA	6	Stiff PREDOMINANTLY GRAY (5Y 4/1) (DARK GRAY) Silty CLAY w/ 5-10% fine to med sand, w/ 5% poorly sorted fine gravel - angular and subrounded iron oxide trace and mineral (weathering indicating some lateral fracturing) med. plast. slightly moist	CL	2.0	PID 0.0 ppm; BY 40 cpm
2.5	12-29-94 0910 402744	NA	6	same as above w/ lateral fracturing indicated by iron oxide staining and fine sand/silt deposition	CL	2.0	PID ppm; BY 40 cpm
13.0	12-29-94 0910 402744	NA	6	Stiff Sample taken from this interval - remnant soil and original log indicate this material is same GRAY Silty CLAY med. Plast. Slightly Moist.	CL	2.0	PID 0.0 ppm; BY 40 cpm; TCLP 402731; Kd 402733
3.5	12-29-94 0910 402744	NA	6	Stiff Sample taken from this interval, original log indicates 5Y 4/1 DARK GRAY Silty CLAY w/ some gravel and sand, med. plasticity Slightly Moist	CL	2.0	PID 0.0 ppm; BY 40 cpm; TCLP 402734; Kd 402736
4.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/29/94	0800
ALPHA	NA	/NA	NA
BETA / GAMMA	See Pg. 1	12/29/94	0800

NOTES: See Pg. 1

FEB 23 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

G:/WPSC/94-778.DRW (11-23-9

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11502B-009

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11502B

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: 14.0 ~~13.6~~ GALLONS Estimated

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.5	12-29-94 0920 402739	NA	6	Stiff (5Y 4/1) DARK GRAY Silty CLAY w/ poorly sorted fine gravel 2-3% (angular to subangular). Small area (15mm) of iron oxide deposition indicating small fracture 2-3% sand Med. Plast., Slightly Moist	CL	2.0	PID 0.0 ppm BY 40 cpm
15.0	12-29-94 0920 402739	NA	6	~~Stiffly~~ same as 14.0-14.5' except slightly increased sand (3-5%) and 20-25% coarse angular to subangular gravel that is poorly sorted. iron oxide deposition around contact space of large gravel	CL	2.0	PID 0.0 ppm BY 40 cpm
15.5	12-29-94 0920 402739	NA	6	same as 14.0-4.5 except no iron oxide and increased sand 5-10%	CL	2.0	PID 0.0 ppm BY 40 cpm
16.0	12-29-94 0920 402739	NA	6	Stiff (5Y 4/1) DARK GRAY Silty CLAY w/ poorly sorted fine gravel 3-5% subangular to rounded, a few coarse gravel (subangular + 25mm) 10% fine to coarse sand Med. Plast., Slightly Moist	CL	2.0	PID 0.0 ppm BY 40 cpm
16.5	12-29-94 0920 402739	NA	6	same as 16.0-16.5'	CL	2.0	PID 0.0 ppm BY 40 cpm
17.0	12-29-94 0920 402740	NA	6	same as 16.0-16.5	CL	2.0	PID 0.0 ppm BY 40 cpm
	12-29-94 0920 402740	NA	6	Stiff (5Y 4/1) DARK GRAY Silty CLAY w/ increased fine sand to 15-25% A large coarse to coarse gravel 60mm x 35mm 1-3% fine gravel Med. Plast. Slightly Moist	CL	2.0	PID 0.0 ppm BY 40 cpm Moist. 402749

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/29/94	0800
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	12/29/94	0800

NOTES: See Pg. 1

FEB 23 1995

000733

CONFIDENTIAL

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11502B-010

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11502B

COORDINATES: See Pg.1

RELATED FAL NO.(s):

SURFACE ELEVATION: See Pg.1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: Estimated 14.0 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.5	12-29-94 0930 402740	NA	6	Stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 5-10% fine to med sand, ~~5% subangular~~ TL 2-3-95 ~~TL 2-3-95 coarse~~ 1 or 2 subrounded coarse gravel 20 mm, 5% fine subangular gravel; Med Plast. Slightly Moist; Some poorly sorted sand deposition in lateral parting	CL	2.0	PID 0.0 ppm; BY 30 cpm
18.0	12-29-94 0930 402740	NA	6	Stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 5% fine angular gravel 3-5mm, 3-5% fine to med sand, 1% coarse sand Med Plast.; Slightly Moist	CL	2.0	PID 0.0 ppm; BY 30 cpm
18.5	12-29-94 0930 402740	NA	6	Stiff same as 18.0-18.5 except 1-2 coarse subangular gravel 25mm	CL	2.0	PID 0.0 ppm; BY 30 cpm
19.0	12-29-94 0930 402740	NA	6	same as 18.0-18.5 except 1 or 2 coarse subangular gravel 40mm x 30mm, increased fine gravel-poorly sorted 5-10%	CL	2.0	PID 0.0 ppm; BY 30 cpm
19.5	12-29-94 0930 402740	NA	6	same as 18.0-18.5 except increased fine poorly sorted angular to subangular gravel (5-10%) and increased coarse sand (3%)	CL	2.0	PID 0.0 ppm; BY 30 cpm
20.0	12-29-94 0930 402741	NA	6	Stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 3-5% fine gravel (angular to subangular) (2-5mm) 1% coarse sand, 3-5% fine to med grain sand Med Plast. Slightly Moist.	CL	2.0	PID 0.0 ppm; BY 30 cpm
20.5	12-29-94 0930 402741	NA	6	same as 20.0 to 20.5	CL	2.0	PID 0.0 ppm; BY 30 cpm
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg.1	12/29/94	0800
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg.1	12/29/94	0800

NOTES: See Pg.1

PRIME QA FEB 23 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

CONTROL NO.: 200307-11502B-~~010~~ 011

FEMP
LITHOLOGIC LOG

PAGE 7 OF 10

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11502B

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12-29-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: 14.0 ~~13.0~~ GALLONS (JC 2-13-95 Estimated)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTHEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	12-29-94 0940 402741	NA	6	Stiff Samples taken from this interval - original field log described: (5Y 4/1) DARK GRAY Silty CLAY w/ Med. Plast. sand and brown sand stringer WET	CL	1.0	PID 0.0 ppm; BY 30 cpm; Tot. U/ISOV. 402738; TCLP - 402737; Moist. - 402750
21.5	12-29-94 0940 402741	NA	6	Stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 3-5% fine to med sand, 5% fine gravel (2-5mm) and Cobble 100mm x 55mm x 20 thick Med. Plast. Slightly Moist (2.5Y 4/4) OLIVE BROWN SAND DEPOSIT (fine grain) AND COARSE GRAVEL 40mm x 35mm	CL	1.0	PID 0.0 ppm; BY 30 cpm
22.0	12-29-94 0940 402741	NA	6	Very Stiff (5Y 4/1) DARK GRAY SILTY CLAY same as 21.5-22.0' except no sand deposits Med. Plast.; Slightly Moist	CL	2.5	PID 0.0 ppm; BY 30 cpm
22.5	12-29-94 0940 402741	NA	6	very Stiff (5Y 4/1) DARK GRAY SILTY CLAY w/ increased fine gravel (5%) subangular to rounded, 2-3% coarse sand subangular, 1 or 2 subangular coarse gravel (20mm) Med. Plast. Slightly Moist	CL	2.5	PID 0.0 ppm; BY 30 cpm
23.0	12-29-94 0940 402741	NA	6	very Stiff Samples taken from this interval original field log indicates same as 22.5-23.0' Med. Plast.; Slightly moist	CL	2.5	PID 0.0 ppm; BY 30 cpm; Moist. 402751
23.5	12-29-94 0940 402741	NA	6	very Stiff (5Y 4/1) DARK GRAY SILTY CLAY w/ 3-5% fine to med sand, 1% coarse sand, 3-5% fine gravel and Cobble 75 x 50 x 25mm thick Med. Plast. Slightly Moist.	CL	2.5	PID 0.0 ppm; BY 30 cpm
24.0	12-29-94 0940 402742	NA	6	very Stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 10-15% fine gravel (poorly sorted) (angular to subangular), 3% coarse gravel (subangular), 5-10% fine sand + med sand / wood fragments 2-3 coarse subangular gravel 30-40 mm Med. Plast. Slightly Moist.	CL	2.5	PID 0.0 ppm; BY 30 cpm
4.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/29/94	0800
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	12/29/94	0800

NOTES: See Pg. 1

FEMP QA FEB 23 1995

~~SAMPLES CONSOLIDATED PER ASTM STANDARD PENETRATION TEST~~

000735

G:/WPSC/94-770 DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11502B-012	PAGE 8 OF 10
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11502B	COORDINATES: See Pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: N/A DATE: TIME:
DATE STARTED: 12-29-94	
GEOLOGIST: LAYNE / GEIGER / RILEY	GROUNDWATER LEVEL: N/A DATE: TIME:
DATE COMPLETED: 12-29-94	
WATER USED DURING DRILLING: 14.0 GALLONS Estimated	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
25.0	12-29-94 0945 402742	NA	6	same as 24.0-24.5'	CL	2.0	PID 0.0 ppm BY 40 cpm
25.5	12-29-94 0945 402742	NA	6	same as 24.0-24.5'	CL	2.0	PID 0.0 ppm BY 40 cpm
26.0	12-29-94 0945 402742	NA	6	same as 24.0-24.5' except, Cobble 80mm x 60mm x 20mm thick Limestone Fragment - Vertical Orientation	CL	2.0	PID 0.0 ppm BY 40 cpm
26.5	12-29-94 0945 402742	NA	6	same as 24.0-24.5' except no coarse gravel or cobbles and no wood fragments BUT A Conglomerate of fossil fragments 35mm x 35mm x 35mm	CL	2.0	PID 0.0 ppm BY 40 cpm
27.0	12-29-94 0945 402742	NA	6	Stiff (5Y 4/1) DARK GRAY SILTY CLAY w/ 5-10% fine gravel (3-12mm), 15-20% fine to med sand, ~~a2~~ 2-3% coarse gravel (20mm) Med. Plast. Slightly moist	CL	2.0	PID 0.0 ppm BY 40 cpm
27.5	12-29-94 0945 402743	NA	6	Stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 15-25% fine sand and med sand, 5% fine subangular gravel, 3-5% coarse sand Med. Plast. Slightly Moist.	CL	2.0	PID 0.0 ppm BY 40 cpm
28.0	12-29-94 0945 402743	NA	6	Stiff same as 27.0-27.5 except 5% Coarse angular gravel (1)45x30mm) and a "pocket" of fine sand	CL	2.0	PID 0.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/29/94	0800
ALPHA	NA	(NA)	NA
BETA / GAMMA	See Pg. 1	12/29/94	0800

NOTES: See Pg. 1

FEB 23 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

CONTROL NO.:	FEMP LITHOLOGIC LOG	PAGE 9 OF 10
20807 -11502B-~~OT2~~ 013 (R1.15.95)		

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11502 B	See Pg. 1	

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg. 1				12-29-94
GEOLOGIST:	**GROUNDWATER LEVEL:**	**DATE:**	**TIME:**	**DATE COMPLETED:**
LAYNE / GEIGER / RILEY				12-29-94

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
Estimated 140 GALLONS	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0	12-29-94 0950 402743	NA	6	Stiff same as 27.0-27.5' except areas of clayey sand "pockets" (Core is too moist & disturbed to assess a pattern)	CL	2.0	PID 0.0 ppm; BY 40 cpm
28.5	12-29-94 0950 402743	NA	6	Stiff same as 27.0-27.5' except a coarse gravel 50mm x 30mm x 30mm and a brachiopod 45mm x 40mm	CL	2.0	PID 0.0 ppm; BY 40 cpm
29.0	12-29-94 0950 402743	NA	6	Stiff same as 27.0-27.5 except some areas of increased gravel (fine)	CL	2.0	PID 0.0 ppm; BY 40 cpm
29.5	12-29-94 0950 402743	NA	6	Stiff same as 27.0-27.5 except increased coarse sand 5-10% and a few coarse gravel 15-25% that are rounded and some angular	CL	2.0	PID 0.0 ppm; BY 40 cpm
30.0	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
30.5	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
31.0	NA	NA	NA	No Recovery	NA	NA	PID NA ppm; BY NA cpm
1.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	12/29/94	0800
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	12/29/94	0800

NOTES: See Pg. 1

FEB 23 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

G:/WPSC/94-776.DRW (11-23-94)

FS-F-2091

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11502B-014

PAGE 10 OF 10

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11502B

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: Estimated 140 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5							
32.0	NA	NA	NA	No Recovery	NA	NA	PID NA ppm BY NA cpm
32.5	NA	NA	NA	No Recovery	NA	NA	PID NA ppm BY NA cpm
33.0	NA	NA	NA	No Recovery	NA	NA	PID NA ppm BY NA cpm
33.5	NA	NA	NA	No Recovery	NA	NA	PID NA ppm BY NA cpm
34.0	NA	NA	NA	No Recovery	NA	NA	PID NA ppm BY NA cpm
34.5	NA	NA	NA	No Recovery	NA	NA	PID NA ppm BY NA cpm
35.0	NA	NA	NA	No Recovery @ 35.0' — BOTTOM OF BORING —	NA	NA	PID NA ppm BY NA cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

FEB 23 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TES~~

ES-F-3681

G:/WPSC/94-778.DRW (11-23-94

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11503-005

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11503

COORDINATES: N487583.987 E1382127.821

RELATED FAL NO.s: 200307-11503-004

SURFACE ELEVATION: 595.99

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: ~~13.6~~ 14.0 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	12-29-94 403484 13:15	NA	6	SOFT, BROWN (10YR 4/3) BROKEN, SILTY-LOAMY CLAY W/ SURFACE VEG. & ROOTS - MOIST MED. PLASTICITY: CLAY FRACTION >90% - V. MINOR (<5%) COARSE SUBANGULAR SAND, FINE GRAVEL	CL	0.5F <.25L	PID 0.0 ppm BY 40 cpm
0.5	12-29-94 403484 13:15	NA	6	SOFT, OLIVE BROWN (2.5Y 4/4) SILTY CLAY ~90% OF MASS: MOIST, MOD. PLASTICITY, SLIGHTLY MOTTLED W/ FE STAIN - V. SMALL ROOTLETS: ≤10% COARSE SAND & FINE GRAVEL (2-3% max.)	CL	1.0F <.5L	PID 0.0 ppm BY 40 cpm
1.0	12-29-94 403484 13:15	NA	6	SAME AS ABOVE, WITH LESS SAND & GRAVEL (i.e. SILTY CLAY TO >95% TOTAL MASS)	CL	1.0F <.25L	PID 0.0 BY 40 cpm
1.5	12-29-94 403484 13:15	NA	6	CLAY SAME AS ABOVE, WITH COARSE SUBANGULAR SAND & SUBANGULAR GRAVEL INCREASING, AS A% OF MASS, TO ~10%: 'STICKY' CLAY	CL	1.0F <.5L	PID 0.0 ppm BY 40 cpm
2.0	12-29-94 403484 13:15	NA	6	SOFT, OLIVE BROWN (2.5Y 4/4) CLAY, <5% SILT, SLIGHTLY MOIST, MEDIUM PLASTICITY ('STICKY' CLAY) W/ COARSE SD-SIZED SUBROUNDED HEMA	CL	1.0F <.25L	PID 0.0 ppm BY 40 cpm
2.5	12-29-94 403484 13:16	NA	6	SAME AS ABOVE, WITH 10-15% COARSE SD-SIZED, SUBROUNDED, V. DUSKY RED (10R 2.5/2) HEMATITIC NODULES (OR SPLOTCHES) IN CLAY: CLAY SOFT	CL	1.0F <.25L	PID 0.0 ppm BY 40 cpm
3.0	12-29-94 403484 13:15	NA	6	LIGHT OLIVE BROWN (2.5Y 5/6) SILTY CLAY (80-85%) SLIGHTLY MOIST, MEDIUM PLASTICITY (MOD. 'STICKY'), WITH SUBANGULAR TO SUBROUNDED FINE CHERTY GRAVEL: CLAY SOFT	CL	1.0F <.25L	PID 0.0 ppm BY 40 cpm
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/29/94	13:00
ALPHA	NA	/NA/	NA
BETA / GAMMA	50	12/29/94	13:00

NOTES: DIFFERENCES IN OBSERVED MEASURED CONSISTENCY ARE NOTED FOR FIELD (F) & LABORATORY (L) VALUES. LAB VALUES OF MEASURED CONSISTENCY TAKEN 1-27-95

Lithologic logs updated by Lee from archived cons on 1-27-95 JCH

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP
LITHOLOGIC LOG

CONTROL NO.:	200307-11503-006
PAGE	2 OF 11
PROJECT NAME:	PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION
PROJECT NO.:	20.03.07
BORING NUMBER:	11503
COORDINATES:	See pg 1
RELATED FAL NO.:	200307-11503-004
SURFACE ELEVATION:	See pg 1
GROUNDWATER LEVEL:	N/A
DATE:	
TIME:	
DATE STARTED:	12-29-94
GEOLOGIST:	LEE / GEIGER / RILEY
GROUNDWATER LEVEL:	N/A
DATE:	
TIME:	
DATE COMPLETED:	12-29-94
WATER USED DURING DRILLING:	14.0 GALLONS (est)
DRILLING CONTRACTOR:	ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT:	ROTASONIC
DRILLER / HELPER:	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	12-29-94 403484 13:15	NA	6 + SLOWER	LIGHT OLIVE BROWN (2.5Y 5/6) CLAY, SLIGHTLY SILTY (<10%) SL. MOIST, MODERATE PLASTICITY W/ FINE GRAVEL-SIZED CHERT & HEMATITIC NODULES (10-15%) - NO ORIENTATION	CL	1.0F 0.75L	PID 0.0 ppm BY 40 cpm
4.0 – 4.5	12-29-94 403485 13:15	NA	6 + SLOWER	LIGHT OLIVE BROWN (2.5Y 5/6) CLAY, SL. SILTY (<10%) STIFF, DRY TO SL. MOIST, W/ FINE TO COARSE SUB ROUNDED GRAVEL (CHERT & LS.): ~25-30% GRVL & 70-75% CLAY NO ORIENTATION	CL	3.5F 2.25L	PID 0.0 ppm BY 40 cpm
4.5 – 5.0	12-29-94 403486 13:15	NA	6 + SLOWER	SAME AS ABOVE, & PROPORTIONS; GRAVEL COMPOSITION INCLUDES CHERTS, LIMESTONE FRAGS., MUDSTONES, WEATHERED MAT'L. - ALL SUB ROUNDED (CLAY STIFF)	CL	3.5F 3.25L	PID 0.0 ppm BY 40 cpm
5.0 – 5.5	12-29-94 403485 13:15	NA	6+ SLOWER	SAME AS ABOVE - W/ VERTICALLY ORIENTED PELYCPOD SHELL HASH FRAGMENTS (2" LONG x 1" WIDE) (CLAY STIFF)	CL	3.0F 3.0L	PID 0.0 ppm BY 40 cpm
5.5 – 6.0	12-29-94 403485 13:15	NA	6	SAME AS ABOVE (PER CLAY-SLT), WITH INCREASED FE-STAIN MOTTLING STILL NO CLAST ORIENTATION TO COARSE GRAVELS (25-30% OF MASS)	CL	3.0F 2.5L	PID 0.0 ppm BY 40 cpm
6.0 – 6.5	12-29-94 403485 13:15	NA	6+ FLUFFY	SAME AS ABOVE, (CLAY STIFF) SOME FINE GRAVEL → BRIGHT ORANGE (RUSTY) COLORED SUBANGULAR FRAGMENTS	CL	3.5F 3.5L	PID 0.0 ppm BY 40 cpm
6.5 – 7.0	12-29-94 403486 13:15	NA	6+ SLOWER	SILTY CLAY: (>90% OF MASS) 2 COLORS: LIGHT OLIVE BROWN (2.5Y 5/4) AND GRAY (2.5Y 6/1) & V. DUSKY RED (10R 2.5/2) PARTINGS & FINER COARSE GRAVEL SIZED HEMATITIC CLASTS (<5%)	CL	3.5F 3.5L	PID 0.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
PHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: DIFFERENCES IN OBSERVED MEASURED CONSISTENCY ARE NOTED FOR FIELD (F) AND LABORATORY (L) VALUES. LAB VALUES OF MEASURED CONSISTENCY TAKEN 1-27-95 JCNLR
See page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PAR 1/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21 7 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11503-007	PAGE 3 OF 11
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11503	COORDINATES: See pg. 1
RELATED FAL NO.s: 200307-11503-004	
SURFACE ELEVATION: See pg. 1	GROUNDWATER LEVEL: N/A DATE: TIME:
DATE STARTED: 12-29-94	
GEOLOGIST: LEE / GEIGER / RILEY	GROUNDWATER LEVEL: N/A DATE: TIME:
DATE COMPLETED: 12-29-94	
WATER USED DURING DRILLING: JC 2-14-95 ~~13.6~~ 14.0 GALLONS (est)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0	12-29-94 403480 13:20	NA	6	LIGHT BROWN OLIVE CLAY (2.5Y5/4), (>90% OF MASS), SILTY, MOIST, MODERATE PLASTICITY, V. SLIGHTLY SANDY, WITH FINE GRAVEL (CHERTY, FOSSILIFEROUS) (15-20%) CLAY MOSTLY SOFT	CL	3.0F 1.0L	PID 0.0 ppm BY 40 CPM
7.5	12-29-94 403480 13:20	NA	6	SAME AS ABOVE, WITH V. DUSKY RED (10R 2.5/2) SUBHORIZONTAL FE-STAINED PARTINGS: CLAY STIFFER THAN LAST 6" (SL. MOIST)	CL	3.0F 2.5L	PID 0.0 ppm BY 40 CPM
8.0	12-29-94 403481 13:20	NA	6" stretched	OLIVE BROWN SILTY CLAY (2.5Y 4/4), SOME FE-STAINED PARTINGS & V. DUSKY RED (10R 2.5/2) TO ORANGE CLASTS, w/ 10-15% FINE TO COARSE (2") GRAVELS: AS COMPARED TO THE PREVIOUS 6", CLAY SLIGHTLY SOFTER	CL	3.0F 1.5L	PID 0.0 BY 40 CPM
8.5	12-29-94 403481 13:20	NA	slough + 6" stretched	SAME AS ABOVE, WITH SUB-VERTICAL FE-STAINED PARTINGS & FRACTURES (FINE & FEATHERY)	CL	3.0F 1.0L	PID 0.0 ppm BY 40 CPM
9.0	12-29-94 403481 13:20	NA	6"	SAME AS ABOVE WITH CONTINUED SUB-VERTICAL FE-STAINED PARTINGS & FRACTURES - ALL CONNECTED & CONTINUOUSLY TRACEABLE (CLAY STIFF)	CL	3.0F 1.0L	PID 0.0 ppm BY 40 CPM
9.5	12-29-94 403481 13:20	NA	6"	SAME AS ABOVE, SAME FRACTURES & FRACTURE FILL: FE STAIN PENETRATES CLAY TO 1/8" ON FRACTURE SIDES COARSE SUBANGULAR GRAVEL INCREASES TO 20% MAX.	CL	3.0F 0.75L	PID 0.0 ppm BY 40 CPM
10.0	12-29-94 403481 13:20	NA	6"	SAME AS ABOVE, COARSE GRAVELS DECREASE TO 10-15% CLAY FAIRLY STIFF	CL	3.0F 0.5L	PID 0.0 ppm BY 40 CPM
10.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: DIFFERENCES IN OBSERVED MEASURED CONSISTENCY ARE NOTED FOR FIELD (F) AND LABORATORY (L) VALUES. LAB VALUE OF MEASURED CONSISTENCY TAKEN 1-27-95 JCHL III See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/4/95

FS-F-3881

000741

F-352

FEMP QA 21

FEB 27 1995

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.:	200307-11503-008
PAGE	4 OF 11
PROJECT NAME:	PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION
PROJECT NO.:	20.03.07
BORING NUMBER:	11503
COORDINATES:	See pg. 1
RELATED FAL NO.s:	200307-11503-004
SURFACE ELEVATION:	See pg. 1
GROUNDWATER LEVEL:	N/A
DATE:	
TIME:	
DATE STARTED:	12-29-94
GEOLOGIST:	LEE / GEIGER / RILEY
GROUNDWATER LEVEL:	N/A
DATE:	
TIME:	
DATE COMPLETED:	12-29-94
WATER USED DURING DRILLING:	JC 2-17-93 ~~13.6~~ 14.0 GALLONS (est)
DRILLING CONTRACTOR:	ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT:	ROTASONIC
DRILLER / HELPER:	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	12-29-94 403481	NA	6	LIGHT BROWN OLIVE CLAY (2.5Y 5/4), STIFF, V. SL. MOIST, SILTY, CONTAINING 20% FINE TO COARSE SUBANGULAR TO SUB-ROUNDED GRAVEL: CONTINUED SUB-VERTICAL FE-STAINED FEATHERY/BRANCHING	CL	3.0F 2.5L	PID 0.0 ppm BY 40 cpm
11.0	12-29-94 403481	NA	6	FRACTURES SAME AS ABOVE: GRAVEL SLIGHTLY HIGHER % (10-25% MAX, AVG. 10-15%) CONTINUED VERTICAL FRACTURES	CL	3.0F 2.5L	PID 0.0 ppm BY 40 cpm
11.5	12-29-94 403481	NA	6	TRANSITIONAL COLOR CHANGE: CHANGING FROM LIGHT OLIVE BROWN (2.5Y 5/6) TO GRAY (2.5Y 5/1), STILL FRACTURED, WITH FACES COATED IN FE-STAIN (BRN >> GRAY 70-30). COARSE FOSSILIFEROUS GRAVELS	CL	3.5F 2.5L	PID 0.0 ppm BY 40 cpm
T (TOP OF GRAY) 12.0	12-29-94 403481	NA	6	STILL MOTTLED CLAY (2.5Y 5/1, INCREASING) FRACTURE INTENSITY/CONNECTED PATTERN INCREASING, BOTH VERTICALLY & SUBHORIZONTALLY - FLAT FOSSILIFEROUS 1" CLASTS STANDING VERTICALLY ON-EDGE	CL	1.5F 1.25L	PID 0.0 ppm BY 40 cpm
12.5	12-29-94 403481	NA	6	CONTINUED VERTICAL FRACTURES IN GRAY SILTY CLAY (2.5Y 5/1 NOW > 2.5Y 5/6) FINE GRAVEL (SUBANGULAR CLASTS) - COARSEST CLASTS NOT PRESENT ANY MORE -	CL	2.0F 1.5L	PID 0.0 ppm BY 40 cpm
13.0	12-29-94 403482	NA	6	MEDIUM STIFF TO SOFT, GRAY (2.5Y 5/1) SILTY CLAY, CONTAINING FINE TO COARSE GRAVEL (SUBANGULAR) - LT. BROWN OLIVE CLAY (2.5Y 5/4) VERTICALLY ORIENTED ALONG FRACTURES - GRVL. ~15% (OF MASS)	CL	2.5F 2.0L	PID 0.0 ppm BY 40 cpm
13.5	12-29-94 403482	NA	6	SAME AS ABOVE, MOST GRAVELS NOT ORIENTED & UP TO 3½" IN DIAMETER GRAVEL ~15-20% (OF MASS) - LARGEST GRAVEL CLAST 3½" x 1½" x 1" ORIENTED ON LONG EDGE	CL	2.5F 2.0L	PID 0.0 ppm BY 40 cpm
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: DIFFERENCES IN MEASURED CONSISTENCY NOTED BETWEEN FIELD(F) & LAB(L) WHEN STUDIED IN LAB.

See pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

FEMP QA 21 FEB 27 1995

G: / WPSC / 94-776.DRW (11-23-94)

CONTROL NO.: 200307-11503-009

FEMP

LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11503

COORDINATES: See pg. 1

RELATED FAL NO.s: 200307-11503-004

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: 2-14-95 ~~3-6~~ 14.0 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	12-29-94 403482 13:30	NA	6" + slough	DARK GRAY (2.5Y 4/1), SILTY, MED. STIFF, MODERATELY PLASTIC CLAY W/ COARSE (20%) SUBANGULAR GRAVEL - HEAVILY FRACTURED SUB-VERTICALLY (ONE SIDE OF CORE) - FRACTURE FILL LT. OLIVE BRN. CLAY (2.5Y 5/4): MOD. SILTY	CL	2.5F 1.5L	PID 0.0 ppm BY 40 cpm
14.5	12-29-94 403482 13:30	NA	6"	SAME AS ABOVE, FRACTURES PERSIST SUBVERTICALLY - GRAVELS (COARSE) NON-ORIENTED @ 15-20% - SUBANGULAR AND SUBROUNDED	CL	2.5F 2.25L	PID 0.0 ppm BY 40 cpm
15.0	12-29-94 403482 13:30	NA	6" + FLUFF	SAME AS ABOVE, CONTINUED HEAVY FRACTURING (SUBVERTICAL), SAME GRAVEL ROUNDNESS/ANGULARITY W/ NO ORIENTATION - FRACTURING DECREASES IN BOTTOM 24"	CL	2.0F 2.0L	PID 0.0 ppm BY 40 cpm
15.5	12-29-94 403482 13:30	NA	6" + FLUFF	MOSTLY DARK GRAY (2.5Y 4/1) SILTY, MED. STIFF TO SOFT, MOD. PLASTIC TO PLASTIC CLAY - 1 VERTICALLY ORIENTED 5"x3"x2" SUBANGULAR MICROXTALLINE FOSSILIFERAS LIMESTONE COBBLE - GRAVEL CRS/SUBANGULAR	CL	2.0L to 1.25L	PID 0.0 ppm BY 40 cpm
16.0	12-29-94 403482 13:30	NA	6" + FLUFF	SAME AS ABOVE, FRACTURING APPARENTLY MINOR - GRAVELS SUB-ROUNDED TO SUBANGULAR, COARSE & FINE, W/ NO PREDOMINANT ORIENTATION	CL	1.25L	PID 0.0 ppm BY 40 cpm
16.5	12-29-94 403482 13:30	NA	6" + FLUFF	VERTICAL FRACTURING REINTENSIFIES FRACTURE FILL LT OLIVE BRN. SILTY CLAY (FE-ST) (2.5Y 5/4) - FRACTURES FEATHERING TO BASE OF INTERVAL: SUBANGULAR GRVL. SIZE DECREASING TO FINE SIZE @ BOTTOM	CL	1.0L	PID 0.0 ppm BY 40 cpm
17.0 17.5	12-29-94 403483 13:30	NA	6" + FLUFF	DARK GRAY (2.5Y 4/1) SILTY, MED. STIFF TO SOFT MOD. PLASTIC CLAY W/ COARSE (20%) SUBANGULAR GRAVEL & SLIGHT SAND VERTICAL FE-STAINED FRACTURES ARE DECREASING	CL	2.5F 1.0L	PID 0.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: DIFFERENCES IN MEASURED CONSISTENCY NOTED BETWEEN FIELD (F) & LAB (L) VALUES WHEN STUDIED IN LAB See Page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP DA FEB 27 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11503-010

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11503

COORDINATES: See page 1

RELATED FAL NO.s: 200307-11503-004

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12-29-94

GEOLOGIST: LEE/ GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: JC 2-14-95 ~~13.6~~ 14.0 GALLONS (QSY) | DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL | DRILLING EQUIPMENT: ROTASONIC | DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
11.5	12-29-94 403483 13:30	NA	6" + FLUFF	DARK GRAY (2.5Y 4/1), SILTY, MED-STIFF TO SOFT, MODERATELY PLASTIC CLAY W/ COARSE GRAVEL: MAX. SIZE 2"x2"x1" ORIENTED SUB-VERTICALLY ON LONG AXIS - V. POORLY SORTED, SOME CHERTS (BRN.) & LS. FRAGMENTS (15%)	CL	2.5F 1.0L	PID 0.0 ppm BY 40 cpm
18.0	12-29-94 403476 13:30	NA	6" + FLUFF	DARK GRAY (2.5Y 4/1) CLAY AS ABOVE, SL. STIFFER, V. SL. MOIST, W/ COARSE GRVL. (NO V. LARGE CLASTS) - FRACTURE (SUB-V) TRACES VERY FAINT - FEATHERING TO NO TRACE DOWNWARD (15-20%)	CL	2.5F 1.75L	PID 0.0 ppm BY 40 cpm
18.5	12-29-94 403476 13:30	NA	6" + FLUFF	SAME AS ABOVE (GRAY CLAY W/ GRVL.) PLUS INCLINED (~45° OFF VERTICAL) 3" WOOD FRAGMENTS (SAMPLE TAKEN) GRAVELS 20-25%	CL	2.5F 1.5F	PID 0.0 ppm BY 40 cpm
19.0	12-29-94 403476 13:30	NA	6" + FLUFF	SAME AS ABOVE: NO WOOD; GRAVELS V. POORLY SORTED (FINE TO V. COARSE - 2.5"x1.5"x1", SUBROUNDED CLASTS) SL. SANDY - CLAY STIFF GRAVELS ~20%	CL	2.5F 2.25	PID 0.0 ppm BY 40 cpm
19.5	12-29-94 403476 13:30	NA	6" + FLUFF	SAME AS ABOVE: CHERTY & MUDSTN. GRAVELS MOSTLY SUBROUNDED: GRAVELS 20-25%	CL	2.5F 2.5L	PID 0.0 ppm BY 40 cpm
20.0	12-29-94 403476 13:30	NA	6" + FLUFF	SAME AS ABOVE - BOTH MATRIX & CLASTS V. POORLY SORTED GRAY CLAY V. STIFF, SAME TEXTURE, COLOR & COMPOSITION	CL	2.5F 2.5L	PID 0.0 ppm BY 40 cpm
20.5	12-29-94 403476 13:30	NA	6" + FLUFF	SAME AS ABOVE - NO CLAST ORIENTATION - SOME ROOTFRAGMTS GRAVELS MOSTLY SUBROUNDED & V. COARSE	CL	2.5F 2.5L	PID 0.0 ppm BY 40 cpm
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: DIFFERENCES IN MEASURED CONSISTENCY NOTED BETWEEN FIELD (F) & LAB (L) VALUES WHEN STUDIED IN LAB

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 12/4/94

FS-F-3681

G: / WPSC / 94-778.DRW (11-23-94)

FEMP DA 31 FEB 07 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11503-011

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11503

COORDINATES: See page 1

RELATED FAL NO.s: 200307-11503-004

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12-29-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: ~~36~~ 14.0 GALLONS (est) | DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL | DRILLING EQUIPMENT: ROTASONIC | DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.0	12-29-94 403476 13:30	NA	6" + FLUFF	DARK GRAY (2.5Y 4/1), SILTY, MED. STIFF MODERATELY PLASTIC, V. SL. MOIST CLAY WITH V. POORLY SORTED FINE TO COARSE SUBANGULAR TO SUBROUNDED GRAVEL (20%) - NO ORIENTATION (CHERT & MUDSTONE)	CL	2.5F 3.0L	PID 0.0 ppm BY 40 cpm
21.5	12-29-94 403476 13:30	NA	6" + FLUFF	SAME AS ABOVE - MAX. COARSE GRAVEL CLAST SIZE (RANGE) 2" x 1.5" x 1.5", SUB VERTICALLY ORIENTED → MAX. 3" x 3" x 2"	CL	2.5F 2.5L	PID 0.0 ppm BY 40 cpm
22.0	12-29-94 403477 13:40	NA	6" + FLUFF	SAME AS ABOVE VERY POORLY SORTED GRAVELS (SUBANGULAR MOSTLY) IN GRAY CLAY MATRIX: NON-ORIENTED GRAVELS (20%) MAX SIZE: 3" x 2" x 1.5"	CL	2.0F 2.0L	PID 0.0 ppm BY 40 cpm
22.5	12-29-94 403477 13:40	NA	6"	SAME AS ABOVE - ABUNDANT BLACK & BROWN CHERT (20-25%) (MAX. SIZE 1" GRAVEL)	CL	2.0F 1.5L	PID 0.0 ppm BY 40 cpm
23.0	12-29-94 403477 13:40	NA	6"	SAME AS ABOVE - BLACK, BRN. CHERT (2.5Y 4/2 to N 2.5/-) SUB-ROUNDED MOSTLY		2.0F 1.25L	PID 0.0 PPM BY 40 cpm
23.5	12-29-94 403477 13:40	NA	6"	SAME AS ABOVE COARSE GRAVEL NON-ORIENTED, TO 1.5 x 1" MAX. SIZE (GRAVELS 20-25%)		2.5F	PID 0.0 ppm BY 40 cpm
24.0	12-29-94 403477 13:40	NA	6"	SAME AS ABOVE - BLACK & BROWN CHERT AS ABOVE - GRAVELS MOSTLY SUBROUNDED, COARSE (20%)		2.0F	PID 0.0 ppm BY 40 cpm
24.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: DIFFERENCES IN MEASURED CONSISTENCY NOTED BETWEEN FIELD (F) & LAB (L) VALUES WHEN STUDIED IN LAB

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000745

FEMP DA FEB 27 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11503-012

PAGE 8 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11503

COORDINATES: See page 1

RELATED FAL NO.s: 200307-11503-004

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12-29-94

GEOLOGIST: LEE / GEIGER / RYLEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: JC 12-13-95 75 to 140 GALLONS (est) | DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL | DRILLING EQUIPMENT: ROTASONIC | DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5	12-29-94 403477 13:45	NA	6	DARK GRAY (2.5Y 4/1), SL. SILTY, STIFF, MODERATELY PLASTIC, V.SL. MOIST CLAY W/ V. POORLY SORTED FINE TO COARSE SUBROUNDED (& MINOR SUBANGULAR) GRAVEL (20-25%) → NO ORIENTATION	CL	2.0F 1.75L	PID 0.0 ppm BY 40 cpm
25.0	12-29-94 403477 13:46	NA	6	SAME AS ABOVE - MOSTLY SUBRNDED GRAVELS - SOME BROKEN ROOTLETS (1/8" DIAMETER) GRAVELS 15-20% (OF MASS)	CL	2.0F 2.0L	PID 0.0 ppm BY 40 cpm
25.5	12-29-94 403477 13:46	NA	6	SAME AS ABOVE, CLAY W/ V. POORLY SORTED FINE TO COARSE GRAVEL (MAX. 1" DIAM.) BOTH SUBANGULAR & SUBROUNDED CLASTS	CL	2.0F 2.0L	PID 0.0 ppm BY 40 cpm
26.0	12-29-94 403477 13:45	NA	6	SAME AS ABOVE, BROWN (2.5Y 4/2) & TAN (2.5Y 7/2) SUBANGULAR GRAVELS ARE 15-20% OF MASS	CL	2.0F 1.5L	PID 0.0 ppm BY 40 cpm
26.5	12-29-94 403477 13:45	NA	6	SAME AS ABOVE, DOWN TO LAST 1-2": THEN DARK GRAYISH BROWN (2.5Y 4/2) SAND (90%) MEDIUM-GRAINED, SUBANGULAR, W/ FINE TO COARSE SUBROUNDED CHERTY GRAVEL V. POORLY SORTED SEDIMENT (10%)	CL / SP	2.0F 2.0L	PID 0.0 ppm BY 40 cpm
27.0	12-29-94 403478 13:45	NA	6" + FLUFF	DARK GRAYISH BROWN (2.5Y 4/1) SAND (75%) MED-GRAINED, SUBANGULAR [WET TO FULLY SATURATED] ~1" THICK, OVER SANDY DARK GRAY (2.5Y 4/1) CLAY W GRAVEL, V. SOFT INCLUDES SOME F.G. SAND TOO	SP / CL	2.0F <1L	PID 0.0 ppm BY 40 cpm
27.5	12-29-94 403478 13:45	NA	6" + FLUFF	SOFT DARK GRAY SILTY SANDY CLAY (prop. 10-10-80) WET, MOD. PLASTICITY, WITH FINE GRAVEL ABOVE, V. COARSE GRAVELS BELOW: MAX SIZE: 2.5"x2.5"x1" ORIENTED SUB-VERTICALLY	CL	0.25F <0.25L	PID 0.0 ppm BY 40 cpm
28.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	(NA)	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: DIFFERENCES IN MEASURED CONSISTENCY NOTED BETWEEN FIELD (E) & LAB (L) VALUES WHEN STUDIED IN LAB

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PDR 1/16/96

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 21

FEB 27 1995

CONTROL NO.: 200307-11503-013

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11503

COORDINATES: See page 1

RELATED FAL NO.s: 200307-11503-004

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: ~~13.0~~ 14.0 GALLONS (est) FC 2-17-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
28.0 – 28.5	12-29-94 403478 13:50	NA	6" + FLUFF	DARK GRAY (2.5Y 4/1), SILTY, MODERATELY STIFF, MODERATELY PLASTIC, SLIGHTLY MOIST CLAY W/ VERY POORLY SORTED FINE TO COARSE CHERTY & FOSSILIFERAS GRAVEL (15-20%) MAX. SIZE 2.5"x2"x1" NO ORIENTATION	CL	1.0F 1.0L	PID 0.0 ppm BY 40 cpm
28.5 – 29.0	12-29-94 403478 13:50	NA	6" + FLUFF	SAME AS ABOVE, GRAVELS INCLUDE MUDSTONE, CHERT, LS. FRAGMENTS W/ NO ORIENTATION, W CLAY MATRIX (85-90%) MAX. SIZE: 1"x0.5"x0.5"	CL	1.0F 1.5L	PID 0.0 ppm BY 40 cpm
29.0 – 29.5	12-29-94 403478 13:50	NA	6" + FLUFF	SAME AS ABOVE, MAX.-SIZED SUB-ANGULAR GRAVEL CLAST SUB-VERTICALLY ORIENTED 3" x 2.5" x 2" (LIMESTONE) STIFF CLAY MATRIX (80-85%)	CL	1.0F 2.75L	PID 0.0 ppm BY 40 cpm
29.5 – 30.0	12-29-94 403478 13:50	NA	6" + FLUFF	SAME AS ABOVE, MAX.-SIZED SUB-ANGULAR GRAVEL CLAST SUBVERTICALLY ORIENTED 2" x 2" x 1", SOME WELL-ROUNDED CHERT CLASTS (V. COARSE)	CL	2.0F 2.0L	PID 0.0 ppm BY 40 cpm
30.0 – 30.5	12-29-94 403479 13:50	NA	6"	SAME AS ABOVE, SIMILAR SUB-VERTICALLY ORIENTED V. COARSE FOSSILIFERAS GRAVEL CLASTS (GRAVEL 15-20%)	CL	2.0F 1.5L	PID 0.0 ppm BY 40 cpm
30.5 – 31.0	12-29-94 403479 13:50	NA	6"	SAME AS ABOVE IN ALL ASPECTS (GRAVEL 15-20% OF MASS)	CL	2.0F 2.0L	PID 0.0 ppm BY 40 cpm
31.0 – 31.5	12-29-94 403479 13:50	NA	6" + FLUFF	SAME AS ABOVE, SUBANGULAR GRAVEL (15-20%) SUSPENDED IN GRAY CLAY MATRIX 2.75" x 2" x 1.5" MAX. CLAST DIMENSIONS	CL	3.0F 2.25L	PID 0.0 ppm BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: DIFFERENCES IN MEASURED CONSISTENCY NOTED BETWEEN FIELD (F) & LAB (L) VALUES WHEN STUDIED IN LAB See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PJA 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEB 27 1995

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11503-014

PAGE 10 OF 11

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11503

COORDINATES: See pg. 1

RELATED FAL NO.s: 200307-11503-004

SURFACE ELEVATION: See pg. 1

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE STARTED: 12-29-94

GEOLOGIST: LEE / GEIGER / RILEY

GROUNDWATER LEVEL: N/A DATE: TIME:

DATE COMPLETED: 12-29-94

WATER USED DURING DRILLING: ~~13.0~~ 14.0 GALLONS (est) JC 2-14-95

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
31.5	12-29-94 403479 13:50	NA	6" + FLUFF	DARK GRAY (2.5Y 4/1), SILTY, MODERATELY STIFF, MODERATELY PLASTIC, V. SLIGHTLY MOIST CLAY W/ VERY POORLY SORTED FINE TO COARSE CHERTY & FOSSILIFEROUS GRAVEL (15-20%) W/ NO ORIENTATION	CL	2.0F 1.5L	PID 0.0 PPM BY 40 CPM
32.0	12-29-94 403479 13:50	NA	6" + FLUFF	SAME AS ABOVE, GRAVELS INCLUDE MOSTLY FOSSILIFEROUS CLASTS (GRAVEL 15-20%)	CL	2.0F 1.5L	PID 0.0 PPM BY 40 CPM
32.5	12-29-94 403479 13:50	NA	6"	SAME AS ABOVE (GRAVEL 15-20%)	CL	2.0F 1.0L	PID 0.0 PPM BY 40 CPM
33.0	12-29-94 403479 13:50	NA	6"	SAME AS ABOVE, (GRAVEL 20%) ONE CLAST MEASURING 3" x 2" x 1/2" LYING SUBHORIZONTALLY ACROSS CORE IN LONGEST, FLATEST ORIENTATION	CL	2.0F 1.0L	PID 0.0 PPM BY 40 CPM
33.5	12-29-94 403479 13:50	NA	6"	SAME AS ABOVE COARSEST FRACTION NOT PRESENT (IE. MOST GRAVEL SUBROUNDED, MEASURING 1/16" TO 1/4" IN DIAMETER)	CL	2.0F 1.0L	PID 0.0 PPM BY 40 CPM
34.0	12-29-94 403479 13:50	NA	6"	SAME AS ABOVE, SEVERAL PLANAR SUBANGULAR GRAVEL CLASTS LYING HORIZONTALLY ACROSS THE CORE	CL	2.0F 1.0L	PID 0.0 PPM BY 40 CPM
34.5	12-29-94 403479 13:50	NA	6"	SAME AS ABOVE, MOSTLY BROWN, CHERTY GRAVEL CLASTS IN NO ORIENTATION (COARSE % = 20%)	CL	2.0F 1.5L	PID 0.0 PPM BY 40 CPM
35				Bottom of Boring 35'			

INSTRUMENT	BACKGROUND	DATE	TIME
PID	SEE PAGE 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	SEE PAGE 1	/ /	

NOTES: DIFFERENCES IN MEASURED CONSISTENCY NOTED BETWEEN FIELD (F) & LAB (L) VALUES WHEN STUDIED IN LAB

See pg. 1.

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PaA 1/11/95

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

FEB 9 7 1995

2-[illegible]-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11504-005

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11504

COORDINATES: N479205.749, E1332688.796

RELATED FAL NO.(s): 200307-11504-004

SURFACE ELEVATION: 592.66 ft.

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 01/03/95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 01/03/95

WATER USED DURING DRILLING: Estimated 6 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.5	1/3/95 1600 403370	NA	6	very stiff (2.5Y 4/4) OLIVE BROWN Clayey Silt/Silty CLAY w/ Surface Vegetation, subsurface roots and 2-3% Coarse Sand and fine gravel; Med. Plast.; Slightly Moist.	CL/ML	2.5	PID 0.0 ppm BY 40 cpm
1.0	1/3/95 1000 403370	NA	6	stiff same as 0.0 to 0.5 except traces of iron oxide precipitates and black hematite nodules ½ to 1mm diameter med Plast. slightly Moist.	CL/ML	2.0	PID 0.0 ppm BY 40 cpm
1.5	1/3/95 1000 403370	NA	6	stiff same as 0.0-0.5 except for iron oxide traces and increased clay content; Med Plast. slightly Moist	CL	2.0	PID 0.0 ppm BY 40 cpm
2.0	1/3/95 1000 403370	NA	6	stiff same as 0.0-0.5 except color is becoming a YELLOWISH BROWN (10YR 5/8) because of the iron oxides and soil is increasing in clay content; Med Plast. Slightly Moist.	CL	2.0	PID 0.0 ppm BY 40 cpm
2.5	1/3/95 1000 403370	NA	6	stiff same as 0.0-0.5 except YELLOWISH BROWN (10YR 5/8) and silty clay; Med. Plast. Slightly Moist.	CL	2.0	PID 0.0 ppm BY 40 cpm
3.0	1/3/95 1000 403370	NA	6	stiff ~~(2.5Y) same as 0.0-0.5 except~~ YELLOWISH BROWN (10YR 5/8) Silty Clay w/ 2-3% Coarse Sand and fine gravel irregular inclusion of organic clayey silt (black 10YR 5/1) Med. Plast. Slightly Moist.	CL	2.0	PID 0.0 ppm BY 40 cpm
	1/3/95 1005 ~~1000~~ FP 2-13-95 403371	NA	6	stiff Color change to (5Y 5/2) OLIVE GRAY SILTY CLAY w/ homogenous iron oxide precipitate throughout and 1% sand grains; Med. Plast. Slightly Moist.	CL/ML	1.0	PID 0.0 ppm BY 30 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	1/3/94	1000
ALPHA	NA	(NA)	NA
BETA / GAMMA	40	1/3/94	1000

NOTES: This Lithologic Log was updated using Archived Soil Cores by Geologist Thea Layne on 02/01/95

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PWR 1/4/1995

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

2-21-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11504-006	PAGE 2 OF 6
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11504	COORDINATES: See Pg. 1
RELATED FAL NO.s: 20030.7-11504-004	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 1/3/95
GEOLOGIST: LAYNE / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 1/3/95
WATER USED DURING DRILLING: Estimated 6 GALLONS	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	1/3/95 1005 403371	NA	6	Stiff same as 3.0-3.5'	CL/ML	1.0	PID 0.0 ppm BY 30 cpm
4.0	1/3/95 1005 403371	NA	6	Stiff (5Y 4/2) OLIVE Silty CLAY or Clayey Silt iron oxide precipitated particles homogenous throughout and 3% fine to med sand Med Plast., Slightly Moist.	CL/ML	1.0	PID 0.0 ppm BY 30 cpm
4.5	1/3/95 1005 403371	NA	6	Stiff same as 4.0-4.5 except increased iron oxides	CL/ML	1.0	PID 0.0 ppm BY 30 cpm
5.0	1/3/95 1005 403371	NA	6	Stiff same as 4.0-4.5 except basic color is lighter (5Y 5/2) OLIVE GRAY and iron oxide staining increasing to 85-95% of surface area, increased clay content iron nodules; Med. Plast. Slightly Moist	CL/ML	1.0	PID 0.0 ppm BY 30 cpm
5.5	1/3/95 1005 403371	NA	6	Stiff (5Y 5/2) OLIVE GRAY Clayey Silt or Silty CLAY w/ iron oxide staining over 85% of surface area, 3% fine to med sand a few coarse sand (rounded) (to 4.8mm) grains Med Plast. Slightly Moist	CL/ML	1.0	PID 0.0 ppm BY 30 cpm
6.0	1/3/95 1005 403371	NA	6	Stiff (10YR 5/8) YELLOWISH BROWN Clayey Silt w/ (7.5YR 6/8) Reddish yellow iron oxide precipitate covering 30-40% of surface area, 1% sand Med. Plast. Slightly Moist	ML	1.0	PID 0.0 ppm BY 30 cpm
6.5	1/3/95 1005 403371	NA	6	Stiff same as 6.0-6.5' w/ increased clay content	CL/ML	1.0	PID 0.0 ppm BY 30 cpm
7.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PCR 1/4/95

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

811

2-21-95

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 3 OF 6
200307-11504-007	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11504	See Pg. 1	200307-01504-004

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg. 1				1/3/95

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
LAYNE / GEIGER / RILEY				1/3/95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
Estimated 6 GALLONS	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0							
	1/3/95 1010 403372	NA	6	Stiff (2.5Y 5/4) ~~LT OLIVE BROWN~~ LT YELLOWISH BROWN 6/4 ~~OLIVE YELLOW~~ CLAYEY SILT OR Silty CLAY w/ trace of iron oxide precipitate, 10-20% fine gravel (subangular) (5-10 mm), 3-5% coarse sand (angular), 1-2% fine to med grain sand ERRATIC VERTICAL FRACTURE PATTERN w/ deposition	CL/ML	1.0	PID ppm 0.0 gray; PY cpm 30; BROWN
7.5	1/3/95 1010 403372	NA	6	of (2.5Y 5/2) GRAYISH BROWN SILT particles Stiff same as 7.0-7.5' except 20% (4-5) large coarse subangular to angular gravel (30-55 mm), fracture pattern continues on down and widens	CL/ML	1.0	PID ppm 0.0; PY cpm 30; gray; BROWN
8.0	1/3/95 1010 403373 ~~403373~~ ~~2-8-95~~	NA	6	Stiff (2.5Y 6/4) ~~OLIVE~~ LT YELLOW BROWN CLAYEY SILT or Silty CLAY w/ "pocket" of (2.5Y 5/2) GRAYISH BROWN CLAY or Silt and fine to coarse sand depositional "pocket" next to cobble 120 mm X 45 mm X 35 mm thick and angular 2-5% rounded to subangular fine gravel — cobble is oriented vertically	CL/ML	1.5	PID ppm; PY cpm 30; COBBLE
8.5	1/3/95 1010 403373	NA	6	Stiff same as 8.0-8.5' except NO COBBLE AND increased fine gravel and a coarse gravel size limestone fossil fragment, and increased coarse sand (5%) — depositional pattern of gray continues 2-10 mm wide	CL/ML	1.0	PID ppm 0.0 GRAY; PY cpm 30
9.0	1/3/95 1010 403373	NA	6	Stiff same as 8.0-8.5' except no cobble and increased fine gravel (subrounded to subangular) (15-20%), fossil fragments from 2-20 mm, CLAY/SILT is parting laterally and gray depositional pattern becomes lateral (traces)	CL/ML	1.0	PID ppm 0.0; PY cpm 30; GRAY
9.5	1/3/95 1010 403373	NA	6	Stiff (2.5Y 5/4) LT OLIVE BROWN CLAYEY SILT or Silty CLAY w/ 10-15% fine subangular gravel, 5-10% coarse sand-subangular, 10% (2 or 3) coarse subangular gravel, 5% med grain sand trace of iron oxides, lateral parting	CL/ML	1.0	PID 0.0 ppm; PY 30 cpm
10.0	1/3/95 1010 403373	NA	6	Stiff same as 9.5-10.0' except this interval has sand pocket-20 mm diameter 10 mm deep, sand is fine grain and dark brown	CL/ML	1.0	PID 0.0 ppm; PY 30 cpm
0.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	NA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 1/4/95

FS-F-3681

000751

F-362

G:/WPSC/94-776.DRW (11-23-94)

2-8-95

118

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11504-008

PAGE 4 OF 6

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11504

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11504-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/3/95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/3/95

WATER USED DURING DRILLING: Estimated 6 GALLONS

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.5	1/3/95 1015 403373	NA	6	Stiff, same as 10.0-10.5' except no sand pocket and two trace "pockets" of iron oxides in colors of (5YR 4/6) yellowish RED and (10YR 6/8) BROWNISH YELLOW	CL/ML	1.0	PID 0.0 ppm BY 30 cpm
11.0	1/3/95 1015 403375	NA	6	Stiff (2.5Y 5/4) LT OLIVE BROWN CLAYEY SILT OR VERY Silty CLAY w/ 3-5% fine angular gravel (5mm), 5-10% fine angular gravel (15-20mm), 15% coarse gravel (1 GRAVEL) that is 45mm x 45mm x 40mm - SUB rounded to SUB angular 2-3% fine to coarse sand	CL/ML	1.5	PID 0.0 ppm BY 30 cpm
11.5	1/3/95 1015 403375	NA	6	same as 11.0-11.5' except no large coarse gravel	CL/ML	1.5	PID 0.0 ppm BY 30 cpm
12.0	1/3/95 1015 403375	NA	6	same as 11.0-11.5'	CL/ML	1.0	PID 0.0 ppm BY 30 cpm
12.5	1/3/95 1015 403375	NA	6	same as 11.0-11.5'	CL	1.0	PID 0.0 ppm BY 30 cpm
13.0	1/3/95 1015 403375	NA	6	same as 11.0-11.5	CL	1.0	PID 0.0 ppm BY 30 cpm
13.5	1/3/95 1015 403375	NA	6	~~STIFF~~ SAMPLES TAKEN FROM 14.0-15.0 DISTURBED THIS INTERVAL BUT IT APPEARS TO BE SAME AS ABOVE 13.0-13.5'	CL	1.0	PID 0.0 ppm BY 30 cpm
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ [illegible] 1/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000752

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11504-009

PAGE 5 OF 6

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11504

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11504-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/3/95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/3/95

WATER USED DURING DRILLING: 6 GALLONS (Est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS TCLP - 403362 TCLP DUP - 403363 KD - 403359
14.0	1/3/95 1020 403375	NA	6	Stiff ORIGINAL FIELD LOG INDICATES THIS INTERVAL same as 13.5-14.0' (samples taken in the interim) (and material has been removed)	CL/ML	1.0	PID 0.0 ppm BY 30 cpm
14.5	1/3/95 1020 CONTACT 403376	NA	6	Stiff (2.5Y 5/4) LT OLIVE BROWN CLAYEY SILT / Silty CLAY w/ abundant coarse subangular gravel (30mm to 50mm size), (5Y 5/1) GRAY MOTTLING. Stiff BECOMING PREDOMINANTLY GRAY W/ EVIDENCE OF LATERAL FRACTURING connected by very fine vertical fractures BETWEEN PARALLEL LATERAL PLANES	ML	1.0 / 1.0	PID 0.0 ppm BY 30 cpm BROWN SILT / GRAY — CONNECTED FRACTURING
15.0	1/3/95 1020 403375	NA	6	Very stiff (5Y 5/1) GRAY VERY SILTY CLAY w/ 2-3% fine gravel poorly sorted, 15% fine to med SAND, evidence of lateral fracturing	CL	2.5	PID 0.8 BY 30 GRAY / GRAY / GRAY CLAY — BROWN SILT — CPM
15.5	1/3/95 1020 403375	NA	6	Very stiff ORIGINAL FIELD LOG INDICATES THIS INTERVAL SAME AS 15.0-15.5 (samples taken from this interval in the field and material has been removed)	CL	2.5	PID 0.0 ppm BY 30 cpm
16.0	1/3/95 1020 403375	NA	6	Very stiff / Very stiff (5Y 5/1) GRAY VERY SILTY CLAY w/ 5-10% fine angular to subangular gravel, 15-20% fine to coarse SAND	CL / CL MED	2.5 / 2.5	PID 0.0 ppm BY 30 cpm Total VOC - 403357 Total VOC DUP - 403358 TCLP
16.5	1/3/95 1020 403375	NA	4	Very stiff same as 16.0-16.5'	CL	2.5	PID 0.0 ppm BY 30 cpm
17.0	1/3/95 1020 403374	NA	2 / 1-3 / 2-6	(2.5Y 4/3) OLIVE BROWN SILTY SAND w/ 20-25% fine subrounded gravel (poorly sorted) 20% coarse subrounded gravel, SAND IS 2-3% coarse subrounded to subangular and 2-3% med grain, 95% fine sand. GRAVEL-CLAY-SAND MIXTURE - WITH POORLY SORTED GRAVEL PREDOMINANTLY COARSE, SAND IS predominantly coarse to med. Very stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 5-10% fine to med sand, 1-3% coarse subangular sand, 5% fine angular to subangular gravel, A coarse subangular gravel 35mm AND COARSE SAND / VERY FINE GRAVEL INCREASING DOWNWARD TO 10% (3-5mm) Also, twig fragments	CL	2.5	~~PID~~ Could be slough PPM 0. BY 30 CPM 30 Moist 403366
17.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: Also See Pg. 1
Total VOC - 403361
15-15.5 KD - 403360
Total VOC DUP - 403364
Moist - 403365

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

000753

G:/WPSC/94-778.DRW (11-23-94)

18

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11504-010

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11504

COORDINATES: See Pg. 1

RELATED FAL NO.s: 200307-11504-004

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/3/95

GEOLOGIST: LAYNE / GEIGER / RYLEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/3/95

WATER USED DURING DRILLING: 6 GALLONS (Est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.5	1/3/95 1030 403374	NA	6	Very stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 5-10% fine to med sand, 10% coarse sand (3-5mm) a few subangular fine gravel (4-5) (15mm)	CL	2.5	PID 0.0 ppm; BY 30 cpm
18.0	1/3/95 1030 403374	NA	6	very stiff same as 17.5-18.0 except several larger coarse gravel (30mm) (2-3) rounded and angular	CL	2.5	PID 0.0 ppm; BY 30 cpm
18.5	1/3/95 1030 403374	NA	6	Very stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 2-5% fine gravel (subangular), 15% coarse angular gravel (2-3 that are 20 to 45mm) SAND IS FINING and increased 15% fine to med grain 1-3% coarse sand	CL	2.5	PID 0.0 ppm; BY 30 cpm
19.0	1/3/95 1030 403374	NA	6	Very stiff (5Y 4/1) DARK GRAY Silty CLAY w/ 15-20% fine gravel that is poorly sorted and angular to subangular, 1 coarse 45mm siltstone, 20-25% fine to med grain sand, 1% coarse sand NOTE: LATERAL FRACTURE AT TOP OF INTERVAL INDICATED BY SILT & FINE SAND DEPOSITION	CL	2.5	PID ppm 0.0; BY cpm 30
19.5	1/3/95 1030 403374	NA	6	Very stiff same as 19.0-19.5' except less fine gravel 10-15%, this interval also has appearance of lateral fracturing w/ deposition of fine sand and silt cobble 75mm x 30mm	CL	2.5	PID ppm 0; BY cpm 30 FRACTURE Moist: 403367 FRACTURE FOLLOWS OUTSIDE OF CORE
20.0		NA		BOTTOM OF BORING @ 20.0'			PID ppm; BY cpm
20.5		NA					PID ppm; BY cpm
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: See Pg. 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681

000754

C:/WPSC/94-776.DRW (11-23-94)

CONTROL NO.: 200307-11505-005

FEMP

LITHOLOGIC LOG

2-18-95

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11505

COORDINATES: N479199.767 E1382681.305

RELATED FAL NO.s: 200307-11505-004

SURFACE ELEVATION: 592.61

GROUNDWATER LEVEL: | DATE: | TIME:

DATE STARTED: 1/3/95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME:

DATE COMPLETED: 1/3/95

WATER USED DURING DRILLING: 8.0 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1/3/95 1245 403376	NA	6	(2.5Y 4/3) OLIVE BROWN Silty CLAY w/ organics (surface vegetation and abundant root material), 2-3% coarse angular sand and 2-3% fine to med sand	CL	3.0	PID 0.0 ppm; BY 40 cpm
0.5	1/3/95 1245 403376	NA	6	(2.5Y 4/3) OLIVE BROWN Silty CLAY w/ 2-3% coarse sand and 2-3% fine to med sand, abundant root material and iron oxide precipitates throughout	CL	3.0	PID 0.0 ppm; BY 40 cpm
1.0	1/3/95 1245 403376	NA	6	(10YR 6/6) BROWNISH YELLOW Silty CLAY, unconsolidated due to heavy organics, 60mm x 2-1-95 diameter pocket of (10YR 2/2) VERY DARK BROWN SILT	CL / OH	0.0	PID 0.0 ppm; BY 40 cpm
1.5	NA	NA	0	NO RECOVERY			PID ppm; BY cpm
2.0	NA	NA	0	NO RECOVERY			PID ppm; BY cpm
2.5	NA	NA	0	NO RECOVERY			PID ppm; BY cpm
3.0	1/3/95 1245 403376	NA	6	(2.5Y 5/2) GRAYISH BROWN Silty CLAY w/ iron oxide precipitates homogeneous throughout, falls apart easily due to heavy organic content/high silt content	CL	1.5	PID 0.0 ppm; BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	1/3/95	1200
ALPHA	NA	(NA)	NA
BETA / GAMMA	40	1/3/95	1200

NOTES: ~~ABOVE~~ 2-1-95
Lithologic log updated by Layne from archived cores on 2-1-95.

