NOTICE!

ALL DRAWINGS
ARE LOCATED
AT THE END OF
THE DOCUMENT

DRAFT FINAL

Phase III RFI/RI Report

Rocky Flats Plant
881 Hillside Area
(Operable Unit No. 1)

Volume IV

Appendices A2 and A3
Geologic Data

U.S. Department of Energy
Rocky Flats Plant
Golden, Colorado

October 1992

REVIEWED FOR CLASSIFICATION/UCNI
By
Date 11/4/92

ADMIN RECORD

A-OU01-000442

Appendix A

Geologic Data

Phase III
RFI/RI Report

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LIST OF ACRONYMS AND ABBREVIATIONS

ASTM	American Society for Testing and Materials
BH	Borehole
cm/sec	centimeters per second
DCN	Document Change Notice
DOE	Department of Energy
E	extraction well
EMD	Environmental Management Department
EPA	Environmental Protection Agency
FSP	Field Sampling Plan
GRRASP	General Radiochemistry and Routine Analytical Services Protocol
GT	geotechnical
GW	groundwater
I	injection well
I.D.	inside diameter
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
ml	milliliter
MW	monitoring well
O	observation well
O.D.	outside diameter
OU	operable unit
OU1	Operable Unit No. 1
PCB	Polychlorinated biphenyl
PH	pilot hole
PZ	Piezometer
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RFEDS	Rocky Flats Environmental Database System
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RFP	Rocky Flats Plant
SOP	Standard Operating Procedure
SOPA	SOP Addendum
SVOC	Semivolatile organic compound
SW	surface water
TOC	total organic carbon
USCS	Unified Soil Classification System
VOC	Volatile organic compound

Appendix A2 · Text

Geotechnical Data

Phase III
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A2 GEOTECHNICAL DATA

Geotechnical samples were collected during the Phase III Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) at Operable Unit No. 1 (OU1) at the Rocky Flats Plant (RFP). The purpose of collecting samples for geotechnical analysis was to quantify certain physical characteristics of soils and bedrock within OU1 including Atterberg limits, grain size distributions, specific gravity, permeability, soil moisture, and both dry and wet density. These data are crucial to the development of both groundwater and contaminant fate and transport models. The following is a summary of sampling locations, and both the field and the analytical methods employed. Results are presented and briefly discussed in the final section of this appendix. Attachment A2-1 contains the raw geotechnical data.

A2.1 SAMPLE LOCATIONS

Twenty-three intervals from 11 boreholes (Figure A2-1) were sampled for geotechnical analysis in an off-site laboratory. In general, following the geotechnical field sampling plan, each of the 11 boreholes was sampled in alluvium within 6 feet (1.83 meters) of the surface and in alluvium just above the alluvium/bedrock contact. Boreholes slated for completion as bedrock wells or piezometers were also sampled just below the alluvium/bedrock contact and from within the anticipated screen interval. This sampling protocol, illustrated in Figure A2-2, was followed within site-specific constraints.

Table A2-1 compares the proposed number of intervals to be sampled as outlined in the geotechnical field sampling plan to the actual number of intervals sampled during the Phase III field investigation at OU1. In boreholes 37391 and 37591, samples were collected in strict accordance with the field sampling plan. In boreholes 37891, 37991, 38591, 39191, and 39691, only one alluvial interval was sampled due to prohibitively shallow bedrock contacts. A single alluvial interval was also sampled in borehole 37491 as a result of sampling error. The first interval sampled in borehole 37691 was from 7.4 to 7.8 feet (2.26 to 2.38 meters), falling outside the prescribed 0- to 6-feet (1.83-meter) range as a result of poor recovery in the first 6 feet. In borehole 38991, the target interval for bedrock screening (sandy siltstone or sandstone) was not

encountered and no samples were collected; the interval chosen for well screening (fractured clayey siltstone) was, therefore, not sampled for geotechnical analysis. Two unscheduled samples were collected at the discretion of the rig geologist: a bedrock sample from 37891, and an alluvial sample from borehole 39091. The cumulative effects of these variances from the field sampling plan resulted in a total of 23 sampled intervals, rather than the proposed 28 intervals.

A2.2 FIELD METHODS

Two samples were taken from each of the prescribed intervals to help expedite laboratory analyses. The first was collected in a 3-inch-long stainless steel sleeve. The second sample was taken from immediately above or below the stainless steel sleeve as outlined in the field sampling plan, and placed in a 500-milliliter (16.9-fluid-ounce) amber jar. Sample numbers were assigned to each individual sample, resulting in a total of 46 samples from the 23 unique intervals.

All samples were drive samples collected with a sleeve-mounted, split-spoon sampler in conformance with American Society for Testing and Materials (ASTM) D1586. ASTM D1586 methods were employed in preference to ASTM D1587 because the thin-walled shelby tubes used in ASTM D1587 procedures do not have sufficient structural strength to penetrate alluvial and bedrock materials at OU1. Because split-spoon procedures were followed, the permeability values presented in Tables A2-2 and A2-3 should be used with caution (EPA 1991). Internal method consistency does, however, justify the relative permeability analysis of alluvial and bedrock materials made in Section 3.7 of this report.

A2.3 ANALYTICAL METHODS

Analytical methods followed standardized ASTM procedures. Geotechnical analyses requested were Atterberg limits including liquid and plastic limits and plasticity index (ASTM D4318), grain-size analyses including sieve analysis and hydrometer testing (ASTM D422), specific gravity (ASTM D854), back-pressure permeability (ASTM D5084), and moisture/density analyses including moisture content (ASTM D2216) and both dry and wet density (ASTM D2937). In

including moisture content (ASTM D2216) and both dry and wet density (ASTM D2937). In accordance with ASTM D2487, Atterberg limits data were also used to classify alluvial samples according to the Unified Soil Classification System (USCS).

Although all procedures are standardized by ASTM guidelines, simplifying assumptions and variations from RFP standard operating procedures (SOPs) (EG&G 1991) call for more detailed discussion. Specifically, back-pressure permeability tests were run using standardized rather than sample-specific confining pressures, and the sieves used for grain-size analysis were not, as prescribed by RFP SOPs, altered for bedrock and alluvial materials. The remainder of this section addresses the potential impacts of these two procedures nuances.

Back-pressure permeability tests were performed in a triaxial compression chamber. Within the pressurized chamber, in situ hydrostatic forces can be reproduced, making laboratory measurements more truly representative of actual conditions. However, samples tested in this program were all placed under a standard hydrostatic pressure (1,152 pounds per square foot) corresponding to approximately 10 feet of depth in a clay soil. The applicability of this standard pressure as an approximation of in situ conditions varies from sample to sample. Assuming that variations in the density of overlying material are relatively insignificant, the applicability of the chosen standard pressure depends primarily on the sample depth.

Samples from a depth greater than 10 feet were tested at artificially low confining pressures, and the permeability values calculated may, as a result, be slightly high. Samples collected from 0 to 10 feet, on the other hand, were tested under unrealistically high pressures, that generally yield slightly depressed permeability values. Correcting for these shifts would, in general, accentuate trends of decreasing permeability with depth. Most importantly, any such corrections would only magnify the disparity between alluvial and bedrock permeabilities noted in Section 3.7 of this report, reinforcing the conclusion that bedrock acts as a relatively impermeable barrier and effectively isolates the alluvial flow system.

Geotechnical SOP GT.1 calls for the use of different classification systems when logging alluvial and bedrock materials; the USCS is to be used for alluvial materials, and Compton's *Manual of Field Geology* (1962) is to be used for bedrock materials. When describing grain sizes, the USCS is to be used for alluvial material, and the Wentworth grain-size scale (as referenced by Compton 1962 and EG&G 1991) is to be used for bedrock materials.

For purposes of the Phase III RFI/RI, the critical difference between the USCS and Wentworth systems is the grain-size limit used to define the silt-sand boundary. Specifically, the USCS uses a #200 standard sieve (0.074 millimeter) to define the silt-sand boundary, and the Wentworth scale uses the #230 mesh sieve (0.0625 millimeter). Therefore, as illustrated in Figure A2-3, the silt fraction of the USCS scale includes coarser material than the silt fraction of the Wentworth scale. Because of this discrepancy, Geotechnical SOP GT.1 calls for a modification of ASTM D422 procedures for grain-size analysis when analyzing bedrock materials, substituting a #230 mesh sieve for the standard #200 mesh sieve.

In deviation from the SOP guidelines, the #200 standard sieve was used for all laboratory grain-size analyses, including those performed on bedrock material. By superimposing the #230 sieve cutoff, however, Wentworth-scale percentages were read directly from the grain-size distribution curves presented in the raw data (Attachment A2-1). Based on these curves, the grain-size percentages for bedrock materials presented in Table A2-3 reflect Wentworth rather than USCS ranges. Although this correction does not reflect a strict procedural compliance with the Geotechnical SOPs, the data presented in Table A2-3 are gauged to the correct scale and are considered reliable to within 1 percent.

A2.4 RESULTS

Tables A2-2 and A2-3 summarize the results from all geotechnical analyses for alluvial and bedrock samples, respectively. Sand, silt, and clay percentages were read from the grain-size distribution curves provided by geotechnical analyses (Attachment A2-1). Because the USCS does not define a specific silt-clay boundary, the silt-clay boundary of the Wentworth scale was

applied to alluvial as well as bedrock materials. Following Geotechnical SOP GT.1, all samples were classified according to their sand, silt, and clay percentages. Alluvial samples were further classified according to the USCS based on the results of Atterberg limits tests.

Bedrock lithology classifications show a 100-percent correlation between laboratory and field results, and USCS classifications made in the laboratory conform to the original core log descriptions in 80 percent of the cases. These results support a high level of confidence in the core log descriptions made during the OU1 Phase III RFI/RI field investigation.

Attachment A2-1 presents the geotechnical data for the 23 samples collected at OU1 in individual packets. Because samples were taken in sets of two, not all analyses were performed on each individual sample. Each sample data packet is prefaced by an index sheet that shows the data available, broken down into the following five categories:

- Grain-size analysis (sieve and hydrometer test) data
- Atterberg limits test data
- Specific gravity test data
- Moisture/density and back-pressure permeability (triaxial compression test) data
- Core sample photograph

All tests conducted on the stainless steel sleeve samples are combined in the fourth group, which includes back-pressure permeability, moisture content, and both dry and wet density. Core sample photographs are also included for stainless steel sleeve samples. All other data, including grain-size analyses, Atterberg limit tests, and specific gravity tests are grouped together in data packets that correspond to the amber jar samples. Data packets are arranged in numerical order by borehole location number.

A2.5 REFERENCES

American Society for Testing and Materials. 1991. *Annual Book of Standards*, ASTM, Philadelphia, PA.

Compton, R.R. 1962. *Manual of Field Geology*, John Wiley & Sons, Inc., New York, NY.

EG&G. 1991. Rocky Flats Plant Environmental Management Department Standard Operating Procedures.

EPA. 1991. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells, EPA/600/4-89/034, March 1991.

Appendix A2 · Tables

Geotechnical Data

Phase III
RFI/RI Report

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Table A2-1 Phase III Geotechnical Sampling Summary

Borehole/ Well Number	Work Plan Designation	Lithology Group	Sample Intervals Proposed in FSP	Actual Intervals Sampled	Variation from FSP	Comments
37391	BH02	Alluvium	2	2	No	
37491	BH42	Alluvium	2	1	Yes	Sampling error
37591	MW22	Alluvium	2	2	No	
37691	MW23	Alluvium	2	2	Yes	First geotechnical sample taken at 7.4-7.8 feet
37891	MW27	Alluvium	2	1	Yes	Shallow bedrock
		Bedrock	2	3	Yes	Geologist discretion
37991	MW29	Alluvium	2	1	Yes	Shallow bedrock
		Bedrock	2	2	No	
38591	MW34	Alluvium	2	1	Yes	Shallow bedrock
38991	PZ03	Alluvium	2	2	No	
		Bedrock	2	1	Yes	No sample from screened interval
39091	PH01	Alluvium	0	1	Yes	Geologist discretion
39191	MW28	Alluvium	2	1	Yes	Shallow bedrock
		Bedrock	2	2	No	
39691	MW20	Alluvium	2	1	Yes	Shallow bedrock
	TOTAL		28	23		

FSP = Field sampling plan
MW = Monitoring well
BH = Borehole
PZ = Piezometer

Table A2-2. Summary of Alluvial Materials Geotechnical Results

Borehole Number/ Sample Number	Test Interval (feet)	Grain Size (%) Sand	Silt	Clay	Textural Classification	Atterberg Limits Liquid Limit	Plastic Limit	Plastic Index	USCS	Moisture Content (% dry wt)	Dry Density (lb/ft3)	Wet Density (lb/ft3)	Back-Pressure Permeability (cm/sec)	Specific Gravity
37391/BH00648EBU1	2.55-2.80	--	--	--	--	--			--	22.1	98.8	120.6	8.1×10^{-9}	--
37391/BH00661EBU1	2.20-2.55	44	19	37	Silty sandy clay	52.8/22.6/30.2			CH	--	--	--	--	--
37391/BH00660EBU1	11.00-11.75	27	27	46	Silty sandy clay	48.8/17.1/31.7			CL	--	--	--	--	--
37391/BH00658EBU1	11.75-12.00	--	--	--	--	--			--	25.8	103.0	129.6	2.5×10^{-9}	--
37491/BH00570EBU1	2.70-3.00	--	--	--	--	--			--	17.4	113.2	132.9	1.7×10^{-8}	--
37491/BH00571EBU1	3.00-3.25	44	26	30	Silty sandy clay	37.3/15.1/22.2			CL	--	--	--	--	--
37591/BH00665EBU1	3.00-3.25	38	13	49	Silty sandy clay	57.3/25.0/32.8			CH	--	--	--	--	--
37591/BH00664EBU1	3.25-3.50	--	--	--	--	--			--	24.9	96.3	120.3	5.9×10^{-6}	--
37591/BH00671EBU1	6.95-7.45	64	11	25	Silty clayey sand	43.8/15.4/28.4			SC	--	--	--	--	--
37591/BH00670EBU1	7.45-7.70	--	--	--	--	--			--	12.6	114.0	128.3	1.3×10^{-5}	--
37691/BH00592EBU1	7.40-7.55	78	11	11	Silty clayey sand	36.2/16.7/19.5			SM	--	--	--	--	--
37691/BH00591EBU1	7.55-7.80	--	--	--	--	--			--	N/A	N/A	N/A	N/A	--
37691/BH00596EBU1	13.50-13.80	56	14	30	Silty clayey sand	43.8/19.4/24.4			SC	--	--	--	--	--
37691/BH00595EBU1	13.80-14.00	--	--	--	--	--			--	18.4	111.0	131.4	3.7×10^{-8}	--
37891/BH00712EBU1	0.80-1.10	33	22	45	Silty sandy clay	54.4/20.5/33.9			CH	--	--	--	--	--
37891/BH00711EBU1	1.10-1.35	--	--	--	--	--			--	13.3	107.4	121.6	1.8×10^{-7}	--

N/A = Not applicable
cm/sec = centimeters per second
lb/ft^3 = pounds per cubic foot
USCS = Unified Soil Classification System
CH = Fat clay
CL = Lean clay
ML = Silt
SC = Clayey sand
SM = Silty sand
SW = Clean sand
-- = Not analyzed

Table A2-2. Summary of Alluvial Materials Geotechnical Results

Borehole Number/ Sample Number	Test Interval (feet)	Grain Size (%) Sand	Silt	Clay	Textural Classification	Atterberg Limits Liquid Limit	Plastic Limit	Plastic Index	USCS	Moisture Content (% dry wt)	Dry Density (lb/ft3)	Wet Density (lb/ft3)	Back-Pressure Permeability (cm/sec)	Specific Gravity
37991/BH00720EBU1	3.00-3.50	06	13	81	Clay	58.1/20.5/37.6			CH	--			--	--
37991/BH00719EBU1	3.50-3.75	--	--	--	--	--			--	15.2	113.5	130.8	$1.3x10^{-8}$	--
38591/BH00812EBU1	4.80-5.05	82	11	7	Sand	20.9/15.9/5.0			SM	--	--	--	--	2.72
38591/BH00811EBU1	5.05-5.30	--	--	--	--	--			--	N/A	N/A	N/A	N/A	--
38991/BH00833EBU1	1.50-1.75	43	19	38	Silty sandy clay	50.8/19.7/31.1			CH	--	--	--	--	2.75
38991/BH00832EBU1	1.75-2.00	--	--	--	--	--			--	14.5	97.7	111.9	$1.7x10^{-5}$	--
38991/BH00840EBU1	11.50-11.75	24	24	52	Sandy silty clay	43.5/15.0/28.5			CL	--	--	--	--	2.70
38991/BH00839EBU1	11.75-12.00	--	--	--	--	--			--	10.1	114.2	125.8	$5.1x10^{-8}$	--
39091/BH00753EBU1	0.50-0.90	93	03	04	Sand	N/A			SW	--	--	--	--	2.68
39091/BH00752EBU1	0.90-1.15	--	--	--	--	--			--	8.2	97.9	105.9	$1.2x10^{-3}$	--
39191/BH00761EBU1	3.00-3.25	11	16	73	Sandy silty clay	62.6/22.2/40.4			CH	--	--	--	--	2.78
39191/BH00760EBU1	3.25-3.50	--	--	--	--	--			--	21.0	102.1	123.6	$2.1x10^{-8}$	--
39691/BH00866EBU1	5.00-5.25	28	29	43	Sandy silty clay	34.3/12.5/21.8			CL	--	--	--	--	2.71
39691/BH00865EBU1	5.25-5.50	--	--	--	--	--			--	17.4	109.5	128.6	$7.6x10^{-7}$	--

N/A = Not applicable
cm/sec = centimeters per second
lb/ft^3 = pounds per cubic foot
USCS = Unified Soil Classification System
CH = Fat clay
CL = Lean clay
ML = Silt
SC = Clayey sand
SM = Silty sand
SW = Clean sand
-- = Not analyzed

Table A2-3 Summary of Bedrock Geotechnical Results

Borehole Number/ Sample Number	Test Interval (feet)	Grain Size (%) Sand	Silt	Clay	Rock Type	Atterberg Limits Liquid Limit	Plastic Limit	Plastic Index	Moisture Content (% dry wt)	Dry Density (lb/ft^3)	Wet Density (lb/ft^3)	Back-Pressure Permeability (cm/sec)	Specific Gravity
37891/BH00716EBU1	7.20-7.50	27	26	47	Silty sandy claystone	57.5/23.6/33.9			--	--	--	--	--
37891/BH00715EBU1	7.50-7.75	--	--	--	--	--			21.5	99.5	121.0	3.8×10^{-8}	--
37891/BH00738EBU1	10.00-10.20	02	16	82	Claystone	61.5/24.5/37.0			--	--	--	--	2.69
37891/BH00737EBU1	10.20-10.45	--	--	--	--	--			21.7	100.6	122.5	4.7×10^{-8}	--
37891/BH00747EBU1	45.70-46.15	08	64	28	Sandy clayey siltstone	38.3/19.9/18.4			--	--	--	--	3.72
37891/BH00746EBU1	46.15-46.40	--	--	--	--	--			14.8	100.3	115.2	5.0×10^{-8}	--
37991/BH00724EBU1	11.10-11.40	3	17	80	Claystone	65.2/22.7/42.5			--	--	--	--	--
37991/BH00723EBU1	11.40-11.65	--	--	--	--	--			22.7	103.4	126.8	5.5×10^{-9}	--
37991/BH00734EBU1	46.70-48.00	14	50	36	Sandy clayey siltstone	40.3/16.9/23.4			--	--	--	--	2.69
37991/BH00732EB41	46.45-46.70	--	--	--	--	--			15.1	92.0	105.9	7.8×10^{-5}	--
38991/BH00845EBU1	20.90-21.15	02	21	77	Silty claystone	64.9/23.4/41.5			--	--	--	--	2.76
38991/BH00844EBU1	21.15-21.40	--	--	--	--	--			21.4	106.4	129.2	4.2×10^{-9}	--
39191/BH00766EBU1	11.50-11.75	10	43	47	Sandy silty claystone	39.7/15.8/23.9			--	--	--	--	2.64
39191/BH00765EBU1	11.75-12.00	--	--	--	--	--			12.0	124.0	138.9	9.5×10^{-8}	--
39191/BH00775EBU1	42.00-42.25	04	57	39	Clayey siltstone	43.2/17.4/25.8			--	--	--	--	2.76
39191/BH00774EBU1	42.25-42.50	--	--	--	--	--			15.6	109.8	126.9	1.6×10^{-6}	--

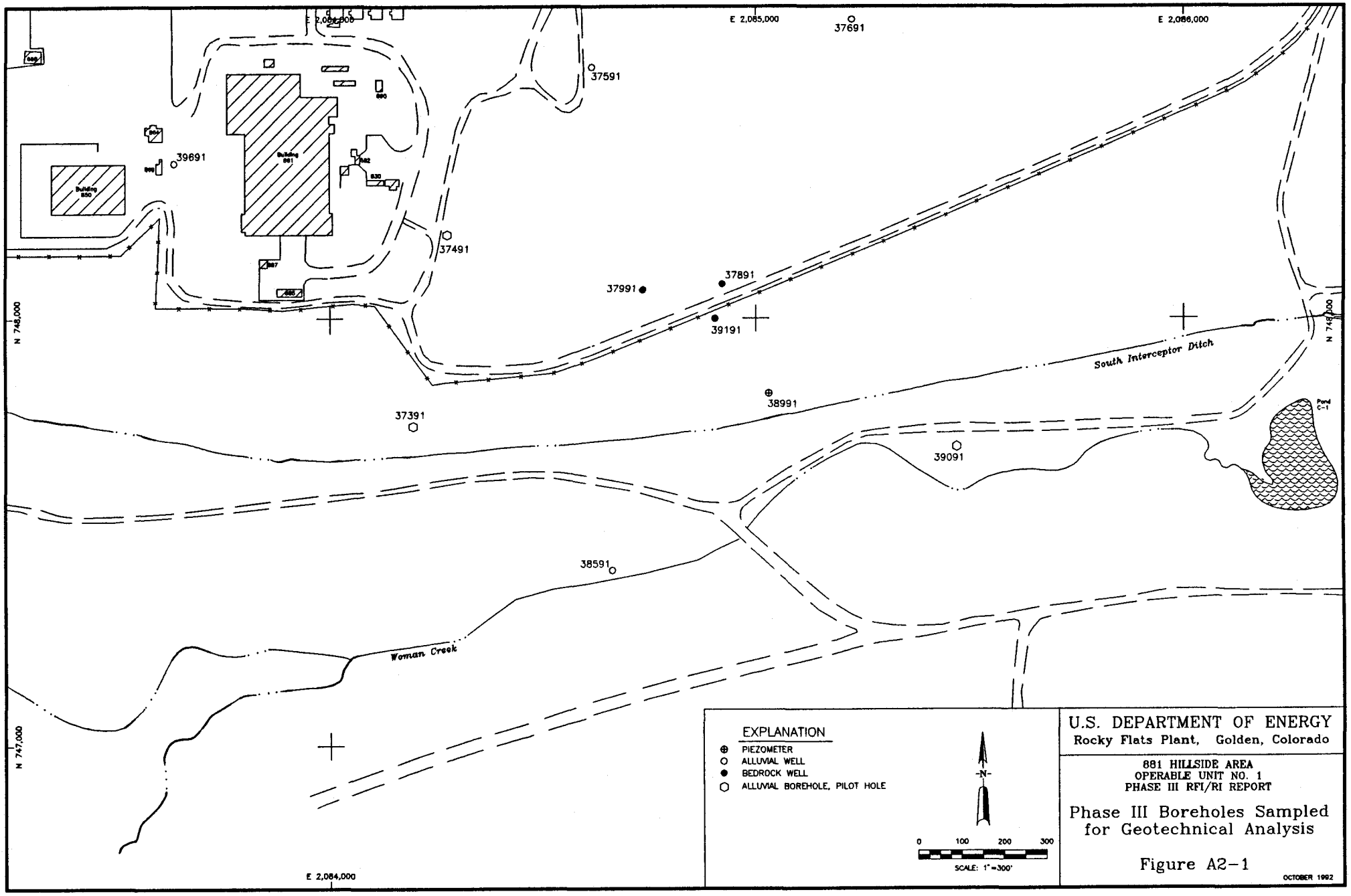
cm/sec = centimeters per second
lb/ft^3 = pounds per cubic foot
-- = Not analyzed

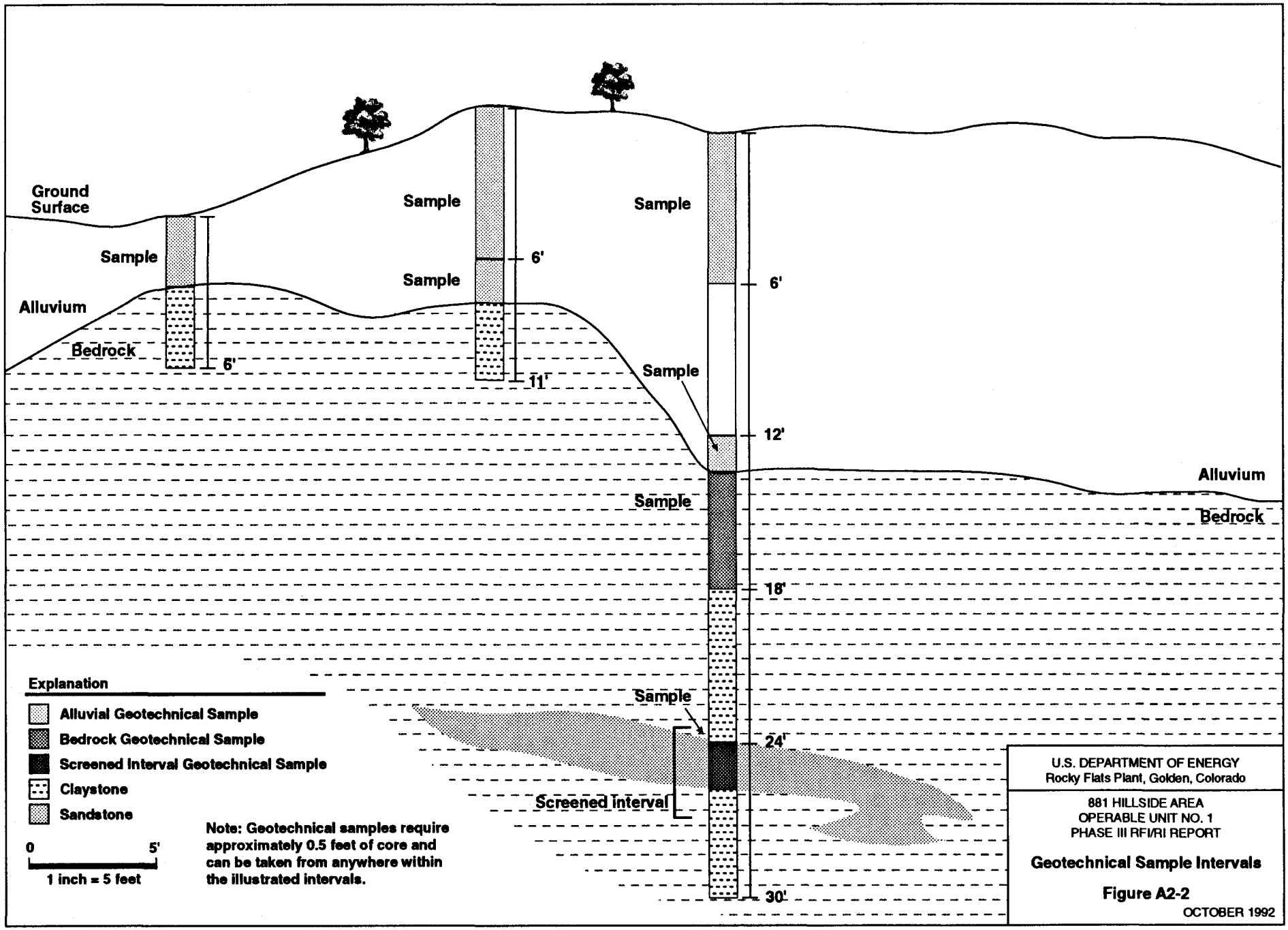
Appendix A2 · Figures

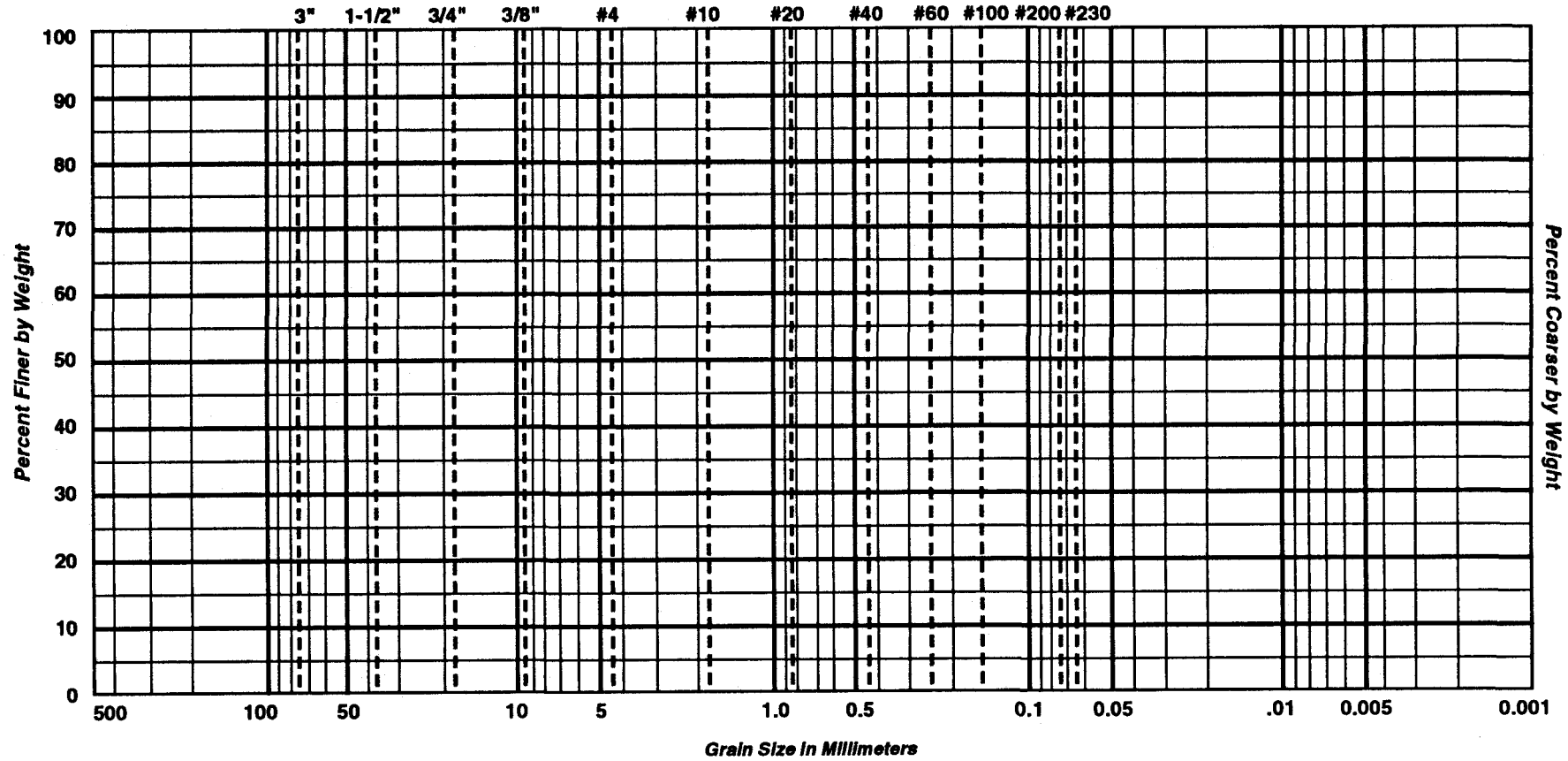
Geotechnical Data

Phase III
RFI/RI Report

U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881
1 OU1 OU1
side 881 Hill
U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881


E 2,085,000
E 2,086,000
E 2,084,000
N 748,000
N 747,000
37691
37591
39691
37491
37991
37891
39191
38991
37391
39091
38591
South Interceptor Ditch
Woman Creek
Building 881
Building 850
Pond C-1
EXPLANATION
PIEZOMETER
ALLUVIAL WELL
BEDROCK WELL
ALLUVIAL BOREHOLE, PILOT HOLE
-N-
0 100 200 300
SCALE: 1"=300'
U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant, Golden, Colorado
881 HILLSIDE AREA
OPERABLE UNIT NO. 1
PHASE III RFI/RI REPORT
Phase III Boreholes Sampled for Geotechnical Analysis
Figure A2-1
OCTOBER 1992