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PaA 1/4/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

FEMP QA 2/7/95

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11505-006

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11505

COORDINATES: See page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/3/95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/3/95

WATER USED DURING DRILLING: 8.0 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5							
4.0	1/3/95 1255 403376	NA	6	Same as 3.0-3.5'	CL	1.5	PID 0 ppm; BY 40 cpm
4.5	1/3/95 1255 403377	NA	6	Same as 3.0-3.5' with small pocket (15mm) of peat	CL	1.5	PID 0 ppm; BY 40 cpm
5.0	1/3/95 1255 403377	NA	6	Same as 3.0-3.5' except heavy iron oxide staining is causing change in color to (10YR 6/6) BROWNISH YELLOW [(Mottling (vague) of 2.5Y 6/2 LT GRAY MAY INDICATE ORIGINAL MATRIX COLOR	CL	2.0	PID 0 ppm; BROWNISH BY 40 cpm
5.5	1/3/95 1255 403377	NA	6	Same as 3.0-3.5' except heavy iron oxide staining is causing change in color to (10YR 6/6) BROWNISH YELLOW	CL	2.0	PID 0 ppm; BY 40 cpm
6.0	1/3/95 1255 403377	NA	6	Same as 3.0-3.5' except heavy iron oxide staining is causing change in overall color to (10 YR 6/6) BROWNISH YELLOW	CL	2.0	PID 0 ppm; BY 40 cpm
6.5	1/3/95 1255 403377	NA	6	Same as 3.0-3.5' except heavy iron oxide staining is causing change in overall color to (10 YR 6/6) BROWNISH YELLOW	CL	2.0	PID 0 ppm; BY 40 cpm
7.0	1/3/95 1255 403377	NA	6	Same as 3.0-3.5 except heavy iron staining is causing overall color change to (10 YR 6/6) BROWNISH YELLOW and clay is ~~[illegible]~~ (1-31-95) more cohesive due to increased moisture content - also 1-2% med grain sand in this interval	CL and	.25	PID 0 ppm; BY 40 cpm; decrease in silt & organics

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: NONE

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 1/4/1995

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11505-007

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11505

COORDINATES: See page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 1/3/95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 1/3/95

WATER USED DURING DRILLING: 8.0 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	1/3/95 1305 403378	NA	6	(2.5Y 6/6) OLIVE YELLOW Silty CLAY, w/ 2-5% coarse subangular sand, 10-15% fine subangular gravel, 10-15% coarse gravel (subangular to subrounded) 3% fine to med sand	CL	3.0	PID 0 ppm; BY 40 cpm
7.5	1/3/95 1305 403378	NA	6	Same as 7.0-7.5' evidence of lateral fracturing? w/ traces of lamination w/ (2.5Y 5/2) GRAYISH BROWN CLAY	CL	3.0	PID 0 ppm; BY 40 cpm
8.0	1/3/95 1305 403378	NA	6	same as 7.0-7.5' and mottling of (2.5Y 5/2) GRAYISH BROWN that may indicate? lateral depositional planes 1-2mm thick	CL	3.0	PID 0 ppm; BY 40 cpm
8.5	1/3/95 1305 403378	NA	6	same as 7.0-7.5' with some dark brown staining (iron oxide staining? fracture deposit?) AND irregular mottling of (2.5Y 5/2) GRAYISH BROWN CLAY	CL	3.0	PID 0 ppm; BY 40 cpm
9.0	1/3/95 1305 CONTACT	NA	4	(2.5Y 6/4) LT YELLOWISH BROWN Silty CLAY mottled w/ (2.5Y 4/3) OLIVE BROWN, 20-30% coarse subangular GRAVEL, 15-20% fine angular gravel, 5% coarse subangular sand grains, 10-15% fine to med SAND GRAINS	CL	3.0	PID 0 ppm; BY 40 cpm
9.5	403378		2	(2.5Y 4/3) OLIVE BROWN SILTY CLAY w/ IRON oxide staining (10YR 5/4) YELLOWISH BROWN OR could be depositional blown clay from above	CL	3.0	
	1/3/95 1305	NA	3	5-10% coarse subangular SAND, 2-3% MED SUBROUNDED SAND 2-5% fine subangular to subrounded gravel OVERALL FINER MATERIAL IN CLAY MATRIX		3.0	PID 0 ppm; BY 40 cpm
10.0	403378		3	MATRIX BECOMING (5Y 4/1) DARK GRAY SILTY CLAY w/ (2.5Y 4/3) OLIVE BROWN SILTY CLAY MOTTLING (LATERAL PLANE OF GRAY 40 mm THICK)			
	1/3/95 1305 GRAVEL LENS 403378	NA	6	(5Y 4/1) DARK GRAY SILTY CLAY 1st inch of core breaks into lateral plane — plane surface exhibits (10YR 5/6) YELLOWISH BROWN mottling, 2-5% angular fine gravel 2-5mm in size 2-3% fine to med SAND COARSENING DOWN TO coarse subangular GRAVELS	3.0 CL GC CL		PID 0 ppm; BY 40 cpm

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: 20x30mm AND 80x60x65 mm THICK COBBLE AND CLAYEY GRAVEL AND THEN BACK TO SILTY CLAY W/ FINES DESCRIBED ABOVE AND 2 OR 3 COARSE GRAVEL (30x20mm)

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 1/4/94

FS-F-3681

G: / WPSC / 94-776.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11505-008	PAGE 4 OF 8
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11505	COORDINATES: See page 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See page 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 1/3/95
GEOLOGIST: LAYNE / GEIGER / RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 1/3/95
WATER USED DURING DRILLING: 8.0 GALLONS (est)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL
DRILLING EQUIPMENT: ROTASONIC	DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5	NA	NA	N/A	NO RECOVERY	N/A	N/A	PID N/A ppm; BY N/A CPM
11.0	NA	NA	N/A	NO RECOVERY	N/A	N/A	PID N/A ppm; BY N/A CPM
11.5	NA	NA	N/A	NO RECOVERY	N/A	N/A	PID N/A ppm; BY N/A CPM
12.0	NA	NA	N/A	NO RECOVERY	N/A	N/A	PID N/A ppm; BY N/A CPM
12.5	NA	NA	N/A	NO RECOVERY	N/A	N/A	PID N/A ppm; BY N/A CPM
13.0	NA	NA	N/A	NO RECOVERY	N/A	N/A	PID N/A ppm; BY N/A CPM
13.5	NA	NA	N/A	NO RECOVERY	N/A	N/A	PID N/A ppm; BY N/A CPM
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: None

See page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/14/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

811

SA 1.95 2-18-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11505-009

PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11505

COORDINATES: See page 1

RELATED FAL NO.s:

SURFACE ELEVATION: See page 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/3/95

GEOLOGIST: LAYNE / GEIGER / RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/3/95

WATER USED DURING DRILLING: 8.0 GALLONS (est)

DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL

DRILLING EQUIPMENT: ROTASONIC

DRILLER / HELPER: BREWER / GRIM / FORTHEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	NA	NA	NA	NO RECOVERY	N/A	N/A	PID ppm; BY N/A cpm
14.5	NA	NA	NA	NO RECOVERY	N/A	N/A	PID ppm; BY N/A cpm
15.0	NA	NA	NA	NO RECOVERY	N/A	N/A	PID; BY N/A
15.5	NA	NA	NA	NO RECOVERY	N/A	N/A	PID ppm; BY N/A cpm
16.0	NA	NA	NA	NO RECOVERY	N/A	N/A	PID ppm; BY N/A cpm
16.5	NA	NA	NA	NO RECOVERY	N/A	N/A	PID ppm; BY N/A cpm
17.0	1/3/95 1315 403379	NA	NA	(5Y 4/1) DARK GRAY SILTY CLAY w/ 2-3% coarse subangular SAND, 3-5% fine to med grain sand, 5-10% poorly sorted fine gravel (angular to subangular) A COARSE GRAVEL 40mm x 35mm (angular) FINE SAND DEPOSITION ALONG PARTING PLANES INDICATING FRACTURING IN CLAY	CL	2.5	PID 0 ppm; BY 40 cpm
7.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: NONE

See page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 12/4/94

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

000759

FEMP
LITHOLOGIC LOG

CONTROL NO.: 200307-11505-010	PAGE 6 OF 8
PROJECT NAME: PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11505	COORDINATES: See page 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See page 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 1/3/95
GEOLOGIST: LAYNE / GEIGER & RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 1/3/95
WATER USED DURING DRILLING: 80 GALLONS (est)	DRILLING CONTRACTOR: ALLIANCE ENVIRONMENTAL / DRILLING EQUIPMENT: ROTASONIC / DRILLER / HELPER: BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5							
	1/3/95 1325 403379	NA	6	SAME AS 17.0-17.5 except NO indication of fracturing	CL	2.0	PID 0 ppm; BY 40 cpm
18.0	1/3/95 1325 403379	NA	6	SAME AS 17.0-17.5' (Silty Clay w/ poorly sorted SAND & GRAVEL) NO indication OF FRACTURING Increased med grain SAND-Subangular	CL	2.0	PID 0 ppm; BY 40 cpm
18.5	1/3/95 1325 403379	NA	6	(5Y 4/1) DARK GRAY SILTY CLAY w/ increased sand and very fine gravel — fine to med grain sand (10-15%), fine gravel Angular to subangular 10-15%, Coarse subangular sand 2-3%, Also increased Coarse Subangular gravel 25-35% of matrix	CL	2.0	PID 0 ppm; BY 40 cpm
19.0	1/3/95 1325 403380	NA	6	(5Y 4/1) DARK GRAY ~~SILTY CLAY w/~~ CLAYEY SILT w/ 60mm x 45mm Coarse gravel (angular) AND silty clay w/ SAND & FINE GRAVEL RADIATING DOWNWARD (POST DEPOSITIONAL INTRUSION)	ML	3.0	PID ppm; BY cpm; gravel; Intrusion silt
19.5	1/3/95 1325 403380	NA	3	(5Y 4/1) DARK GRAY CLAYEY SILT		3.0	PID ppm; BY cpm; SMOOTH SILT
20.0			3	(5Y 4/1) DARK GRAY CLAYEY SILT w/ decaying organics (wood) and silty clay w/ fine gravel. Vertical Fracture w/ fine sand deposition on fracture plane		3.0	
	1/3/95 1325 403380	NA	6	(5Y 4/1) DARK GRAY CLAYEY SILT w/ Silty Clay that is 3% fine angular gravel (2-5 mm) and 2-3% coarse angular sand. (Intruding Silt "Finger" w/ decayed wood at top)		3.0	PID 0 ppm; BY 40 cpm; DECAYED WOOD; Silt "FINGER"
20.5	1/3/95 1325 403380	NA	6	(5Y 4/1) DARK GRAY VERY SILTY CLAY w/ 3-5% fine to med grain sand, 3% coarse angular sand — some fine sand along parting planes may indicate fracturing. Also, 3-5% fine Subangular gravel and 1 or 2 coarse subangular gravel		3.0	PID 0 ppm; BY 40 cpm
21.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/ NA /	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: NONE

See Page 1

~~• SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGA 1/4/95

FS-F-3581

G: / WPSC / 94-776.DRW (11-23-94)

811

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 7 OF 8
200307-11505-011	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11505	See page 1	

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See page 1				1/3/95

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
LAYNE / GEIGER / RILEY				1/3/95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
80 GALLONS (est)	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.0	1/3/95 1340 403380	NA	6	Same as 20.5-21.0 except increased coarse gravel both rounded and angular (4 & 5) (25mm to 55mm size range)	CL	2.5	PID 0 ppm; BY 40 cpm
21.5	1/3/95 1340 403380	NA	6	same as 20.5-21.0 except increased fine gravel (15%) and increased coarse angular to subanger gravel (30-40%) poorly sorted (20mm to 60mm range), fine sand and silt deposit on clay planes around large coarse gravel	CL	2.5	PID 0 ppm; BY 40 cpm
22.0	1/3/95 1340 403381	NA	6	(5Y 4/1) DARK GRAY VERY SILTY CLAY w/ 2-3% fine subangular gravel (2 to 5mm) 5% subangular fine gravel (15-20mm), 2-3% coarse subangular sand and 15% fine to med sand 10% coarse subangular to subrounded gravel	CL	2.5	PID 0 ppm; BY 40 cpm; moist. 403364
22.5	1/3/95 1340 403381	NA	6	same as 22.0-22.5' except increased coarse gravel (subangular) (25%)	CL	2.5	PID 0 ppm; BY 40 cpm
23.0	1/3/95 1340 403381	NA	6	same as 22.0 to 22.5' except 60x30 mm size "pocket" of poorly sorted fine to coarse sand and silt			PID 0 ppm; BY 40 cpm
23.5	1/3/95 1340 403381	NA	6	same as 22.0 to 22.5 w/ traces of sand deposits along fracture plane			PID 0 ppm; BY 40 cpm
24.0	1/3/95 1340 403381	NA	6	(5Y 4/1) Dark Gray Silty Clay w/ 2-3% subangular fine gravel that is 15-20mm range 2% subangular fine gravel 5mm 3% subangular coarse sand, 15% fine to med sand 85mm x 60mm x 20mm thick cobble subangular to subrounded oriented vertically and at a tilt			PID 0 ppm; BY 40 cpm; cobble
25							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	/NA/	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: NONE

See page 1

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PER 12/14/94

FS-F-3681

G:/WPSC/94-778.DRW (11-23-94)

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 8 OF 8
200307-11505-012	

PROJECT NAME:	PROJECT NO.:
PHASE I AND II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11505	See Page 1	

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Page 1				1/3/95

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
LAYNE / GEIGER / RILEY				1/3/95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
80 GALLONS (est)	ALLIANCE ENVIRONMENTAL	ROTASONIC	BREWER / GRIM / FORTNEY

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5	1/3/95 1355 403381	NA	6	(5Y 4/1) DARK GRAY Silty Clay w/ 1-2% fine subangular gravel, 1-2% ~~med to~~ coarse subangular sand, a few fine subangular 10-20 mm size gravel, 10-15% fine sand, 2 or 3 rounded coarse gravel (10 mm size fine sand pocket) VERY	CL	2.0	PID 0 403353 Total PPM Iso-U; BY 40 CPM; TCLP 403352
25.0	1/3/95 1355 403381	NA	6	(5Y 4/1) DARK GRAY Silty CLAY w/ 3 or 4 subrounded and subangular gravel that is coarse size (approx 20-25 mm), 1% med to coarse sand, 2-3% fine sand — Basically matrix is finer w/ a few gravels - borderline clayey silt offset from parking	CL/ML	2.0	PID 0 ppm; BY 40 CPM; Moist. 403355
25.5	1/3/95 1355 403381	NA	6	(5Y 4/1) DARK GRAY Silty CLAY w/ 5-10% poorly sorted angular to subangular fine gravel, 1-2% coarse subangular sand 5-10% fine to med coarse sand, 2 or 3 subrounded to rounded coarse gravels 20 mm	CL	2.0	PID 0 ppm; BY 40 CPM
26.0	1/3/95 1355 403381	NA	6	same as 25.5 to 26.0' except increased fine to med grain sand (15%) and 80x50x20 mm thick limestone fossilized ~~(The 25-25.5 mm~~ fragment	CL	2.0	PID 0 ppm; BY 40 CPM
26.5	1/3/95 1355 403381	NA	6	same as 25.5 to 26.0' except coarse gravels are angular to subangular and broken (30-40 mm size) rounded clasts and increased fine gravel	CL	2.0	PID 0 ppm; BY 40 CPM; Moist 403356
27.0				BOTTOM OF BORING			
27.5		NA					PID ppm; BY CPM
8.0		NA					PID ppm; BY CPM

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg. 1	/ /	
ALPHA	NA	INA	NA
BETA / GAMMA	See Pg. 1	/ /	

NOTES: NONE

See Page 1

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PGR 1/4/95

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

000762

B I I 2-18-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11544-005

PAGE 1 OF 4

PROJECT NAME: Phase I+II of The OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11541

COORDINATES: N482101.898, E1382457.582

RELATED FAL NO.s: 200307-11541-004

SURFACE ELEVATION: 602.72 ft.

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12/22/94

GEOLOGIST: RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12/22/94

WATER USED DURING DRILLING: NONE

DRILLING CONTRACTOR: ~~Allignce~~ EFO PR 12/28/94

DRILLING EQUIPMENT: GEOPROBE ~~Rotosonic~~ PR 12/28/94

DRILLER / HELPER: GROB / NEYER

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.0	12/22/94 0930	NA	12	STIFF (10YR 4/3) BROWN SILTY CLAY WITH ROOTS, SLIGHT TO MEDIUM PLASTICITY, SLIGHTLY MOIST TO DRY	CL	1.5	PID 0.0 BY 60
2.0	12/22/94 0930	NA	12	STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY WITH TRACE OF SAND, ROOTS, SLIGHTLY MOIST, SLIGHT TO MEDIUM PLASTICITY	CL	1.0	PID 0.0 BY 50
3.0	12/22/94 0930	NA	12	SAME AS ABOVE	CL	1.5	PID 0.0 BY 50
4.0	12/22/94 0930	NA	12	SAME AS ABOVE	CL	1.5	PID 0.0 BY 50
5.0	12/22/94 0940	NA	12	SAME AS ABOVE	CL	1.5	PID 0.0 BY 50
6.0	12/22/94 0940	NA	12	SAME AS ABOVE	CL	1.5	PID 0.0 BY 55
7.0	12/22/94 0940	NA	12	SAME AS ABOVE	CL	1.5	PID 0.0 BY 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/22/94	0930
ALPHA	NA	NA	NA
BETA / GAMMA	50	12/22/94	0930

NOTES:

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681 PR 12/22/94

G: / WPSC / 94-776.DRW (11-23-94)

000763

FEMP QA 19

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11544-006

PAGE 2 OF 4

PROJECT NAME: Phase I+II of The OU2 Pre-Design Field Investigation	PROJECT NO.: 20.03.07
BORING NUMBER: 11541	COORDINATES: See Page 1
RELATED FAL NO.s: 200307-11542-004	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED:
GEOLOGIST: Riley	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED:
WATER USED DURING DRILLING: NONE	DRILLING CONTRACTOR: EFO ~~Alliance~~ PR 12/20/94
DRILLING EQUIPMENT: GeoProbe ~~Rotosonic~~ PR 12/20/94	DRILLER / HELPER: GROB / NEYER

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
9.0	12/22/94 0940	NA	12	SAME AS ABOVE	CL	1.5	PID 0.0 β/γ 50
9.0	12/22/94 0952	NA	12	SAME AS ABOVE	CL	1.5	PID 0.0 β/γ 50
10.0	12/22/94 0952	NA	12	SAME AS ABOVE	CL	1.5	PID 0.0 β/γ 50
11.0	12/22/94 0952	NA	6	SAME AS ABOVE	CL	1.0	PID 0.0 β/γ 50
			6	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH SOME GRAVEL (FINE TO MED.), TRACE OF SAND, MEDIUM PLASTICITY, MOIST	CL	1.0	
12.0	12/22/94 0952	NA	6	SAME AS ABOVE	CL	1.0	PID 0.0 β/γ 50
			6	(5Y 4/1) DARK GRAY GRAVELLY SAND, WITH SOME FINES, WET	SC	NA	
13.0	12/22/94 1002	NA	12	SAME AS ABOVE	SC	NA	PID 0.0 β/γ 50
14.0	12/22/94 1002	NA	12	SAME AS ABOVE	SC	NA	PID 0.0 β/γ 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/22/94	0930
ALPHA	NA	NA	NA
BETA / GAMMA	50	12/22/94	0930

NOTES:

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

PR 12/22/94

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

2-14-95 FEMP QA 19

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11544-007

PROJECT NAME: PHASE I + II OF THE OU2 PRE-DESIGN INVESTIGATION			PROJECT NO.: 20-0307
BORING NUMBER: 11541	COORDINATES: See Page 1	RELATED FAL NO.s: 200307-11541-004	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED: 12/22/94
GEOLOGIST: RILEY	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED: 12/22/94
WATER USED DURING DRILLING: NONE	DRILLING CONTRACTOR: EFO	DRILLING EQUIPMENT: GEOPROBE	DRILLER / HELPER: GROB / NEYER

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (T&F)	REMARKS
14.0 – 15.0	12/22/94 1002	NA	12	SAME AS ABOVE	SC	NA	BG 50 PID 0.0
15.0 – 16.0	12/22/94 1002	NA	12	SAME AS ABOVE	SC	NA	BG 60 PID 0.0
16.0 – 17.0	12/22/94 1030	NA ~~12~~ PR 12/22/94	12	SAME AS ABOVE	SC	NA	BG 50 PID 0.0
17.0 – 18.0	12/22/94 1030	NA ~~12~~ PR 12/22/94	12	SAME AS ABOVE	SC	NA	BG 50 PID 0.0
18.0				BOTTOM OF BORING 18.0 FT PR 12/22/94			

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/22/94	0930
ALPHA	NA	NA	NA
BETA / GAMMA	50	12/22/94	0930

NOTES:

~~* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~

FS-F-3681

PR 12/22/94

G:/WPSC/94-776.DRW (11-23-94)

000765

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11542-005

PAGE 1 OF 3

PROJECT NAME: Phase I+II of The OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11542

COORDINATES: N1382461.27 E 481868.41

RELATED FAL NO.s: 200307-11542-004

SURFACE ELEVATION: 600.03

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/28/94

GEOLOGIST: RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/28/94

WATER USED DURING DRILLING: NONE

DRILLING CONTRACTOR: EFO ~~Alliance~~ PR 12/23/94

DRILLING EQUIPMENT: GEOPROBE ~~Rotosonic~~ PR 12/28/94

DRILLER / HELPER: GROB / REYNOLDS

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.0	12/28/94 1330	NA	12	STIFF (10YR 3/4) DARK YELLOWISH BROWN SILTY CLAY WITH ROOTS AND TRACE OF SAND SLIGHT TO MEDIUM PLASTICITY, MOIST	CL	1.0	PID 0.0 BY 60
2.0	12/28/94 1345	NA	6 / 6	STIFF (10YR 3/4) YELLOWISH BROWN SILTY CLAY WITH TRACE OF SAND, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 0.0 BY 60
3.0		NA	12	SAME AS ABOVE	CL	1.5	PID 0.0 BY 60
4.0	12/28/94 1357 ~~PR~~ PR 12/28/94	NA	12 ~~PR~~	SAME AS ABOVE	CL	1.5	PID 0.0 BY 6.0
5.0	12/28/94 1405	NA	6 / 6	SAME AS ABOVE SOME GRAVEL	CL	1.5	PID 0.0 BY 60
6.0	12/28/94 1405	NA	12	SAME AS ABOVE	CL	1.25	PID 0.0 BY 60
7.0	12/28/94 1420	NA	12	LOOSE (10YR 5/6) YELLOWISH BROWN FINE CLAYEY SILTY SAND, NON-PLASTIC, ~~WET~~ PR 12/28/94 WET	SC	NA	PID 0.0 BY 60

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/28/94	1315
ALPHA	NA	NA	NA
BETA / GAMMA	~~50~~ 60 PR 12/28/94	12/28/94	1315

NOTES:

* ~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~ PR

FS-F-3681

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEB 23 1995

811

CONTROL NO.: 200307-11542-006

FEMP
LITHOLOGIC LOG

PAGE 2 OF 3

PROJECT NAME: Phase I+II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11542

COORDINATES: See Page 1

RELATED FAL NO.s: 200307-11542-004

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE STARTED: 12/28/94

GEOLOGIST: RILEY

GROUNDWATER LEVEL: N/A | DATE: | TIME: | DATE COMPLETED: 12/28/94

WATER USED DURING DRILLING: NONE

DRILLING CONTRACTOR: ~~Alliance~~ EFO ~~PRL 12/28/94~~

DRILLING EQUIPMENT: GEOPROBE ~~Rotosonic PRL 12/28/94~~

DRILLER / HELPER: GROB / REYNOLDS

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	12/28/94 1420	NA	6	STIFF (10YR 5/6) YELLOWISH BROWN GRAVELLY SANDY SILT, NON-PLASTIC, WET	ML	2.0	PID 0.0 BY 60
8.0	12/28/94 1425		6				
	12/28/94 1425	NA	12	SAME AS ABOVE	ML	2.0	PID 0.0
9.0				LOOSE (10YR 5/4)			BY 60
	12/28/94 1500	NA	12				PID 0.0
10.0				VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY, WITH SOME SAND AND GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST			BY 60
	12/28/94 1500	NA	6	VERY STIFF (5Y 4/1) DARK GRAY, SILTY CLAY SOME SAND AND GRAVEL, MEDIUM PLASTICITY, SLIGHTLY	CL	2.5	PID 0.0
11.0				BOTTOM OF BORING (10.5 FT)			BY 60
		NA					PID BY
12.0							
		NA					PID BY
13.0							
		NA					PID BY
14.0							

NATHAN FOWLER PRL 12/28/94

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/28/94	1315
ALPHA	NA	NA	NA
BETA / GAMMA	~~50~~ 60 PRL 12/28/94	12/28/94	1315

NOTES:

* SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.

FS-F-3681 PRL

FEMP QA 21

G:/WPSC/94-776.DRW (11-23-94)

FEB 23 1995

118

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11543-005	PAGE 1 OF 2
PROJECT NAME: PHASE I + II OF THE OU2 PRE-DESIGN INVESTIGATION	PROJECT NO.: 2003.07
BORING NUMBER: 11543	COORDINATES: N481563.766; E1382449.995
RELATED FAL NO.s: 200307-11543-004	
SURFACE ELEVATION: 597.08 ft	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 12/27/94
GEOLOGIST: RILEY	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 12/27/94
WATER USED DURING DRILLING: NONE	DRILLING CONTRACTOR: EFO / DRILLING EQUIPMENT: GEOPROBE / DRILLER / HELPER: GIZOB / DEMO

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
2.0	12/27/94 0850	NA	24	VERY STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY WITH ROOTS AND TRACE OF FINE SAND, SOME MED TO FINE GRAVELS, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 0.0 BG 50
4.0	12/27/94 0850	NA	24	SAME AS 0.0 - 2.0 FT	CL	2.3	PID 0.0 BG 50
6.0	12/27/94 0905	NA	24	SAME AS 2.0 - 4.0 FT	CL	2.0	PID 0.0 BG 50
6.0	12/27/94 0905	NA	24	SAME AS 4.0 - 6.0 FEET UNTIL 4.5 FEET, GRADING INTO A MEDIUM STIFF (10YR 4/6) DARK YELLOWISH BROWN SANDY SILT WITH SOME GRAVEL, NON PLASTIC	CL / ML	2.0 / 1.0	PID 0.0 BG 50
8.0	12/27/94 0922	NA	29	STIFF (10YR 5/4) YELLOWISH BROWN SILTY CLAY WITH TRACE GRAVEL AND SAND, MED. PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 0.0 BG 50
10.0	12/27/94 0922	NA	24	STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH SOME MEDIUM TO FINE GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.5	PID 0.0 BG 50
12.0	12/27/94 0936	NA	24	SAME AS 10.0 - 12.0 FT	CL	2.0	PID 0.0 BG 50
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/27/94	0845
ALPHA	NA	NA	NA
BETA / GAMMA	50	12/27/94	0845

NOTES:

* ~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3681

G:/WPSC/94-776.DRW (11-23-94)

311

FEMP

LITHOLOGIC LOG

PR 12/27/

CONTROL NO.:	PAGE 2 OF 3
200307-11543-006	

PROJECT NAME:	PROJECT NO.:
PHASE I + II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
~~11543~~ PR 11543	See Page 1	200307-11543-004

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg. 1				12/27/94

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
RILEY				12/27/94

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
NONE	EFO	GEOPROBE	GROB / DEMO

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
16.0	12/27/94 0935	NA	24	VERY STIFF (5Y4/1) DARK GRAY CLAYEY SILT WITH LITTLE % OF SAND. NON PLASTIC, VERY MOIST, GRADING INTO A SILTY/CLAYEY SAND, WET	ML SM	3.0 NA	PID 0.0 BG 50
18.0	12/27/94 1030	NA	24	SAME AS 14.0-16.0 MOIST	SM	NA	PID 0.0 BG 50
20.0	12/27/94 1030	NA	~~24~~ PR 12/27/94 0	NO RECOVERY	NA	NA	PID NA BG NA
				20.0 BOTTOM OF BORING			

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/27/94	0845
ALPHA	NA	NA	NA
BETA / GAMMA	50	12/27/94	0845

NOTES:

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ PR 12/27/94

FS-F-3681 G:/WPSC/94-778.DRW (11-23-94)

000769

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11544-005

PAGE 1 OF 4

PROJECT NAME: OU2 PRE-DESIGN INVESTIGATION

PROJECT NO.: 20.03.07

BORING NUMBER: 11544

COORDINATES: N1382700.59 E479203.52

RELATED FAL NO.s: 200307-11544-004

SURFACE ELEVATION: 589.40 ft.

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 12/28/94

GEOLOGIST: RILEY

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 12/28/94

WATER USED DURING DRILLING: (0 GALLONS)

DRILLING CONTRACTOR: EFO

DRILLING EQUIPMENT: GEOPROBE

DRILLER / HELPER: GROB / REYNOLDS

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.0	12/28/94 0835	NA	12	VERY STIFF (10YR 4/4) DARK YELLOWISH BROWN SILTY CLAY WITH ROOTS, MEDIUM PLASTICITY, SLIGHTLY MOIST, IRON AND MANGANESE STAINING	CL	2.5	PID 0.0 BG 60
2.0	12/28/94 0835	NA	12	SAME AS ABOVE	CL	2.0	PID 0.0 BG 60
3.0	12/28/94 0835	NA	12	SAME AS ABOVE	CL	2.0	PID 0.0 BG 60
4.0	12/28/94 0835	NA	12	STIFF (10YR 3/4) BROWN SILTY CLAY WITH A TRACE OF FINE SAND, MEDIUM TO LOW PLASTICITY, IRON AND MANGANESE STAINING, SLIGHTLY MOIST	CL	1.0	PID 0.0 BG 60
5.0	12/28/94 0846	NA	12	SAME AS ABOVE	CL	1.25	PID 0.0 BG 60
6.0	12/28/94 0846	NA	12	SAME AS ABOVE	CL	1.25	PID 0.0 BG 60
7.0	12/28/94 0846	NA	12	SAME AS ABOVE	CL	1.0	PID 0.0 BG 60

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/28/94	0830
ALPHA	NA	NA	NA
BETA / GAMMA	60	12/28/94	0830

NOTES:

FEMP QA

FEB 23 1995

* ~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3881

G: / WPSC / 94-776.DRW (11-23-94)

811

CONTROL NO.: 200307-11544-006

FEMP
LITHOLOGIC LOG

PROJECT NAME: PHASE I + II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NO.: 20.03.07
BORING NUMBER: 11544	COORDINATES: See Page 1
RELATED FAL NO.s: 200307-11544-004	
SURFACE ELEVATION: See Page 1	GROUNDWATER LEVEL: / DATE: / TIME:
DATE STARTED: 12/28/94	
GEOLOGIST: RILEY	GROUNDWATER LEVEL: / DATE: / TIME:
DATE COMPLETED: 12/28/94	
WATER USED DURING DRILLING: NONE	DRILLING CONTRACTOR: EFO
DRILLING EQUIPMENT: GEOPROBE	DRILLER / HELPER: GROB / REYNOLDS

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8.0	12/28/94 0846	NA	12	SAME AS ABOVE	CL	1.0	PID 0.0 BZ 60
9.0	12/28/94 0915	NA	12	STIFF (10YR 5/4) YELLOWISH BROWN, SILTY CLAY WITH SOME FINE SAND AND MEDIUM TO FINE ANGULAR GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	1.25	PID 0.0 BZ 60
10.0	12/28/94 0915	NA	12	SAME AS ABOVE	CL	1.0	PID 0.0 BZ 60
11.0	12/28/94 0915	NA	12	SAME AS ABOVE	CL	1.0	PID 0.0 BZ 60
12.0	12/28/94 0915	NA	10	SAME AS ABOVE	CL	1.25	PID 0.0 BZ 60
13.0	12/28/94 0940	NA	12	SAME AS ABOVE	CL	1.25	PID 0.0 BZ 55
14.0	12/28/94 0940	NA	12	SAME AS ABOVE	CL	1.0	PID 0.0 BZ 60

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/28/94	0830
ALPHA	NA	NA	NA
BETA / GAMMA	60	12/28/94	0830

NOTES:

QA FEB 23 1995

~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST.~~ P.2 12/28/94

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

000771

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11544-007

PAGE 3 OF 4

PROJECT NAME: PHASE I + II OF TAE

PROJECT NO.: 20.03.07

BORING NUMBER: 11544

COORDINATES: See Page 1

RELATED FAL NO.(s): 200307-11544-004

SURFACE ELEVATION: See Page 1

GROUNDWATER LEVEL: N/A

DATE:

TIME:

DATE STARTED: 12/28/94

GEOLOGIST: RILEY

GROUNDWATER LEVEL: N/A

DATE:

TIME:

DATE COMPLETED: 12/28/94

WATER USED DURING DRILLING: NONE

DRILLING CONTRACTOR: EFO

DRILLING EQUIPMENT: GEOPROBE

DRILLER / HELPER: GROB/REYNOLDS

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	12/28/94 0940	NA	12	SAME AS ABOVE	CL	1.0	PID 0.0 BG 60
5.0	12/28/94 0940	NA	12	SAME AS ABOVE	CL	1.0	PID 0.0 BG 50
10.0	12/28/94 1045	NA	12	VERY STIFF (5Y 4/1) DARK GRAY SILTY CLAY WITH TRACE OF FINE SAND AND MEDIUM TO FINE ANGULAR GRAVEL, MEDIUM PLASTICITY, SLIGHTLY MOIST	CL	2.5	PID 0.0 BG 50
15.0	12/28/94 1045	NA	12	SOFT (5Y 4/1) DARK GRAY SILTY CLAY WITH SIGNIFICANTLY MORE SAND AND GRAVEL, LOW PLASTICITY, SLIGHTLY MOIST	CL	0.25	PID 0.0 BG 55
18.0	12/28/94 1045	NA	10	SAME AS ABOVE	CL	0.25	PID 0.0 BG 50
				BOTTOM OF BORING 18.5 FT			
19.0	NA	NA	NA	NA	NA	NA	PID NA BG NA
20.0				NOTHING FOLLOWS BR 12/28/94			

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0.0	12/28/94	0830
ALPHA	NA	NA	NA
BETA / GAMMA	60	12/28/94	0830

NOTES:

QA FEB 23 1995

* ~~SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST~~

FS-F-3881

G:/WPSC/94-776.DRW (11-23-94)

811

8-21-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11546-005	PAGE 1 OF 5
PROJECT NAME: Phase I + II of The OU2 Pre-Design Field Investigation	PROJECT NO.: 20.03.01
BORING NUMBER: 11546	COORDINATES: N481836.062 E1382754.998
RELATED FAL NO.:	
SURFACE ELEVATION: 601.36	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 1/16/95
GEOLOGIST: Geiger / Riley	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 1/16/95
WATER USED DURING DRILLING: 0.0 gal (Est)	DRILLING CONTRACTOR: Alliance / DRILLING EQUIPMENT: Rotosonic / DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0 – .5	1/16/95 403523 1340	NA	6	Very Soft 10YR 4/3 Dark Brown; Silty Clay w/ 15% corse sand w/a Trace of fine gravel sub-Angular and Roots; med. Plast. Slightly moist.	CL	<.25	PID 1.8 BY 50
.5 – 1.0	1/16/95 1340 403523 ~~1340 1/16/95~~	NA	6	Stiff 10YR 4/2 Dark Grayish Brown; w/ ~~Light~~ KG 7/2.5Y Liter Brown mottling; w/Silty Clay and a Trace Corse Sand and med. Plast. slightly Moist.	CL	1.5	PID 1.8 BY 50
1.0 – 1.5	1/16/95 1340 403523	NA	6	Soft 10YR 4/2 Dark Grayish Brown; Silty Clay w/Trace corse sand and Med. Plast. Slightly Moist.	CL	.5	PID 1.8 BY 50
1.5 – 2.0	1/16/95 1340 403523	NA	6	Soft 10YR 4/2 Dark Grayish Brown; Silty Clay w/Trace corse sand and Med. Plast. slightly Moist.	CL	.5	PID 1.8 BY 50
2.0 – 2.5	1/16/95 1340 403523	NA	6	Med. Stiff 10YR 4/3 Dark Brown w/Trace gray Mottling and Fe stains; silty clay; w/Trace of fine Sand and Med. Plast. Slightly Moist.	CL	.75	PID 1.8 BY 50
2.5 – 3.0	1/16/95 1340 403523	NA	6	Stiff 10YR 4/4 Dark Yellowish Brown w/Trace of Gray Mottling; Fe stains and Mn; and trace of med. Sand; Med. Plast. Slightly Moist.	CL	1.5	PID 1.8 BY 50
3.0 – 3.5	1/16/95 1340 403523	NA	6	Stiff 10YR 4/6 Dark Yellowish Brown; w/Trace of Gray Mottling; silty Clay w/Trace of med. sand; Med. Plast. Slightly Moist.	CL	2.0	PID 1.8 BY 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0 ppm	1/16/95	1340
ALPHA	N/A	N/A	N/A

NOTES:

000273

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11546-006

PAGE 2 OF 5

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.01

BORING NUMBER: 11546

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/16/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/16/95

WATER USED DURING DRILLING: 0.0 gal. (Est.)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	1/16/95 403523 1340	NA	6	Stiff 10YR 4/6 Dark Yellowish Brown; w/trace of Gray mottling; Fe stains and mn; and trace of med. sand; Med. Plast. Slightly Moist.	CL	1.0	PID 1.8 By 50
4.0 – 4.5	1/16/95 403524 1345	NA	6	Stiff 10YR 5/4 Yellowish Brown; silty Clay w/30% med.-Corse Angular gravel; Irregular orientation; Trace of 10YR 6/2 Lite Brownish gray Mottling; 5% corse sand. Med. Plast. Slightly Moist.	CL	2.0	PID .2 By 50
4.5 – 5.0	1/16/95 403524 1345	NA	6	Stiff 10YR 5/4 Yellowish Brown; silty Clay w/20% med.-Corse Angular gravel; Irregular orientation; Trace of 10YR 6/2 Lite Brownish gray mottling; 5% corse sand. Med. Plast. slightly Moist.	CL	2.0	PID .2 By 50
5.0 – 5.5	1/16/95 403524 1345	NA	6	VERY STIFF 10YR 5/4 - YELLOWISH BROWN SILTY CLAY WITH A TRACE OF COURSE SAND AND FINE ANGULAR GRAVEL TO SUBANGULAR. IRREGULAR ORIENTATION LITE BROWNISH GRAY MOTTLING. MED. PLAST, SLIGHTLY MOIST	CL	2.5	PID .2 By 50
5.5 – 6.0	1/16/95 1345 403524	NA	6	SAA with fine GRAVEL 15% SUBANGULAR, IRREGULAR ORIENTATION. MED. PLAST SLIGHTLY MOIST.	CL	3.0	PID .2 By 50
6.0 – 6.5	1/16/95 1345 403524	NA	6	VERY STIFF 10YR 5/4 - YELLOWISH BROWN WITH 10YR 6/1 GRAY MOTTLING, SILTY CLAY WITH A TRACE OF COURSE SAND AND 10% FINE GRAVEL. SUBANGULAR to ANGULAR. IRREGULAR ORIENTATION. MED. PLAST, SLIGHTLY MOIST.	CL	3.0	PID .2 By 50
6.5 –	1/16/95 403524 1345	NA	6	VERY STIFF 10YR 6/4 - YELLOWISH BROWN WITH SOME 10YR 6/1 GRAY MOTTLING SILTY CLAY WITH A TRACE OF COURSE GRAVEL 15% fine GRAVEL SUBANGULAR. IRREGULAR ORIENTATION, MED. PLAST. SLIGHTLY MOIST	CL	3.5	PID .2 By 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID		1/16/95	
ALPHA	NA	NA	NA

NOTES: NONE

811

2-21-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11546-007

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.01

BORING NUMBER: 11546

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/16/95

GEOLOGIST: Geiger / Kilov

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/16/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.0 – 7.5	1/16/95 403525 1350	NA	6	Stiff 10YR 5/4 Yellowish Brown silty Clay; w/ <5% corse sand and 15% angular gravel; Irregular orientation; Med. Plast. Slightly moist to Moist. (drilling fluid)	CL	1.5	PID 2.4 By 50
7.5 – 8.0	1/16/95 403525 1350	NA	6	Stiff 10YR 5/4 Yellowish Brown, Silty Clay; w/ <5% corse sand and 15% angular gravel; Irregular orientation; and 2 Limestone Cobbles Flat orientation 9mm x 7mm x 4mm, 9mm x 6mm x 3mm. ~~Med to~~ Low Plast. Slightly Moist. PR 1-18-95	CL	1.5	PID 2.4 By 50 403527
8.0 – 8.5	1/16/95 403525 1350	NA	6	very stiff 10YR ~~5/6~~ 5/4 PR 1-18-95 Yellowish Brown; Silty Clay w/15-20% med sub-Angular-Angular gravel; 7mm 5mm x 5mm Striated cobble (Dolomite); Low plast. slightly moist.; Irregular orrientation	CL	2.25	PID 2.4 By 50
8.5 – 9.0	1/16/95 403525 1350	NA	6	Same As 8.0" – 8.5"	CL	2.0 ~~2.25~~ PR. 1-18-95	PID 2.4 By 50
9.0 – 9.5	1/16/95 403525 1350	NA	6	very stiff 10YR 5/4 Yellowish Brown, very Silty Clay w/15-20% Angular gravel w/Irregular orrientation, Low Plast. Slightly moist.	CL	2.5	PID 2.4 By 50
9.5 – 10.0	1/16/95 403525 1350	NA	6	very stiff 10YR 5/4 Yellowish Brown, Very Silty Clay w/15-20% Angular gravel w/Irregular orrientation, Low Plast. Slightly Moist.; 10YR 6/8 Brownish Yellow Silt Inclusion 1mm x 3mm x 4mm	CL	2.0	PID 2.4 By 50
10.0 – 10.5	1/16/95 403525 1350	NA	6	Very stiff 10YR 5/4 Yellowish Brown, Silty Clay w/25% Fine-Med. Angular gravel; Fe staining 4mm x 2mm x 3mm Limestone Cobble Irregular orientation; Low Plast. Slightly Moist.	CL	2.5	PID 2.4 By 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	000775	NA	NA

NOTES: None

FEMP

LITHOLOGIC LOG

2-21-95

CONTROL NO.: 200307-11546-008	PAGE 4 OF 5
PROJECT NAME: Phase I+II of the OU2 Pre-Design Field Investigation	PROJECT NO.: 20.03.01
BORING NUMBER: 11546	COORDINATES: See Pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 11/16/95
GEOLOGIST: Geiger / Riley	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 11/16/95
WATER USED DURING DRILLING: 0.0 gal (Est)	DRILLING CONTRACTOR: Alliance / DRILLING EQUIPMENT: Rotosonic / DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	11/16/95 403525 1350	NA	6	Same As 10.0"—10.5" w/Lime Stone Cobble 9mx 9mm x 3mm Tilted 45° ~~Flat~~ ~~Vertical~~ ORRientation; Cobble appears to be cored;	CL	3.25	PID 2.4 By 50
11.0	11/16/95 403525 1350	NA	6	Very Stiff 10YR 5/4 Yellowish Brown; Silty Clay w/25% Fine-Med. Angular gravel; Fe staining w/Gray Mottling 10YR 6/1 gray. Small silt inclusions Low Plast. Slightly moist.	CL	2.5	PID 2.4 By 50
11.5	11/16/95 403525 1350	NA	6	Very Stiff Same As 11.0"—11.5"	CL	2.75	PID 2.4 By 50 403528 moisture
12.0	11/16/95 403526 1350	NA	6	Stiff 10YR 5/4 ~~Silty Clay~~ Yellowish Brown Silty Clay, 20% Sub-Ang. Lo-Angular Fine-Med. Gravel; Trace of Coise Sand; Trace of Gray Mottling 10YR 6/2 Lite Brownish gray; Interface begins at 12'4" Interface Plane is on 45° Angle; That Plane is 1cm Thick; The Surface has a Irregular Texture; Interface 10YR 5/6 Yellowish Brown; Gray Has Dessication cracks 6-7mm ~~Fe~~ filled w/Fe staining Low-Med. Plast. Slightly moist.	CL	1.25	PID 3.2 By 50
12.5	11/16/95 403526 1350	NA	6	Stiff 5Y 4/1 Dark Gray; Silty Clay w/<5% fine Sand; 10% fine-Med. Angular gravel; Irregular orientation; Low Plast. Slightly Moist.	CL	2.0	PID 3.2 By 50
13.0	11/16/95 403526 1350	NA	6	SAme As 12.5"—13.0"	CL	2.5	PID 3.2 By 50
13.5	11/16/95 403526 1350	NA	6	Very Stiff 5Y 4/1 Dark Gray; Silty Clay w/<5% fine Sand; 10% fine-Med. Angular gravel; Irregular orientation; Low Plast. Slightly Moist. Vertically oriented Limestone Cobble 5x4x2mm	CL	2.25	PID 3.2 By 50
14.0							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg 1		
ALPHA	NA	NA	NA

NOTES: None

811

2-21-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11546-009

PROJECT NAME: Phase I+II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11546

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/16/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/16/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	1/16/95 ~~403526~~ 403529 1350	NA	6	PR 1-18-95 Very Stiff 5YR 4/1 Dark Gray; Silty Clay w/<5% fine Sand; 10% fine-Med. Angular gravel; Irregular orrientation; Low Plast. Slightly Moist.	CL	2.5	PID 3.2 BY50 403529
14.5 – 15.0	1/16/95 403526 1350	NA	6	PR 1-18-95 Very Stiff 5YR 4/1 Dark Gray; Silty Clay <5% fine Sand; 10% Fine-Med. Angular gravel; Irregular orrientation; Low Plast. Slightly Moist; a Fracture on a 45° plane is filled w/ 10YR clayey silt (3mm x 15mm x 3mm) Does not Extend to Next interval. No zone of weathering Present	CL	2.25	PID 3.2 BY50
15.0 – 15.5	1/16/95 403526 1350	NA	6	Stiff 5Y 4/1 Dark Gray silty Clay <5% fine Sand; 10% fine-Med. Angular and sub Angular gravel; Irregular orrientation; Low Plast. Slightly Moist.	CL	2.0	PID 3.2 BY50
15.5 – 16.0	1/16/95 403526 1350	NA	6	Very Stiff Same As 15'–15.5"	CL	2.5	PID 3.2 BY50
16.0 – 16.5	1/16/95 403526 1350	NA	6	Very Stiff Same As 15.5"–16'	CL	2.25	PID 3.2 BY50
16.5 – 17.0	1/16/95 403525 1350	NA	6	Stiff Same As 16'–16.5"	CL	1.75	PID 3.2 BY50
17.0 – 17.5		NA		Bottom			PID BY

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg 1		
ALPHA	NA	NA	NA

NOTES: None

2-18-95 FEMP CA

118

CONTROL NO.: 200307-11547-005

FEMP

LITHOLOGIC LOG

PAGE 1 OF 5

PROJECT NAME: Phase I + II of The OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11547

COORDINATES: N480438.760 E382426.919

RELATED FAL NO.: 200307-11547-004

SURFACE ELEVATION: 590.70 ft.

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/16/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/16/95

WATER USED DURING DRILLING: (EST) 0.0 gallons

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1/16/95 1430 403530	NA	6	Very Soft 10YR 3/3 Dark Brown; silty Clay w/Trace of fine sand 10%; Roots med. Plast. Slightly Moist.	CL	.25	PID 1.3 BY 40
.5	1/16/95 1430 403530	NA	6	Soft 10YR 4/4 Dark Yellowish Brown; silty Clay w/Trace of fine Sand 10%; Roots med. Plast. Slightly Moist.	CL	.5	PID 1.3 BY 40
1.0	1/16/95 1430 403530	NA	6	Soft 10YR 4/4 Dark Yellowish Brown; w/Trace of gray modeling silty Clay w/Trace of Corse Sand 10%; Med. Plast. Slightly Moist.	CL	.5	PID 1.3 BY 40
1.5	1/16/95 1430 403530	NA	6	Med. stiff 10YR 4/6 Dark Yellowish Brown; w/Trace of Gray Modeling; Mg stains silty Clay Med. Plast. Slightly Moist.	CL	.75	PID 1.3 BY 40
2.0	1/16/95 1430 403530	NA	6	Stiff 10YR 4/6 Dark Yellowish Brown, Mg stains silty Clay Med. Plast. Slightly Moist.	CL	2.0	PID 1.3 BY 40
2.5	1/16/95 1430 403530	NA	6	Stiff 10YR 4/4 Dark Yellowish Brown; w/Trace Gray Modeling silty Clay w/Some Corse Sand 20% and fine gravel 10%; Med. Plast. Slightly Moist.	CL	1.5	PID 1.3 BY 40
3.0	1/16/95 1430 403530	NA	6	Stiff 10YR 4/4 Dark Yellowish Brown, w/Trace Gray Modeling; silty Clay w/ Some Corse Sand 20% and Trace of fine gravel 20%. Med. Plast. Slightly Moist.	CL	1.5	PID 1.3 BY 40

INSTRUMENT	BACKGROUND	DATE	TIME
PID	0ppm	1-16-95	1425
ALPHA	NA	NA	NA
[illegible]	0ppm	[illegible]	1425

NOTES: None

000778

FEMP

LITHOLOGIC LOG

CONTROL NO.:	PAGE 2 OF 5
20037-11547-006	

PROJECT NAME:	PROJECT NO.:
Phase I + II of the OU2 Pre-Design Field Investigation	20.03.07

BORING NUMBER:	COORDINATES:	RELATED FAL NO.s:
11547	See Pg. 1	

SURFACE ELEVATION:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE STARTED:
See Pg. 1				1/16/95

GEOLOGIST:	GROUNDWATER LEVEL:	DATE:	TIME:	DATE COMPLETED:
Geiger / Riley				1/16/95

WATER USED DURING DRILLING:	DRILLING CONTRACTOR:	DRILLING EQUIPMENT:	DRILLER / HELPER:
0.0 gal (Est)	Alliance	Rotosonic	Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5 – 4.0	1/16/95 1430 403530	NA	66 NS	STIFF 10YR 4/4 DARK YELLOWISH BROWN with A TRACE of GRAY MOTTLING SILTY CLAY with COURSE SAND and fine GRAVEL, MED. PLAST SLIGHTLY MOIST.	CL	1.5	PID 1.3 BY 40
4.5	1/16/95 ~~1445~~ 1435 403531	NA	66 NS	VERY SOFT 10YR 5/4 YELLOWISH BROWN, SILTY CLAY with SAND < 5% And fine GRAVEL (TRACE) (VERY MOIST DRILLING FLUID) MED. PLAST	CL	<.25	PID 1.7 BY 40
5.0	1/16/95 1435 403531	NA	66 NS	VERY STIFF 10YR 5/3 - BROWN SILTY CLAY with A 10YR 6/2 LIGHT BROWNISH GRAY MOTTLING 10% to 15% MED. to fine SUBANGULAR GRAVEL. 5% - 10% fine SAND MED. PLAST. SLIGHTLY MOIST.	CL	2.5	PID 1.7 BY 40
5.5	1/16/95 1435 403531	NA	66 NS	SAA - with 1 1/2 ANGULAR lime STONE COBBLE'S 1 X 2 X 1 1/2	CL	2.0	PID 1.7 BY 40
6.0	1/16/95 1435 403531	NA	66 NS	10YR 5/4 - YELLOWISH BROWN SANDY CLAY with 20% MED. to fine SUBANGULAR GRAVEL with 10YR 6/2 light BROWNISH. GRAY MOTTLING. LOW PLAST. SLIGHTLY MOIST.	CL	2.0	PID 1.7 BY 40
6.5	1/16/95 1435 403531	NA	66 NS	STIFF 10YR 5/4 - YELLOWISH SILTY CLAY with SAND (10%) LARGE 3X3X2 ANGULAR LIMESTONE COBBLE. MED. to low PLAST. SLIGHTLY MOIST.	CL	2.0	PID 1.7 BY 40
7.0	1/16/95 1435 ~~1445~~ 403531	NA	6	10YR 4/3 - BROWN CLAYE SAND GRADEING into A 10YR 5/3 BROWN SILTY CLAY with FE. STAINING 15% to 20% MED ANGULAR GRAVEL. LOW PLAST. SLIGHTLY MOIST	CL	3.0	PID 1.7 BY 40

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg 1		
ALPHA	N/A	N/A	N/A

NOTES: None

000779

F-390

FEMP QA 18

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11547-007

PAGE 3 OF 5

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 1547

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/16/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/16/95

WATER USED DURING DRILLING: 0.0 gallons (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1/16/95 1440 403532	NA	6	Very stiff 10YR 5/6 Yellowish Brown; Silty Clay w/Trace of Gray mottling w/20% Corse Sand and a Trace <10% angular gravel Med. Plast. Slightly Moist.	CL	2.75	PID 3.2 BY 50
2.5	1/16/95 1440 403532	NA	6	Very stiff 10YR 5/6 Yellowish Brown; Silty Clay w/20% Corse Sand ~~w/5~~ 5% Fine gravel sub Angular to Angular Med. Plast. Slightly Moist.	CL	2.5	PID 3.2 403534 BY 50 moisture
5.0	1/16/95 1440 403532	NA	6	Stiff 10YR 5/4 Yellowish Brown Silty Clay w/20% Corse Sand w/a Trace of Corse Lime stone gravel subangular; Med. Plast. slightly Moist.	CL	1.75	PID 3.2 BY 50
7.5	1/16/95 1440 403532	NA	6	Very stiff 10YR 4/3 Dark Brown; Silty Clay w/med. to Corse Sand 15% w/Trace of Corse gravel Limestone; Sub-Angular Med. Plast. slightly Moist.	CL	2.5	PID 3.2 BY 50
9.5	1/16/95 1440 403532	NA	6	Very stiff 10YR 4/3 Dark Brown; Silty Clay w/10% med. Sand w/Trace of fine gravel and Lime-Stone Cobble 3x2x1 Sub-Angular; Med. Plast. Slightly Moist.	CL	2.5	PID 3.2 BY 50
10.0	1/16/95 1440 403532	NA	6	Very stiff 10YR 4/3 Dark Brown; silty Clay w/10% Med-Corse sand w/Trace of Corse gravel Limestone sub-Angular; Med. Plast. Slightly Moist.	CL	3.75	PID 3.2 BY 50
12.5	1/16/95 1440 403532	NA	6	Very stiff 10YR 4/3 Dark Brown; silty Clay w/10% med-Corse sand w/Trace of fine gravel sub-Angular; Med. Plast. slightly Moist.	CL	3.5	PID 3.2 BY 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA
[illegible]	See pg 1		

NOTES: None

811

FEMP OA 19 2-28-95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 700307-11547-008

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.07

BORING NUMBER: 11547

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/16/95

GEOLOGIST: Geiger / Kilay

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/16/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	1/16/95 1440 403532	NA	6	Stiff 10YR 4/3 Dark Brown; silty Clay w/10% med-Corse sand w/Trace of fine gravel sub-Angular; med. Plast. slightly Moist.	CL	1.5	PID 3.2 BY 50
11.5	1/16/95 1440 403532	NA	6	Very stiff 10YR 4/3 Dark Brown; w/5Y 4/1 Dark Gray seams .5mm Thick; silty Clay w/med-Corse Sand 10% w/Trace of fine gravel sub-Angular, Irregular orientation; med. Plast. slightly Moist.	CL	3.5	PID 3.2 BY 50
12.0	1/16/95 1440 403532	NA	6	Very stiff 5Y 4/1 Dark Gray w/10Y 4/6 Dark Yellowish Brown seam 2mm; silty Clay w/10% Corse Sand and a Trace of fine gravel sub-Angular; Irregular orientation med. Plast. slightly Moist.	CL	2.75	PID 3.2 403535 BY 50 moistual
12.5	1/16/95 1440 403533	NA		STIFF 5Y 4/1 - DARK GRAY SILTY CLAY WITH 5% COURSE SAND 15% MED. to FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION. MED. to LOW PLAST. SLIGHTLY MOIST	CL	2.0	PID 1.7 BY 40
13.0	1/16/95 1440 403533	NA		STIFF 5Y 4/1 - DARK GRAY SILTY CLAY WITH 5% COURSE SAND 15% MED. to FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION. AND A 1X2X2 STRIATED LIMESTONE COBBLE. MED. PLAST SLIGHTLY MOIST	CL	2.0	PID 1.7 BY 40
13.5	1/16/95 1440 403533	NA		STIFF 5Y 4/1 - DARK GRAY SILTY CLAY WITH 5% COURSE SAND 15% MED. to FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION. MED. PLAST. SLIGHTLY MOIST.	CL	2.0	PID 1.7 BY 40
14.0	1/16/95 1440 403533	NA		STIFF 5Y 4/1 - DARK GRAY SILTY CLAY WITH 5% COURSE SAND 15% MED to FINE ANGULAR GRAVEL, IRREGULAR ORIENTATION. MED. PLAST. SLIGHTLY MOIST.	CL	2.0	PID 1.7 BY 40

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg 1		

NOTES: None

000781

NA NA

FEMP QA 3/8/95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11547-009

PAGE 5 OF 5

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.01

BORING NUMBER: 11547

COORDINATES: See Pg. 1

RELATED FAL NO.:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: | DATE: | TIME: | DATE STARTED: 1/16/95

GEOLOGIST: Grigik / Riley

GROUNDWATER LEVEL: | DATE: | TIME: | DATE COMPLETED: 1/16/95

WATER USED DURING DRILLING: 0.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0 – 14.5	1/16/95 1440 403533	NA		STIFF 5Y 4/1 - DARK GRAY SILTY CLAY 15% to 20% MED. to FINE SUBANGULAR to ANGULAR GRAVEL < 5% COURSE SAND. WOOD FRAGMENTS. MED. PLAST SLIGHTLY MOIST ~~FLUGULAR ORIENTATION~~ IRREGULAR ORIENTATION	CL	2.0	PID 1.7 BY 4/0 403536 Moisture
15.0	1/16/95 1440 403533	NA		SAA	CL	2.0	PID 1.7 BY 4/0
15.5	1/16/95 1440 403533	NA		SAA	CL	2.0	PID 1.7 BY 4/0
16.0	1/16/95 1440 403533	NA		STIFF 5Y 4/1 - DARK GRAY SILTY CLAY. < 5% COURSE SAND AND MED. to FINE ANGULAR to SUBANGULAR GRAVEL MED. PLAST. SLIGHTLY MOIST. ~~FLUGULAR ORIENTATION~~ IRREGULAR ORIENTATION	CL	2.0	PID 1.7 BY 4/0
16.5	1/16/95 1440 403533	NA		STIFF 5Y 4/1 - DARK GRAY SILTY CLAY WITH A TRACE < 5% COURSE SAND AND SOME MED. to FINE ANGULAR to SUBANGULAR GRAVEL 15% MED. PLAST SLIGHTLY MOIST. ~~FLUGULAR ORIENTATION~~ IRREGULAR ORIENTATION	CL	2.0	PID 1.7 BY 4/0
17.0	1/16/95 1440 403533	NA		NR			PID < BY ~~4/0~~ N.T.
		NA		Bottom 17.0'			PID BY

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg 1		
ALPHA	NA	NA	NA

NOTES: None

000782

118

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11548-005

PROJECT NO.: 20.03.07

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

BORING NUMBER: 11548

COORDINATES: N 479728.540 E 1382427.297

RELATED FAL NO.: 200307-11548-004

SURFACE ELEVATION: 588.20 ft.

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 1/13/95

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 1/13/95

GEOLOGIST: Geiger / Riley

WATER USED DURING DRILLING: 0.0 gallons (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0	1/13/95 403515 1120	NA	6	Stiff 10YR 4/4 Dark Yellowish Brown Silty Clay w/Trace of Coarse sand; Roots Med. Plast. Slightly Moist.	CI	1.0	PID 4 BY 50
.5	1/13/95 403515 1120	NA	6	soft 10YR 4/6 Dark Yellowish Brown, Silty Clay w/Trace of fine gravel; med. Plasticity slightly Moist.	CI	.5	PID 4 BY 50
1.0	1/13/95 403515 1120	NA	6	SAA	CI	.5	PID 4 BY 50
1.5	1/13/95 403515 1120	NA	6	SAA	CI	.5	PID 4 BY 50
2.0	1/13/95 403515 1120	NA	6	Stiff 10YR 4/6 Dark Yellowish Brown, Silty Clay w/FE + Mg stains, Some gray ~~modeling~~ MOTTLING; JCHLB 2/14/95 Med. Plast. Slightly Moist.	CI	2	PID 4 BY 50
2.5	1/13/95 403515 1120	NA	6	SAA	CI	2	PID 4 BY 50
3.0	1/13/95 403515 1120	NA	6	SAA	CI	2.75	PID 4 BY 50
3.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	4.0	1/13/95	1115
ALPHA 000783	N/A	N/A	F-394 N/A

NOTES: ~~NONE~~ JCHLB 2-14-95
THIS LOG WAS UPDATED USING ARCHIVED SOIL CORES BY GEOLOGIST PAT RILEY & RECORDED BY T. M. CAPANNARI

FEMP

LITHOLOGIC LOG

CONTROL NO.: 00307-11548-006

PROJECT NO.: 20.03.07

PROJECT NAME: Phase I + II of the OU2 Pre-Design Field Investigation

RELATED FAL NO.:

BORING NUMBER: 11548

COORDINATES: See Pg. 1

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME:

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 1/13/95

DATE COMPLETED: 1/13/95

GEOLOGIST: Geiger / Riley

WATER USED DURING DRILLING: 0.0 gallons (EST)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3.5	1/13/95 403515 1120	NA	6	Very stiff 10YR 4/4 Dark Yellowish Brown, Silty Clay w/some fine Gravel. Low Plast. Slightly moist.	Cl	2.5	PID 4 BY 50
4.0	1/13/95 403516 1125	NA	6	Stiff 10YR 4/4 Dark Yellowish Brown, Gray ~~mottling~~ MOTTLING, silty clay w/Trace Fine Gravel; med. Plast. Slightly Moist. JCM 2/14/95	Cl	1.5	PID 2.0 BY 50
4.5	1/13/95 403516 1125	NA	6	Stiff SAA	Cl	2	PID 2.0 BY 50
5.0	1/13/95 403516 1125	NA	6	Stiff 10YR 4/4 Dark Yellowish Brown, Silty Clay w/some ~~fine~~ KG 2-13-95 Corse Sand and Corse Gravel, Med. plast. Slightly Moist.	Cl	1	PID 2.0 BY 50
5.5	1/13/95 403516 1125	NA	6	Very Stiff 10YR 4/4 Dark Yellowish Brown, Trace Gray ~~Mottling~~ MOTTLING JCM 2-14-95, silty Clay; Trace Corse Sand; Med. Plast. Slightly Moist.	Cl	3	PID 2.0 BY 50
6.0	1/13/95 403516 1125	NA	6	Very Stiff 10YR - DARK YELLOWISH BROWN TRACE of GRAY ~~mottling~~ MOTTLING JCM 2-14-95 SILTY CLAY TRACE of COURSE SAND AND COURSE GRAVEL. MED. PLAST. SLIGHTLY MOIST	Cl	2.75	PID 2.0 BY 50
6.5	1/13/95 403516 1125	NA	6	Stiff SAA	Cl	1.75	PID 2.0 BY 50

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See Pg 1		
ALPHA	NA	NA	NA

NOTES: None

000784

.811

FEMP QA 19 8/18/95

FEMP

LITHOLOGIC LOG

CONTROL NO.: 00307-11548-007

PROJECT NO.: 20.03.01

PROJECT NAME: Phase I + II of The OU2 Pre-Design Field Investigation

RELATED FAL NO.s:

BORING NUMBER: 11548

COORDINATES: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 1/13/95

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME:

DATE COMPLETED: 1/13/95

GEOLOGIST: Wright / Riley

DRILLING EQUIPMENT: Roto Sonic

DRILLER / HELPER: Brown / Grim

WATER USED DURING DRILLING: (Est) 0.0 gallons

DRILLING CONTRACTOR: Alliance

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	1/13/95 403516 1125	NA	6	SAA	CL	1.75	PID 2.0 By 50
2.5	1/13/95 403516 1125	NA	6	very stiff 10YR 4/4 - DARK YELLOWISH BROWN. SILTY CLAY with A TRACE of COURSE SAND. MED. PLAST SLIGHTLY MOIST	CL	2.5	PID 2.0 By 50
5.0	1/13/95 403517 1130	NA	6	very stiff 10YR 4/4 DARK YELLOWISH BROWN. SILTY CLAY WITH A TRACE of COURSE SAND + fine GRAVEL. MED. PLAST. SLIGHTLY MOIST.	CL	2.5	PID 2.4 By 70
7.5	1/13/95 403517 1130	NA	6	SAA	CL	2.5	PID 2.4 By 70
8.0	1/13/95 403517 1130	NA	6	SAA with some GRAY ~~modeling~~ MOTTLING JLHR 2-14-95	CL	2.5	PID 2.4 By 70 403522 Moisture
9.5	1/13/95 403517 1130	NA	6	SAA	CL	2.5	PID 2.4 By 70
10.0	1/13/95 403517 1130	NA	6	very stiff 2.5Y 4/3 OLIVE BROWN SILTY CLAY with SOME COURSE SAND + fine GRAVEL. MED PLAST. SLIGHTLY MOIST.	CL	3.0	PID 2.4 By 70

NOTES: None

INSTRUMENT	BACKGROUND	DATE	TIME
PID 000785	See Pg 1		

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11548-008

PAGE 4 OF 7

PROJECT NAME: Phase I+II of the OU2 Pre-Design Field Investigation

PROJECT NO.: 20.03.01

BORING NUMBER: 11548

COORDINATES: See Pg. 1

RELATED FAL NO.s:

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME: DATE STARTED: 1/13/95

GEOLOGIST: Geiger / Riley

GROUNDWATER LEVEL: DATE: TIME: DATE COMPLETED: 1/13/95

WATER USED DURING DRILLING: 0.0 gallons (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Rotosonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5 – 11.0	1/13/95 403517 1130	NA	6	SAA	CL	2.5	PID 2.4 BY 70
11.0 – 11.5	1/13/95 403517 1130	NA	6	SAA	CL	2.5	PID 2.4 BY 70
11.5 – 12.0	1/13/95 403517 1130	NA	6	very stiff 5Y 4-5/2 - Olive Gray with Brown mottling ~~[illegible]~~ silty clay with coarse sand & fine gravel with cobble 3x3x2 - med. plast, slightly moist	CL	2.5	PID 2.4 BY 70
12.0 – 12.5	1/13/95 403518 1135	NA	6	stiff 10YR 4/3 - Dark Brown silty clay w/ coarse sand and fine gravel; med. plast. slightly moist.	CL	1.5	PID 1.7 BY 70
12.5 – 13.0	1/13/95 403518 1135	NA	6	SAA	CL	1.5	PID 1.7 BY 70
13.0 – 13.5	1/13/95 403518 1135	NA	6	very stiff 5Y 4/1 - Dark Gray silty clay w/ coarse sand and fine gravel; med. plast. slightly moist.	CL	2.5	PID 1.7 BY 70 moisture ~~[illegible]~~ 403520 ~~[illegible]~~
13.5 – 14.0	1/13/95 403518 1135	NA	6	stiff SAA	CL	2.0	PID 1.7 BY 70

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA

NOTES: None

811

FEMP QA 18

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11548-009

PROJECT NO.: 20.03.01

PROJECT NAME: Phase I+II of The OU2 Pre-Design Field Investigation

RELATED FAL NO.:

BORING NUMBER: 11548

COORDINATES: See Pg. 1

SURFACE ELEVATION: See Pg. 1

GROUNDWATER LEVEL: DATE: TIME:

GROUNDWATER LEVEL: DATE: TIME:

DATE STARTED: 1/13/95

DATE COMPLETED: 1/13/95

GEOLOGIST: Grigik / Riley

WATER USED DURING DRILLING: 8.0 gal (Est)

DRILLING CONTRACTOR: Alliance

DRILLING EQUIPMENT: Roto sonic

DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.0	1/13/95 403518 1135	NA	6	Stiff 5Y 4/1 Dark Gray, Silty Clay w/ Corse sand and Corse Gravel; Med. Plast. Slightly Moist.	Cl	1.5	PID 1.7 By 50
14.5	1/13/95 403518 1135	NA	6	Stiff 5Y 4/1 Dark Gray; Silty Clay w/ Corse sand and fine Gravel; Med. Plast. Slightly Moist.	Cl	2.0	PID 1.7 By 50
15.0	1/13/95 403519 1140	NA	6	Stiff 5Y 4/1 Dark Gray; Silty Clay w/ Corse sand and fine Gravel; Med. Plast. Slightly Moist.	Cl	2.0	PID 1.5 By 50 403521 moisture
15.5	1/13/95 403519 1140	NA	6	Very Stiff SAA	Cl	2.5	PID 1.5 By 50
16.0	1/13/95 403519 1140	NA	6	Stiff 5Y 4/1 Dark Gray Silty Clay Course Sand and Course Gravel Med. Plast Slightly Moist	Cl	1.5	PID 1.5 By 50
16.5	1/13/95 403519 1140	NA	6	Very Stiff 5Y 4/1 - Dark Gray Silty Clay with Course Sand and Cobble 3x2x1 - Med. Plast Slightly Moist.	Cl	3.0	PID 1.5 By 50
17.0	1/13/95 403519 1140	NA	6	Very Stiff 5Y 4/1 - Dark Gray Silty Clay with Course Sand + Gravel, Med. Plast Slightly Moist.	Cl	2.5	PID 1.5 By 50
17.5							

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg 1		
ALPHA	NA	NA	NA

NOTES: None

000787

FEMP

LITHOLOGIC LOG

CONTROL NO.: 200307-11548-010	PAGE 6 OF 7
PROJECT NAME: Phase I+II of the OU2 Pre-Design Field Investigation	PROJECT NO.: 20.03.01
BORING NUMBER: 11548	COORDINATES: See Pg. 1
RELATED FAL NO.s:	
SURFACE ELEVATION: See Pg. 1	GROUNDWATER LEVEL: / DATE: / TIME: / DATE STARTED: 1/13/95
GEOLOGIST: Geiger / Riley	GROUNDWATER LEVEL: / DATE: / TIME: / DATE COMPLETED: 1/13/95
WATER USED DURING DRILLING: 0.0 gal (Est)	DRILLING CONTRACTOR: Alliance / DRILLING EQUIPMENT: Rotosonic / DRILLER / HELPER: Brown / Grim

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
17.5	1-13-95			SAA			PID 1.5
	403519	NA	6		CI	2.5	BY 50
18.0	1140						
		NA		Bottom of Boring	~~CI~~	~~2.5~~	PID BY
18.5							
		NA					PID BY
19.0							
		NA					PID BY
19.5							
		NA					PID BY
20.0							
		NA					PID BY
20.5							
		NA					PID BY

INSTRUMENT	BACKGROUND	DATE	TIME
PID	See pg. 1		
ALPHA	NA	NA	NA

F-399

NOTES: ~~None~~ JKLR 2-14-95

NOTE: PAGE 7 OF 7 THIS SEQUENCE IS THE WELL COMPLETION LOG, CN 200307-11548-011

Appendix G

WELL NUMBER: B- 11468

FEMP
WELL COMPLETION LOG

CONTROL NUMBER: 200307-11468 - 022

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

PROJECT NUMBER: 20.03.07

GEOLOGIST: CLIFF LEE 10257

DRILLING METHOD: AUGER

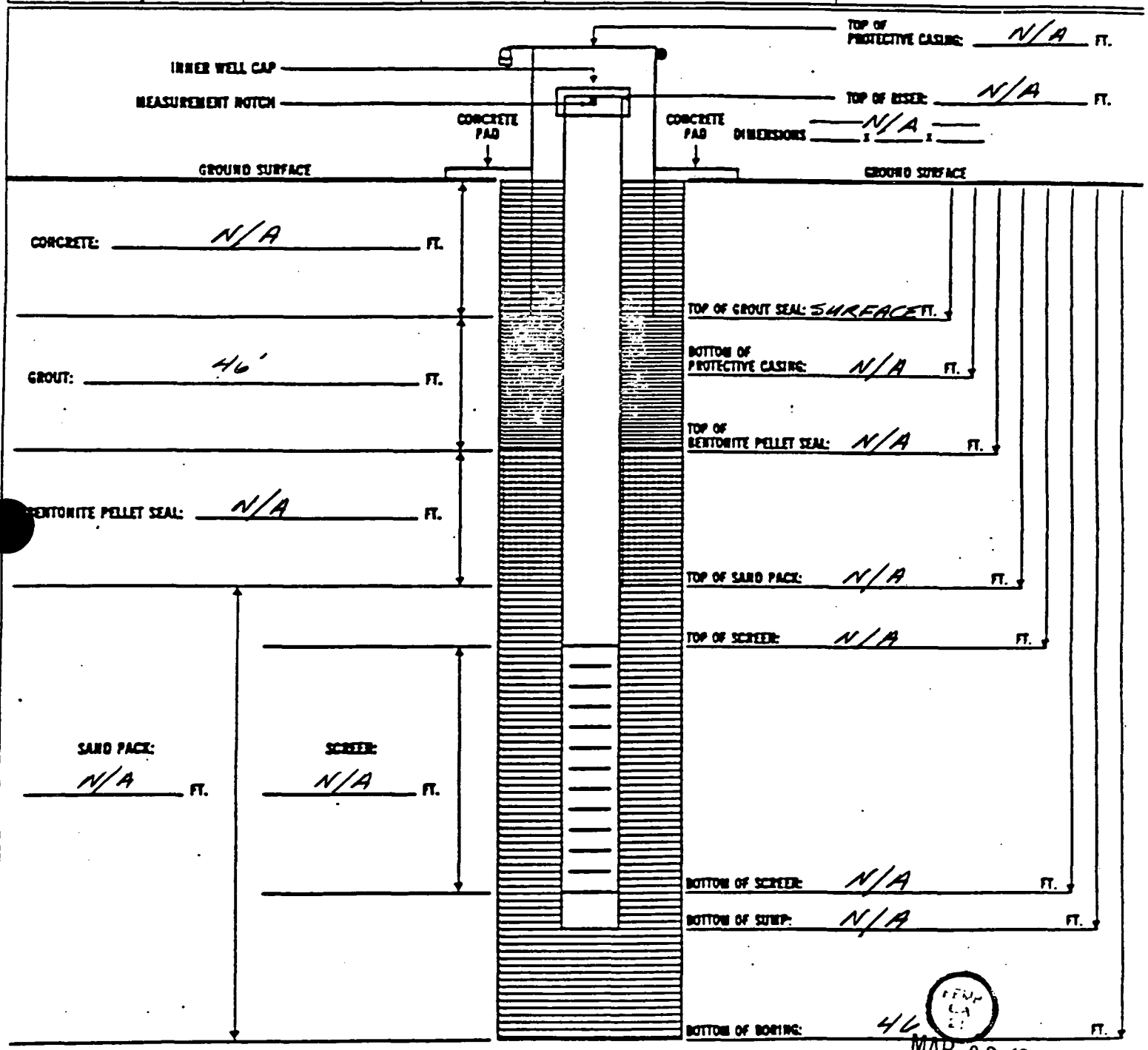
DATES OF INSTALLATION: 1/10-12/95

WATER LEVEL (RL): N/A

DATE: —

RELATED FAL NUMBERS: 200 307-11468-001 thru 200307-11468-006

CHECKED BY: KP 2-8-95



FEMP CA MAR 03 1995

TYPE AND AMOUNT OF GROUT USED: TYPE E-1-K PORTLAND EXPANSIVE CEMENT ~ 846 LBS

BENTONITE PELLETS (5-GALLON BUCKETS): N/A

DEEPEST TEMPORARY DRILLING CASING PENETRATION: N/A FT.