Ground Surface
Sample
Alluvium
Bedrock
6'
Sample
Sample
6'
11'
Sample
6'
Sample
12'
Alluvium
Sample
Bedrock
18'
Sample
24'
Screened Interval
30'
Explanation
Alluvial Geotechnical Sample
Bedrock Geotechnical Sample
Screened Interval Geotechnical Sample
Claystone
Sandstone
0
5'
1 inch = 5 feet
Note: Geotechnical samples require approximately 0.5 feet of core and can be taken from anywhere within the illustrated intervals.
U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant, Golden, Colorado
881 HILLSIDE AREA
OPERABLE UNIT NO. 1
PHASE III RFI/RI REPORT
Geotechnical Sample Intervals
Figure A2-2
OCTOBER 1992



USCS	Cobbles	Gravel		Sand			Silt or Clay			
		Coarse	Fine	Coarse	Medium	Fine				
Wentworth	Cobbles to Boulders	Pebble Gravel				Sand			Silt	Clay
		Coarse	Med	Fine	Gran	Coarse	Med	Fine		

U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant, Golden, Colorado

881 HILLSIDE AREA
OPERABLE UNIT NO. 1
PHASE III RFI/RI REPORT

U.S. Standard Sieve Sizes for USCS and Wentworth Classifications

Figure A2-3

OCTOBER 1992

Appendix A2
Attachments

Geotechnical Data

Phase III
RFI/RI Report

U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881
1 OU1 OU1
side 881 Hill
U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37391**
Sample Number:	**BH00661EBU1**
Sample Depth:	**2.20-2.55 feet (Alluvium)**

Data Available:

✔ Grain Size Analysis (Sieve and Hydrometer Test) Data

✔ Atterberg Limits Test Data

__ Specific Gravity Test Data

__ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

__ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37391	SAMPLED	10-16-91 T.C.&B.P.
DEPTH	2.55 - 2.8'	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00661EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	29.84
Wt. Dry Soil & Pan (g)	29.04
Wt. Lost Moisture (g)	0.80
Wt. of Pan Only (g)	3.83
Wt. of Dry Soil (g)	25.21
Moisture Content %	3.2
Wt. Hydrom. Sample Wet (g)	60.01
Wt. Hydrom. Sample Dry (g)	58.16

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	381.83
Weight of + #10 Before Washing (g)	106.00
Weight of + #10 After Washing (g)	81.11
Weight of - #10 Wet (g)	275.83
Weight of - #10 Dry (g)	291.47
Wt. Total Sample Dry (g)	372.58
Calc. Wt. "W" (g)	74.35
Calc. Mass + #10	16.19

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	39.62	39.62	39.62	10.6	89.4
3/8"	0.00	20.18	20.18	59.80	16.1	83.9
#4	0.00	10.55	10.55	70.35	18.9	81.1
#10	0.00	10.76	10.76	81.11	21.8	78.2
#20	1.30	3.51	2.21	2.21	24.7	75.3
#40	1.32	3.69	2.37	4.58	27.9	72.1
#60	1.46	4.16	2.70	7.28	31.6	68.4
#100	1.32	4.94	3.62	10.90	36.4	63.6
#200	1.30	6.80	5.50	16.40	43.8	56.2

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37391
DEPTH	2.55 - 2.8'
SAMPLE NO.	BH00661EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-16-91 T.C.&B.P.
DATE TESTED	11-08-91 SR
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	29.840
Wt. Dry Soil & Pan (g)	29.040
Wt. of Pan Only (g)	3.830
Sieve:	
Wt. Total Sample Wet (g)	381.83
Weight of + #10 Before Washing (g)	106.00
Weight of + #10 After Washing (g)	81.11
Weight of - #10 Wet (g)	275.83

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.007
% of Total Sample	100.0

HYDROMETER ANALYSIS - SEDIMENTATION DATA

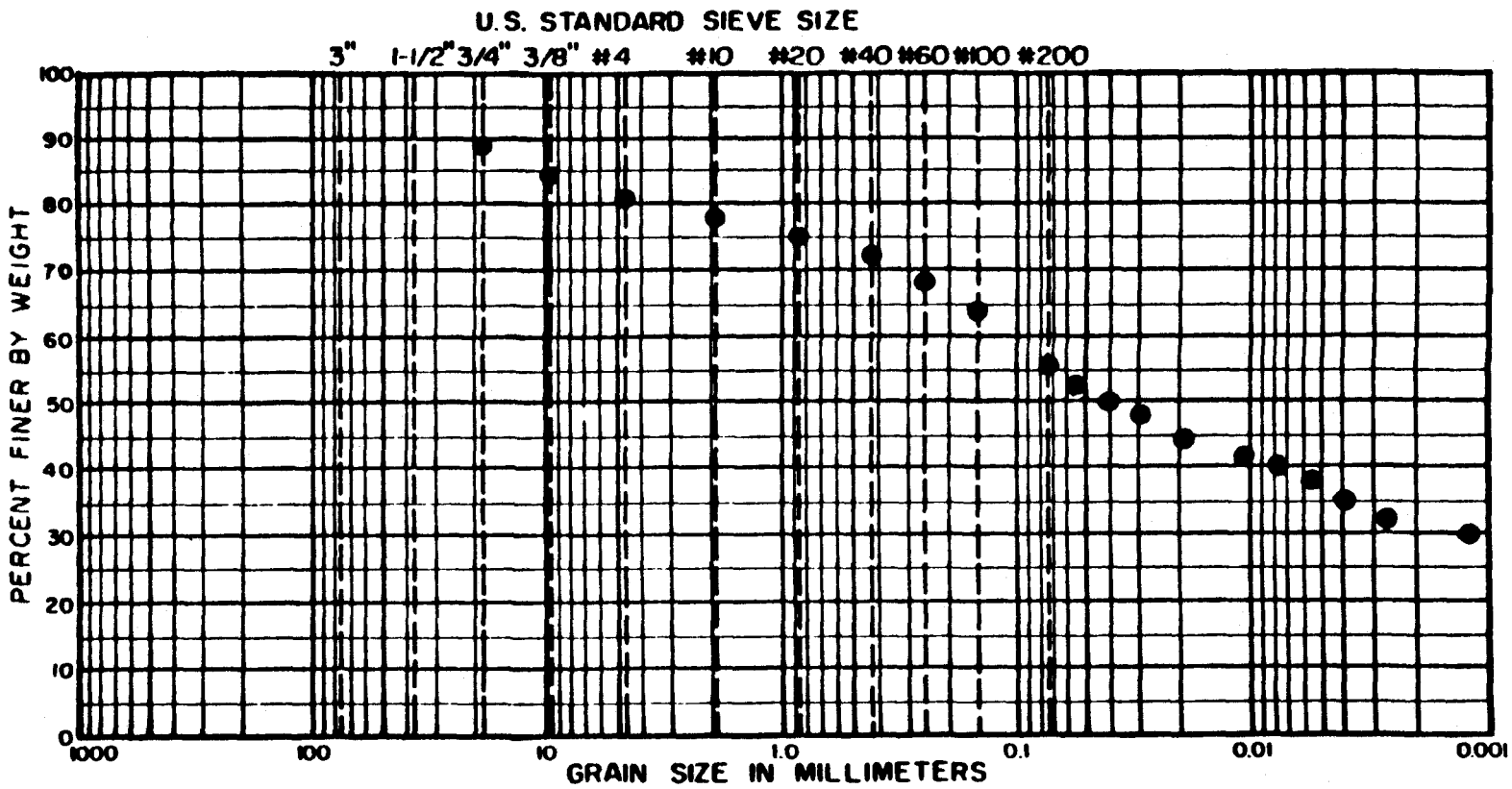
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37391	SAMPLED	10-16-91 T.C.&B.P.
DEPTH	2.55 - 2.8'	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00661EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	74.346
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	44.00	39.00	52.5	52.5	9.07	0.0561
1.0	42.00	37.00	49.8	49.8	9.40	0.0404
2.0	41.00	36.00	48.4	48.4	9.57	0.0288
5.0	37.50	32.50	43.7	43.7	10.14	0.0188
15.0	36.00	31.00	41.7	41.7	10.39	0.0110
30.0	35.00	30.00	40.4	40.4	10.55	0.0078
60.0	33.00	28.00	37.7	37.7	10.88	0.0056
120.0	31.00	26.00	35.0	35.0	11.21	0.0040
250.0	29.00	24.00	32.3	32.3	11.53	0.0028
1440.0	27.00	22.00	29.6	29.6	11.86	0.0012

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00661EBUI	2.55 -2.8'	Sample # 379

ADVANCED TERRA TESTING

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EBASCO

LOCATION 373

BORING 0400461030 SAMPLE ____ DEPTH 2.5-2.8

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

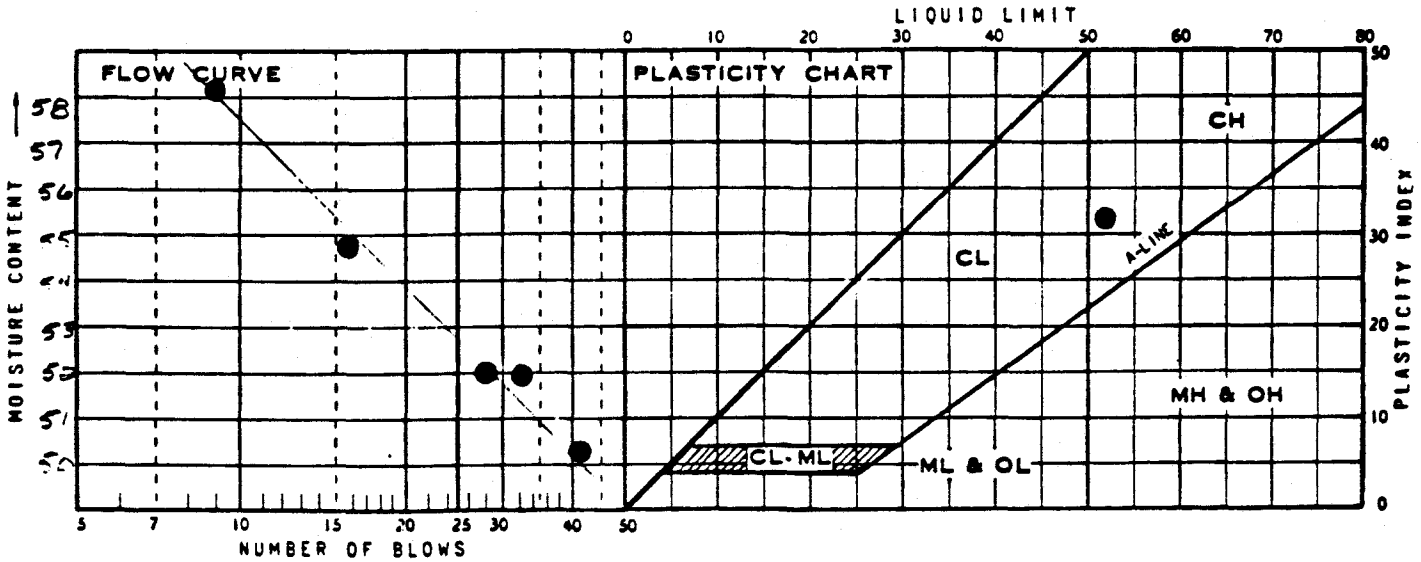
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SB 11/12/81

DETERMINATION	1	2	3	4	5	6
DISH	61 C	29 C	36 C			
WT OF DISH + WET SOIL g	7.05	8.96	8.82			
WT OF DISH + DRY SOIL g	6.77	7.48	7.41	—	—	—
WT OF MOISTURE g	1.28	1.48	1.41			
WT OF DISH g	1.06	1.06	1.06	—	—	—
WT OF DRY SOIL g	5.71	6.42	6.35			
MOISTURE CONTENT %	22.4	23.1	22.2			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	24	22	3 C	60 C	28 C	
NUMBER OF BLOWS	41	33	28 ±	16	10 ±	
WT OF DISH + WET SOIL g	15.13	14.50	16.11	16.99	16.36	
WT OF DISH + DRY SOIL g	10.41	9.90	10.96	11.36	10.73	—
WT OF MOISTURE g	4.72	4.60	5.15	5.63	5.63	
WT OF DISH g	1.03	1.04	1.05	1.06	1.05	—
WT OF DRY SOIL g	9.38	8.86	9.91	10.30	9.68	
MOISTURE CONTENT %	50.3	51.9	52.0	54.7	58.2	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		52.8	22.6	30.2	—	

ADVANCED TEST

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37391**
Sample Number:	**BH00648EBU1**
Sample Depth:	**2.55-2.80 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37391	SAMPLED	10-16-91 TC & BP
DEPTH	2.55 - 2.80 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00648EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	15S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	351.8	361.4
Wt. Wet Soil & Pan (g)	361.1	370.7
Wt. Dry Soil & Pan (g)	297.5	297.5
Wt. Lost Moisture (g)	63.6	73.2
Wt. of Pan Only (g)	9.3	9.3
Wt. of Dry Soil (g)	288.2	288.2
Moisture Content %	22.1	25.4
Wet Density PCF	120.6	131.9
Dry Density PCF	98.8	105.2

Init. Diameter (in)	2.385	(cm)	6.058
Init. Area (sq in)	4.468	(sq cm)	28.824
Init. Height (in)	2.488	(cm)	6.320
Vol. Bef. Consol. (cu ft)	0.00643		
Vol. After Consol. (cu ft)	0.00604		
Effective Porosity %	42.77		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
997.0	59820	49.8	49.1	15.7	2.2E-08
1492.0	89520	49.1	48.5	16.4	1.2E-08
1453.0	87180	48.5	48.0	17.0	1.1E-08
1339.0	80340	48.0	47.5	17.5	1.2E-08
1440.0	86400	47.5	47.1	18.0	8.7E-09
1459.0	87540	47.1	46.7	18.4	9.7E-09
1421.0	85260	46.6	46.2	19.0	8.9E-09
1450.0	87000	46.2	45.8	19.4	8.7E-09
1569.0	94140	45.8	45.4	19.8	8.1E-09

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37391
DEPTH	2.55 - 2.80 FT
SAMPLE NO.	BH00648EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-16-91 TC & BP
TEST STARTED	11-12-91 DCW
TEST FINISHED	11-25-91
SETUP NO.	15S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	351.770
Wt Soil & Moist at	361.370
Wt. Dry Soil & Pan	297.520
Wt. of Pan Only (g)	9.320
Consol Info:	
Init. Diameter in.	2.385
Initial Height in.	2.488
Vol. change (sat. con.) CC	18.000
Cell Exp.	6.900
Height Change in.	0.019
Test info:	
Pore pres @ begin. psi	59.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37391	SAMPLED	10-16-91 TC & BP
DEPTH	2.55 - 2.80 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00648EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	15S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	13.4				
50.0	48.0	11.4	12.3	38.0	46.8	8.8	0.88
60.0	58.0	12.3	13.0	48.2	57.4	9.2	0.92
70.0		13.3	13.4	58.3	67.8	9.5	0.95

CONSOLIDATION DATA

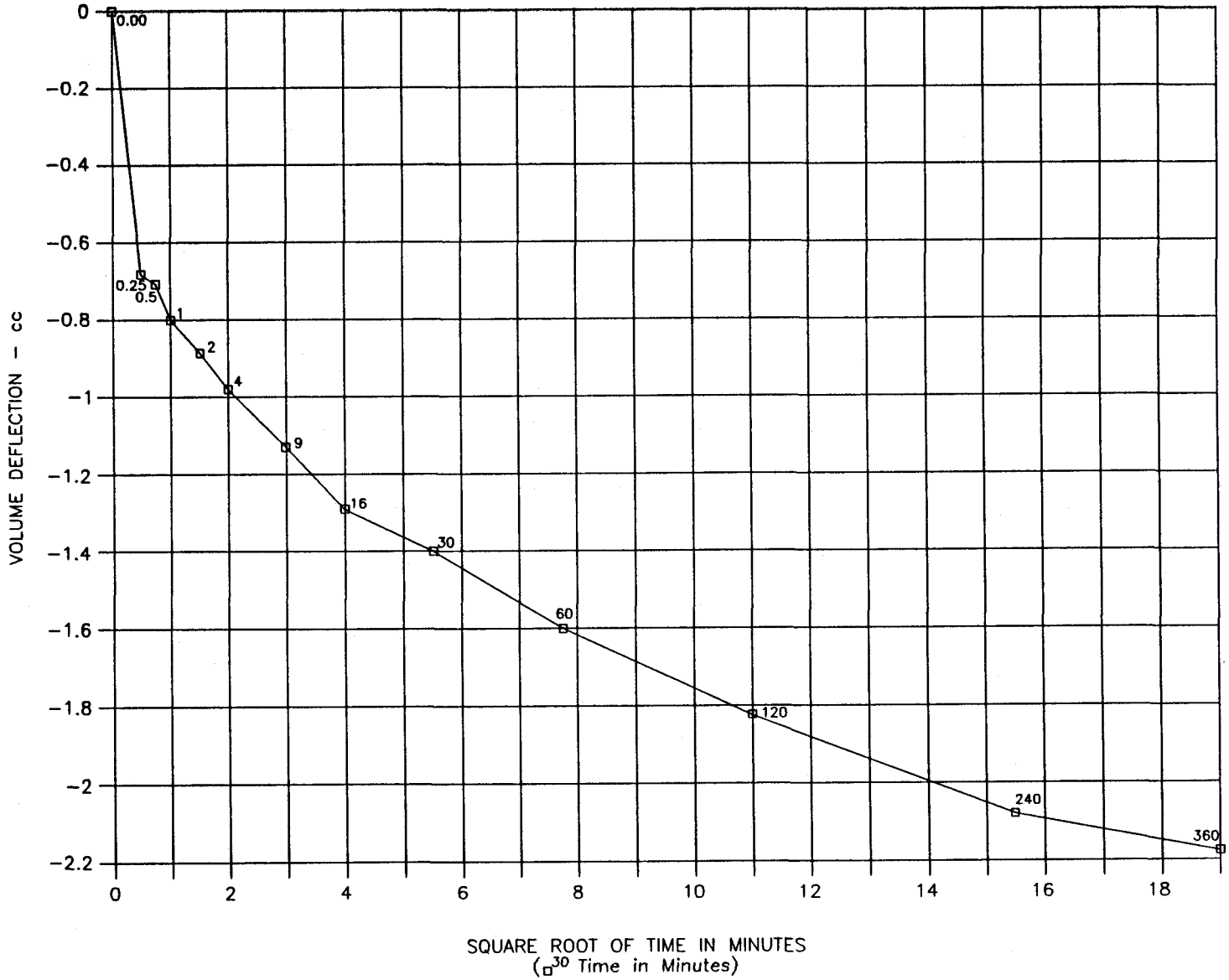
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	13.40	0.00
0.25	0.50	14.08	-0.67
0.5	0.71	14.10	-0.70
1	1.00	14.20	-0.80
2	1.41	14.28	-0.88
4	2.00	14.38	-0.97
9	3.00	14.53	-1.13
16	4.00	14.68	-1.28
30	5.48	14.80	-1.40
60	7.75	15.00	-1.60
120	10.95	15.23	-1.82
240	15.49	15.48	-2.07
360	18.97	15.58	-2.17

Initial Height (in)	2.488	Init. Vol. (CC)	182.18
Height Change (in)	0.019	Vol. Change (CC)	18.00
Ht. After Cons. (in)	2.469	Cell Exp. (CC)	6.90
Initial Area (sq in)	4.468	Net Change (CC)	11.10
Area After Cons. (sq in)	4.228	Cons. Vol. (CC)	171.08

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00648EBU1 @ 2.55-2.80', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37391	SAMPLED	10-16-91 TC & BP
DEPTH	2.55 - 2.80 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00648EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	15S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.488	Init. Area (sq in)	4.468
Consol. Ht. (in)	2.469	Consol. Area (sq in)	4.228
Back Pres. PSI	59.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.228	0	59.00	0.0	1152	0	0.00
125.0	4258	0.01	0.41	4.245	4481	49.50	-1368.0	2520	7001	2.78
165.0	5620	0.02	0.81	4.262	5891	50.00	-1296.0	2448	8339	3.41
187.0	6370	0.03	1.22	4.280	6649	51.00	-1152.0	2304	8953	3.89
193.0	6574	0.04	1.62	4.297	6834	54.50	-648.0	1800	8634	4.80
190.0	6472	0.05	2.03	4.315	6701	56.80	-316.8	1469	8169	5.56
185.0	6301	0.06	2.43	4.333	6497	57.00	-288.0	1440	7937	5.51
180.0	6131	0.07	2.84	4.351	6295	57.40	-230.4	1382	7678	5.55
176.0	5995	0.08	3.24	4.369	6130	57.60	-201.6	1354	7483	5.53
172.0	5859	0.09	3.65	4.388	5965	57.70	-187.2	1339	7305	5.45
167.0	5688	0.10	4.05	4.406	5768	57.80	-172.8	1325	7092	5.35
151.0	5143	0.15	6.08	4.501	5105	57.80	-172.8	1325	6430	4.85
140.0	4769	0.20	8.10	4.600	4631	57.80	-172.8	1325	5956	4.50
139.0	4735	0.25	10.13	4.704	4497	57.80	-172.8	1325	5821	4.39
150.0	5109	0.30	12.15	4.812	4743	57.80	-172.8	1325	6068	4.58
157.5	5365	0.35	14.18	4.926	4866	58.00	-144.0	1296	6162	4.75
164.5	5603	0.40	16.20	5.045	4962	58.40	-86.4	1238	6200	5.01
175.0	5961	0.45	18.23	5.170	5151	58.70	-43.2	1195	6346	5.31
149.0	5075	0.50	20.25	5.301	4277	59.20	28.8	1123	5400	
140.0	4769	0.55	22.28	5.439	3917	59.50	72.0	1080	4997	
140.0	4769	0.60	24.30	5.585	3815	59.70	100.8	1051	4866	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH

37391

BH00648EBUI

2.55–2.80 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37391**
Sample Number:	**BH00660EBU1**
Sample Depth:	**11.00-11.75 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT EBASCO

JOB NO. 2031-05

BORING NO.	37391	SAMPLED	10-17-91
DEPTH	11.00 - 11.75 FT	DATE TESTED	11-11-91 TNU
SAMPLE NO.	BH00660EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	34.33
Wt. Dry Soil & Pan (g)	33.83
Wt. Lost Moisture (g)	0.50
Wt. of Pan Only (g)	3.66
Wt. of Dry Soil (g)	30.17
Moisture Content %	1.7
Wt. Hydrom. Sample Wet (g)	60.01
Wt. Hydrom. Sample Dry (g)	59.03

WASH SIEVE ANALYSIS

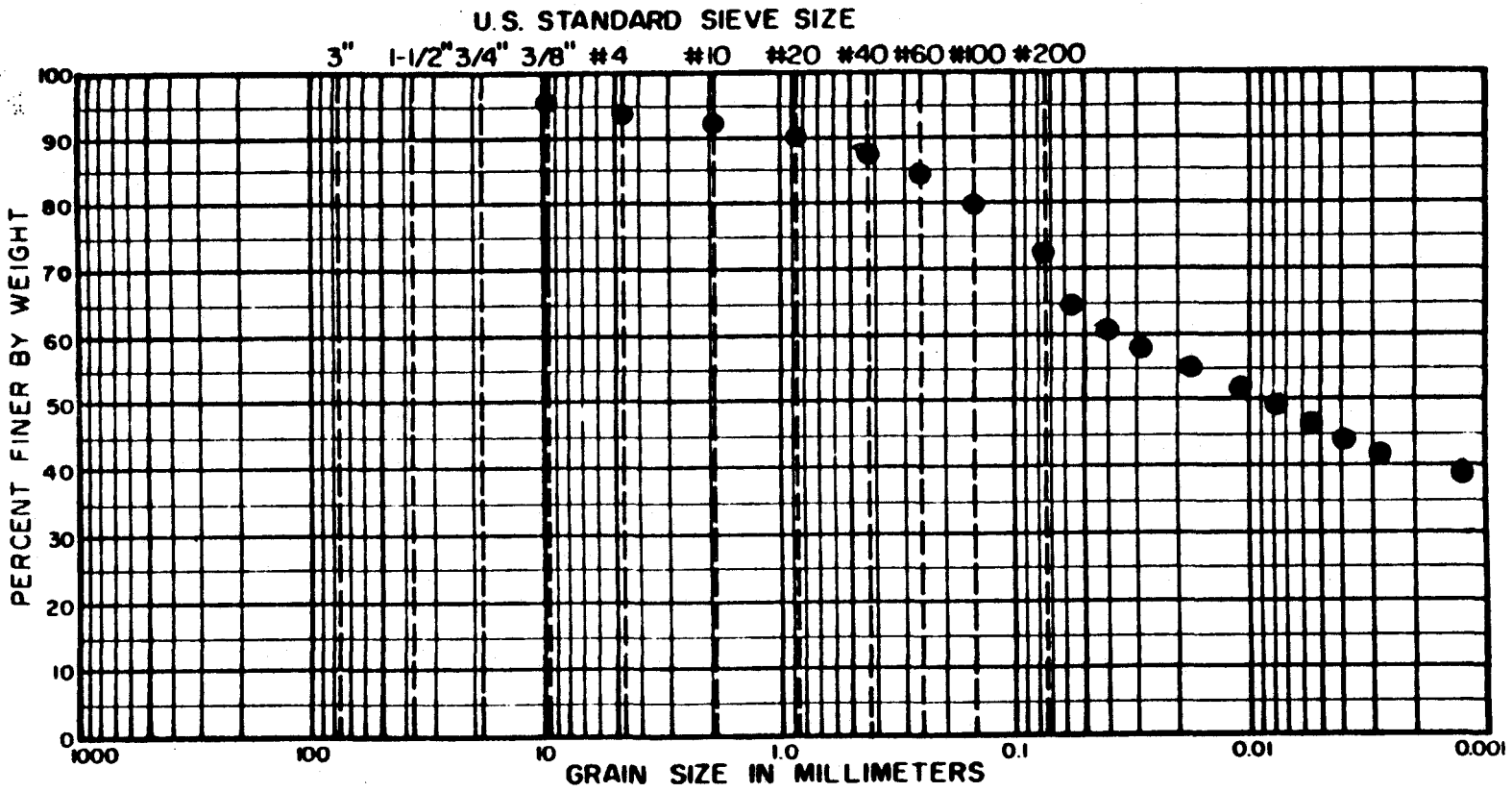
Wt. Total Sample Wet (g)	415.74
Weight of + #10 Before Washing (g)	36.85
Weight of + #10 After Washing (g)	28.94
Weight of - #10 Wet (g)	378.89
Weight of - #10 Dry (g)	380.49
Wt. Total Sample Dry (g)	409.43
Calc. Wt. "W" (g)	63.52
Calc. Mass + #10	4.49

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	22.00	22.00	22.00	5.4	94.6
#4	0.00	4.13	4.13	26.13	6.4	93.6
#10	0.00	2.81	2.81	28.94	7.1	92.9
#20	1.33	3.16	1.83	1.83	9.9	90.1
#40	1.30	3.08	1.78	3.61	12.8	87.2
#60	1.32	3.28	1.96	5.57	15.8	84.2
#100	1.31	3.93	2.62	8.19	20.0	80.0
#200	1.30	5.76	4.46	12.65	27.0	73.0

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37391
DEPTH	11.00 - 11.75 FT
SAMPLE NO.	BH00660EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-17-91
DATE TESTED	11-11-91 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	34.330
Wt. Dry Soil & Pan (g)	33.830
Wt. of Pan Only (g)	3.660
Sieve:	
Wt. Total Sample Wet (g)	415.74
Weight of + #10 Before Washing (g)	36.85
Weight of + #10 After Washing (g)	28.94
Weight of - #10 Wet (g)	378.89

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.011
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00l600EBLI	11- 15'	Sample # 373

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37391	SAMPLED	10-17-91
DEPTH	11.00 - 11.75 FT	DATE TESTED	11-11-91 TNU
SAMPLE NO.	BH00660EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	63.523
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	46.50	41.50	65.3	65.3	8.66	0.0548
1.0	43.75	38.75	61.0	61.0	9.12	0.0398
2.0	42.00	37.00	58.2	58.2	9.40	0.0286
5.0	40.50	35.50	55.9	55.9	9.65	0.0183
15.0	38.00	33.00	51.9	51.9	10.06	0.0108
30.0	36.50	31.50	49.6	49.6	10.30	0.0077
60.0	35.00	30.00	47.2	47.2	10.55	0.0055
120.0	33.00	28.00	44.1	44.1	10.88	0.0040
250.0	31.50	26.50	41.7	41.7	11.12	0.0028
1440.0	30.00	25.00	39.4	39.4	11.37	0.0012

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EBASCO

LOCATION 373

BORING 5400 40 EBW1 SAMPLE ____ DEPTH 11-15'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

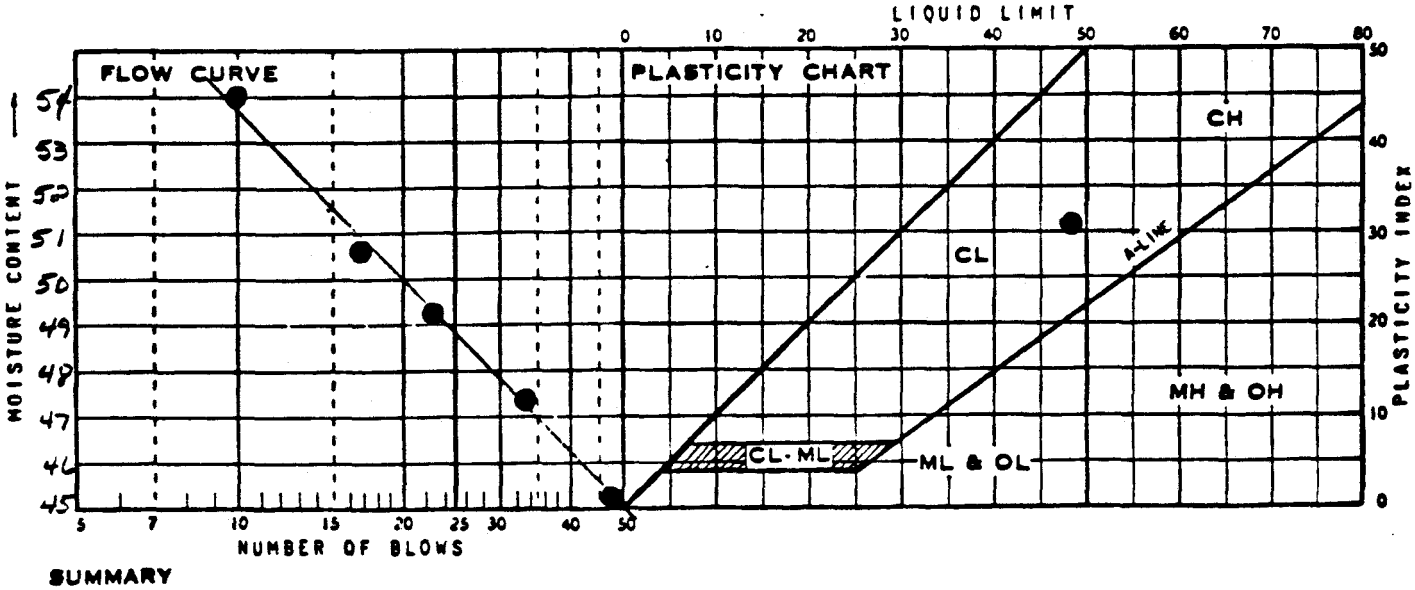
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SB. 11/12/91.

DETERMINATION	1	2	3	4	5	6
DISH	1	35 C	69 C			
WT OF DISH + WET SOIL g	9.00	8.62	7.70			
WT OF DISH + DRY SOIL g	7.82	7.50	6.76	—	—	—
WT OF MOISTURE g	1.18	1.12	.94			
WT OF DISH g	1.04	1.05	1.04	—	—	—
WT OF DRY SOIL g	6.78	6.45	5.72			
MOISTURE CONTENT %	17.4	17.4	16.4			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	32 C	46 C	50 C	54 C	30 C	
NUMBER OF BLOWS	49	34	23	17	10	
WT OF DISH + WET SOIL g	17.75	16.32	18.08	17.03	16.23	
WT OF DISH + DRY SOIL g	12.55	11.42	12.47	11.66	10.92	—
WT OF MOISTURE g	5.20	4.90	5.61	5.37	5.31	
WT OF DISH g	1.04	1.05	1.06	1.05	1.08	—
WT OF DRY SOIL g	11.51	10.37	11.41	10.61	9.84	
MOISTURE CONTENT %	45.2	47.3	49.2	50.6	54.0	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		48.8	17.1	31.7	CL	

ADVANCED TERRA TESTING

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37391**
Sample Number:	**BH00658EBU1**
Sample Depth:	**11.75-12.00 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37391	SAMPLED	10-16-91 TC&BP
DEPTH	11.75 - 12.00 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00658EBU1	TEST FINISHED	11-30-91
SOIL DESCR.	SS LINER	SETUP NO.	4P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	398.1	404.4
Wt. Wet Soil & Pan (g)	407.6	413.8
Wt. Dry Soil & Pan (g)	325.9	325.9
Wt. Lost Moisture (g)	81.7	87.9
Wt. of Pan Only (g)	9.5	9.5
Wt. of Dry Soil (g)	316.4	316.4
Moisture Content %	25.8	27.8
Wet Density PCF	129.6	127.9
Dry Density PCF	103.0	100.1

Init. Diameter (in)	2.386	(cm)	6.060
Init. Area (sq in)	4.471	(sq cm)	28.849
Init. Height (in)	2.617	(cm)	6.647
Vol. Bef. Consol. (cu ft)	0.00677		
Vol. After Consol. (cu ft)	0.00697		
Effective Porosity %	44.55		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
1370.0	82200	49.7	49.4	15.6	6.5E-09
1569.0	94140	49.4	49.2	15.8	3.8E-09
1420.0	85200	49.2	49.0	16.0	4.2E-09
1335.0	80100	49.0	48.9	16.2	2.2E-09
1444.0	86640	48.9	48.7	16.4	4.1E-09
1426.0	85560	48.7	48.6	16.5	2.1E-09
1205.0	72300	48.4	48.3	16.9	2.5E-09

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37391
DEPTH	11.75 - 12.00 FT
SAMPLE NO.	BH00658EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-16-91 TC&BP
TEST STARTED	11-12-91 DCW
TEST FINISHED	11-30-91
SETUP NO.	4P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	398.110
Wt Soil & Moist at	404.360
Wt. Dry Soil & Pan	325.890
Wt. of Pan Only (g)	9.460
Consol Info:	
Init. Diameter in.	2.386
Initial Height in.	2.617
Vol. change (sat. con.) CC	6.900
Cell Exp.	12.500
Height Change in.	0.005
Test info:	
Pore pres @ begin. psi	99.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37391	SAMPLED	10-16-91 TC&BP
DEPTH	11.75 - 12.00 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00658EBU1	TEST FINISHED	11-30-91
SOIL DESCR.	SS LINER	SETUP NO.	4P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.1	7.2				
50.0	48.0	4.2	5.0	36.8	39.7	2.9	0.29
60.0	58.0	2.3	2.9	47.6	52.1	4.5	0.45
70.0	68.0	1.5	2.3	57.6	63.7	6.1	0.61
80.0	78.0	1.7	2.8	67.8	75.0	7.2	0.72
90.0	88.0	2.3	3.3	77.6	85.8	8.2	0.82
100.0	98.0	3.1	4.1	87.6	96.6	9.0	0.90
110.0		4.0	4.0	97.7	107.0	9.3	0.93

CONSOLIDATION DATA

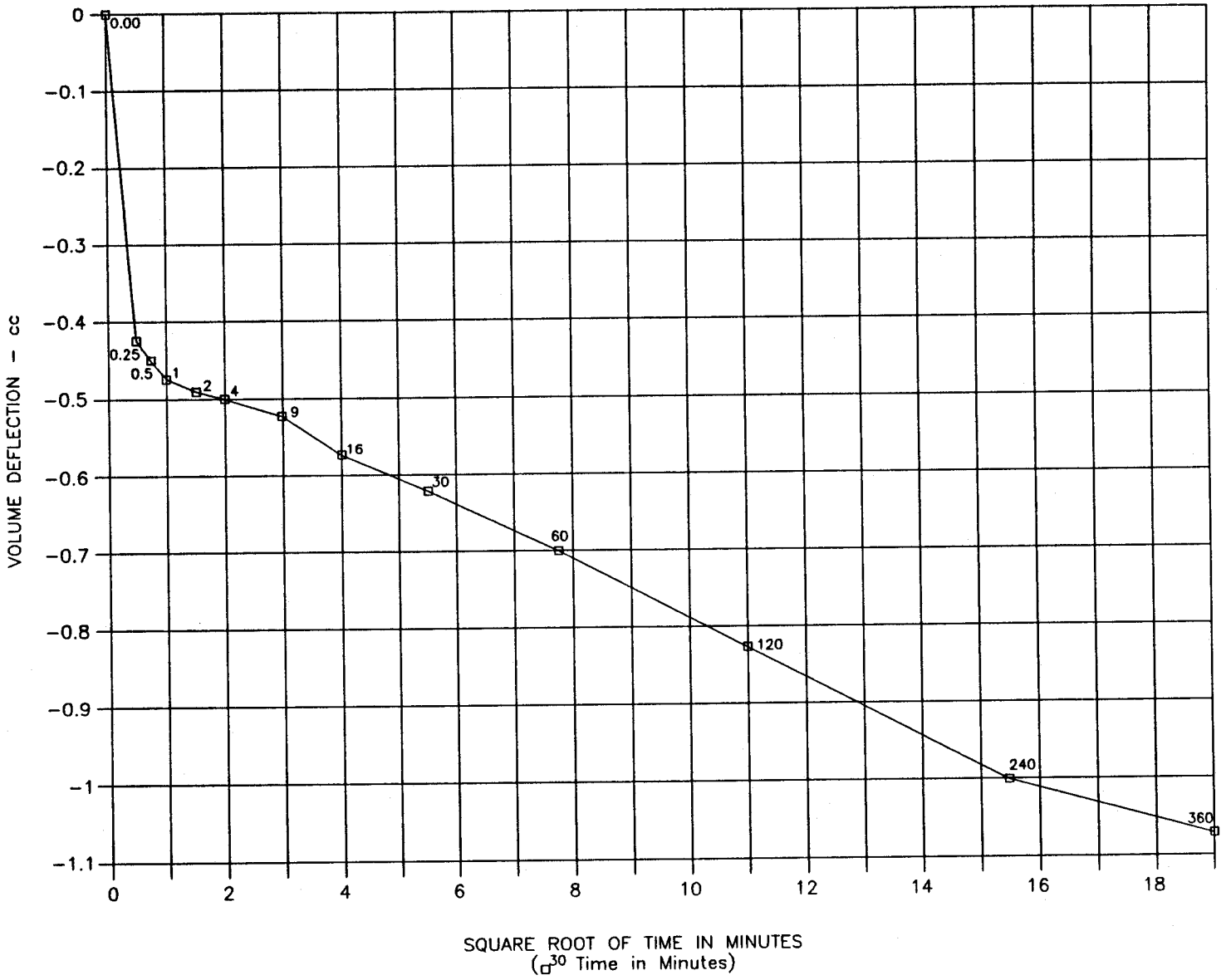
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	3.90	0.00
0.25	0.50	4.33	-0.43
0.5	0.71	4.35	-0.45
1	1.00	4.38	-0.48
2	1.41	4.39	-0.49
4	2.00	4.40	-0.50
9	3.00	4.43	-0.52
16	4.00	4.48	-0.57
30	5.48	4.53	-0.63
60	7.75	4.60	-0.70
120	10.95	4.73	-0.82
240	15.49	4.90	-1.00
360	18.97	4.98	-1.07

Initial Height (in)	2.617	Init. Vol. (CC)	191.78
Height Change (in)	0.005	Vol. Change (CC)	6.90
Ht. After Cons. (in)	2.612	Cell Exp. (CC)	12.50
Initial Area (sq in)	4.471	Net Change (CC)	-5.60
Area After Cons. (sq in)	4.611	Cons. Vol. (CC)	197.38

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00658EBU1 @ 11.75-12.00', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

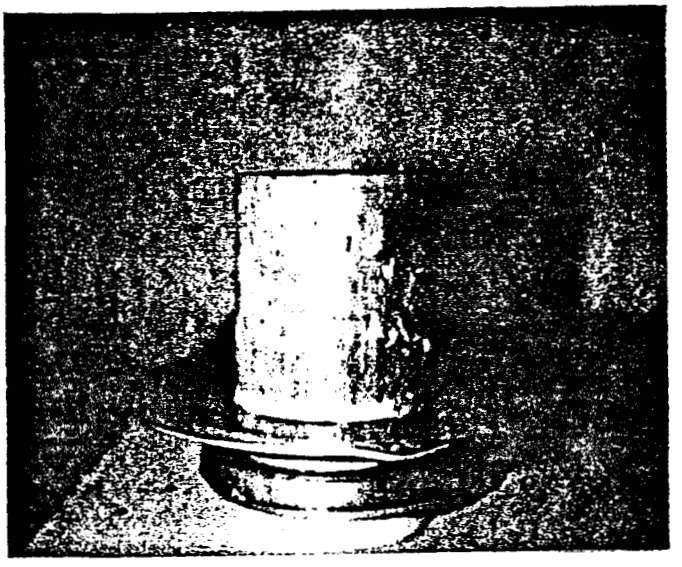
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37391	SAMPLED	10-16-91 TC&BP
DEPTH	11.75 - 12.00 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00658EBU1	TEST FINISHED	11-30-91
SOIL DESCR.	SS LINER	SETUP NO.	4P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.617	Init. Area (sq in)	4.471
Consol. Ht. (in)	2.612	Consol. Area (sq in)	4.611
Back Pres. PSI	99.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. in.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.611	0	99.00	0.0	1152	0	0.00
125.0	3904	0.01	0.38	4.628	3772	49.50	-7128.0	8280	12052	1.46
165.0	5153	0.02	0.77	4.646	4959	50.00	-7056.0	8208	13167	1.60
187.0	5840	0.03	1.15	4.664	5599	51.00	-6912.0	8064	13663	1.69
193.0	6028	0.04	1.53	4.682	5756	54.50	-6408.0	7560	13316	1.76
190.0	5934	0.05	1.91	4.701	5645	56.80	-6076.8	7229	12873	1.78
185.0	5778	0.06	2.30	4.719	5475	57.00	-6048.0	7200	12675	1.76
180.0	5622	0.07	2.68	4.738	5306	57.40	-5990.4	7142	12448	1.74
176.0	5497	0.08	3.06	4.756	5167	57.60	-5961.6	7114	12281	1.73
172.0	5372	0.09	3.45	4.775	5030	57.70	-5947.2	7099	12129	1.71
167.0	5216	0.10	3.83	4.794	4864	57.80	-5932.8	7085	11949	1.69
151.0	4716	0.15	5.74	4.892	4311	57.80	-5932.8	7085	11396	1.61
140.0	4372	0.20	7.66	4.993	3916	57.80	-5932.8	7085	11000	1.55
139.0	4341	0.25	9.57	5.099	3807	57.80	-5932.8	7085	10892	1.54
150.0	4685	0.30	11.49	5.209	4021	57.80	-5932.8	7085	11106	1.57
157.5	4919	0.35	13.40	5.324	4131	58.00	-5904.0	7056	11187	1.59
164.5	5138	0.40	15.31	5.444	4219	58.40	-5846.4	6998	11218	1.60
175.0	5466	0.45	17.23	5.570	4387	58.70	-5803.2	6955	11342	1.63
149.0	4654	0.50	19.14	5.702	3649	59.20	-5731.2	6883	10532	
140.0	4372	0.55	21.06	5.840	3347	59.50	-5688.0	6840	10187	
140.0	4372	0.60	22.97	5.986	3266	59.70	-5659.2	6811	10077	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37391

BH00658EBUI

11.75–12.00 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37491**
Sample Number:	**BH00570EBU1**
Sample Depth:	**2.70-3.00 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37491	SAMPLED	10-16-91 AC&KM
DEPTH	2.70 - 3.00 FT	TEST STARTED	11-16-91 DCW
SAMPLE NO.	BH00570EBU1	TEST FINISHED	12-05-91
SOIL DESCR.	SS LINER	SETUP NO.	1P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	391.2	396.0
Wt. Wet Soil & Pan (g)	400.7	405.4
Wt. Dry Soil & Pan (g)	342.6	342.6
Wt. Lost Moisture (g)	58.1	62.8
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	333.2	333.2
Moisture Content %	17.4	18.9
Wet Density PCF	132.9	133.2
Dry Density PCF	113.2	112.0

Init. Diameter (in)	2.392	(cm)	6.076
Init. Area (sq in)	4.494	(sq cm)	28.994
Init. Height (in)	2.495	(cm)	6.337
Vol. Bef. Consol. (cu ft)	0.00649		
Vol. After Consol. (cu ft)	0.00656		
Effective Porosity %	33.84		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
921.0	55260	50.1	48.7	5.2	4.0E-08
1359.0	81540	48.7	47.2	6.5	2.9E-08
735.0	44100	47.2	46.6	7.5	2.2E-08
709.0	42540	46.6	45.9	8.1	2.6E-08
1425.0	85500	45.9	44.6	9.0	2.5E-08
1686.0	101160	44.6	43.4	10.2	2.0E-08
1211.0	72660	43.4	42.5	11.2	1.9E-08
1538.0	92280	42.5	41.5	12.0	1.8E-08
1611.0	96660	41.5	40.5	12.9	1.7E-08
1147.0	68820	40.5	39.8	13.7	1.7E-08
1563.0	93780	48.6	47.6	6.4	1.7E-08

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37491
DEPTH	2.70 - 3.00 FT
SAMPLE NO.	BH00570EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-16-91 AC&KM
TEST STARTED	11-16-91 DCW
TEST FINISHED	12-05-91
SETUP NO.	1P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	391.230
Wt Soil & Moist at	395.980
Wt. Dry Soil & Pan	342.590
Wt. of Pan Only (g)	9.440
Consol Info:	
Init. Diameter in.	2.392
Initial Height in.	2.495
Vol. change (sat. con.) CC	14.600
Cell Exp.	16.500
Height Change in.	0.021
Test info:	
Pore pres @ begin. psi	89.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37491	SAMPLED	10-16-91 AC&KM
DEPTH	2.70 - 3.00 FT	TEST STARTED	11-16-91 DCW
SAMPLE NO.	BH00570EBU1	TEST FINISHED	12-05-91
SOIL DESCR.	SS LINER	SETUP NO.	1P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.1	8.1				
50.0	48.0	5.1	6.3	38.5	46.6	8.1	0.81
60.0	58.0	6.0	7.3	48.4	57.0	8.6	0.86
70.0	68.0	7.1	8.3	58.6	67.7	9.1	0.91
80.0	78.0	8.5	9.7	68.6	78.0	9.4	0.94
90.0		9.7	11.0	78.4	88.0	9.6	0.96

CONSOLIDATION DATA

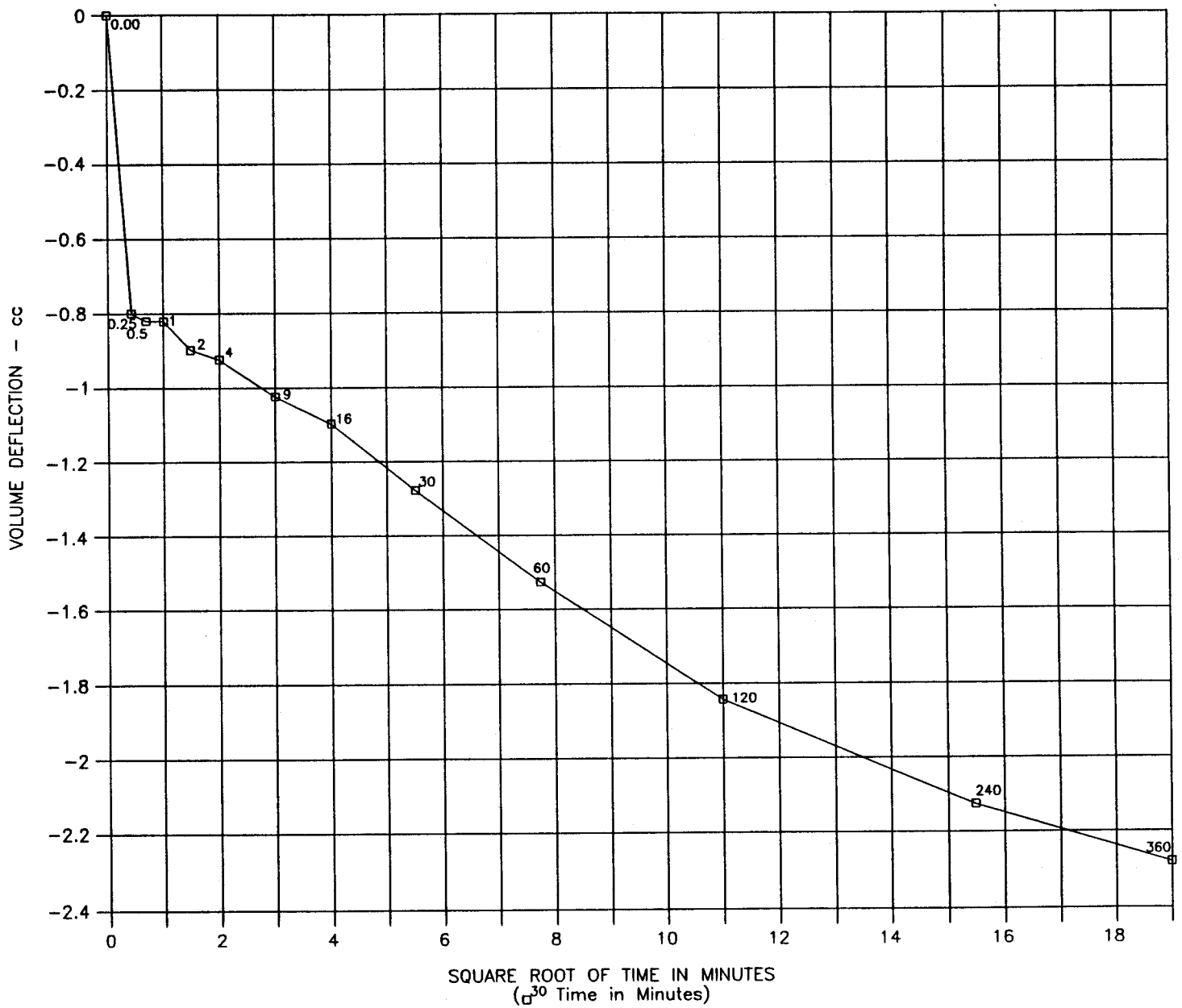
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	11.10	0.00
0.25	0.50	11.90	-0.80
0.5	0.71	11.93	-0.83
1	1.00	11.93	-0.83
2	1.41	12.00	-0.90
4	2.00	12.03	-0.93
9	3.00	12.13	-1.03
16	4.00	12.20	-1.10
30	5.48	12.38	-1.28
60	7.75	12.63	-1.53
120	10.95	12.95	-1.85
240	15.49	13.23	-2.13
360	18.97	13.38	-2.28

Initial Height (in)	2.495	Init. Vol. (CC)	183.76
Height Change (in)	0.021	Vol. Change (CC)	14.60
Ht. After Cons. (in)	2.474	Cell Exp. (CC)	16.50
Initial Area (sq in)	4.494	Net Change (CC)	-1.90
Area After Cons. (sq in)	4.579	Cons. Vol. (CC)	185.66

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00570EBU1 @ 2.70–3.00', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

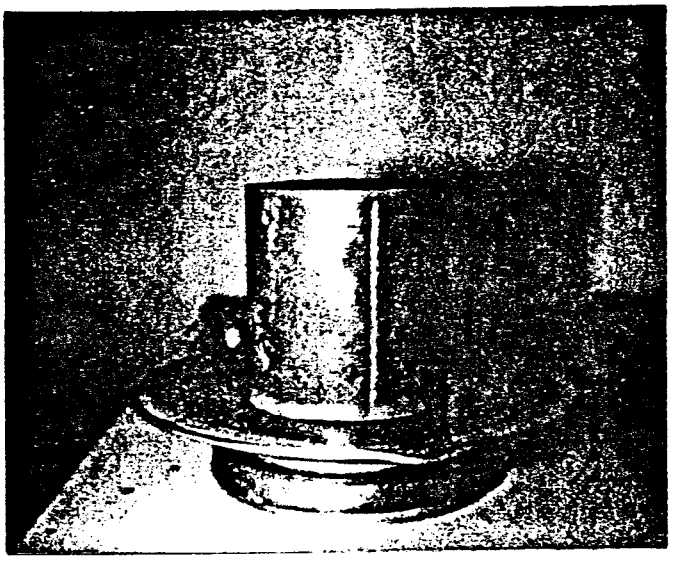
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37491	SAMPLED	10-16-91 AC&KM
DEPTH	2.70 - 3.00 FT	TEST STARTED	11-16-91 DCW
SAMPLE NO.	BH00570EBU1	TEST FINISHED	12-05-91
SOIL DESCR.	SS LINER	SETUP NO.	1P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.495	Init. Area (sq in)	4.494
Consol. Ht. (in)	2.474	Consol. Area (sq in)	4.579
Back Pres. PSI	89.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.579	0	89.00	0.0	1152	0	0.00
125.0	3931	0.01	0.40	4.597	3843	49.50	-5688.0	6840	10683	1.56
165.0	5189	0.02	0.81	4.616	5052	50.00	-5616.0	6768	11820	1.75
187.0	5881	0.03	1.21	4.635	5702	51.00	-5472.0	6624	12326	1.86
193.0	6070	0.04	1.62	4.654	5861	54.50	-4968.0	6120	11981	1.96
190.0	5975	0.05	2.02	4.673	5746	56.80	-4636.8	5789	11535	1.99
185.0	5818	0.06	2.43	4.693	5572	57.00	-4608.0	5760	11332	1.97
180.0	5661	0.07	2.83	4.712	5399	57.40	-4550.4	5702	11101	1.95
176.0	5535	0.08	3.23	4.732	5257	57.60	-4521.6	5674	10930	1.93
172.0	5409	0.09	3.64	4.752	5116	57.70	-4507.2	5659	10775	1.90
167.0	5252	0.10	4.04	4.772	4946	57.80	-4492.8	5645	10591	1.88
151.0	4749	0.15	6.06	4.874	4378	57.80	-4492.8	5645	10023	1.78
140.0	4403	0.20	8.08	4.981	3972	57.80	-4492.8	5645	9617	1.70
139.0	4371	0.25	10.11	5.093	3857	57.80	-4492.8	5645	9502	1.68
150.0	4717	0.30	12.13	5.211	4068	57.80	-4492.8	5645	9713	1.72
157.5	4953	0.35	14.15	5.333	4174	58.00	-4464.0	5616	9790	1.74
164.5	5173	0.40	16.17	5.462	4256	58.40	-4406.4	5558	9815	1.77
175.0	5504	0.45	18.19	5.597	4419	58.70	-4363.2	5515	9934	1.80
149.0	4686	0.50	20.21	5.739	3670	59.20	-4291.2	5443	9113	
140.0	4403	0.55	22.23	5.888	3361	59.50	-4248.0	5400	8761	
140.0	4403	0.60	24.25	6.045	3273	59.70	-4219.2	5371	8644	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37491

BH00570EBUI

2.70–3.00 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37491**
Sample Number:	**BH00571EBU1**
Sample Depth:	**3.00-3.25 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37491	SAMPLED	10-15-91 K.M.&A.C.
DEPTH	3.00 - 3.25 FT	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00571EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	52.08
Wt. Dry Soil & Pan (g)	51.27
Wt. Lost Moisture (g)	0.81
Wt. of Pan Only (g)	3.77
Wt. of Dry Soil (g)	47.50
Moisture Content %	1.7
Wt. Hydrom. Sample Wet (g)	60.01
Wt. Hydrom. Sample Dry (g)	59.00

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	389.75
Weight of + #10 Before Washing (g)	8.68
Weight of + #10 After Washing (g)	6.65
Weight of - #10 Wet (g)	381.07
Weight of - #10 Dry (g)	376.68
Wt. Total Sample Dry (g)	383.33
Calc. Wt. "W" (g)	60.04
Calc. Mass + #10	1.04

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	1.28	1.28	1.28	0.3	99.7
#10	0.00	5.37	5.37	6.65	1.7	98.3
#20	1.31	3.07	1.76	1.76	4.7	95.3
#40	1.33	4.34	3.01	4.77	9.7	90.3
#60	1.33	5.54	4.21	8.98	16.7	83.3
#100	1.31	8.16	6.85	15.83	28.1	71.9
#200	1.33	10.83	9.50	25.33	43.9	56.1

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37491
DEPTH	3.00 - 3.25 FT
SAMPLE NO.	BH00571EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-15-91 K.M.&A.C.
DATE TESTED	11-08-91 SR
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	52.080
Wt. Dry Soil & Pan (g)	51.270
Wt. of Pan Only (g)	3.770
Sieve:	
Wt. Total Sample Wet (g)	389.75
Weight of + #10 Before Washing (g)	8.68
Weight of + #10 After Washing (g)	6.65
Weight of - #10 Wet (g)	381.07

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.009
% of Total Sample	100.0

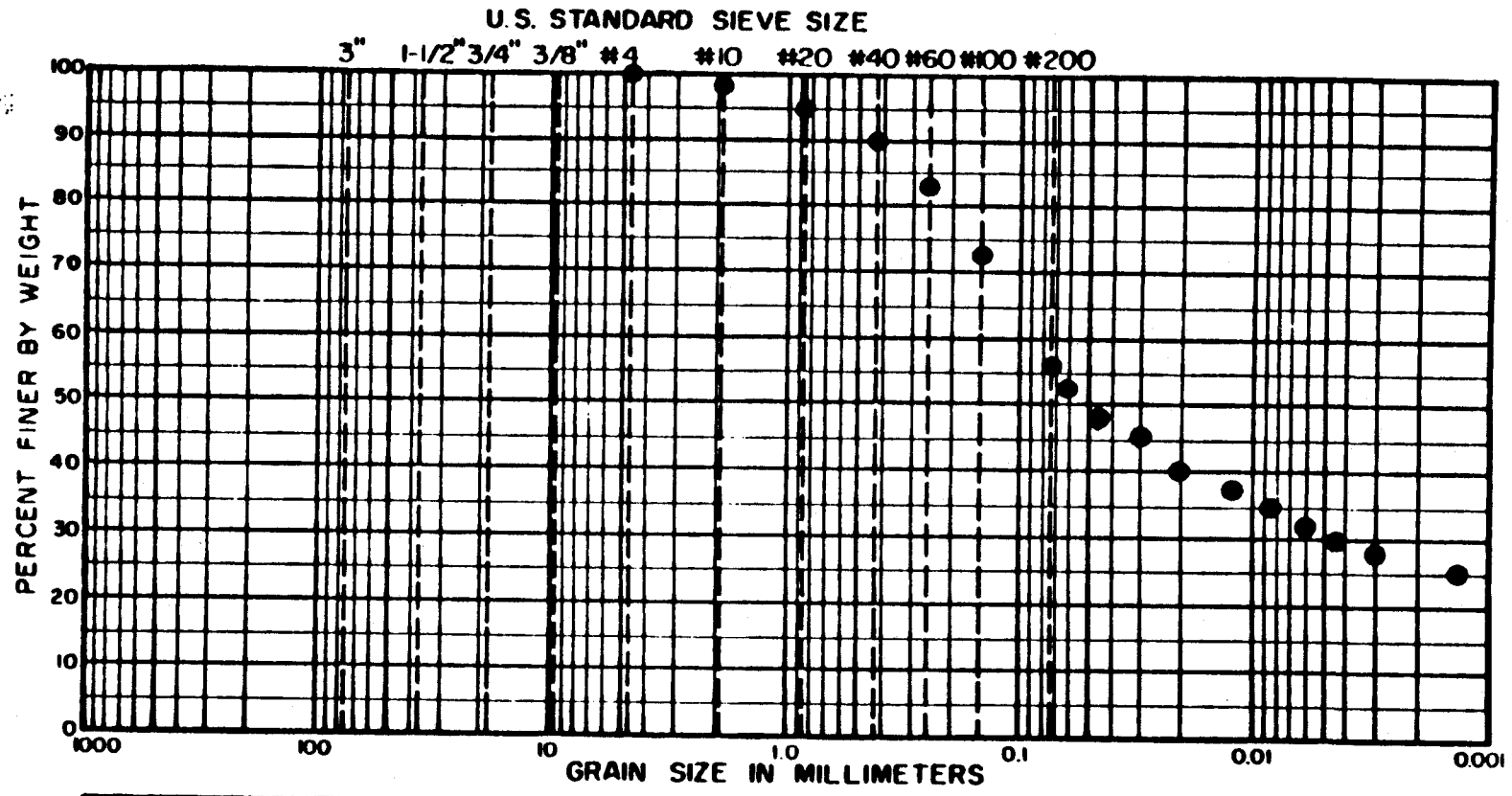
HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37491	SAMPLED	10-15-91 K.M.&A.C.
DEPTH	3.00 - 3.25 FT	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00571EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	60.045
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	36.50	31.50	52.5	52.5	10.30	0.0598
1.0	34.00	29.00	48.3	48.3	10.71	0.0431
2.0	32.75	27.75	46.2	46.2	10.92	0.0308
5.0	29.00	24.00	40.0	40.0	11.53	0.0200
15.0	28.00	23.00	38.3	38.3	11.70	0.0116
30.0	26.00	21.00	35.0	35.0	12.03	0.0083
60.0	24.25	19.25	32.1	32.1	12.31	0.0060
120.0	23.00	18.00	30.0	30.0	12.52	0.0043
250.0	21.50	16.50	27.5	27.5	12.76	0.0030
1440.0	19.75	14.75	24.6	24.6	13.05	0.0013

Grain Diameter = K*(SQRT(L/T))



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH005THEBUCI	3 - 3.25'	Sample # 374

ADVANCED TERRA TESTING

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. _____

CLIENT/OWNER _____

LOCATION 374

BORING _____ SAMPLE _____ DEPTH 5.5-5.25

FIELD DENSITY BY _____

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

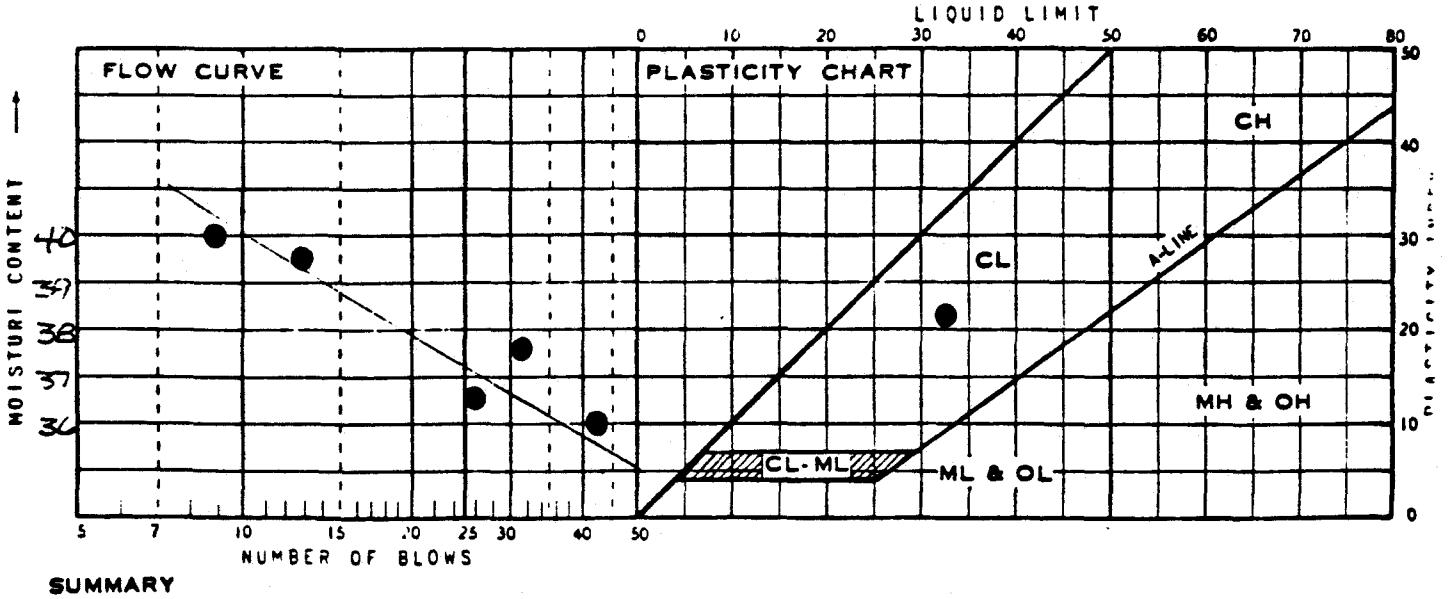
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SB. 11/7/91.