VOLUME OF WATER USED DURING DRILLING: N/A GAL

RISER MATERIAL: N/A

VOLUME OF WATER USED FOR GROUT HYDRATION: ~ 45 GAL

RISER WALL THICKNESS: N/A

TYPE OF SAND PACK: N/A

SCREEN MATERIAL: N/A

DRILLING CASING DIAMETER: N/A IN.

RISER/SCREEN DIAMETER: N/A IN.

SCREEN SLOT SIZE: N/A IN

SCREEN TYPE: N/A

DEPTH OF CENTRALIZER(S): N/A FT

FEMP

WELL COMPLETION LOG

CONTROL NUMBER: 200307-11469-025

BER: 11469

PROJECT NUMBER: 20.03.07

NAME: OU2 PREDESIGN
POSAL FACILITY BORING

DRILLING METHOD: AUGER

ST: F LEE 10257

CHECKED BY: KP 2-7-95

RELATED FAL NUMBERS: 200307-11469-004 thru 200307-11469-010

F INSTALLATION: - 12/22/94

WATER LEVEL (ft): DRY

DATE: 12/21/94

TOP OF PROTECTIVE CASING: N/A FT.

TOP OF RISER: N/A FT.

INNER WELL CAP

MEASUREMENT NOTCH

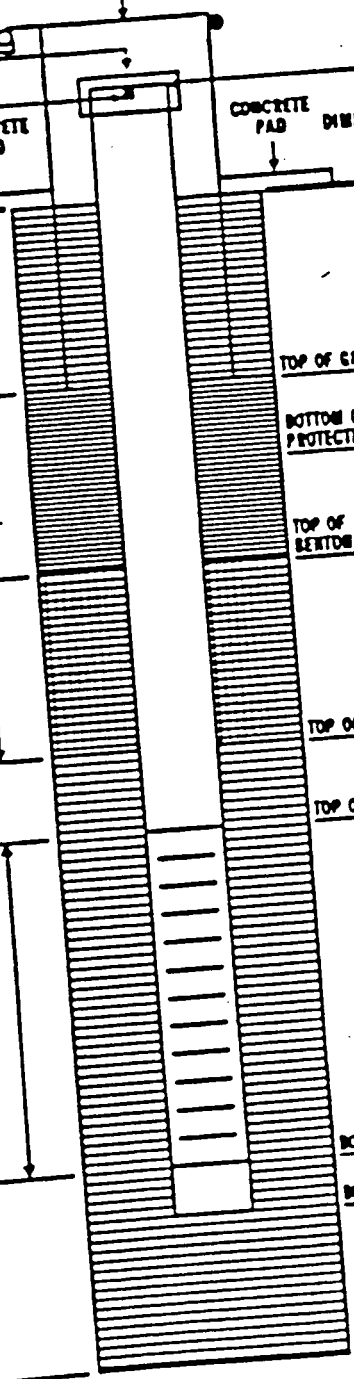
CONCRETE PAD

CONCRETE PAD

DIMENSIONS: N/A

GROUND SURFACE

GROUND SURFACE



RCRETE: N/A FT.

ROUT: 45' FT.

BENTONITE PELLET SEAL: N/A FT.

SAND PACK: N/A FT.

SCREEN: N/A FT.

TOP OF GROUT SEAL: SURFACE FT.

BOTTOM OF PROTECTIVE CASING: N/A FT.

TOP OF BENTONITE PELLET SEAL: N/A FT.

TOP OF SAND PACK: N/A FT.

TOP OF SCREEN: N/A FT.

BOTTOM OF SCREEN: N/A FT.

BOTTOM OF SUMP: N/A FT.

BOTTOM OF BORING: 45 FT.

BOREHOLE DIAMETER: 8 IN.

TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND CEMENT 846 LB EXPANSIVE CEMENT JC 02-16-95 LB

BENTONITE PELLETS (5-GALLON BUCKETS): GRANULAR JC 2/16/95 9 LB

DEEPEST TEMPORARY DRILLING CASING PENE

VOLUME OF WATER USED FOR GROUT HYDRATION: 42 GAL

VOLUME OF WATER USED DURING DRILLING: N/A 000790 GAL

RISER MATERIAL: N/A

MATERIAL: N/A

DRILLING CASING DIAMETER: N/A IN

TYPE OF SAND PACK: N/A

DEPTH OF CENTRALIZER(S): N/A FT

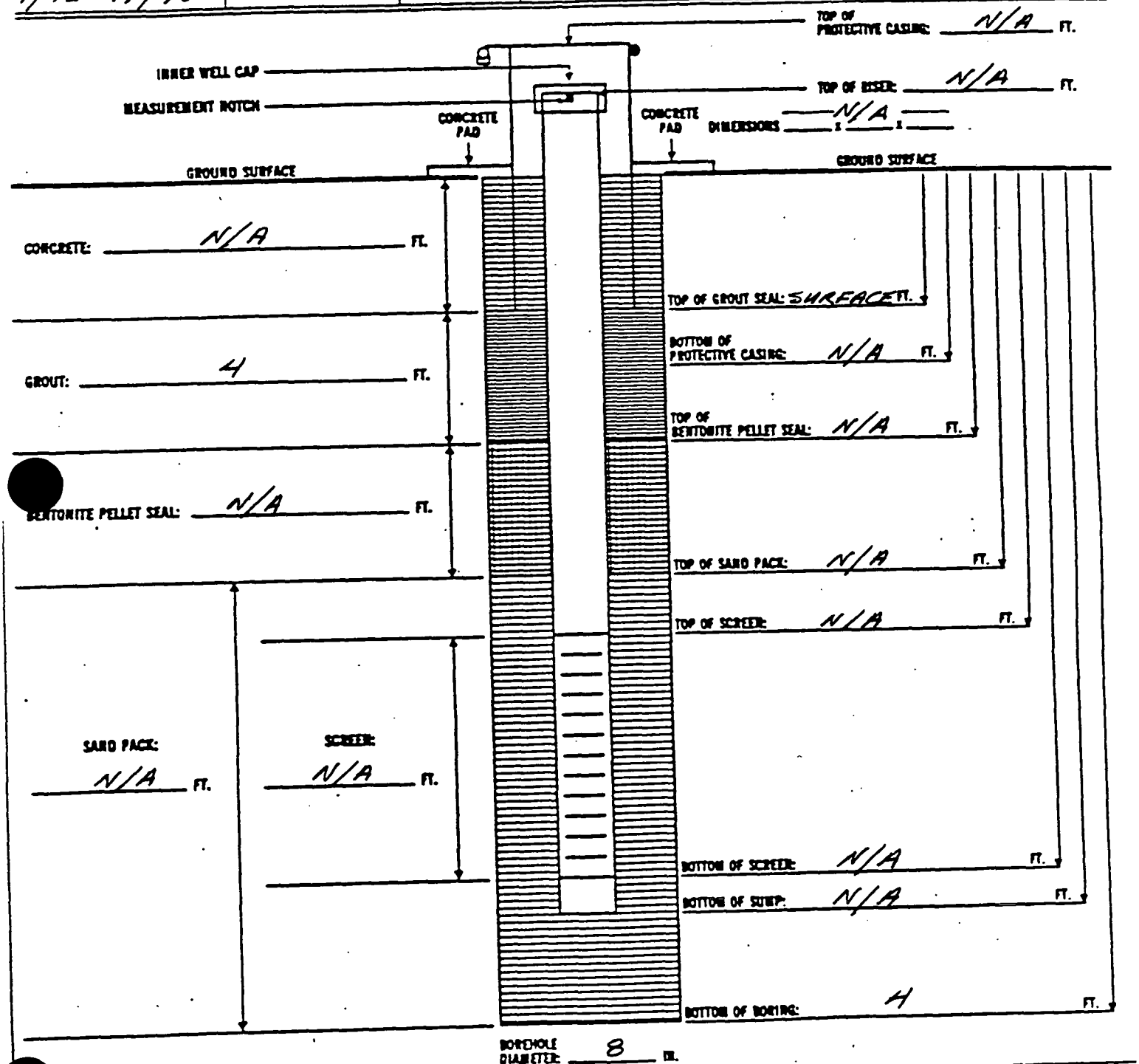
THICKNESS:

G-2

FEMP
WELL COMPLETION LOG

I NUMBER: B- 11470 A	CONTROL NUMBER: 200307-11470-021
NAME: OU2 PREDESIGN DISPOSAL LITY BORING	PROJECT NUMBER: 20.03.07
OLOGIST: CLIFF LEE 10257	DRILLING METHOD: AUGER

TES OF INSTALLATION:	WATER LEVEL (FL):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
1/12-17/95	1.5' BLS	1-17-95		



E AND AMOUNT OF GROUT USED: TYPE E-1-K PORTLAND EXPANSIVE CEMENT <<141 LBS.	BENTONITE PELLETS (5-GALLON BUCKETS): N/A	DEEPEST TEMPORARY DRILLING CASING PENETRATION: N/A FT.
VOLUME OF WATER USED DURING DRILLING: N/A GAL	RISER MATERIAL: N/A	VOLUME OF WATER USED FOR GROUT HYDRATION: <10 GAL
RISER WALL THICKNESS: N/A	TYPE OF SAND PACK: N/A	EN MATERIAL: N/A
DRILLING CASING DIAMETER: N/A IN.	RISER/SCREEN DIAMETER:	SCREEN SLOT SIZE:
SCREEN TYPE: N/A	DEPTH OF CENTRALIZER(S): N/A FT	

811

FEMP
WELL COMPLETION LOG

WELL NUMBER: B - 11471

CONTROL NUMBER: 200307-11471-021

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

PROJECT NUMBER: 20.03.07

GEOLOGIST: CLIFF LEE 10257

DRILLING METHOD: AUGER

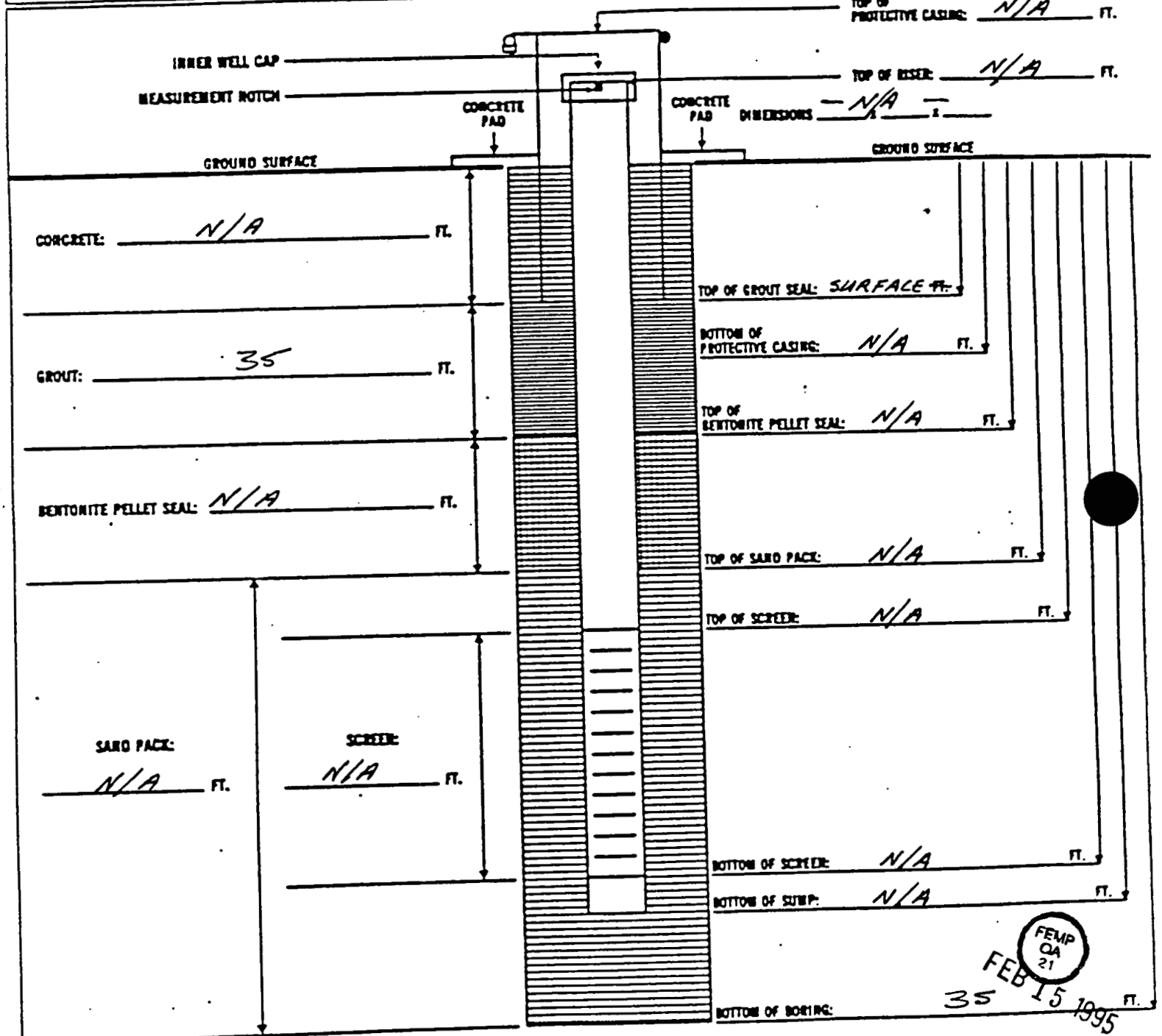
DATES OF INSTALLATION: 12/30/94

WATER LEVEL (ft): 3' BLS

DATE: 12/30/94

RELATED FAL NUMBERS: 200307-11471-004 thru 200307-11471-009

CHECKED BY: KP 2-8-95



FEMP QA 21 FEB 15 1995

TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND EXPANSIVE CEMENT ≤ 846 LB

BENTONITE PELLETS (5-GALLON BUCKETS): GRANULAR 9 LB

DEEPEST TEMPORARY DRILLING CASING PENETRATION: N/A FT.

VOLUME OF WATER USED DURING DRILLING: N/A GAL

RISER MATERIAL: N/A

VOLUME OF WATER USED FOR GROUT HYDRATION: < 40 GAL

RISER WALL THICKNESS: N/A

TYPE OF SAND PACK: N/A

SCREEN MATERIAL: N/A

DRILLING CASING DIAMETER: N/A

RISER/SCREEN DIAMETER: N/A

SCREEN SLOT SIZE: N/A

SCREEN TYPE: N/A

DEPTH OF CENTRALIZER(S): N/A

G-4

000792

FEMP
WELL COMPLETION LOG

WELL NUMBER: B - 11472

CONTROL NUMBER: 200307-11472-016

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

PROJECT NUMBER: 20.03.07

GEOLOGIST: CLIFF LEE 10257

DRILLING METHOD: AUGER

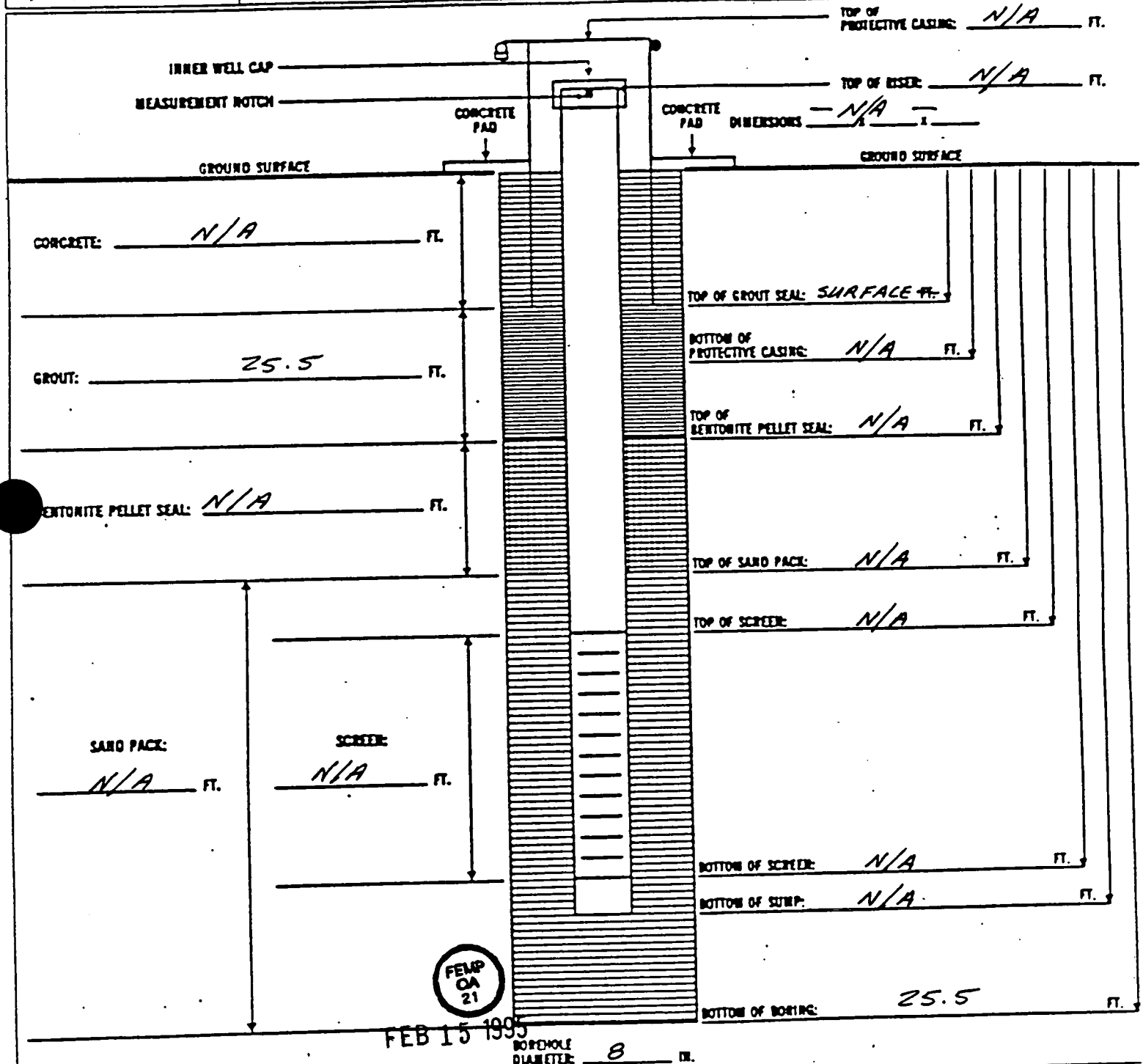
DATES OF INSTALLATION: 12/29/94

WATER LEVEL (R.): 13.7' BLS

DATE: 12/29/94

RELATED FAL NUMBERS: ——

CHECKED BY: N/A



FEMP OA 21

FEB 15 1995

TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND EXPANSIVE CEMENT 282 LB	BENTONITE PELLETS (5-GALLON BUCKETS): GRANULAR 3 LB	DEEPEST TEMPORARY DRILLING CASING PENETRATION: N/A FT	
VOLUME OF WATER USED DURING DRILLING: N/A GAL	RISER MATERIAL: N/A	VOLUME OF WATER USED FOR GROUT HYDRATION: 21 GAL	
RISER WALL THICKNESS: N/A	TYPE OF SAND PACK: N/A	SCREEN MATERIAL: N/A	DRILLING CASING DIAMETER: N/A IN
RISER/SCREEN DIAMETER: N/A	SCREEN SLOT SIZE: N/A	SEAL TYPE: N/A	DEPTH OF CENTRALIZER(S): N/A FT

G-5

000793

811

WELL NUMBER: B - 11473

FEMP
WELL COMPLETION LOG

CONTROL NUMBER: 200307-11473-015

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

PROJECT NUMBER: 20.03.07

GEOLOGIST: CLIFF LEE 10257

DRILLING METHOD: AUGER

DATES OF INSTALLATION: 12/28/94

WATER LEVEL (B.L): N/A

DATE: N/A

RELATED FAL NUMBERS: 200307-11473-004 and 200307-11473-005

CHECKED BY: KP 2-8-95

TOP OF PROTECTIVE CASING: N/A FT.

INNER WELL CAP

MEASUREMENT NOTCH

TOP OF RISER: N/A FT.

CONCRETE PAD

CONCRETE PAD

DIMENSIONS: N/A

GROUND SURFACE

GROUND SURFACE

CONCRETE: N/A FT.

GROUT: 25 FT.

BENTONITE PELLET SEAL: N/A FT.

SAND PACK: N/A FT.

SCREEN: N/A FT.

TOP OF GROUT SEAL: SURFACE FT.

BOTTOM OF PROTECTIVE CASING: N/A FT.

TOP OF BENTONITE PELLET SEAL: N/A FT.

TOP OF SAND PACK: N/A FT.

TOP OF SCREEN: N/A FT.

BOTTOM OF SCREEN: N/A FT.

BOTTOM OF SUMP: N/A FT.

BOTTOM OF BORING: 25 FT.

BOREHOLE DIAMETER: 8 IN.

FEMP QA 21 FEB 15 1995

TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND EXPANSIVE CEMENT < 423 LB

BENTONITE PELLETS (5-GALLON BUCKETS): GRANULAR < 4.5 LB

DEEPEST TEMPORARY DRILLING CASING PE[redacted]IO N/A F

VOLUME OF WATER USED DURING DRILLING: N/A GAL

RISER MATERIAL: N/A

VOLUME OF WATER USED FOR GROUT HYDRATION: < 31.5 GA

RISER WALL THICKNESS: N/A IN.

TYPE OF SAND PACK: N/A

SCREEN MATERIAL: N/A

DRILLING CASING DIAMETER: N/A IN

RISER/SCREEN DIAMETER: N/A IN.

SCREEN SLOT SIZE: N/A IN.

SCREEN TYPE: N/A

DEPTH OF CENTRALIZER(S): N/A F

FEMP
WELL COMPLETION LOG

WELL NUMBER: B - 11474

CONTROL NUMBER: 200307-11474-016

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

PROJECT NUMBER: 20.03.07

GEOLOGIST: CLIFF LEE 10257

DRILLING METHOD: AUGER

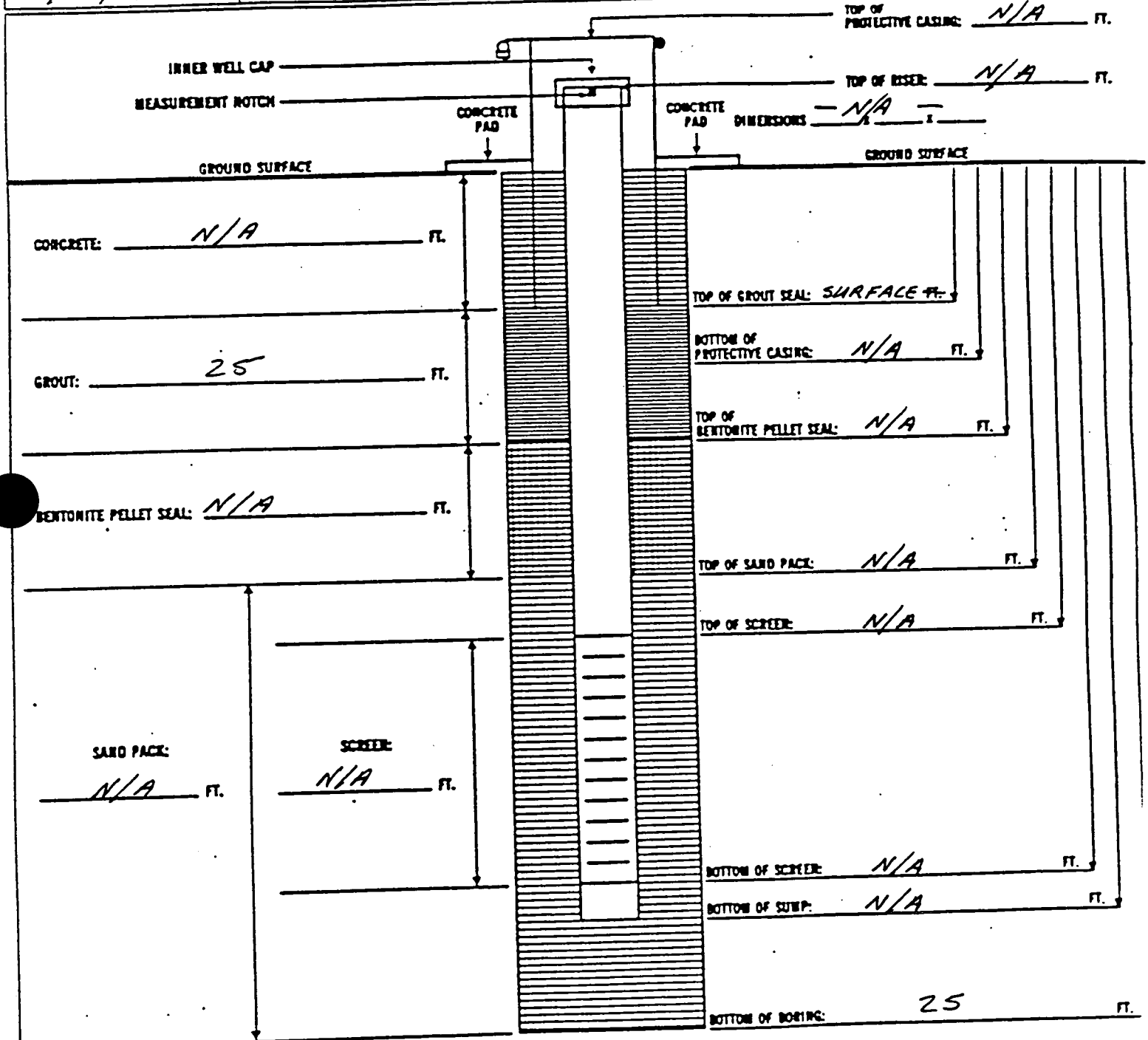
DATES OF INSTALLATION: 12/27/94

WATER LEVEL (FL): N/A

DATE: —

RELATED FAL NUMBERS:

CHECKED BY:



TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND EXPANSIVE CEMENT 282 LB

BENTONITE PELLETS (5-GALLON BUCKETS): GRANULAR 3 LB

DEEPEST TEMPORARY DRILLING CASING PENETRATI: N/A

VOLUME OF WATER USED FOR GROUT HYDRATION: 21 G

VOLUME OF WATER USED DURING DRILLING: N/A GAL

RISER MATERIAL: N/A

SCREEN MATERIAL: N/A

DRILLING CASING DIAMETER: N/A

RISER WALL THICKNESS: N/A

TYPE OF SAND PACK: N/A

SCREEN TYPE: N/A

DEPTH OF CENTRALIZER(S): N/A

RISER/SCREEN DIAMETER:

SCREEN SLOT SIZE:

200307-11475-007

WELL NUMBER: B-11475

FEMP
WELL COMPLETION LOG

CONTROL NUMBER: ~~200307-11475-004~~

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY AUGER BORINGS

PROJECT NUMBER: 20.03.07

GEOLOGIST: CLIFF LEE 10257

DRILLING METHOD: AUGER

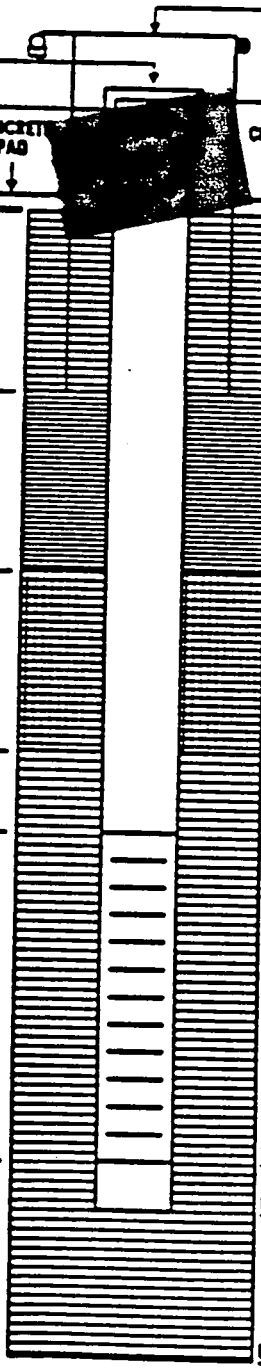
DATES OF INSTALLATION: 1/17-18/95

WATER LEVEL (BLS): 16' BLS

DATE: 1/18/95

RELATED FAL NUMBERS: 200307-11475-004 thru 200307-11475-006

CHECKED BY: KP 2-9-95



TOP OF PROTECTIVE CASING: N/A FT.

INNER WELL CAP

MEASUREMENT NOTCH

TOP OF RISER: N/A FT.

CONCRETE PAD

CONCRETE PAD

DIMENSIONS: — N/A — x — x —

GROUND SURFACE

GROUND SURFACE

CONCRETE: N/A FT.

TOP OF GROUT SEAL: SURFACE FT.

GROUT: 21 FT.

BOTTOM OF PROTECTIVE CASING: N/A FT.

TOP OF BENTONITE PELLET SEAL: N/A FT.

BENTONITE PELLET SEAL: N/A FT.

TOP OF SAND PACK: N/A FT.

TOP OF SCREEN: N/A FT.

SAND PACK: N/A FT.

SCREEN: N/A FT.

FEMP QA 21 FEB 13 1995

BOTTOM OF SCREEN: N/A FT.

BOTTOM OF SUMP: N/A FT.

BOTTOM OF BORING: 21 FT.

BOREHOLE DIAMETER: 8 IN.

TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND EXPANSIVE CEMENT 282 LBS.

BENTONITE PELLETS (5-GALLON BUCKETS): N/A

DEEPEST TEMPORARY DRILLING CASING PENETRATI[illegible] N/A F[illegible]

VOLUME OF WATER USED DURING DRILLING: N/A GAL

RISER MATERIAL: N/A

VOLUME OF WATER USED FOR GROUT HYDRATION: ≤ 21 GAL

RISER WALL THICKNESS: N/A

TYPE OF SAND PACK: N/A

SCREEN MATERIAL: N/A

DRILLING CASING DIAMETER: N/A IN.

RISER/SCREEN DIAMETER: N/A IN.

SCREEN SLOT SIZE: N/A IN

SCREEN TYPE: N/A

DEPTH OF CENTRALIZER(S): N/A FT

000796

118

2-05-95

FEMP
WELL COMPLETION LOG

WELL NUMBER: B - 11476

CONTROL NUMBER: 200307-11476-017

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

PROJECT NUMBER: 20.03.07

GEOLOGIST: CLIFF LEE 10257

DRILLING METHOD: AUGER

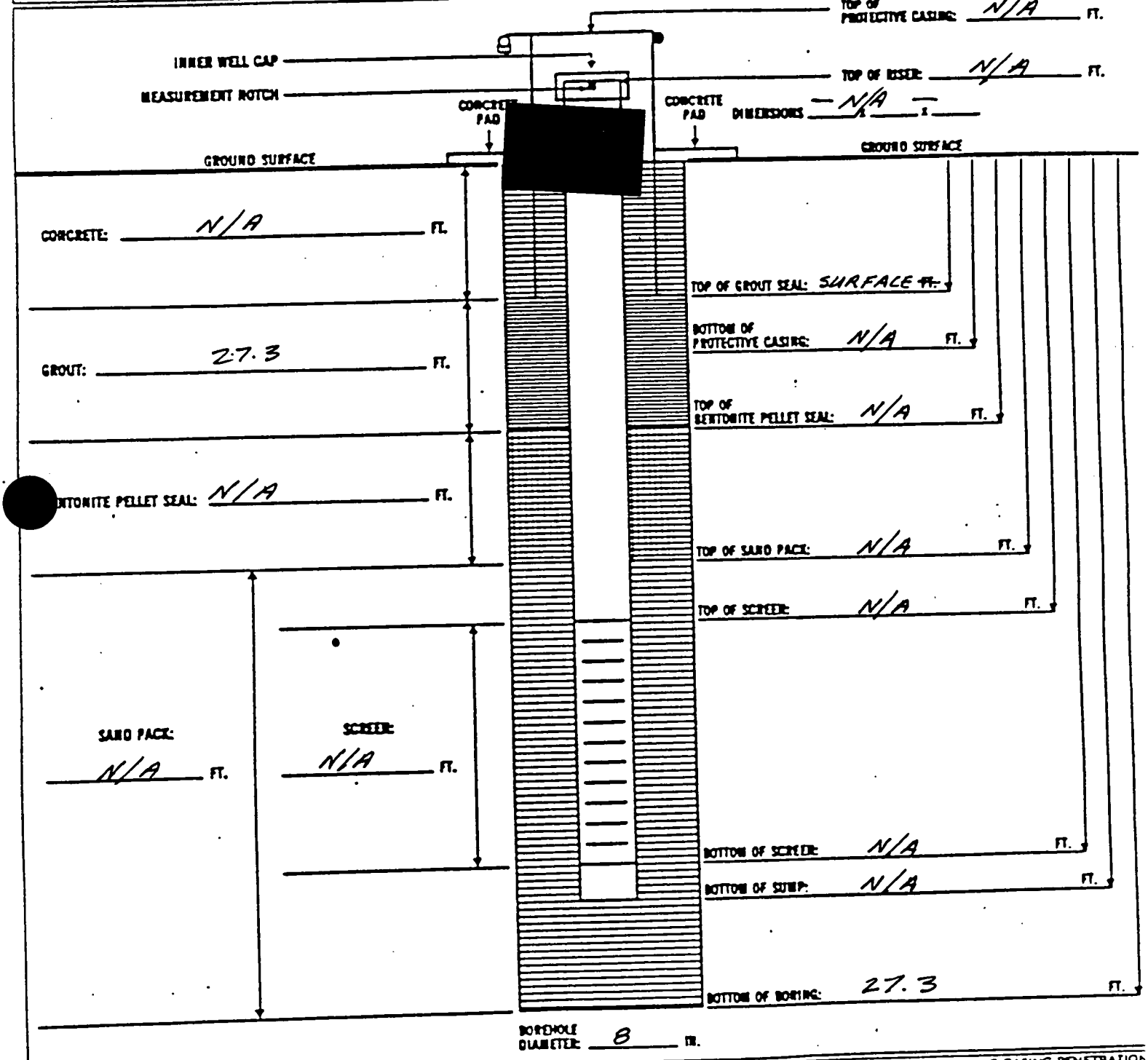
DATES OF INSTALLATION: 1/4 - 10/95

WATER LEVEL (FL): 5' BLS

DATE: 1/10/95

RELATED FAL NUMBERS:

CHECKED BY:



TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND & 564LB EXPANSIVE CEMENT

BENTONITE PELLETS (5-GALLON BUCKETS): GRANULAR N/A LB

DEEPEST TEMPORARY DRILLING CASING PENETRATION: N/A FT

VOLUME OF WATER USED DURING DRILLING: N/A GAL

RISER MATERIAL: N/A

VOLUME OF WATER USED FOR GROUT HYDRATION: 42 GAL

RISER WALL THICKNESS: N/A

TYPE OF SAND PACK: N/A

SCREEN MATERIAL: N/A

DRILLING CASING DIAMETER: N/A IN

RISER/SCREEN DIAMETER: N/A IN

SCREEN SLOT SIZE: N/A IN

SCREEN TYPE: N/A

DEPTH OF CENTRALIZER(S): N/A FT

000797

811

FEMP OA 19

200307-11477-020

CONTROL NUMBER: ~~200307-11477-018~~ KP 2-9-95

FEMP
WELL COMPLETION LOG

WELL NUMBER: B - 11477

PROJECT NUMBER: 20.03.07

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

DRILLING METHOD: AUGER

GEOLOGIST: CLIFF LEE 10257

CHECKED BY: KP 2-9-95

DATES OF INSTALLATION: 12/22/94

WATER LEVEL (R.F.): 23.5' BLS

DATE: 12/22/94

RELATED FAL NUMBERS:

TOP OF PROTECTIVE CASING: N/A FT.

INNER WELL CAP

TOP OF RISER: N/A FT.

MEASUREMENT NOTCH

CONCRETE PAD

CONCRETE PAD

DIMENSIONS: N/A x x

GROUND SURFACE

GROUND SURFACE

CONCRETE: N/A FT.

TOP OF GROUT SEAL: SURFACE FT.

BOTTOM OF PROTECTIVE CASING: N/A FT.

GROUT: 35.5' FT.

TOP OF BENTONITE PELLET SEAL: N/A FT.

BENTONITE PELLET SEAL: N/A FT.

TOP OF SAND PACK: N/A FT.

TOP OF SCREEN: N/A FT.

SAND PACK: N/A FT.

SCREEN: N/A FT.

BOTTOM OF SCREEN: N/A FT.

BOTTOM OF SUMP: N/A FT.

BOTTOM OF BORING: 35.5 FT.

BOREHOLE DIAMETER: 8 IN.

TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND EXPANSIVE CEMENT 423 LB

BENTONITE PELLETS (5-GALLON BUCKETS): GRANULAR 4.5 LB

DEEPEST TEMPORARY DRILLING CASING PENETRATION: N/A FT

VOLUME OF WATER USED FOR GROUT HYDRATION: 31.5 GAL

VOLUME OF WATER USED DURING DRILLING: N/A GAL

RISER MATERIAL: N/A

RISER WALL THICKNESS: N/A

TYPE OF SAND PACK: N/A

SCREEN MATERIAL: N/A

DRILLING CASING DIAMETER: N/A IN

SCREEN SLOT SIZE

SCREEN TYPE: N/A

DEPTH OF CENTRALIZER(S): N/A FT

000798

118

FEMP

WELL COMPLETION LOG

CONTROL NUMBER: 200307-11478-017

WELL NUMBER: B - 11478

PROJECT NUMBER: 20.03.07

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

DRILLING METHOD: AUGER

GEOLOGIST: CLIFF LEE 10257

CHECKED BY: N/A

DATES OF INSTALLATION: 12/16 - 19/94

WATER LEVEL (R.L.): DRY

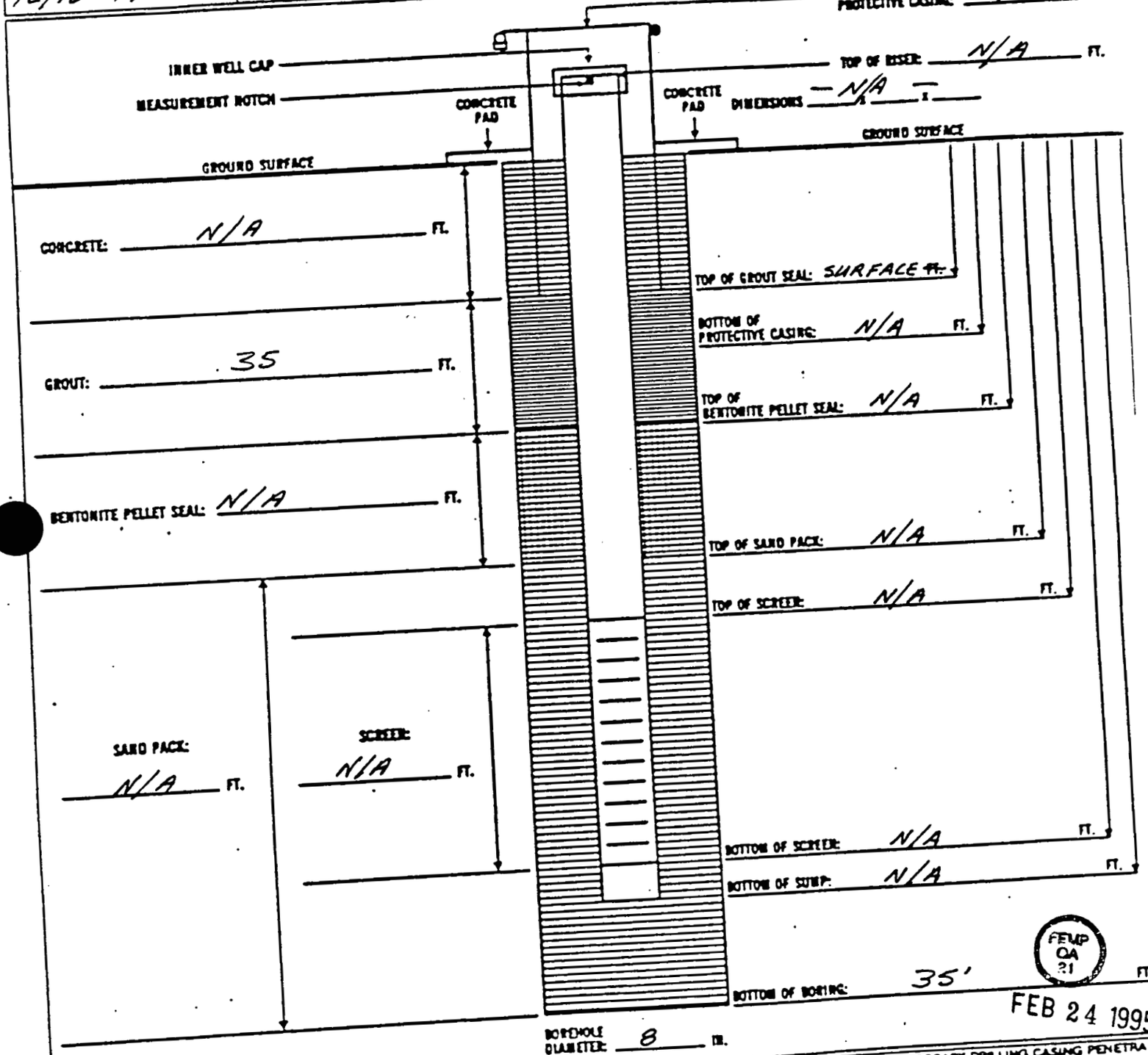
DATE: 12/19/94

RELATED FAL NUMBERS: N/A

TOP OF PROTECTIVE CASING: N/A FT.

TOP OF RISER: N/A FT.

DIMENSIONS: N/A



FEMP QA 21

FEB 24 1995

TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND EXPANSIVE CEMENT 423 LB

BENTONITE PELLETS (5-GALLON BUCKETS): GRANULAR 4.5 LB

DEEPEST TEMPORARY DRILLING CASING PENETRATION: N/A

VOLUME OF WATER USED FOR GROUT HYDRATION: 31.5 GAL

VOLUME OF WATER USED DURING DRILLING: N/A GAL

RISER MATERIAL: N/A

DRILLING CASING DIAMETER: N/A

RISER WALL THICKNESS: N/A

TYPE OF SAND PACK: N/A

SCREEN MATERIAL: N/A

DEPTH OF CENTRALIZER(S): N/A

RISER/SCREEN DIAMETER: N/A IN.

SCREEN SLOT SIZE: N/A IN.

SCREEN TYPE: N/A

G-11

900799

811

FEMP
WELL COMPLETION LOG

NUMBER: 3 - 11479

CONTROL NUMBER: 200307-11479-021

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

PROJECT NUMBER: 20.03.07

GEOLOGIST: LEE 10257

DRILLING METHOD: AUGER

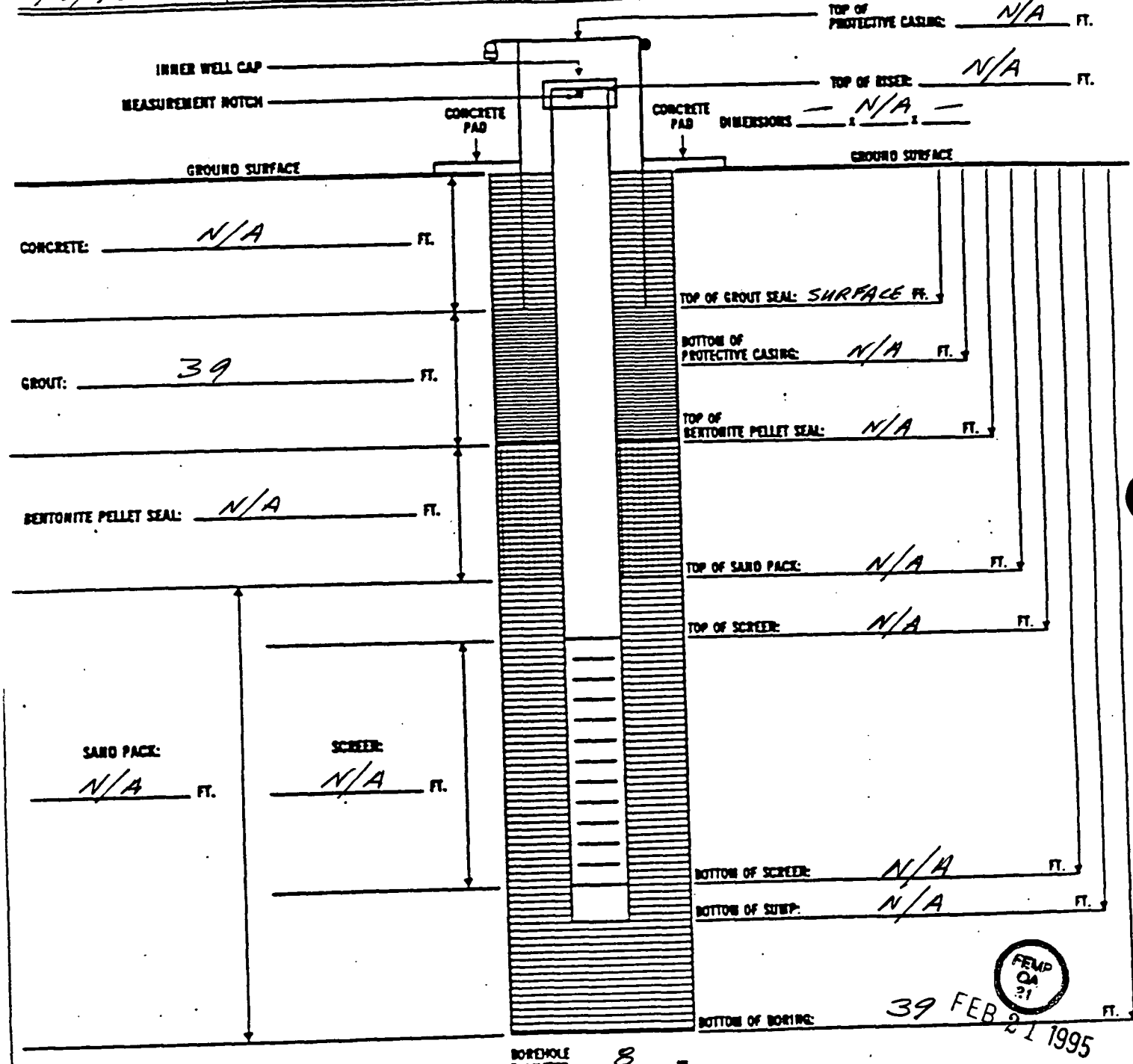
DATE OF INSTALLATION: 1/9/95

WATER LEVEL (ft): 25.7 BLS

DATE: 1/9/95

RELATED FAL NUMBERS: N/A

CHECKED BY: N/A



TYPE AND AMOUNT OF GROUT USED: APPROX. 564-658 lb.	BENTONITE PELLETS (5-GALLON BUCKETS): N/A	DEEPEST TEMPORARY DRILLING CASING PENETRATI[illegible] N/A
VOLUME OF WATER USED DURING DRILLING: N/A GAL	RISER MATERIAL: N/A	VOLUME OF WATER USED FOR GROUT HYDRATION: ~ 40 GAL
RISER WALL THICKNESS: N/A	TYPE OF SAND PACK: N/A	[illegible]N MATERIAL N/A	DRILLING CASING DIAMETER: N/A IN.
SCREEN DIAMETER:	SCREEN SLOT SIZE:	SCREEN TYPE N/A	DEPTH OF CENTRALIZER(S): N/A FT

000800

FEMP
WELL COMPLETION LOG

WELL NUMBER: B - 11480

CONTROL NUMBER: 200307-11480-018

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

PROJECT NUMBER: 20.03.07

GEOLOGIST: CLIFF LEE 10257

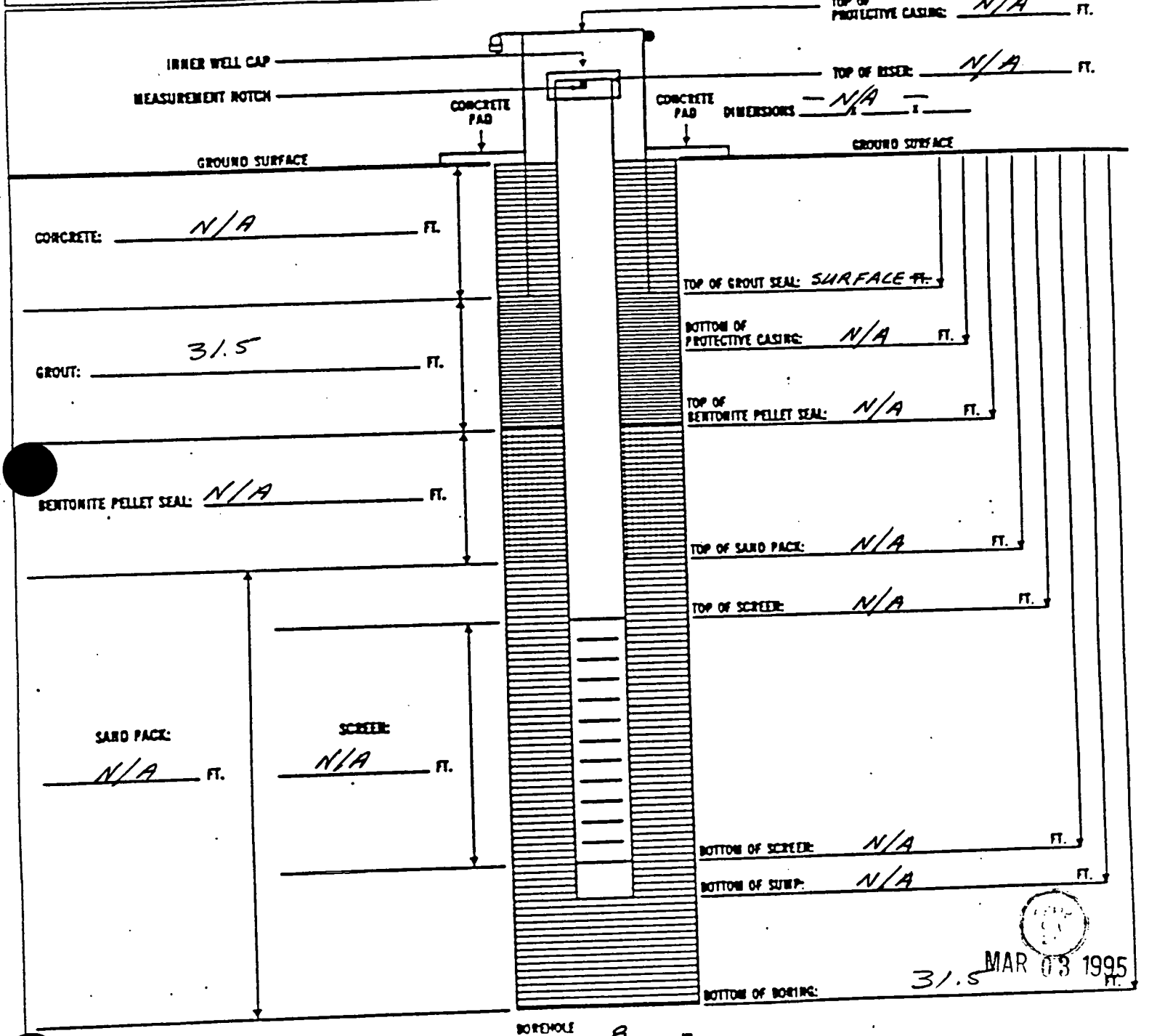
DRILLING METHOD: AUGER

DATES OF INSTALLATION: 2-14-95 thru 2-15-95

WATER LEVEL (R.L): N/A DATE:

RELATED FAL NUMBERS: 200307-11480-004 thru 200307-11480-008

CHECKED BY: RP 2-9-95



MAR 03 1995

TYPE AND AMOUNT OF GROUT USED: TYPE E-I-K PORTLAND EXPANSIVE CEMENT - 355 LB

BENTONITE PELLETS (5-GALLON BUCKETS): GRANULAR - 3.8 LB

DEEPEST TEMPORARY DRILLING CASING PENETRATION: N/A FT

VOLUME OF WATER USED FOR GROUT HYDRATION: ~26.5 GAL

VOLUME OF WATER USED DURING DRILLING: N/A GAL

RISER MATERIAL: N/A

DRILLING CASING DIAMETER: N/A IN

RISER WALL THICKNESS: N/A

TYPE OF SAND PACK: N/A

SCREEN MATERIAL: N/A

SCREEN TYPE

DEPTH OF CENTRALIZER(S): N/A

000801

811

WELL NUMBER: B - 11481

FEMP
WELL COMPLETION LOG

CONTROL NUMBER: 200307-11481-022

PROJECT NAME: OU2 PREDESIGN DISPOSAL FACILITY BORING

PROJECT NUMBER: 20.03.07

GEOLOGIST: CLIFF LEE 10257

DRILLING METHOD: AUGER

DATES OF INSTALLATION:	WATER LEVEL (ft.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
1/16-18/95	4.1' BLS	1/18/95	200307-11481-001 thru 200307-11481-008	Payne

TOP OF PROTECTIVE CASING: N/A FT.

INNER WELL CAP

MEASUREMENT NOTCH

TOP OF RISER: N/A FT.

CONCRETE PAD

CONCRETE PAD DIMENSIONS: N/A

GROUND SURFACE

GROUND SURFACE

CONCRETE: N/A FT.

GROUT: 39.9 FT.

BENTONITE PELLET SEAL: N/A FT.

SAND PACK: N/A FT.

SCREEN: N/A FT.

TOP OF GROUT SEAL: SURFACE FT.

BOTTOM OF PROTECTIVE CASING: N/A FT.

TOP OF BENTONITE PELLET SEAL: N/A FT.

TOP OF SAND PACK: N/A FT.

TOP OF SCREEN: N/A FT.

BOTTOM OF SCREEN: N/A FT.

BOTTOM OF SUMP: N/A FT.

BOTTOM OF BORING: 39.9 FT.

BOREHOLE DIAMETER: 8 IN.

FEMP QA 21 FEB 21 1995

TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENET
TYPE E-I-K PORTLAND EXPANSIVE CEMENT 2564 LB	GRANULAR N/A LB	N/A
VOLUME OF WATER USED DURING DRILLING: N/A GAL	RISER MATERIAL: N/A	VOLUME OF WATER USED FOR GROUT HYDRATION: ~ 50 GAL

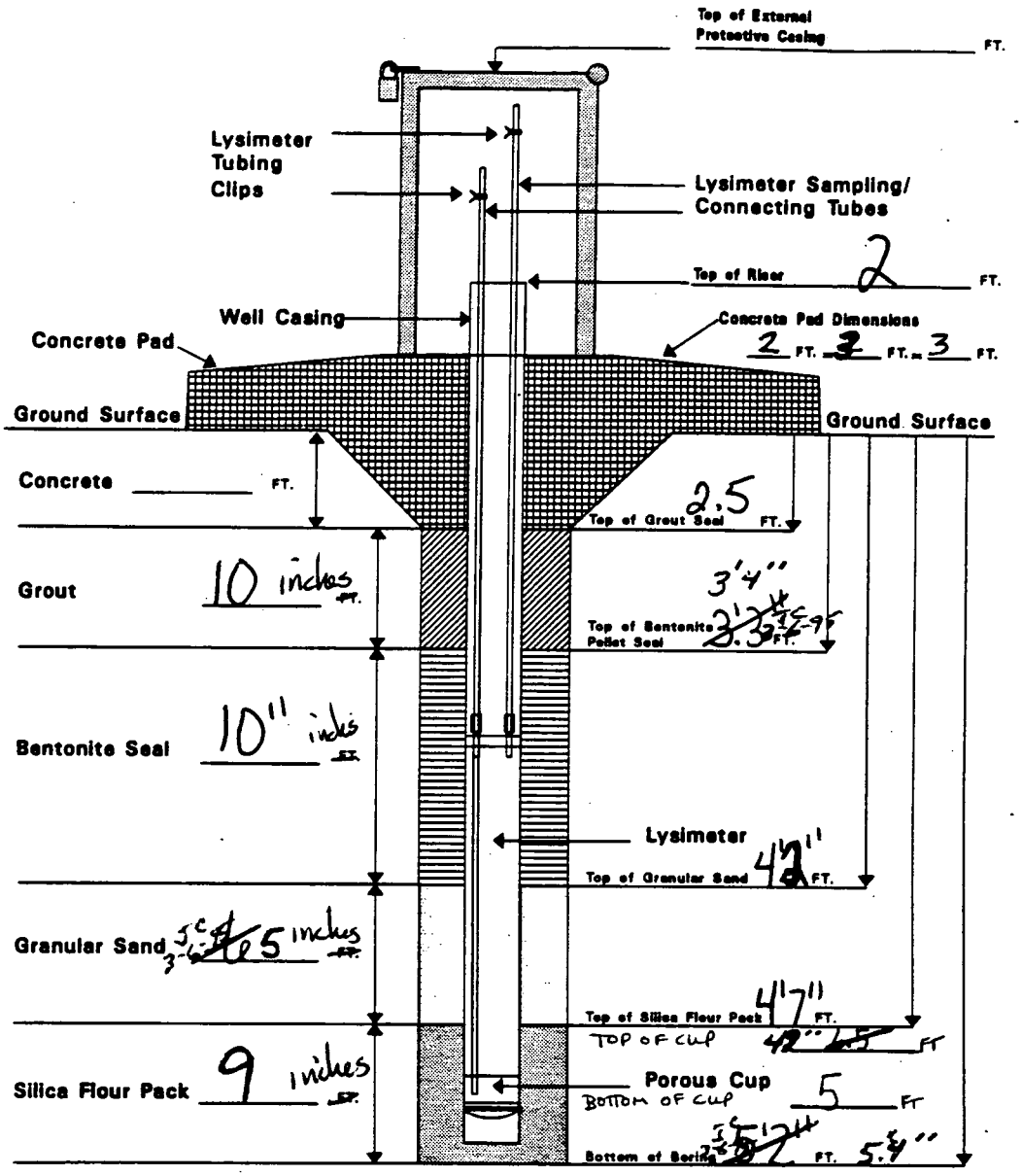
RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
N/A	N/A	N/A	N/A IN.
RISER/SCREEN DIAMETER: N/A IN.	SCREEN SLOT SIZE: N/A IN	SCREEN TYPE: N/A	DEPTH OF CENTRALIZER(S): N/A FT.

000802

FEMP CA 3-7-95

FEMP
Lysimeter Completion Log

WELL NUMBER: (REPLACEMENT) 11482	CONTROL NUMBER: 017 200307-11482-018
PROJECT NAME: OU2 Pre-design Investigation	PROJECT NUMBER: 20.03.07
GEOLOGIST: J. Capinarri / Rob Thomas	DRILLING METHOD: Hand Auger
DATES OF INSTALLATION: 1-24-95 → 2/1/95	WATER LEVEL (FT.): N/A
DATE: 2/1/95	CHECKED BY:



BOREHOLE DIAMETER: 6 1/4" IN.

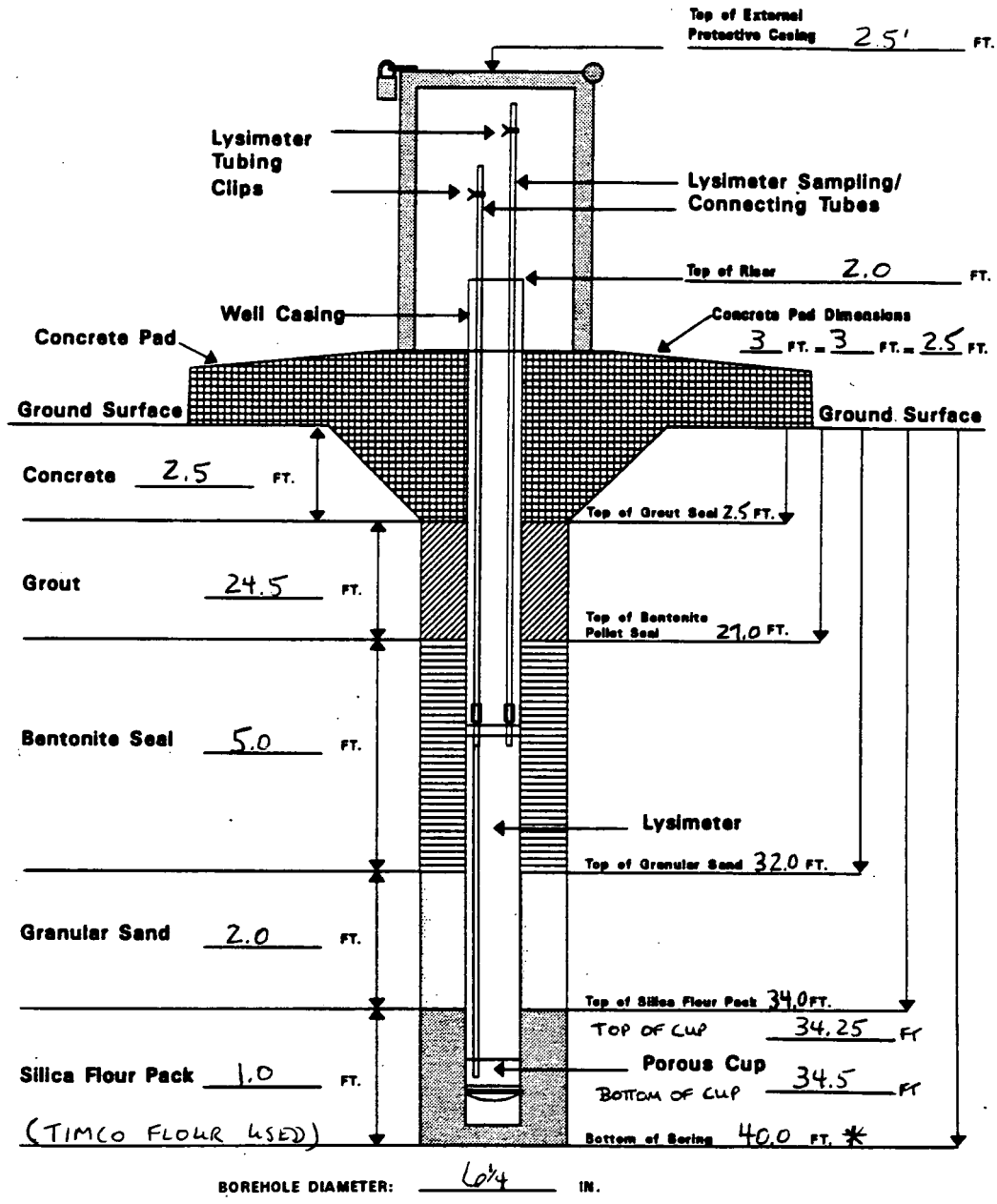
TYPE AND AMOUNT OF GROUT USED: Volclay 1/10 Bag	BENTONITE PELLETS (5-GALLON BUCKETS): 1/4 Bucket		DEEPEST TEMPORARY CASING PENETRATION: N/A FT.
VOLUME OF WATER LOST DURING INSTALLATION: 1 N/A	RISER MATERIAL: PVC Schedule 40		VOLUME OF WATER USED FOR GROUT HYDRATION: 3L silica flour / 1 grout GAL.
RISER WALL THICKNESS: 1/8 inch	TYPE OF SAND PACK: Global #5	SCREEN MATERIAL: Ceramic	DRILLING CASING DIAMETER: OD IN. ID IN.
RISER/SCREEN DIAMETER: OD 2 IN. ID 1.75 IN.	SCREEN SLOT SIZE: >200 mesh IN.	SCREEN TYPE:: Ceramic cup	DEPTH OF CENTRALIZER(S): N/A FT.