DETERMINATION	1	2	3	4	5	6
DISH	115	21A	25A			
WT OF DISH + WET SOIL g	7.37	7.71	7.98			
WT OF DISH + DRY SOIL g	6.60	6.87	7.04	—	—	—
WT OF MOISTURE g	.77	.84	.88			
WT OF DISH g	1.47	1.32	1.30	—	—	—
WT OF DRY SOIL g	5.13	5.55	5.74			
MOISTURE CONTENT %	15.0	15.1	15.3			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	05	122	10	36A	105	
NUMBER OF BLOWS	43	32	26	12±	9	
WT OF DISH + WET SOIL g	17.23	16.53	14.65	15.67	19.71	
WT OF DISH + DRY SOIL g	13.01	12.36	11.08	11.61	14.45	—
WT OF MOISTURE g	4.22	4.17	3.57	4.06	5.26	
WT OF DISH g	1.29	1.30	1.31	1.32	1.31	—
WT OF DRY SOIL g	11.72	11.06	9.77	10.29	13.14	
MOISTURE CONTENT %	36.0	37.7	36.5	39.5	40.0	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		37.3	15.1	22.2	CL	

ADVANCED TERRA TESTING INC

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37591**
Sample Number:	**BH00665EBU1**
Sample Depth:	**3.00-3.25 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37591	SAMPLED	10-17-91
DEPTH	3.00 - 3.25 FT	DATE TESTED	11-11-91 TNU
SAMPLE NO.	BH00665EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	47.85
Wt. Dry Soil & Pan (g)	46.08
Wt. Lost Moisture (g)	1.77
Wt. of Pan Only (g)	3.66
Wt. of Dry Soil (g)	42.42
Moisture Content %	4.2

Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	57.60

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	373.44
Weight of + #10 Before Washing (g)	71.96
Weight of + #10 After Washing (g)	56.81
Weight of - #10 Wet (g)	301.48
Weight of - #10 Dry (g)	303.95
Wt. Total Sample Dry (g)	360.76

Calc. Wt. "W" (g)	68.36
Calc. Mass + #10	10.77

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	37.33	37.33	37.33	10.3	89.7
#4	0.00	10.38	10.38	47.71	13.2	86.8
#10	0.00	9.10	9.10	56.81	15.7	84.3
#20	1.31	4.12	2.81	2.81	19.9	80.1
#40	1.30	4.30	3.00	5.81	24.2	75.8
#60	1.32	4.33	3.01	8.82	28.6	71.4
#100	1.30	4.41	3.11	11.93	33.2	66.8
#200	1.31	4.98	3.67	15.60	38.6	61.4

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37591
DEPTH	3.00 - 3.25 FT
SAMPLE NO.	BH00665EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-17-91
DATE TESTED	11-11-91 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	47.850
Wt. Dry Soil & Pan (g)	46.080
Wt. of Pan Only (g)	3.660
Sieve:	
Wt. Total Sample Wet (g)	373.44
Weight of + #10 Before Washing (g)	71.96
Weight of + #10 After Washing (g)	56.81
Weight of - #10 Wet (g)	301.48

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.001
% of Total Sample	100.0

HYDROMETER ANALYSIS - SEDIMENTATION DATA

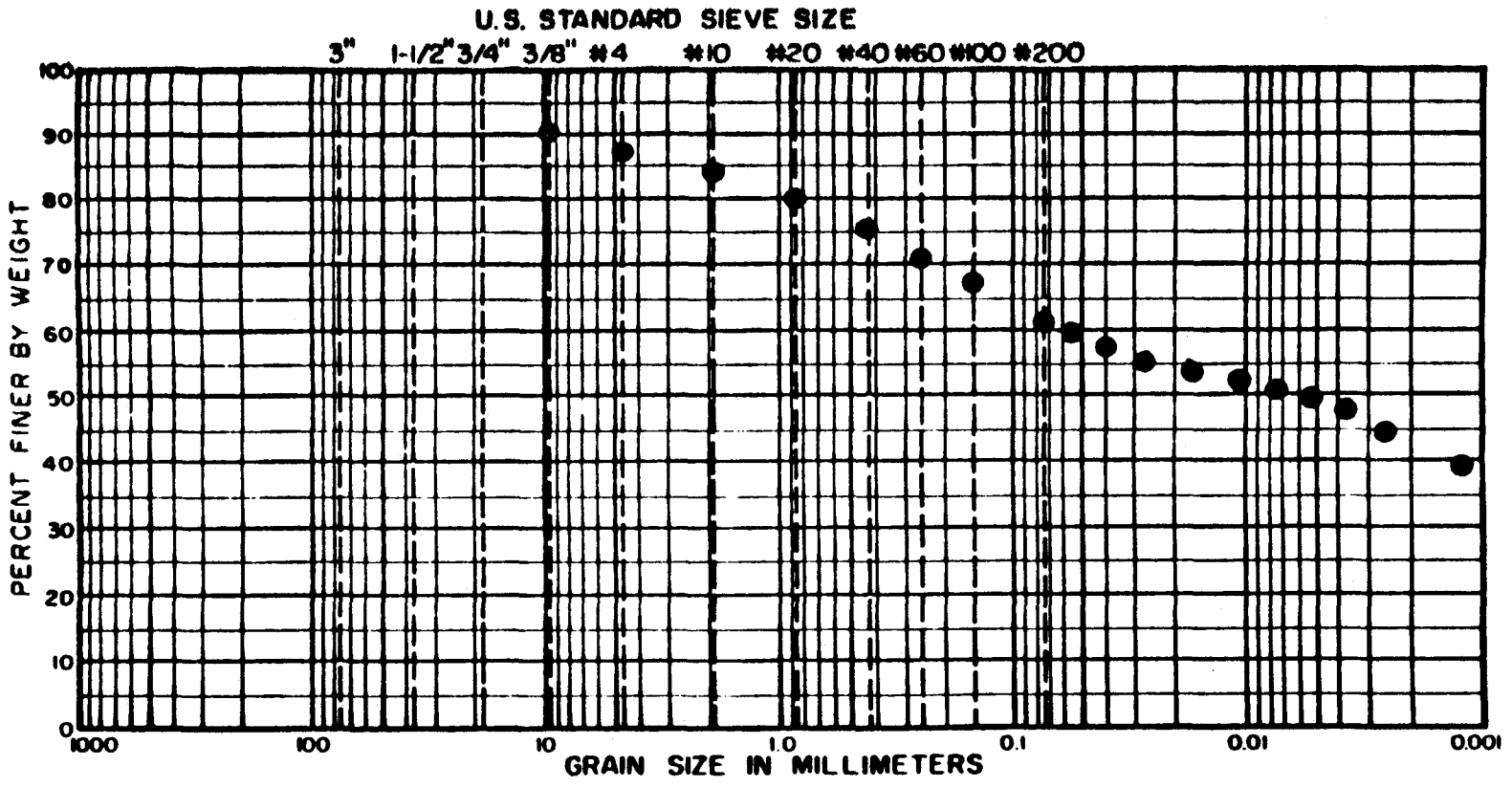
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37591	SAMPLED	10-17-91
DEPTH	3 - 3.25'	DATE TESTED	11-11-91 TNU
SAMPLE NO.	MW00665EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	68.363
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	46.00	41.00	60.0	60.0	8.75	0.0551
1.0	44.00	39.00	57.0	57.0	9.07	0.0397
2.0	43.00	38.00	55.6	55.6	9.24	0.0283
5.0	42.00	37.00	54.1	54.1	9.40	0.0181
15.0	41.00	36.00	52.7	52.7	9.57	0.0105
30.0	40.00	35.00	51.2	51.2	9.73	0.0075
60.0	39.00	34.00	49.7	49.7	9.89	0.0053
120.0	37.50	32.50	47.5	47.5	10.14	0.0038
250.0	35.00	30.00	43.9	43.9	10.55	0.0027
1440.0	31.50	26.50	38.8	38.8	11.12	0.0012

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
MW06665BUI	3 - 3.25'	Sample # 375

ADVANCED TERRA TESTING

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 203-05

CLIENT/OWNER EBASCO

LOCATION 375 MWOOGLSEBU

BORING ____ SAMPLE ____ DEPTH 24-25

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

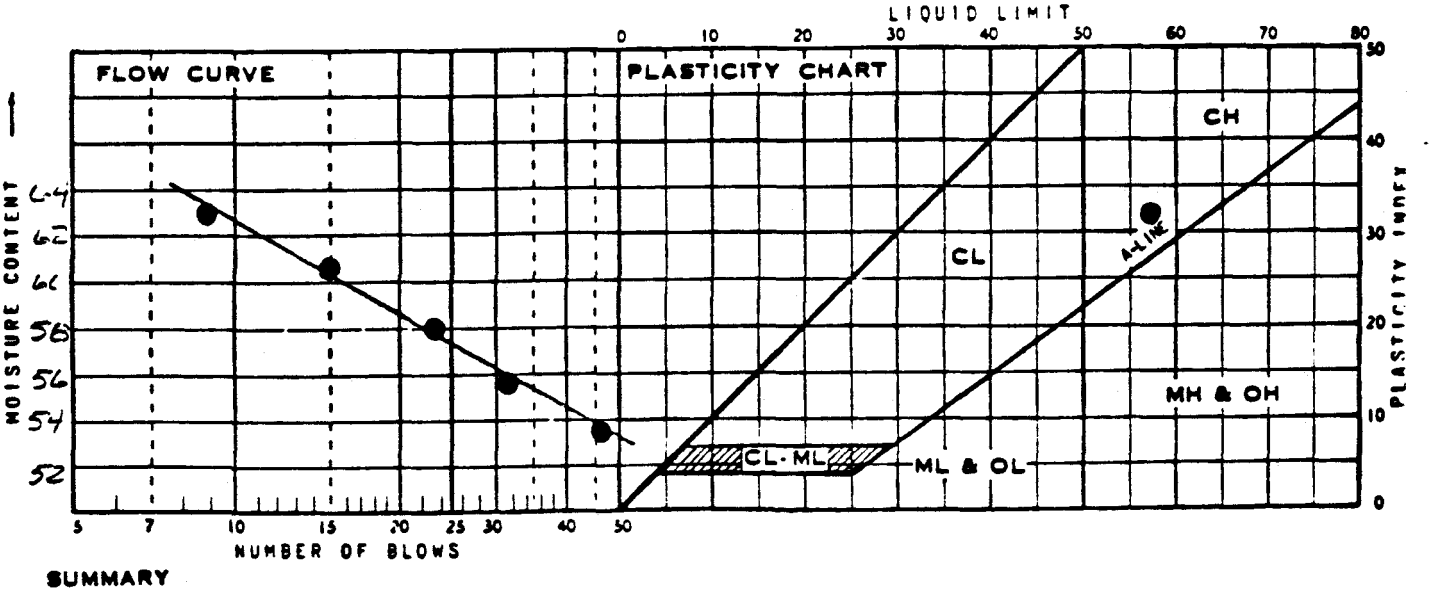
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY ____/__/__

DETERMINATION	1	2	3	4	5	6
DISH	75 B	13 A	70 A			
WT OF DISH + WET SOIL g	10.18	10.13	6.86			
WT OF DISH + DRY SOIL g	8.37	8.37	5.78	—	—	—
WT OF MOISTURE g	1.81	1.76	1.08			
WT OF DISH g	1.30	1.31	1.32	—	—	—
WT OF DRY SOIL g	7.07	7.06	4.46			
MOISTURE CONTENT %	25.6	25.0	24.2			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	35 A	4 A	79 B	91	129	
NUMBER OF BLOWS	46	31	23	15	8	
WT OF DISH + WET SOIL g	16.36	18.40	17.79	17.41	16.04	
WT OF DISH + DRY SOIL g	11.12	12.28	11.73	11.36	10.34	—
WT OF MOISTURE g	5.24	6.12	6.06	6.05	5.70	
WT OF DISH g	1.32	1.30	1.29	1.32	1.29	—
WT OF DRY SOIL g	9.80	10.98	10.44	10.04	9.05	
MOISTURE CONTENT %	53.5	55.7	58.0	60.3	63.0	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		57.3	24.6	[illegible]	[illegible]	

ADVANCED TERRA TESTING

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37591**
Sample Number:	**BH00664EBU1**
Sample Depth:	**3.25-3.50 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37591	SAMPLED	10-17-91 SC & BP
DEPTH	3.25 - 3.50 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00664EBU1	TEST FINISHED	11-20-91
SOIL DESCR.	SS LINER	SETUP NO.	14S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	387.9	398.5
Wt. Wet Soil & Pan (g)	396.1	406.7
Wt. Dry Soil & Pan (g)	318.7	318.7
Wt. Lost Moisture (g)	77.4	88.0
Wt. of Pan Only (g)	8.2	8.2
Wt. of Dry Soil (g)	310.5	310.5
Moisture Content %	24.9	28.3
Wet Density PCF	120.3	128.0
Dry Density PCF	96.3	99.7

Init. Diameter (in)	2.391	(cm)	6.073
Init. Area (sq in)	4.490	(sq cm)	28.970
Init. Height (in)	2.735	(cm)	6.947
Vol. Bef. Consol. (cu ft)	0.00711		
Vol. After Consol. (cu ft)	0.00686		
Effective Porosity %	45.27		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
70.0	4200	48.7	31.9	25.5	8.4E-06
60.0	3600	31.9	21.1	40.4	7.2E-06
60.0	3600	21.1	13.0	50.6	6.0E-06
120.0	7200	47.8	24.3	30.1	7.1E-06
120.0	7200	48.8	25.3	29.0	7.0E-06
122.0	7320	48.5	25.3	29.2	6.9E-06
120.0	7200	48.6	26.2	28.6	6.7E-06
187.0	11220	48.7	16.9	33.6	6.4E-06
180.0	10800	48.4	18.4	33.0	6.2E-06
184.0	11040	48.7	18.6	32.7	6.1E-06
186.0	11160	48.5	19.0	32.6	5.9E-06
185.0	11100	48.1	18.8	32.9	5.9E-06
186.0	11160	48.4	18.9	32.7	5.9E-06
186.0	11160	48.3	18.9	32.7	5.9E-06

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37591
DEPTH	3.25 - 3.50 FT
SAMPLE NO.	BH00664EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-17-91 SC & BP
TEST STARTED	11-12-91 DCW
TEST FINISHED	11-20-91
SETUP NO.	14S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	387.890
Wt Soil & Moist at	398.510
Wt. Dry Soil & Pan	318.700
Wt. of Pan Only (g)	8.190
Consol Info:	
Init. Diameter in.	2.391
Initial Height in.	2.735
Vol. change (sat. con.) CC	13.900
Cell Exp.	7.000
Height Change in.	0.039
Test info:	
Pore pres @ begin. psi	59.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT EBASCO

JOB NO. 2031-05

BORING NO.	37591	SAMPLED	10-17-91 SC & BP
DEPTH	3.25 - 3.50 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00664EBU1	TEST FINISHED	11-20-91
SOIL DESCR.	SS LINER	SETUP NO.	14S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	7.7				
50.0	48.0	7.9	8.6	37.9	46.4	8.5	0.85
60.0	58.0	9.1	9.8	48.2	57.4	9.2	0.92
70.0		10.3	10.3	58.3	67.9	9.6	0.96

CONSOLIDATION DATA

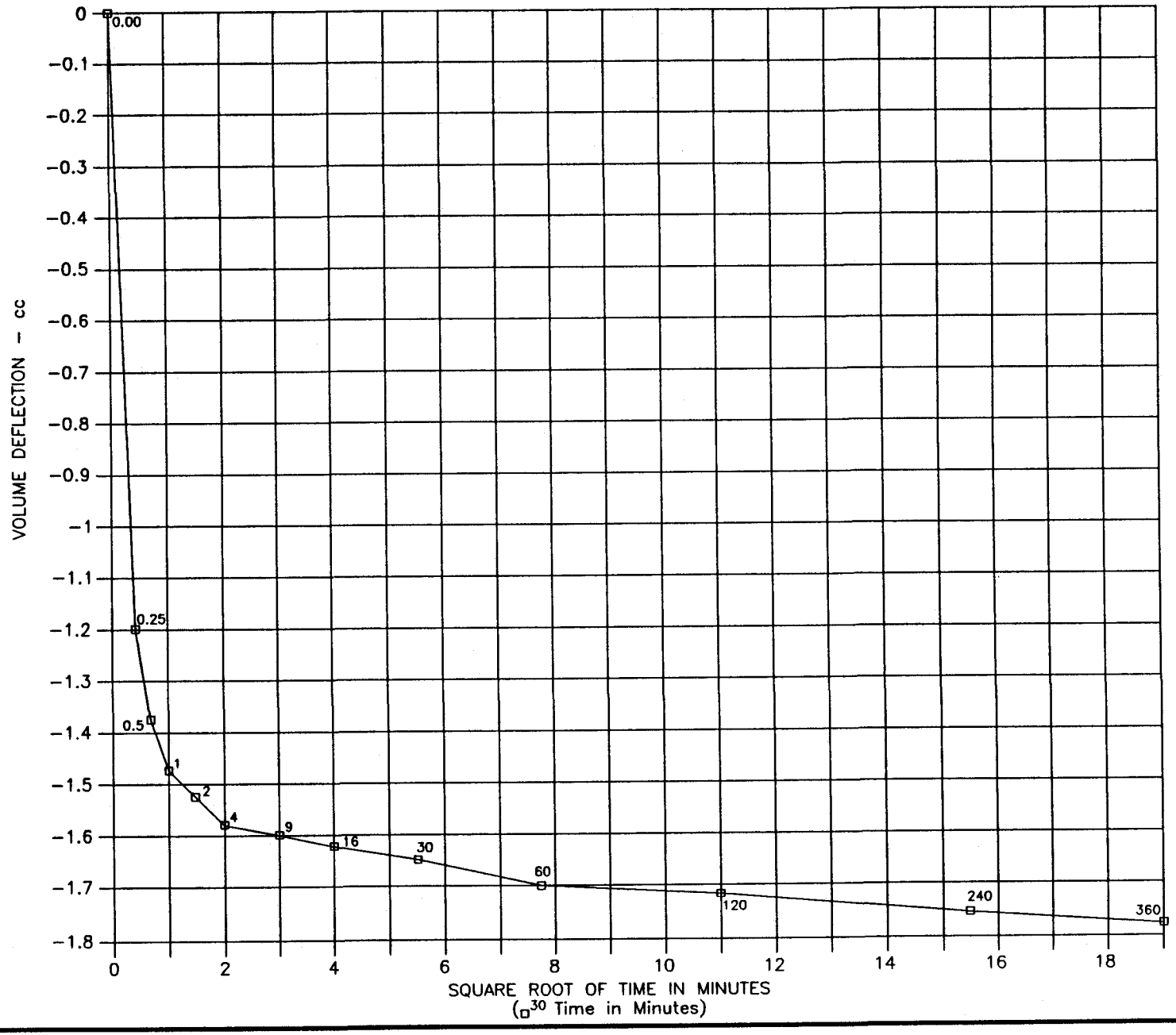
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	10.30	0.00
0.25	0.50	11.50	-1.20
0.5	0.71	11.68	-1.38
1	1.00	11.78	-1.47
2	1.41	11.83	-1.52
4	2.00	11.88	-1.57
9	3.00	11.90	-1.60
16	4.00	11.93	-1.63
30	5.48	11.95	-1.65
60	7.75	12.00	-1.70
120	10.95	12.02	-1.72
240	15.49	12.05	-1.75
360	18.97	12.08	-1.77

Initial Height (in)	2.735	Init. Vol. (CC)	201.27
Height Change (in)	0.039	Vol. Change (CC)	13.90
Ht. After Cons. (in)	2.696	Cell Exp. (CC)	7.00
Initial Area (sq in)	4.490	Net Change (CC)	6.90
Area After Cons. (sq in)	4.399	Cons. Vol. (CC)	194.37

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00664EBU1 @ 3.25–3.50', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

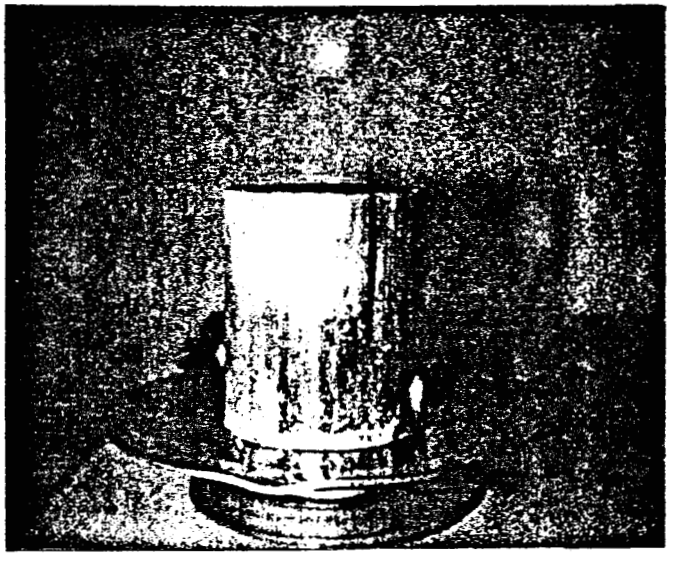
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37591	SAMPLED	10-17-91 SC & BP
DEPTH	3.25 - 3.50 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00664EBU1	TEST FINISHED	11-20-91
SOIL DESCR.	SS LINER	SETUP NO.	14S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.735	Init. Area (sq in)	4.490
Consol. Ht. (in)	2.696	Consol. Area (sq in)	4.399
Back Pres. PSI	59.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.399	0	59.00	0.0	1152	0	0.00
125.0	4092	0.01	0.37	4.415	4161	49.50	-1368.0	2520	6681	2.65
165.0	5401	0.02	0.74	4.432	5473	50.00	-1296.0	2448	7921	3.24
187.0	6122	0.03	1.11	4.448	6179	51.00	-1152.0	2304	8483	3.68
193.0	6318	0.04	1.48	4.465	6353	54.50	-648.0	1800	8153	4.53
190.0	6220	0.05	1.85	4.482	6231	56.80	-316.8	1469	7700	5.24
185.0	6056	0.06	2.23	4.499	6044	57.00	-288.0	1440	7484	5.20
180.0	5892	0.07	2.60	4.516	5858	57.40	-230.4	1382	7241	5.24
176.0	5762	0.08	2.97	4.533	5706	57.60	-201.6	1354	7060	5.22
172.0	5631	0.09	3.34	4.551	5555	57.70	-187.2	1339	6895	5.15
167.0	5467	0.10	3.71	4.568	5373	57.80	-172.8	1325	6698	5.06
151.0	4943	0.15	5.56	4.658	4765	57.80	-172.8	1325	6090	4.60
140.0	4583	0.20	7.42	4.751	4331	57.80	-172.8	1325	5656	4.27
139.0	4550	0.25	9.27	4.848	4214	57.80	-172.8	1325	5539	4.18
150.0	4910	0.30	11.13	4.950	4454	57.80	-172.8	1325	5779	4.36
157.5	5156	0.35	12.98	5.055	4580	58.00	-144.0	1296	5876	4.53
164.5	5385	0.40	14.84	5.165	4681	58.40	-86.4	1238	5920	4.78
175.0	5729	0.45	16.69	5.280	4872	58.70	-43.2	1195	6067	5.08
149.0	4878	0.50	18.55	5.400	4055	59.20	28.8	1123	5179	
140.0	4583	0.55	20.40	5.526	3724	59.50	72.0	1080	4804	
140.0	4583	0.60	22.26	5.658	3637	59.70	100.8	1051	4688	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37591

BH00664EBUI

3.25–3.50 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37591**
Sample Number:	**BH00670EBU1**
Sample Depth:	**7.45-7.70 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37591	SAMPLED	10-18-91 SC&BP
DEPTH	7.45 - 7.70 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00670EBU1	TEST FINISHED	11-19-91
SOIL DESCR.	SS LINER	SETUP NO.	2P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	327.8	339.3
Wt. Wet Soil & Pan (g)	337.3	348.7
Wt. Dry Soil & Pan (g)	300.6	300.6
Wt. Lost Moisture (g)	36.6	48.1
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	291.2	291.2
Moisture Content %	12.6	16.5
Wet Density PCF	128.3	139.1
Dry Density PCF	114.0	119.4

Init. Diameter (in)	2.387	(cm)	6.063
Init. Area (sq in)	4.475	(sq cm)	28.873
Init. Height (in)	2.175	(cm)	5.525
Vol. Bef. Consol. (cu ft)	0.00563		
Vol. After Consol. (cu ft)	0.00538		
Effective Porosity %	31.54		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
60.0	3600	48.9	22.4	17.9	1.2E-05
63.0	3780	49.4	22.3	17.7	1.1E-05
60.0	3600	49.8	23.7	16.9	1.1E-05
60.0	3600	49.6	23.0	17.3	1.2E-05
60.0	3600	49.3	22.0	17.9	1.2E-05
61.0	3660	49.3	20.1	18.8	1.3E-05
64.0	3840	49.4	18.5	19.5	1.3E-05
60.0	3600	49.5	17.9	19.7	1.4E-05
71.0	4260	49.5	16.3	20.4	1.3E-05
61.0	3660	49.7	20.9	18.2	1.3E-05
87.0	5220	49.5	10.2	23.2	1.3E-05

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37591
DEPTH	7.45 - 7.70 FT
SAMPLE NO.	BH00670EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-18-91 SC&BP
TEST STARTED	11-12-91 DCW
TEST FINISHED	11-19-91
SETUP NO.	2P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152.00
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	327.830
Wt Soil & Moist at	339.270
Wt. Dry Soil & Pan	300.640
Wt. of Pan Only (g)	9.420
Consol Info:	
Init. Diameter in.	2.387
Initial Height in.	2.175
Vol. change (sat. con.) CC	22.000
Cell Exp.	14.800
Height Change in.	0.027
Test info:	
Pore pres @ begin. psi	79.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37591	SAMPLED	10-18-91 SC&BP
DEPTH	7.45 - 7.70 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00670EBU1	TEST FINISHED	11-19-91
SOIL DESCR.	SS LINER	SETUP NO.	2P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	13.3				
50.0	48.0	13.2	14.4	38.4	47.0	8.6	0.86
60.0	58.0	14.8	16.0	48.4	57.7	9.3	0.93
70.0	68.0	16.3	17.6	58.5	68.2	9.7	0.97
80.0	78.0						

CONSOLIDATION DATA

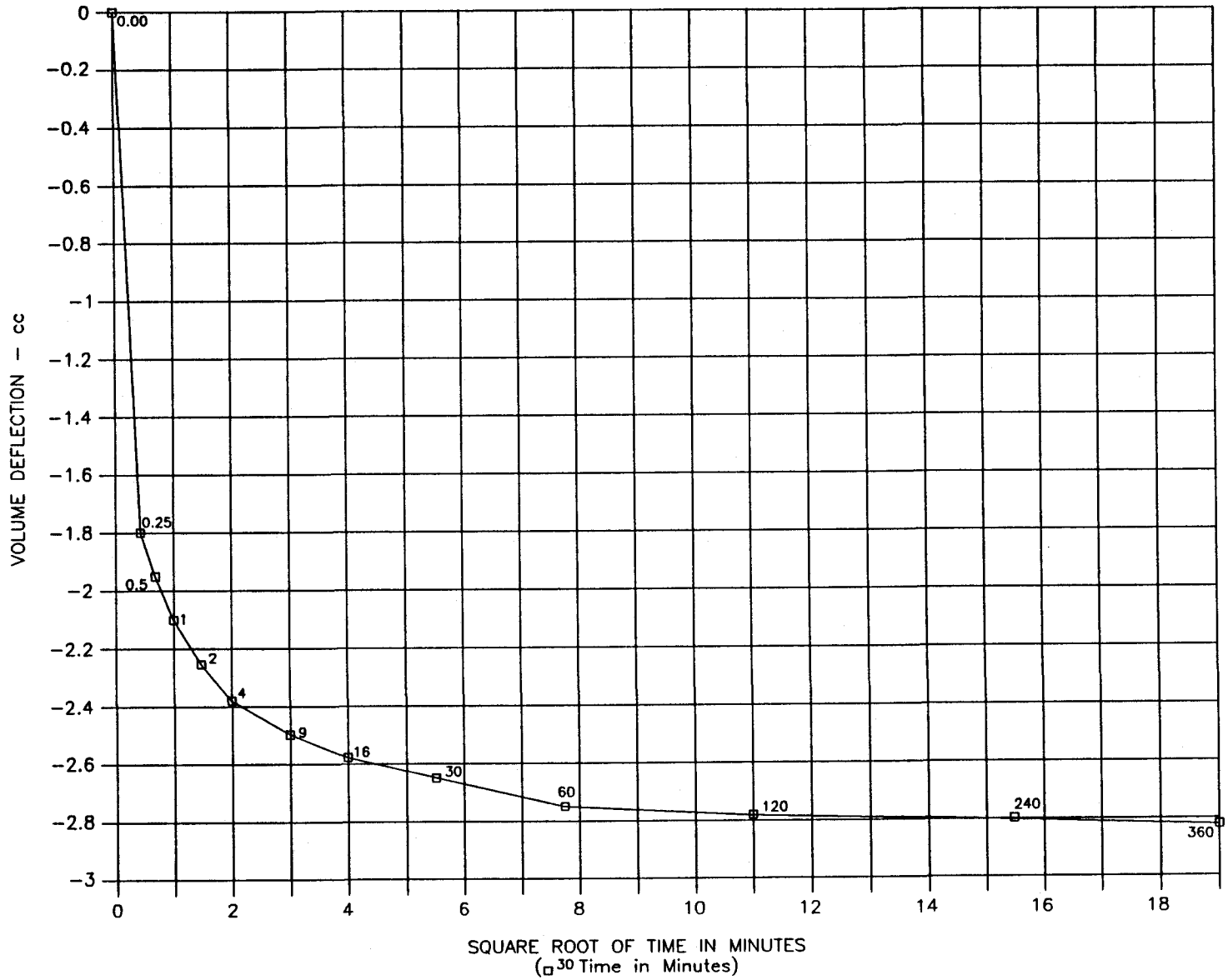
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	19.10	0.00
0.25	0.50	20.90	-1.80
0.5	0.71	21.05	-1.95
1	1.00	21.20	-2.10
2	1.41	21.35	-2.25
4	2.00	21.48	-2.38
9	3.00	21.60	-2.50
16	4.00	21.68	-2.57
30	5.48	21.75	-2.65
60	7.75	21.85	-2.75
120	10.95	21.88	-2.77
240	15.49	21.90	-2.80
360	18.97	21.93	-2.82

Initial Height (in)	2.175	Init. Vol. (CC)	159.53
Height Change (in)	0.027	Vol. Change (CC)	22.00
Ht. After Cons. (in)	2.148	Cell Exp. (CC)	14.80
Initial Area (sq in)	4.475	Net Change (CC)	7.20
Area After Cons. (sq in)	4.327	Cons. Vol. (CC)	152.33

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00670EBU1 @ 7.45–7.70', 1152 psf (confining pressure)