8 1 1

FEMP
Lysimeter Completion Log

WELL NUMBER: 11483	CONTROL NUMBER: 200307-11483-028
PROJECT NAME: CRU 2 PRE-DESIGN INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: KEN GEIGER	DRILLING METHOD: ROTOSONIC

DATES OF INSTALLATION:	WATER LEVEL (FT.)	DATE:	CHECKED BY:
1/9/95	N/A	N/A	N/A



BOREHOLE DIAMETER: 6¼ IN.

TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY CASING PENETRATION
90 LBS VOLCLAY	100 LBS	40.0 FT.
VOLUME OF WATER LOST DURING INSTALLATION:	RISER MATERIAL:	VOLUME OF WATER USED FOR GROUT HYDRATION:
NONE USED	PVC Schedule 40	38.0 GAL.

RISER WALL THICKNESS:	TYPE OF SAND PACK:	~~SCREEN~~ CUP MATERIAL:	DRILLING CASING DIAMETER:
⅛" in.	Global #5 10LB	Ceramic	OD 6¼ IN. ID IN.
RISER/SCREEN DIAMETER:	SCREEN SLOT SIZE:	SCREEN TYPE::	DEPTH OF CENTRALIZER(S):
OD 2⅜" IN. ID 2.0" IN.	N/A IN.	N/A	N/A FT.

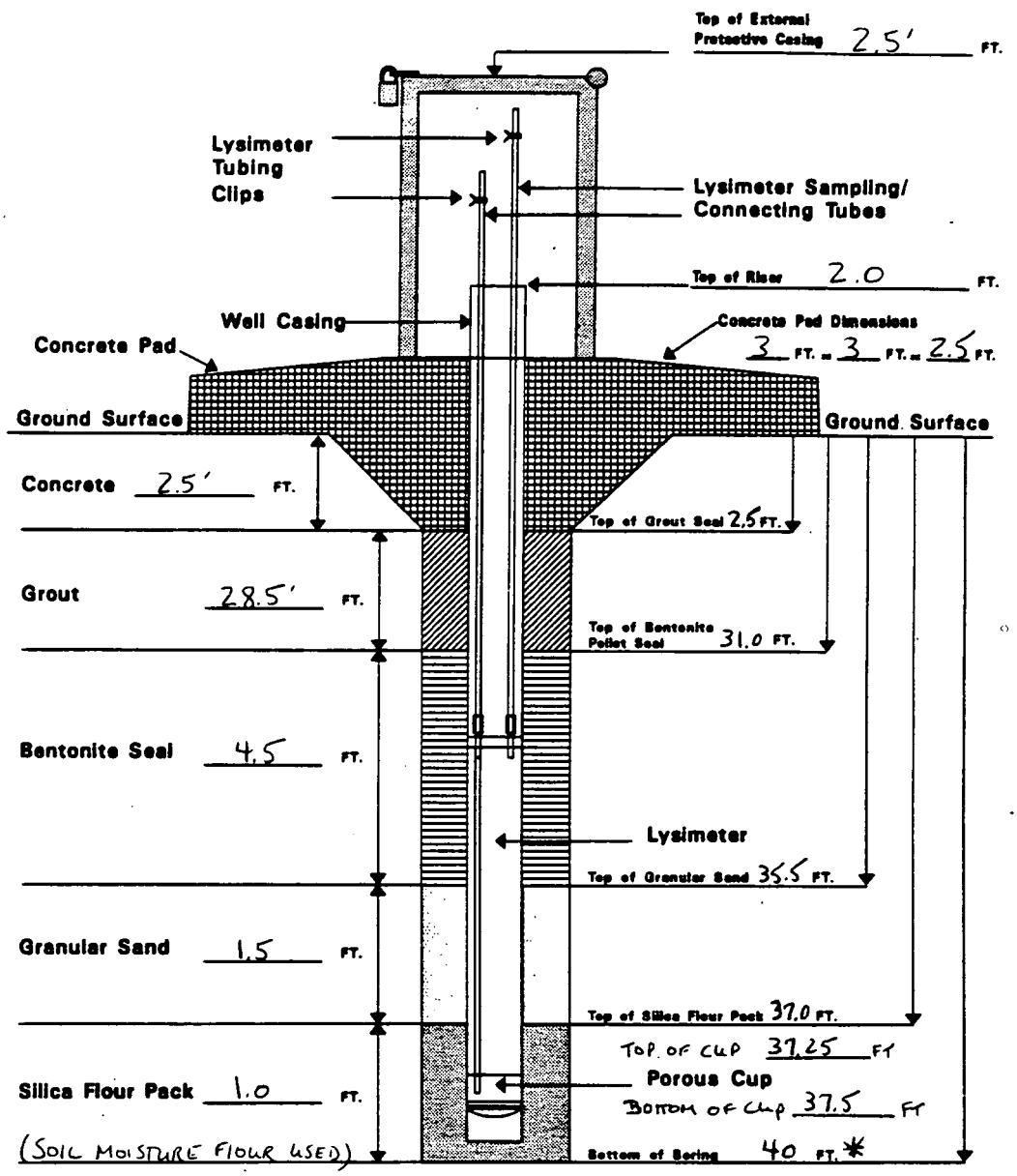
* BOREHOLE COLLAPSED TO 35.0'

000804

FEMP LA MAR 05 1995

FEMP
Lysimeter Completion Log

WELL NUMBER: 11484	CONTROL NUMBER: 200307-11484-017
PROJECT NAME: CRUZ PRE-DESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: KEN GEIGER	DRILLING METHOD: ROTOSONIC
DATES OF INSTALLATION: ~~1-6-95~~ 1-5-95	WATER LEVEL (FT.): N/A; DATE: N/A; CHECKED BY: N/A



BOREHOLE DIAMETER: 6¼" IN.

FEMP LA MAR 03 1995

TYPE AND AMOUNT OF GROUT USED: YOLCLAY 90 LBS	BENTONITE PELLETS (5-GALLON BUCKETS): 80 LBS	DEEPEST TEMPORARY CASING PENETRATION 40.0 FT.
VOLUME OF WATER LOST DURING INSTALLATION: NONE	RISER MATERIAL: PVC Schedule 40	VOLUME OF WATER USED FOR GROUT HYDRATION: 38.0 GAL.

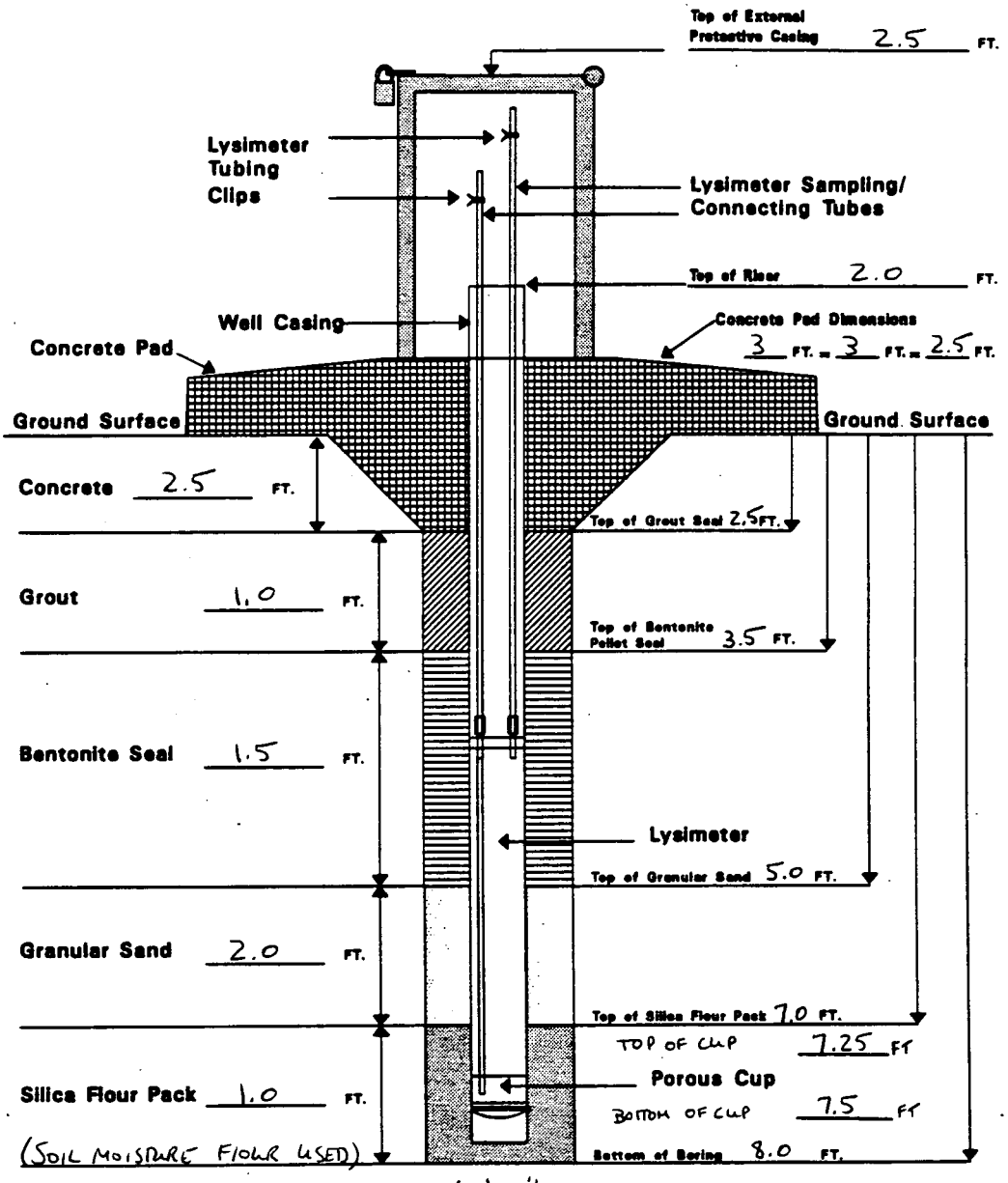
BER WALL THICKNESS: ~~3/8"~~ in. 1/8" in	TYPE OF SAND PACK: Global #5 10LB	SCREEN MATERIAL: N/A	DRILLING CASING DIAMETER: OD 6¼ IN. ID N/A IN.
RISER/SCREEN DIAMETER: OD 2 3/8" IN. ID 2.0 IN.	SCREEN SLOT SIZE: N/A IN.	SCREEN TYPE:: N/A	DEPTH OF CENTRALIZER(S): N/A FT.

* BOREHOLE COLLAPSED TO 38.0 FT

811

FEMP
Lysimeter Completion Log

WELL NUMBER: 11485	CONTROL NUMBER: 200307-11485-00
PROJECT NAME: CRU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: KEN GEIGER	DRILLING METHOD: ROTOSONIC
DATES OF INSTALLATION: 1-6-95	WATER LEVEL (FT.): N/A — DATE: — CHECKED BY:



BOREHOLE DIAMETER: 6 1/4" IN.

TYPE AND AMOUNT OF GROUT USED: VOLCLAY 10LBS	BENTONITE PELLETS (5-GALLON BUCKETS): 20LBS	DEEPEST TEMPORARY CASING PENETRATION 8.0 FT.
VOLUME OF WATER LOST DURING INSTALLATION: NONE USED	RISER MATERIAL: PVC Schedule 40	VOLUME OF WATER USED FOR GROUT HYDRATION: 5.0 GAL.

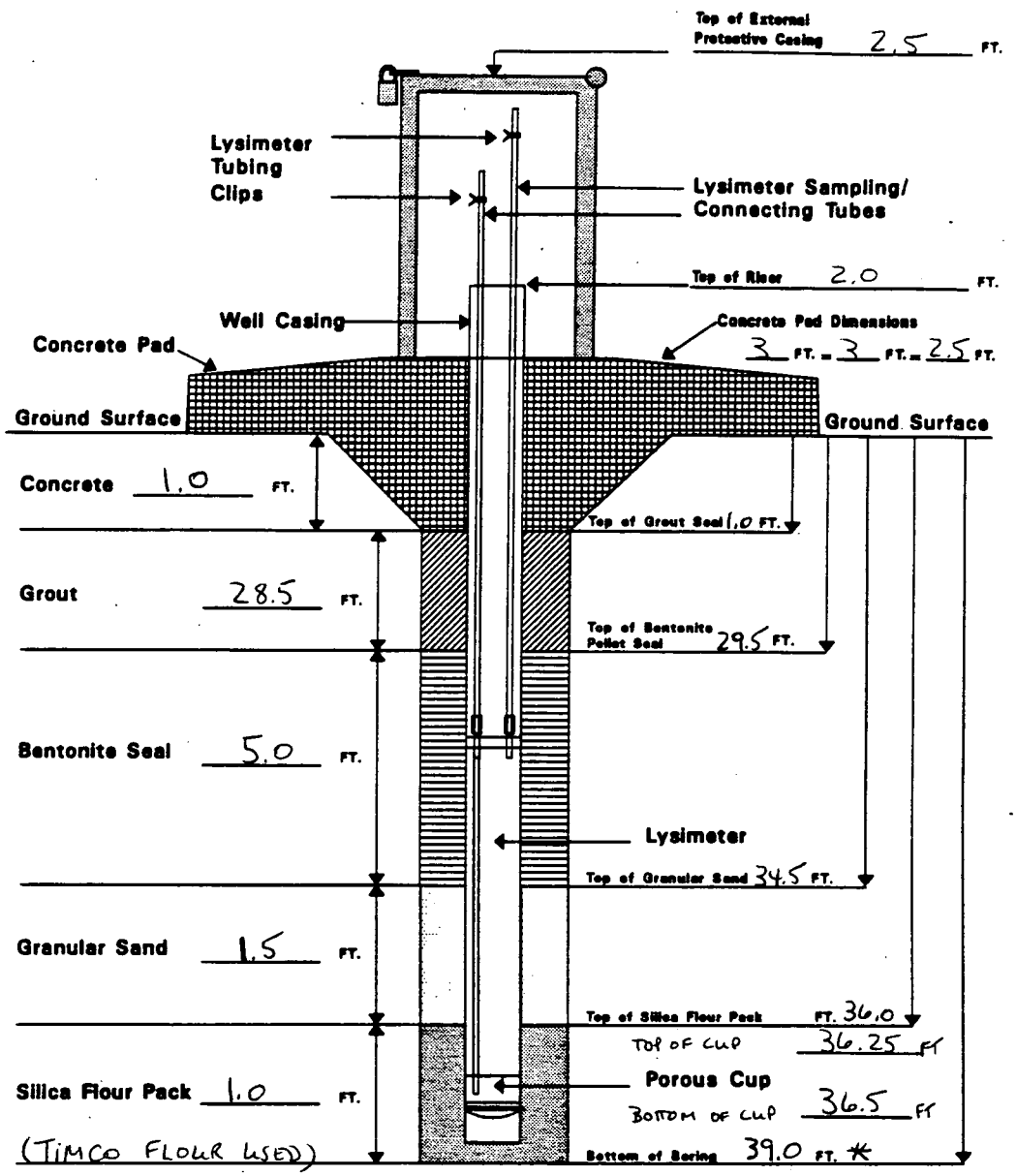
RISER WALL THICKNESS: 1/8" in.	TYPE OF SAND PACK: Global #5	~~SCREEN~~ CUP MATERIAL: CERAMIC	DRILLING CASING DIAMETER: OD 6 1/4" IN. ID N/A IN.
RISER/SCREEN DIAMETER: OD 2 3/8" IN. ID 2.0" IN.	SCREEN SLOT SIZE: <200 MESH IN.	SCREEN TYPE:: N/A	DEPTH OF CENTRALIZER(S): N/A FT.

000806

MAR 03 1995

FEMP
Lysimeter Completion Log

WELL NUMBER: 11486	CONTROL NUMBER: 200307-11486-017
PROJECT NAME: CRU 2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: KEN GEIGER	DRILLING METHOD: ROTOSONIC
DATES OF INSTALLATION: 1-10-95	WATER LEVEL (FT.): N/A DATE: N/A CHECKED BY: N/A



BOREHOLE DIAMETER: 6¼ IN.

FEMP QA 21 FEB 23 1995

TYPE AND AMOUNT OF GROUT USED: 100 LBS YOLCLAY	BENTONITE PELLETS (5-GALLON BUCKETS): 75 LBS	DEEPEST TEMPORARY CASING PENETRATION 39.0 FT.
VOLUME OF WATER LOST DURING INSTALLATION: NONE USED	RISER MATERIAL: PVC Schedule 40	VOLUME OF WATER USED FOR GROUT HYDRATION: 45.0 GAL.

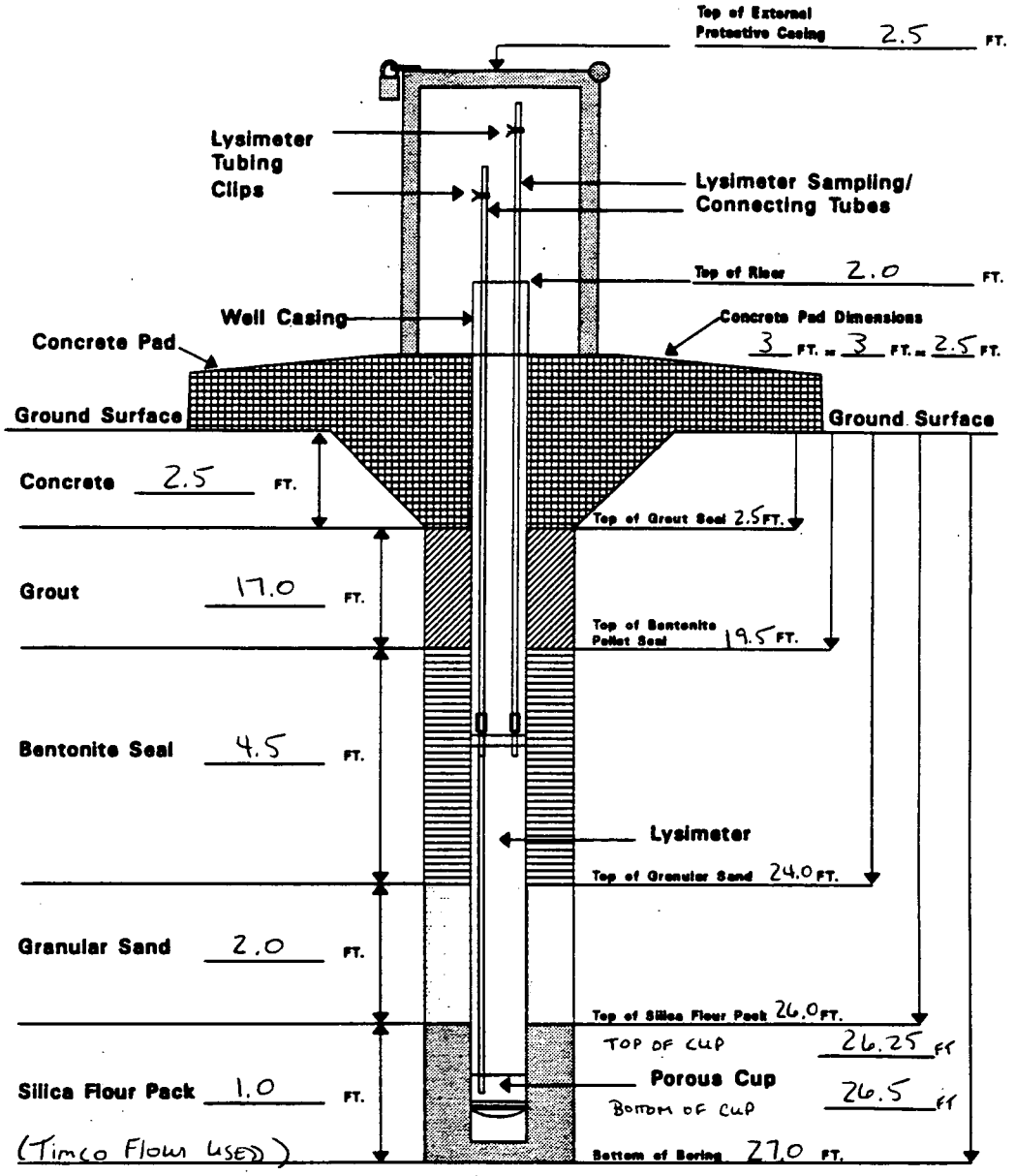
RISER WALL THICKNESS: ⅛" in.	TYPE OF SAND PACK: Global #5	~~SCREEN~~ CUP MATERIAL: CERAMIC	DRILLING CASING DIAMETER: OD 6¼" IN. ID N/A IN.
RISER/SCREEN DIAMETER: OD 2⅜ IN. ID 2.0 IN.	SCREEN SLOT SIZE: <200 MESH IN.	SCREEN TYPE:: N/A	DEPTH OF CENTRALIZER(S): N/A FT.

* BOREHOLE COLLAPSED TO 37.0'

FEMP QA 21 FEB 22 1995

FEMP
Lysimeter Completion Log

WELL NUMBER: 11487	CONTROL NUMBER: 200307-11487-013
PROJECT NAME: CRUZ PRE-DESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: KEN GEIGER	DRILLING METHOD: ROTOSONIC
DATES OF INSTALLATION: 1-10-95	WATER LEVEL (FT.): N/A; DATE: N/A; CHECKED BY: KP 2-14-95



BOREHOLE DIAMETER: 6¼" IN.

TYPE AND AMOUNT OF GROUT USED: VOLCLAY 50 LBS	BENTONITE PELLETS (5-GALLON BUCKETS): 50 LBS	DEEPEST TEMPORARY CASING PENETRATION 27.0 FT.
VOLUME OF WATER LOST DURING INSTALLATION: NONE USED	RISER MATERIAL: PVC Schedule 40	VOLUME OF WATER USED FOR GROUT HYDRATION: 25.0 GAL.

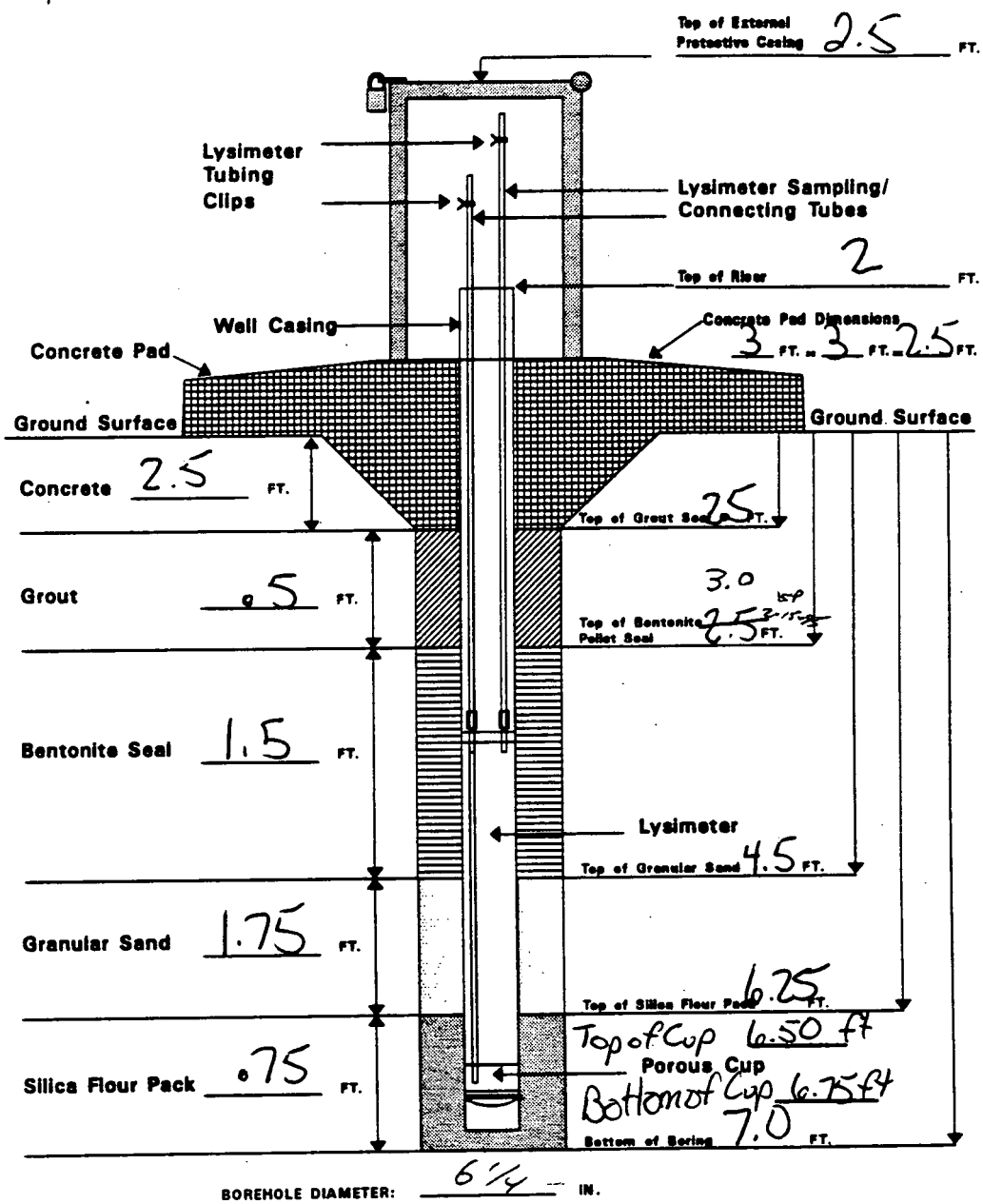
RISER WALL THICKNESS: ⅛" in	TYPE OF SAND PACK: Global #5	~~SCREEN~~ CUP MATERIAL: CERAMIC	DRILLING CASING DIAMETER: OD 6¼" IN. ID — IN.
RISER/SCREEN DIAMETER: OD 2⅜" IN. ID 2.0 IN.	SCREEN SLOT SIZE: <200 MESH IN.	SCREEN TYPE:: N/A	DEPTH OF CENTRALIZER(S): N/A FT.

FEMP QA 31 FEB 03 19

FEMP QA 19

FEMP
Lysimeter Completion Log

WELL NUMBER: 11488	CONTROL NUMBER: 200307-11488-007
PROJECT NAME: CR02 Re-Design Field Investigation	PROJECT NUMBER: 20.03.07
GEOLOGIST: Ken Geiger	DRILLING METHOD: Rotosonic
DATES OF INSTALLATION: 1/11/95	WATER LEVEL (FT.): DATE: CHECKED BY: Payne



BOREHOLE DIAMETER: 6 1/4 IN.

TYPE AND AMOUNT OF GROUT USED: Volclay 20lb	BENTONITE PELLETS (5-GALLON BUCKETS): 75lb	DEEPEST TEMPORARY CASING PENETRATION 7.0 FT.
VOLUME OF WATER LOST DURING INSTALLATION: NONE USED	RISER MATERIAL: PVC sch 40	VOLUME OF WATER USED FOR GROUT HYDRATION: 10 GAL.

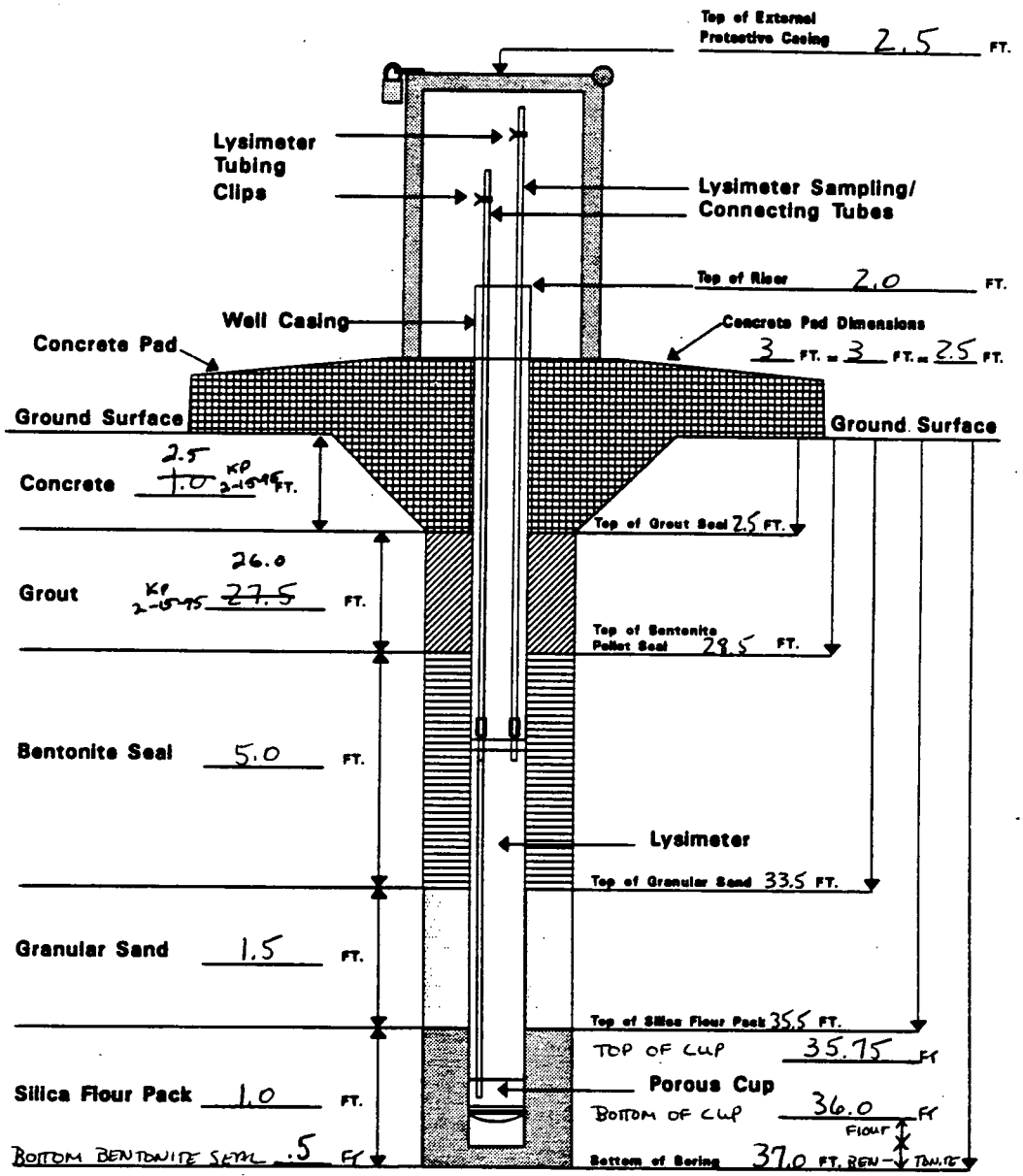
RISER WALL THICKNESS: sch 40 1/8 inch	TYPE OF SAND PACK: Global #5	SCREEN MATERIAL: N/A	DRILLING CASING DIAMETER: 6 1/4 OD N/A ID IN.
RISER/SCREEN DIAMETER: OD 2 3/8 IN. ID 2 IN.	SCREEN SLOT SIZE: <200mesh IN.	SCREEN TYPE: Ceramic	DEPTH OF CENTRALIZER(S): N/A FT.

811

1 of 2

FEMP
Lysimeter Completion Log

WELL NUMBER: 11489	CONTROL NUMBER: 200307-11489-016
PROJECT NAME: CRU 2 PREDESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: KEN GEIGER	DRILLING METHOD: ROTOSONIC
DATES OF INSTALLATION: 1-11-95	WATER LEVEL (FT.): N/A; DATE: N/A; CHECKED BY: Payne



TYPE AND AMOUNT OF GROUT USED: 85 LBS VOLCLAY	BENTONITE PELLETS (5-GALLON BUCKETS): 75 LBS	DEEPEST TEMPORARY CASING PENETRATION 37.0 FT.
VOLUME OF WATER LOST DURING INSTALLATION: NONE USED	RISER MATERIAL: PVC Schedule 40	VOLUME OF WATER USED FOR GROUT HYDRATION: 35.0 GAL.

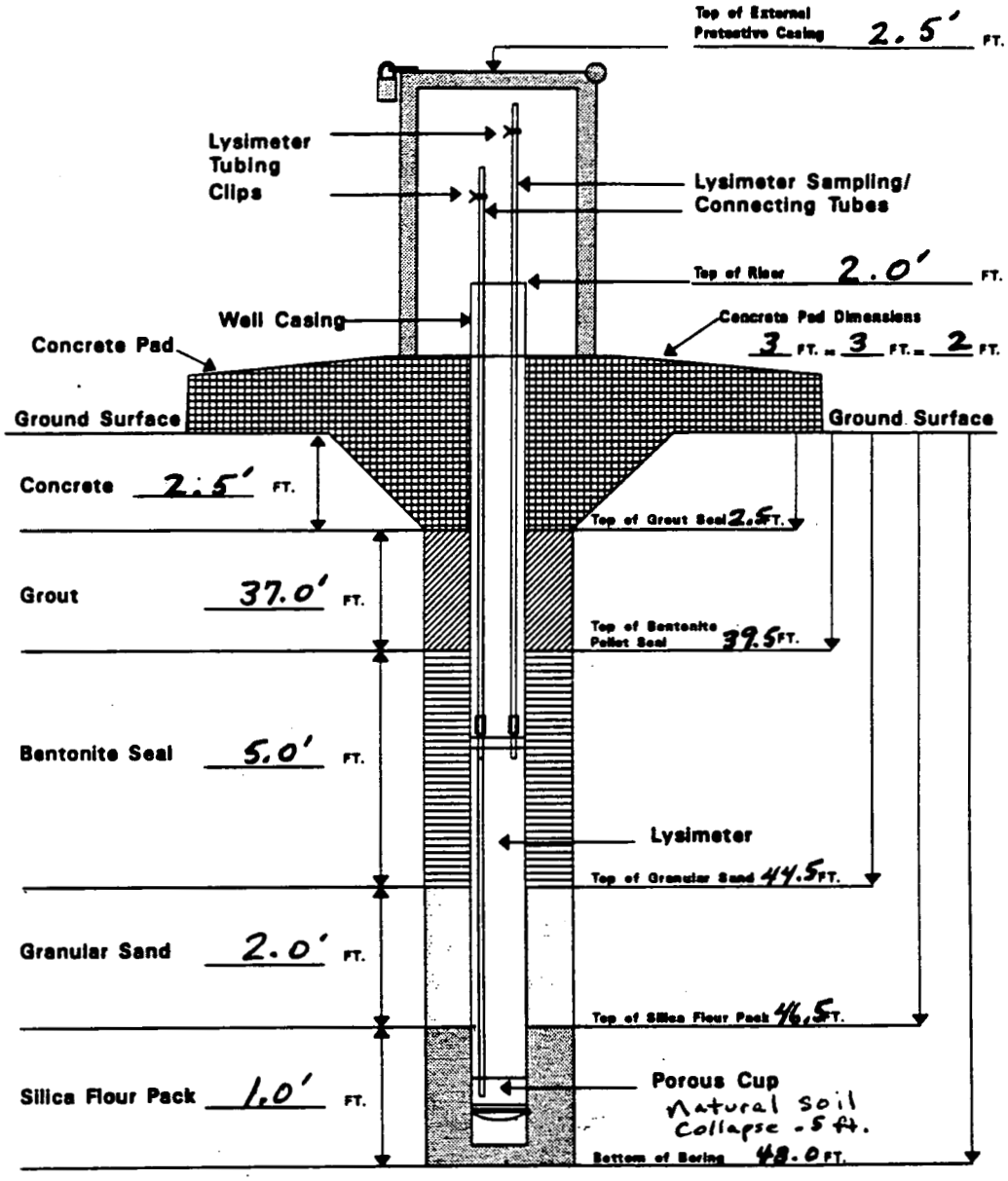
RISER WALL THICKNESS: ⅛" in	TYPE OF SAND PACK: 20/10 Global #5	~~SCREEN~~ CUP MATERIAL: CERAMIC	DRILLING CASING DIAMETER: OD 6¼" IN. ID IN.
RISER/SCREEN DIAMETER: OD 2⅜" IN. ID 2.0" IN.	SCREEN SLOT SIZE: < 200 MESH IN.	SCREEN TYPE:: N/A	DEPTH OF CENTRALIZER(S): N/A FT.

000810

MAR 06 1995

FEMP
Lysimeter Completion Log

WELL NUMBER: 11490	CONTROL NUMBER: 200307-11490-019
PROJECT NAME: OU2 Pre-Design Field Investigation	PROJECT NUMBER: 20.03.07
GEOLOGIST: Ken Geiger	DRILLING METHOD: Rotasonic
DATES OF INSTALLATION: 1/11/95	WATER LEVEL (FT.): DATE: CHECKED BY:



BOREHOLE DIAMETER: _____ IN.

TYPE AND AMOUNT OF GROUT USED: Volclay 95 lb.	BENTONITE PELLETS (5-GALLON BUCKETS): 25 lb.	DEEPEST TEMPORARY CASING PENETRATION 47.0' FT.
VOLUME OF WATER LOST DURING INSTALLATION: 0.0	RISER MATERIAL: sch 40 PVC	VOLUME OF WATER USED FOR GROUT HYDRATION: 40.0 GAL.

RISER WALL THICKNESS: sch 40	TYPE OF SAND PACK: 20/10	SCREEN MATERIAL: Ceramic	DRILLING CASING DIAMETER: OD 6 1/4" IN. ID NA IN.
RISER/SCREEN DIAMETER: OD 2 3/8" IN. ID 2.0' IN.	SCREEN SLOT SIZE: 200 Mesh IN.	SCREEN TYPE:: Ceramic Cup	DEPTH OF CENTRALIZER(S): NA FT.

811

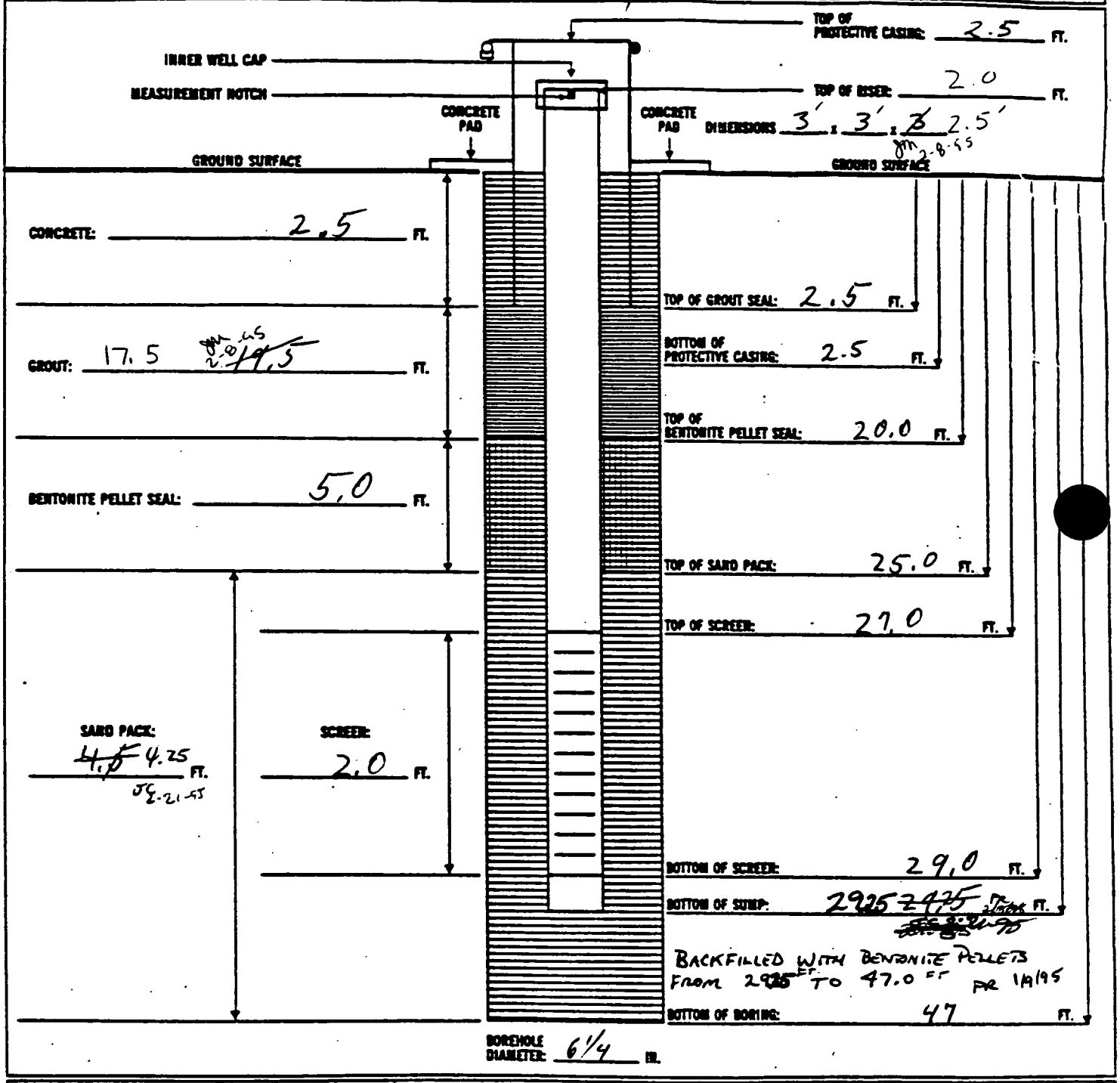
2-22-95 FEMP QA 13

1 of 2 ~~1 of 13~~ JG 2-7-95

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11491	CONTROL NUMBER: 200307-11491-020
PROJECT NAME: Phase I + II of The OU2 Pre Design Investigation	PROJECT NUMBER: 29 03.07
GEOLOGIST: Ken Geiger	DRILLING METHOD: Roto Sonic

DATES OF INSTALLATION:	WATER LEVEL (ft.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12-14-94 - 12-15-94	10 Feet	12-16-94	N/A	



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION:
Volclay 65/35	7 Bags	47.0
VOLUME OF WATER USED DURING DRILLING: 34 ~~32~~ KG 12-16-94 ~~200~~ 12-17-94 GAL	RISER MATERIAL: 21 10 Slot Screen 30' Riser SS 316	VOLUME OF WATER USED FOR GROUT HYDRATION: 32 GAL

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
3/16 Gauge Sch 40	10/20 Sand Global #5	S.S.	6 1/4 IN.
RISER/SCREEN DIAMETER: 2.0 IN.	SCREEN SLOT SIZE: 10 Slot	TYPE: S.S. Screw Type Flush	DEPTH OF CENTRALIZER(S): NA FT.

FS-F-3684 (9/10/93)

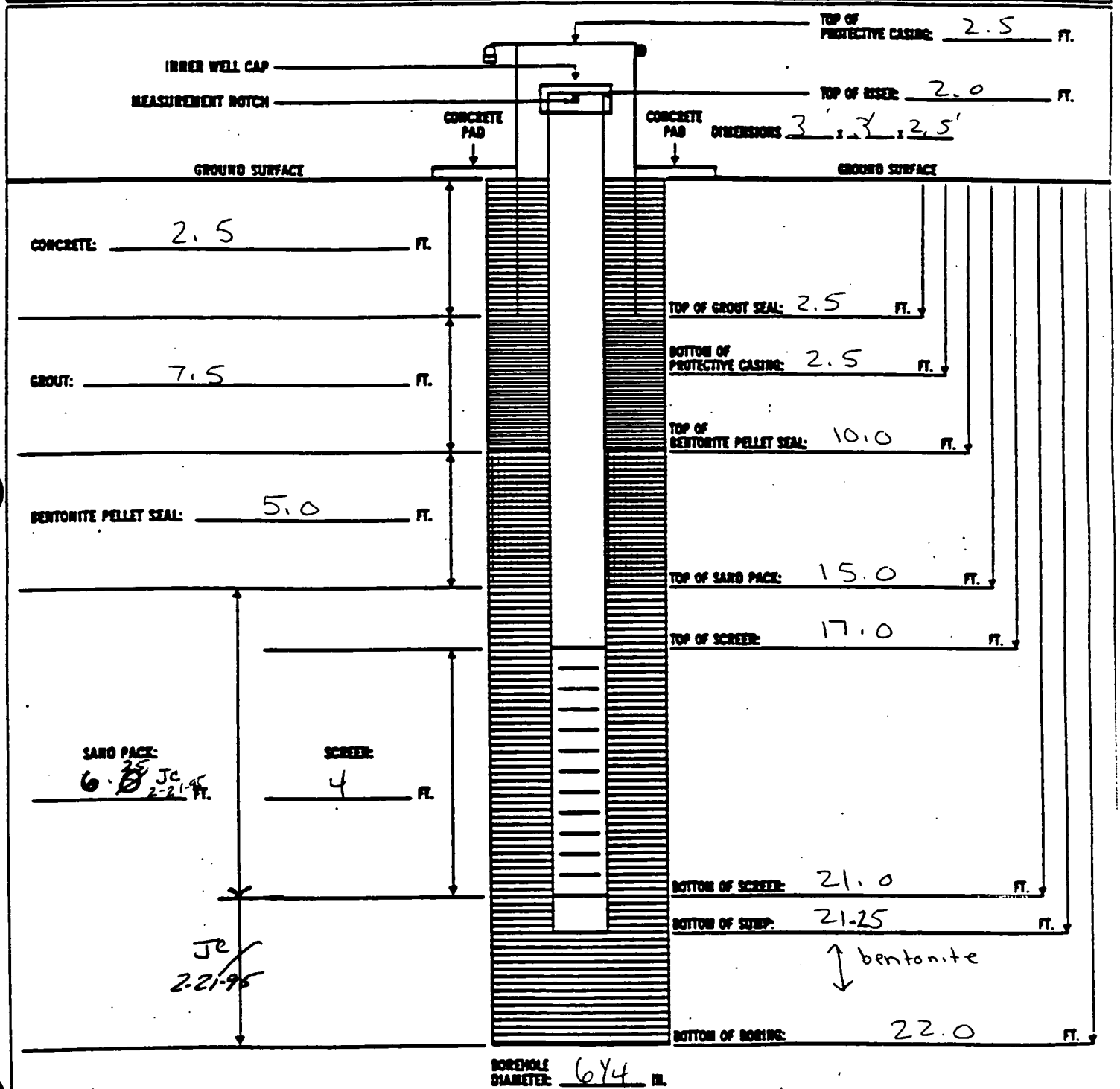
000812

FEMP QA 13 2000

FEMP WELL COMPLETION LOG

WELL NUMBER: 11492	CONTROL NUMBER: 200307-11492-014
PROJECT NAME: CRU2 Predesign Field Investigation	PROJECT NUMBER: 20.03.07
GEOLOGIST: K. Geiger	DRILLING METHOD: Rotosonic

DATES OF INSTALLATION:	WATER LEVEL (R.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12-15-94 - 12-16-94	NA	NA	NA	NA



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION:
Volclay 40lb.	75 lb.	22.0 FT.
VOLUME OF WATER USED DURING DRILLING: 8.5 GAL	RISER MATERIAL: 316 Stainless steel	VOLUME OF WATER USED FOR GROUT HYDRATION: 20 GAL

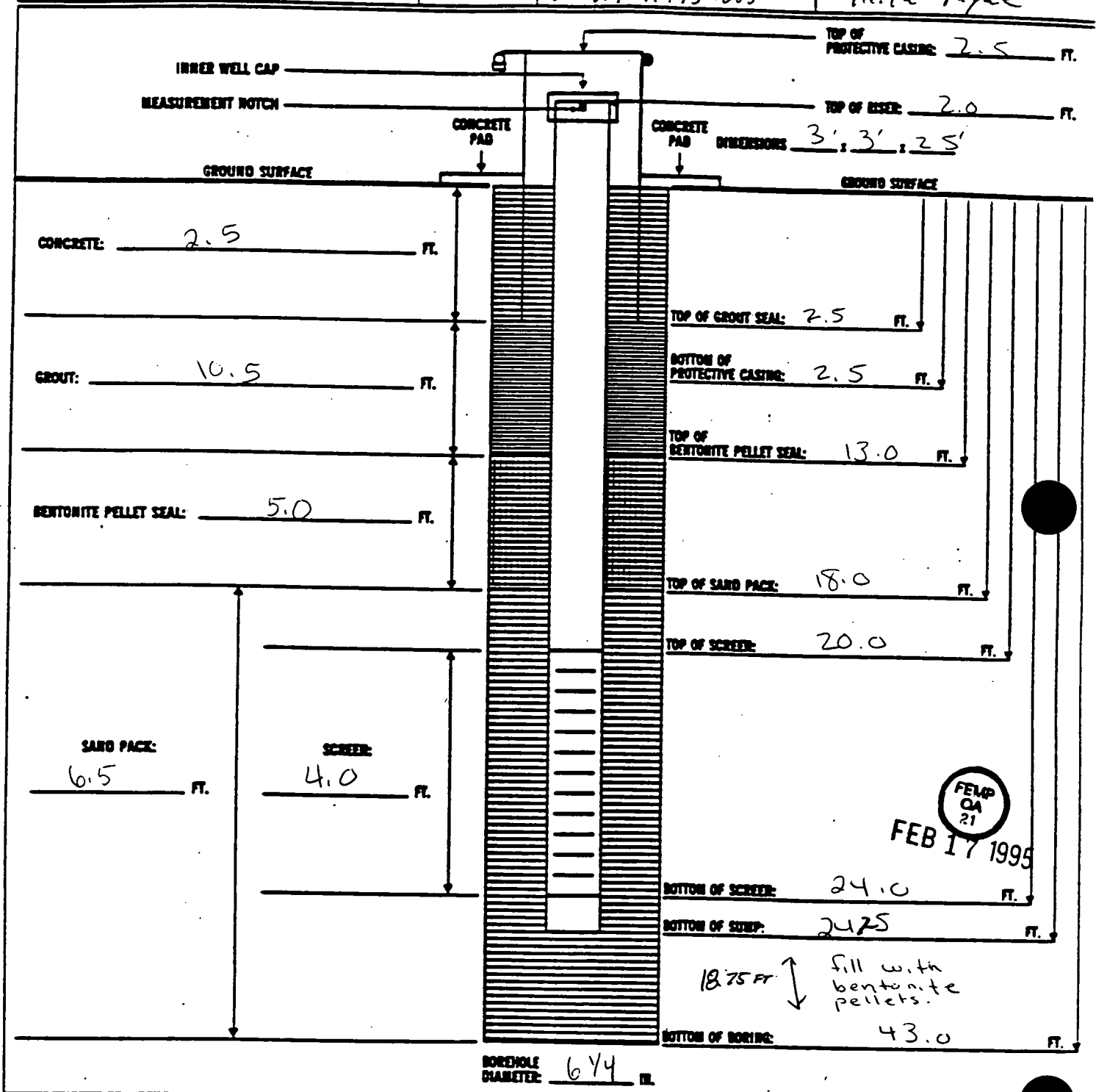
RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
Sch 40	Global # 5 G-25	Stainless steel	6¼ IN.
RISER/SCREEN DIAMETER:	SCREEN SLOT SIZE:	SCREEN TYPE:	DEPTH OF CENTRALIZER(S):

000813

811

WELL NUMBER: 11493	FEMP WELL COMPLETION LOG	CONTROL NUMBER: 200307-11493-019

PROJECT NAME: CRU2 Predesign Field Investigation
PROJECT NUMBER: 20.03.07
GEOLOGIST: K. Geiger
DRILLING METHOD: Rotasonic
DATES OF INSTALLATION: 12-21-94
WATER LEVEL (ft): N/A
DATE:
RELATED FAL NUMBERS: 200307-11493-004 and 200307-11493-005
CHECKED BY: Keith Payne



FEMP QA 21 FEB 17 1995

TYPE AND AMOUNT OF GROUT USED: Vol clay 50 lb.	BENTONITE PELLETS (5-GALLON BUCKETS): 250 lb.	DEEPEST TEMPORARY DRILLING CASING PENETRATION: 43.0 FT.
VOLUME OF WATER USED DURING DRILLING: 12.8 GAL	RISER MATERIAL: 316 stainless steel	VOLUME OF WATER USED FOR GROUT HYDRATION: 25 GAL
RISER WALL THICKNESS: Sch 40	TYPE OF SAND PACK: Global #5 G-26	SCREEN MATERIAL: 316 stainless steel
DRILLING CASING DIAMETER: 6 1/4 IN.	RISER/SCREEN DIAMETER:	SCREEN SLOT SIZE:
SCREEN TYPE:	DEPTH OF CENTRALIZER(S):	

000814

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11494

CONTROL NUMBER: 200307-11494-010

PROJECT NAME: OU2 PRE-DESIGN FIELD INVESTIGATION

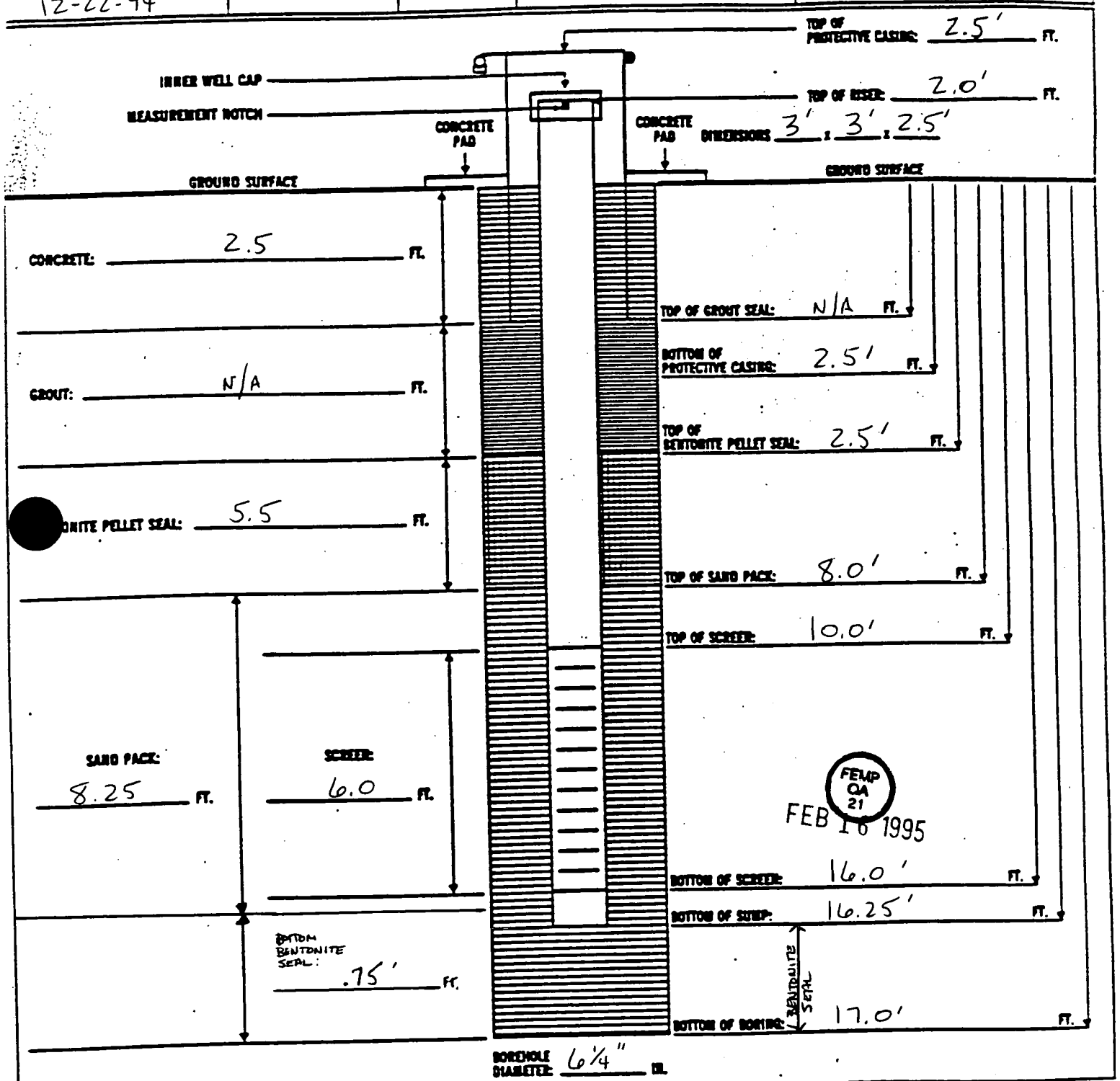
PROJECT NUMBER: 20.03.07

[redacted]ST: GEIGER / RILEY

DRILLING METHOD: ROTOSONIC

DATES OF INSTALLATION: 12-22-94

WATER LEVEL (R.L): | DATE: | RELATED FAL NUMBERS: | CHECKED BY:



[redacted]UND AMOUNT OF GROUT USED: N/A	BENTONITE PELLETS (5-GALLON BUCKETS): 100 lbs / NO WATER USED	DEEPEST TEMPORARY DRILLING CASING PENETRATION: 17.0 FT.
VOLUME OF WATER USED DURING DRILLING: 25 GAL	RISER MATERIAL: 3/16 STAINLESS STEEL	VOLUME OF WATER USED FOR GROUT HYDRATION: N/A GAL
RISER WALL THICKNESS: Schedule 40	TYPE OF SAND PACK: 20/10	SCREEN MATERIAL: STAINLESS STEEL
		DRILLING CASING DIAMETER: 6¼ IN.
RISER/SCREEN DIAMETER:	SCREEN SLOT SIZE:	SCREEN TYPE: SCREW TYPE
		DEPTH OF CENTRALIZER(S): N/A FT.

G-27

000815

WELL NUMBER: 11495

FEMP
WELL COMPLETION LOG

FEMP QA 18

CONTROL NUMBER: 200307-11495-029

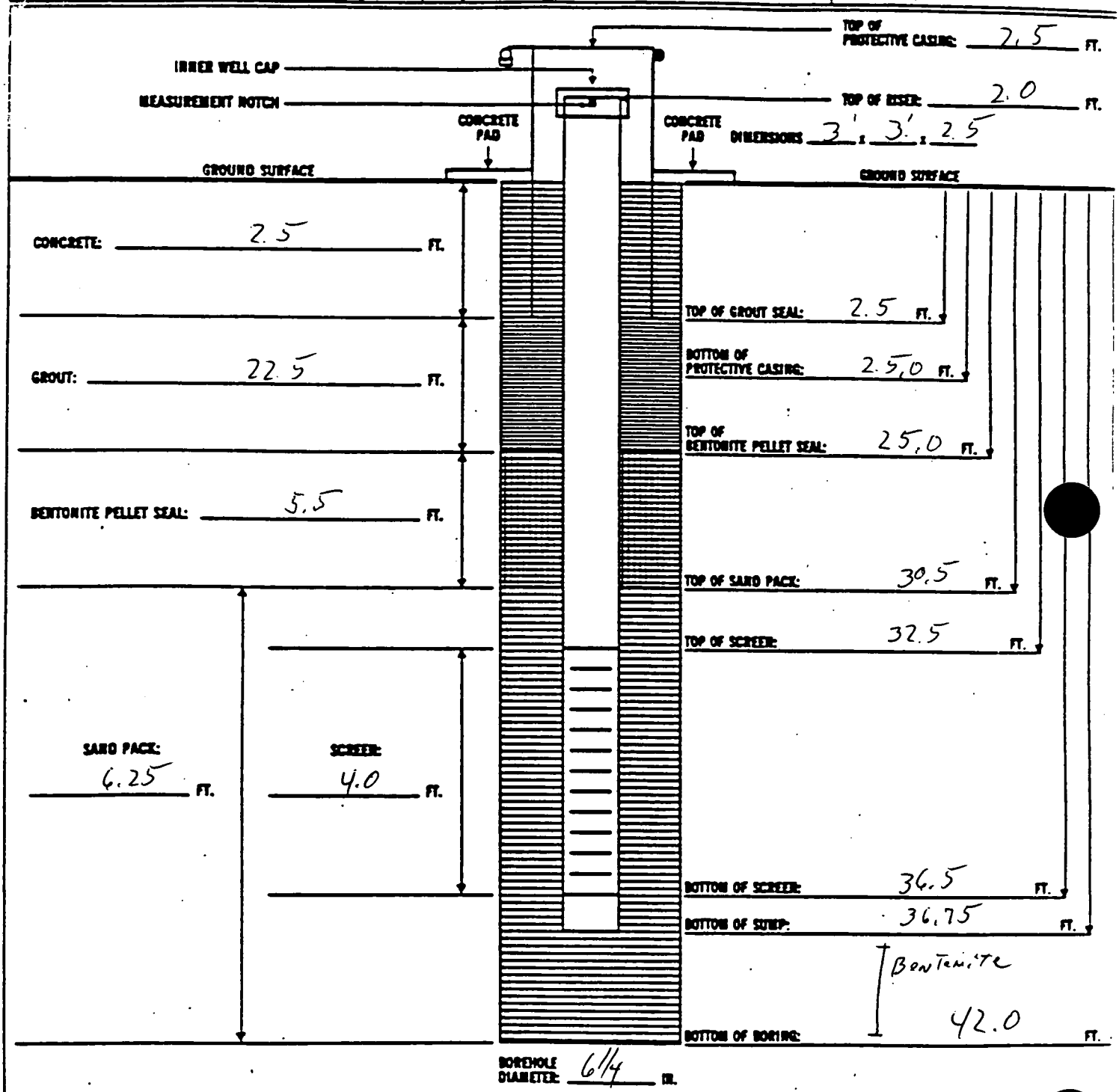
PROJECT NAME: Cruz Pre Design Field Investigation

PROJECT NUMBER: 20.03.07

GEOLOGIST: Kim Geiger

DRILLING METHOD: Rotosonic

DATES OF INSTALLATION:	WATER LEVEL (R.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12-22-94	NA	NA	NA	NA



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING P[illegible]IC
Volclay 85lbs	100lbs	42.0 F
VOLUME OF WATER USED DURING DRILLING:	**RISER MATERIAL:**	**VOLUME OF WATER USED FOR GROUT HYDRATION:**
~~13.6~~ 2.13 gal 14.0 GAL	316 Stainless Steel	42 GA

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
316 Stainless Steel	#56 Colorsal	Stainless Steel	6 1/4 I
RISER/SCREEN DIAMETER:	**SCREEN SLOT SIZE:**	**SCREEN TYPE:**	**DEPTH OF CENTRALIZER(S):**
2.0 IN	.010 IN	Flush Screw Type Stainless Steel	NA F

000816

Field copy

~~1-30~~ 1-7 118

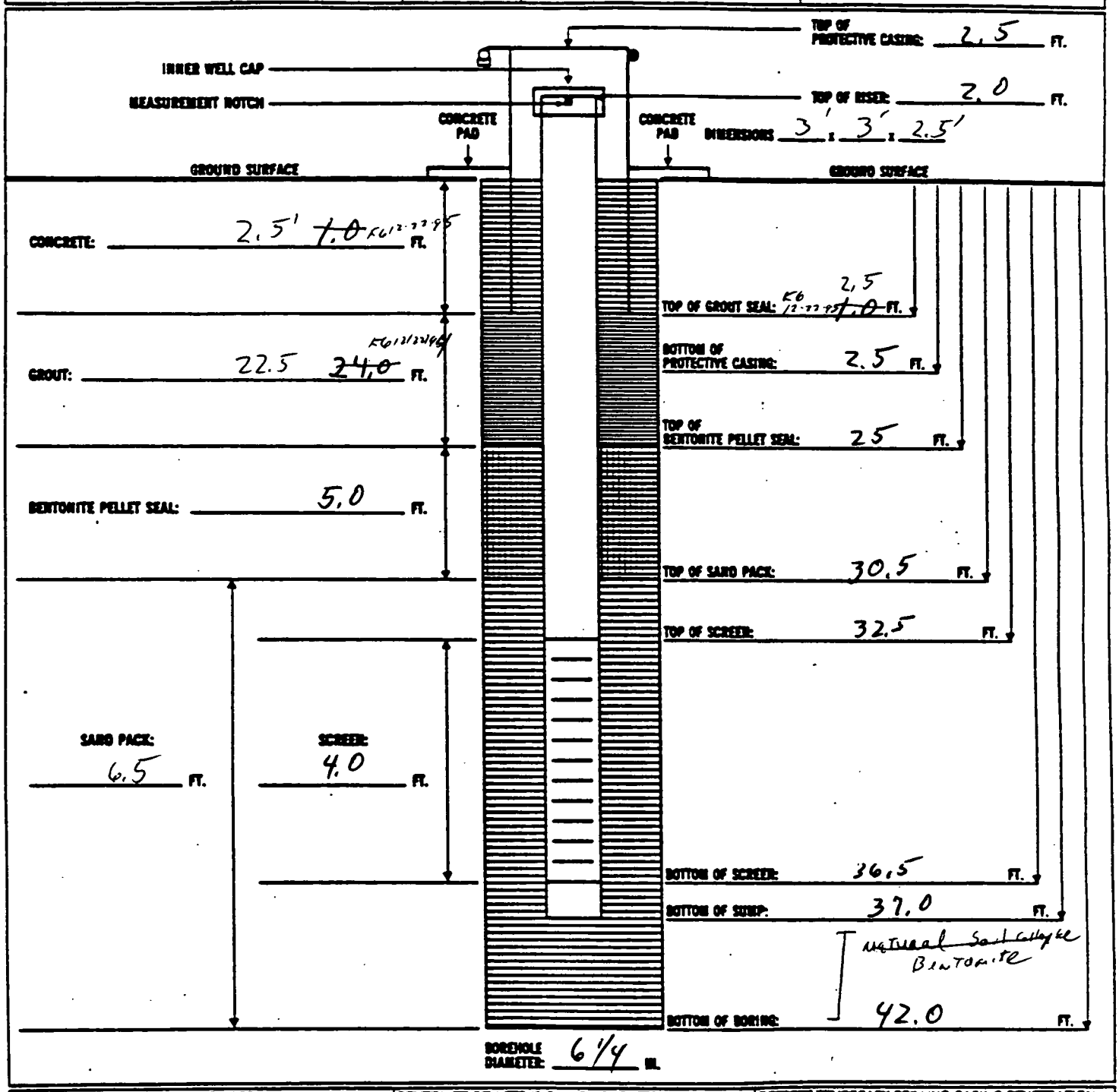
FEMP WELL COMPLETION LOG

WELL NUMBER:	CONTROL NUMBER:
11495	200307-11495-030

PROJECT NAME:	PROJECT NUMBER:
OU2 Pre-Design	20.03.04

GEOLOGIST:	DRILLING METHOD:
Geiger / Riley	Rotosonic

DATES OF INSTALLATION:	WATER LEVEL (R.L):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12-22-94				



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION:
Volclay 85 lbs	100 lbs	42.0 FT.

VOLUME OF WATER USED DURING DRILLING:	RISER MATERIAL:	VOLUME OF WATER USED FOR GROUT HYDRATION:
13.6 ~~60~~ gal 1/3/95 GAL	Stainless Steel	42 gal GAL

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
Sch 40	20/10 Sand G-29	Stainless Steel	6 1/4 IN.

RISER/SCREEN DIAMETER:	SCREEN SLOT SIZE:	SCREEN TYPE:	DEPTH OF CENTRALIZER(S):
2.0 IN.	10 slot .010 IN.	Stainless Steel Flush Screw Type	NA FT.

FS-F-3684 (9/10/93)

SEE REVISED WELL COMPLETION LOG - GW-200307-11495-029

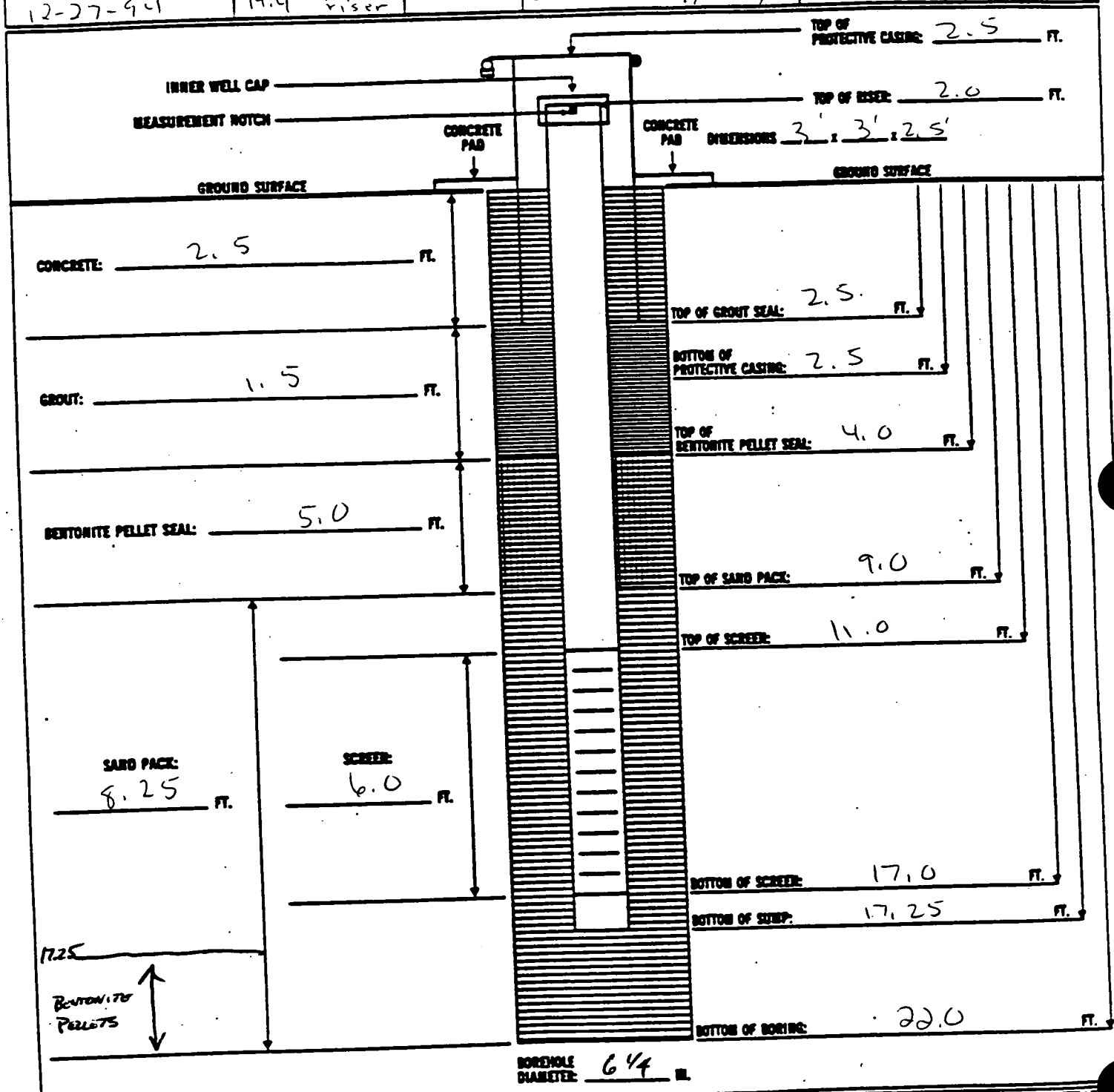
000817

311

FEMP QA 19 2-14-95

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11496	CONTROL NUMBER: 200307-11496-013
PROJECT NAME: CRU2 Predesign Field Investigation	PROJECT NUMBER: 20.03.07
GEOLOGIST: Geiger / Riley	DRILLING METHOD: Rotosonic
DATES OF INSTALLATION: 12-27-94	WATER LEVEL (R.I.): 19.4 top of riser; DATE: 12-27-94
RELATED FAL NUMBERS: 200307-11496-004	CHECKED BY: KP 2-12-95



TYPE AND AMOUNT OF GROUT USED: Volclay 16 lbs.	BENTONITE PELLETS (5-GALLON BUCKETS): 125 lb.	DEEPEST TEMPORARY DRILLING CASING PENETRATION: 22.0 FT.
VOLUME OF WATER USED DURING DRILLING: 7.7 GAL	RISER MATERIAL: Stainless steel	VOLUME OF WATER USED FOR GROUT HYDRATION: 5 GAL
RISER WALL THICKNESS: Sch 40	TYPE OF SAND PACK: Global #5	SCREEN MATERIAL: Stainless steel 316
SCREEN TYPE:		DRILLING CASING DIAMETER: 6 1/4 IN.
		DEPTH OF CENTRALIZER(S):

000818

G-30

Pg. 12 of 12 118

FEMP QA 13

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11497

CONTROL NUMBER: 200307-11497-016

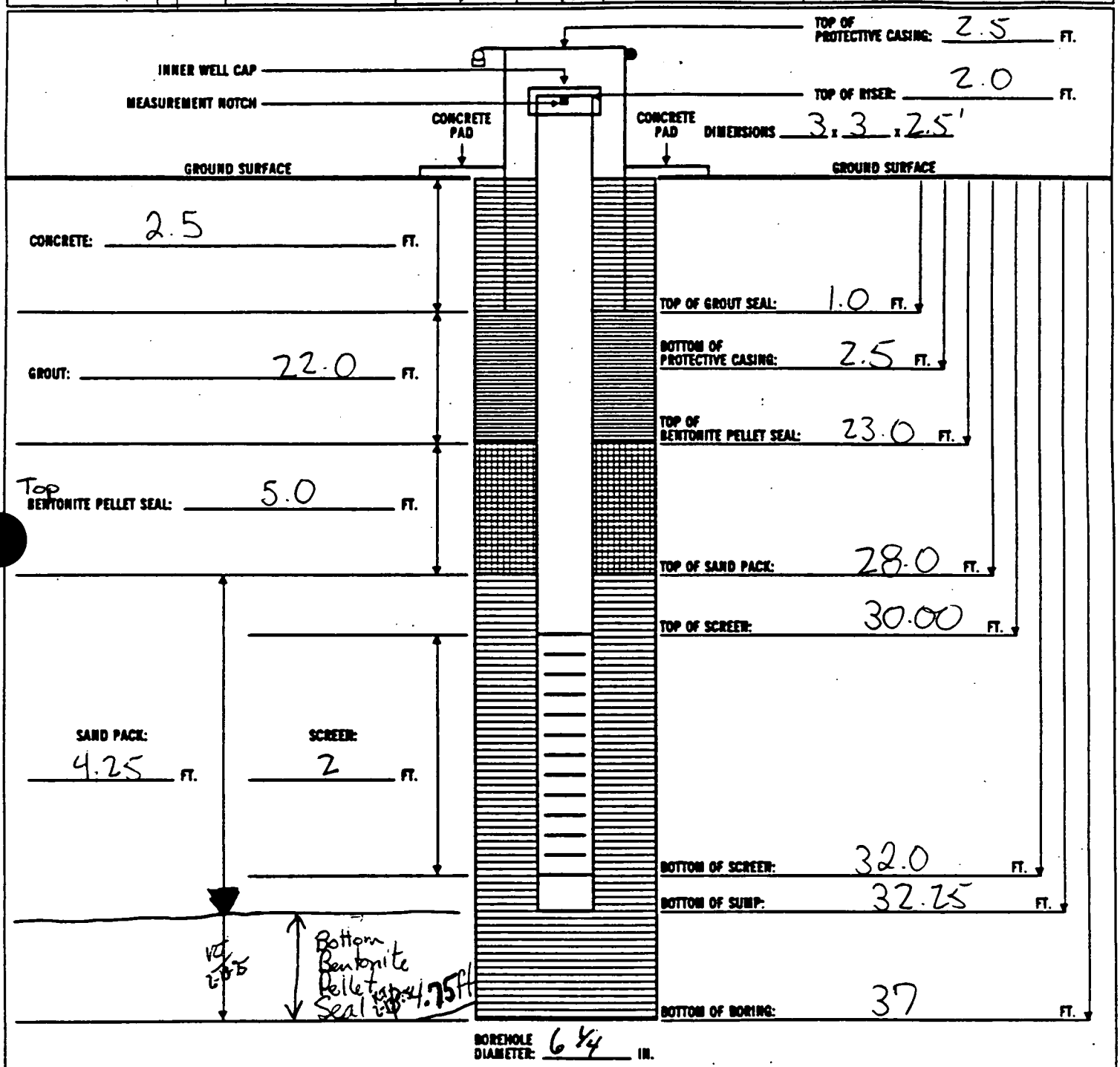
PROJECT NAME: OU2 Pre-Design Field Investigation

PROJECT NUMBER: 20.03.07

GEOLOGIST: Geiger/Reilly

DRILLING METHOD: Rotosonic

DATES OF INSTALLATION:	WATER LEVEL (ft.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12-27-94	NA	NA	NA	NA



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION:
40 lbs Volclay		37.0 FT.
VOLUME OF WATER USED DURING DRILLING:	**RISER MATERIAL:**	**VOLUME OF WATER USED FOR GROUT HYDRATION:**
13 GAL.	Stainless Steel	~~12.8~~ 13.0 GAL.

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
sch 40	20/10 Global #5	Stainless Steel	6 1/4 IN.
RISER/SCREEN DIAMETER:	**SCREEN SLOT SIZE:**	**SCREEN TYPE:**	**DEPTH OF CENTRALIZER(S):**
2.0 IN.	10 slot IN.	Flush Screw Type Stainless Steel	N/A FT.

FS-F-3684 (9/10/93)

000819

811

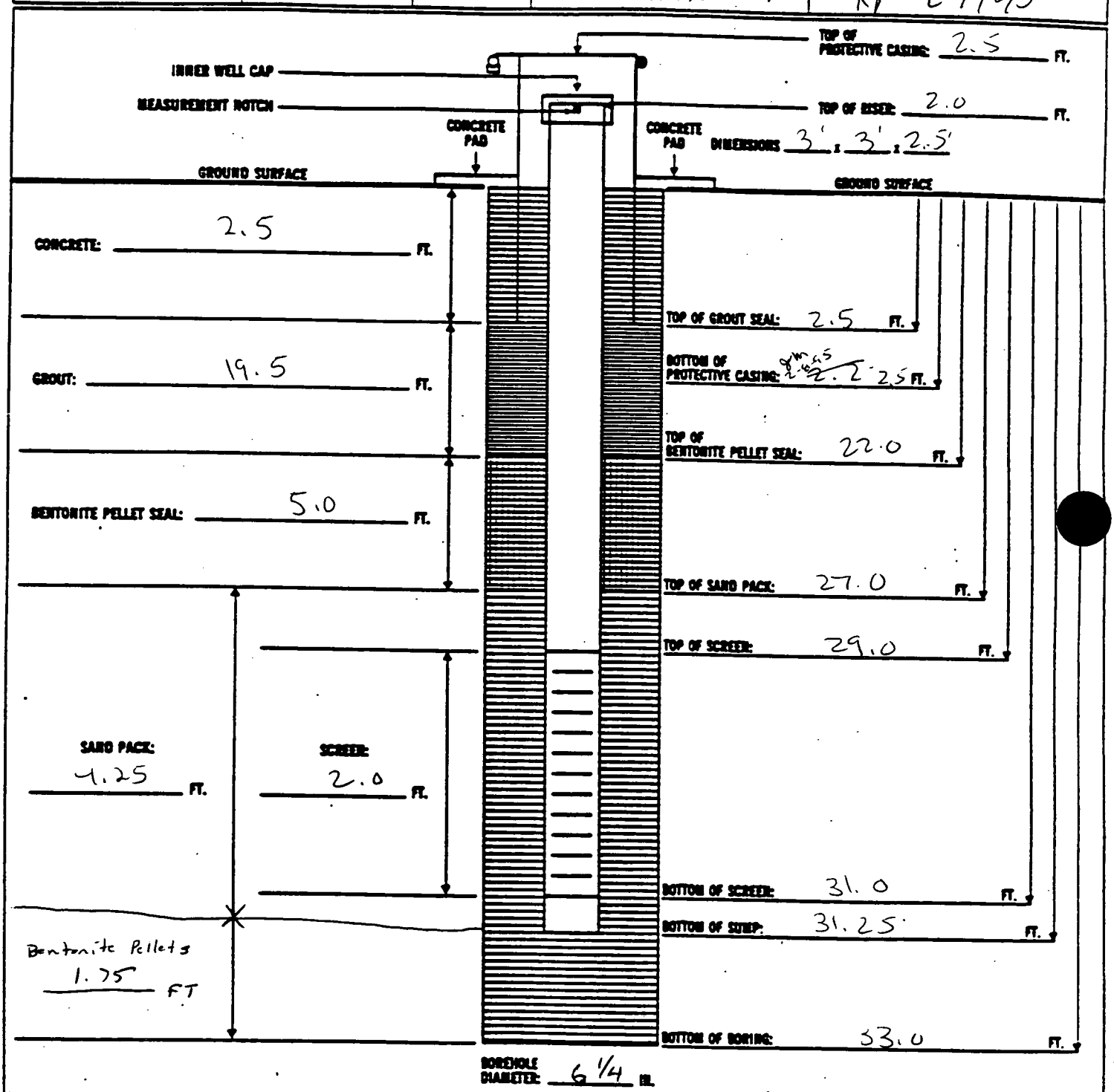
11 of 11

200307-11498.015

FEMP OA 13

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11498	CONTROL NUMBER: ~~200307-11498.026~~
PROJECT NAME: OU2 Predesign Field Investigation	PROJECT NUMBER: 20.03.07
GEOLOGIST: Geiger / Riley	DRILLING METHOD: Roto Sonic
DATES OF INSTALLATION: 12-28-94	WATER LEVEL (R.L): DATE:
RELATED FAL NUMBERS: 200307-11498-004	CHECKED BY: KP 2-14-95



TYPE AND AMOUNT OF GROUT USED: Vol Clay 80 lbs.	BENTONITE PELLETS (5-GALLON BUCKETS): 125 lb	DEEPEST TEMPORARY DRILLING CASING PENETRA: 33.0
VOLUME OF WATER USED DURING DRILLING: 12 GAL	RISER MATERIAL: 316 Stainless Steel	VOLUME OF WATER USED FOR GROUT HYDRATION: 40 GAL
RISER WALL THICKNESS: Sch 40	TYPE OF SAND PACK: Global #5	SCREEN MATERIAL: 316 Stainless Steel	DRILLING CASING DIAMETER: 6 1/4 IN.
RISER/SCREEN DIAMETER: 2.0 IN.	SCREEN SLOT SIZE: .010 IN	SCREEN TYPE: Flush threaded	DEPTH OF CENTRALIZER(S): N.A FT.

G-32

000820

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11499

CONTROL NUMBER: 200307-11499-012

PROJECT NAME: OU2 Pre-Design Field Investigation

PROJECT NUMBER: 20.03.07

GEOLOGIST: Ken Geiser

DRILLING METHOD: Rotosonic

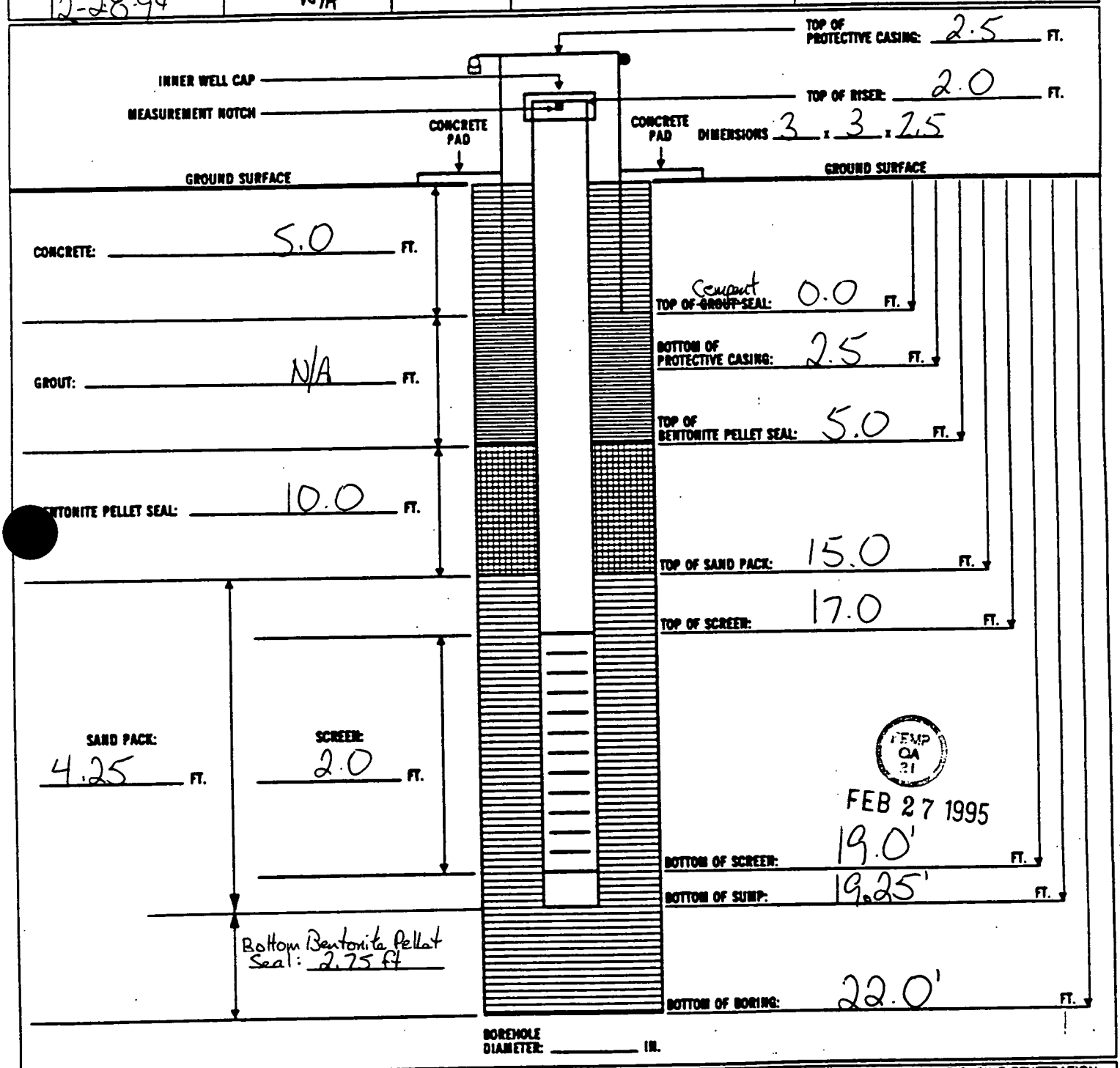
DATES OF INSTALLATION: 12-28-94

WATER LEVEL (ft.): N/A

DATE:

RELATED FAL NUMBERS:

CHECKED BY:



TYPE AND AMOUNT OF GROUT USED: N/A	BENTONITE PELLETS (5-GALLON BUCKETS): 100 lb	DEEPEST TEMPORARY DRILLING CASING PENETRATION: 22.0 FT.
VOLUME OF WATER USED DURING DRILLING: 6 GAL	RISER MATERIAL: 3/16 stainless steel	VOLUME OF WATER USED FOR GROUT HYDRATION: N/A GAL.
RISER WALL THICKNESS: sch 40	TYPE OF SAND PACK: 20/10	SCREEN MATERIAL: stainless steel
DRILLING CASING DIAMETER: 6.25 IN.	RISER/SCREEN DIAMETER: 2.0 IN.	SCREEN SLOT SIZE: 10 slot
SCREEN TYPE: Flush screw type	DEPTH OF CENTRALIZER(S): N/A FT.	

FS-F-3684 (9/10/93)

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11500

CONTROL NUMBER: 200307-11500-020

PROJECT NAME: OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NUMBER: 20.03.07

GEOLOGIST: KEN GEIGER / PAT RILEY

DRILLING METHOD: ROTOSONIC

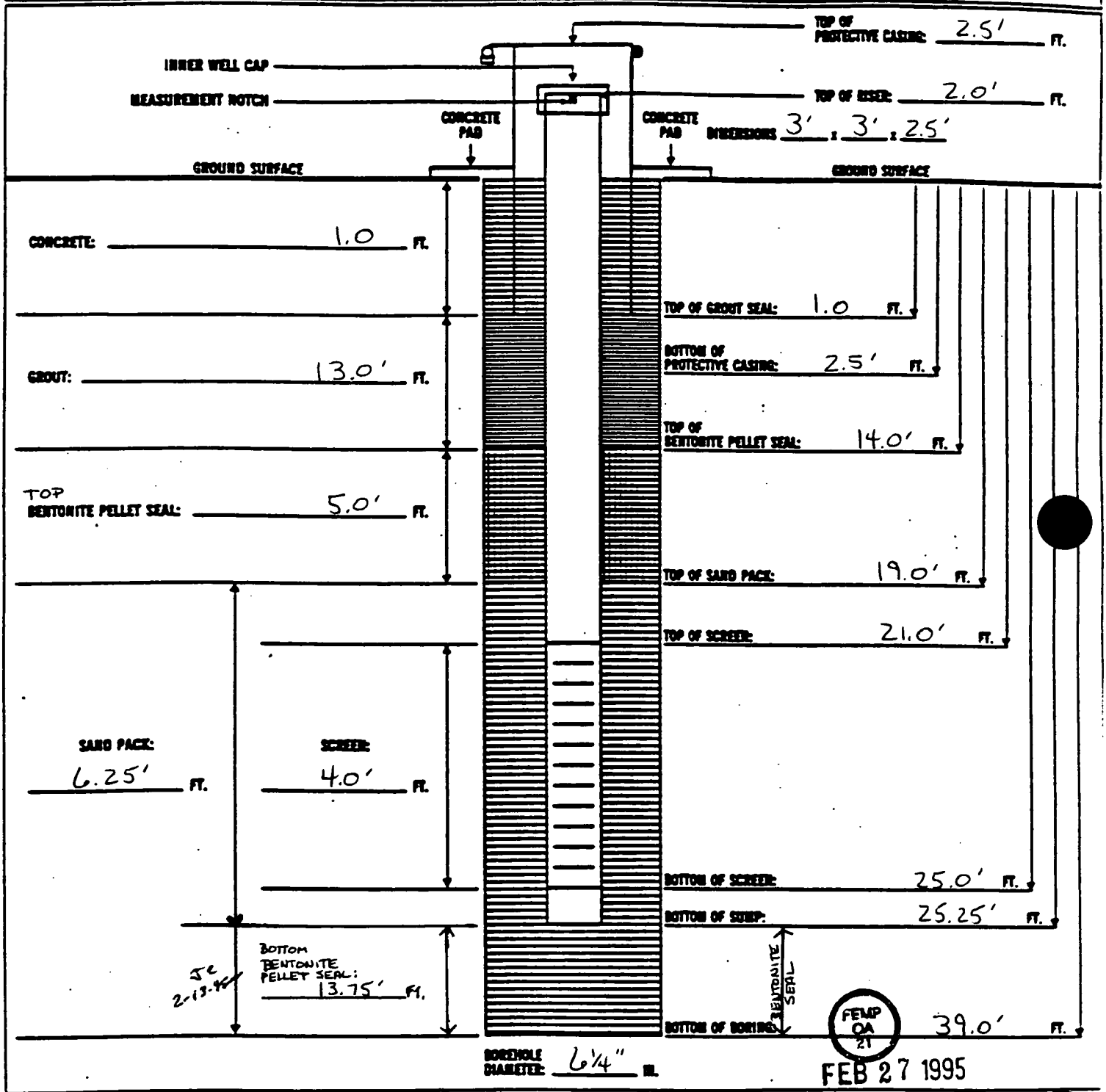
DATES OF INSTALLATION: 12-20-94

WATER LEVEL (R.): N/A

DATE:

RELATED FAL NUMBERS:

CHECKED BY:



FEMP QA 21
FEB 27 1995

TYPE AND AMOUNT OF GROUT USED: VOLCLAY — 60 lbs	BENTONITE PELLETS (5-GALLON BUCKETS): 75 lbs	DEEPEST TEMPORARY DRILLING CASING PENETRATION: 39.0'
VOLUME OF WATER USED DURING DRILLING: 12 gal. GAL	RISER MATERIAL: STAINLESS STEEL	VOLUME OF WATER USED FOR GROUT HYDRATION: 30.0 GAL
RISER WALL THICKNESS: Schedule 40	TYPE OF SAND PACK: 150 LBS 10/20 = Global #5	SCREEN MATERIAL: STAINLESS STEEL
DRILLING CASING DIAMETER: 6¼ IN.	RISER/SCREEN DIAMETER: 2.0 IN.	SCREEN SLOT SIZE: .010"
SCREEN TYPE: SCREW-TYPE FLUSH MOUNT	DEPTH OF CENTRALIZER(S): N/A FT.	

000822

200307-11501-017 KP 118

2-14-95 ~~13 of 13~~

WELL NUMBER: 11501

FEMP
WELL COMPLETION LOG

KP 2-14-95

CONTROL NUMBER: ~~200307-11501-018~~

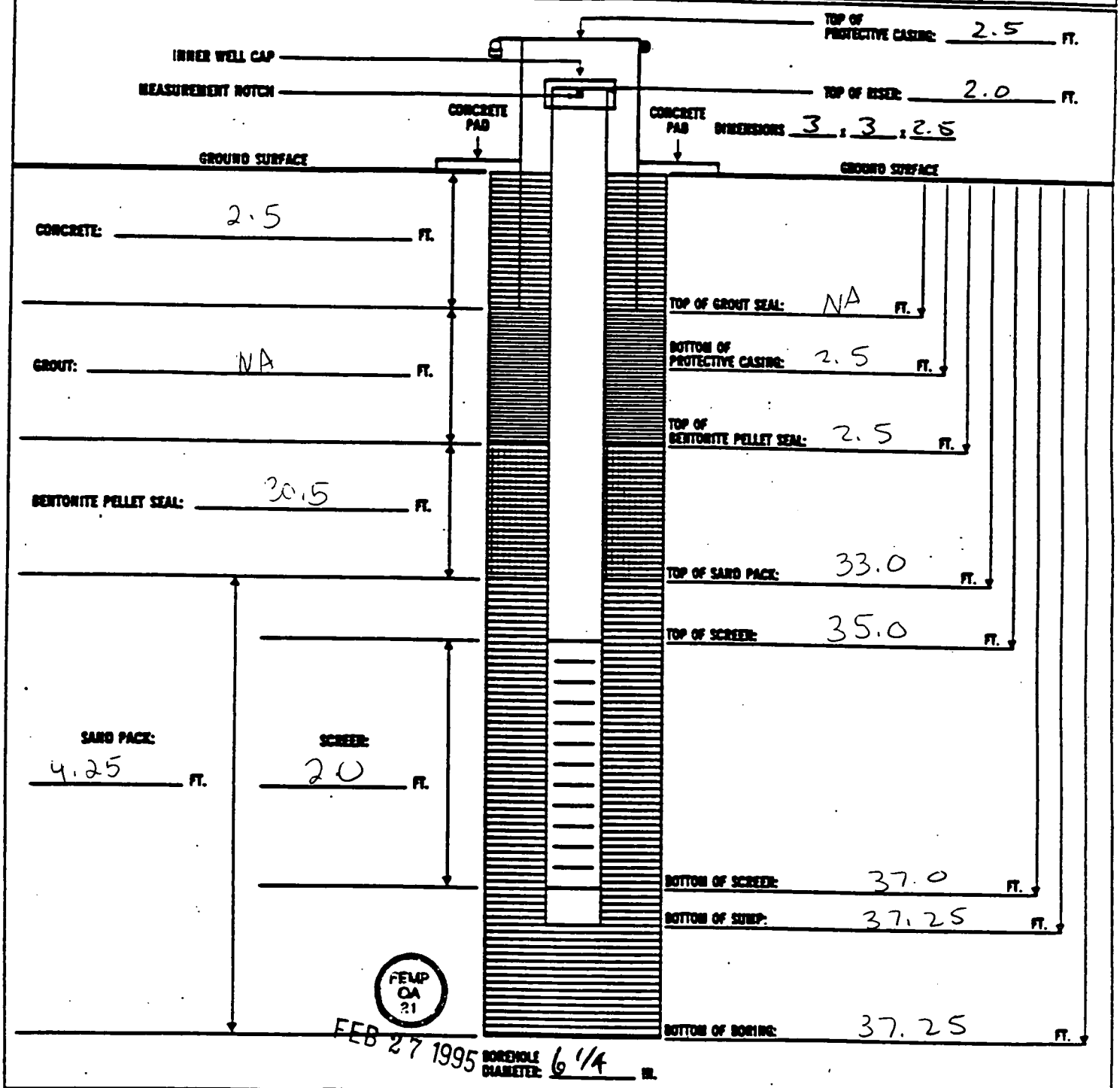
PROJECT NAME: CRUZ Predesign Field Investigation

PROJECT NUMBER: 20.03.07

GEOLOGIST: K. Geiger

DRILLING METHOD: Rotosonic

DATES OF INSTALLATION:	WATER LEVEL (R.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12-30-94	N/A	N/A	200307-11501-004	Kathi Payne



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION:
NA	250 lbs.	37.25 FT.
VOLUME OF WATER USED DURING DRILLING:	RISER MATERIAL:	VOLUME OF WATER USED FOR GROUT HYDRATION:
120 GAL.	316 stainless steel	NA GAL.

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
sch 40	Global #5	316 Stainless steel	6 1/4 IN.
RISER/SCREEN DIAMETER:	SCREEN SLOT SIZE:	SCREEN TYPE:	DEPTH OF CENTRALIZER(S):
2.0 IN.	.010 IN	flush screw	N/A FT.

G-35

000823

WELL NUMBER: 11502 B

FEMP
WELL COMPLETION LOG

CONTROL NUMBER: 200307-11502B-015

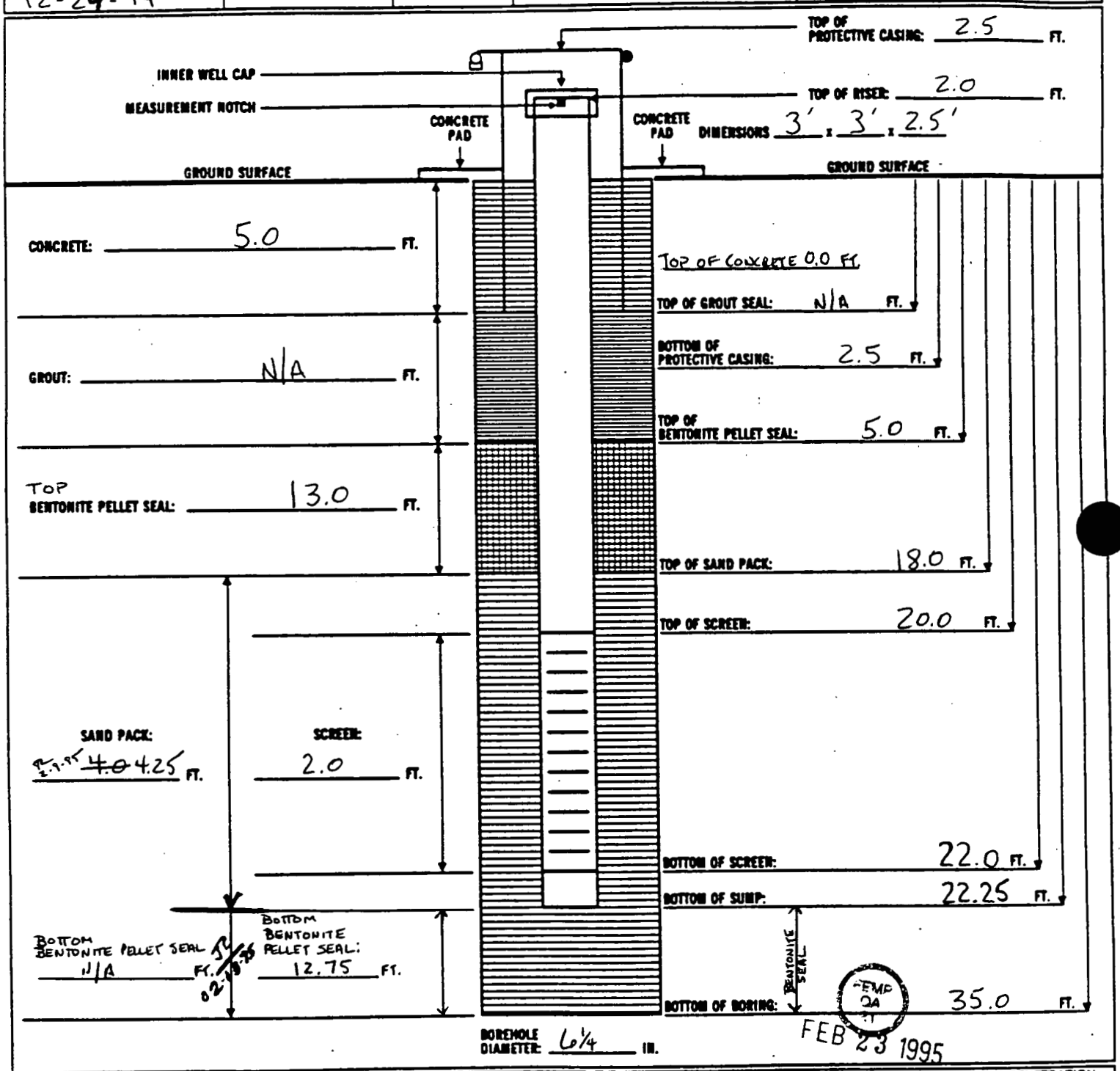
PROJECT NAME: OU2 PRE-DESIGN FIELD INVESTIGATION

PROJECT NUMBER: 20.03.07

GEOLOGIST: Ken Geiger

DRILLING METHOD: Rotosonic

DATES OF INSTALLATION:	WATER LEVEL (ft.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12-29-94	N/A	N/A	N/A	N/A



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION:
N/A	200 lbs	35.0 FT.

VOLUME OF WATER USED DURING DRILLING:	RISER MATERIAL:	VOLUME OF WATER USED FOR GROUT HYDRATION:
14.0 GAL	25 FT 3/4 STAINLESS STEEL	N/A GAL

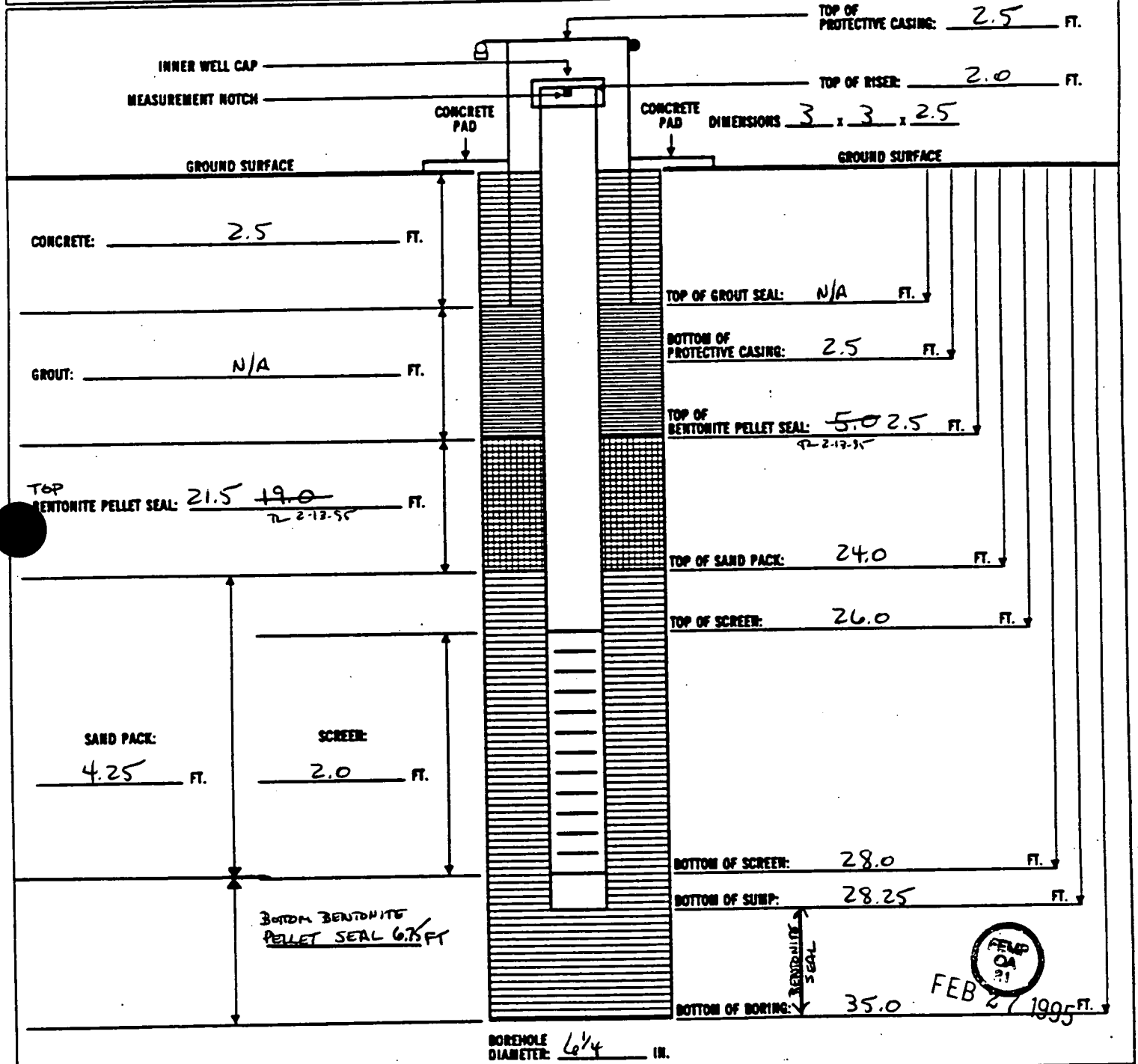
RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
Schedule 40	20/10 = Global #5	STAINLESS STEEL	6¼ IN.
RISER/SCREEN DIAMETER:	**SCREEN SLOT SIZE:**	**SCREEN TYPE:**	**DEPTH OF CENTRALIZER(S):**
2.0	.010 10 SLOT	SCREW TYPE FLUSH MOUNT	N/A FT.

FS-F-3684 (9/10/93)

000824

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11503	CONTROL NUMBER: 200307-11503-015
PROJECT NAME: CRU PRE-DESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
LOGGIST: REN GEIGER	DRILLING METHOD: ROTOSONIC
DATES OF INSTALLATION: 12-29-94	WATER LEVEL (ft.): DATE:
RELATED FAL NUMBERS: 200307-11503-004	CHECKED BY: KP 2-14-95



TYPE AND AMOUNT OF GROUT USED: N/A	BENTONITE PELLETS (5-GALLON BUCKETS): 250 LBS	DEEPEST TEMPORARY DRILLING CASING PENETRATION: 35.0 FT.
VOLUME OF WATER USED DURING DRILLING: 17.0 GAL	RISER MATERIAL: 3/16 STAINLESS STEEL	VOLUME OF WATER USED FOR GROUT HYDRATION: N/A GAL
RISER WALL THICKNESS: Schedule 40	TYPE OF SAND PACK: Global #5	SCREEN MATERIAL: STAINLESS STEEL
DRILLING CASING DIAMETER: 6¼" IN.	RISER/SCREEN DIAMETER: 2.0" I.D. IN.	SCREEN SLOT SIZE: .010"
SCREEN TYPE: screw type-flush thread	DEPTH OF CENTRALIZER(S): N/A FT.	

G-37

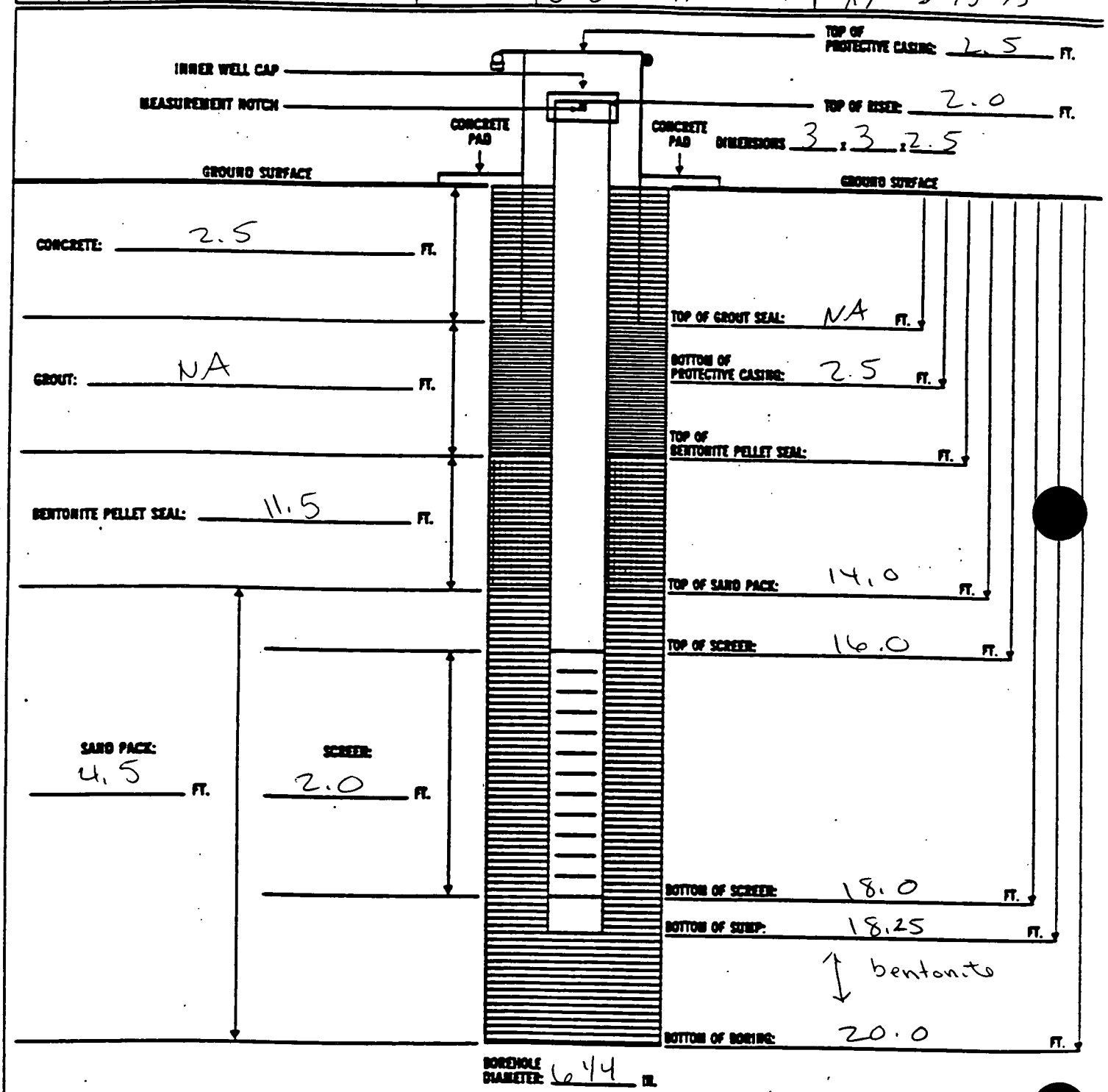
KP 2-14-95

FS-F-3684 (9/10/93)

2-23-95

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11504	CONTROL NUMBER: 200307-11504-011
PROJECT NAME: -Cruz Predesign Field Investigation	PROJECT NUMBER: 20.03.07
GEOLOGIST: K. Geiger	DRILLING METHOD: Roto Sonic
DATES OF INSTALLATION: 1/3/95	WATER LEVEL (ft.): DATE:
RELATED FAL NUMBERS: 200307-11504-004	CHECKED BY: KP 2-13-95



TYPE AND AMOUNT OF GROUT USED: NA	BENTONITE PELLETS (5-GALLON BUCKETS): 150 lb.	DEEPEST TEMPORARY DRILLING CASING PENE: 20.0 FT.
VOLUME OF WATER USED DURING DRILLING: 6 GAL	RISER MATERIAL: 316 Stainless Steel	VOLUME OF WATER USED FOR GROUT HYDRATION: NA GAL
RISER WALL THICKNESS: Sch 40	TYPE OF SAND PACK: Global #5	SCREEN MATERIAL: 316 Stainless Steel	DRILLING CASING DIAMETER: 6 1/4 IN.
RISER/SCREEN DIAMETER: 2.0 IN.	SCREEN SLOT SIZE: .010	SCREEN TYPE: flush screw type	DEPTH OF CENTRALIZER(S): N/A

G-38

000826

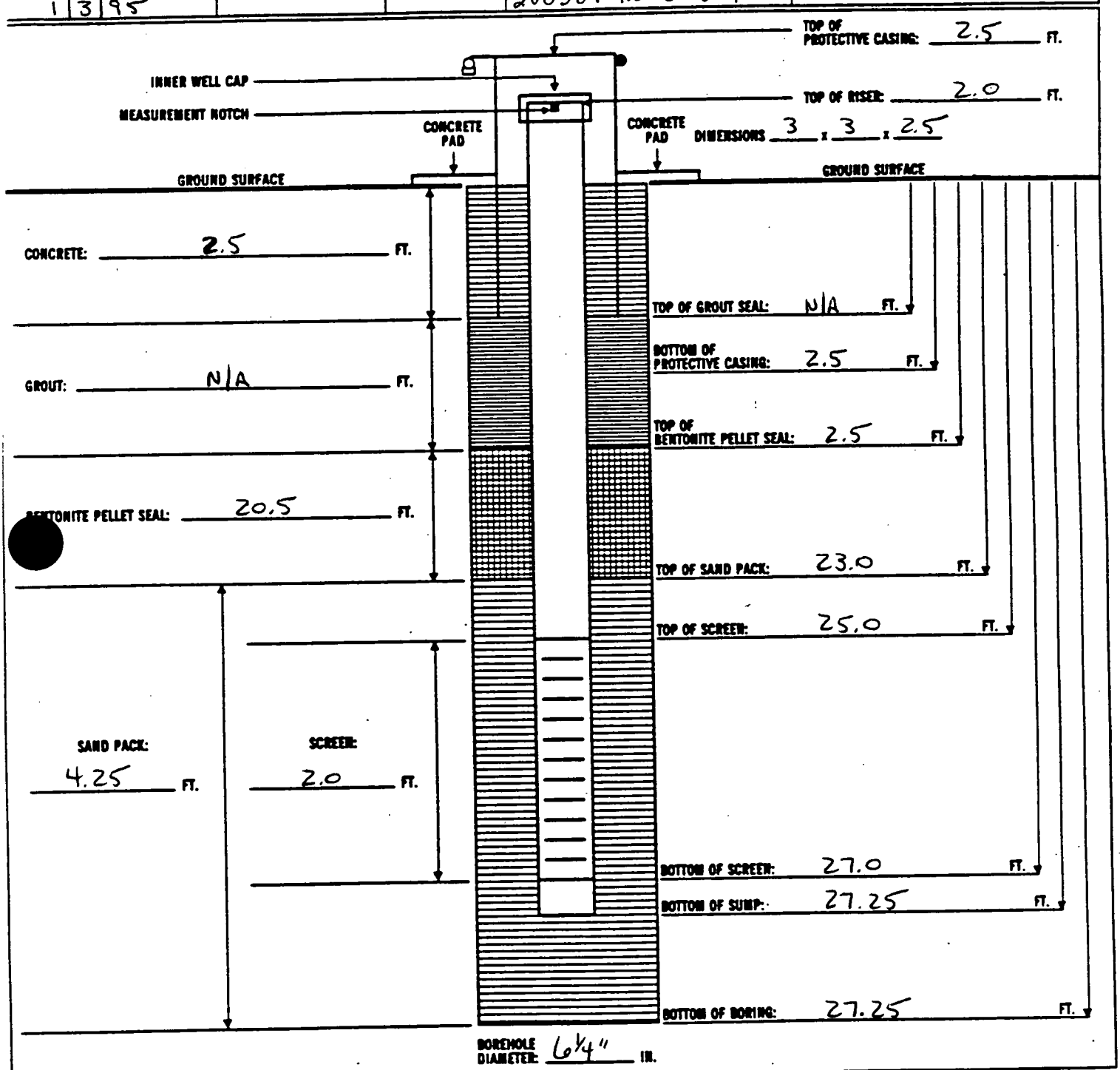
2-18-95 FEMP SA

1 of 2

118

FEMP
WELL COMPLETION LOG

WELL NUMBER: 11505	CONTROL NUMBER: 200307-11505-013
PROJECT NAME: OU 2 PREDESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
[redacted]T: [redacted]N GEIGER	DRILLING METHOD: ROTOSONIC
DATES OF INSTALLATION: 1/3/95	WATER LEVEL (ft.): DATE: RELATED FAL NUMBERS: 200307-11505-004 CHECKED BY:



TYPE AND AMOUNT OF GROUT USED: N/A	BENTONITE PELLETS (5-GALLON BUCKETS): 200 LBS	DEEPEST TEMPORARY DRILLING CASING PENETRATION: 27.25 FT.
[redacted]E OF WATER USED DURING DRILLING: 8.0 GAL	RISER MATERIAL: 3/16 STAINLESS STEEL	VOLUME OF WATER USED FOR GROUT HYDRATION: N/A GAL.
RISER WALL THICKNESS: Schedule 40	TYPE OF SAND PACK: Global #5	SCREEN MATERIAL: STAINLESS STEEL
RISER/SCREEN DIAMETER: 2.0" I.D. IN.	SCREEN SLOT SIZE: .010"	SCREEN TYPE: screw type/flush mount
DRILLING CASING DIAMETER: 6¼" IN.	DEPTH OF CENTRALIZER(S): N/A FT.	

G-39

FS-F-3684 (9/10/93)

000827

311

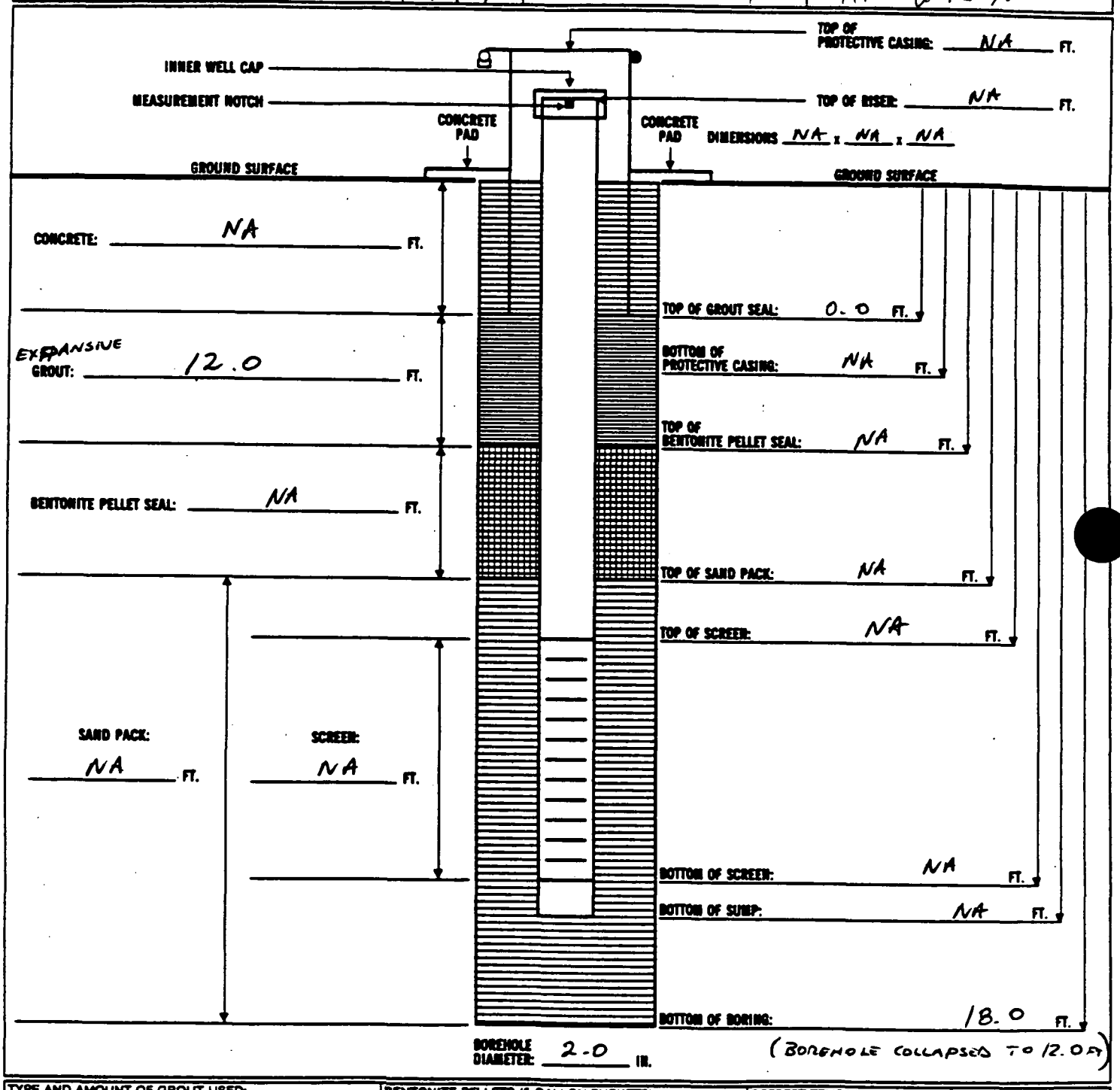
PAGE 4 OF 4

FEMP QA 18

WELL NUMBER: 11541	FEMP WELL COMPLETION LOG	CONTROL NUMBER: 200307-11544-008

PROJECT NAME: OU2 PRE-DESIGN INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: PATRICK RILEY	DRILLING METHOD: GEOPROBE

DATES OF INSTALLATION:	WATER LEVEL (ft.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12/22/94	11.8	12/22/94	200307-11544-004	KP 2-13-95



TYPE AND AMOUNT OF GROUT USED: EXPANSIVE K-TYPE 14 lbs	BENTONITE PELLETS (5-GALLON BUCKETS): NA	DEEPEST TEMPORARY DRILLING CASING PENETRATION: 18.0 FT.
VOLUME OF WATER USED DURING DRILLING: NONE GAL.	RISER MATERIAL: NA	VOLUME OF WATER USED FOR GROUT HYDRATION: 1.25 GAL.

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
NA	NA	NA	PR 12/22/94 ~~NA~~ 2.0 IN.
RISER/SCREEN DIAMETER: NA IN.	SCREEN SLOT SIZE: NA	SCREEN TYPE: NA	DEPTH OF CENTRALIZER(S): NA FT.

FS-F-3684 (9/10/93)

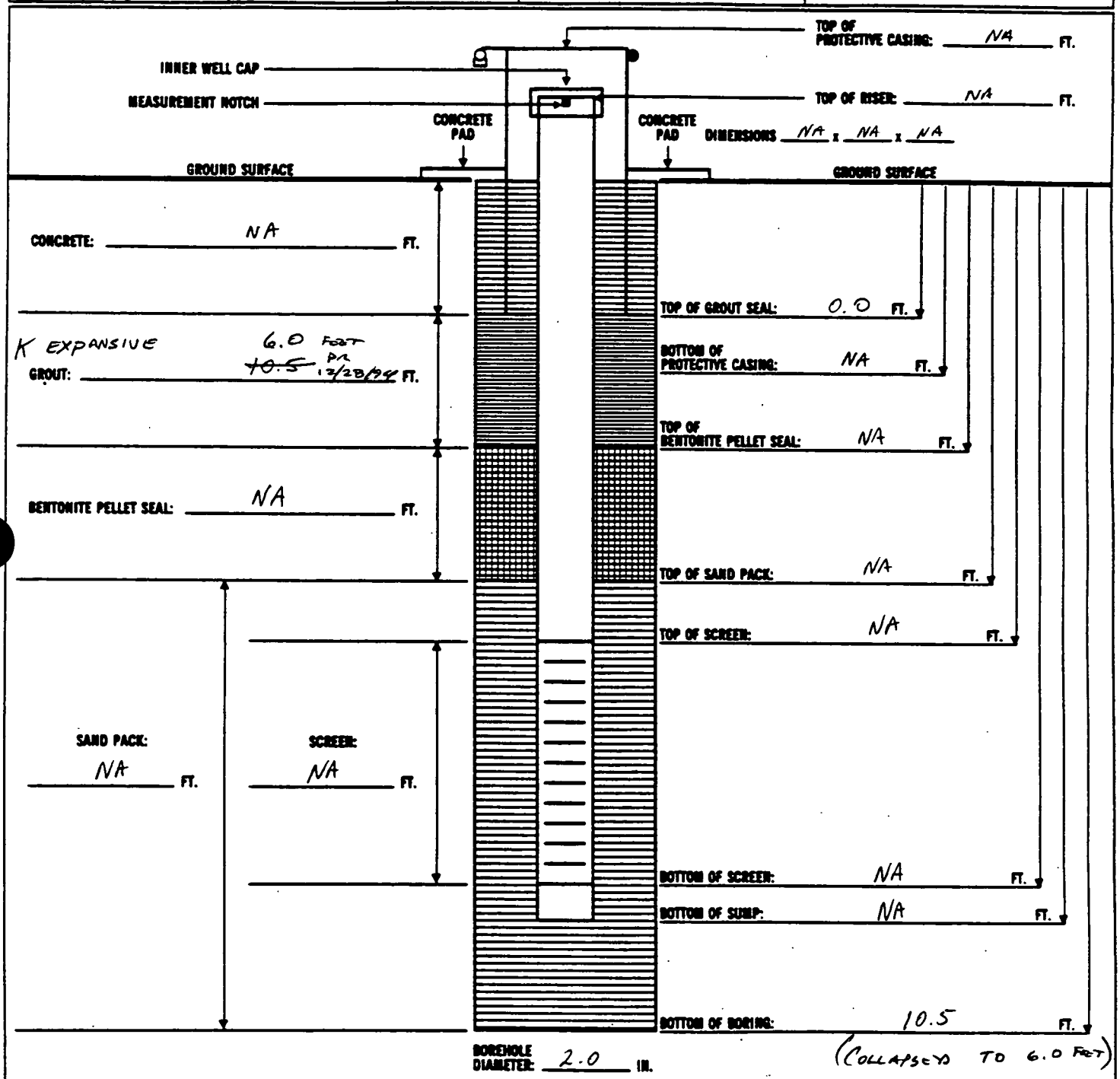
000828

118 PAGE 3 of 3

WELL NUMBER: 11542	FEMP WELL COMPLETION LOG	CONTROL NUMBER: 200307-11542-007

PROJECT NAME: PHASE I + II OF THE OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: PATRICK RILEY	DRILLING METHOD: GEOPROBE

DATES OF INSTALLATION:	WATER LEVEL (ft.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12/28/94	6.0	12/28/94	200307-11542-004	KP 2-13-95



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION:
EXPANSIVE K-TYPE 8 lbs.	NA	10.5 FT.
VOLUME OF WATER USED DURING DRILLING: NONE GAL	RISER MATERIAL: NA	VOLUME OF WATER USED FOR GROUT HYDRATION: 0.75 GAL

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
NA	NA	NA	NA IN.
RISER/SCREEN DIAMETER: NA IN.	SCREEN SLOT SIZE: NA	SCREEN TYPE: NA	DEPTH OF CENTRALIZER(S): NA FT.

FS-F-3684 (9/10/93)

FEMP QA 21

FEB 23 1995

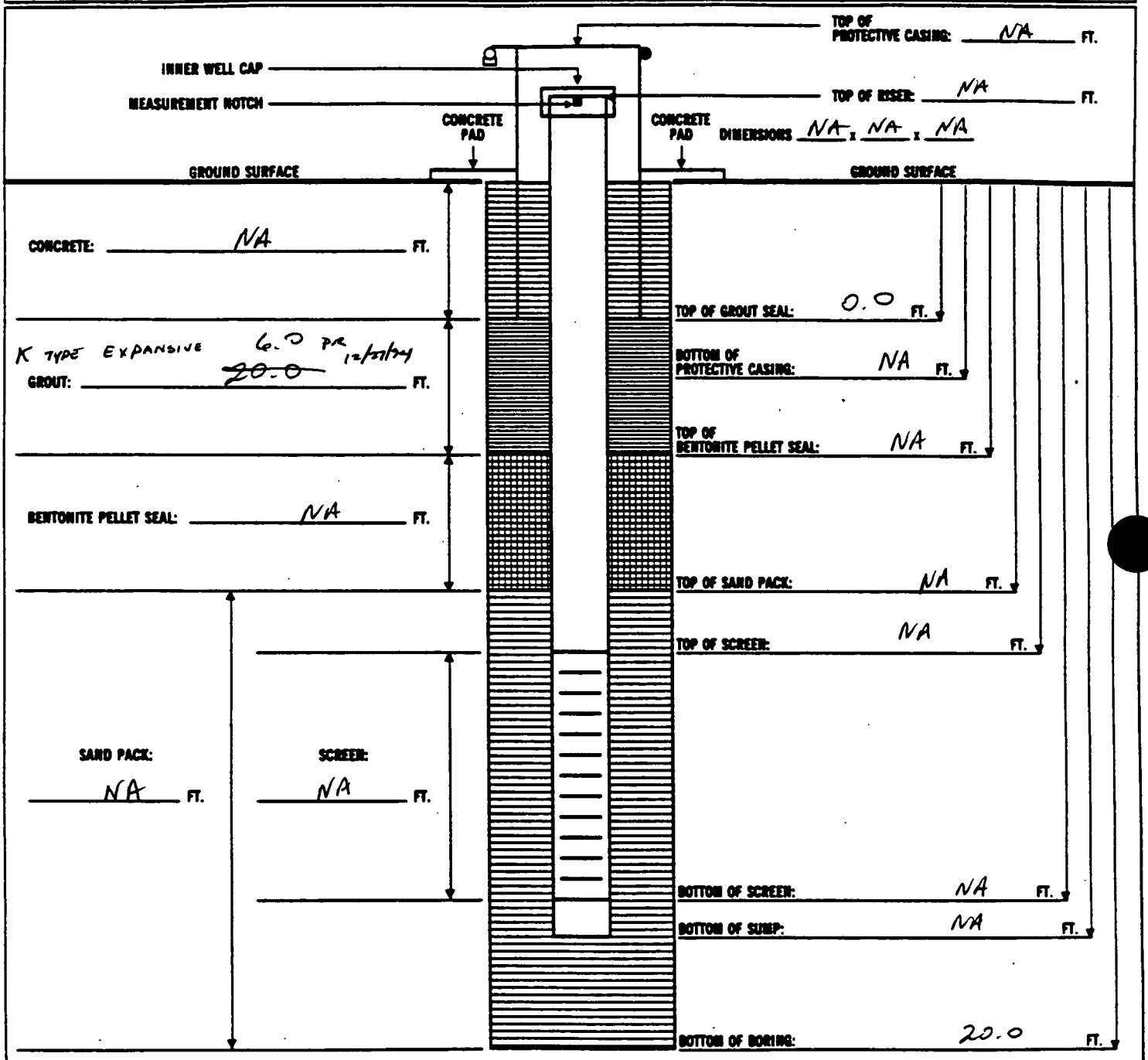
000829

811 2-18-95 PAGE 3003

WELL NUMBER: 11543	FEMP **WELL COMPLETION LOG**	CONTROL NUMBER: 200307-11543-007

PROJECT NAME: OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: P. RILEY	DRILLING METHOD: GEOPROBE

DATES OF INSTALLATION:	WATER LEVEL (ft.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12/27/94			200307-11543-004	KP 2-13-95



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION:
EXPANSIVE K-TYPE 7 lbs	NA	20.0 FT.
VOLUME OF WATER USED DURING DRILLING: NONE GAL.	RISER MATERIAL: NA	VOLUME OF WATER USED FOR GROUT HYDRATION: 0.5 GAL.

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
NA	NA	NA	2.0 IN.
RISER/SCREEN DIAMETER: NA IN.	SCREEN SLOT SIZE: NA	SCREEN TYPE: NA	DEPTH OF CENTRALIZER(S): NA FT.