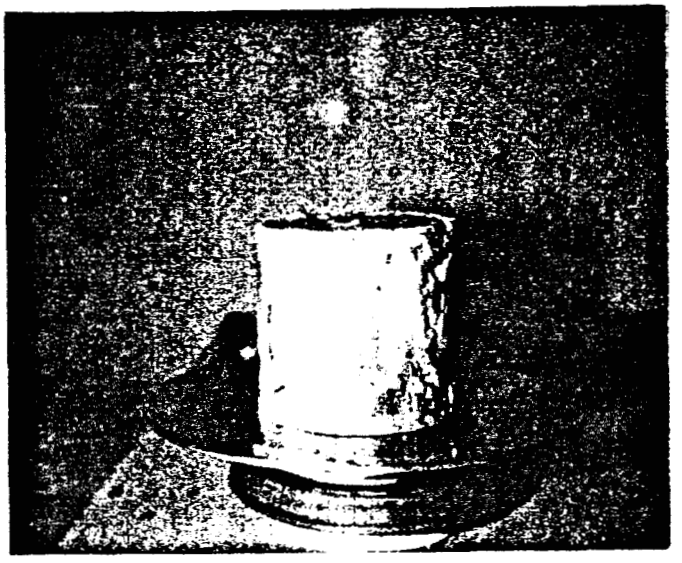
TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37591	SAMPLED	10-18-91 SC&BP
DEPTH	7.45 - 7.70 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00670EBU1	TEST FINISHED	11-19-91
SOIL DESCR.	SS LINER	SETUP NO.	2P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.175	Init. Area (sq in)	4.475
Consol. Ht. (in)	2.148	Consol. Area (sq in)	4.327
Back Pres. PSI	79.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.327	0	79.00	0.0	1152	0	0.00
125.0	4160	0.01	0.47	4.347	4283	49.50	-4248.0	5400	9683	1.79
165.0	5491	0.02	0.93	4.367	5627	50.00	-4176.0	5328	10955	2.06
187.0	6224	0.03	1.40	4.388	6347	51.00	-4032.0	5184	11531	2.22
193.0	6423	0.04	1.86	4.409	6520	54.50	-3528.0	4680	11200	2.39
190.0	6323	0.05	2.33	4.430	6388	56.80	-3196.8	4349	10737	2.47
185.0	6157	0.06	2.79	4.451	6190	57.00	-3168.0	4320	10510	2.43
180.0	5991	0.07	3.26	4.473	5994	57.40	-3110.4	4262	10256	2.41
176.0	5858	0.08	3.72	4.494	5833	57.60	-3081.6	4234	10066	2.38
172.0	5724	0.09	4.19	4.516	5672	57.70	-3067.2	4219	9892	2.34
167.0	5558	0.10	4.66	4.538	5481	57.80	-3052.8	4205	9686	2.30
151.0	5025	0.15	6.98	4.652	4835	57.80	-3052.8	4205	9040	2.15
140.0	4659	0.20	9.31	4.771	4370	57.80	-3052.8	4205	8575	2.04
139.0	4626	0.25	11.64	4.897	4228	57.80	-3052.8	4205	8433	2.01
150.0	4992	0.30	13.97	5.029	4442	57.80	-3052.8	4205	8647	2.06
157.5	5242	0.35	16.29	5.169	4538	58.00	-3024.0	4176	8714	2.09
164.5	5475	0.40	18.62	5.317	4608	58.40	-2966.4	4118	8726	2.12
175.0	5824	0.45	20.95	5.473	4762	58.70	-2923.2	4075	8837	2.17
149.0	4959	0.50	23.28	5.639	3935	59.20	-2851.2	4003	7938	
140.0	4659	0.55	25.61	5.816	3585	59.50	-2808.0	3960	7545	
140.0	4659	0.60	27.93	6.004	3473	59.70	-2779.2	3931	7404	

CORE PHOTOGRAPH



37591

MW00670EBUI

7.45–7.70 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37591**
Sample Number:	**BH00671EBU1**
Sample Depth:	**7.45-7.70 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37591	SAMPLED	–
DEPTH	6.95 - 7.45 FT	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00671EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	27.14
Wt. Dry Soil & Pan (g)	26.78
Wt. Lost Moisture (g)	0.36
Wt. of Pan Only (g)	3.75
Wt. of Dry Soil (g)	23.03
Moisture Content %	1.6
Wt. Hydrom. Sample Wet (g)	60.01
Wt. Hydrom. Sample Dry (g)	59.08

WASH SIEVE ANALYSIS

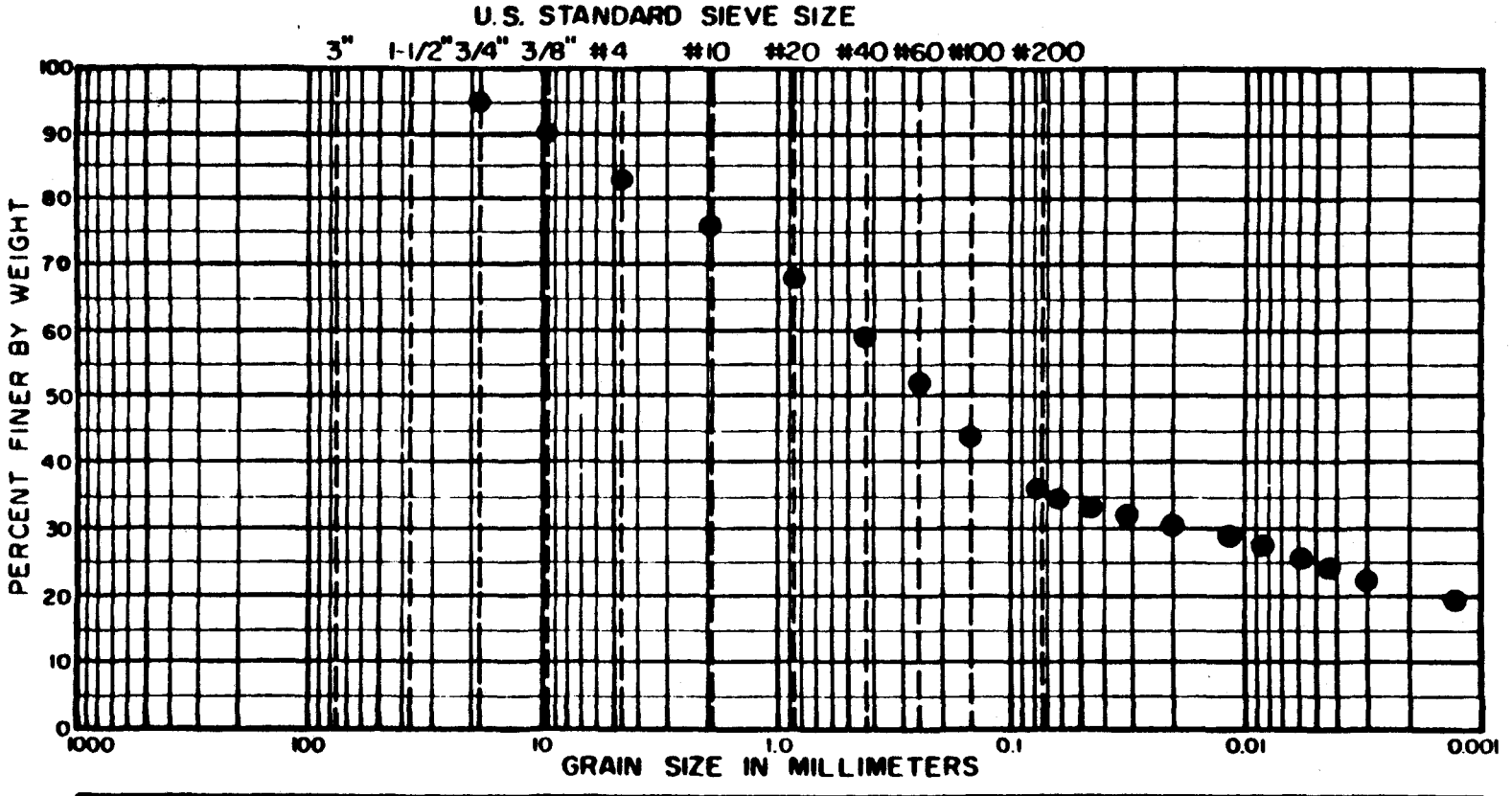
Wt. Total Sample Wet (g)	399.20
Weight of + #10 Before Washing (g)	99.60
Weight of + #10 After Washing (g)	93.19
Weight of - #10 Wet (g)	299.54
Weight of - #10 Dry (g)	301.24
Wt. Total Sample Dry (g)	394.43
Calc. Wt. "W" (g)	77.36
Calc. Mass + #10	18.28

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	21.15	21.15	21.15	5.4	94.6
3/8"	0.00	19.09	19.09	40.24	10.2	89.8
#4	0.00	25.13	25.13	65.37	16.6	83.4
#10	0.00	27.82	27.82	93.19	23.6	76.4
#20	1.31	7.98	6.67	6.67	32.2	67.8
#40	1.31	7.79	6.48	13.15	40.6	59.4
#60	1.32	7.27	5.95	19.10	48.3	51.7
#100	1.31	7.13	5.82	24.92	55.8	44.2
#200	1.31	7.44	6.13	31.05	63.8	36.2

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37591
DEPTH	6.95 - 7.45 FT
SAMPLE NO.	BH00671EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	--
DATE TESTED	11-08-91 SR
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	27.140
Wt. Dry Soil & Pan (g)	26.780
Wt. of Pan Only (g)	3.750
Sieve:	
Wt. Total Sample Wet (g)	399.20
Weight of + #10 Before Washing (g)	99.60
Weight of + #10 After Washing (g)	93.19
Weight of - #10 Wet (g)	299.54

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.006
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
MW00671EBUI	6.95 - 7.45'	37591 AL MW KLM 04/09/92

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37591	SAMPLED	--
DEPTH	6.95 - 7.45 FT	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00671EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	77.360
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	32.00	27.00	34.9	34.9	11.04	0.0619
1.0	31.25	26.25	33.9	33.9	11.17	0.0440
2.0	30.75	25.75	33.3	33.3	11.25	0.0312
5.0	29.00	24.00	31.0	31.0	11.53	0.0200
15.0	27.75	22.75	29.4	29.4	11.74	0.0117
30.0	26.75	21.75	28.1	28.1	11.90	0.0083
60.0	25.00	20.00	25.9	25.9	12.19	0.0059
120.0	24.75	19.75	25.5	25.5	12.23	0.0042
250.0	22.00	17.00	22.0	22.0	12.68	0.0030
1440.0	20.00	15.00	19.4	19.4	13.01	0.0013

Grain Diameter = K*(SQRT(L/T))

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05
CLIENT/OWNER ERASCO
LOCATION 37591 ALMN
BORING ____ SAMPLE ____ DEPTH 6.75-7.0

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

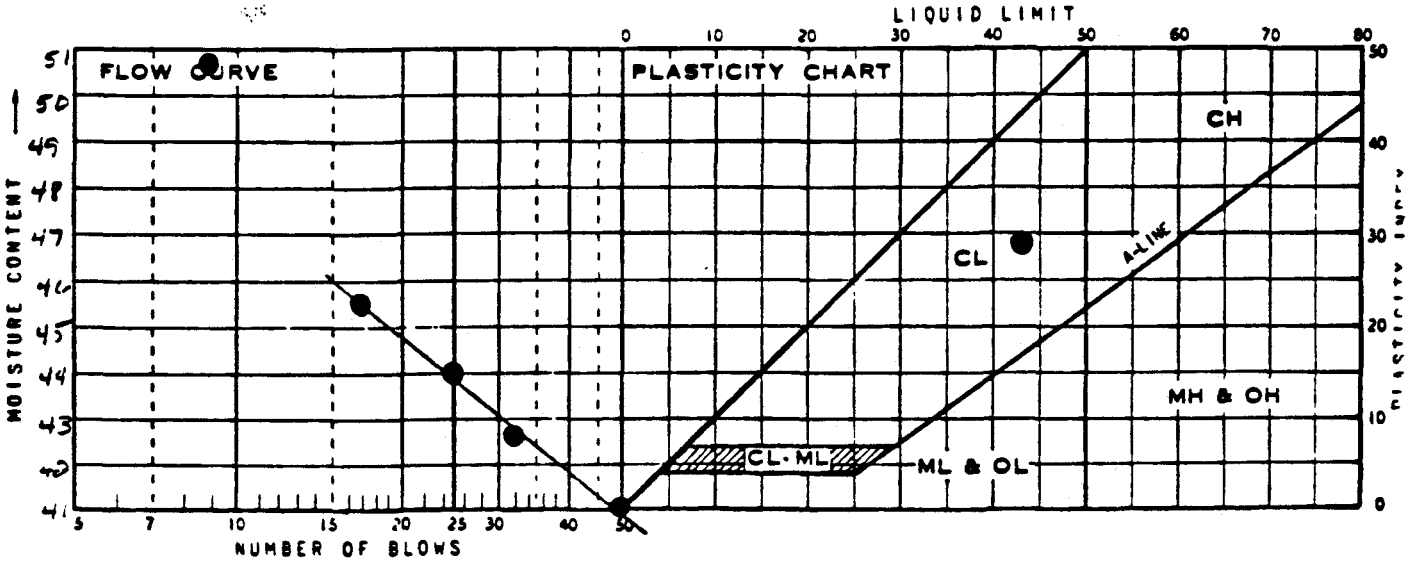
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SR. 11/18/91.

DETERMINATION	1	2	3	4	5	6
DISH	15C	49C	45C			
WT OF DISH + WET SOIL g	6.87	6.62	6.82			
WT OF DISH + DRY SOIL g	6.10	5.87	6.06	—	—	—
WT OF MOISTURE g	.77	.75	.76			
WT OF DISH g	1.06	1.06	1.06	—	—	—
WT OF DRY SOIL g	5.04	4.81	5.00			
MOISTURE CONTENT %	15.3	15.6	15.2			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	11	66C	37C	56C	2	
NUMBER OF BLOWS	50	32	25	17	9	
WT OF DISH + WET SOIL g	13.88	16.24	16.35	14.21	13.09	
WT OF DISH + DRY SOIL g	10.15	11.70	11.68	10.10	9.04	—
WT OF MOISTURE g	3.73	4.54	4.67	4.11	4.05	
WT OF DISH g	1.05	1.04	1.07	1.07	1.05	—
WT OF DRY SOIL g	9.10	10.66	10.61	9.03	7.99	
MOISTURE CONTENT %	41.0	42.6	44.0	45.5	50.7	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		43.8	15.4	28.4	CL	

ADVANCED TERRA TESTING

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37691**
Sample Number:	**BH00592EBU1**
Sample Depth:	**7.40-7.55 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37691	SAMPLED	10-17-91
DEPTH	7.40 - 7.55 FT	DATE TESTED	11-08-91 TNU
SAMPLE NO.	BH00592EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	31.36
Wt. Dry Soil & Pan (g)	31.03
Wt. Lost Moisture (g)	0.33
Wt. of Pan Only (g)	3.60
Wt. of Dry Soil (g)	27.43
Moisture Content %	1.2
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.29

WASH SIEVE ANALYSIS

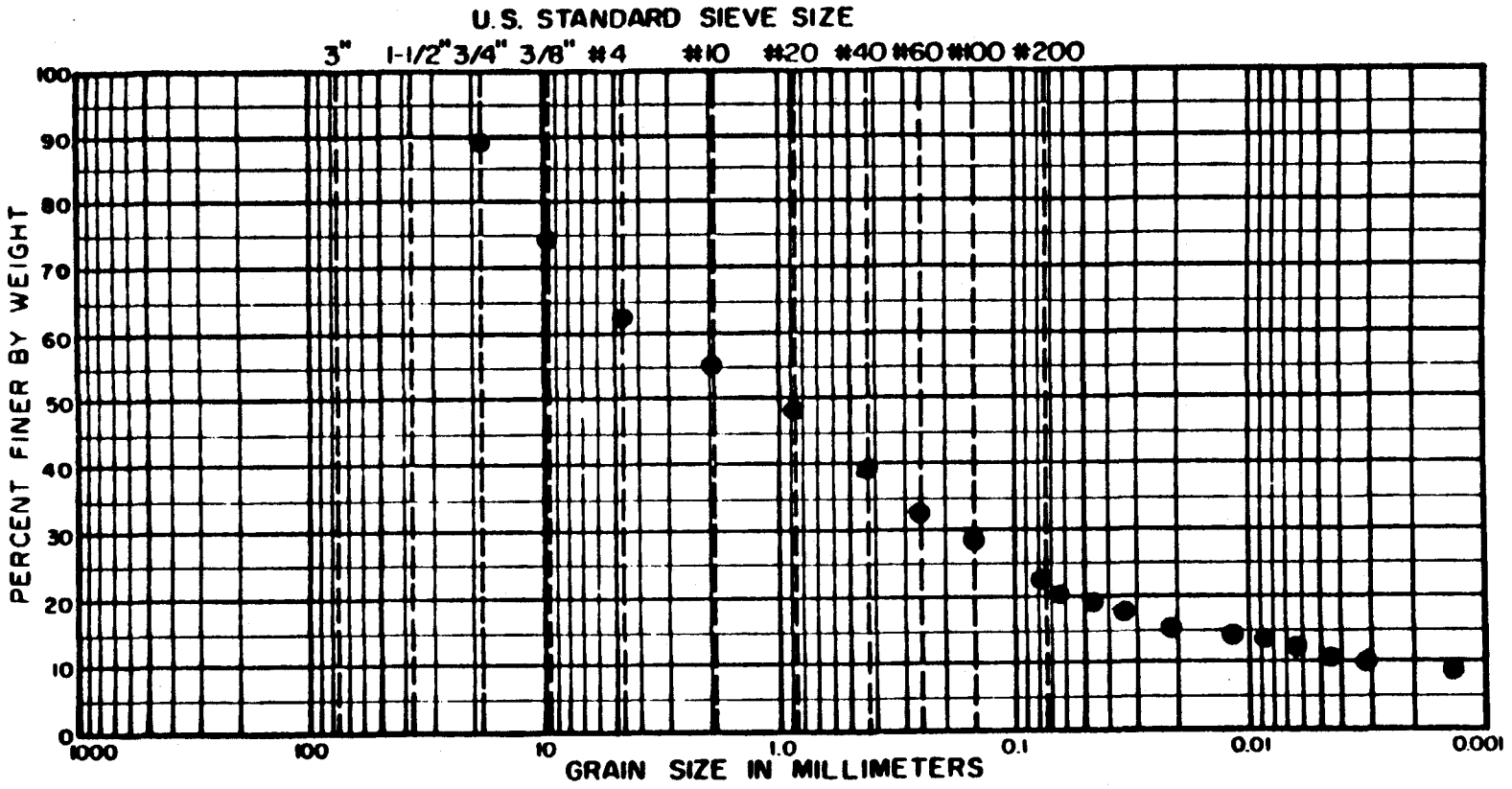
Wt. Total Sample Wet (g)	616.28
Weight of + #10 Before Washing (g)	300.35
Weight of + #10 After Washing (g)	276.44
Weight of - #10 Wet (g)	315.93
Weight of - #10 Dry (g)	335.80
Wt. Total Sample Dry (g)	612.24
Calc. Wt. "W" (g)	108.10
Calc. Mass + #10	48.81

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	66.40	66.40	66.40	10.8	89.2
3/8"	0.00	93.24	93.24	159.64	26.1	73.9
#4	0.00	70.33	70.33	229.97	37.6	62.4
#10	0.00	46.47	46.47	276.44	45.2	54.8
#20	1.32	9.23	7.91	7.91	52.5	47.5
#40	1.33	10.36	9.03	16.94	60.8	39.2
#60	1.30	8.16	6.86	23.80	67.2	32.8
#100	1.31	7.09	5.78	29.58	72.5	27.5
#200	1.32	7.66	6.34	35.92	78.4	21.6

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37691
DEPTH	7.40 - 7.55 FT
SAMPLE NO.	BH00592EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-17-91
DATE TESTED	11-08-91 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	31.360
Wt. Dry Soil & Pan (g)	31.030
Wt. of Pan Only (g)	3.600
Sieve:	
Wt. Total Sample Wet (g)	616.28
Weight of + #10 Before Washing (g)	300.35
Weight of + #10 After Washing (g)	276.44
Weight of - #10 Wet (g)	315.93

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.001
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
mw00591EBUI mw00592EBUI	7.4 - 7.55'	Sample # 576

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37691	SAMPLED	10-17-91
DEPTH	7.40 - 7.55 FT	DATE TESTED	11-08-91 TNU
SAMPLE NO.	BH00592EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	108.095
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	26.25	21.25	19.7	19.7	11.99	0.0645
1.0	25.00	20.00	18.5	18.5	12.19	0.0460
2.0	24.25	19.25	17.8	17.8	12.31	0.0327
5.0	21.50	16.50	15.3	15.3	12.76	0.0210
15.0	20.50	15.50	14.3	14.3	12.93	0.0122
30.0	20.00	15.00	13.9	13.9	13.01	0.0087
60.0	18.25	13.25	12.3	12.3	13.30	0.0062
120.0	17.25	12.25	11.3	11.3	13.46	0.0044
250.0	16.25	11.25	10.4	10.4	13.63	0.0031
1440.0	15.25	10.25	9.5	9.5	13.79	0.0013

Grain Diameter = K*(SQRT(L/T))

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2631-05

CLIENT/OWNER BRASCO

LOCATION 376

BORING MW00592EBU1 SAMPLE ____ DEPTH 7.4-7.55'

MW00591EBU1

FIELD DENSITY BY ...../../..

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

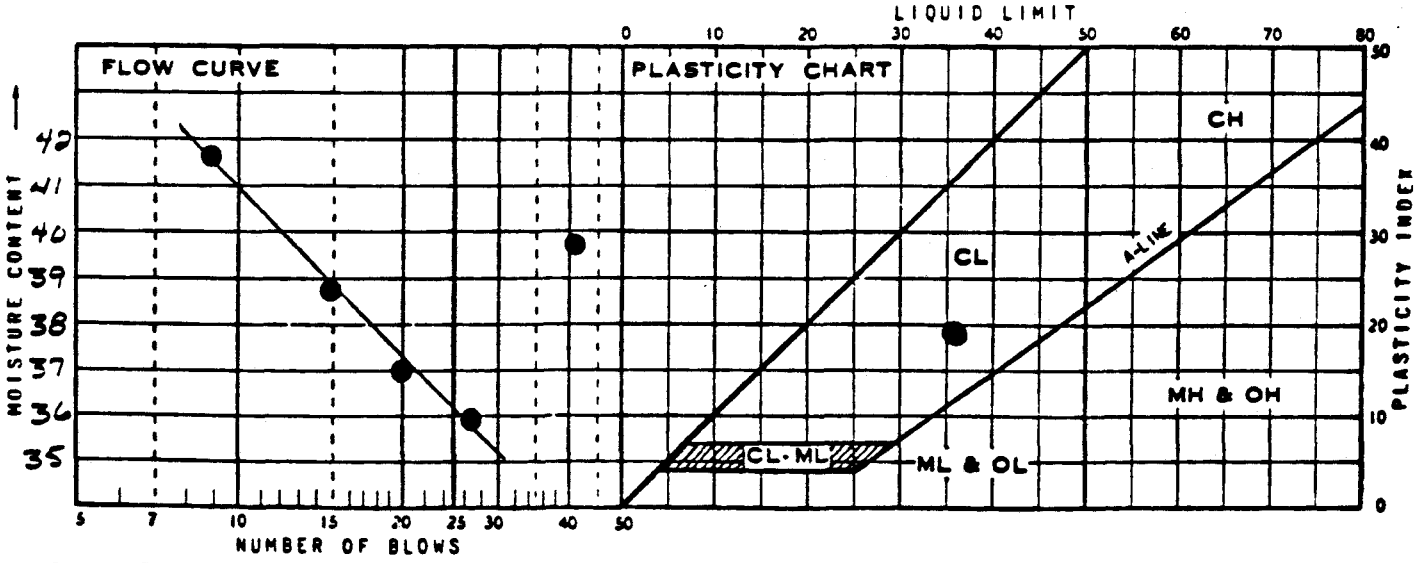
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SR.11/12/91

DETERMINATION	1	2	3	4	5	6
DISH	19 C	59 C	64 C			
WT OF DISH + WET SOIL g	9.28	9.13	7.73			
WT OF DISH + DRY SOIL g	8.13	7.93	6.79	—	—	—
WT OF MOISTURE g	1.15	1.20	.94			
WT OF DISH g	1.04	1.06	1.08	—	—	—
WT OF DRY SOIL g	7.09	6.87	5.71			
MOISTURE CONTENT %	16.2	17.5	16.5			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	38 C	1D	2D	3D	4D	
NUMBER OF BLOWS	41	27	20	15	9	
WT OF DISH + WET SOIL g	16.36	14.61	15.71	19.22	16.25	
WT OF DISH + DRY SOIL g	12.01	11.03	11.74	14.14	11.78	—
WT OF MOISTURE g	4.35	3.58	3.97	5.08	4.47	
WT OF DISH g	1.04	1.05	1.02	1.05	1.03	—
WT OF DRY SOIL g	10.97	9.98	10.72	13.09	10.75	
MOISTURE CONTENT %	39.7	35.9	37.0	38.8	41.6	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		36.2	16.7	19.5	CL	

ADVANCED TERRA TESTING

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37691**
Sample Number:	**BH00596EBU1**
Sample Depth:	**13.50-13.80 feet (Alluvium)**

Data Available:

- ✓ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✓ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37691	SAMPLED	10-19-91
DEPTH	13.50 - 13.80 FT	DATE TESTED	11-11-91
SAMPLE NO.	BH00596EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	35.00
Wt. Dry Soil & Pan (g)	34.38
Wt. Lost Moisture (g)	0.62
Wt. of Pan Only (g)	3.76
Wt. of Dry Soil (g)	30.62
Moisture Content %	2.0
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	58.81

WASH SIEVE ANALYSIS

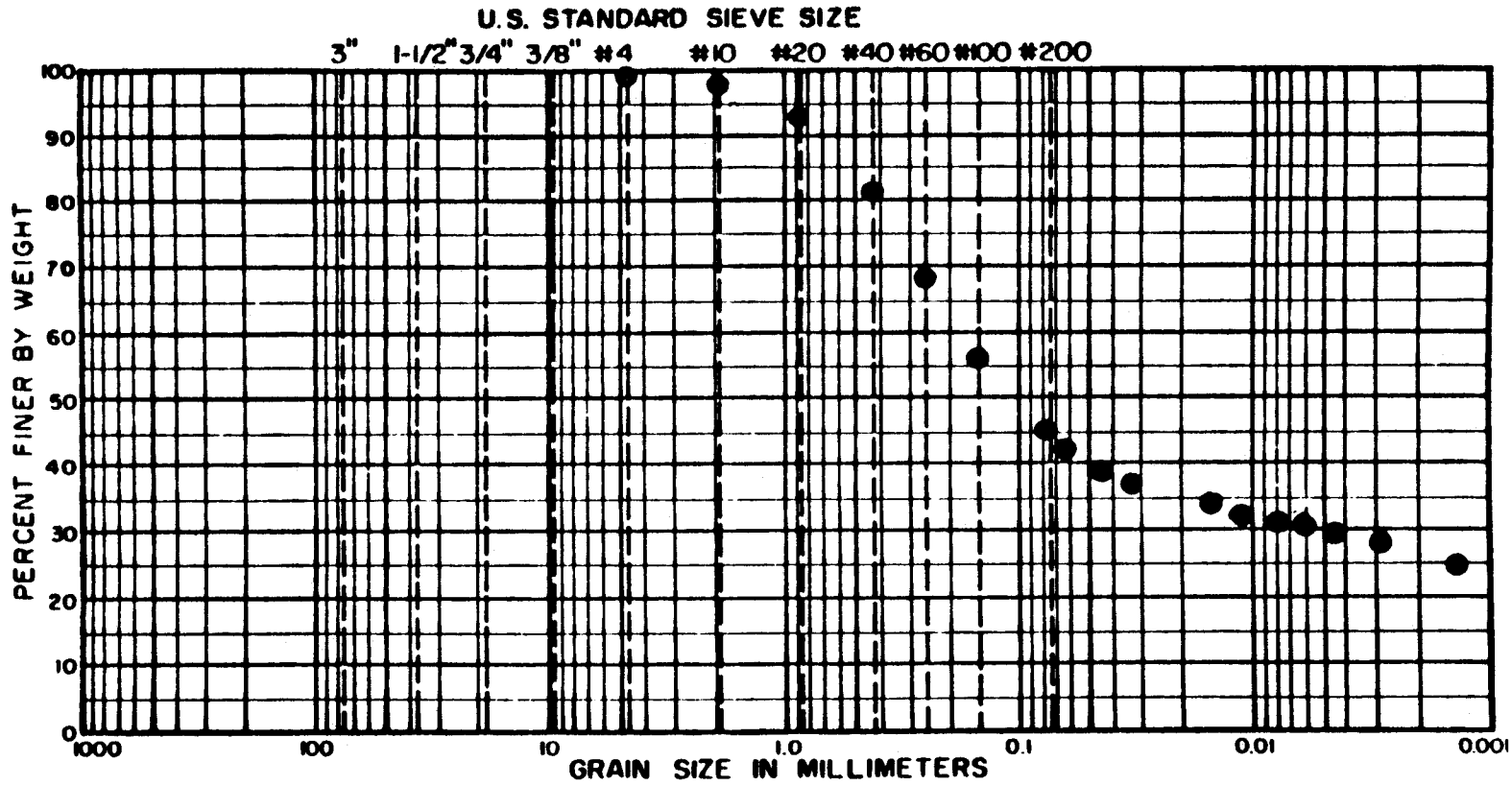
Wt. Total Sample Wet (g)	353.42
Weight of + #10 Before Washing (g)	10.22
Weight of + #10 After Washing (g)	6.83
Weight of - #10 Wet (g)	343.20
Weight of - #10 Dry (g)	339.71
Wt. Total Sample Dry (g)	346.54
Calc. Wt. "W" (g)	59.99
Calc. Mass + #10	1.18

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	3.11	3.11	3.11	0.9	99.1
#10	0.00	3.72	3.72	6.83	2.0	98.0
#20	1.32	4.26	2.94	2.94	6.9	93.1
#40	1.30	8.37	7.07	10.01	18.7	81.3
#60	1.31	9.10	7.79	17.80	31.6	68.4
#100	1.32	8.67	7.35	25.15	43.9	56.1
#200	1.31	8.17	6.86	32.01	55.3	44.7

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37691
DEPTH	13.50 - 13.80 FT
SAMPLE NO.	BH00596EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-19-91
DATE TESTED	11-11-91
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	35.000
Wt. Dry Soil & Pan (g)	34.380
Wt. of Pan Only (g)	3.760
Sieve:	
Wt. Total Sample Wet (g)	353.42
Weight of + #10 Before Washing (g)	10.22
Weight of + #10 After Washing (g)	6.83
Weight of - #10 Wet (g)	343.20

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
MW00596EBU1	13.5 - 13.8'	Sample # 376

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37691	SAMPLED	10-19-91
DEPTH	13.50 - 13.80 FT	DATE TESTED	11-11-91
SAMPLE NO.	BH00596EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	59.992
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	30.00	25.00	41.7	41.7	11.37	0.0628
1.0	28.00	23.00	38.3	38.3	11.70	0.0450
2.0	27.00	22.00	36.7	36.7	11.86	0.0321
8.0	25.50	20.50	34.2	34.2	12.11	0.0162
15.0	25.00	20.00	33.3	33.3	12.19	0.0119
34.0	24.00	19.00	31.7	31.7	12.35	0.0079
60.0	23.50	18.50	30.8	30.8	12.44	0.0060
120.0	22.75	17.75	29.6	29.6	12.56	0.0043
267.0	21.00	16.00	26.7	26.7	12.85	0.0029
1440.0	20.00	15.00	25.0	25.0	13.01	0.0013

Grain Diameter = K*(SQRT(L/T))

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION - - - - - - - - - - - - - - - -

LABORATORY CLASSIFICATION - - - - - - - - - - - - -

JOB NO. 203-05

CLIENT/OWNER EBASCO

LOCATION 376

BORING MW009 SAMPLE - - - - DEPTH 13.5-38'

FIELD DENSITY BY - - - - - - / - - / - - -

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

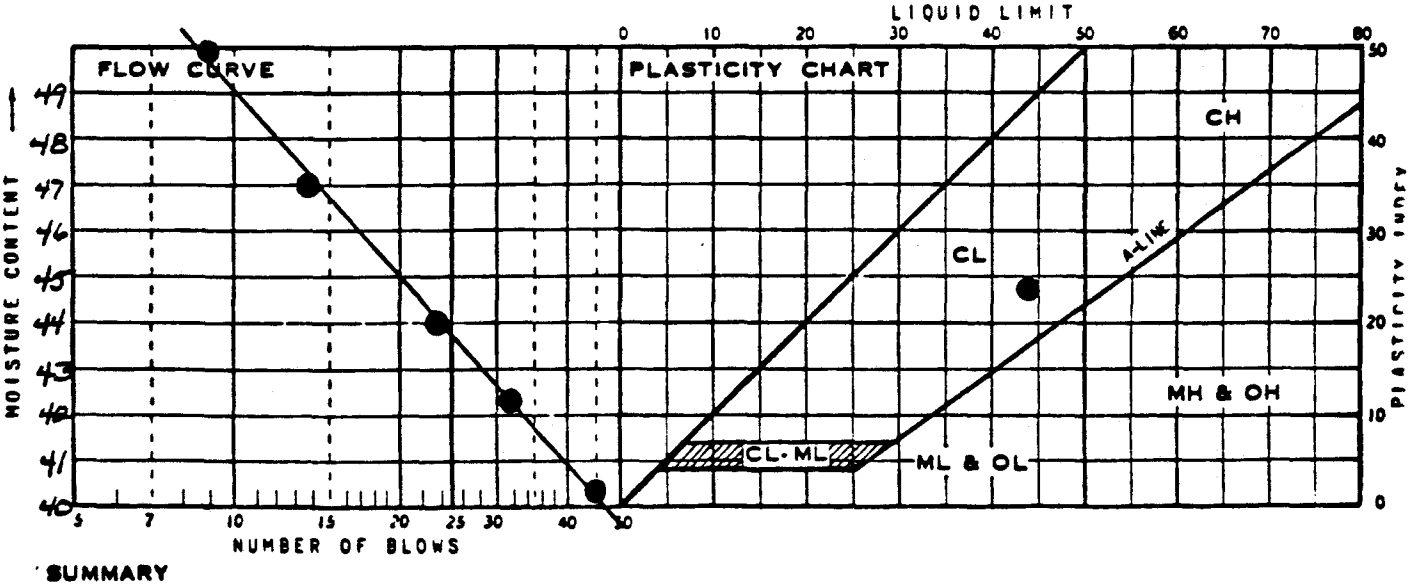
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY - - - - - / - - / - - -

DETERMINATION	1	2	3	4	5	6
DISH	56A	134	77B			
WT OF DISH + WET SOIL g	7.15	7.57	8.29			
WT OF DISH + DRY SOIL g	6.22	6.55	7.14	—	—	—
WT OF MOISTURE g	.93	1.02	1.15			
WT OF DISH g	1.32	1.30	1.31	—	—	—
WT OF DRY SOIL g	4.90	5.25	5.83			
MOISTURE CONTENT %	19.0	19.4	19.7			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	89	123	112	23	62B	
NUMBER OF BLOWS	45	32	24	14	9	
WT OF DISH + WET SOIL g	20.70	17.74	17.53	19.84	21.27	
WT OF DISH + DRY SOIL g	15.12	12.86	12.58	13.91	14.63	—
WT OF MOISTURE g	5.58	4.88	4.95	5.93	6.64	
WT OF DISH g	1.29	1.31	1.32	1.31	1.32	—
WT OF DRY SOIL g	13.83	11.55	11.26	12.60	13.31	
MOISTURE CONTENT %	40.3	42.3	44.0	47.1	49.9	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		43B	19	24	CL	

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37691**
Sample Number:	**BH00595EBU1**
Sample Depth:	**13.80-14.00 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37691	SAMPLED	10-17-91 KM&AC
DEPTH	13.80 - 14.00 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00595EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	5P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	446.2	452.9
Wt. Wet Soil & Pan (g)	455.6	462.3
Wt. Dry Soil & Pan (g)	386.4	386.4
Wt. Lost Moisture (g)	69.3	75.9
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	377.0	377.0
Moisture Content %	18.4	20.1
Wet Density PCF	131.4	134.0
Dry Density PCF	111.0	111.6

Init. Diameter (in)	2.394	(cm)	6.081
Init. Area (sq in)	4.501	(sq cm)	29.042
Init. Height (in)	2.874	(cm)	7.300
Vol. Bef. Consol. (cu ft)	0.00749		
Vol. After Consol. (cu ft)	0.00745		
Effective Porosity %	35.97		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
935.0	56100	49.9	48.7	15.8	4.3E-08
1302.0	78120	48.7	47.2	17.3	4.0E-08
1442.0	86520	47.2	45.5	19.0	3.9E-08
1458.0	87480	45.5	44.0	20.7	3.6E-08
1420.0	85200	44.0	42.4	22.4	4.0E-08
1451.0	87060	42.4	41.0	24.0	3.5E-08
1569.0	94140	41.0	39.4	25.6	3.7E-08
1420.0	85200	39.4	38.0	27.3	3.7E-08

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37691
DEPTH	13.80 - 14.00 FT
SAMPLE NO.	BH00595EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-17-91 KM&AC
TEST STARTED	11-12-91 DCW
TEST FINISHED	11-25-91
SETUP NO.	5P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	446.220
Wt Soil & Moist at	452.850
Wt. Dry Soil & Pan	386.370
Wt. of Pan Only (g)	9.410
Consol Info:	
Init. Diameter in.	2.394
Initial Height in.	2.874
Vol. change (sat. con.) CC	11.850
Cell Exp.	10.800
Height Change in.	0.006
Test info:	
Pore pres @ begin. psi	79.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37691	SAMPLED	10-17-91 KM&AC
DEPTH	13.80 - 14.00 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00595EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	5P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	6.6				
50.0	48.0	4.1	4.9	37.5	43.5	6.0	0.60
60.0	58.0	5.4	6.3	47.8	56.1	8.3	0.83
70.0	68.0	6.7	7.4	57.9	66.9	9.0	0.90
80.0	78.0	7.7	8.4	67.9	77.2	9.3	0.93
90.0		8.7	8.8	77.9	87.5	9.6	0.96

CONSOLIDATION DATA

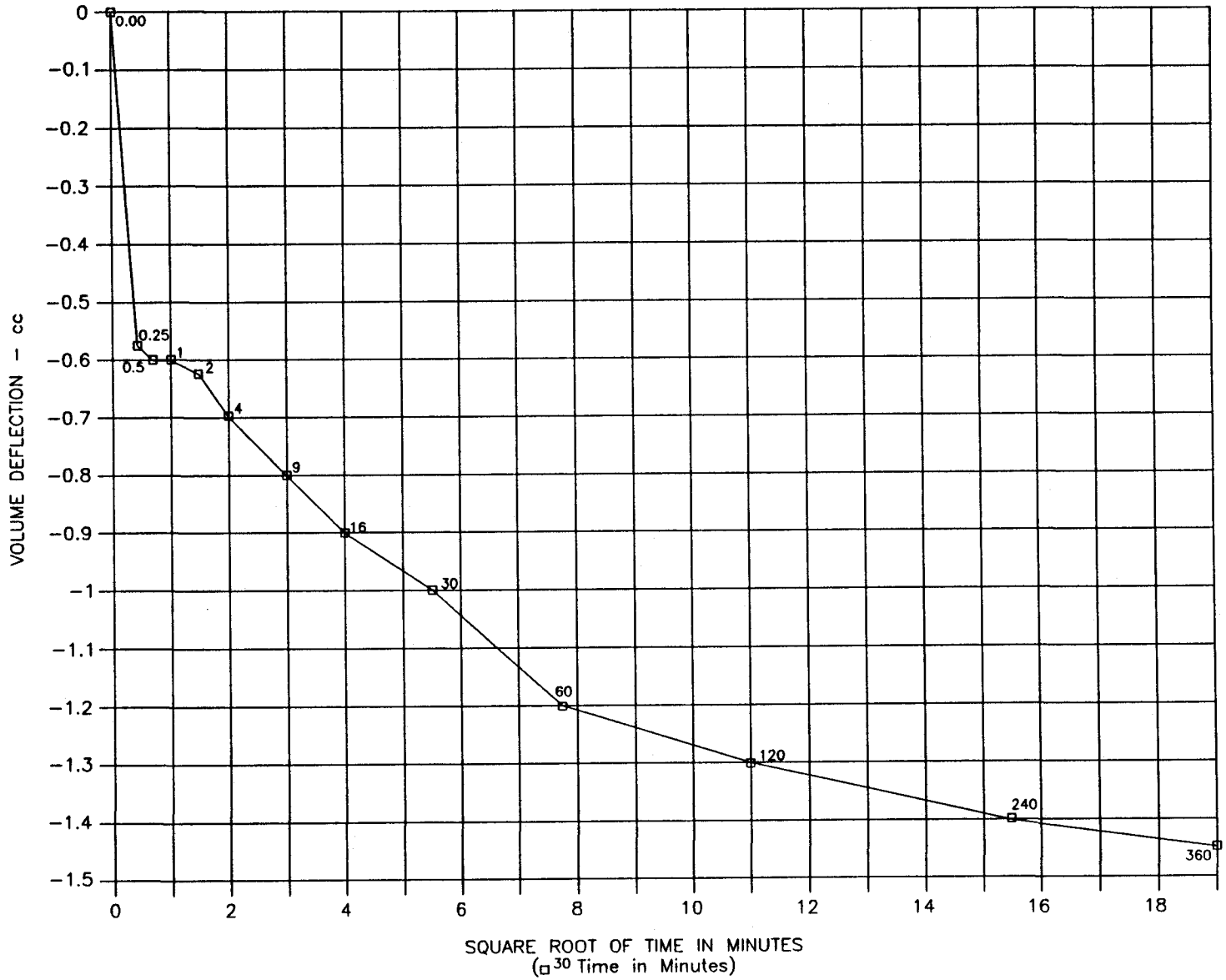
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	8.70	0.00
0.25	0.50	9.28	-0.58
0.5	0.71	9.30	-0.60
1	1.00	9.30	-0.60
2	1.41	9.33	-0.63
4	2.00	9.40	-0.70
9	3.00	9.50	-0.80
16	4.00	9.60	-0.90
30	5.48	9.70	-1.00
60	7.75	9.90	-1.20
120	10.95	10.00	-1.30
240	15.49	10.10	-1.40
360	18.97	10.15	-1.45

Initial Height (in)	2.874	Init. Vol. (CC)	212.03
Height Change (in)	0.006	Vol. Change (CC)	11.85
Ht. After Cons. (in)	2.868	Cell Exp. (CC)	10.80
Initial Area (sq in)	4.501	Net Change (CC)	1.05
Area After Cons. (sq in)	4.488	Cons. Vol. (CC)	210.98

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00595EBU1 @ 13.80-14.00', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

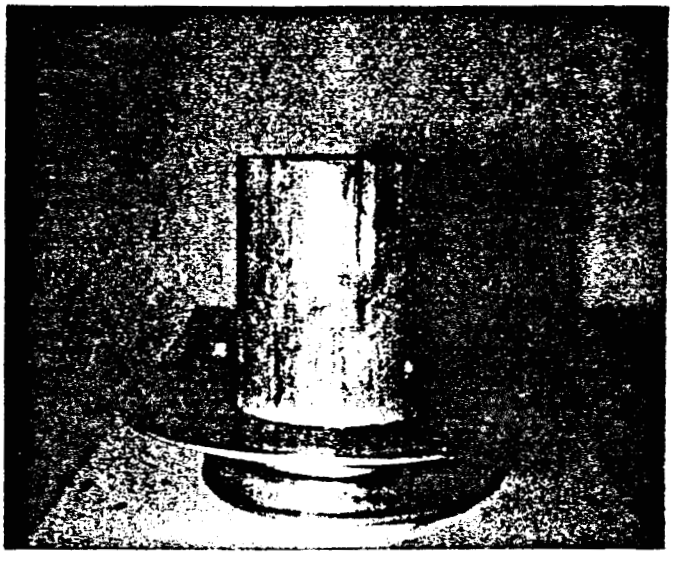
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37691	SAMPLED	10-17-91 KM&AC
DEPTH	13.80 - 14.00 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00595EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	5P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.874	Init. Area (sq in)	4.501
Consol. Ht. (in)	2.868	Consol. Area (sq in)	4.488
Back Pres. PSI	79.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.488	0	79.00	0.0	1152	0	0.00
125.0	4010	0.01	0.35	4.504	4008	49.50	-4248.0	5400	9408	1.74
165.0	5294	0.02	0.70	4.520	5272	50.00	-4176.0	5328	10600	1.99
187.0	5999	0.03	1.05	4.536	5954	51.00	-4032.0	5184	11138	2.15
193.0	6192	0.04	1.39	4.552	6123	54.50	-3528.0	4680	10803	2.31
190.0	6096	0.05	1.74	4.568	6007	56.80	-3196.8	4349	10356	2.38
185.0	5935	0.06	2.09	4.584	5828	57.00	-3168.0	4320	10148	2.35
180.0	5775	0.07	2.44	4.601	5650	57.40	-3110.4	4262	9913	2.33
176.0	5647	0.08	2.79	4.617	5505	57.60	-3081.6	4234	9738	2.30
172.0	5518	0.09	3.14	4.634	5360	57.70	-3067.2	4219	9580	2.27
167.0	5358	0.10	3.49	4.651	5186	57.80	-3052.8	4205	9391	2.23
151.0	4845	0.15	5.23	4.736	4604	57.80	-3052.8	4205	8809	2.10
140.0	4492	0.20	6.97	4.825	4190	57.80	-3052.8	4205	8395	2.00
139.0	4460	0.25	8.72	4.917	4083	57.80	-3052.8	4205	8287	1.97
150.0	4812	0.30	10.46	5.013	4321	57.80	-3052.8	4205	8526	2.03
157.5	5053	0.35	12.20	5.112	4449	58.00	-3024.0	4176	8625	2.07
164.5	5278	0.40	13.95	5.216	4555	58.40	-2966.4	4118	8673	2.11
175.0	5614	0.45	15.69	5.324	4747	58.70	-2923.2	4075	8822	2.16
149.0	4780	0.50	17.43	5.436	3958	59.20	-2851.2	4003	7962	
140.0	4492	0.55	19.18	5.553	3641	59.50	-2808.0	3960	7601	
140.0	4492	0.60	20.92	5.676	3562	59.70	-2779.2	3931	7493	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37691

MW00595EBUI

13.80–14.00 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37891**
Sample Number:	**BH00712EBU1**
Sample Depth:	**0.80-1.10 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-21-91 K.M.&A.P.
DEPTH	0.80 - 1.10 FT	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00712EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	29.63
Wt. Dry Soil & Pan (g)	29.16
Wt. Lost Moisture (g)	0.47
Wt. of Pan Only (g)	3.71
Wt. of Dry Soil (g)	25.45
Moisture Content %	1.8
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	58.91

WASH SIEVE ANALYSIS

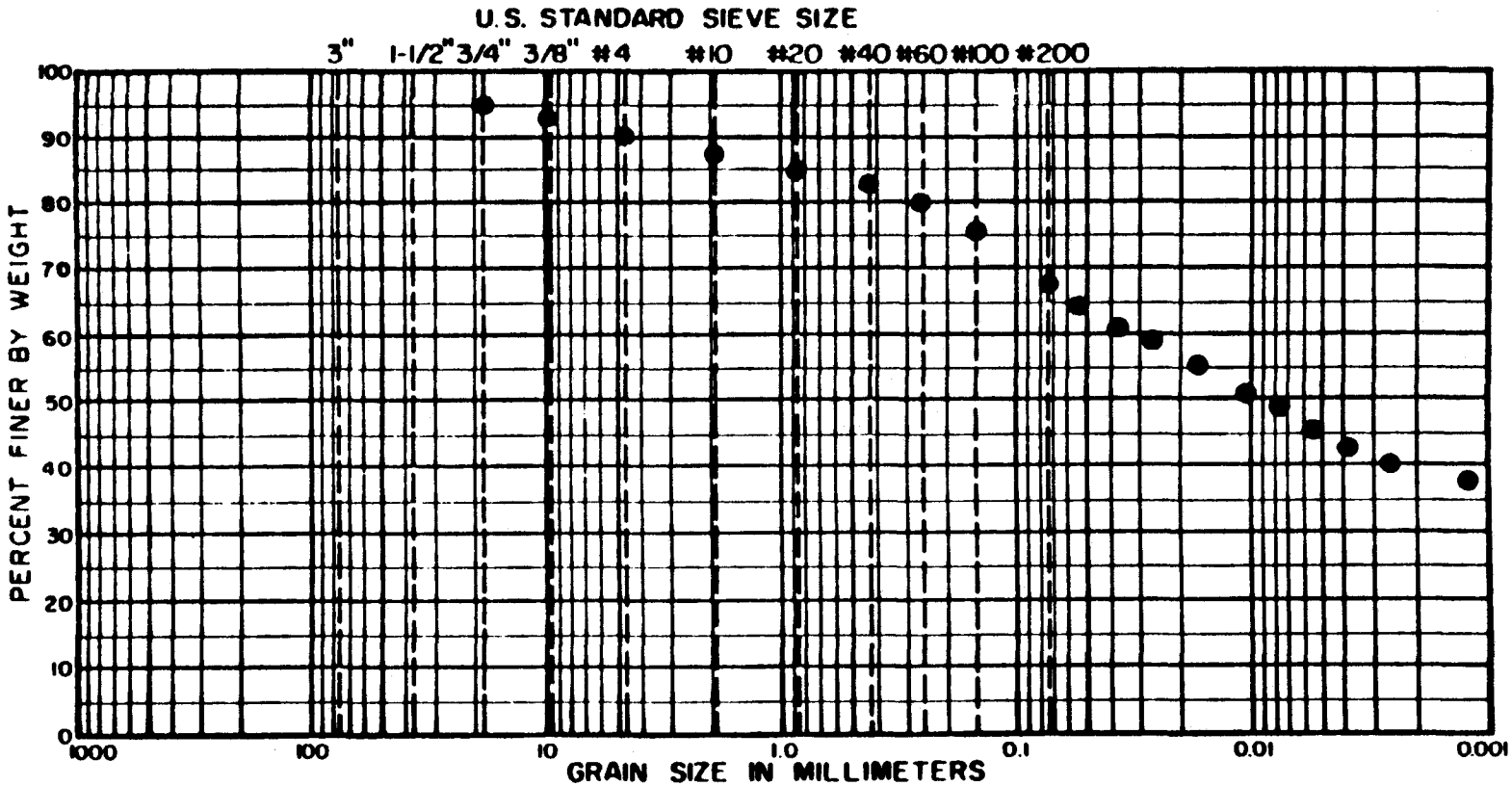
Wt. Total Sample Wet (g)	422.03
Weight of + #10 Before Washing (g)	61.12
Weight of + #10 After Washing (g)	51.97
Weight of - #10 Wet (g)	360.91
Weight of - #10 Dry (g)	363.35
Wt. Total Sample Dry (g)	415.32
Calc. Wt. "W" (g)	67.34
Calc. Mass + #10	8.43

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	19.49	19.49	19.49	4.7	95.3
3/8"	0.00	9.04	9.04	28.53	6.9	93.1
#4	0.00	11.68	11.68	40.21	9.7	90.3
#10	0.00	11.76	11.76	51.97	12.5	87.5
#20	1.34	2.78	1.44	1.44	14.7	85.3
#40	1.30	2.99	1.69	3.13	17.2	82.8
#60	1.31	3.23	1.92	5.05	20.0	80.0
#100	1.32	4.37	3.05	8.10	24.5	75.5
#200	1.33	6.49	5.16	13.26	32.2	67.8

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37891
DEPTH	0.80 - 1.10 FT
SAMPLE NO.	BH00712EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-21-91 K.M.&A.P.
DATE TESTED	11-08-91 SR
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	29.630
Wt. Dry Soil & Pan (g)	29.160
Wt. of Pan Only (g)	3.710
Sieve:	
Wt. Total Sample Wet (g)	422.03
Weight of + #10 Before Washing (g)	61.12
Weight of + #10 After Washing (g)	51.97
Weight of - #10 Wet (g)	360.91

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
mw0071 2EBLI	.8 - 1.1'	sample # 378

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-21-91 K.M.&A.P.
DEPTH	0.80 - 1.10 FT	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00712EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	67.338
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	48.00	43.00	63.9	63.9	8.42	0.0540
1.0	46.00	41.00	60.9	60.9	8.75	0.0389
2.0	45.25	40.25	59.8	59.8	8.87	0.0277
5.0	41.75	36.75	54.6	54.6	9.44	0.0181
15.0	39.50	34.50	51.2	51.2	9.81	0.0107
30.0	38.00	33.00	49.0	49.0	10.06	0.0076
60.0	36.25	31.25	46.4	46.4	10.35	0.0055
120.0	34.00	29.00	43.1	43.1	10.71	0.0039
250.0	32.00	27.00	40.1	40.1	11.04	0.0028
1440.0	30.25	25.25	37.5	37.5	11.33	0.0012

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

CLIENT/OWNER [illegible]

LOCATION 378 [illegible]

BORING ____ SAMPLE ____ DEPTH ____

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

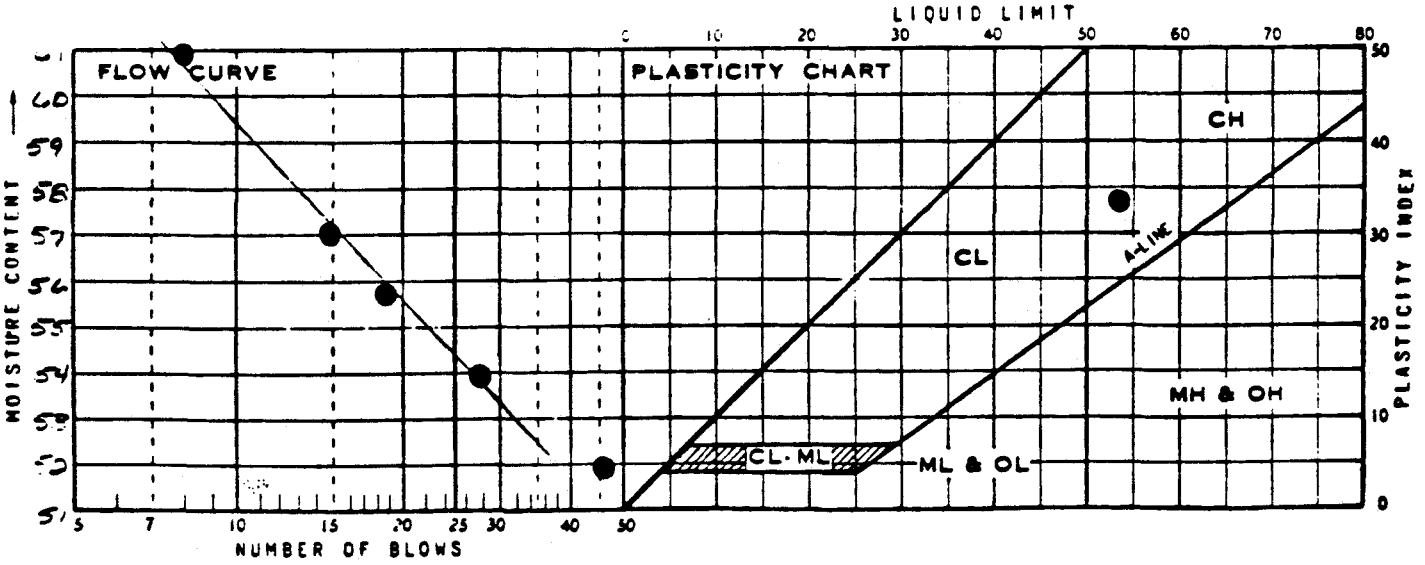
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SR. 11/13/91.

DETERMINATION	1	2	3	4	5	6
DISH	25C	22C	14			
WT OF DISH + WET SOIL g	7.90	7.36	8.99			
WT OF DISH + DRY SOIL g	6.76	6.28	7.63	—	—	—
WT OF MOISTURE g	1.14	1.08	1.36			
WT OF DISH g	1.08	1.06	1.05	—	—	—
WT OF DRY SOIL g	5.68	5.22	6.58			
MOISTURE CONTENT %	20.1	20.7	20.7			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	16C	17C	53C	10C	67C	
NUMBER OF BLOWS	46	28	19	15	8	
WT OF DISH + WET SOIL g	15.72	17.62	15.33	18.79	19.44	
WT OF DISH + DRY SOIL g	10.71	12.2	10.22	12.34	12.48	—
WT OF MOISTURE g	5.01	5.20	5.11	6.45	6.96	
WT OF DISH g	1.06	1.06	1.05	1.05	1.05	—
WT OF DRY SOIL g	9.65	10.76	9.17	11.29	11.43	
MOISTURE CONTENT %	51.9	53.9	55.7	57.1	60.9	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION
		54	20.5	33.9	CH

ADVANCED TERRA TESTING INC

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37891**
Sample Number:	**BH00711EBU1**
Sample Depth:	***1.10-1.35 feet (Alluvium)***

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-21-91 AC&KM
DEPTH	1.10 - 1.35 FT	TEST STARTED	11-16-91 DCW
SAMPLE NO.	BH00711EBU1	TEST FINISHED	12-05-91
SOIL DESCR.	SS LINER	SETUP NO.	10S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	286.1	313.2
Wt. Wet Soil & Pan (g)	295.5	322.6
Wt. Dry Soil & Pan (g)	261.9	261.9
Wt. Lost Moisture (g)	33.6	60.7
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	252.5	252.5
Moisture Content %	13.3	24.0
Wet Density PCF	121.6	138.6
Dry Density PCF	107.4	111.7

Init. Diameter (in)	2.363	(cm)	6.002
Init. Area (sq in)	4.385	(sq cm)	28.295
Init. Height (in)	2.043	(cm)	5.189
Vol. Bef. Consol. (cu ft)	0.00518		
Vol. After Consol. (cu ft)	0.00498		
Effective Porosity %	43.01		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
1200.0	72000	49.9	38.3	10.1	2.3E-07
699.0	41940	38.3	32.9	17.9	2.0E-07
834.0	50040	50.0	42.4	8.2	2.2E-07
501.0	30060	42.4	38.5	13.5	1.9E-07
1107.0	66420	38.5	31.1	18.7	1.7E-07
1147.0	68820	31.1	24.7	25.1	1.5E-07
697.0	41820	49.9	44.2	7.3	1.9E-07
718.0	43080	44.2	39.0	12.4	1.8E-07
1558.0	93480	39.0	28.0	19.9	1.8E-07

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37891
DEPTH	1.10 - 1.35 FT
SAMPLE NO.	BH00711EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-21-91 AC&KM
TEST STARTED	11-16-91 DCW
TEST FINISHED	12-05-91
SETUP NO.	10S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	286.100
Wt Soil & Moist at	313.210
Wt. Dry Soil & Pan	261.930
Wt. of Pan Only (g)	9.400
Consol Info:	
Init. Diameter in.	2.363
Initial Height in.	2.043
Vol. change (sat. con.) CC	30.000
Cell Exp.	24.250
Height Change in.	0.009
Test info:	
Pore pres @ begin. psi	89.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-21-91 AC&KM
DEPTH	1.10 - 1.35 FT	TEST STARTED	11-16-91 DCW
SAMPLE NO.	BH00711EBU1	TEST FINISHED	12-05-91
SOIL DESCR.	SS LINER	SETUP NO.	10S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	19.9				
50.0	48.0	16.3	18.2	38.2	45.2	7.0	0.70
60.0	58.0	18.0	19.7	48.4	55.8	7.4	0.74
70.0	68.0	19.7	21.3	58.2	66.6	8.4	0.84
80.0	78.0	21.5	23.2	68.4	77.1	8.7	0.87
90.0	88.0	23.3	25.1	78.3	87.3	9.0	0.90
100.0		25.3	25.4	88.4	97.8	9.4	0.94

CONSOLIDATION DATA

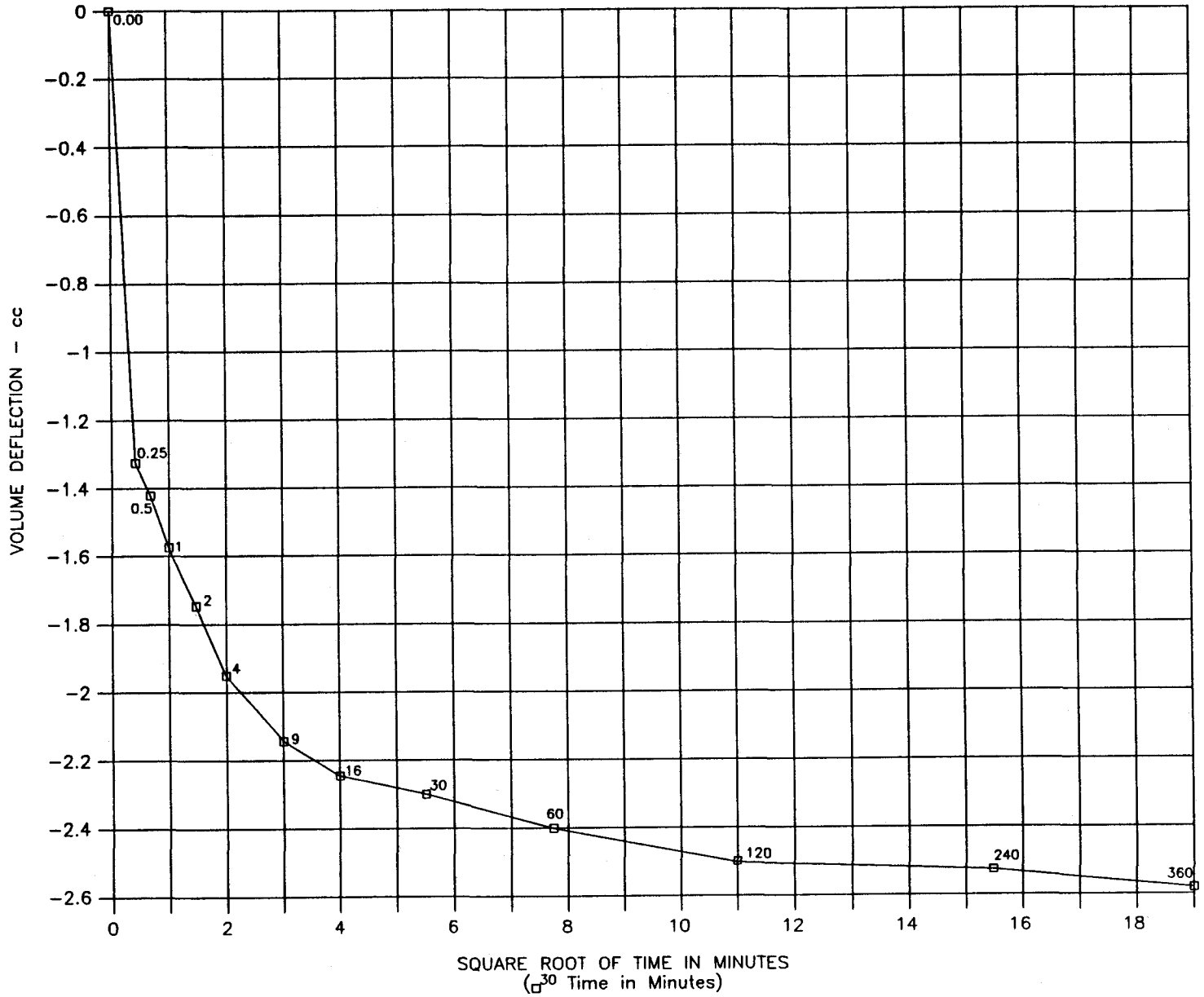
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	25.40	0.00
0.25	0.50	26.73	-1.33
0.5	0.71	26.83	-1.43
1	1.00	26.98	-1.58
2	1.41	27.15	-1.75
4	2.00	27.35	-1.95
9	3.00	27.55	-2.15
16	4.00	27.65	-2.25
30	5.48	27.70	-2.30
60	7.75	27.80	-2.40
120	10.95	27.90	-2.50
240	15.49	27.93	-2.53
360	18.97	27.98	-2.58

Initial Height (in)	2.043	Init. Vol. (CC)	146.85
Height Change (in)	0.009	Vol. Change (CC)	30.00
Ht. After Cons. (in)	2.034	Cell Exp. (CC)	24.25
Initial Area (sq in)	4.385	Net Change (CC)	5.75
Area After Cons. (sq in)	4.232	Cons. Vol. (CC)	141.10

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00711EBU1 @ 1.10–1.35', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