FS-F-3684 (9/10/93) 000830

11544

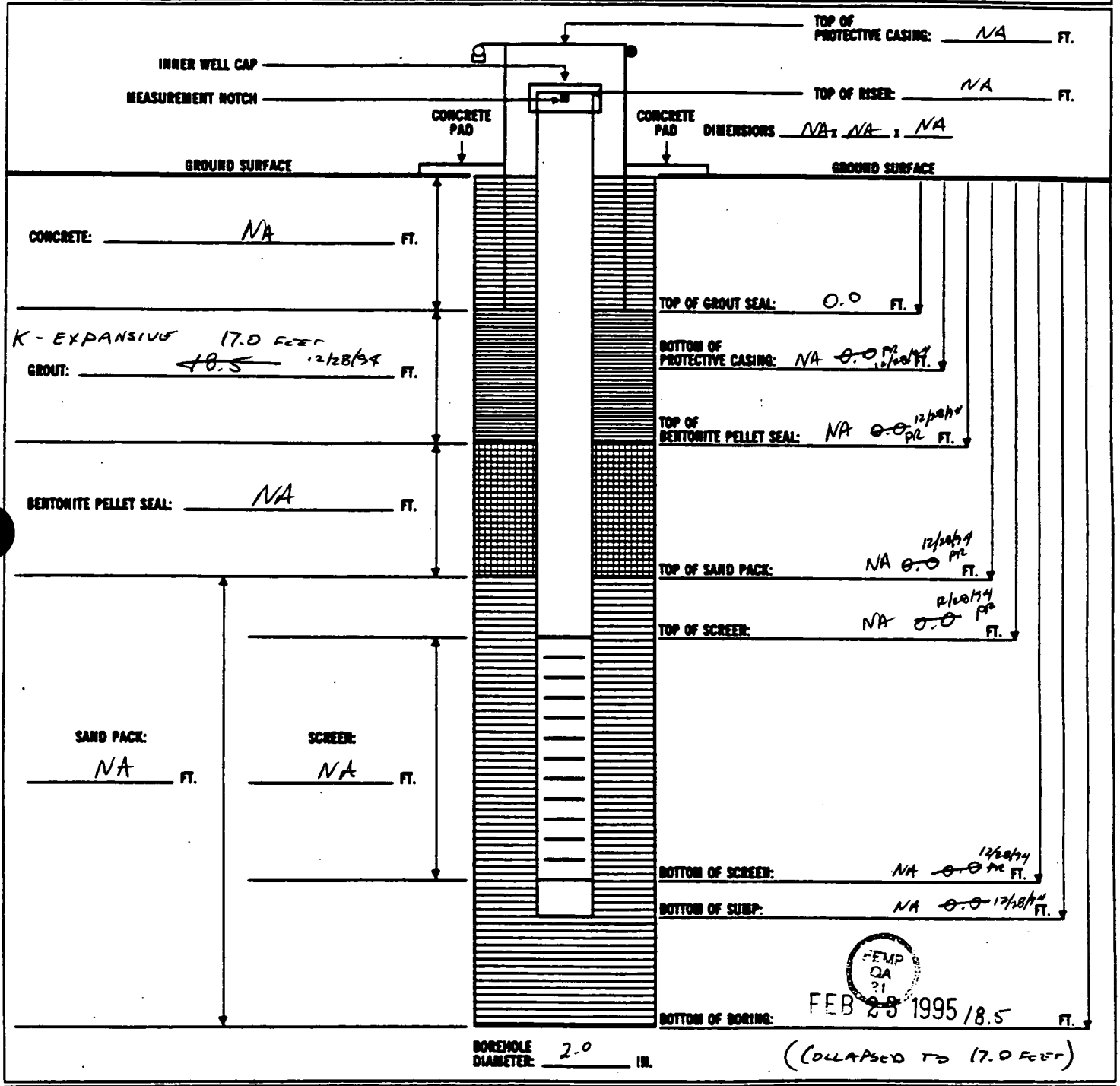
WELL NUMBER: ~~200307-11544-008~~ KP 2-13-95

FEMP
WELL COMPLETION LOG

CONTROL NUMBER: 200307-11544-008

PROJECT NAME: OU2 PRE-DESIGN FIELD INVESTIGATION	PROJECT NUMBER: 20.03.07
GEOLOGIST: PATRICK RILEY	DRILLING METHOD: GEOPROBE

DATES OF INSTALLATION:	WATER LEVEL (ft.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
12/28/94	17.0 FT	12/28/94	200307-11544-004	KP 2-13-94



TYPE AND AMOUNT OF GROUT USED: EXPANSIVE K-GROUT	BENTONITE PELLETS (5-GALLON BUCKETS): NA	DEEPEST TEMPORARY DRILLING CASING PENETRATION: 18.5 FT.
VOLUME OF WATER USED DURING DRILLING: NONE GAL.	RISER MATERIAL: NA	VOLUME OF WATER USED FOR GROUT HYDRATION: ~~N/A~~ PR 12/28/94 21. GAL.

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
NA	NA	NA	2.0 IN.
RISER/SCREEN DIAMETER:	SCREEN SLOT SIZE:	SCREEN TYPE:	DEPTH OF CENTRALIZER(S):
NA IN.	NA	NA	NA FT.

FS-F-3684 (9/10/93)

000831

811

2-21-95

FEMP

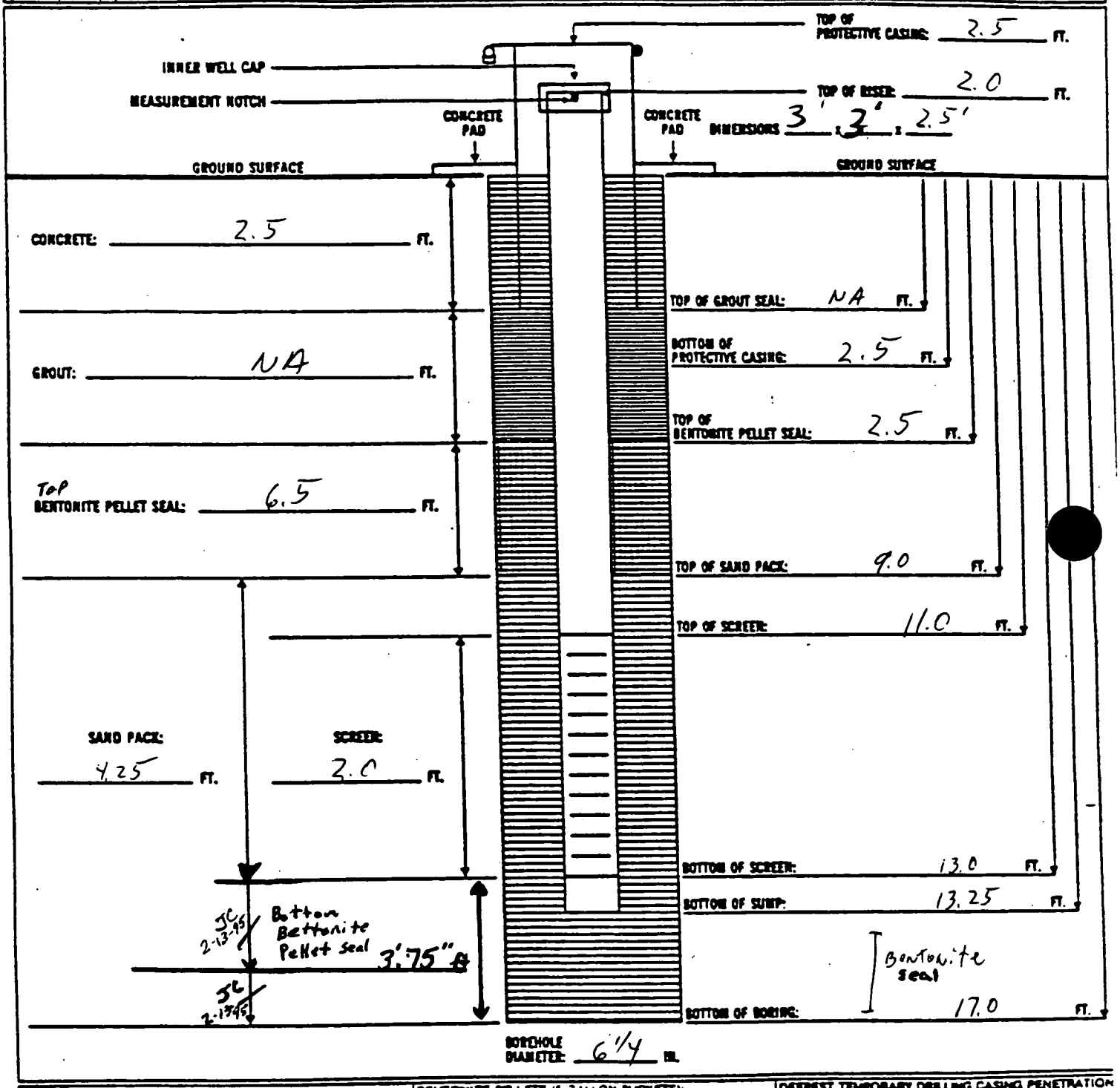
WELL COMPLETION LOG

WELL NUMBER:	CONTROL NUMBER:
11546	200307-11546-010

PROJECT NAME:	PROJECT NUMBER:
Cruz Bay Design Field Investigation	20.03.07

GEOLOGIST:	DRILLING METHOD:
Ken Geiger	Rotosonic

DATES OF INSTALLATION:	WATER LEVEL (R.L.	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
1/16/95				



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION
NA	1.50 lb	17.0 FT
VOLUME OF WATER USED DURING DRILLING:	RISER MATERIAL:	VOLUME OF WATER USED FOR GROUT HYDR
0.0 GAL	316 Stainless	NA GAL

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
316 Stainless	Global #5	316 Stainless	6 1/4 IN
RISER/SCREEN DIAMETER:	**SCREEN SLOT SIZE:**	**SCREEN TYPE:**	**DEPTH OF CENTRALIZER(S):**
2.0 IN.	.010	Flush Screw Type	NA F

FS-F-3684 (9/10/93)

000832

2-18-95 FEMP QA

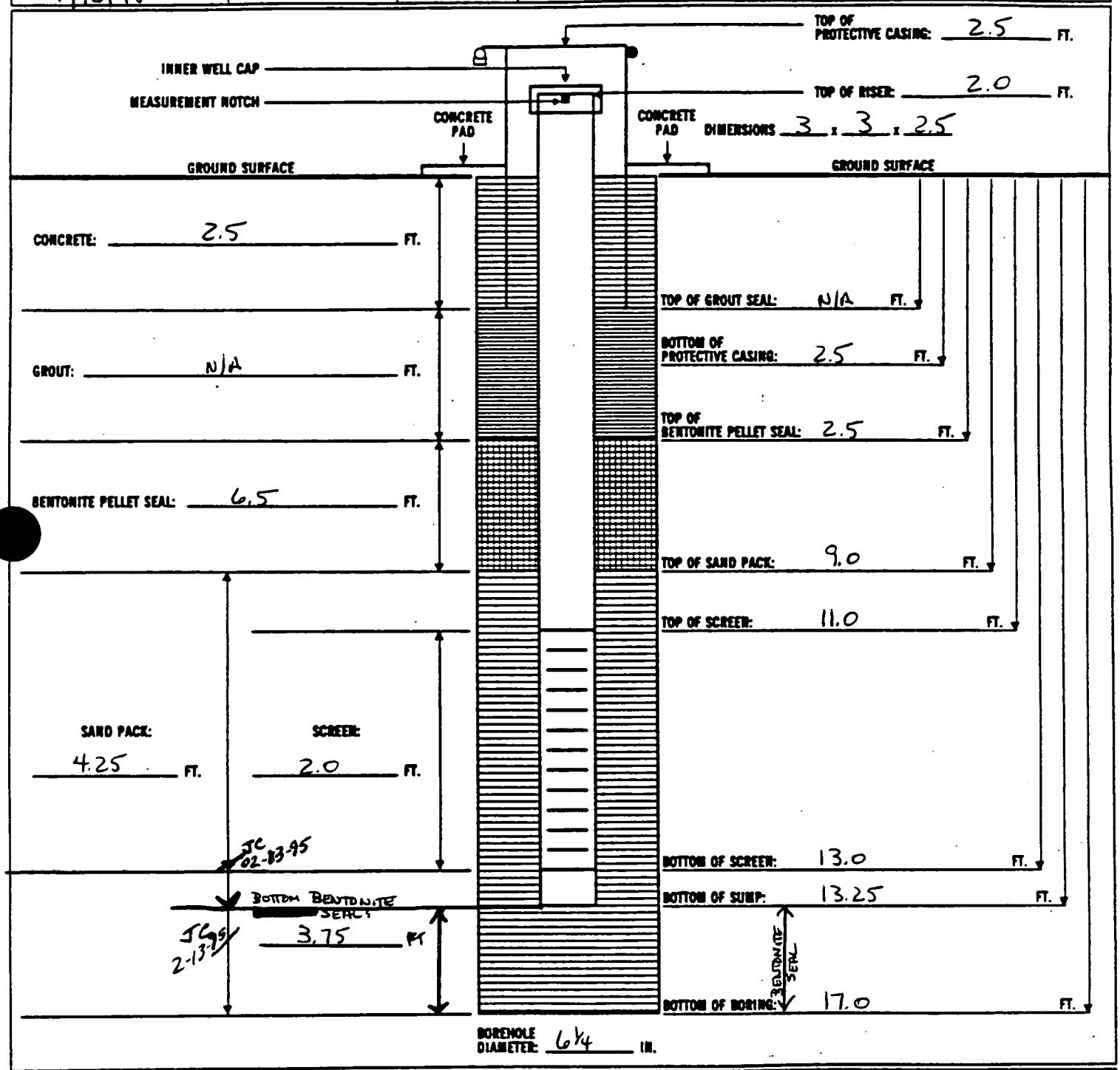
118

WELL NUMBER:	FEMP WELL COMPLETION LOG	CONTROL NUMBER:
11547		200307-11547-010

PROJECT NAME:	PROJECT NUMBER:
CRU 2 PREDESIGN FIELD INVESTIGATION	20.03.07

LOGIST:	DRILLING METHOD:
EN GEIGER	ROTOSONIC

DATES OF INSTALLATION:	WATER LEVEL (R.):	DATE:	RELATED FAL NUMBERS:	CHECKED BY:
1/16/95				



TYPE AND AMOUNT OF GROUT USED:	BENTONITE PELLETS (5-GALLON BUCKETS):	DEEPEST TEMPORARY DRILLING CASING PENETRATION:
N/A	150 LBS	17.0 FT.
VOLUME OF WATER USED DURING DRILLING:	**RISER MATERIAL:**	**VOLUME OF WATER USED FOR GROUT HYDRATION:**
NONE USED GAL	STAINLESS STEEL	N/A GAL.

RISER WALL THICKNESS:	TYPE OF SAND PACK:	SCREEN MATERIAL:	DRILLING CASING DIAMETER:
3/16 STAINLESS	Global #5	Stainless Steel	6 1/4" IN.
RISER/SCREEN DIAMETER:	**SCREEN SLOT SIZE:**	**SCREEN TYPE:**	**DEPTH OF CENTRALIZER(S):**
2.0" I.D. IN.	.010"	Flush screw type	N/A FT.

G-45

FS-F-3684 (9/10/93)

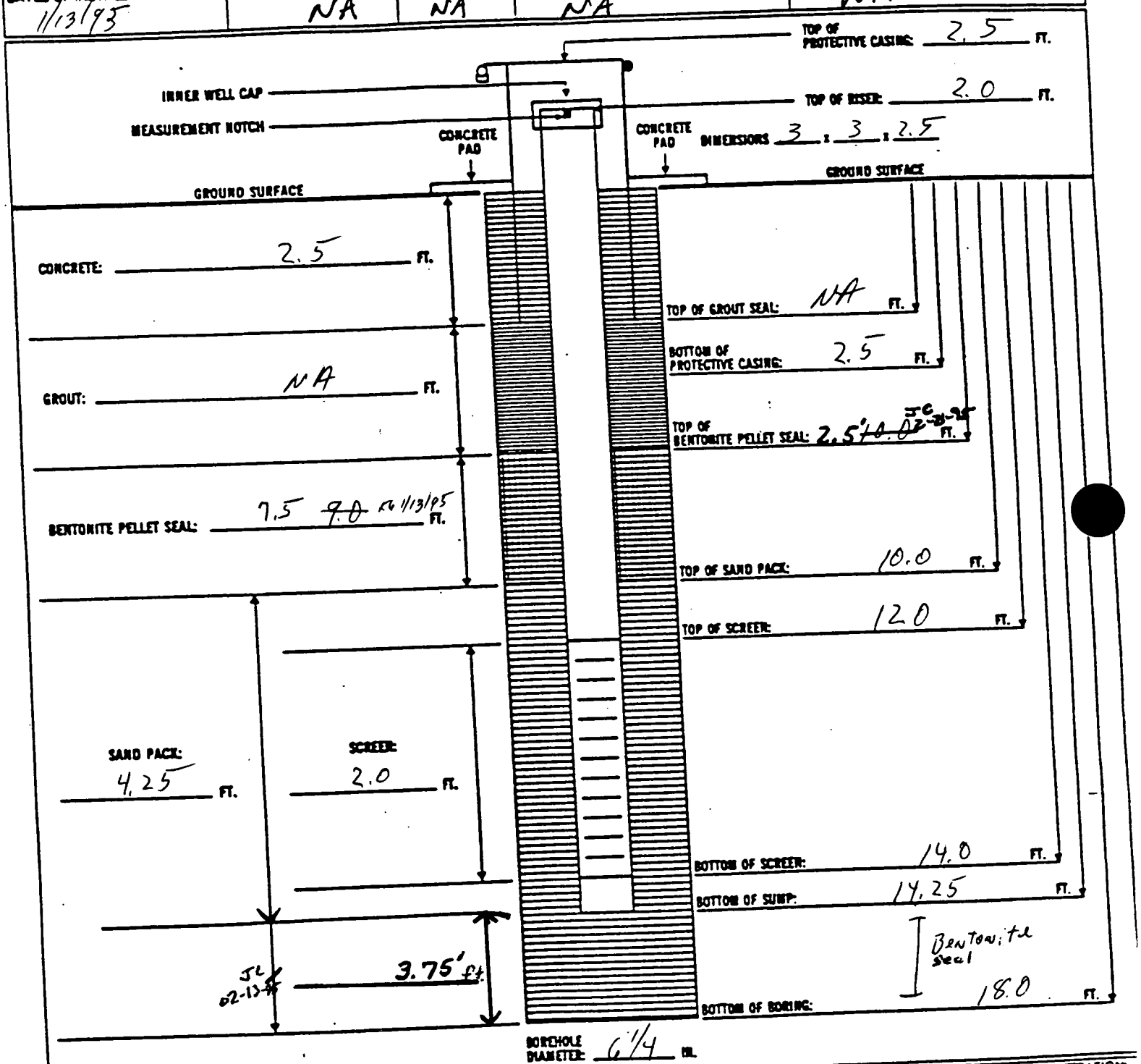
000833

811

FEMP
WELL COMPLETION LOG

FEMP DA 13

WELL NUMBER: 11548	CONTROL NUMBER: 200307-11548-011
PROJECT NAME: Cru2 Area Design Field Investigation	PROJECT NUMBER: 20.03.07
GEOLOGIST: Ken Geiger	DRILLING METHOD: RotoSonic
DATES OF INSTALLATION: 11/13/95	WATER LEVEL (ft): NA — DATE: NA — RELATED FAL NUMBERS: NA — CHECKED BY: NA



TYPE AND AMOUNT OF GROUT USED: NA	BENTONITE PELLETS (5-GALLON BUCKETS): 100 lbs		DEEPEST TEMPORARY DRILLING CASING PENETRATION: 18.0
VOLUME OF WATER USED DURING DRILLING: 0.0 GAL	RISER MATERIAL: 316 Stainless Steel		VOLUME OF WATER USED FOR GROUT HYDRATION: NA GAL
RISER WALL THICKNESS: 316 Stainless	TYPE OF SAND PACK: #5 Global	SCREEN MATERIAL: 316 Stainless	DRILLING CASING DIAMETER: 6 1/4 IN.
RISER/SCREEN DIAMETER: 2.0 IN	SCREEN SLOT SIZE: .010 IN	SCREEN TYPE: Flush Screw Type	DEPTH OF CENTRALIZER(S): NA FT

G-46

000834

Appendix H

SUMMARY OF GEOTECHNICAL SOIL TESTS

Boring 11468

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX-perm PSP	D 5084 RM/TX-perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX-perm PSP	D 5084 Vt/TX-perm Act.	D 4767 TX--CUpp PSP	D 4767 TX--CUpp Act.	D 4767 RM/TX-CUp PSP	D 4767 RM/TX-CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
403071	01/10/95	0	2.0- 4.5	1	1	1	1	1	1	1	1							1			1								
403103	01/10/95	5	2.0- 4.5				1				1	1	1			1	1								1				
403073	01/10/95	5	4.5- 6.0																										
403074	01/10/95	5	4.5- 6.0	1	1	1	1	1	1	1	1							1		1									
403077	01/10/95	10	9.0-11.5	1	1	1	1	1	1	1	1							1					1						
403104	01/10/95	10	9.0-13.0				1				1	1	1																
403081	01/10/95	16	15.0-17.5	1	1	1	1	1	1	1	1							1		1	1	1					1		
403084	01/10/95	21	19.5-22.0	1	1	1	1	1	1	1	1							1											
403086	01/11/95	21	22.0-23.5																										
403089	01/11/95	26	25.0-26.5	1	1	1	1	1	1	1	1							1											
			Boring #11468 Totals:	6	6	6	8	6	6	6	8	2	2			1	1	6	0	2	2	1	1	0	1	0	1		

Boring 11469

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX-perm PSP	D 5084 RM/TX-perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX-perm PSP	D 5084 Vt/TX-perm Act.	D 4767 TX--CUpp PSP	D 4767 TX--CUpp Act.	D 4767 RM/TX-CUp PSP	D 4767 RM/TX-CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
402820	12/20/94	0	1.5- 3.0	1	1	1	1	1	1	1	1							1											
402821	12/20/94	5	3.0- 5.5	1	1	1	1	1	1	1	1							1		1	1		1						
402824	12/20/94	5	3.0- 7.5				1				1	1	1			1	1												
402826	12/20/94	10	9.0-10.5	1	1	1	1	1	1	1	1							1											
402828	12/20/94	10	7.5-12.0				1				1	1	1																
402831	12/20/94	16	15.5-18.0	1	1	1	1	1	1	1	1			1	1			1		1	1	1					1		
402833	12/20/94		18.0-19.5																										
402835	12/20/94	21	20.0-21.5	1	1	1	1	1	1	1	1							1											
402838	12/20/94	25	24.0-25.5	1	1	1	1	1	1	1	1							1											
402842	12/20/94	30	30.0-31.5	1	1	1	1	1	1	1	1							1											
402845	12/20/94		34.5-36.0																										
402848	12/20/94		39.0-40.5																										
402851	12/20/94		43.5-45.0																										
			Boring #11469 Totals:	7	7	7	9	7	7	7	9	2	2	1	1	1	1	7	0	2	2	1	1	0	0	0	1		

Boring 11470B

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX-perm PSP	D 5084 RM/TX-perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX-perm PSP	D 5084 Vt/TX-perm Act.	D 4767 TX--CUpp PSP	D 4767 TX--CUpp Act.	D 4767 RM/TX-CUp PSP	D 4767 RM/TX-CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
403131	01/12/95	0	2.5- 3.0	1	1	1	1	1	1	1	1							1											
403132	01/12/95	5	3.5- 6.0	1	1	1	1	1	1	1	1							1		1	1								
403169	01/12/95	5	3.5- 7.5				1				1	1	1			1	1												

SUMMARY OF GEOTECHNICAL SOIL TESTS

403135	01/12/95	5	6.0– 7.5																										
403137	01/12/95	10	8.0–10.5	1	1	1	1	1	1	1	1							1					1				1		
403170	01/12/95	10	7.5–12.0				1				1	1	1																
403141	01/12/95	16	13.5–15.0	1	1	1	1	1	1	1	1			1				1		1		1							
403142	01/12/95		15.5–18.0																										
403144	01/12/95	21	18.0–19.5	1	1	1	1	1	1	1	1							1											
403147	01/12/95	21	20.5–22.0																										
403150	01/12/95	26	23.5–25.0	1	1	1	1	1	1	1	1							1											
403154	01/13/95	30	30.0–32.0	1	1	1	1	1	1	1	1							1			1								
			Boring #11470B Totals:	7	7	7	9	7	7	7	9	2	2	1	0	1	1	7	0	2	2	1	1			0	1		

Boring 11471

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX–perm PSP	D 5084 RM/TX–perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX–perm PSP	D 5084 Vt/TX–perm Act.	D 4767 TX–CUpp PSP	D 4767 TX–CUpp Act.	D 4767 RM/TX–CUp PSP	D 4767 RM/TX–CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
402962	12/30/94	0	1.5– 3.0	1	1	1	1	1	1	1	1							1											
402963	12/30/94	5	3.5– 6.0	1	1	1	1	1	1	1	1							1		1	1								
402966	12/30/94	5	3.0– 7.5				1				1	1	1			1	1												
402978	12/30/94	10	7.5–10.5				1				1	1	1																
402969	12/30/94	10	10.5–11.5	1	1	1	1	1	1	1	1							1											
402973	12/30/94		15.0–16.5	1	1	1	1	1	1	1	1							1											
402974	12/30/94	17	17.0–19.5	1	1	1	1	1	1	1	1			1	1			1		1	1	1					1		
402976	12/30/94	22	19.5–21.0																										
402979	12/30/94	27	27.5–29.0	1	1	1	1	1	1	1	1							1											
			Boring #11471 Totals:	6	6	6	8	6	6	6	8	2	2	1	1	1	1	6	0	2	2	1	0	0	0	0	1		

Boring 11472

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX–perm PSP	D 5084 RM/TX–perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX–perm PSP	D 5084 Vt/TX–perm Act.	D 4767 TX–CUpp PSP	D 4767 TX–CUpp Act.	D 4767 RM/TX–CUp PSP	D 4767 RM/TX–CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
402939	12/29/94	0	1.5– 3.0	1	1	1	1	1	1	1	1							1											
402940	12/29/94	5	3.5– 6.0	1	1	1	1	1	1	1	1							1		1	1						1		
402942	12/29/94	5	6.0– 7.5																										
402958	12/29/94	5	3.5– 7.5				1				1	1	1			1	1												
402945	12/29/94	10	9.5–11.5	1	1	1	1	1	1	1	1			1	1			1											
402959	12/29/94	10	9.0–12.0				1				1	1	1												1				
402947	12/29/94	15	12.0–13.5																										
402953	12/29/94	15	18.5–19.5	1	1	1	1	1	1	1	1							1		1		1							
	12/29/94	20		1		1		1		1								1											
402956	12/29/94	25	23.0–25.5	1	1	1	1	1	1	1	1							1			1		1						
			Boring #11472 Totals:	6	5	6	7	6	5	6	7	2	2	1	1	1	1	6	0	2	2	1	1	0	1	0	1		

000836

SUMMARY OF GEOTECHNICAL SOIL TESTS

Boring 11473

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX-perm PSP	D 5084 RM/TX-perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX-perm PSP	D 5084 Vt/TX-perm Act.	D 4767 TX--CUpp PSP	D 4767 TX--CUpp Act.	D 4767 RM/TX-CUp PSP	D 4767 RM/TX-CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
402916	12/28/94		0.0- 1.5																										
402918	12/28/94	0	3.5- 6.0	1	1	1	1	1	1	1	1							1											
402920	12/28/94	5	6.5- 8.5	1	1	1	1	1	1	1	1							1		1	1						1		
402922	12/28/94	10	9.0-10.5	1	1	1	1	1	1	1	1							1											
402923	12/28/94	5	3.0- 7.5				1				1	1	1			1	1												
402925	12/28/94	10	7.5-12.0				1				1	1	1																
402928	12/28/94	15	15.5-18.0	1	1	1	1	1	1	1	1							1		1	1	1					1		
402931	12/28/94	20	20.0-22.0	1	1	1	1	1	1	1	1							1					1						
402934	12/28/94	25	23.5-25.0	1	1	1	1	1	1	1	1							1											
			Boring #11473 Totals:	6	6	6	8	6	6	6	8	2	2			1	1	6	0	2	2	1	1	0	0	0	2		

Boring 11474

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX-perm PSP	D 5084 RM/TX-perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX-perm PSP	D 5084 Vt/TX-perm Act.	D 4767 TX--CUpp PSP	D 4767 TX--CUpp Act.	D 4767 RM/TX-CUp PSP	D 4767 RM/TX-CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
402891	12/27/94	0	1.5- 3.0	1	1	1	1	1	1	1	1							1											
402892	12/27/94	5	3.5- 6.0	1	1	1	1	1	1	1	1							1		1	1								
402894	12/27/94	5	1.5- 3.0																										
402896	12/27/94	5	3.0- 7.5				1				1	1	1			1	1								1				
402898	12/27/94	10	9.0-10.5	1	1	1	1	1	1	1	1							1											
402901	12/27/94	10	7.5-12.0				1				1	1	1																
402903	12/27/94	15	12.0-13.5																										
402904	12/27/94	15	14.0-16.5	1	1	1	1	1	1	1	1			1	1			1		1	1	1					1		
402906	12/27/94		16.5-18.0																										
402907	12/27/94	20	18.5-21.0	1	1	1	1	1	1	1	1							1											
402911	12/27/94	25	23.5-25.0	1	1	1	1	1	1	1	1							1											
		30		1		1		1		1								1											
			Boring #11474 Totals:	7	6	7	8	7	6	7	8	2	2	1	1	1	1	7	0	2	2	1	0	0	1	0	1		

Boring 11475

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX-perm PSP	D 5084 RM/TX-perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX-perm PSP	D 5084 Vt/TX-perm Act.	D 4767 TX--CUpp PSP	D 4767 TX--CUpp Act.	D 4767 RM/TX-CUp PSP	D 4767 RM/TX-CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
403251	01/17/95	0	2.0- 4.5	1	1	1	1	1	1	1	1							1											
403264	01/17/95	5	4.5- 8.5				1				1	1	1			1	1												
403254	01/17/95	5	6.5- 9.0	1	1	1	1	1	1	1	1							1		1									
403258	01/17/95	10	11.0-13.5	1	1	1	1	1	1	1	1							1			1		1						
403260	01/17/95	15	15.5-18.0	1	1	1	1	1	1	1	1			1				1		1	1	1					1		

SUMMARY OF GEOTECHNICAL SOIL TESTS

				D2216 MC		D 422 GSw/ Hydr.		D 854 SpG		D 4318 AL		D 698 Std.Proc		D 2435 Consol		D 5084 RM/TX- perm		D 2937 UW		D 5084 Vt/TX- perm		D 4767 TX- -CUpp		D 4767 RM/TX- CUp		D 2166 UCS		D 2435 RM/ Consol	
403263	01/17/95	20	19.5-21.0	1	1	1	1	1	1	1	1							1											
		25		1		1		1		1								1											
		10										1																	
			Boring #11475 Totals:	6	5	6	6	6	5	6	6	2	1	1	0	1	1	6	0	2	2	1	1			0	1		

Boring 11476

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX- perm PSP	D 5084 RM/TX- perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX- perm PSP	D 5084 Vt/TX- perm Act.	D 4767 TX- -CUpp PSP	D 4767 TX- -CUpp Act.	D 4767 RM/TX- CUp PSP	D 4767 RM/TX- CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/ Consol PSP	D 2435 RM/ Consol Act.
402988	01/04/95	0	1.5- 3.0	1	1	1	1	1	1	1	1							1											
402989	01/04/95	5	3.5- 6.0	1	1	1	1	1	1	1	1							1		1	1								
402991	01/04/95	5	6.0- 7.5																										
402993	01/04/95	5	3.5- 7.5				1				1	1	2			1	1												1
402995	01/06/95	10	9.5-12.0	1	1	1	1	1	1	1	1			1	1			1									1		
402998	01/06/95	15	14.0-16.5	1	1	1	1	1	1	1	1							1		1	1	1	1						
403010	01/06/95	15	12.0-15.0				1				1	1	1																
403000	01/06/95	15	16.5-18.0																										
403002	01/06/95	20	18.5-21.0	1	1	1	1	1	1	1	1							1											
403006	01/06/95	25	24.0-25.5	1	1	1	1	1	1	1	1							1											
			Boring #11476 Totals:	6	6	6	8	6	6	6	8	2	3	1	1	1	1	6	0	2	2	1	1			0	1	0	1

Boring 11477

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX- perm PSP	D 5084 RM/TX- perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX- perm PSP	D 5084 Vt/TX- perm Act.	D 4767 TX- -CUpp PSP	D 4767 TX- -CUpp Act.	D 4767 RM/TX- CUp PSP	D 4767 RM/TX- CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/ Consol PSP	D 2435 RM/ Consol Act.
402863	12/22/94	0	1.5- 3.0	1	1	1	1	1	1	1	1							1											
402864	12/22/94	5	3.5- 6.0	1	1	1	1	1	1	1	1							1		1	1						1		
402866	12/22/94	5	3.5- 7.5				1				1	1	1			1	1												
402868	12/22/94	10	8.0- 9.0	1	1	1	1	1	1	1	1							1											
402873	12/22/94	15	14.0-16.5	1	1	1	1	1	1	1	1			1	1			1		1	1	1	1						
402874	12/22/94	15	14.0-18.0				1				1	1	1																
402878	12/22/94	20	22.0-22.5	1	1	1	1	1	1	1	1							1											
402879	12/22/94	26	22.5-23.5	1	1	1	1	1	1	1	1							1											
402880	12/22/94		24.0-26.5																										
402885	12/22/94		31.5-34.0																										
402887	12/22/94	35	34.0-35.5	1	1	1	1	1	1	1	1							1											
			Boring #11477 Totals:	7	7	7	9	7	7	7	9	2	2	1	1	1	1	7	0	2	2	1	1	0	0	0	1		

000838

SUMMARY OF GEOTECHNICAL SOIL TESTS

Boring 11478

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX-perm PSP	D 5084 RM/TX-perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX-perm PSP	D 5084 Vt/TX-perm Act.	D 4767 TX-CUpp PSP	D 4767 TX-CUpp Act.	D 4767 RM/TX-CUp PSP	D 4767 RM/TX-CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
402790	12/16/94	0	1.5- 3.0	1	1	1	1	1	1	1	1							1											
402792	12/16/94	5	3.5- 6.0	1	1	1	1	1	1	1	1							1		1	1		1						
402793	12/16/94	5	6.0- 7.5																										
402796	12/16/94	5	3.5- 7.5				1				1	1	1			1	1								1				
402813	12/16/94	10	7.5-10.0				1				1	1	1																
402798	12/19/94	10	10.5-12.0	1	1	1	1	1	1	1	1							1											
402803	12/19/94	20	20.0-21.5																										
402805	12/19/94	20	21.5-23.0	1	1	1	1	1	1	1	1							1		1		1							
402807	12/19/94	25	24.5-26.0	1	1	1	1	1	1	1	1							1											
402810	12/19/94	30	30.5-32.0	1	1	1	1	1	1	1	1							1											
402812	12/19/94	35	33.5-35.0	1	1	1	1	1	1	1	1							1											
			Boring #11478 Totals:	7	7	7	9	7	7	7	9	2	2			1	1	7	0	2	1	1	1	0	1	0	0	0	0

Boring 11479

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX-perm PSP	D 5084 RM/TX-perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX-perm PSP	D 5084 Vt/TX-perm Act.	D 4767 TX-CUpp PSP	D 4767 TX-CUpp Act.	D 4767 RM/TX-CUp PSP	D 4767 RM/TX-CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
403021	01/09/95	0	1.5- 3.0	1	1	1	1	1	1	1	1							1											
403022	01/09/95	5	3.5- 6.0	1	1	1	1	1	1	1	1							1		1	1								
403048	01/09/95	5	3.5- 7.5				1				1	1	1			1	1												
403049	01/09/95	10	7.5-10.5				1				1	1	1																1
403032	01/09/95	10	16.5-17.5	1	1	1	1	1	1	1	1							1											
403034	01/09/95	20	18.5-21.0	1	1	1	1	1	1	1	1							1		1	1	1					1		
403037	01/09/95	25	23.0-25.5	1	1	1	1	1	1	1	1							1											
403039	01/09/95		25.5-27.0																										
403043	01/09/95	30	31.5-33.0	1	1	1	1	1	1	1	1							1											
403045	01/09/95		34.5-36.0		1		1		1		1																		
			Boring #11479 Totals:	6	7	6	9	6	7	6	9	2	2			1	1	6		2	2	1	0			0	1	0	1

Boring 11480

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX-perm PSP	D 5084 RM/TX-perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX-perm PSP	D 5084 Vt/TX-perm Act.	D 4767 TX-CUpp PSP	D 4767 TX-CUpp Act.	D 4767 RM/TX-CUp PSP	D 4767 RM/TX-CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
402768	12/14/94	0	0.5- 3.0	1	1	1	1	1	1	1	1							1									1		
402769	12/14/94	5	3.5- 4.5																										
402770	12/14/94	5	5.0- 7.5	1	1	1	1	1	1	1	1							1		1									
402771	12/14/94	5	3.0- 7.5				1				1	1	1			1	1												
402773	12/15/94	10	9.5-12.0	1	1	1	1	1	1	1	1							1			1								

SUMMARY OF GEOTECHNICAL SOIL TESTS

402774	12/15/94	10	7.5–12.0				1				1	1	1																
402775	12/15/94	15	12.0–13.5																										
402777	12/15/94	15	14.0–16.5	1	1	1	1	1	1	1	1							1		1	1	1	1						
402779	12/15/94	20	18.0–20.0	1	1	1	1	1	1	1	1							1											
402783	12/15/94		22.5–24.0																										
402784	12/15/94	25	24.5–27.0	1	1	1	1	1	1	1	1							1											
402785	12/15/94		27.0–28.5																										
402787	12/15/94	30	29.0–31.5	1	1	1	1	1	1	1	1							1											
Boring #11480 Totals:				7	7	7	9	7	7	7	9	2	2			1	1	7	0	2	2	1	1	0	0	0	1		

Boring 11481

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	D2216 MC PSP	D2216 MC Act.	D 422 GSw/ Hydr. PSP	D 422 GSw/ Hydr. Act.	D 854 SpG PSP	D 854 SpG Act.	D 4318 AL PSP	D 4318 AL Act.	D 698 Std.Proc PSP	D 698 Std.Proc Act.	D 2435 Consol PSP	D 2435 Consol Act.	D 5084 RM/TX–perm PSP	D 5084 RM/TX–perm Act.	D 2937 UW PSP	D 2937 UW Act.	D 5084 Vt/TX–perm PSP	D 5084 Vt/TX–perm Act.	D 4767 TX–CUpp PSP	D 4767 TX–CUpp Act.	D 4767 RM/TX–CUp PSP	D 4767 RM/TX–CUp Act.	D 2166 UCS PSP	D 2166 UCS Act.	D 2435 RM/Consol PSP	D 2435 RM/Consol Act.
403202	01/16/95	0	3.5– 6.0	1	1	1	1	1	1	1	1							1											
403230	01/16/95	5	3.5– 7.5				1				1	1	1			1	1												
403204	01/16/95	5	6.5– 9.0	1	1	1	1	1	1	1	1							1		1	1						1		
403231	01/16/95	15	13.5–18.5				1				1	1	1																1
403211	01/16/95	15	15.5–18.0	1	1	1	1	1	1	1	1							1					1						
403214	01/16/95	20	20.0–22.0	1	1	1	1	1	1	1	1							1		1	1	1							
403219	01/16/95	25	26.5–28.0	1	1	1	1	1	1	1	1							1											
403223	01/16/95	30	32.5–34.0	1	1	1	1	1	1	1	1							1											
403227	01/16/95	35	37.0–38.5	1	1	1	1	1	1	1	1							1											
Boring #11481 Totals:				7	7	7	9	7	7	7	9	2	2			1	1	7	0	2	2	1	1			0	1	0	1

000840

SUMMARY OF TOTAL U & ISOTOPIC U SOIL TESTS FOR GEOTECHNICAL BORINGS

Boring 11468

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
403071	01/10/95	0	2.0–4.5		
403103	01/10/95	5	2.0–6.5		
403073	01/10/95	5	4.5–6.0	1	1
403074	01/10/95	5	4.5–6.0		
403077	01/10/95	10	9.0–11.5		
403104	01/10/95	10	9.0–13.0		
403081	01/10/95	16	15.0–17.5		
403084	01/10/95	21	19.5–22.0		
403086	01/11/95	21	22.0–23.5	1	1
403089	01/11/95	26	25.0–26.5		
			Boring # 11468 Totals:	2	2

Boring 11469

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
402820	12/20/94	0	1.5–3.0		
402821	12/20/94	5	3.0–5.5		
402824	12/20/94	5	3.0–7.5		
402826	12/20/94	10	9.0–10.5		
402828	12/20/94	10	7.5–12.0		
402831	12/20/94	16	15.5–18.0		
402833	12/20/94		18.0–19.5		
402835	12/20/94	21	20.0–21.5		
402838	12/20/94	25	24–25.5		
402842	12/20/94	30	30–31.5		
402845	12/20/94		34.5–36.0		
402848	12/20/94		39.0–40.5		
402851	12/20/94		43.5–45.0		
			Boring # 11469 Totals:	0	0

Boring 11470

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
403131	01/12/95	0	2.5–3.0		
403132	01/12/95	5	3.5–6.0		
403169	01/12/95	5	3.5–7.5		
403135	01/12/95	5	6.0–7.5	1	1
403137	01/12/95	10	8.0–10.5		
403170	01/12/95	10	7.5–12.0		
403141	01/12/95	16	13.5–15.0		
403142	01/12/95		15.5–18.0		
403144	01/12/95	21	18.0–19.5		
403147	01/12/95	21	20.5–22.0	1	1
403150	01/12/95	26	23.5–25.0		
403154	01/13/95	30	30.0–32.0		
			Boring # 11470 Totals:	2	2

Boring 11471

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
402962	12/30/94	0	1.5–3.0		
402963	12/30/94	5	3.5–6.0		
402966	12/30/94	5	3.0–7.5		
402978	12/30/94	10	7.5–10.5		
402969	12/30/94	10	10.5–11.5		
402973	12/30/94		15.0–16.5		
402974	12/30/94	17	17.0–19.5		
402976	12/30/94	22	19.5–21.0		
402979	12/30/94	27	27.5–29		
			Boring # 11471 Totals:	0	0

Boring 11472

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
402939	12/29/94	0	1.5–3.0		
402940	12/29/94	5	3.5–6.0		
402942	12/29/94	5	6.0–7.5	1	1
402958	12/29/94	5	3.5–7.5		
402945	12/29/94	10	9.5–11.5		
402959	12/29/94	10	9.0–12.0		
402947	12/29/94	15	12.0–13.5	1	1
402953	12/29/94	15	18.5–19.5		
	12/29/94	20			
402956	12/29/94	25	23.0–25.5		
			Boring # 11472 Totals:	2	2

Boring 11473

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
402916	12/28/94		0.0–1.5		
402918	12/28/94	0	3.5–6.0		
402920	12/28/94	5	6.5–8.5		
402922	12/28/94	10	9.0–10.5		
402923	12/28/94	5	3.0–7.5		
402925	12/28/94	10	7.5–12.0		
402928	12/28/94	15	15.5–18.0		
402931	12/28/94	20	20.0–22.0		
402934	12/28/94	25	23.5–25		
			Boring # 11473 Totals:	0	0

Boring 11474

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
402891	12/27/94	0	1.5–3.0		
402892	12/27/94	5	3.5–6.0		
402894	12/27/94	5	1.5–3.0	1	1
402896	12/27/94	5	3.0–7.5		
402898	12/27/94	10	9.0–10.5		
402901	12/27/94	10	7.5–12.0		
402903	12/27/94	15	12.0–13.5	1	1
402904	12/27/94	15	14.0–16.5		
402906	12/27/94		16.5–18.0		
402907	12/27/94	20	18.5–21.0		
402911	12/27/94	25	23.5–25		
		30			
			Boring # 11474 Totals:	2	2

Boring 11475

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
403251	01/17/95	0	2.0–4.5		
403264	01/17/95	5	4.5–8.5		
403254	01/17/95	5	6.5–9.0		
403258	01/17/95	10	11.0–13.5		
403260	01/17/95	15	15.5–18.0		
403263	01/17/95	20	19.5–21.0		
		25			
			Boring # 11475 Totals:	0	0

SUMMARY OF TOTAL U & ISOTOPIC U SOIL TESTS FOR GEOTECHNICAL BORINGS

Boring 11476

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
402988	01/04/95	0	1.5–3.0		
402989	01/04/95	5	3.5–6.0		
402991	01/04/95	5	6.0–7.5	1	1
402993	01/04/95	5	3.5–7.5		
402995	01/06/95	10	9.5–12.0		
402998	01/06/95	15	14–16.5		
403010	01/06/95	15	12.0–15.0		
403000	01/06/95	15	16.5–18.0	1	1
403002	01/06/95	20	18.5–21.0		
403006	01/06/95	25	24.0–25.5		
			Boring # 11476 Totals:	2	2

Boring 11477

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
402863	12/22/94	0	1.5–3.0		
402864	12/22/94	5	3.5–6.0		
402866	12/22/94	5	3.5–7.5		
402868	12/22/94	10	8.0–9.0		
402873	12/22/94	15	14.0–16.5		
402874	12/22/94	15	14.0–18.0		
402878	12/22/94	20	22.0–22.5		
402879	12/22/94	26	22.5–23.5		
402880	12/22/94		24.0–26.5		
402885	12/22/94		31.5–34.0		
402887	12/22/94	35	34–35.5		
			Boring # 11477 Totals:	0	0

Boring 11478

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
402790	12/16/94	0	1.5–3.0		
402792	12/16/94	5	3.5–6.0		
402793	12/16/94	5	6.0–7.5	1	1
402796	12/16/94	5	3.5–7.5		
402813	12/16/94	10	7.5–10.0		
402798	12/19/94	10	10.5–12.0		
402803	12/19/94	20	20.0–21.5	1	1
402805	12/19/94	20	21.5–23.0		
402807	12/19/94	25	24.5–26.0		
402810	12/19/94	30	30.5–32.0		
402812	12/19/94	35	33.5–35.0		
			Boring # 11478 Totals:	2	2

Boring 11479

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
403021	01/09/95	0	1.5–3.0		
403022	01/09/95	5	3.5–6.0		
403048	01/09/95	5	3.5–7.5		
403049	01/09/95	10	7.5–10.5		
403032	01/09/95	10	16.5–17.5		
403034	01/09/95	20	18.5–21.0		
403037	01/09/95	25	23.0–25.5		
403039	01/09/95		25.5–27.0		
403043	01/09/95	30	31.5–33.0		
403045	01/09/95		34.5–36.0		
			Boring # 11479 Totals:	0	0

Boring 11480

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
402768	12/14/94	0	0.5–3.0		
402769	12/14/94	5	3.5–4.5	1	1
402770	12/14/94	5	5.0–7.5		
402771	12/14/94	5	3.0–7.5		
402773	12/15/94	10	9.5–12.0		
402774	12/15/94	10	7.5–12.0		
402775	12/15/94	15	12.0–13.5	1	1
402777	12/15/94	15	14.0–16.5		
402779	12/15/94	20	18.0–20.0		
402783	12/15/94		22.5–24.0		
402784	12/15/94	25	24.5–27.0		
402785	12/15/94		27.0–28.5		
402787	12/15/94	30	29.0–31.5		
			Boring # 11480 Totals:	2	2

Boring 11481

Sam. No.	Date Sampled	PSP Approx. Depth(ft)	Actual Depth(ft)	Tot/IsoU PSP	Tot/IsoU Act.
403202	01/16/95	0	3.5–6.0		
403230	01/16/95	5	3.5–7.5		
403204	01/16/95	5	6.5–9.0		
403231	01/16/95	15	13.5–18.5		
403211	01/16/95	15	15.5–18.0		
403214	01/16/95	20	20.0–22.0		
403219	01/16/95	25	26.5–28.0		
403223	01/16/95	30	32.5–34.0		
403227	01/16/95	35	37.0–38.5		
			Boring # 11481 Totals:	0	0

SUMMARY OF CHEMICAL AND RADIOLOGICAL SOIL TESTS
MONITORING WELLS

Location/ (Screened Interval)	PSP Approx. Depth (Ft.)	Actual Depth (Ft.)	K_d Total U & Isotopic U		Total U & Isotopic U		TCLP Total U & Isotopic U		Sample #	Date Collected
			Proposed	Collected	Proposed	Collected	Proposed	Collected		
11491	TBD[A]	13.0					x	x	402633	12/14/94
	TBD	13.5					x	x	402635	12/14/94
	25.0–29.5[B]	27.0–29.0			x	x			402636	12/14/94
	25.0–29.5	27.0–29.0					x	x	402637	12/14/94
	TBD	13.5	x	x					402638	12/14/94
	TBD	13.0	x	x					402639	12/14/94
11492	15.0–22.0	20.0					x	x	402640	12/15/94
	15.0–22.0	20.0			x	x			402641	12/15/94
11493	TBD	13.0–13.5					x	x	403340	12/21/94
	TBD	13.5–14.0					x	x	403342	12/21/94
	18.0–24.5	21.0			x	x			403343	12/21/94
	18.0–24.5	21.0					x	x	403344	12/21/94
	TBD	13.0–13.5	x	x					403345	12/21/94
	TBD	13.5–14.0	x	x					403346	12/21/94
11494	8.0–17.0	11.0–11.5					x	x	403491	12/22/94
	8.0–17.0	11.0–11.5					x	x	403492	12/22/94
	8.0–17.0	11.0–11.5			x	x			403493	12/22/94
11495	30.5–37.0	33.0					x	x	403486	12/22/94
		33.0			x	x			403487	12/22/94
	30.5–37.0									
11496	TBD	8.0– 8.5					x	x	402759	01/17/95
	TBD	8.0– 8.5	x	x					402761	01/17/95
	TBD	8.5– 9.0					x	x	402762	01/17/95
	TBD	8.5– 9.0	x	x					402764	01/17/95
	9.0–17.0	13.0					x	x	402765	01/17/95
	9.0–17.0	13.0			x	x			402766	01/17/95
11497	28.0–32.0	30.0–32.0					x	x	402767	12/27/94
	28.0–32.0	30.0–32.0			x	x			403488	12/27/94
	28.0–32.0	30.0–32.0			x(dup)	x(dup)			403489	12/27/94
11498	TBD	6.5					x	x	403327	01/17/95
	TBD	7.0					x	x	403329	01/17/95
	27.0–31.0	30.0					x	x	403331	01/17/95
	27.0–31.0	30.0			x	x			403332	01/17/95
	TBD	6.5– 7.0	x	x					403333	01/17/95
	TBD	7.0– 7.5	x	x					403334	01/17/95

SUMMARY OF CHEMICAL AND RADIOLOGICAL SOIL TESTS
MONITORING WELLS

Location/ (Screened Interval)	PSP Approx. Depth (Ft.)	Actual Depth (Ft.)	K_d Total U & Isotopic U		Total U & Isotopic U		TCLP Total U & Isotopic U		Sample #	Date Collected
			Proposed	Collected	Proposed	Collected	Proposed	Collected		
11499	15.0–22.0	18.0					x	x	402757	12/28/94
	15.0–22.0	18.0			x	x			402758	12/28/94
11500	TBD	12.0–12.5	x	x					402643	12/19/94
	TBD	11.0–12.0	x	x					402644	12/19/94
	TBD	10.5–11.0					x	x	402646	12/19/94
	TBD	12.5–13.0					x	x	402648	12/19/94
	19.0–25.5	21.0–22.0			x	x			402649	12/19/94
	19.0–25.5	21.0					x	x	402650	12/19/94
11501	33.0–37.0	35.0			x	x			403335	12/30/94
	33.0–37.0	35.0					x	x	403336	12/30/94
11502	TBD	13.0–13.5					x	x	402731	12/29/94
	TBD	13.0–13.5	x	x					402733	12/29/94
	TBD	13.5–14.0					x	x	402734	12/29/94
	TBD	13.5–14.0	x	x					402736	12/29/94
	18.0–22.0	21.0					x	x	402737	12/29/94
	18.0–22.0	21.0			x	x			402738	12/29/94
11503	24.0–28.0	27.0					x	x	403337	12/29/94
	24.0–28.0	27.0			x	x			403338	12/29/94
11504	14.0–18.0	16.0–18.0			x	x			403357	01/03/95
	14.0–18.0	16.0–18.0					x	x	403358	01/03/95
	TBD	14.0–15.0	x	x					403359	01/03/95
	TBD	15.0–16.0	x	x					403360	01/03/95
	TBD	15.0–16.0			x	x			403361	01/03/95
	TBD	14.0–15.0					x	x	403362	01/03/95
	TBD	14.0–15.0					x	x	403363	01/03/95
	TBD	15.0–16.0			x	x			403364	01/03/95
11505	23.0–27.0	25.0–27.0					x	x	403352	01/03/95
	23.0–27.0	25.0–27.0			x	x			403353	01/03/95
11546										
11547										
11548										

SUMMARY OF GEOTECHNICAL SOIL TESTS
MONITORING WELLS

Location	Moisture Content					
	Well Screened Interval Depth (ft)	Samples Proposed	Samples Collected	Actual Depth (ft)	Sample #	Date Collected
11491						
11492						
11493						
11494	8.0–16.5		1	12.0	402658	12/22/94
			1	16.5–17.0	402656	12/22/94
11495	30.5–37.0		1	31.5	402655	12/22/94
			1	32.5–36.5	402653	12/22/94
			1	37.0	402654	12/22/94
11496	9.0–17.0		1	10.0	403472	12/27/94
			1	14.0	403471	12/27/94
			1	17.5	403470	12/27/94
11497	28.0–32.0	1	1	26.0	403467	12/27/94
			1	29.0	403468	12/27/94
			1	32.0	403469	12/27/94
11498	27.0–31.0	1	1	25.0	402717	12/28/94
			1	29.0	402716	12/28/94
			1	32.0	402718	12/28/94
11499	15.0–22.0	1	1	16.0	402728	12/28/94
			1	19.0	402730	12/28/94
			1	20.0	402729	12/28/94
11500	19.0–25.5	1	1	21.0	402652	12/19/94
11501	33.0–37.0	1	1	31.0	403350	12/30/94
			1	37.0	403351	12/30/94
11502	18.0–22.0	1	1	17.0	402749	12/29/94
			1	21.0	402750	12/29/94
			1	23.0	402751	12/29/94
11503	24.0–28.0	1	1	23.0	403475	12/29/94
			1	27.0	403474	12/29/94
			1	29.0	403473	12/29/94
11504	14.0–18.0	1	1	15.0–15.5	403365	01/03/95
			1	17.0–17.5	403366	01/03/95

SUMMARY OF GEOTECHNICAL SOIL TESTS
MONITORING WELLS

Location	Moisture Content					
	Well Screened Interval Depth (ft)	Samples Proposed	Samples Collected	Actual Depth (ft)	Sample #	Date Collected
			1	19.5–20.0	403367	01/03/95
11505	23.0–27.0	1	1	22.0–22.5	403354	01/03/95
			1	25.0–25.5	403355	01/03/95
			1	26.5–27.0	403356	01/03/95
11546	9.0–13.0		1	7.5–8.0	403527	01/16/95
			1	11.5–12.0	403528	01/16/95
			1	14.0–14.5	403529	01/16/95
11547	9.0–13.0		1	7.5–8.0	403534	01/16/95
			1	11.5–12.0	403535	01/16/95
			1	14.0–14.5	403536	01/16/95
11548	10.0–14.0		1	9.0–9.5	403522	01/13/95
			1	13.0–14.0	403520	01/13/95
			1	15.0–15.5	403521	01/13/95

SUMMARY OF CHEMICAL AND RADIOLOGICAL SOIL TESTS
LYSIMETERS

Location	PSP Approx. Depth (Ft.)	Actual Depth (Ft.)	Total U & Isotopic U		TCLP Total U & Isotopic U		Sample #	Date Collected
			Proposed	Collected	Proposed	Collected		
11482								
	7.0	6.5 – 7.0			x	x	403413	01/09/95
	7.0	6.5 – 7.0	x	x			403414	01/09/95
11483	35.0	39.5			x	x	403410	01/09/95
	35.0	39.5	x	x			403411	01/09/95
11484	55.0	36.0–37.0			x	x	403392	01/05/95
(Duplicate)	55.0	36.0–37.0			x	x	403393	01/05/95
	55.0	36.0–37.0	x	x			403394	01/05/95
11485	7.0	7.0– 8.0			x	x	403398	01/06/95
	7.0	7.0– 8.0	x	x			403399	01/06/95
11486	35.0	36.5–37.0			x	x	403428	01/10/95
	35.0	36.5–37.0	x	x			403429	01/10/95
11487	55.0	26.0–26.5			x	x	403436	01/10/95
	55.0	26.0–26.5	x	x			403437	01/10/95
(Duplicate)	55.0	26.0–26.5	x	x			403438	01/10/95
11488	7.0	6.5– 7.0			x	x	403465	01/11/95
	7.0	6.5– 7.0	x	x			403466	01/11/95
11489	35.0	36.0–36.5			x	x	403461	01/11/95
	35.0	36.0–36.5	x	x			403462	01/11/95
11490	55.0	46.5–47.0			x	x	403450	01/11/95
	55.0	46.5–47.0	x	x			403451	01/11/95

SUMMARY OF GEOTECHNICAL SOIL TESTS
LYSIMETERS

Location	PSP Approx. Depth (ft)	Moisture Content Samples Proposed	Moisture Content Samples Collected	Grain Size Samples Proposed	Grain Size Samples Collected	Sample #	Date Collected
11482							
	7.0	X		X			
11483							
	35.0	X		X			
11484							
	55.0	X		X			
11485							
	7.0	X		X			
11486							
	35.0	X		X			
11487							
	55.0	X		X			
11488							
	7.0	X		X			
11489							
	35.0	X		X			
11490							
	55.0	X		X			

I.0 INVERSE GROUNDWATER MODELING

I.1 INVERSE GROUNDWATER MODELING

The term inverse modeling is used to distinguish it from normal groundwater flow modeling. In groundwater flow modeling, estimates of model parameters such as infiltration rate and hydraulic conductivity are used to produce estimates of aquifer hydraulic head. In contrast, the objective of inverse modeling is to estimate the value of one or more model parameters based on historical groundwater elevation data. Therefore, inverse modeling is a parameter estimation procedure.

I.1.1 Objectives of Inverse Modeling

Inverse modeling was conducted to obtain a set of estimated values of hydraulic conductivity in the pre-design investigation study area based on the measured water levels in monitoring wells collected over a period of time. The resulting estimates of hydraulic conductivity were used to test assumptions concerning the physical structure of the site geology, assist in determining the appropriateness of conceptual models of the site hydrogeology, and to provide qualitative indications of the degree of connectedness in the till hydrogeology and the ability of the soils to transmit water horizontally.

I.1.2 Methodology

The methodologies utilized for inverse modeling consisted of evaluation of existing groundwater elevation data, development of a conceptual model, set-up of the model structure and time domain, identification of model parameters based on existing data, collection of water level and supporting data, model execution, and interpretation of results. Two computer models were used to perform inverse modeling. MODINV was used to optimize hydraulic conductivity based on observed water level measurements in monitoring wells. MODINV uses the U.S. Geological Survey (USGS) modular three-dimensional finite difference groundwater flow model, MODFLOW, as its forward processor. The HELP model was used to estimate the infiltration rates needed for MODFLOW.

I.1.2.1 MODINV Model Description

The MODINV model, developed at the James Cook University (Doherty, 1990), is an inverse modeling or parameter estimation program for the MODFLOW (McDonald and Harbaugh, 1988) groundwater flow model. Using MODINV, model parameters are optimized such that model generated heads are compared to a set of monitoring well water level elevation readings that have been collected over a period of time.

In modeling groundwater flow, model parameters such as recharge rate and hydraulic conductivity are specified, then an analytical or numerical computer model is executed to find current and future aquifer head values. Model calibration is performed by varying one or more model parameters until the model predicted aquifer heads match the field observations within a specified tolerance. Inverse modeling is an automated model calibration procedure in which the model adjusts parameter values in an attempt to find an optimum set that minimizes the differences between the modeled heads and field observations.

A basic part of the execution of the inverse modeling algorithm is the ability to predict water levels using current estimates of model parameters, that is, to carry out routine solutions of the forward groundwater flow problem. It is these model outputs that are compared with the field measurements. MODINV uses MODFLOW as its forward processor. Because field observed head data exists at only a limited number of points that are not necessarily located at the center of a model grid cell, the MODFLOW output head array is interpolated to obtain head values at locations corresponding to the locations of the available monitoring wells. It is these interpolated head values that are compared with the historical water elevation data. During MODINV optimization, the sum of the weighted squared differences between these two sets of head values is minimized. During a MODINV run, MODFLOW is run many times in order to calculate derivatives, and to test parameter improvements.

I.1.2.2 HELP Model Description

The HELP model was used to determine the infiltration rates through the investigation area. The HELP model (EPA 1984) is a quasi-two-dimensional hydrologic model of water movement across, into, through, and out of the area being modeled. The model accepts climatologic, soil, and design data and simulates a number of hydraulic processes including surface storage, runoff, infiltration, percolation, evapotranspiration, soil moisture storage, and lateral drainage. The systems that can be modeled by HELP include various combinations of vegetation, cover soils, waste cells, drainage layers, and relatively impermeable barrier soils.

The HELP model is designed to perform water budget calculations for a system having as many as 12 layers by modeling each of the hydrologic processes that occur. Each layer must be identified as either a vertical percolation, lateral drainage, or barrier soil layer. The identification of each layer used in the model is critical because the program models water flow through the various types of layers in different ways. Runoff is computed using the Soil Conservation Service (SCS) runoff curve

number method by considering daily precipitation totals. Percolation and vertical water flow is modeled using Darcy's Law with hydraulic conductivity as a function of saturation, i.e, relative permeability effects. Evapotranspiration is estimated by a modified Penman method adjusted for limiting soil moisture conditions.

The HELP model calculates and reports average monthly totals, average annual totals, and peak daily values for the simulation variables. The simulation variables include precipitation, runoff, evapotranspiration, percolation through the base of each layer, and lateral drainage through each layer.

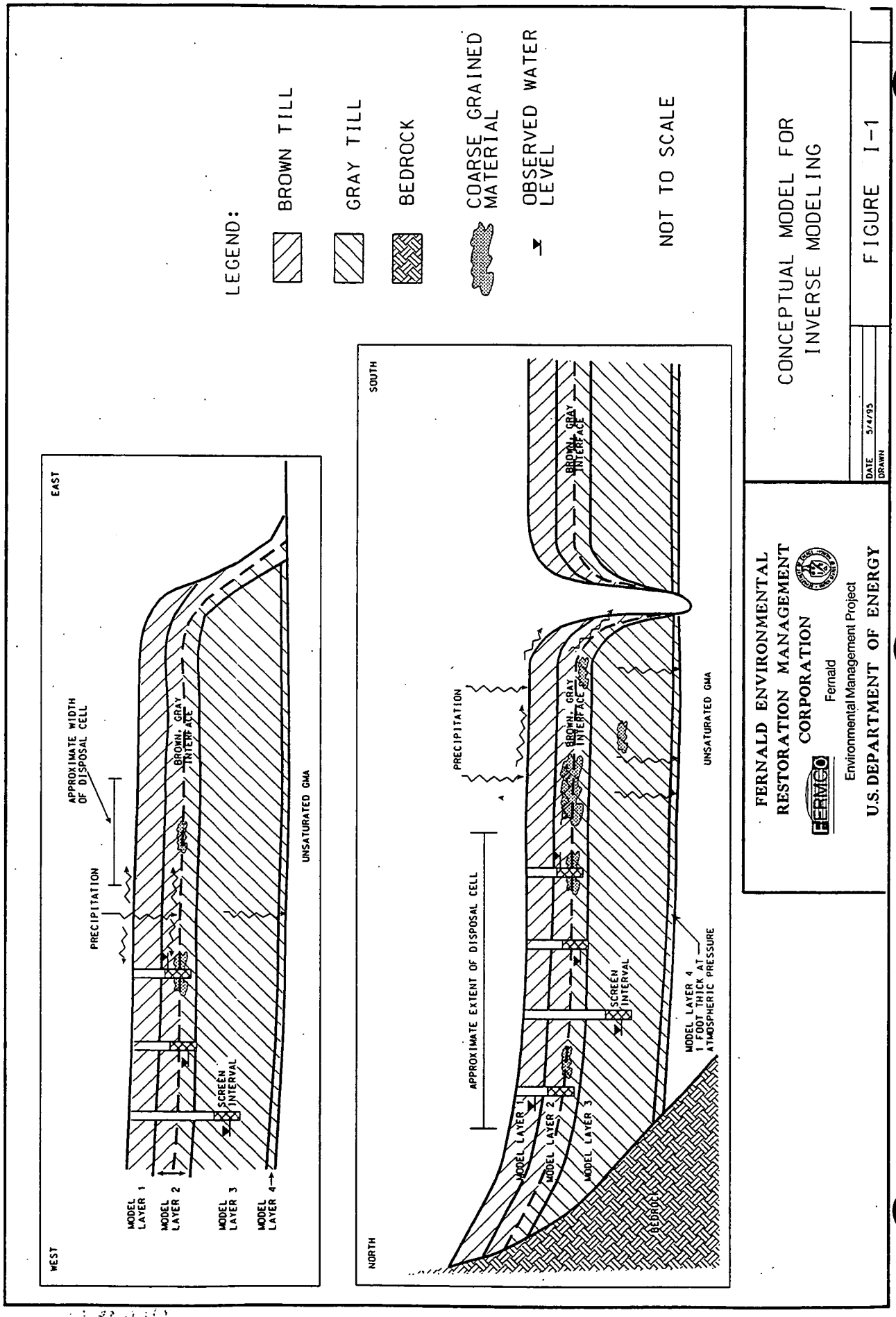
I.1.2.3 Conceptual Model

Dense, fine grained glacial overburden (till) overlies the unsaturated and saturated Great Miami Aquifer. Visual inspection of borings in this and previous investigations at the FEMP site indicate that the till deposit can be divided into a brown till layer underlain by a gray till layer. In general, the gray till has low hydraulic conductivity and provides a till matrix with high adsorption potential. Therefore, at the FEMP, the gray till with its appreciable silt and clay content, is regarded as providing a degree of protectiveness to the Great Miami Aquifer (Dove and Norris, 1951).

Within the till deposits, there are some water-bearing zones that have limited interconnection. Movement of water and contaminants within these units is expected to be limited due to limited areal and vertical extent and lack of interconnection between these units. The majority of these zones are of glaciofluvial origin and consist of small beds of highly-sorted sands and gravels. These intertill perched zones have the following general characteristics:

- High variability in areal extent, thickness, and volume
- Based on lithology and hydrograph analysis, the interconnection between the intertill saturated zones is limited
- Hydraulic conductivities are highly variable with a range of 2.8×10^{-5} to 220 feet/day (1×10^{-8} to 0.08 cm/sec) (OU5 RI Report, 1994; On-site Disposal Cell, Predesign Engineering Supplemental Report, July 1994)

Figure I-1 presents a generalized conceptual model of the glacial overburden. For the modeling purposes, the glacial overburden was divided into four layers. Layer 1 is the top-most layer and is entirely within the brown till. Layer 1 extends from ground surface to approximately five (5) feet


LEGEND:
BROWN TILL
GRAY TILL
BEDROCK
COARSE GRAINED MATERIAL
OBSERVED WATER LEVEL
NOT TO SCALE
EAST
WEST
APPROXIMATE WIDTH OF DISPOSAL CELL
PRECIPITATION
BROWN-GRAY INTERFACE
UNSATURATED GMA
SCREEN INTERVAL
MODEL LAYER 1
MODEL LAYER 2
MODEL LAYER 3
MODEL LAYER 4
SOUTH
NORTH
APPROXIMATE EXTENT OF DISPOSAL CELL
MODEL LAYER 4 1 FOOT THICK AT ATMOSPHERIC PRESSURE
BEDROCK
CONCEPTUAL MODEL FOR INVERSE MODELING
FIGURE I-1
DATE 5/4/95
DRAWN
FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY
FILE NAME: /USR/ERMA5/2CCS1/DGN/MAP/HDR/00036.DGN

above the brown/gray till interface, except where the brown till thickness is less than eight (8) feet. When brown till thickness was less than 8 feet, Layer 1 bottom was defined such that a minimum thickness of 3 feet was maintained for Layer 1. Layer 1 may be partially saturated and was modeled as an unconfined aquifer.