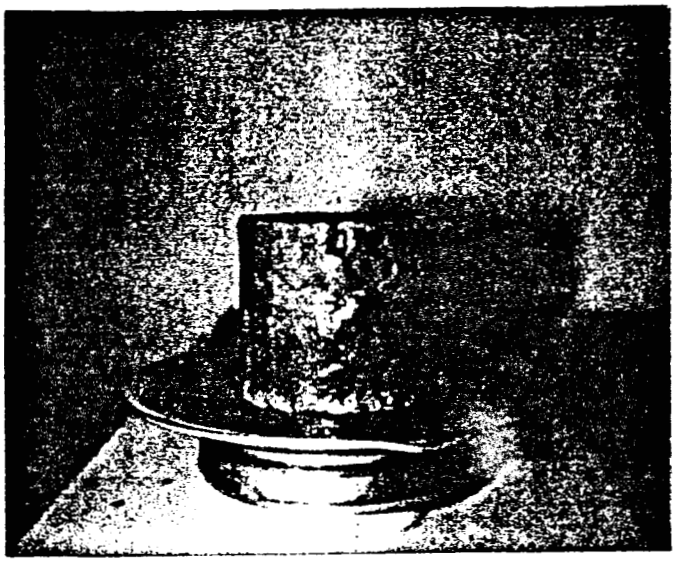
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-21-91 AC&KM
DEPTH	1.10 - 1.35 FT	TEST STARTED	11-16-91 DCW
SAMPLE NO.	BH00711EBU1	TEST FINISHED	12-05-91
SOIL DESCR.	SS LINER	SETUP NO.	10S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.043	Init. Area (sq in)	4.385
Consol. Ht. (in)	2.034	Consol. Area (sq in)	4.232
Back Pres. PSI	89.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.232	0	89.00	0.0	1152	0	0.00
125.0	4253	0.01	0.49	4.253	4385	49.50	-5688.0	6840	11225	1.64
165.0	5614	0.02	0.98	4.274	5760	50.00	-5616.0	6768	12528	1.85
187.0	6362	0.03	1.47	4.296	6495	51.00	-5472.0	6624	13119	1.98
193.0	6566	0.04	1.97	4.317	6670	54.50	-4968.0	6120	12790	2.09
190.0	6464	0.05	2.46	4.339	6534	56.80	-4636.8	5789	12322	2.13
185.0	6294	0.06	2.95	4.361	6330	57.00	-4608.0	5760	12090	2.10
180.0	6124	0.07	3.44	4.383	6127	57.40	-4550.4	5702	11830	2.07
176.0	5988	0.08	3.93	4.406	5961	57.60	-4521.6	5674	11634	2.05
172.0	5852	0.09	4.42	4.428	5795	57.70	-4507.2	5659	11455	2.02
167.0	5682	0.10	4.92	4.451	5598	57.80	-4492.8	5645	11243	1.99
151.0	5138	0.15	7.37	4.569	4931	57.80	-4492.8	5645	10576	1.87
140.0	4763	0.20	9.83	4.694	4450	57.80	-4492.8	5645	10095	1.79
139.0	4729	0.25	12.29	4.826	4298	57.80	-4492.8	5645	9943	1.76
150.0	5103	0.30	14.75	4.965	4508	57.80	-4492.8	5645	10153	1.80
157.5	5359	0.35	17.21	5.112	4597	58.00	-4464.0	5616	10213	1.82
164.5	5597	0.40	19.67	5.268	4659	58.40	-4406.4	5558	10217	1.84
175.0	5954	0.45	22.12	5.435	4804	58.70	-4363.2	5515	10320	1.87
149.0	5069	0.50	24.58	5.612	3962	59.20	-4291.2	5443	9405	
140.0	4763	0.55	27.04	5.801	3601	59.50	-4248.0	5400	9001	
140.0	4763	0.60	29.50	6.003	3480	59.70	-4219.2	5371	8851	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37891

MW00711EBUI

1.10–1.35 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37891**
Sample Number:	**BH00716EBU1**
Sample Depth:	**7.20-7.50 feet (Bedrock)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-17-91
DEPTH	7.20 - 7.50 FT	DATE TESTED	11-11-91 TNU
SAMPLE NO.	BH00716EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	27.17
Wt. Dry Soil & Pan (g)	26.68
Wt. Lost Moisture (g)	0.49
Wt. of Pan Only (g)	3.77
Wt. of Dry Soil (g)	22.91
Moisture Content %	2.1
Wt. Hydrom. Sample Wet (g)	60.01
Wt. Hydrom. Sample Dry (g)	58.75

WASH SIEVE ANALYSIS

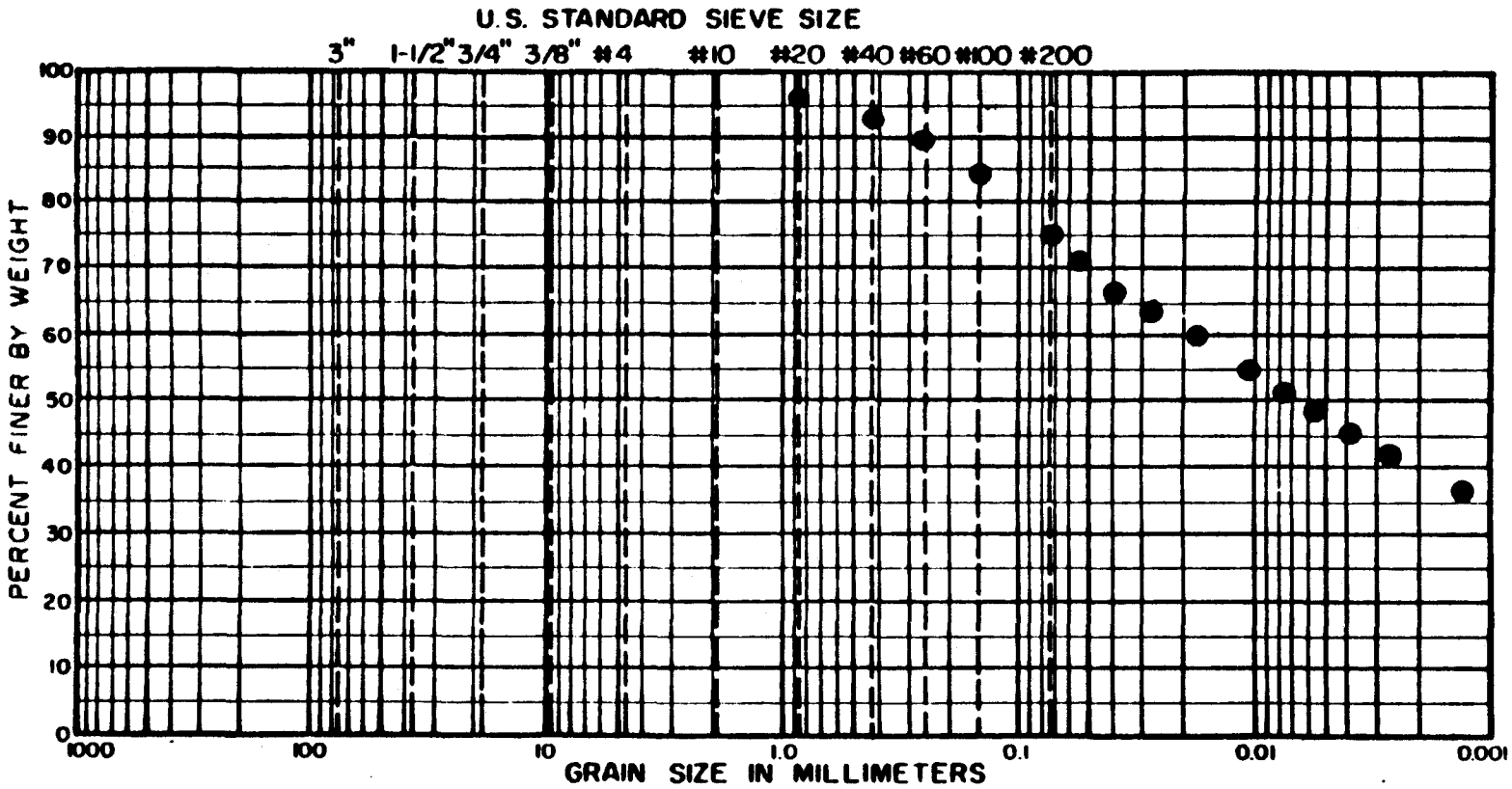
Wt. Total Sample Wet (g)	60.01
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.01
Weight of - #10 Dry (g)	58.75
Wt. Total Sample Dry (g)	58.75
Calc. Wt. "W" (g)	58.75
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	1.30	3.69	2.39	2.39	4.1	95.9
#40	1.32	3.01	1.69	4.08	6.9	93.1
#60	1.32	3.10	1.78	5.86	10.0	90.0
#100	1.32	4.60	3.28	9.14	15.6	84.4
#200	1.32	6.82	5.50	14.64	24.9	75.1

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37891
DEPTH	7.20 - 7.50 FT
SAMPLE NO.	BH00716EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-17-91
DATE TESTED	11-11-91 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	27.170
Wt. Dry Soil & Pan (g)	26.680
Wt. of Pan Only (g)	3.770
Sieve:	
Wt. Total Sample Wet (g)	60.01
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.01

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.007
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
MW007160 EBUIC	7.2 - 7.5'	37891 ALMW KLM 04/09/92

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-17-91
DEPTH	7.20 - 7.50 FT	DATE TESTED	11-11-91 TNU
SAMPLE NO.	BH00716EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	58.750
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	47.50	42.50	72.3	72.3	8.50	0.0543
1.0	44.00	39.00	66.4	66.4	9.07	0.0397
2.0	43.00	38.00	64.7	64.7	9.24	0.0283
5.0	40.00	35.00	59.6	59.6	9.73	0.0184
15.0	37.00	32.00	54.5	54.5	10.22	0.0109
30.0	35.00	30.00	51.1	51.1	10.55	0.0078
60.0	33.50	28.50	48.5	48.5	10.80	0.0056
120.0	31.25	26.25	44.7	44.7	11.17	0.0040
250.0	30.00	25.00	42.6	42.6	11.37	0.0028
1440.0	27.00	22.00	37.4	37.4	11.86	0.0012

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EBASCO

LOCATION 37A

BORING MW007/6EBU1 SAMPLE ____ DEPTH 2.5-7.5'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

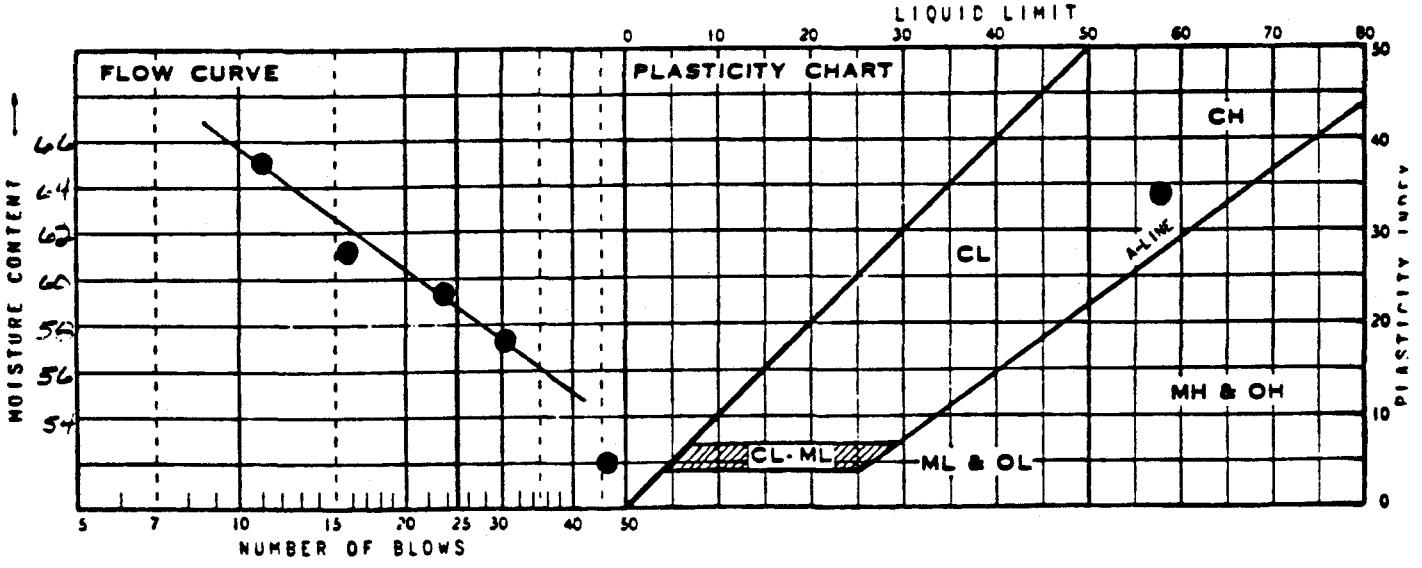
DETERMINATION	1	-
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY ____/__/__

DETERMINATION	1	2	3	4	5	6
DISH	29B	2B	51			
WT OF DISH + WET SOIL g	9.01	8.30	8.76			
WT OF DISH + DRY SOIL g	7.53	7.00	7.33	—	—	—
WT OF MOISTURE g	1.48	1.30	1.43			
WT OF DISH g	1.41	1.32	1.32	—	—	—
WT OF DRY SOIL g	6.12	5.68	6.01			
MOISTURE CONTENT %	24.2	22.9	23.8			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	69B	75B	16	121	65B	
NUMBER OF BLOWS	46	31	24	16	11	
WT OF DISH + WET SOIL g	16.09	16.46	17.96	18.70	17.85	
WT OF DISH + DRY SOIL g	10.90	10.94	11.76	12.05	11.35	—
WT OF MOISTURE g	5.19	5.54	6.20	6.65	6.52	
WT OF DISH g	1.31	1.32	1.30	1.31	1.30	—
WT OF DRY SOIL g	9.59	9.62	10.46	10.74	10.05	
MOISTURE CONTENT %	54.1	57.4	59.3	61.9	65.0	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		57.5	23.6	33.9	CH	

ADVANCED TERRA TESTING

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37891**
Sample Number:	**BH00715EBU1**
Sample Depth:	**7.50-7.75 feet (Bedrock)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-21-91 KM&AC
DEPTH	7.50 - 7.75 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00715EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	6P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	287.1	296.5
Wt. Wet Soil & Pan (g)	296.6	305.9
Wt. Dry Soil & Pan (g)	245.7	245.7
Wt. Lost Moisture (g)	50.9	60.3
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	236.3	236.3
Moisture Content %	21.5	25.5
Wet Density PCF	121.0	130.0
Dry Density PCF	99.5	103.6

Init. Diameter (in)	2.382	(cm)	6.050
Init. Area (sq in)	4.456	(sq cm)	28.752
Init. Height (in)	2.029	(cm)	5.154
Vol. Bef. Consol. (cu ft)	0.00523		
Vol. After Consol. (cu ft)	0.00503		
Effective Porosity %	42.30		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
929.0	55740	49.9	47.0	16.7	7.6E-08
1301.0	78060	47.0	44.1	19.9	5.6E-08
1441.0	86460	44.1	41.4	22.9	4.8E-08
1458.0	87480	41.4	38.9	25.7	4.5E-08
1421.0	85260	38.9	36.7	28.2	4.2E-08
1450.0	87000	36.7	34.6	30.5	4.0E-08
1569.0	94140	34.6	32.5	32.8	3.8E-08
1420.0	85200	32.5	30.6	34.9	3.8E-08

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37891
DEPTH	7.50 - 7.75 FT
SAMPLE NO.	BH00715EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-21-91 KM&AC
TEST STARTED	11-12-91 DCW
TEST FINISHED	11-25-91
SETUP NO.	6P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	287.130
Wt Soil & Moist at	296.510
Wt. Dry Soil & Pan	245.680
Wt. of Pan Only (g)	9.430
Consol Info:	
Init. Diameter in.	2.382
Initial Height in.	2.029
Vol. change (sat. con.) CC	16.050
Cell Exp.	10.300
Height Change in.	0.024
Test info:	
Pore pres @ begin. psi	69.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-21-91 KM&AC
DEPTH	7.50 - 7.75 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00715EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	6P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	11.0				
50.0	48.0	8.5	9.7	37.7	45.7	8.0	0.80
60.0	58.0	9.8	10.8	47.9	56.6	8.7	0.87
70.0	68.0	11.1	11.9	57.8	66.9	9.1	0.91
80.0		12.2	12.2	67.9	77.5	9.6	0.96

CONSOLIDATION DATA

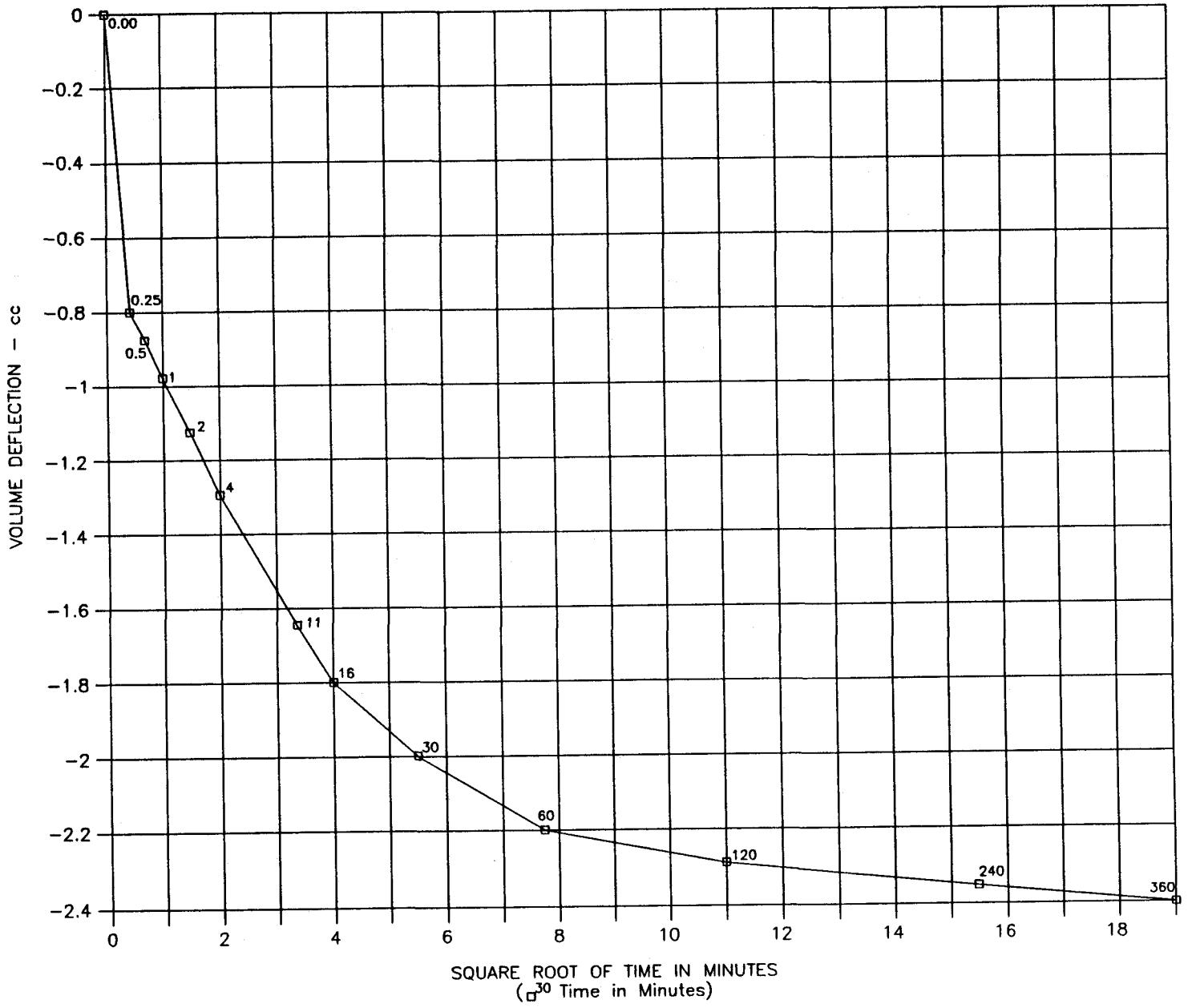
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	12.40	0.00
0.25	0.50	13.20	-0.80
0.5	0.71	13.28	-0.88
1	1.00	13.38	-0.97
2	1.41	13.53	-1.13
4	2.00	13.70	-1.30
11	3.32	14.05	-1.65
16	4.00	14.20	-1.80
30	5.48	14.40	-2.00
60	7.75	14.60	-2.20
120	10.95	14.70	-2.30
240	15.49	14.75	-2.35
360	18.97	14.80	-2.40

Initial Height (in)	2.029	Init. Vol. (CC)	148.20
Height Change (in)	0.024	Vol. Change (CC)	16.05
Ht. After Cons. (in)	2.005	Cell Exp. (CC)	10.30
Initial Area (sq in)	4.456	Net Change (CC)	5.75
Area After Cons. (sq in)	4.335	Cons. Vol. (CC)	142.45

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00715EBU1 @ 7.50-7.75', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

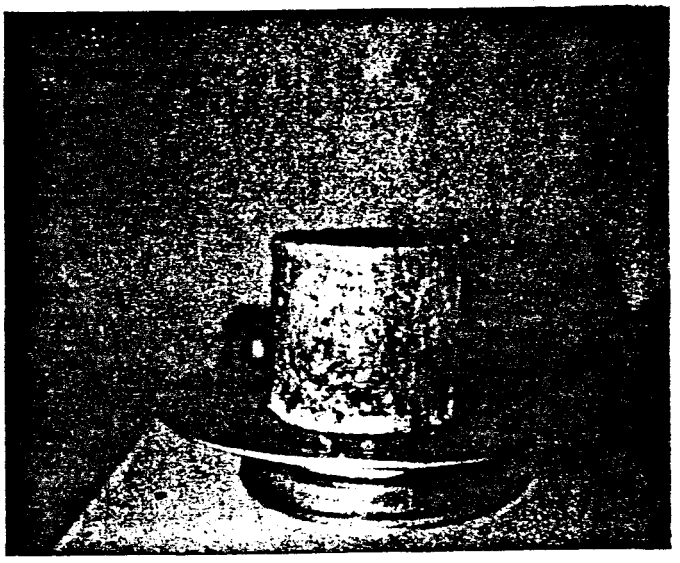
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	10-21-91 KM&AC
DEPTH	7.50 - 7.75 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00715EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	6P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.029	Init. Area (sq in)	4.456
Consol. Ht. (in)	2.005	Consol. Area (sq in)	4.335
Back Pres. PSI	69.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.335	0	69.00	0.0	1152	0	0.00
125.0	4153	0.01	0.50	4.356	4248	49.50	-2808.0	3960	8208	2.07
165.0	5481	0.02	1.00	4.378	5579	50.00	-2736.0	3888	9467	2.43
187.0	6212	0.03	1.50	4.401	6291	51.00	-2592.0	3744	10035	2.68
193.0	6412	0.04	2.00	4.423	6460	54.50	-2088.0	3240	9700	2.99
190.0	6312	0.05	2.49	4.446	6327	56.80	-1756.8	2909	9236	3.18
185.0	6146	0.06	2.99	4.468	6129	57.00	-1728.0	2880	9009	3.13
180.0	5980	0.07	3.49	4.491	5933	57.40	-1670.4	2822	8755	3.10
176.0	5847	0.08	3.99	4.515	5771	57.60	-1641.6	2794	8565	3.07
172.0	5714	0.09	4.49	4.538	5611	57.70	-1627.2	2779	8390	3.02
167.0	5548	0.10	4.99	4.562	5419	57.80	-1612.8	2765	8184	2.96
151.0	5016	0.15	7.48	4.685	4771	57.80	-1612.8	2765	7536	2.73
140.0	4651	0.20	9.98	4.815	4304	57.80	-1612.8	2765	7069	2.56
139.0	4618	0.25	12.47	4.952	4155	57.80	-1612.8	2765	6920	2.50
150.0	4983	0.30	14.96	5.097	4356	57.80	-1612.8	2765	7121	2.58
157.5	5232	0.35	17.46	5.251	4440	58.00	-1584.0	2736	7176	2.62
164.5	5465	0.40	19.95	5.415	4497	58.40	-1526.4	2678	7176	2.68
175.0	5814	0.45	22.44	5.589	4635	58.70	-1483.2	2635	7271	2.76
149.0	4950	0.50	24.94	5.775	3820	59.20	-1411.2	2563	6383	
140.0	4651	0.55	27.43	5.973	3470	59.50	-1368.0	2520	5990	
140.0	4651	0.60	29.93	6.186	3351	59.70	-1339.2	2491	5842	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37891

MW00715EBUI

7.50–7.75 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37891**
Sample Number:	**BH00738EBU1**
Sample Depth:	**10.00-10.20 feet (Bedrock)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	11-06-91 KM,JN
DEPTH	10.00 - 10.20 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00738EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	44.11
Wt. Dry Soil & Pan (g)	43.45
Wt. Lost Moisture (g)	0.66
Wt. of Pan Only (g)	3.80
Wt. of Dry Soil (g)	39.65
Moisture Content %	1.7
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.02

WASH SIEVE ANALYSIS

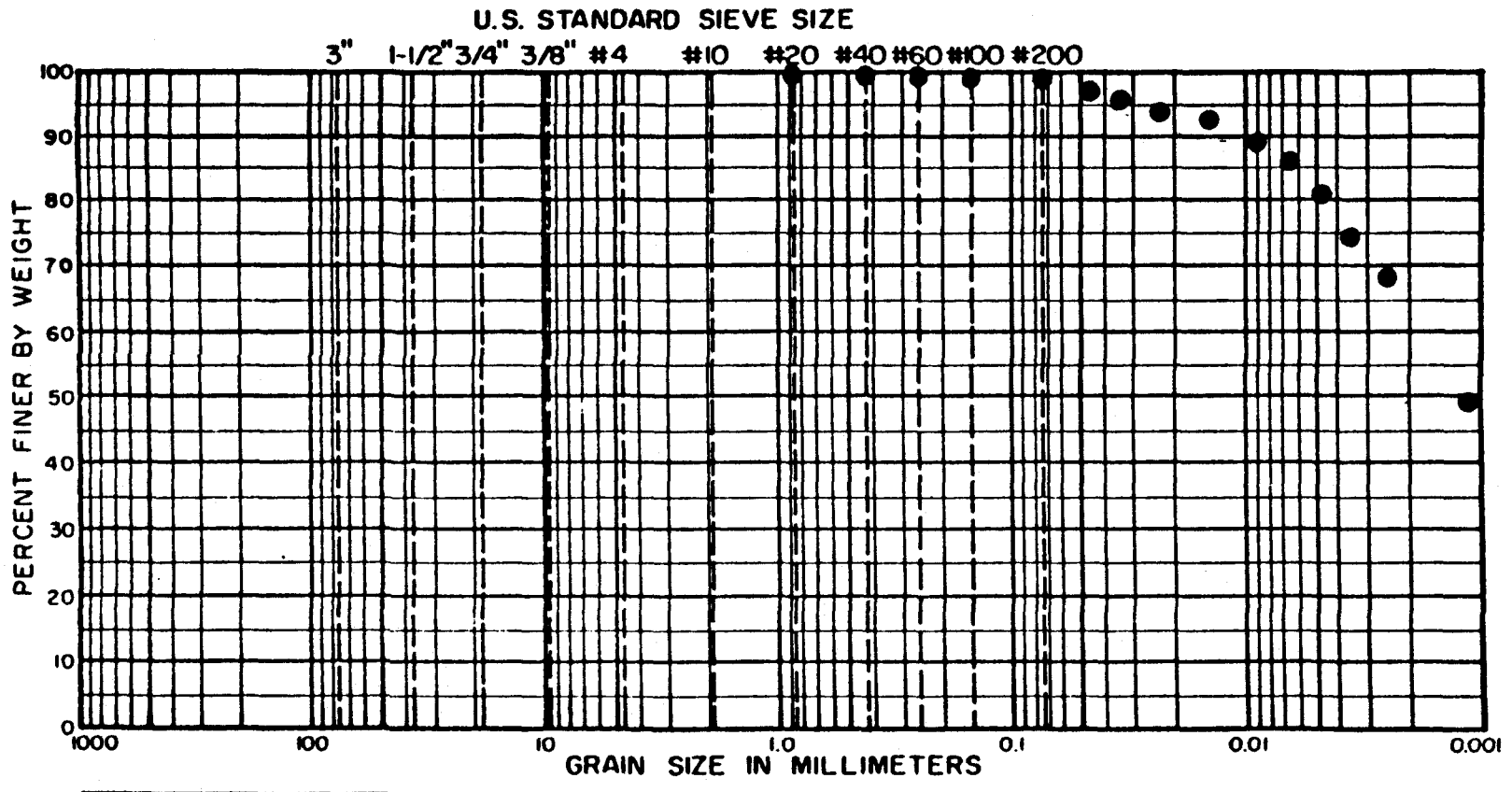
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00
Weight of - #10 Dry (g)	59.02
Wt. Total Sample Dry (g)	59.02
Calc. Wt. "W" (g)	59.02
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	1.31	1.38	0.07	0.07	0.1	99.9
#40	1.31	1.38	0.07	0.14	0.2	99.8
#60	1.32	1.36	0.04	0.18	0.3	99.7
#100	1.29	1.34	0.05	0.23	0.4	99.6
#200	1.31	1.43	0.12	0.35	0.6	99.4

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37891
DEPTH	10.00 - 10.20 FT
SAMPLE NO.	BH00738EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-06-91 KM,JN
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	44.110
Wt. Dry Soil & Pan (g)	43.450
Wt. of Pan Only (g)	3.800
Sieve:	
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.690
Value of "a"	0.992
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	21.000
Temp. Coef. K	0.01332
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00738EBUI	10.0 - 10.2'	#37891

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	11-06-91 KM,JN
DEPTH	10.00 - 10.20 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00738EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	21.000
Sp. Gr. of Soil	2.690	Temp. Coef. K	0.01332
Value of "a"	0.992	Wt. Dry Sample "W"	59.018
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.000		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	63.00	58.00	97.5	97.5	5.96	0.0460
1.0	62.00	57.00	95.8	95.8	6.12	0.0330
2.0	61.00	56.00	94.1	94.1	6.29	0.0236
5.0	60.00	55.00	92.4	92.4	6.45	0.0151
15.0	58.00	53.00	89.1	89.1	6.78	0.0090
30.0	56.00	51.00	85.7	85.7	7.11	0.0065
60.0	53.00	48.00	80.7	80.7	7.60	0.0047
120.0	49.50	44.50	74.8	74.8	8.17	0.0035
250.0	45.50	40.50	68.1	68.1	8.83	0.0025
1440.0	34.50	29.50	49.6	49.6	10.63	0.0011

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2051-05

CLIENT/OWNER EBASCO

LOCATION 37891

BORING EB41 (3400796) SAMPLE ____ DEPTH 10.5-10.2'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD [redacted]

DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

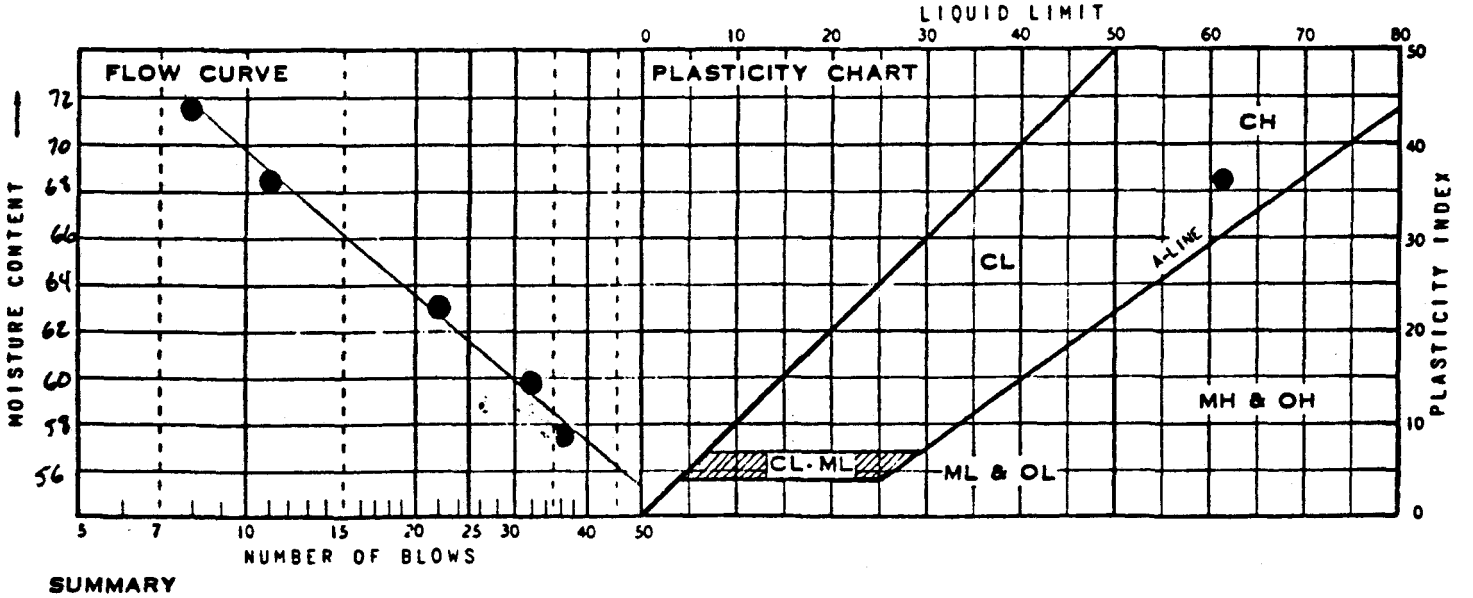
PLASTIC LIMIT BY AH 1/15/92

DETERMINATION	1	2	3	4	5	6
DISH	36C	59C	16C			
WT OF DISH + WET SOIL g	10.63	11.34	10.84			
WT OF DISH + DRY SOIL g	8.74	9.29	8.95	—	—	—
WT OF MOISTURE g	1.89	2.05	1.89			
WT OF DISH g	1.06	1.07	1.08	—	—	—
WT OF DRY SOIL g	7.68	8.22	7.87			
MOISTURE CONTENT %	24.6	24.9	24.0			

LIQUID LIMIT

?