Layer 2 of the model is partly in the brown till and partly in the gray till. This layer consists of fine-grained till deposits (brown and gray) interbedded with sand and gravel glaciofluvial stringers. This layer extends from the bottom of Layer 1 to 5 feet below the brown/gray till interface. In the northern portions of modeled area, bedrock rises sharply terminating the gray till deposits. In this area, Layer 2 extends to the top of bedrock. Layer 2 is where the majority of the perched water zones are expected within the glacial overburden. When water level rises above the top of Layer 2, change in water storage is accounted by the storage in Layer 1. This is accomplished by treating Layer 2 as an unconfined aquifer converting to confined aquifer when water level rises above the top of this layer. This allows for adjusting storage coefficient to one corresponding to compressibility of water and aquifer matrix whenever water level rises above the top of Layer 2. Otherwise, specific yield is used to account for changing water storage in Layer 2.

Originally, Layer 2 consisted of two sublayers. One sublayer for the brown till portion of the Layer 2 and second sublayer for the gray till portion. However, most of the monitoring wells are screen across the brown and gray till interface. This made it difficult to assign water levels in these monitoring well to sublayers. Furthermore, additional sublayers would mean more hydraulic conductivities to optimize without any additional data, a difficult task. Therefore, these sublayers were eliminated from the final conceptual model.

Layer 3 consist of all remaining gray till except for the bottom one foot. Layer 3 acts as a leaky confining layer between Layers 2 and 4.

Layer 4 is a 1-foot thick gray till layer resting on top of the unsaturated Great Miami Aquifer. In the northern portions of the modeled area, bedrock rises sharply and the Great Miami Aquifer is not present. In this area, Layer 4 is 1 feet thick gray till (if present) above the bedrock. Layer 4 is expected to have higher permeability than Layer 3 but remain saturated due to high capillary forces expected for the fine grained material of Layer 4. Layer 4 is confined and is held at atmospheric pressure to simulate its contact with the unsaturated Great Miami Aquifer.

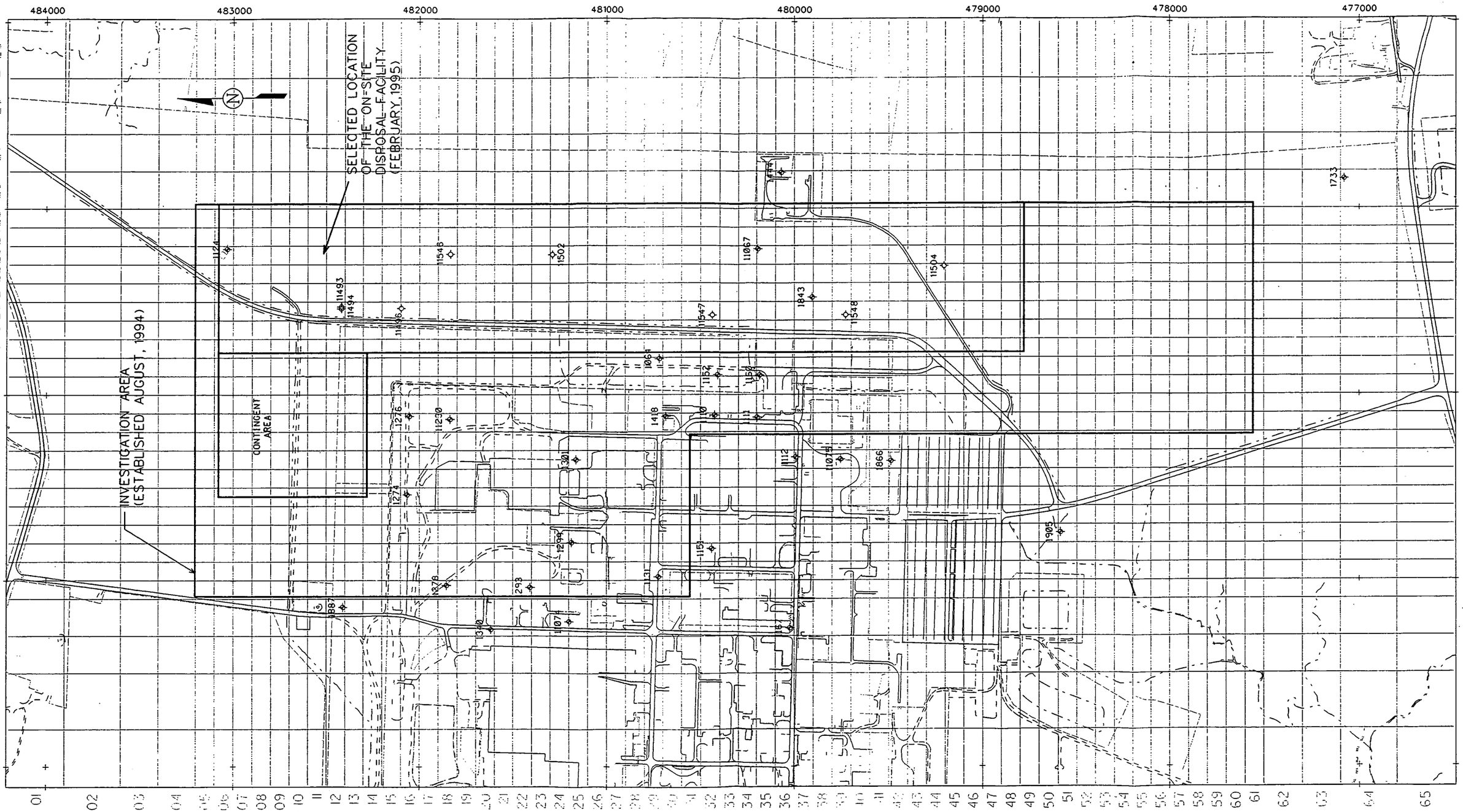
In the northern portions of modeled area, bedrock rises sharply terminating all layers and provide a no-flow boundary (Figure I-1). Figure I-1 also shows that local drainage features in southwestern parts of the modeled area may have exposed unsaturated Great Miami Aquifer. Eastern portion of the modeled area includes a ridge where glacial till thickness decreases sharply and provides a natural seepage face. Hydraulic stresses to the modeled area included pumping at Plant 6 area, bailing activity, infiltration, vertical flow to the Great Miami Aquifer, and seepage to local drainage channels.

I.1.2.4 Technical Approach

Figure I-2 shows the areas under consideration for locating the disposal cell in August 1994. As design was refined and more field data became available, area under consideration for locating the disposal cell was refined in February 1995 (also shown in Figure I-2. It must be emphasized that footprint of the disposal cell is not final and may change as design progresses and more field data become available.

The model grid was selected in October 1994 based on the area under consideration for locating the disposal cell in August 1994. A grid spacing of 100 feet X 100 feet was selected for the disposal cell investigation area. Modeled boundaries were extended 1000 feet beyond the potential location of the disposal cell in each direction to minimize the impact of boundaries on the final results. Grid spacing in this area ranged from 200 to 300 feet. Figure I-2 shows the selected grid with respect to potential disposal cell locations. The modeled area was 4100 feet X 7700 feet and has 29 X 65 grid cells in each layer.

MODINV was used for estimating hydraulic conductivity of Layer 2 by history matching water level measurements taken at the site from October 4, 1994 to February 22, 1995. Inverse modeling or parameter estimation was completed in two stages. The first stage used water level measurements and daily precipitation data from October 4, 1994 to November 30, 1994. Stage I modeling optimized hydraulic conductivities for all grid cells located in the are under consideration for the proposed disposal cell as of August 1994. Results of the first stage of inverse modeling were used to guide water level measurement field program. Stage II used water level measurements and precipitation data from December 1, 1994 to February 22, 1995. Results of the first stage were used as an initial estimate for the second stage of modeling. This phased approach was taken so that field data



LEGEND

- EXISTING 1000 WELLS
- NEW MONITORING WELLS

SCALE

0 250 500 1000 FEET

NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

INVERSE MODELING GRID AND MONITORING WELLS

DATE 3-20-95
DRAWN R. WILLIAMS

FIGURE I-2

collection program could be optimized and water level measurements from newly installed monitoring wells in the investigation area could be incorporated in the modeling.

Selected wells were continuously monitored for water level changes using transducers attached to data loggers while others were monitored manually on a weekly basis. Water levels were also measured within 24 hours of significant rainfall event. Hydrographs were reviewed periodically and monitoring wells were added or removed from water level monitoring program. Wells were also added or removed from the water level measurement schedule based on intermediate results of this modeling. Details of water level monitoring program are provided in Section I.1.3.

During a precipitation event, a portion of precipitation infiltrates the soil surface while the remainder evaporates and runs off the surface (in case of rainfall) or accumulates on surface (in case of snowfall). The amount of infiltration decreases with the increase in the clay content and moisture content of the soil, and decreases with the increase in the intensity and duration of rainfall, ground slope steepness, and ground surface coverage with pavement, asphalt, or buildings. Infiltration also decreases with increased vegetative cover or plants having a deeper root zone, such as pine plantation in north, and subdrain system such as drain tiles located in the eastern fields.

Local historical meteorological data and information on the soil types and vegetation were used in the HELP model to estimate average monthly infiltration. Types and areal density of vegetation in the modeled area and ground cover were provided by aerial photos, site reconnaissance, and interviews with personnel familiar with the area under consideration for locating disposal cell. Local site-specific precipitation data for the modeled time period were then used in conjunction with average monthly infiltration to estimate daily infiltration in the modeled area.

MODFLOW was also run in steady state mode to verify that the average annual infiltration and specified vertical hydraulic conductivities are compatible with the observed water levels.

There are 1885 cells in Layer 2. Each of these cells may have different hydraulic conductivity. The objective of this modeling was to estimate hydraulic conductivity in the area under consideration for the proposed disposal cell. However, a reasonable estimate of hydraulic conductivity is required for cells outside the area of concern. Therefore, 1885 cells were first divided into 22 zones. All cells in a zone had same value for hydraulic conductivity. These zones were created so that all cells

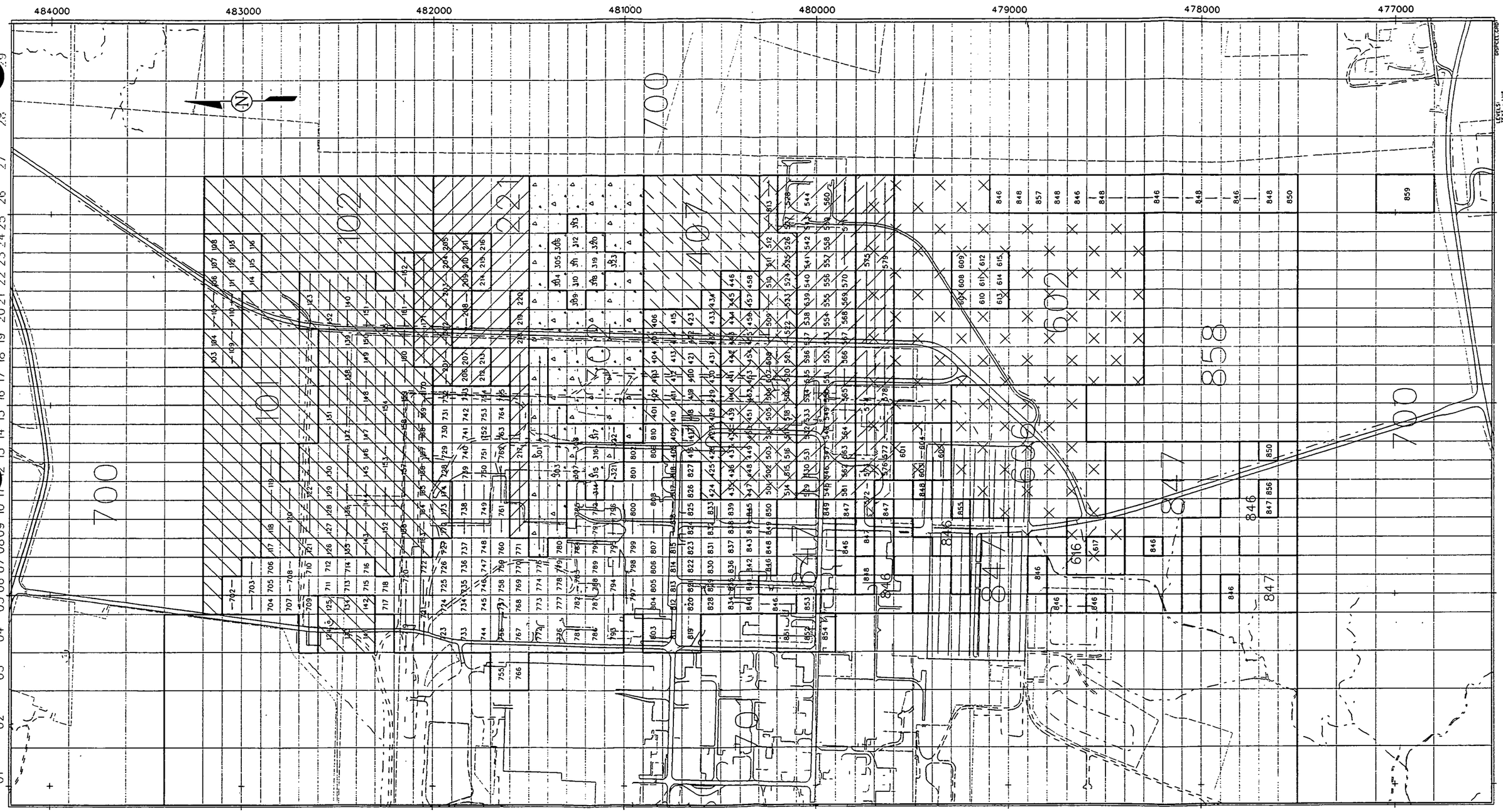
belonging to a zone had similar probability of finding coarse grained material. Zones were not continuous, i.e., cells belonging to a zone need not be located in a contiguous area. In the first MODINV run, hydraulic conductivity for each of 22 zones was optimized. After this run, hydraulic conductivity for cells outside the proposed disposal cell location were not further optimized.

Only hydraulic conductivity of cells within the boundaries of the area under consideration for the disposal cell were optimized in subsequent runs. There are more than 1000 grid cells within the boundaries of the area under consideration for the disposal cell. A single parameter optimization run with 1000 parameters to estimate not only requires large computer resources and time, but also, it is possible that optimization procedure for problem this large may not be successful. In order to develop a more manageable modeling scenario, Layer 2 model cells were organized into groups having the same value of hydraulic conductivity. The grouping of cells was determined by an evaluation of the spacing of available monitoring well used for water level measurements and the likelihood of significant variation in permeability. The assignment of a cell to a group (or zone) was also guided by the indicator kriging/solid block modeling that was conducted prior to the start of the field program. This solid block modeling assigned a probability of locating coarse grained soils on a 100-feet-by-100-feet grid. A total of 432 cell groups (zones) were created for modeling of Layer 2.

Optimization of 432 hydraulic conductivities for Layer 2 was still not practical. In order to create a more manageable modeling scenario, optimization was performed on a subregion basis. A total of six subregions were created. During optimization all 432 zones were used. However, hydraulic conductivity for each zone was either held to a constant specified value, or was allowed to change for optimization. Only the zones belonging to a subregion and in the area of interest were optimized.

Figure I-3 shows six subregions and 432 zones used for modeling. Note that there is an overlap of subregions. Zones numbered from 101 to 617 were the only zones optimized during both stages of modeling. Hydraulic conductivities for zones numbered from 700 to 859 in Figure I-3 were optimized only during Stage I modeling.

Parameter optimization was performed on a subregion by subregion basis using the latest available values of hydraulic conductivities from all previous runs. Iterations on a subregion by subregion continued until no further improvement in hydraulic conductivities were realized. This procedure is similar to the Gauss-Seidel iterative method where newly computed values for unknown parameters



NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

SUBREGIONS AND ZONES OF INDEPENDANT HYDRAULIC CONDUCTIVITIES FOR LAYER 2

DATE 5-12-95
DRAWN

FIGURE 1-3

are used in the iterative procedure as soon as they become available. Convergence was typically achieved in 2 to 3 iterations on a subregion level.

I.1.3 Data Collection Activities

I.1.3.1 Monitoring Well Water Elevations

Water level measurements from existing and newly installed 1000 series monitoring wells were collected from October 4, 1994 through March, 1995. The wells that were measured are shown in Figure I-2. A set of six water level transducers and data loggers were used to obtain hourly readings in six of the wells. The remaining wells were monitored weekly by taking manual readings. In addition, manual reading were taken within 24 hours of a rainfall event exceeding 0.5 inches. Daily manual measurements were obtained for newly installed monitoring wells, until the well response was seen to stabilize.

The well response to precipitation was continuously analyzed as the data were collected. Not all of the wells were monitored throughout the complete modeling time period. Wells were added or deleted from the monitoring list depending on the response to precipitation events, and the need to collect data in specific zones of the model grid. The number of manual water elevation reading was limited to the number of measurements that could be performed in a day. Likewise the list of monitoring wells in which continuous water level transducer reading were obtained was adjusted based on the on-going data needs and the hydrograph response.

I.1.3.2 Extraction Water Volumes

The volumes of water that were extracted from monitoring wells during the modeled time period were obtained and used as additional input data for the inverse modeling. Groundwater extractions occurred for four shallow wells installed within Plant 6, well 1064, and the newly installed monitoring wells in the investigation area. The Plant 6 wells are part of an on-going perched groundwater extraction and treatment system that was previously installed in Plant 6. These volumes are shown in Table I-1. The extraction volume data was obtained from the plant operators, who take daily reading of the amounts pumped. Water was extracted from well 1064 for use in the associated Kd study. Water was extracted from the newly installed monitoring wells for well development. These extracted water volumes are shown in Table I-2.

TABLE I-1

GALLONS OF WATER EXTRACTED FROM PLANT 6 Wells

Date	Monitoring Well No. (Amount Extracted in Gallons)			
	1161	1148	1149	1778
02-Sept-94	0.9	1.6	1.7	6.3
12-Sept-94	5.8	21.1	9.0	74.1
13-Sept-94	1.0	11.7	0.9	6.4
14-Sept-94		1.76	3.0	6.2
15-Sept-94	0.5	3.8	5.1	6.5
16-Sept-94	0.8	1.7	4.9	7.8
19-Sept-94	1.7	10.9	4.9	19.9
20-Sept-94		1.9	3.0	15.9
21-Sept-94	1.0	3.7	2.1	
22-Sept-94	0.4	3.6		18.4
23-Sept-94	0.3	1.9	3.9	7.5
26-Sept-94	2.3	9.1	4.1	27.7
27-Sept-94	0.1	13.9	1.0	6.3
28-Sept-94	10.8	14.9	2.9	5.0
29-Sept-94	0.2	13.5	5.0	7.9
30-Sept-94	0.2	1.9		6.6
03-Oct-94	0.1	1.5	5.1	20.3
04-Oct-94	0.6	1.8	4.1	6.0
05-Oct-94	0.1	3.7		23.5
06-Oct-94	0.7	0.1	0.1	0.3
07-Oct-94	0.1		1.0	6.1
10-Oct-94	1.5		43.5*	19.9
11-Oct-94	0.8	0.2	5.2	6.0
12-Oct-94		0.2	13.5*	6.3
13-Oct-94	0.9		4.6	7.7
14-Oct-94		0.2	4.8	6.1
17-Oct-94	1.3	10.1	4.0	19.8
18-Oct-94	0.3		4.0	6.2
19-Oct-94	0.8		3.9	16.0
20-Oct-94	0.8		4.1	.9
21-Oct-94			4.3	6.1
24-Oct-94	1.6	8.4	5.3	18.4
26-Oct-94	0.8	8.0	4.2	14.3
27-Oct-94	0.1	1.8	2.2	6.5
28-Oct-94	0.7	3.8	3.9	6.7

TABLE I-1
(Continued)

Date	Monitoring Well No. (Amount Extracted in Gallons)			
	1161	1148	1149	1778
31-Oct-94	0.8	7.7	3.2	30.4
01-Nov-94	0.8	4.0	3.3	5.2
02-Nov-94		2.0	4.6	27.2
03-Nov-94	1.0	3.8	4.3	6.8
04-Nov-94	0.1	1.8	3.5	4.7
07-Nov-94	0.4	7.8	3.7	18.7
08-Nov-94	0.8	63.9*		16.6
09-Nov-94	0.1	2.0	4.3	
10-Nov-94	0.9	0.1	9.0	3.0
14-Nov-94	1.7	5.2	5.1	24.7
18-Nov-94	0.9	6.8	4.8	8.4
21-Nov-94	0.7	9.4	0.0	26.8
22-Nov-94	0.8	1.8	3.1	17.5
23-Nov-94	0.1	7.3	4.1	6.7
24-Nov-94		5.5		
28-Nov-94	1.9	2.7	5.1	34.4
29-Nov-94	0.1	3.8	2.8	6.0
30-Nov-94	0.6	1.8	3.0	6.1
01-Dec-94	0.0	4.0	4.0	7.5
02-Dec-94	0.7	1.8	4.0	9.2
04-Dec-94				
05-Dec-94	0.7	9.2	4.0	16.8
06-Dec-94	0.0	2.0	4.0	5.8
07-Dec-94	0.9	1.9	5.4	6.3
08-Dec-94	0.0	1.8	3.6	7.6
09-Dec-94	0.7	3.9		5.9
10-Dec-94				
11-Dec-94				
12-Dec-94	0.6	9.5	8.0	19.7
13-Dec-94	0.8	1.8	3.1	7.7
14-Dec-94	0.0	3.8	5.00	6.3
15-Dec-94	0.7	1.3	0.7	4.9
16-Dec-94	0.1	4.8	2.2	8.1
17-Dec-94				
18-Dec-94				

TABLE I-1
(Continued)

Date	Monitoring Well No. (Amount Extracted in Gallons)			
	1161	1148	1149	1778
19-Dec-94	0.8	7.6	4.0	21.7
20-Dec-94	0.7	3.8	4.0	7.8
21-Dec-94	0.0	1.6	4.1	6.9
22-Dec-94	0.0	2.0	1.9	5.9
23-Dec-94				
24-Dec-94				
25-Dec-94				
26-Dec-94				
27-Dec-94	2.1	5.3	5.0	35.6
28-Dec-94	0.0	13.6	4.2	8.0
29-Dec-94	0.0	2.0	2.9	12.4
30-Dec-94	0.7	2.0	3.0	0.2
31-Dec-94				
01-Jan-95				
02-Jan-95				
03-Jan-95	0.0	0.2	4.8	0.1
04-Jan-95	0.0	6.0	0.2	0.00
05-Jan-95	0.9	2.9	4.0	9.3
06-Jan-95	0.0	3.10	1.9	20.4
07-Jan-95				
08-Jan-95				
09-Jan-95	0.7	8.9		31.8
10-Jan-95	0.8	5.4	10.2	20.7
11-Jan-95	0.2	0.4	4.6	9.5
12-Jan-95	0.7			
13-Jan-95	0.0	3.6	0.00	1.2
14-Jan-95	0.2	0.00	1.0	
15-Jan-95	0.0	6.4	1.9	
16-Jan-95				
17-Jan-95				
18-Jan-95				
19-Jan-95	1.7	13.2	1.3	
20-Jan-95	0.5	1.8	3.0	
21-Jan-95				
22-Jan-95				

TABLE I-1
(Continued)

Date	Monitoring Well No. (Amount Extracted in Gallons)			
	1161	1148	1149	1778
23-Jan-95	0.7	8.5	5.6	43.5
24-Jan-95				
25-Jan-95	0.5	5.4	3.4	22.2
26-Jan-95				
27-Jan-95	0.7	7.3	4.0	19.2
28-Jan-95				
29-Jan-95				
30-Jan-95	0.6	8.9	3.7	27.2
31-Jan-95	0.7			7.5
01-Feb-95	0.0			
02-Feb-95				
03-Feb-95				
04-Feb-95				
05-Feb-95				
06-Feb-95	0.7	21.7	10.9	
7-Feb-95	0.6	3.6	2.4	87.1
08-Feb-95	0.1	3.7	5.9	26.7
09-Feb-95	0.0	1.8	2.5	22.2
10-Feb-95	0.5	13.6	3.7	32.5
11-Feb-95				
12-Feb-95				
13-Feb-95				29.5
14-Feb-95				
15-Feb-95				
16-Feb-95	0.0			32.5
17-Feb-95				
18-Feb-95				
19-Feb-95				
20-Feb-95				
21-Feb-95				
22-Feb-95	1.4			94.1

TABLE I-1
(Continued)

NOTES:

1) Yield is determined through use of flow meter readings and water is pumped into a common holding tank from each well.

2) Volume extracted from 1064 was water used in K_d Study. Data for 1778 after January 13th was not valid.

*Questionable amount error in flow meter readings.

Rust Environmental
Geosyntech
Foster Wheeler
Morrison Knudsen
CDM Federal
Montgomery Watson
Weston

TABLE I-2

GALLON OF WATER EXTRACTED

Date	Monitoring Well No.																		
	1064	11491	11492	11493	11494	11495	11496	11497	11498	11499	11500	11501	11502	11503	11504	11505	11546	11547	11548
26-Dec-94																			
27-Dec-94		7.50	1.50																
28-Dec-94	42.00	2.50	2.70								6.00								
29-Dec-94	2.50										2.50								
30-Dec-94	4.00			0.75	15.50	2.00													
31-Dec-94																			
01-Jan-95																			
02-Jan-95																			
03-Jan-95	14.00						2.00												
04-Jan-95	4.00						4.00												
05-Jan-95	12.00						40.00	3.00											
06-Jan-95																			
07-Jan-95					27.00			0.75	3.00	2.00									
08-Jan-95																			
09-Jan-95									1.00	0.00									
10-Jan-95												7.00							
11-Jan-95					13.00							12.00							
12-Jan-95																			
13-Jan-95					36.00								5.00	6.00					
14-Jan-95													0.00	1.00	10.00				
15-Jan-95					40.00										6.00	4.00			
16-Jan-95																			

FER\TDO\PREDESIGN\G:\PREDESIG\APP-I\TAB.I-2\July26, 1995 1:10pm

TABLE I-2
(Continued)

Date	Monitoring Well No.																		
	1064	11491	11492	11493	11494	11495	11496	11497	11498	11499	11500	11501	11502	11503	11504	11505	11546	11547	11548
17-Jan-95																			
18-Jan-95					30.00											3.50			
19-Jan-95																	2.00		1.00
20-Jan-95																	1.00	3.00	1.00
21-Jan-95																			
22-Jan-95																			
23-Jan-95																		0.70	

000866

I.1.3.3 Precipitation Data

The daily site specific precipitation readings were obtained from the site meteorologist and compiled for use in the inverse modeling and in hydrograph analysis. The precipitation data were obtained covering the model simulation time from October 4, 1994 to February 22, 1995.

I.1.4 Input Data for MODINV

MODINV requires many inputs. Wherever possible, site-specific values were used as inputs. Certain parameters were, however, not available and were estimated based on pertinent scientific literature search, hydrogeologic investigations, geochemical investigations, and were checked for consistency between model results and historical data.

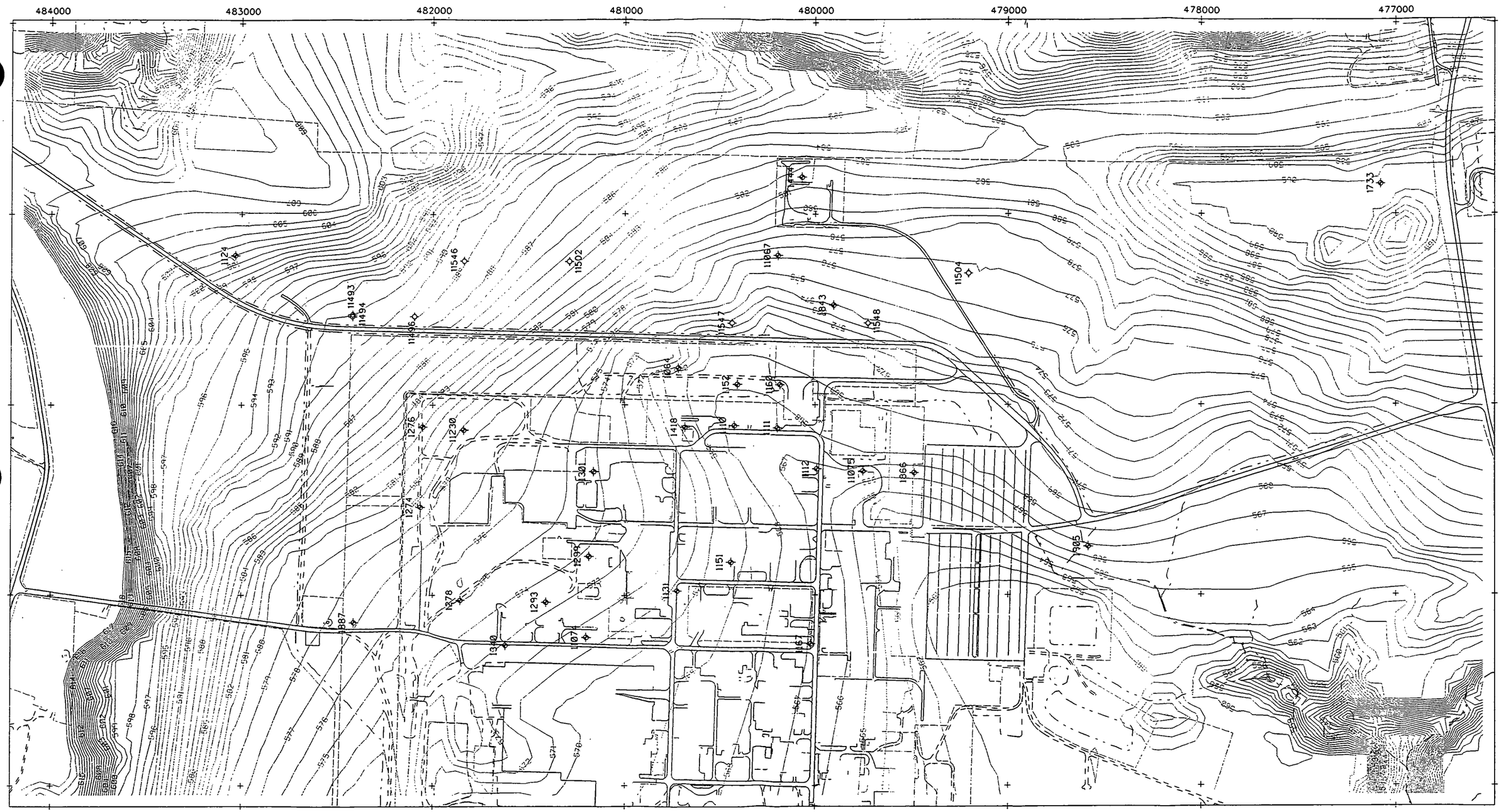
I.1.4.1 Layer Elevations

MODINV modeling required elevations for ground surface, brown/gray till interface, and bottoms of Layers 1 through 4. All surfaces are terminated by sharply rising bedrock in the northern parts of the modeled area. Ground surface elevations used were based on 1992 flyover. The surface which represent brown/gray till interface was determined based on soil borings and monitoring wells installed as part of RI/FS investigations for the OU-2, OU-3, and OU-5 and available in September 1994. Figure I-4 shows the brown/gray till interface surface used to define Layer 2. Recently, cone penetrometer tests (CPT) were conducted and additional monitoring wells and piezometers were installed at the area under consideration for locating disposal cell. Comparison of this new information against Figure I-4 reveled that maximum difference was 3 feet. This was not considered a major difference because Layer 2 was selected to extent 5 feet on both sides of the brown/gray till interface and Layer 2 was defined solely to determine continuity of coarse grained or highly permeable lenses. Therefore, model layers were not redefined during second phase of modeling.

Figures I-5 and I-6 shows bottoms of Layers 1 and 2, respectively. These model layers were set as discussed earlier in Section I.1.2.2, the conceptual model. Bottom of Layer 3 is 1 foot above the Layer 4 and the bottom of Layer 4 is the top of Great Miami Aquifer.

I.1.4.2 Hydrologic Properties

Layers 1, 3 and 4 were assigned uniform, homogeneous, isotropic hydraulic conductivities. The hydraulic conductivity for Layer 1, 3.6 x 10^{-5} cm/sec, was obtained from the geometric average horizontal hydraulic conductivities calculated from slug tests conducted in 1000-series wells completed



LEGEND

- EXISTING 1000 WELLS
- NEW MONITORING WELLS
- BROWN/GRAY TILL INTERFACE SURFACE (FEET ABOVE SEA LEVEL)

SCALE

0 250 500 1000 FEET

NOTE: COORDINATES ARE STATE PLANAR NAD 1927

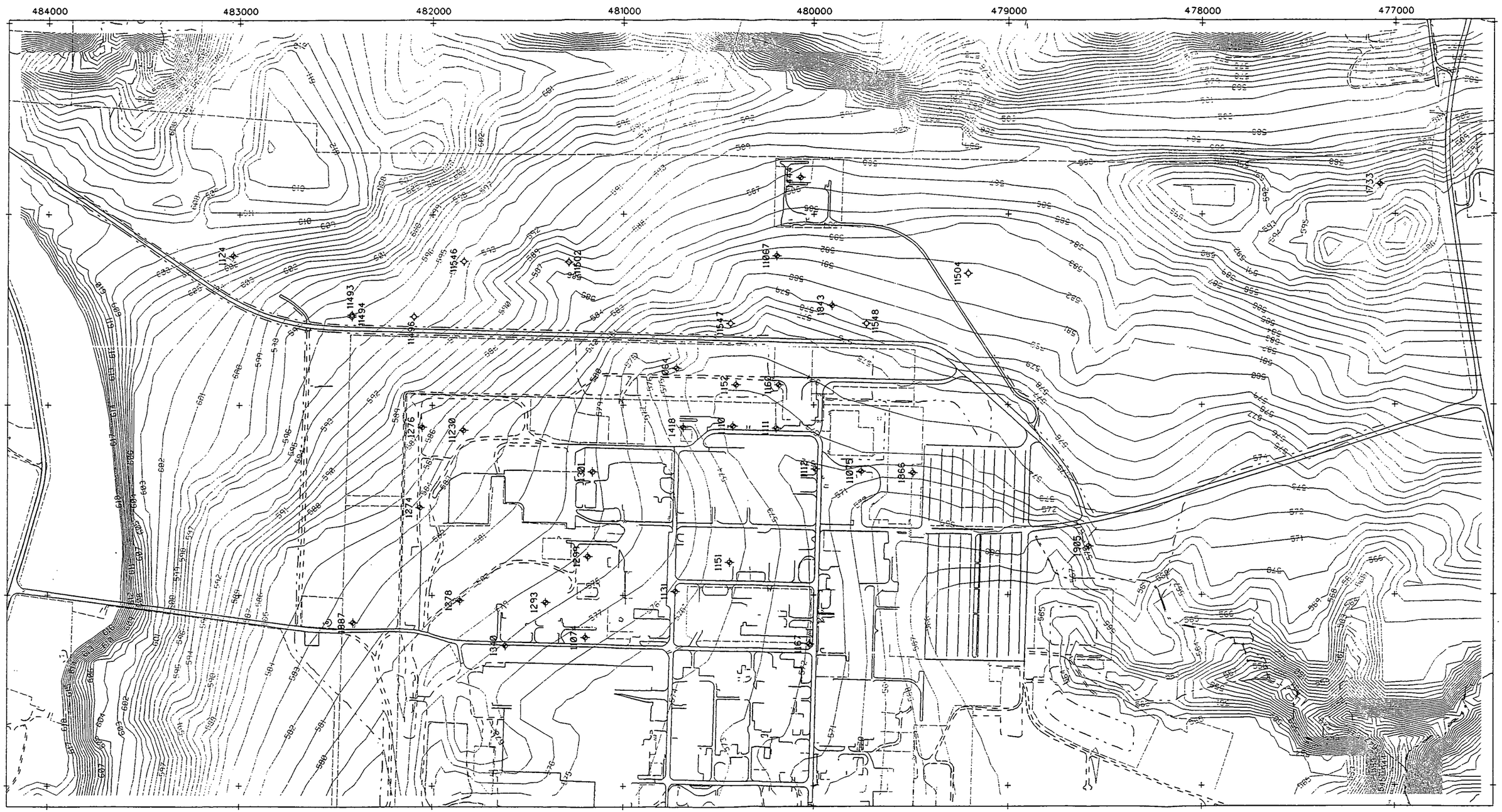
FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

BROWN/GRAY TILL INTERFACE SURFACE (DECEMBER 1994 DATA)

DATE 4-28-95
DRAWN R. WILLIAMS

FIGURE I-4

000868



LEGEND

- EXISTING 1000 WELLS
- NEW MONITORING WELLS
- BOTTOM OF LAYER 1 SURFACE CONTOUR (FEET ABOVE SEA LEVEL)

SCALE

0 250 500 1000 FEET

NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

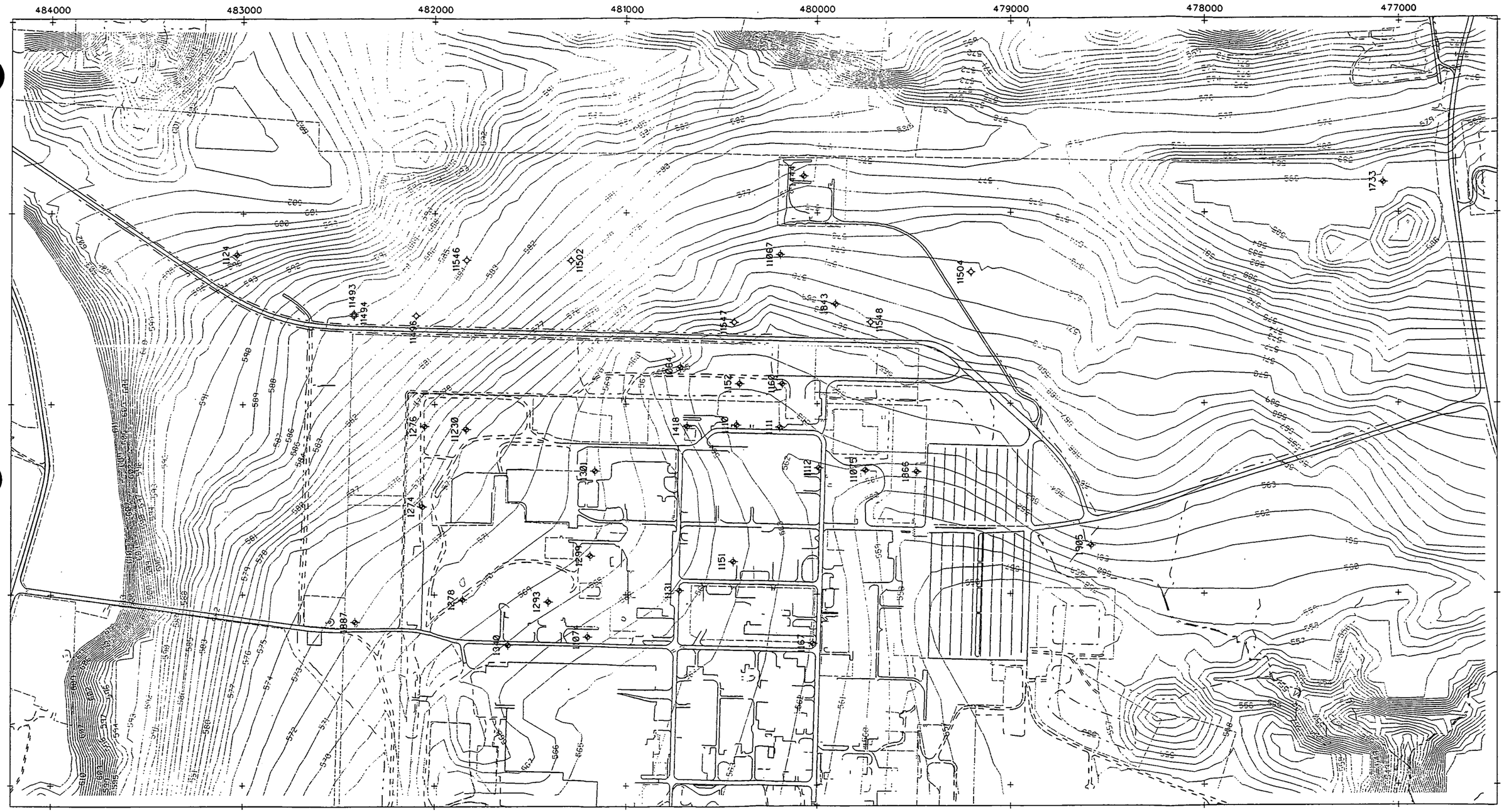
ELEVATION OF THE BOTTOM OF THE MODEL LAYER 1

000869

DATE 4-28-95
DRAWN R. WILLIAMS

FIGURE I-5

FILE NAME: /2ccs1/dgn/map/hor/dpth/ph20032.dgn



LEGEND

- EXISTING 1000 WELLS
- NEW MONITORING WELLS
- BOTTOM OF LAYER 2 CONTOURS (FEET ABOVE SEA LEVEL)

SCALE

0 250 500 1000 FEET

NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

ELEVATION OF THE BOTTOM OF THE MODEL LAYER 2

000870

DATE 4-28-95
DRAWN R. WILLIAMS

FIGURE I-6

FILE NAME: /2ccs1/dgn/map/hor/dpth/ph20033.dgn

in the brown till. The horizontal hydraulic conductivity for Layer 4, 1.9 x 10^{-6} cm/sec, was similarly obtained from the geometric average horizontal hydraulic conductivity calculated from slug tests conducted in 1000-series wells completed in the gray till. The vertical hydraulic conductivity for Layer 3 was obtained by calibrating the steady state model for the disposal cell area such that predicted water level elevations and pattern follow the observed trends. This calibrated vertical hydraulic conductivity for the gray till (4 x 10^{-7} cm/sec) was one-fifth of the geometric mean horizontal hydraulic conductivity for the gray till. Section I.1.4.6 describes the procedure used to obtain initial estimate of hydraulic conductivity for Layer 2.

Storage coefficient, used for confined aquifer conditions, was estimated to be 5 x 10^{-4} while specific yield was estimated to be 0.05. These values were estimated as typical for the soil types encountered at the site.

I.1.4.3 Water Withdrawal Rates

Four wells in the Plant 6 area have automatic water level control system. When water level reaches a certain predefined level, a well pump is turned on and water is withdrawn until water level goes below the low level sensor. Individual pumping event is not recorded. However, total amount of water produced from each well is recorded periodically. Table I-1 provide the water withdrawal data from these four wells. For modeling purposes, it was assumed that a constant pumping rate existed between two events when amount of water produced was recorded.

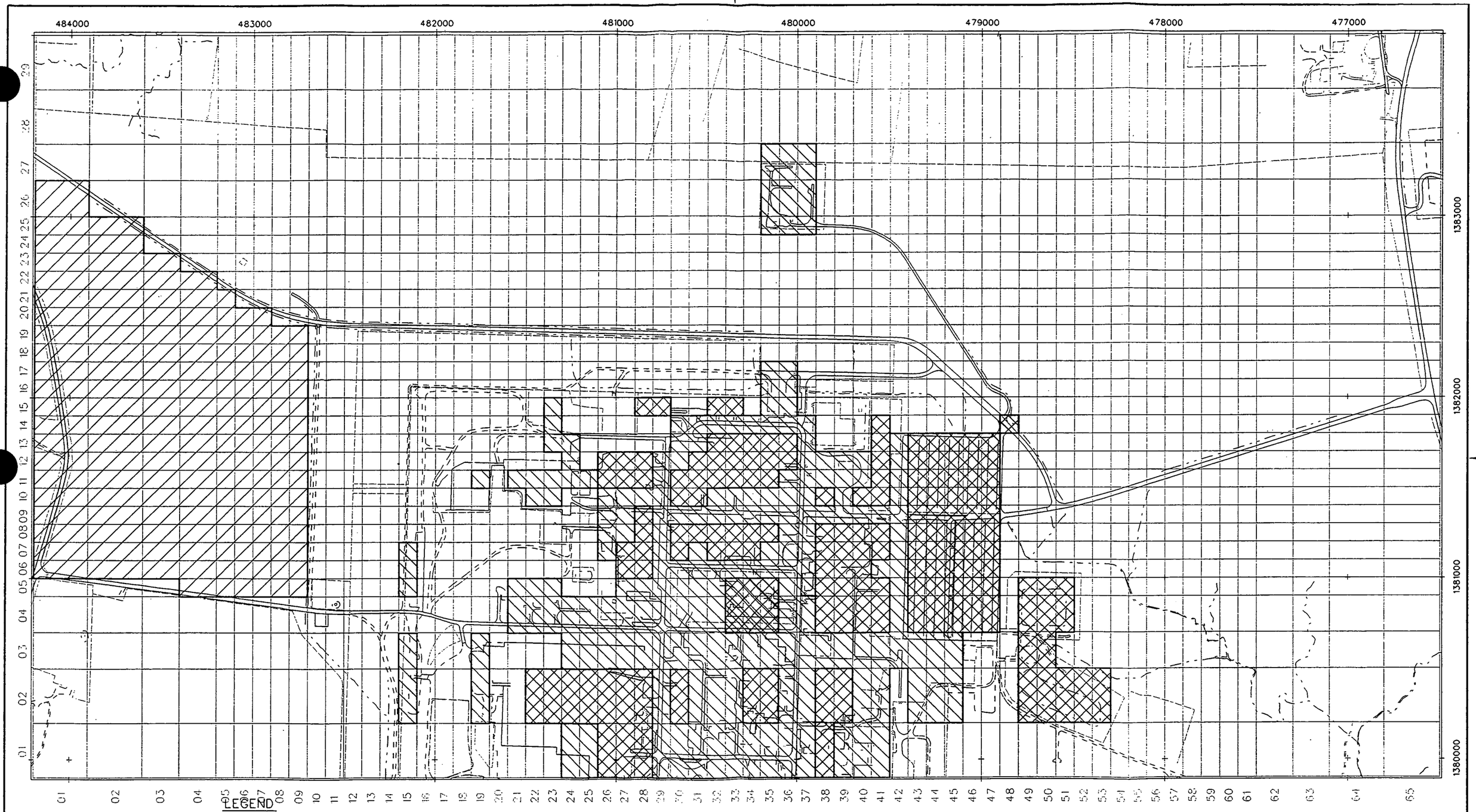
Newly installed monitoring wells and piezometers were periodically bailed. Bailing information is provided in Table I-2. Bailed water was modeled as withdrawn on the day of bailing.

I.1.4.4 Infiltration Rates

The modeled area was divided into four zones for the purposes of infiltrations. These four zones are:

- Open fields or lawn
- Paved areas or areas covered by buildings
- Model grid cell partially paved or covered by buildings
- Dense pine tree area

These zones are identified in Figure I-7. The HELP model was run for all zones except for the partially covered cells to estimate infiltration. For partially covered area, infiltration was estimated to be the average of fully covered area and open fields. Table I-3 provides inputs used to estimate



FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

INFILTRATION ZONES FOR INVERSE MODELING
000872

DATE 5-12-95
DRAWN

FIGURE I-7

TABLE I-3

INPUT PARAMETERS FOR THE HELP MODEL AND CALCULATED INFILTRATION RATES

Parameter	Unit	Open Grass Fields	Pine Tree Area	Paved or Covered Area
Layer Thickness	inches			
Top soil/pavement		18.0	38.0	4.
Brown till		60.0	40.0	60.
Coarse grained soils		60.0	60.0	60.
Gray till		NA	NA	144.
Hydraulic conductivity	cm/sec			
Top soil/pavement		5.2×10^{-4}	5.2×10^{-4}	5.0×10^{-6}
Brown till		9.0×10^{-5}	9.0×10^{-5}	9.0×10^{-5}
Coarse grained soils		1.0×10^{-3}	1.0×10^{-3}	1.0×10^{-3}
Gray till		NA	NA	1.9×10^{-6}
Porosity	percent			
Top soil/pavement		47.3	47.3	40.0
Brown till		43.0	43.0	43.0
Coarse grained soils		45.7	45.7	45.7
Gray till		NA	NA	41.0
Field Capacity	percent			
Top soil/pavement		22.2	22.2	35.0
Brown till		32.1	32.1	32.1
Coarse grained soils		13.1	13.1	45.7
Gray till		NA	NA	37.1
Wilting Point	percent			
Top soil/pavement		10.4	10.4	25.0
Brown till		22.1	22.1	22.1
Coarse grained soils		5.8	5.8	5.8
Gray till		NA	NA	25.1
Vegetative Cover		Fair grass	Pine Trees (fair)	Bare ground
Maximum Leaf Area Index	0-5 scale	2.0	3.3	0.0
Evaporative Zone Depth	inches	18	38	2
SCS Runoff Curve Number	0-100 scale	68	68	97
Calculated infiltration rate	inches/year	9.05	6.59	1.73

infiltration for each zone. Input parameters were estimated from field and laboratory data. The climatological data of precipitation and mean monthly temperature were assumed to be the same as for Cincinnati, Ohio from 1974 to 1978.

The HELP model was run to "steady state," that is, until successive simulations showed no appreciable change in soil moisture content in any of the layer. Summary of the HELP results are presented in Table I-3. Average annual infiltration rate varied from 1.7 inches/year for paved area to nine inches/year for open fields or lawn.

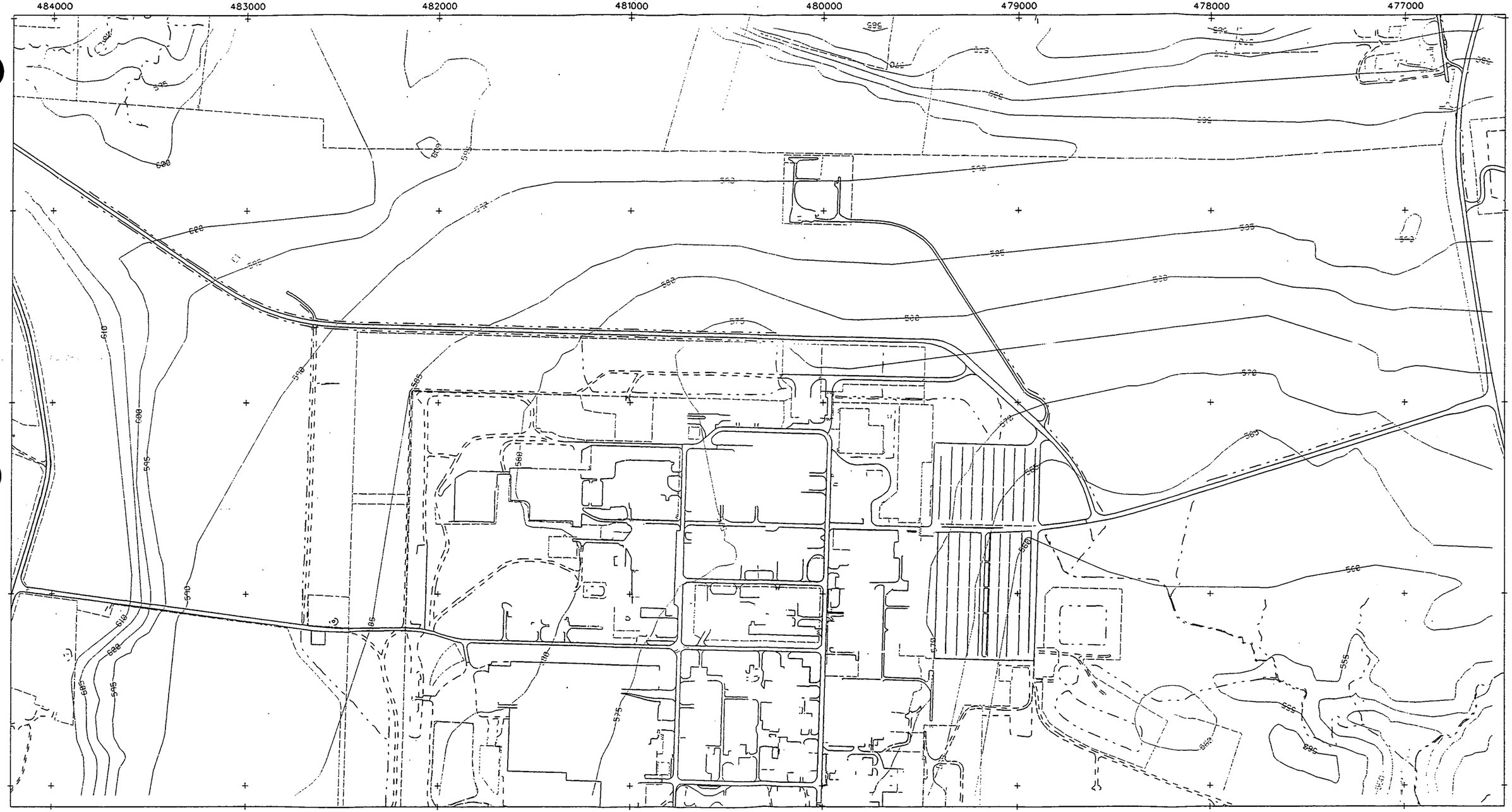
Average monthly infiltration and average monthly precipitation data were used in conjunction with daily site-specific precipitation data to estimate infiltration rates on a daily basis. The ratio of average monthly infiltration to average monthly precipitation provided the factor used to estimate how much of daily precipitation results in infiltration. It is recognized that other factors also influence daily infiltration rates. However, this procedure is expected to yield a good approximation of infiltration rates on an average basis. Estimated daily infiltration rates were used as an input to the MODINV model.

I.1.4.5 Water Levels

Water levels measured on October 4, 1994 and November 30, 1994 were contoured and used as initial water levels for Stage I and Stage II modeling. These water levels are shown in Figures I-8 and I-9. Remaining water level measurements, presented in Section 3.1.3, were used for history matching procedure to optimize hydraulic conductivities for Layer 2.

I.1.4.6 Initial Estimates of Hydraulic Conductivity for Layer 2

Optimization of hydraulic conductivities of Layer 2 was the main focus of the MODINV modeling effort. MODINV requires initial estimates of the parameters to be optimized. Solid block modeling of coarse grained materials was used to estimate probability of finding coarse grained soils in each grid. Grids with ninety-five percent or higher probability of finding coarse grain material were assigned an initial estimate of 1.4×10^{-3} cm/sec for hydraulic conductivity, a geometric mean value of slug test determined hydraulic conductivity for the brown sand. Similarly, grids cells with five percent or less probability of finding coarse grained soils were assigned an initial estimate of 1.7×10^{-5} cm/sec for hydraulic conductivity, a geometric mean value of slug test determined hydraulic



LEGEND

- EXISTING 1000 WELLS
- NEW MONITORING WELLS
- PERCHED GROUNDWATER ELEVATION CONTOURS (FEET ABOVE SEA LEVEL)

SCALE

0 250 500 1000 FEET

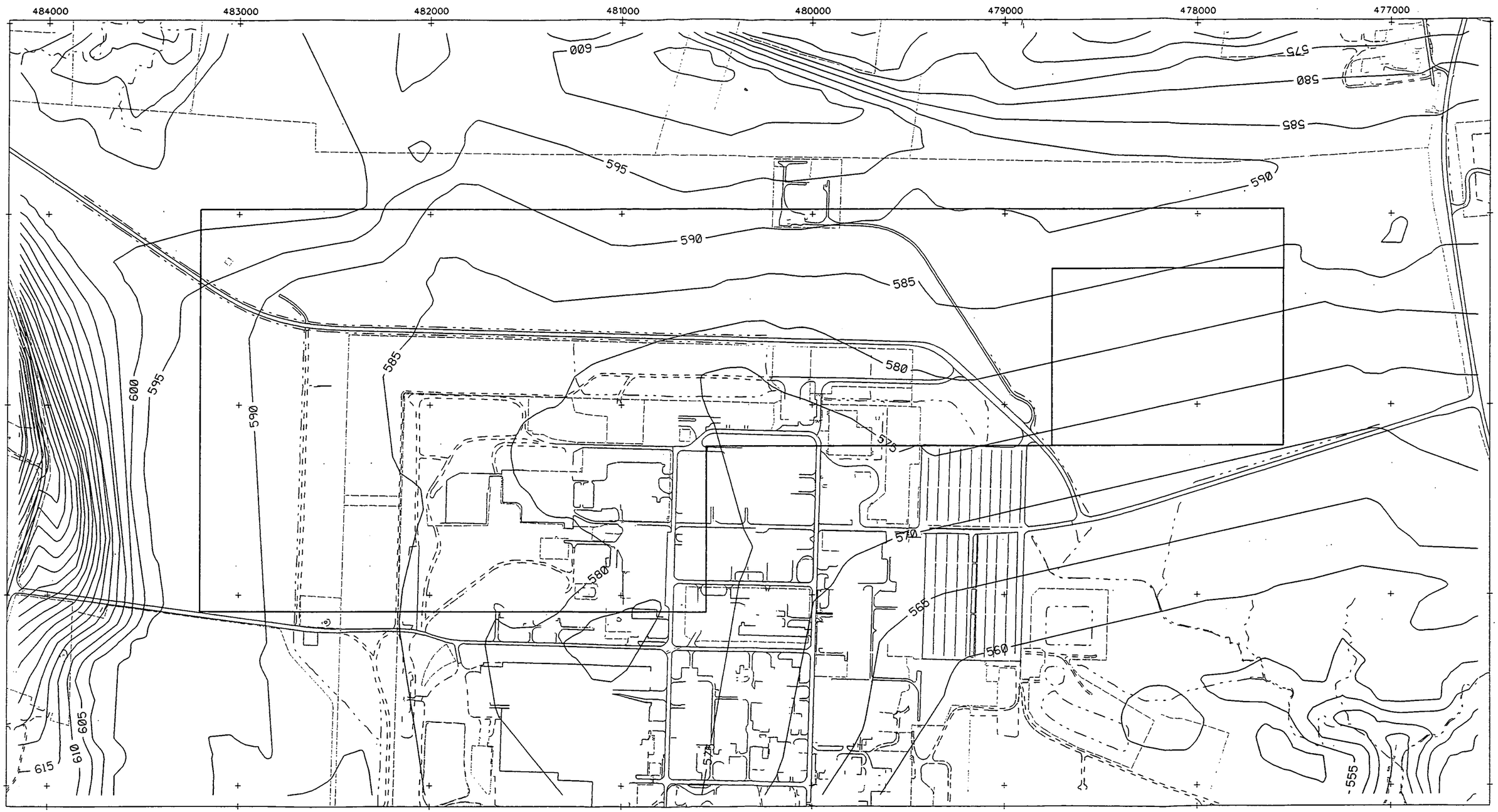
NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

PERCHED GROUND WATER ELEVATION IN LAYER 2 - OCTOBER 4, 1994

DATE 4-28-95
DRAWN

FIGURE 1-8



LEGEND

- EXISTING 1000 WELLS
- NEW MONITORING WELLS
- PERCHED GROUNDWATER ELEVATION CONTOURS (FEET ABOVE SEA LEVEL)

SCALE

0 250 500 1000 FEET

NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

PERCHED GROUND WATER ELEVATIONS IN LAYER 2 - NOVEMBER 30, 1994

DATE 4-28-95
DRAWN

FIGURE I-9

conductivity for the brown or gray silts. Other cells were assigned an initial estimate in between these two ranges.

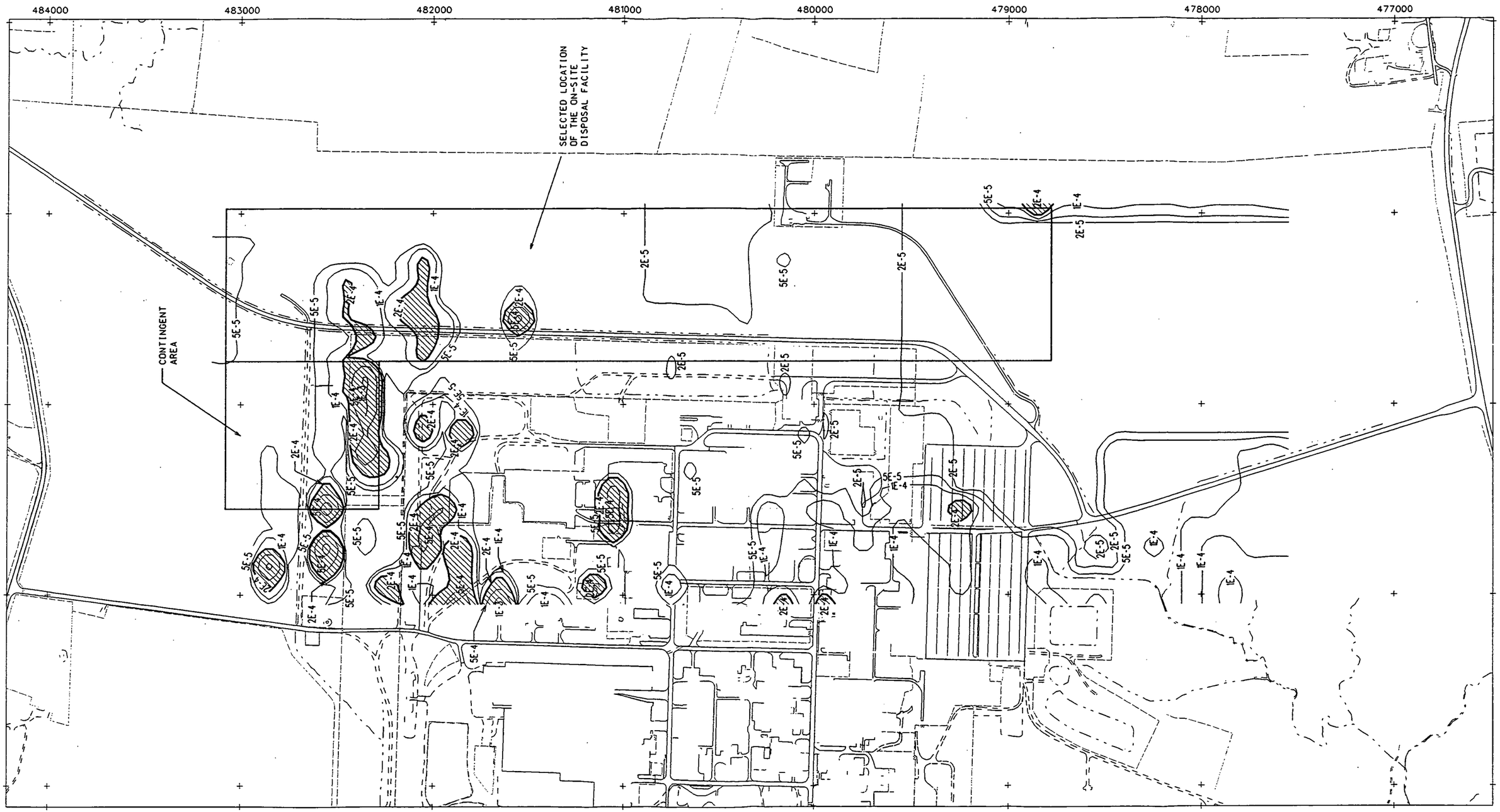
Various zones of equal hydraulic conductivities for the modeling purposes are shown in Figure I-3. Figure I-10 shows the initial estimate of hydraulic conductivity used for Stage I modeling. Results of Stage I modeling provided initial estimate of hydraulic conductivity for Stage II.

I.1.5 MODELING RESULTS

I.1.5.1 Vertical Hydraulic Conductivity of the Gray Till

When MODINV was first run using a vertical hydraulic conductivity of 1.9 x 10^{-6} cm/sec for the gray till, MODFLOW (which is run within the MODINV) predicted that the majority of the modeled area would remain dry during October-November 1994. However, field measurements indicated otherwise. There are two critical parameters influencing the model prediction. These two parameters are the net infiltration rate and the vertical hydraulic conductivity of the gray till. If only infiltration rate is varied, the infiltration rate would have to exceed total precipitation during that time period to prevent large portions of Layer 2 from going dry. Since the modeled area was not irrigated during this time period, infiltration cannot exceed precipitation.

Geotechnical investigations have indicated that the vertical hydraulic conductivity of the gray till ranges from 7 x 10^{-9} to 9.2 x 10^{-8} cm/sec. Furthermore, hydraulic conductivity of 1.9 x 10^{-6} cm/sec was calculated from analysis of slug tests. Slug tests measure horizontal hydraulic conductivity which can be an order of magnitude higher than the vertical hydraulic conductivity. In order to calibrate vertical hydraulic conductivity in Layer 3, MODFLOW was run in the steady state mode. The average annual infiltration rates predicted by the HELP model were used for the steady state run. No water withdrawal was specified. Only vertical flow from the gray till to the unsaturated Great Miami Aquifer was allowed. Vertical hydraulic conductivity of the gray till was varied so that the model predicted steady state water levels were in agreement with the historical water levels at the site. Figure I-11 shows the model predicted steady state ground water elevations for the vertical hydraulic conductivity of 4 x 10^{-7} cm/sec for the gray till. These are in general agreement with the historical water level observations at the site. Lower hydraulic conductivity results in higher predicted water levels and visa versa. Spatial agreement between observed and predicted water levels can be



LEGEND

INITIAL ESTIMATED HYDRAULIC CONDUCTIVITY CONTOUR (cm/sec)

AREAS HAVING INITIAL ESTIMATED HORIZONTAL HYDRAULIC CONDUCTIVITY GREATER THAN 2E-4 cm/sec

SCALE

0 250 500 1000 FEET

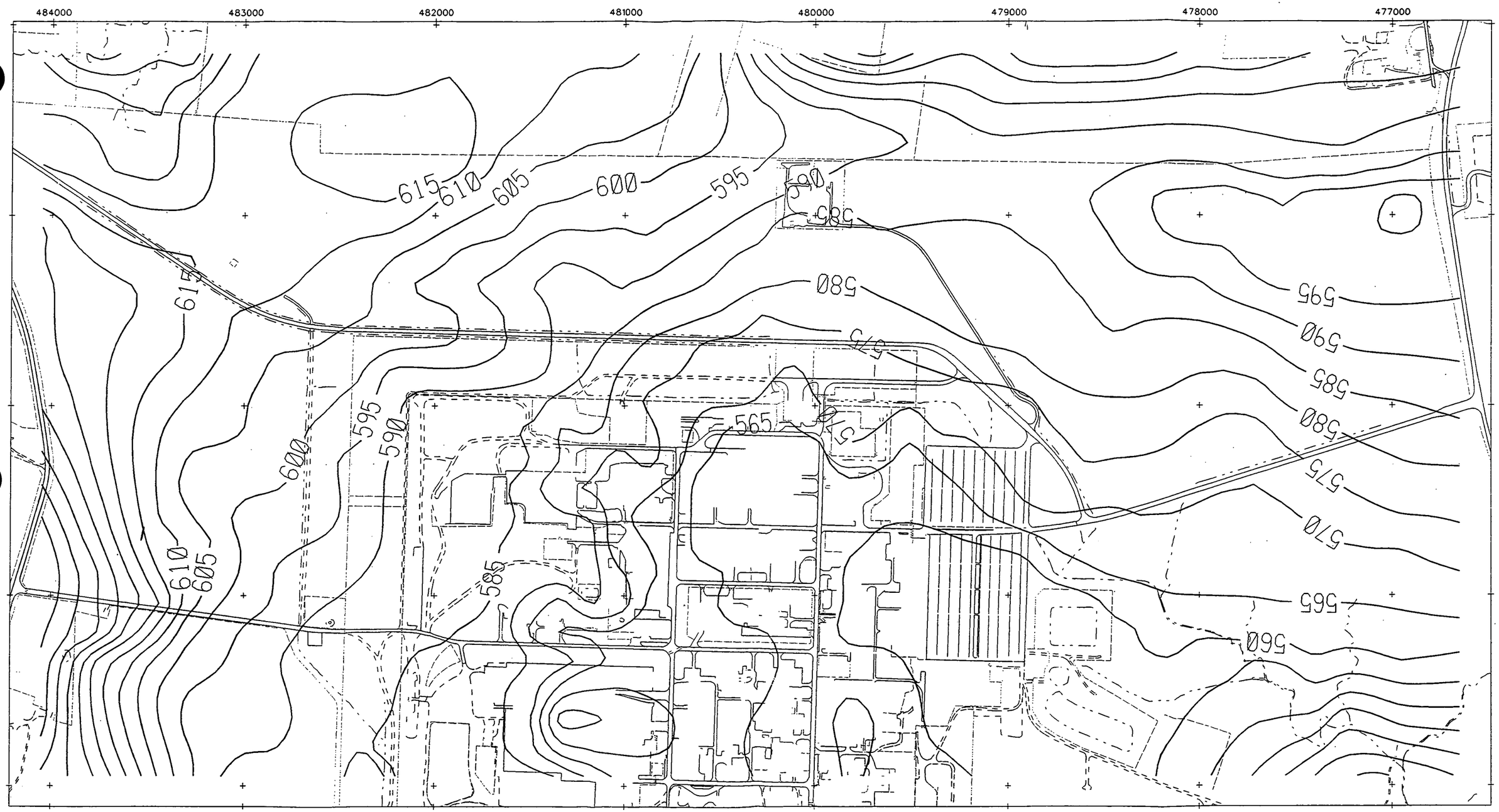
NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

INITIAL ESTIMATES OF HORIZONTAL HYDRAULIC CONUCTIVITY FOR THE BROWN/GRAY INTERFACE LAYER

DATE 4-28-95
DRAWN

FIGURE I-10



LEGEND

—— PERCHED GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

SCALE

0 250 500 1000 FEET

NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

MODEL PREDICTED STEADY STATE PERCHED GROUNDWATER ELEVATION

000879

DATE 4-28-95
DRAWN

FIGURE 1-11

improved by varying the infiltration rate on a block by block basis. However, further model refinement of this type was not justifiable based on the quality and quantity of data available.

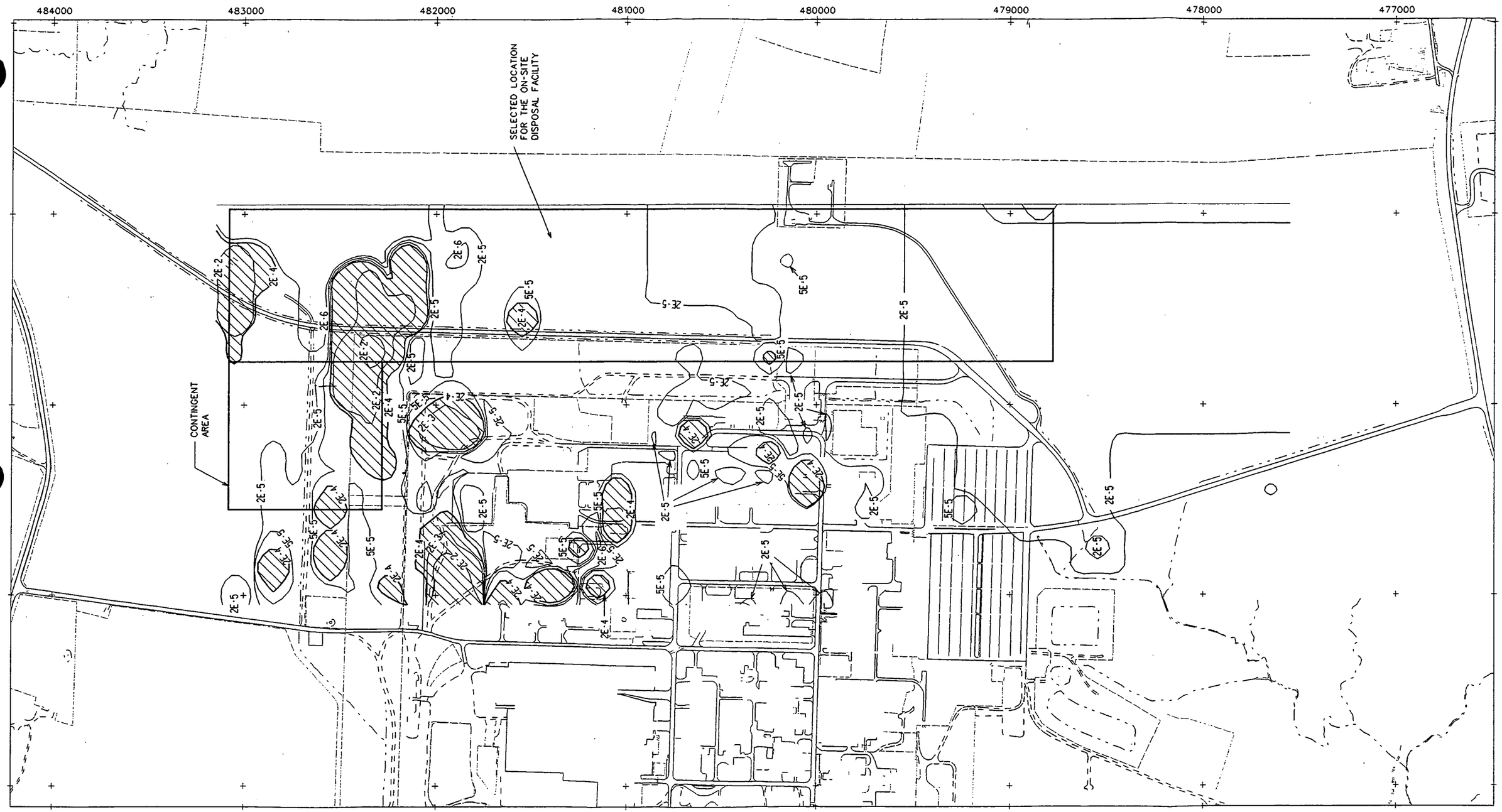
I.1.5.2 Horizontal Hydraulic Conductivity of Layer 2

As noted in Section I.1.2.4, horizontal hydraulic conductivity of Layer 2 was optimized by running MODINV on a subregion by subregion basis. The area of interest was divided into six subregions, as identified in Figure I-3. A typical MODINV run for a subregion may take from 1 to 6 days on a 486/40-MHz personal computer. The MODINV was set to optimize on hydraulic conductivity of Layer 2 by minimizing the differences between model predicted and observed water levels. Modeling was done is two stages as field data became available.

Figure I-12 shows the optimized values of hydraulic conductivities for the model Layer 2. The general distribution of high hydraulic conductivity is similar to the initial estimate based on kriging of coarse grained soils in the till. However, there were some areas where hydraulic conductivity estimates were revised significantly. Figure I-13 and Table I-4 present the relative difference, expressed as orders of magnitude difference, between initial estimate and the MODINV optimized hydraulic conductivities for Model Layer 2. Orders of magnitude differences were calculated as the difference between logarithmic values of optimized and initial values of hydraulic conductivities. A value of 1.0 in Figure I-13 indicates that the optimized value is 10 times (an order of magnitude) higher than the initial value. On the other hand, a value of -1.0 in Figure I-13 indicates that the optimized value is 10 times less than the initial value.

The horizontal hydraulic conductivity for Layer 2 range from 2×10^{-7} to 0.3 cm/sec. The majority of the area has hydraulic conductivity value of 2×10^{-5} cm/sec, which is typical of silt and clay in glacial till deposits. The geotechnical investigation indicate that average vertical hydraulic conductivity of brown till is 1.2×10^{-6} cm/sec, which is an order of magnitude lower than estimated horizontal hydraulic conductivity. An order of magnitude difference between horizontal and vertical hydraulic conductivity in a till deposit is reasonable. This indicates that a network of fractures may not be dominating horizontal flow at the interface except possibly in isolated locations.

High hydraulic conductivities are an indication of continuous coarse grained material lense or fractured media and a potential pathway for leachate from the proposed disposal cell to migrate horizontally and then vertically to the Great Miami aquifer. Figure I-12 shows that there are two



LEGEND

—— ESTIMATED HORIZONTAL HYDRAULIC CONDUCTIVITY CONTOUR (cm/sec)

AREAS HAVING ESTIMATED HORIZONTAL HYDRAULIC CONDUCTIVITY GREATER THAN 2E-4 cm/sec

SCALE

0 250 500 1000 FEET

NOTE: COORDINATES ARE STATE PLANAR NAD 1927

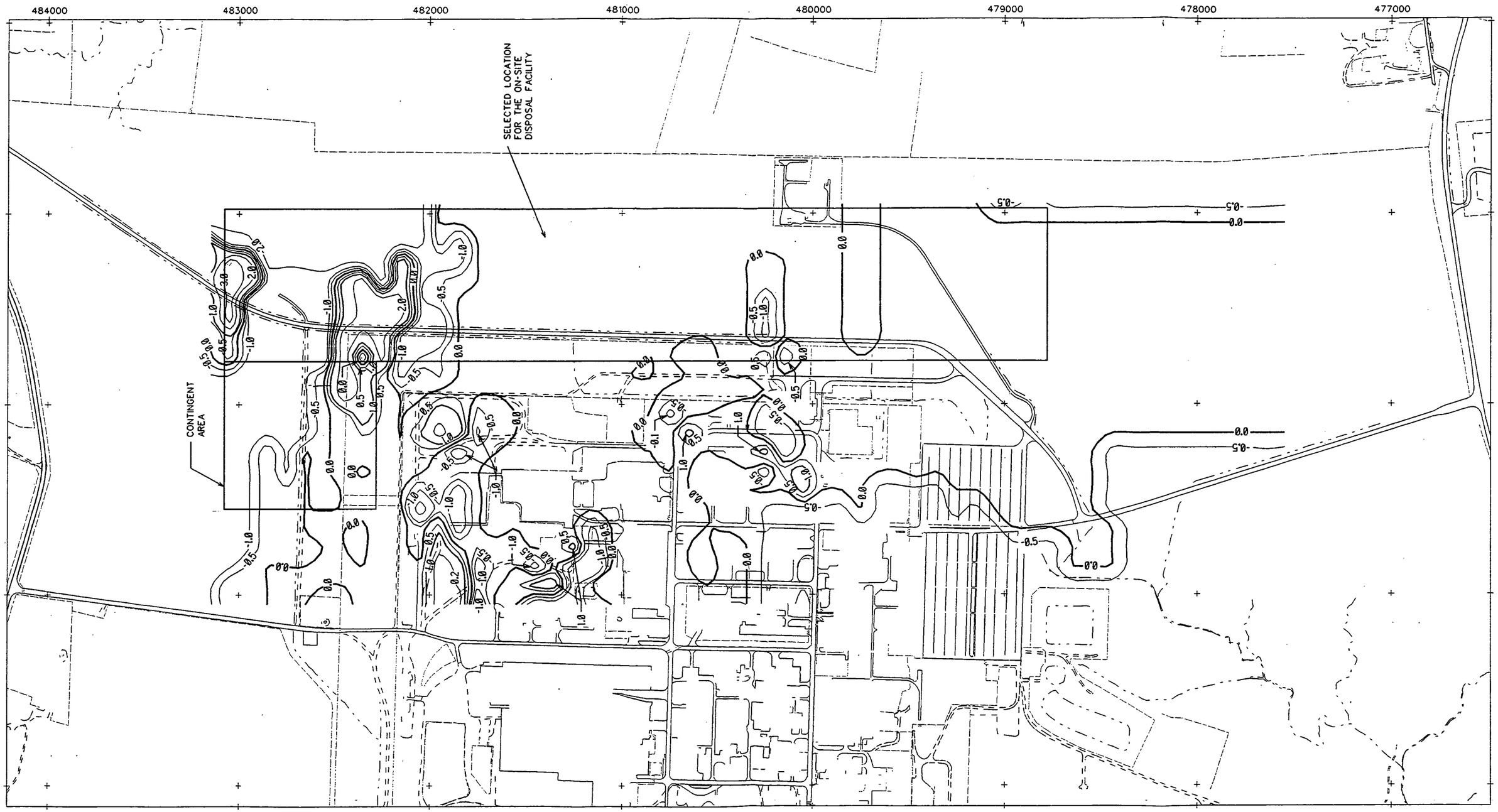
FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

INVERSE MODELING RESULTS HORIZONTIAL HYDRAULIC CONDUCTIVITY FOR BROWN/GRAY INTERFACE LAYER

DATE 4-28-95
DRAWN R. WILLIAMS

FIGURE I-12

000881



LEGEND

—— CHANGE IN HYDRAULIC CONDUCTIVITY (ORDER OF MAGNITUDE)

SCALE

0 250 500 1000 FEET

NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

ORDER OF MAGNITUDE CHANGE IN HORIZONTAL HYDRAULIC CONDUCTIVITY IN LAYER 2

DATE 5-12-95
DRAWN

FIGURE 1-13

000882

TABLE I-4

INITIAL AND OPTIMIZED HORIZONTAL HYDRAULIC CONDUCTIVITIES OF THE BROWN/GRAY TILL INTERFACE (MODEL LAYER 2)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
101	2.89E-05	2.42E-06	-1.08
102	3.30E-05	1.48E-07	-2.35
103	5.72E-05	4.80E-05	-0.08
104	5.72E-05	8.43E-05	0.17
105	5.72E-05	2.04E-04	0.55
106	5.72E-05	3.38E-03	1.77
107	5.72E-05	5.76E-05	0.00
108	5.72E-05	5.90E-04	1.01
109	5.72E-05	2.93E-04	0.71
110	5.72E-05	1.86E-01	3.51
111	5.72E-05	2.60E-01	3.66
112	5.72E-05	2.24E-01	3.59
113	5.72E-05	2.24E-06	-1.41
114	4.45E-05	2.31E-02	2.72
115	4.45E-05	7.77E-03	2.24
116	5.37E-05	8.56E-07	-1.80
117	1.76E-04	1.70E-04	-0.01
118	4.57E-05	4.19E-05	-0.04
119	6.40E-05	5.04E-05	-0.10
120	6.49E-05	2.77E-05	-0.37
121	3.54E-05	2.72E-05	-0.11
122	3.67E-05	3.72E-05	0.01
123	2.56E-05	9.56E-07	-1.43
124	1.72E-05	1.17E-05	-0.17
125	5.08E-05	3.73E-05	-0.13
126	1.25E-03	1.28E-03	0.01
127	8.85E-05	1.80E-04	0.31
128	1.43E-03	1.35E-03	-0.02

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
129	3.19E-04	2.85E-04	-0.05
130	5.06E-05	4.50E-05	-0.05
131	8.34E-05	7.22E-05	-0.06
132	9.80E-05	2.17E-06	-1.65
133	1.72E-05	1.53E-05	-0.05
134	4.33E-05	2.95E-05	-0.17
135	3.05E-05	3.12E-05	0.01
136	3.71E-05	3.82E-05	0.01
137	4.79E-05	6.54E-05	0.14
138	2.08E-04	1.25E-01	2.78
139	6.13E-05	3.18E-02	2.71
140	2.11E-04	2.95E-03	1.15
141	1.72E-05	2.04E-05	0.07
142	2.98E-05	4.28E-05	0.16
143	6.11E-05	4.85E-05	-0.10
144	4.11E-05	5.60E-05	0.13
145	2.50E-04	2.18E-04	-0.06
146	9.93E-04	1.36E-03	0.14
147	5.35E-04	1.92E-03	0.55
148	1.05E-03	3.85E-02	1.57
149	8.48E-05	6.71E-06	-1.10
150	3.14E-04	1.26E-02	1.60
151	1.46E-04	5.09E-02	2.54
152	3.65E-05	7.17E-05	0.29
153	2.24E-04	2.78E-04	0.09
154	3.87E-05	1.04E-04	0.43
155	9.08E-05	2.62E-02	2.46
156	3.48E-05	5.29E-05	0.18
157	3.36E-05	4.00E-05	0.08

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
158	3.97E-05	3.60E-05	-0.04
159	4.79E-05	4.48E-05	-0.03
160	8.96E-05	5.37E-06	-1.22
161	2.32E-04	2.83E-02	2.09
162	6.54E-05	3.30E-03	1.70
163	5.80E-04	2.66E-04	-0.34
164	2.73E-04	6.04E-07	-2.66
165	4.91E-05	4.29E-06	-1.06
166	2.79E-05	3.43E-05	0.09
167	3.38E-05	6.23E-05	0.27
168	3.39E-04	3.62E-03	1.03
169	1.98E-04	3.20E-04	0.21
170	3.24E-05	2.67E-05	-0.08
171	2.50E-04	2.36E-05	-1.03
172	1.84E-04	1.25E-03	0.83
173	5.45E-04	1.44E-04	-0.58
174	1.04E-04	8.00E-05	-0.12
201	4.82E-05	1.36E-05	-0.55
202	1.82E-04	5.99E-06	-1.48
203	2.35E-05	6.02E-06	-0.59
204	2.35E-05	7.99E-07	-1.47
205	2.35E-05	1.50E-05	-0.19
206	3.04E-05	3.22E-05	0.02
207	4.16E-05	4.16E-05	0.00
208	2.35E-05	2.35E-05	0.00
209	2.35E-05	1.36E-05	-0.24
210	2.35E-05	1.14E-06	-1.31
211	2.35E-05	1.04E-06	-1.35
212	2.89E-05	2.89E-05	0.00

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
213	2.73E-05	2.73E-05	0.00
214	2.35E-05	2.35E-05	0.00
215	2.35E-05	2.35E-05	0.00
216	2.35E-05	2.35E-05	0.00
217	2.25E-05	2.24E-05	0.00
218	9.95E-05	9.95E-05	0.00
219	1.19E-03	1.19E-03	0.00
220	1.35E-04	1.35E-04	0.00
221	2.35E-05	2.35E-05	0.00
301	2.12E-05	2.20E-05	0.02
302	2.10E-05	2.10E-05	0.00
303	2.24E-05	2.24E-05	0.00
304	2.10E-05	2.10E-05	0.00
305	2.10E-05	2.10E-05	0.00
306	2.10E-05	2.10E-05	0.00
307	2.14E-05	2.14E-05	0.00
308	2.16E-05	2.16E-05	0.00
309	2.10E-05	2.10E-05	0.00
310	2.10E-05	2.10E-05	0.00
311	2.10E-05	2.10E-05	0.00
312	2.10E-05	2.10E-05	0.00
313	2.10E-05	2.10E-05	0.00
314	2.31E-05	2.31E-05	0.00
315	2.27E-05	2.47E-05	0.04
316	2.19E-05	2.19E-05	0.00
317	2.18E-05	2.18E-05	0.00
318	2.10E-05	2.10E-05	0.00
319	2.10E-05	2.10E-05	0.00
320	2.10E-05	2.10E-05	0.00

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
321	2.24E-05	2.24E-05	0.00
322	2.17E-05	2.17E-05	0.00
323	2.10E-05	2.10E-05	0.00
401	2.17E-05	2.17E-05	0.00
402	2.21E-05	2.91E-05	0.12
403	2.12E-05	2.09E-05	-0.01
404	2.14E-05	2.13E-05	0.00
405	2.30E-05	2.30E-05	0.00
406	2.33E-05	2.32E-05	0.00
407	1.93E-05	1.92E-05	0.00
408	2.01E-05	1.92E-05	-0.02
409	3.12E-05	3.15E-05	0.00
410	2.73E-05	1.57E-06	-1.24
411	2.14E-05	1.32E-05	-0.21
412	1.97E-05	3.06E-05	0.19
413	1.99E-05	2.01E-05	0.00
414	2.18E-05	2.17E-05	0.00
415	2.29E-05	2.29E-05	0.00
416	3.55E-05	4.19E-05	0.07
417	4.45E-05	7.75E-04	1.24
418	4.26E-05	2.72E-05	-0.19
419	2.61E-05	1.79E-05	-0.16
420	2.15E-05	1.86E-05	-0.06
421	2.12E-05	1.71E-05	-0.09
422	2.15E-05	2.13E-05	0.00
423	2.18E-05	2.18E-05	0.00
424	2.66E-05	2.62E-05	-0.01
425	2.23E-05	2.16E-05	-0.01
426	2.10E-05	1.90E-05	-0.04

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
427	2.17E-05	3.64E-05	0.23
428	2.29E-05	2.43E-05	0.03
429	2.49E-05	6.92E-06	-0.56
430	2.74E-05	2.57E-05	-0.03
431	2.32E-05	2.28E-05	-0.01
432	2.18E-05	2.19E-05	0.00
433	2.19E-05	2.19E-05	0.00
434	1.93E-05	1.92E-05	0.00
435	2.69E-05	2.54E-05	-0.02
436	2.31E-05	7.57E-06	-0.48
437	3.30E-05	6.09E-05	0.27
438	3.32E-05	3.64E-05	0.04
439	2.26E-05	3.26E-05	0.16
440	2.08E-05	1.45E-05	-0.15
441	2.14E-05	2.14E-05	0.00
442	2.26E-05	2.30E-05	0.01
443	2.14E-05	2.16E-05	0.00
444	2.05E-05	2.05E-05	0.00
445	1.93E-05	1.92E-05	0.00
446	1.93E-05	1.92E-05	0.00
447	2.37E-05	2.22E-05	-0.03
448	2.77E-05	2.50E-05	-0.04
449	4.37E-05	9.97E-05	0.36
450	3.69E-05	4.37E-05	0.07
451	2.45E-05	3.46E-05	0.15
452	2.14E-05	1.96E-05	-0.04
453	2.23E-05	2.24E-05	0.00
454	2.17E-05	2.19E-05	0.01
455	2.19E-05	2.19E-05	0.00

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
456	1.93E-05	1.92E-05	0.00
457	1.93E-05	1.92E-05	0.00
458	1.93E-05	1.92E-05	0.00
501	2.33E-05	2.97E-05	0.11
502	2.12E-05	3.16E-06	-0.83
503	2.49E-05	4.93E-04	1.30
504	3.22E-05	3.55E-06	-0.96
505	2.60E-05	2.72E-06	-0.98
506	2.33E-05	2.33E-05	0.00
507	2.24E-05	2.29E-05	0.01
508	2.23E-05	2.98E-04	1.13
509	2.36E-05	1.77E-06	-1.13
510	2.68E-05	2.58E-05	-0.02
511	3.99E-05	3.92E-05	-0.01
512	2.82E-05	2.89E-05	0.01
513	1.95E-05	1.95E-05	0.00
514	2.39E-05	2.40E-05	0.00
515	2.23E-05	1.35E-04	0.78
516	2.19E-05	2.23E-06	-0.99
517	2.62E-05	2.75E-06	-0.98
518	2.46E-05	2.46E-05	0.00
519	1.97E-05	1.99E-05	0.00
520	1.94E-05	2.25E-05	0.06
521	2.33E-05	2.67E-06	-0.94
522	3.57E-05	3.57E-05	0.00
523	2.97E-05	2.97E-05	0.00
524	2.93E-05	2.94E-05	0.00
525	5.84E-05	5.84E-05	0.00
526	3.91E-05	3.91E-05	0.00

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
527	2.27E-05	2.26E-05	0.00
528	2.30E-05	2.30E-05	0.00
529	8.48E-05	1.70E-03	1.30
530	2.50E-05	5.00E-04	1.30
531	4.01E-05	3.99E-05	0.00
532	6.18E-05	6.17E-05	0.00
533	2.64E-05	2.64E-05	0.00
534	2.28E-05	2.28E-05	0.00
535	2.25E-05	2.25E-05	0.00
536	2.32E-05	2.32E-05	0.00
537	2.53E-05	2.53E-05	0.00
538	2.30E-05	2.30E-05	0.00
539	2.45E-05	2.45E-05	0.00
540	2.93E-05	2.93E-05	0.00
541	2.64E-05	2.64E-05	0.00
542	2.49E-05	2.49E-05	0.00
543	2.36E-05	2.36E-05	0.00
544	2.54E-05	2.54E-05	0.00
545	2.16E-05	2.15E-05	0.00
546	2.26E-05	2.25E-05	0.00
547	2.07E-05	2.07E-05	0.00
548	1.96E-05	1.95E-05	0.00
549	1.98E-05	1.98E-05	0.00
550	2.22E-05	2.22E-05	0.00
551	2.50E-05	2.50E-05	0.00
552	2.33E-05	2.34E-05	0.00
553	2.35E-05	2.35E-05	0.00
554	2.59E-05	2.59E-05	0.00
555	2.44E-05	2.43E-05	0.00

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
556	3.16E-05	3.16E-05	0.00
557	3.27E-05	3.27E-05	0.00
558	2.42E-05	2.42E-05	0.00
559	3.09E-05	3.09E-05	0.00
560	3.45E-05	3.45E-05	0.00
561	5.62E-05	5.62E-05	0.00
562	2.48E-05	2.48E-05	0.00
563	2.22E-05	2.22E-05	0.00
564	2.18E-05	2.18E-05	0.00
565	2.20E-05	2.20E-05	0.00
566	2.24E-05	2.24E-05	0.00
567	2.25E-05	2.25E-05	0.00
568	2.65E-05	2.65E-05	0.00
569	2.38E-05	2.38E-05	0.00
570	2.50E-05	2.50E-05	0.00
571	2.49E-05	2.49E-05	0.00
572	1.88E-05	1.88E-05	0.00
573	2.17E-05	2.17E-05	0.00
574	2.35E-05	2.35E-05	0.00
575	3.20E-05	2.35E-05	-0.13
576	2.30E-05	2.30E-05	0.00
577	2.33E-05	2.33E-05	0.00
578	2.18E-05	2.18E-05	0.00
579	2.91E-05	2.91E-05	0.00
601	2.27E-05	2.27E-05	0.00
602	1.99E-05	1.99E-05	0.00
603	2.34E-05	4.78E-05	0.31
604	2.30E-05	3.05E-05	0.12
605	2.33E-05	2.51E-05	0.03

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
606	1.80E-05	1.80E-05	0.00
607	1.99E-05	1.99E-05	0.00
608	1.99E-05	1.99E-05	0.00
609	1.99E-05	1.99E-05	0.00
610	1.99E-05	1.99E-05	0.00
611	1.99E-05	1.99E-05	0.00
612	1.99E-05	1.99E-05	0.00
613	1.99E-05	1.99E-05	0.00
614	1.99E-05	1.99E-05	0.00
615	1.99E-05	1.99E-05	0.00
616	1.94E-05	1.94E-05	0.00
617	2.11E-05	2.11E-05	0.00
700	3.30E-04	1.72E-05	-1.28
701	9.30E-05	1.72E-05	-0.73
702	4.66E-05	4.66E-05	0.00
703	3.07E-05	1.13E-05	-0.43
704	4.08E-05	4.08E-05	0.00
705	2.71E-04	2.71E-04	0.00
706	1.16E-03	1.16E-03	0.00
707	3.23E-05	3.23E-05	0.00
708	4.82E-05	4.82E-05	0.00
709	2.75E-05	2.75E-05	0.00
710	4.17E-05	4.17E-05	0.00
711	4.08E-05	4.08E-05	0.00
712	6.27E-04	6.27E-04	0.00
713	6.11E-05	6.11E-05	0.00
714	4.06E-05	4.06E-05	0.00
715	2.64E-05	2.64E-05	0.00
716	3.44E-05	3.44E-05	0.00

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
717	5.32E-05	5.32E-05	0.00
718	3.84E-04	3.84E-04	0.00
719	2.01E-04	2.01E-04	0.00
720	1.14E-04	1.19E-04	0.02
721	8.47E-05	1.17E-04	0.14
722	2.27E-04	3.13E-04	0.14
723	1.79E-05	7.46E-06	-0.38
724	4.58E-04	2.05E-01	2.65
725	1.14E-04	4.56E-02	2.60
726	1.36E-04	5.42E-02	2.60
727	1.85E-04	8.30E-03	1.65
728	7.66E-05	3.71E-05	-0.31
729	4.43E-05	4.26E-05	-0.02
730	4.30E-05	9.78E-03	2.36
731	8.21E-05	4.05E-03	1.69
732	1.07E-04	1.72E-04	0.21
733	1.79E-05	2.37E-06	-0.88
734	8.68E-04	2.65E-01	2.48
735	3.87E-04	3.43E-02	1.95
736	3.87E-04	2.09E-02	1.73
737	3.88E-04	4.72E-04	0.09
738	9.24E-05	3.22E-06	-1.46
739	4.52E-05	5.76E-05	0.11
740	8.42E-05	1.85E-06	-1.66
741	4.85E-04	9.72E-03	1.30
742	1.08E-04	1.04E-03	0.98
743	3.06E-05	7.10E-05	0.37
744	1.79E-05	8.67E-05	0.69
745	9.87E-05	1.15E-06	-1.94

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
746	5.02E-05	7.40E-06	-0.83
747	3.29E-05	1.13E-06	-1.46
748	2.63E-05	8.11E-06	-0.51
749	2.43E-05	2.15E-05	-0.05
750	2.56E-05	2.45E-05	-0.02
751	2.54E-05	1.55E-05	-0.21
752	3.05E-05	2.36E-06	-1.11
753	2.80E-05	4.45E-06	-0.80
754	2.40E-05	2.39E-05	0.00
755	1.79E-05	2.72E-05	0.18
756	1.79E-05	1.18E-04	0.82
757	1.40E-03	2.58E-03	0.27
758	3.53E-04	2.92E-04	-0.08
759	2.41E-05	1.13E-05	-0.33
760	2.42E-05	1.39E-05	-0.24
761	2.28E-05	3.71E-05	0.21
762	2.26E-05	2.24E-05	0.00
763	2.28E-05	1.80E-05	-0.10
764	3.28E-05	3.02E-05	-0.04
765	2.20E-05	2.20E-05	0.00
766	1.79E-05	2.36E-05	0.12
767	1.79E-05	1.48E-05	-0.08
768	4.72E-05	4.79E-05	0.01
769	3.01E-05	6.21E-05	0.31
770	2.54E-05	2.45E-05	-0.02
771	2.48E-05	2.02E-05	-0.09
772	1.72E-05	7.25E-07	-1.37
773	1.59E-04	3.47E-06	-1.66
774	5.29E-05	9.93E-04	1.27

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
775	2.51E-05	1.30E-06	-1.29
776	1.72E-05	9.31E-07	-1.27
777	1.55E-04	5.19E-06	-1.48
778	3.81E-05	9.85E-04	1.41
779	2.56E-05	3.06E-05	0.08
780	2.33E-05	2.42E-05	0.02
781	1.72E-05	6.97E-06	-0.39
782	3.04E-05	1.59E-06	-1.28
783	2.66E-05	1.40E-06	-1.28
784	2.21E-05	4.12E-04	1.27
785	2.21E-05	2.21E-05	0.00
786	1.72E-05	1.41E-05	-0.09
787	2.45E-05	1.97E-05	-0.09
788	5.24E-04	5.24E-04	0.00
789	2.79E-05	1.88E-07	-2.17
790	2.31E-05	5.95E-07	-1.59
791	2.23E-05	1.50E-06	-1.17
792	2.26E-05	2.26E-05	0.00
793	1.72E-05	1.72E-05	0.00
794	2.14E-05	2.14E-05	0.00
795	3.51E-05	3.51E-05	0.00
796	6.90E-04	6.90E-04	0.00
797	2.13E-05	2.13E-05	0.00
798	2.46E-05	2.46E-05	0.00
799	2.33E-05	2.33E-05	0.00
800	2.13E-05	2.13E-05	0.00
801	2.11E-05	2.11E-05	0.00
802	2.12E-05	2.12E-05	0.00
803	1.72E-05	1.72E-05	0.00

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
804	2.13E-05	2.13E-05	0.00
805	2.14E-05	2.14E-05	0.00
806	2.11E-05	2.11E-05	0.00
807	2.09E-05	2.10E-05	0.00
808	2.05E-05	2.05E-05	0.00
809	2.02E-05	2.01E-05	0.00
810	2.04E-05	1.98E-05	-0.01
811	1.72E-05	1.72E-05	0.00
812	5.25E-05	5.25E-05	0.00
813	1.77E-04	1.77E-04	0.00
814	5.59E-05	5.59E-05	0.00
815	2.13E-05	2.13E-05	0.00
816	2.12E-05	2.12E-05	0.00
817	2.02E-05	2.02E-05	0.00
818	2.12E-05	2.12E-05	0.00
819	1.72E-05	1.72E-05	0.00
820	2.73E-05	2.73E-05	0.00
821	3.43E-05	3.43E-05	0.00
822	3.09E-05	3.07E-05	0.00
823	2.41E-05	2.41E-05	0.00
824	2.22E-05	2.22E-05	0.00
825	2.12E-05	2.12E-05	0.00
826	3.22E-05	3.22E-05	0.00
827	6.35E-05	6.41E-05	0.00
828	4.07E-05	4.07E-05	0.00
829	2.89E-05	2.89E-05	0.00
830	2.52E-05	2.46E-05	-0.01
831	3.43E-05	3.34E-05	-0.01
832	3.14E-05	3.14E-05	0.00

TABLE I-4
(Continued)

Zone Number	Initial Estimate of Hydraulic Conductivity (cm/sec)	Optimized Estimate of Hydraulic Conductivity Change (cm/sec)	Order of Magnitude
833	3.05E-05	3.05E-05	0.00
834	4.20E-05	4.19E-05	0.00
835	3.59E-05	3.57E-05	0.00
836	3.20E-05	3.30E-05	0.01
837	3.41E-05	3.78E-05	0.04
838	2.28E-05	2.25E-05	-0.01
839	2.30E-05	2.13E-05	-0.03
840	6.04E-05	6.04E-05	0.00
841	2.76E-05	2.76E-05	0.00
842	2.37E-05	2.36E-05	0.00
843	2.36E-05	2.39E-05	0.00
844	2.23E-05	2.06E-05	-0.03
845	2.27E-05	2.11E-05	-0.03
846	1.08E-04	2.48E-05	-0.64
847	9.30E-05	2.11E-05	-0.64
848	1.26E-04	3.13E-05	-0.61
849	1.71E-04	4.98E-05	-0.54
850	1.47E-04	3.98E-05	-0.57
851	1.72E-05	1.72E-05	0.00
852	1.72E-05	1.72E-05	0.00
853	2.04E-05	2.04E-05	0.00
854	1.72E-05	1.72E-05	0.00
855	3.68E-04	1.56E-04	-0.37
856	2.00E-04	6.19E-05	-0.51
857	5.00E-04	2.57E-04	-0.29
858	1.99E-05	1.99E-05	0.00
859	1.72E-05	1.72E-05	0.00

areas (shown as hatched areas) where hydraulic conductivity exceeds 2 x 10^{-4} cm/sec across the footprints of area under consideration for locating disposal cell. In other words, inverse modeling indicates a potential coarse grained lense or fractured zone crossing the boundaries of the proposed disposal cell. Other than these, two small, discontinuous lenses may also exist under the area under consideration for locating disposal cell and one under the contingent area for additional waste. Therefore, glacial till underneath the area under consideration for locating disposal cell is relatively free from a continuous perched water aquifer in good hydraulic communication. These results are consistent with the solid block modeling result, which also predicts that coarse material are only present in isolated pockets. Therefore, potential for horizontal migration of contaminated leachate, if it goes beyond the linear and leachate collection system, is limited. Some areas under the production area (not under consideration for locating the disposal cell) may have extensive coarse grained material or fractured media (see Figure I-12).

I.1.6 Conclusions

Inverse modeling should only be considered as an attempt to estimate gross characteristics of the till and helps to prevent fatal flaws in the disposal cell design. The following conclusions can be drawn from the inverse modeling results:

- Average vertical hydraulic conductivity of the gray till was estimated to be approximately 4 x 10^{-7} cm/sec. Geotechnical investigations have indicated that the vertical hydraulic conductivity of the gray till ranges from 7 x 10^{-9} to 9.2 x 10^{-8} cm/sec. Furthermore, the geometric mean value of previous slug tests calculated horizontal hydraulic conductivity was 1.9 x 10^{-6} cm/sec, which can be order of magnitude higher than vertical hydraulic conductivity. The Feasibility Study models for OU-2 used 1.9 x 10^{-6} cm/sec as vertical hydraulic conductivity which was a conservative assumption allowing more infiltration.

- Inverse modeling predicted that the horizontal hydraulic conductivity at the brown and gray till interface is approximately 2 x 10^{-5} cm/sec for the area being considered for the disposal cell location (Figure 3-2). This is within the range of typical hydraulic conductivity for till and silty soils (Freeze and Cherry, 1979). This indicates that a network of fractures may not be dominating horizontal flow in the perched water system under the proposed disposal cell.

- The results of inverse modeling indicate that beneath the area under consideration for the disposal cell there are two subareas with potentially high permeability at the brown/gray till interface that are approximately 100 to 200 feet in areal extent and two subareas of potentially higher permeability that may be 500 to 1000 feet in areal extent (Figure I-2). (Note that smallest model grid spacing is 100 feet and only permeability at the brown/gray till interface was estimated.) These areas are underlain by gray till of significantly lower hydraulic conductivity. These areas need consideration during the final design of the disposal facility. Outside the area under consideration for disposal facility and area under

the production facility, there are several zones of potentially higher permeability at the brown/gray till interface.

- Inverse modeling identified two subareas beneath the area under consideration for the disposal cell where a higher permeability zone is not fully contained within the area under consideration. Locations of these two zones are consistent with the geotechnical data. Model indicates that if engineering design does not restrict groundwater flow in these two zones then potential exits for leachate to migrate horizontally away from the disposal cell. Outside the disposal cell, infiltration potential is higher than under the disposal cell. Therefore, in these areas potential exists for contaminants to reach the Great Miami Aquifer faster than elsewhere. Also note that these two areas are underlain by more than 30 feet of low permeability gray till. These two areas need further evaluation during the design.

118

VARIANCE REQUEST

VR No. CRU2-95-01

Page 1 of 1

Date: 1/6/95

VARIANCE (Include justification):

Requirement: Procedure "GROUNDWATER SAMPLING ACTIVITIES, SC-GWM-FO-201", requires that if a well does not yield a sufficient sample volume to allow a full set of analytical parameters the well is to be considered dry.

Variance: This variance applies to wells 11491, 11492, 11493, 11495, 11497, 11498, 11499, 11501, 11502, 11503, 11504, and 11505. These Type I wells have been set in poor yielding hydrogeologic formations using a Rotosonic drill rig. The wells exhibit or may exhibit low recharge volumes, and high turbidity readings.

During drilling, water is used for lubricating the annular space between the drill casing and the sampling core. The water pressure is between 20 to 30 pounds per square inch (psi), which is considered low enough not to expect the water to impregnate the clay formation. Also, water is used to extrude the sample from the core barrel at a pressure of approximately 600 psi; however; this water never enters the borehole. The total amount of water used and recovered during drilling is recorded by the geologist.

The following procedure will be followed for the sampling and the development of the wells listed above:

1. These wells will be purged dry (recording the purge volume each time) and allowed to recover for a minimum of twelve hours before sampling;
2. After the minimum recovery time samples will be collected for all requested parameters except tritium. If the volume of water is sufficient for the collection of all parameters except tritium, then the remaining water will be purged from the well. After this purge and another minimum 12 hour recovery period, tritium samples will be collected.
3. If the volume of water is not sufficient for all of the parameters after the initial purge and recovery time, the well will be sampled on subsequent days, without additional purging, for a maximum of 10 working days with the tritium samples collected last.
4. Field water quality before and after sampling.

The following requirements will not be met due to the nature of the lithology of the screened intervals of these wells:

1. 5 NTU or lower turbidity;
2. Purging 5 times the volume of water lost during drilling, and 5 times the well volume for well development.

Justification: If this variance is not followed, there may be no data from these wells. This variance allows the recovery of some critical water quality data which will be used in conjunction with data from other wells to determine groundwater properties.

REQUESTED BY: John T. Bennett Date: 1-6-95

APPROVED BY:

John T. Bennett Project Manager	Date: 1-6-95	Others as Required	Date:
Quality Assurance	Date: 1-6-95	Others as Required	Date:
SCQ-DCR Coordinator	Date: 1-6-95	Others as Required	Date:

Applicable Document(s) and Section No.(s)

GROUNDWATER SAMPLING ACTIVITIES, SC-GWM-FO-201

81

VARIANCE REQUEST

VR. No. CRU2-2

Page 1 of 1

Date: 2-14-95

VARIANCE (Include justification):

Requirement: The Project Specific Plan For Phases I and II of The Operable Unit 2 Pre-Design Field Investigation required that lysimeter installation meet the requirements detailed in ASTM D4696 and the TIMCO installation methodology, which may be replaced with another vendors specifications. In this particular case Soil Moisture lysimeters were installed; therefore, Soil Moisture specifications were applied.

Variance: The Soil Moisture lysimeter specifications required using a 1.5 inch PVC pipe as casing and riser. However, since Rotosonic drilling was being used to install the lysimeters, 2 inch PVC was used since this diameter was the smallest screw-type flush casing available, instead of coupling connections which would be used with the 1.5 PVC. The coupling connectors could possibly have gotten caught on the drill cassing as it was being extracted from the bore hole; thereby, pulling the lysimeter out along with the casing.

In order that the use of the 2 inch casing could be facilitated, a 1.5 to 2 inch adapter coupling was used to connect the lysimeter to the 2 inch casing. Two stainless steel screws were use to fasten the lysimeter to the adapter coupling. However, the connection was not water tight; therefore, bentonite pellets were used inside the PVC casing to provide an adequate seal. All nine lysimeters were installed using the aformentioned PVC connection and bentonite seal.

Justification: The 2 inch PFC had to be used to avoid potentially pulling the lysimeter from the borehole while extracting the drill casing. The use of bentonite is adequate for sealing the connection since bentonite is used as a sealing plug for well installation.

REQUESTED BY: John J. Berrett Date: 2-14-95

APPROVED BY:

John J. Berrett Date: 2-14-95
Project Manager

Date: 2-21-95
Quality Assurance

Date: 2-21-95
SCQ-DCR Coordinator

Applicable Document(s) and Section No.(s)

VARIANCE REQUEST

VR. No. CRU2-3

Page 1 of 1

Date: 2-14-95

VARIANCE (Include justification):

Requirement: The Project Specific Plan for Phased I and II of The Operable Unit 2 Pre-Design Fiel Investigation required that lysimeter installation meet the requirements detailed in ASTM D4696 and the TIMCO installation methodology, which may be replaced with another vendors specifications. In this particular case Soil Moisture lysimeters were installed; therefore, Soil Moisture specifications should be applied.

Variance: Prior to lysimeter installation the lysimeters are supposed to undergo pressure testing. This is in accordance to the ASTM standard and the manufacturers specifications. However, the nine lysimeters installed during Phase II of the CRU2 Pre-Design Investigation were installed without testing. Consequently, three lysimeters were installed, 11485, 11489, 11490 which can not hold the vacuum needed to extract a sample. Therefore, three additional lysimeters will be installed in place of the non-functional lysimeters. These additional lysimeters, 11557, 11558, 11559 will follow all manufacture testing, installations specifications, and established drilling protocol with continuous lithologic description.

Justification: The additional lysimeter installations are necessary to facilitate the collection of needed data.

REQUESTED BY: John J. Berset Date: 2-14-95

APPROVED BY:

John J. Berset Date: 2-14-95
Project Manager

Quality Assurance Date: 2-21-95

SCQ-DCR Coordinator Date: 2-21-95

Applicable Document(s) and Section No.(s)

VARIANCE REQUEST

VR. No. CRU2-4

Page 1 of 1

Date: 2-15-95

VARIANCE (Include justification):

Requirement: Table 8-5 of the Project Specific Plan for Phases I and II of the Operable Unit 2 Pre-Design Field Investigation specfied taht unit weight tests should be conducted for every geotechnical sample colllected and sent to the laboratory.

Variance: Unit weight tests were not conducted on samples with only index properties tests.

Justification: PARSONS, the A and E responsible for the design of the disposal facility, recommended that the unit weight tests be eliminated for the following:

1. Conducting unit weight tests for every geotechnical sample would require Shelby Tube sampling; therefore limiting the requirement to only triaxial permability tests, consolidation tests would maximize the ability to visually field log the boring and obtain Standard Penetration Test blow counts;

2. Unit weight information comes as a aprt of the triaxial compression test, traxial permeability test, and the consolidation test.

This is a change and clarification to the Project Specific Plan for Phases I and II of the Operable Unit 2 Pre-Design Field Investigation.

REQUESTED BY: John J Bennett Date: 2-28-95

APPROVED BY:

John J Bennett Date: 2-28-95
Project Manager

Date: 3/9/95
PARSONS, Engineering Manager

Date: 3-20-95
Quality Assurance

For G.R. Date: 3-20-95
SCO-DCR Coordinator

Applicable Document(s) and Section No.(s)

VARIANCE REQUEST

VR. No. CRU2-5

—

Page 1 of 1

Date: 2-15-95

VARIANCE (Include justification):

Requirement: Table 8-5 of the Project Specific Plan for Phase I and II of the Operable Unit 2 Pre-Design Investigation specified Standard Proctor and Remolded Permeability tests. This requires collecting bulk samples in 10 gallon cans.

Variance: The addition of performing grain size tests and Atterberg Limit tests on bulk samples collected for the Standard Proctor and Remolded Permeability tests.

Justification: These tests should be conducted to obtain material classification which is imortant obtain correlation in the lithology.

REQUESTED BY: John J Bennett Date: 2-15-95

APPROVED BY:

John J Bennett 2-15-95

Project Manager

Quality Assurance Date: 2-21-95

SCQ-DCR Coordinator Date: 2-21-95

Applicable Document(s) and Section No.(s)

811

VARIANCE REQUEST

VR. No. CRU2-6

Page 1 of 1

Date: 2-17-95

VARIANCE (Include justification):

Requirement: Page 8-27 of the Project Specific Plan of the Operable Unit 2 Pre-Design Investigation specified continuous split barrel sampling in advance of the hollow-stem auger for the geotechnical sampling.

Variance: A six-inch interval was augered prior to collecting a Shelby Tube sample without obtaining a visual description of the soil. The Shelby Tube sample will be visually described in the laboratory.

Justification: The augering of the six inch interval prior to collecting a Shelby Tube sample was conducted to minimized the potential for sample disturbance. The visual description to the Shelby Tube sample will enhance the visual description of the geotechnical boring location.

REQUESTED BY: John J Benetz Date: 2-17-95

APPROVED BY:

John J Benetz Date: 2-17-95
Project Manager

Date: 2-21-95
Quality Assurance

Date: 2-21-95
SCQ-DCR Coordinator

Applicable Document(s) and Section No.(s)

VARIANCE REQUEST

VR. No. CRU2-7

Page 1 of 1

Date: 2-17-95

VARIANCE (Include justification):

Variance: Remolded Triaxial Compression tests and Unconfined Compressive Strength tests were performed.

Justification: PARSONS, the A and E responsible for the design of the disposal facility, recommended that the Remolded Triaxial Compression tests and the Unconfined Compressive Strength tests be performed to provide preliminary data for berm and foundation design.

This is an addition to the Project Specific Plan for Phases I and II of the Operable Unit 2 Pre-Design Field Investigation.

REQUESTED BY: John J Berrett Date: 2-28-95

APPROVED BY:

John J Berrett Date: 2-28-95
Project Manager

H. Hume Date: 3/9/95
PARSONS, Engineering Manager

Date: 3-20-95
Quality Assurance

For C.R. Date: 3-20-95
SCQ-DCR Coordinator

Applicable Document(s) and Section No.(s)

8 1 1

VARIANCE REQUEST

VR. No. CRU2-8

Page 1 of 1

Date: 2-17-95

VARIANCE (Include justification):

Variance: Remolded Consolidation tests were performed which were not required by the Project Specific Plan for Phases I and II of the Operable Unit 2 Pre-Design Field Investigation.

Justification: PARSONS, the A and E responsible for the design of the disposal facility, recommended that the Remolded Consolidation tests be performed to provide a neede preliminary estimate of soil settlement.

This is an addition to the Project Specific Plan for Phases I and II of the Operable Unit 2 Pre-Design Field Investigation.

REQUESTED BY: John J. Benek Date: 2-28-95

APPROVED BY:

John J. Benek Date: 2-28-95
Project Manager

H. Hume Date: 3/9/95
PARSONS, Engineering Manager

Date: ____
Quality Assurance

For G.R. Date: 3-10-95
SCO-DCR Coordinator

Applicable Document(s) and Section No.(s)

000907

K.0 CULTURAL AND NATURAL RESOURCES

Prior to the initiation of intrusive sampling activities, the study area was investigated/evaluated for potential cultural resources (as required by Section 106 of the National Historic Preservation Act), as well as any natural resources such as wetlands and threatened or endangered species (as required by the National Environmental Policy Act). Results overall indicated minimal or no impact as data recovery would be performed on the three cultural resource sites as discussed below prior to the initiation of construction activities. Additionally, restoration/mitigation activities would be completed to offset any natural resource impacts. Sections I.1 and I.2 provide details of the cultural resource investigations and natural resource evaluation, respectively.

K.1 CULTURAL RESOURCE INVESTIGATIONS

Population and cultural growth of an area are determined by factors such as geologic setting, surface waters, soils, vegetation, and climate. The FEMP site and surrounding area are located within a 4.8-kilometer (3-mile) wide subterranean valley formed as a result of Pleistocene glaciation. Additionally, the FEMP site and surrounding area are located near the Great Miami River, which provided a source of water for early residents. Historically, these combined factors made the FEMP site and surrounding area desirable as a settlement place. As a result of this desirability, the area is rich with diverse cultural/archaeological resources.

As part of the Part I cultural resource investigation, literature reviews were conducted to identify previously inventoried cultural resources located within one kilometer of the study area. This information was used to access the data from previous cultural resource investigations in the vicinity and to provide information on the potential types and locational parameters of cultural resource sites in the region. The literature search included a review of the National Register of Historic Places (NRHP), the Ohio Archaeological Inventory, and the Hamilton County archaeological files and maps at the Ohio Historic Preservation Office.

Controlled surface collections were then conducted in the study area. The study area was systematically surveyed using 15-meter (49.2-foot) increment transects. Shovel tests (small excavations approximately 40 centimeters square) were excavated along each transect at 15-meter (49.2-foot) intervals. Each shovel test was profiled, and soil descriptions were documented. All shovel tests were backfilled following documentation. If prehistoric or historic items older than 50

years were recovered from a shovel test, then additional shovel tests were excavated as needed in order to define cultural resource site boundaries. Additional tests were conducted at 5-meter (16-foot) intervals in the four cardinal directions from all original positive tests. Field maps were drawn to illustrate the locations of the positive tests and notes were kept for each test describing the location, soils, surface vegetation and limits of excavations.

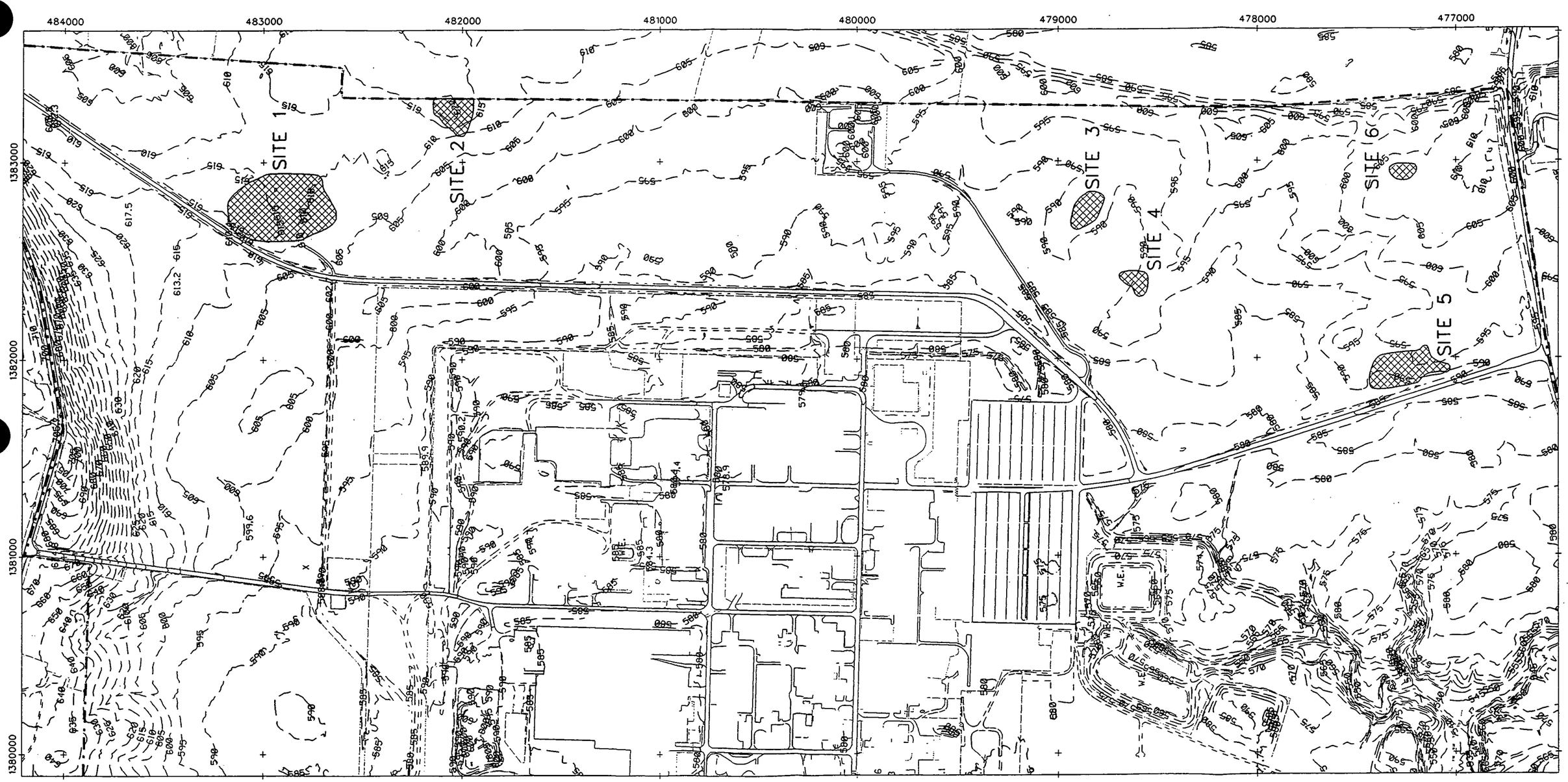
All materials recovered from the Part I cultural resource investigations were transported to the designated cultural resource contractor's (Gray & Pape, Inc.) laboratory for processing, analysis, and temporary curation. Artifactual materials recovered were assigned field specimen numbers, based on recovery provenance and temporarily stored at Gray & Pape, Inc.

Detailed analysis of the artifacts was completed using a binocular microscope under low magnification, consulting the literature, and comparing attributes of the recovered artifacts with those provided in the literature. Standard topological methods were then applied as a prelude to chronological reconstruction. Artifacts were assigned dates through comparison of the identified artifacts with others having documented use-popularity patterns and datable advancements in manufacturing technologies. Artifacts from the study area were also examined on the basis of function in an attempt to establish use patterns and the nature of the site.

A Part I Management Report was prepared in accordance with NHPA implementing guidelines (36 CFR Part 800), to provide the State Historic Preservation Office (SHPO) with 1) the inventory, 2) statement of cultural resource significance, 3) data sufficient to evaluate the processes by which 1 and 2 were determined, and 4) recommendations for the management of cultural resources.

The Part I cultural resource investigations in the study area identified 20 prehistoric and 3 potential historic sites. The prehistoric sites are lithic scatters or isolated finds. The three historic sites include two with surface and/or subsurface features. These two sites seemed to be homestead remnants; the third site seemed to represent secondary trash deposition away from the homelot area.

As recommended by SHPO following review and approval of the Part I Management Report, Part II cultural resource investigations were conducted in April and May 1995 on six of the twenty-six sites as depicted in Figure K-1. These investigations were conducted to assess the eligibility of the sites for the NRHP. Part II cultural resource fieldwork consisted of shovel tests and unit excavations. The



LEGEND

POTENTIAL SITE ELIGIBLE FOR NATIONAL REGISTER OF HISTORIC PLACES

SCALE

0 250 500 1000 FEET

NOTE: COORDINATES ARE STATE PLANAR NAD 1927

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

RESULTS OF PART II CULTURAL RESOURCE INVESTIGATION

000910

DATE 3-20-95
DRAWN R. WILLIAMS

FIGURE K-1

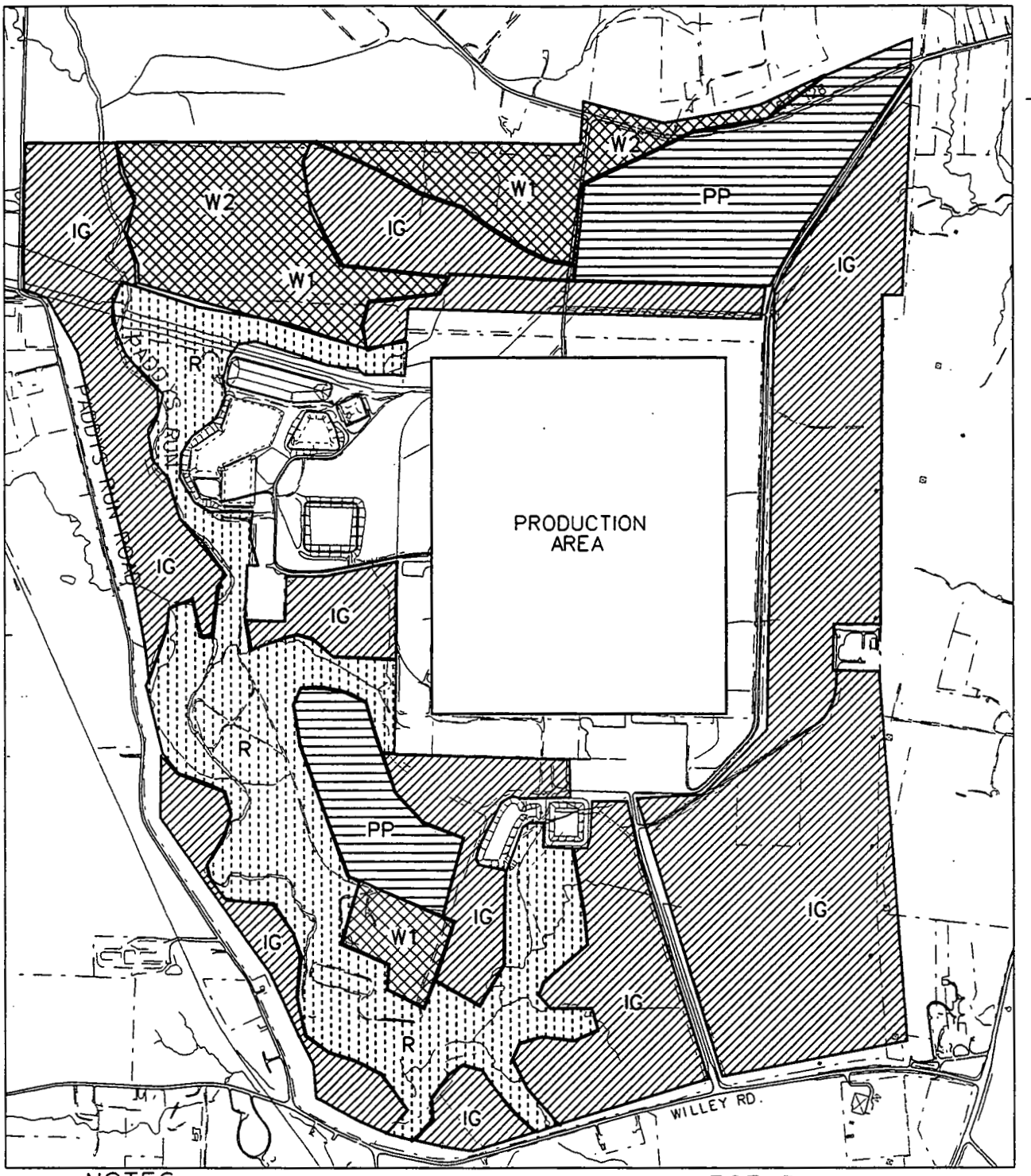
shovel tests measured 40 by 60 centimeters. The units typically measured one by one or one by two meters. The objective of the unit excavations was to determine the presence and nature of intact, sub-plowzone deposits and/or features. Features were encountered and further work has been recommended on three of the six sites (i.e., sites 2, 3, and 5 as identified in Figure I-1). All original notes, forms, negatives, and maps were retained by Gray & Pape, Inc. for future curation with the artifact collections. Curation of project data will be done in accordance with 36 CFR Part 79, "Curation of Federally-Owned and Administered Archaeological Collections."

A Part II Management Report was drafted for SHPO approval. The report includes a discussion of the research methods, resource descriptions, site dimensions, a literature review, tabulation and quantification of site data, and a concise summary regarding any further work (i.e., Part III - Data Recovery/Mitigation). As introduced above, the Part II cultural resource investigations identified the need for data recovery on three of the six sites. Consultation with the SHPO will occur to determine if this work (i.e., Part III data recovery) is necessary. At this time, Part III cultural resource fieldwork on three of the six sites is anticipated; a determination regarding any further work will be made by the SHPO following the issuance of the Part II Management Report. The Part II Management Report was delivered during a visit to the SHPO on May 23, 1995. The SHPO will make a determination within 30 days. It is expected that the SHPO will concur with performing data recovery on the three sites. Any data recovery activities will be completed prior to the construction of the disposal facility; hence, no impact on cultural resources would occur.

K.2 NATURAL RESOURCE EVALUATION

As part of the Operable Unit 2 FS, an evaluation of potentially affected natural resources (Figure K-2) was conducted. The study area lies within an area of the FEMP site that possesses minimal habitat. The introduced grassland/leased pasture and old field habitat that would be impacted (i.e., lost) as a result of construction and operation of a disposal facility are generally inhabitated by small mammals and several species of birds. Restoration of this approximately 80-acre area would be uncomplicated as compared to most habitats (e.g., forested wetlands, early/mid-successional and riparian woodlands) on the FEMP site and completed by regrading and revegetating with grass species.

The Wetlands/Floodplain Assessment that was conducted for the Operable Unit 2 Remedial Action identified less than an acre of drainage ditch/swale wetlands that would be impacted (Figure K-3).



NOTES

HABITAT BOUNDARIES ARE APPROXIMATE.

SCALE

0 800 1600 FEET

SCALE

0 225 450 METERS

LEGEND

- INTRODUCED GRASSLAND (IG)
- PLANTED PINE (PP)
- RIPARAIN (R)
- WOODLANDS
  - EARLY SUCCESSION (W1)
  - MID-SUCCESSION (W2)

FIGURE K-2 HABITAT TYPES PRESENT ON THE FEMP

/usr/cad/floorplan/res/res2236/ fig1-10a.dgn cru2 GES 3-15-94

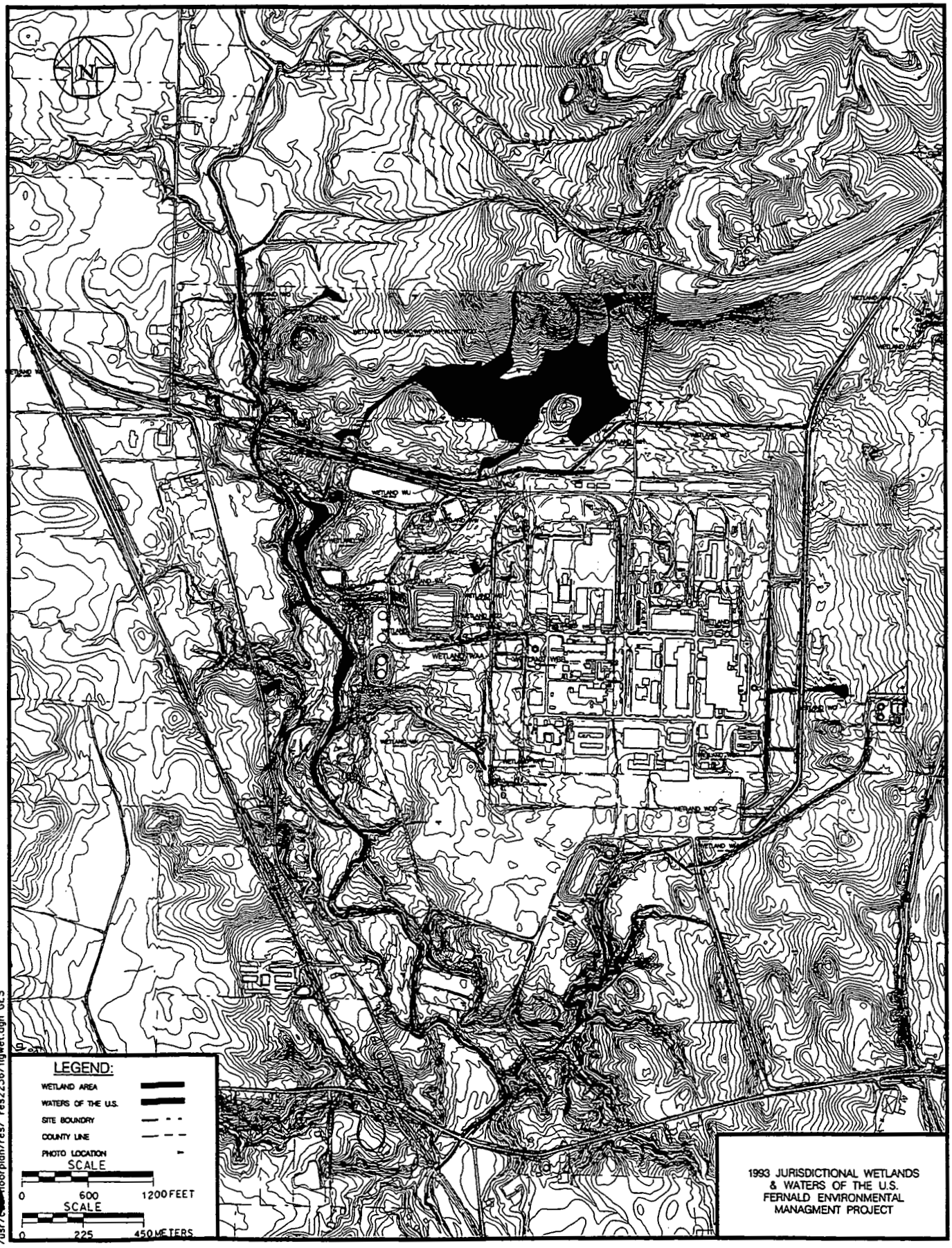


FIGURE K–3 JURISDICTIONAL WETLANDS AT THE FEMP

Appropriate documentation was prepared for these potential wetland impacts. Mitigation of wetland impacts will completed in accordance with 404(b)(1) guidelines of the Clean Water Act following completion of remedial activities.