DETERMINATION	1	2	3	4	5	6
DISH	19C	69C	53C	3	2	38C
NUMBER OF BLOWS	36	32	26	22	11	8
WT OF DISH + WET SOIL g	14.72	13.98	13.06	13.37	12.58	11.51
WT OF DISH + DRY SOIL g	9.74	9.14	8.61	8.61	7.91	7.15
WT OF MOISTURE g	4.98	4.84	4.45	4.76	4.67	4.36
WT OF DISH g	1.08	1.06	1.06	1.06	1.07	1.06
WT OF DRY SOIL g	8.66	8.08	7.55	7.55	6.84	6.09
MOISTURE CONTENT %	57.5	59.9	58.9	63.0	68.3	71.6



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		61.5	24.5	37.0	CH	

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ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

JOB NO. 2031-05 NAME EPASCO

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00734EBU1	BH00840EBU1	BH00812EBU1	BH00738EBU1	BH00775EBU1	BH00766EBU1
DEPTH	46'	11.50-11.75'	4.8-5.05'	10.0-10.2'	41.75-47.25'	11.5-11.75'
Sample # SAS Tag #	37991	38991	38591	37891	39191	39191
Sampled BY:	10-29-91 KM & MC	11-12-91 BP & KH	11-05-91 KH & MC	1-6-91 KM & JN	11-20-91 KM & NORSON	11-14-91 KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask *	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry) (W_o) g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.82g	177.840g	177.89g	177.790g	177.960g	177.690g
Temperature °C, (T_x)	20.7	21.5	22.0	21.6	18.2	19.0
Weight of water and flask at T_x (from cal. curve) (W_a)	162.101g	162.095g	162.084g	162.094g	162.175	162.153
Specific Gravity = *	2.69	2.70	2.72	2.69	2.76	2.64
PAN #	13	21B	27	6C	32	26B

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37891**
Sample Number:	**BH00737EBU1**
Sample Depth:	**10.20-10.45 feet (Bedrock)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✓ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

__ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	11-12-91 KH
DEPTH	10.20 - 10.45 FT	TEST STARTED	12-07-91 DCW
SAMPLE NO.	BH00737EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	1P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	351.5	367.4
Wt. Wet Soil & Pan (g)	360.9	376.8
Wt. Dry Soil & Pan (g)	298.1	298.1
Wt. Lost Moisture (g)	62.8	78.7
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	288.7	288.7
Moisture Content %	21.7	27.2
Wet Density PCF	122.5	132.4
Dry Density PCF	100.6	104.1

Init. Diameter (in)	2.288	(cm)	5.812
Init. Area (sq in)	4.112	(sq cm)	26.527
Init. Height (in)	2.659	(cm)	6.754
Vol. Bef. Consol. (cu ft)	0.00633		
Vol. After Consol. (cu ft)	0.00611		
Effective Porosity %	45.43		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
92.0	5520	49.7	49.4	15.6	1.1E-07
1038.0	62280	49.4	47.3	16.9	6.9E-08
1338.0	80280	47.3	45.5	19.0	4.7E-08
1453.0	87180	45.5	43.5	21.0	4.9E-08
1351.0	81060	43.5	41.7	23.0	4.8E-08
1503.0	90180	41.7	39.8	25.0	4.6E-08
1481.0	88860	39.8	38.1	27.0	4.3E-08
1477.0	88620	38.1	36.4	28.8	4.4E-08
1320.0	79200	49.5	47.7	16.6	4.7E-08
1473.0	88380	47.7	45.7	18.6	4.7E-08
1417.0	85020	45.7	43.8	20.7	4.7E-08

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CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37891
DEPTH	10.20 - 10.45 FT
SAMPLE NO.	BH00737EBU1
SOIL DESCR.	SS LINER
SAMPLED	11-12-91 KH
TEST STARTED	12-07-91 DCW
TEST FINISHED	12-25-91
SETUP NO.	1P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	351.470
Wt Soil & Moist at	367.370
Wt. Dry Soil & Pan	298.100
Wt. of Pan Only (g)	9.400
Consol Info:	
Init. Diameter in.	2.288
Initial Height in.	2.659
Vol. change (sat. con.) CC	23.400
Cell Exp.	17.400
Height Change in.	0.045
Test info:	
Pore pres @ begin. psi	89.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	11-12-91 KH
DEPTH	10.20 - 10.45 FT	TEST STARTED	12-07-91 DCW
SAMPLE NO.	BH00737EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	1P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	-0.2	12.4				
50.0	48.0	10.0	11.3	38.2	47.2	9.0	0.90
60.0	58.0	11.7	12.9	48.4	57.6	9.2	0.92
70.0	68.0	13.2	14.4	58.4	67.8	9.4	0.94
80.0	78.0	14.7	15.8	68.3	77.9	9.6	0.96

CONSOLIDATION DATA

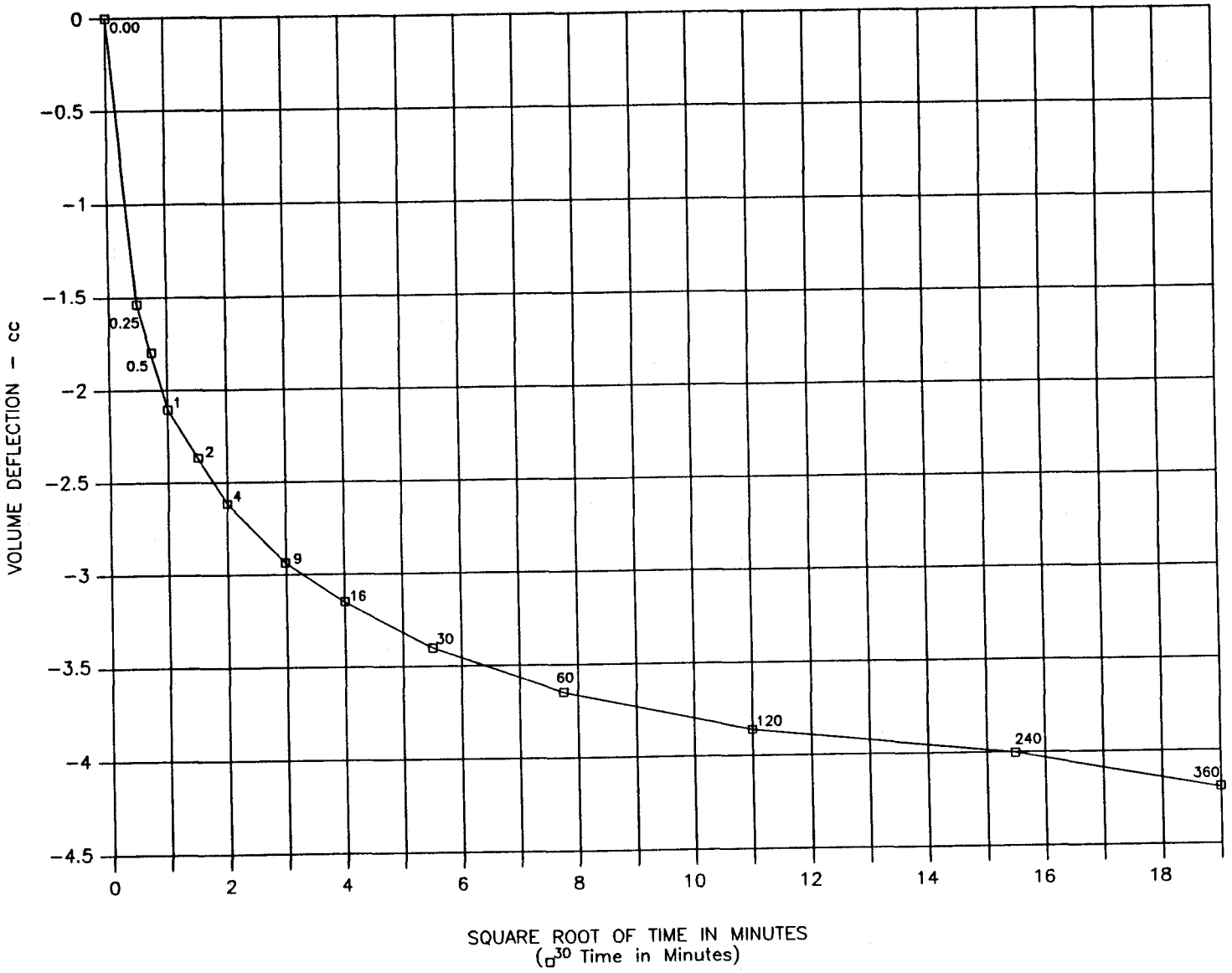
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	17.60	0.00
0.25	0.50	19.15	-1.55
0.5	0.71	19.40	-1.80
1	1.00	19.70	-2.10
2	1.41	19.95	-2.35
4	2.00	20.20	-2.60
9	3.00	20.53	-2.92
16	4.00	20.75	-3.15
30	5.48	21.00	-3.40
60	7.75	21.25	-3.65
120	10.95	21.48	-3.88
240	15.49	21.60	-4.00
360	18.97	21.80	-4.20

Initial Height (in)	2.659	Init. Vol. (CC)	179.18
Height Change (in)	0.045	Vol. Change (CC)	23.40
Ht. After Cons. (in)	2.614	Cell Exp. (CC)	17.40
Initial Area (sq in)	4.112	Net Change (CC)	6.00
Area After Cons. (sq in)	4.042	Cons. Vol. (CC)	173.18

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00737EBU1 @ 10.20-10.45', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05

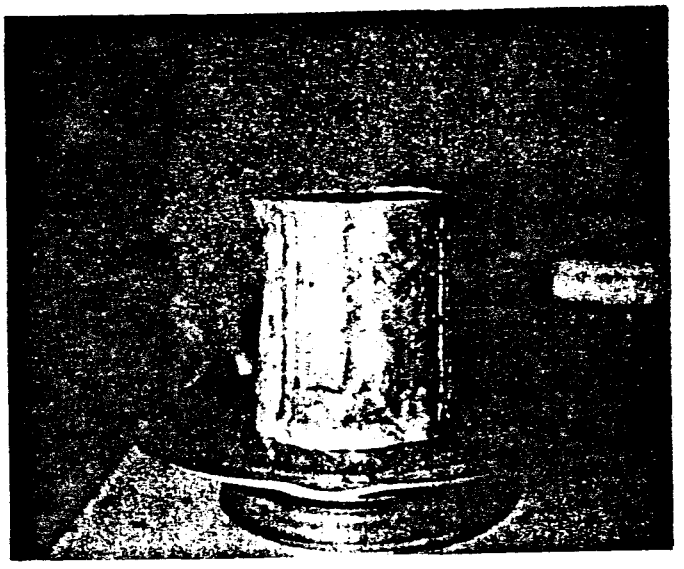
BORING NO.	37891	SAMPLED	11-12-91 KH
DEPTH	10.20 - 10.45 FT	TEST STARTED	12-07-91 DCW
SAMPLE NO.	BH00737EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS Liner	SETUP NO.	1P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.659	Init. Area (sq in)	4.112
Consol. Ht. (in)	2.614	Consol. Area (sq in)	4.042
Back Pres. PSI	89.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.042	0	89.00	0.0	1152	0	0.00
125.0	4453	0.01	0.38	4.058	4512	49.50	-5688.0	6840	11352	1.66
165.0	5878	0.02	0.77	4.073	5933	50.00	-5616.0	6768	12701	1.88
187.0	6662	0.03	1.15	4.089	6698	51.00	-5472.0	6624	13322	2.01
193.0	6875	0.04	1.53	4.105	6886	54.50	-4968.0	6120	13006	2.13
190.0	6769	0.05	1.91	4.121	6753	56.80	-4636.8	5789	12542	2.17
185.0	6590	0.06	2.30	4.137	6549	57.00	-4608.0	5760	12309	2.14
180.0	6412	0.07	2.68	4.153	6347	57.40	-4550.4	5702	12050	2.11
176.0	6270	0.08	3.06	4.170	6182	57.60	-4521.6	5674	11856	2.09
172.0	6127	0.09	3.44	4.186	6018	57.70	-4507.2	5659	11677	2.06
167.0	5949	0.10	3.83	4.203	5820	57.80	-4492.8	5645	11464	2.03
151.0	5379	0.15	5.74	4.288	5157	57.80	-4492.8	5645	10802	1.91
140.0	4987	0.20	7.65	4.377	4685	57.80	-4492.8	5645	10329	1.83
139.0	4952	0.25	9.56	4.470	4555	57.80	-4492.8	5645	10200	1.81
150.0	5344	0.30	11.48	4.566	4811	57.80	-4492.8	5645	10456	1.85
157.5	5611	0.35	13.39	4.667	4943	58.00	-4464.0	5616	10559	1.88
164.5	5860	0.40	15.30	4.773	5048	58.40	-4406.4	5558	10607	1.91
175.0	6234	0.45	17.21	4.883	5249	58.70	-4363.2	5515	10765	1.95
149.0	5308	0.50	19.13	4.998	4366	59.20	-4291.2	5443	9809	
140.0	4987	0.55	21.04	5.119	4005	59.50	-4248.0	5400	9405	
140.0	4987	0.60	22.95	5.246	3908	59.70	-4219.2	5371	9280	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37891

BH00737EBUI

10.20–10.45 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37891**
Sample Number:	**BH00747EBU1**
Sample Depth:	**45.70-46.15 feet (Bedrock)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	11-07-91 KM,MC
DEPTH	45.70 - 46.15 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00747EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	36.36
Wt. Dry Soil & Pan (g)	36.10
Wt. Lost Moisture (g)	0.26
Wt. of Pan Only (g)	3.60
Wt. of Dry Soil (g)	32.50
Moisture Content %	0.8
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.52

WASH SIEVE ANALYSIS

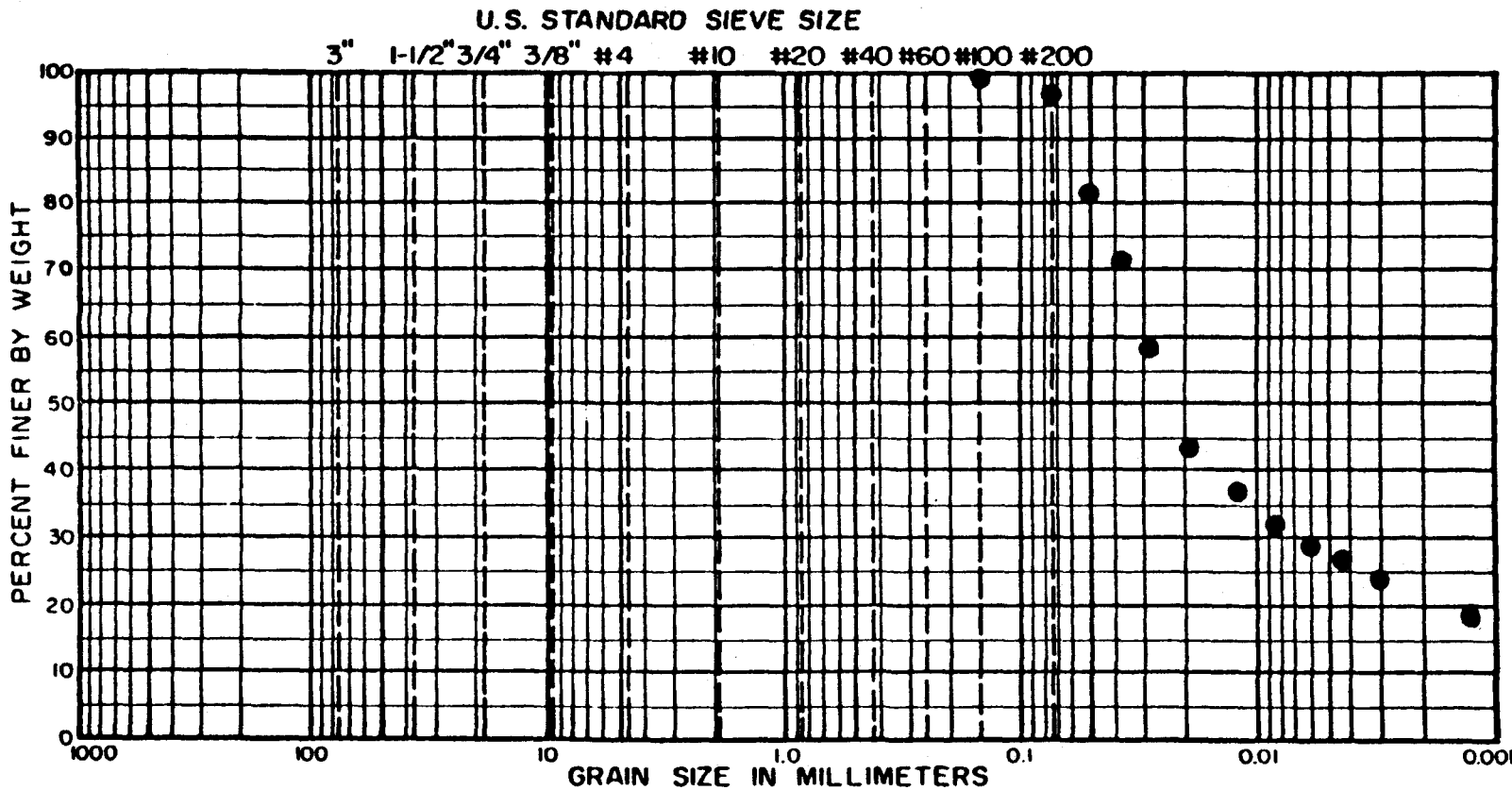
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00
Weight of - #10 Dry (g)	59.52
Wt. Total Sample Dry (g)	59.52
Calc. Wt. "W" (g)	59.52
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	1.31	1.32	0.00	0.00	0.0	100.0
#40	1.32	1.33	0.01	0.01	0.0	100.0
#60	1.31	1.32	0.01	0.02	0.0	100.0
#100	1.31	1.34	0.03	0.05	0.1	99.9
#200	1.31	3.39	2.08	2.14	3.6	96.4

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37891
DEPTH	45.70 - 46.15 FT
SAMPLE NO.	BH00747EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-07-91 KM,MC
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	36.360
Wt. Dry Soil & Pan (g)	36.100
Wt. of Pan Only (g)	3.600
Sieve:	
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.720
Value of "a"	0.986
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.500
Meniscus Corr'n	-1.000
Temp., Deg. C	21.000
Temp. Coef. K	0.01304
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00741EBU1	45.7 - 46.15'	#37891

ADVANCED TERRA TESTING™

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	11-07-91 KM,MC
DEPTH	45.70 - 46.15 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00747EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	21.000
Sp. Gr. of Soil	2.720	Temp. Coef. K	0.01304
Value of "a"	0.986	Wt. Dry Sample "W"	59.524
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.500		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	54.50	49.00	81.2	81.2	7.35	0.0500
1.0	48.50	43.00	71.2	71.2	8.34	0.0377
2.0	40.50	35.00	58.0	58.0	9.65	0.0286
5.0	32.00	26.50	43.9	43.9	11.04	0.0194
15.0	27.50	22.00	36.4	36.4	11.78	0.0116
30.0	25.00	19.50	32.3	32.3	12.19	0.0083
60.0	23.00	17.50	29.0	29.0	12.52	0.0060
120.0	21.50	16.00	26.5	26.5	12.76	0.0043
250.0	20.00	14.50	24.0	24.0	13.01	0.0030
1440.0	17.00	11.50	19.0	19.0	13.50	0.0013

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EGASCO

LOCATION 37871

BORING RH00747 EB01 SAMPLE ____ DEPTH 45.7-46.9'

FIELD DENSITY BY ___/___/___

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

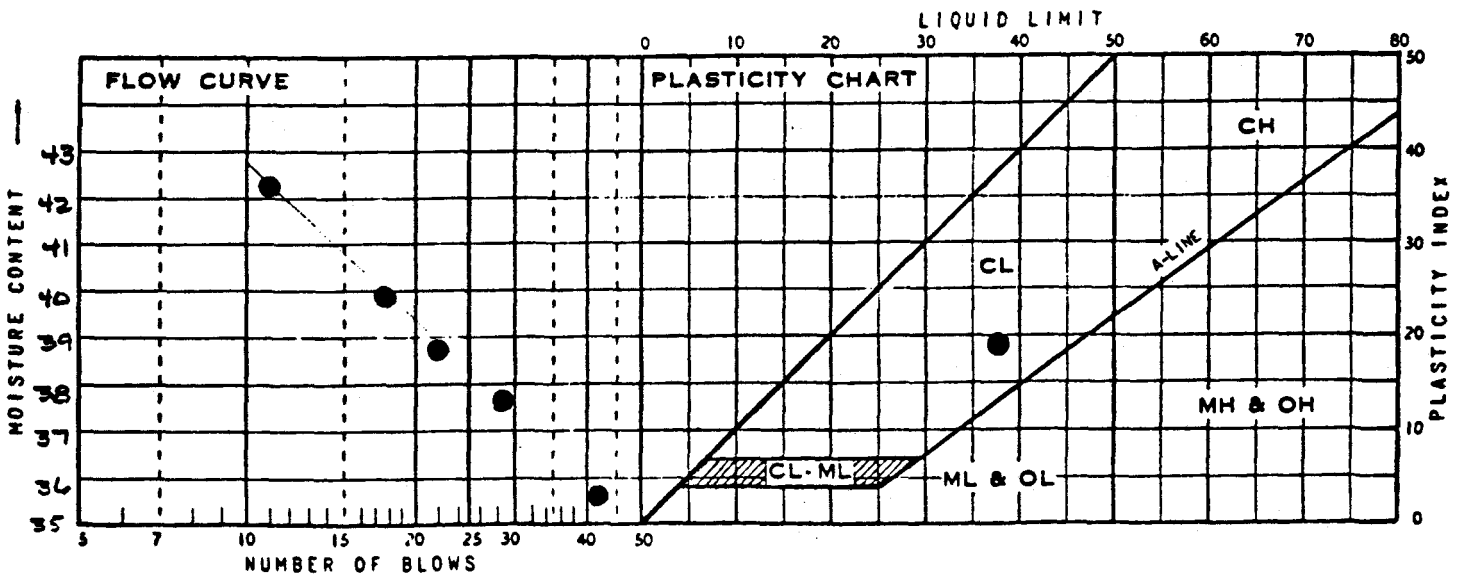
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SR. 1/14/92.

DETERMINATION	1	2	3	4	5	6
DISH	134	105	70A			
WT OF DISH + WET SOIL g	12.60	11.57	9.84			
WT OF DISH + DRY SOIL g	10.70	9.89	8.44	—	—	—
WT OF MOISTURE g	1.90	1.70	1.40			
WT OF DISH g	1.31	1.32	1.32	—	—	—
WT OF DRY SOIL g	9.39	8.57	7.11			
MOISTURE CONTENT %	20.2	19.8	19.7			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	22A	05	54	298	274	
NUMBER OF BLOWS	42	29	22	18	11	
WT OF DISH + WET SOIL g	13.16	15.20	12.40	19.13	16.84	
WT OF DISH + DRY SOIL g	10.65	11.40	9.31	14.08	12.27	—
WT OF MOISTURE g	2.51	3.80	3.09	5.05	4.62	
WT OF DISH g	1.34	1.31	1.32	1.42	1.32	—
WT OF DRY SOIL g	9.31	10.09	7.99	12.66	10.95	
MOISTURE CONTENT %	35.6	37.7	38.7	39.9	42.2	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		38.3	19.7	18.4	CL	

ADVANCED TERRA TESTING INC

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00866EB01	BH00741EB01	BH00761EB01	BH00845EB01	BH00833EB01	BH00759EB01
DEPTH	5.0-5.25'	45.7-46.5'	3.0-3.25'	20.9-21.15'	1.5-1.75'	0.5-0.9'
Sample # SAS Tag #	39691	37891	39191	38991	38991	39091
Sampled	11-25-91	11-07-91	11-14-91	11-12-91	11-11-91	11-15-91
BY:	BP & KH	KM & MC	KM & MC	BP & KH	BP & MS	KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry) (W_o) g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.86g	177.860g	178.070	178.010g	177.99	177.730
Temperature °C, (T_x)	22.4	22.8	22.9	22.0	22.8	23.1
Weight of water and flask at T_x (from cal. curve) (W_a)	162.076g	162.062g	162.066	162.084g	162.062	162.061
Specific Gravity = *	2.71	2.72	2.78	2.76	2.75	2.68
PAN #	2C	34+	517	34	80	31

JOB NO. 2031-05 NAME EB4500

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37891**
Sample Number:	**BH00746EBU1**
Sample Depth:	**46.15-46.40 feet (Bedrock)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	11-07-91 KM
DEPTH	46.15 - 46.40 FT	TEST STARTED	12-06-91 DCW
SAMPLE NO.	BH00746EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	2P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	388.5	423.2
Wt. Wet Soil & Pan (g)	397.9	432.6
Wt. Dry Soil & Pan (g)	347.7	347.7
Wt. Lost Moisture (g)	50.2	84.9
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	338.3	338.3
Moisture Content %	14.8	25.1
Wet Density PCF	115.2	131.7
Dry Density PCF	100.3	105.3

Init. Diameter (in)	2.388	(cm)	6.066
Init. Area (sq in)	4.479	(sq cm)	28.897
Init. Height (in)	2.870	(cm)	7.290
Vol. Bef. Consol. (cu ft)	0.00744		
Vol. After Consol. (cu ft)	0.00709		
Effective Porosity %	42.29		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
1501.0	90060	50.2	46.6	16.8	7.5E-08
1480.0	88800	46.6	43.9	20.2	5.9E-08
1360.0	81600	43.9	40.7	23.4	7.8E-08
1327.0	79620	40.7	38.6	26.2	5.4E-08
1460.0	87600	50.0	47.7	16.3	4.9E-08
1415.0	84900	47.7	45.4	18.8	5.2E-08
2868.0	172080	45.4	41.0	22.4	5.0E-08

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37891
DEPTH	46.15 - 46.40 FT
SAMPLE NO.	BH00746EBU1
SOIL DESCR.	SS LINER
SAMPLED	11-07-91 KM
TEST STARTED	12-06-91 DCW
TEST FINISHED	12-25-91
SETUP NO.	2P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	388.540
Wt Soil & Moist at	423.200
Wt. Dry Soil & Pan	347.730
Wt. of Pan Only (g)	9.400
Consol Info:	
Init. Diameter in.	2.388
Initial Height in.	2.870
Vol. change (sat. con.) CC	23.200
Cell Exp.	13.200
Height Change in.	0.174
Test info:	
Pore pres @ begin. psi	69.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT *EBASCO*

JOB NO. 2031-05

BORING NO.	37891	SAMPLED	11-07-91 KM
DEPTH	46.15 - 46.40 FT	TEST STARTED	12-06-91 DCW
SAMPLE NO.	BH00746EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	2P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.1	10.2				
50.0	48.0	8.3	9.8	38.3	47.0	8.7	0.87
60.0	58.0	10.2	11.5	48.5	57.4	8.9	0.89
70.0	68.0	11.8	13.0	58.5	67.6	9.1	0.91
80.0		13.3	13.4	68.4	77.9	9.5	0.95

CONSOLIDATION DATA

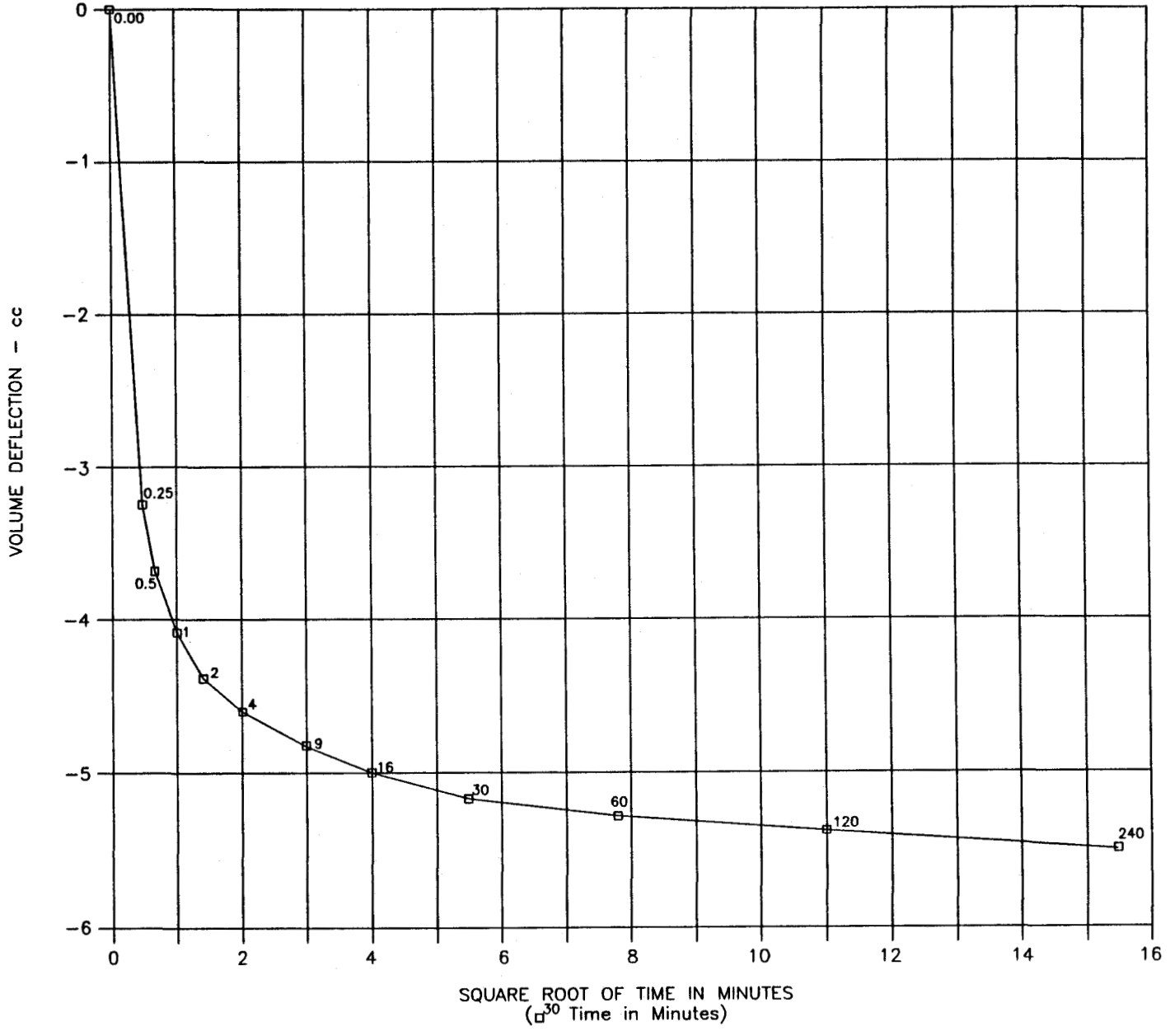
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	13.40	0.00
0.25	0.50	16.65	-3.25
0.5	0.71	17.10	-3.70
1	1.00	17.48	-4.08
2	1.41	17.78	-4.37
4	2.00	18.00	-4.60
9	3.00	18.23	-4.83
16	4.00	18.40	-5.00
30	5.48	18.58	-5.17
60	7.75	18.68	-5.28
120	10.95	18.78	-5.37
240	15.49	18.90	-5.50

Initial Height (in)	2.870	Init. Vol. (CC)	210.68
Height Change (in)	0.174	Vol. Change (CC)	23.20
Ht. After Cons. (in)	2.696	Cell Exp. (CC)	13.20
Initial Area (sq in)	4.479	Net Change (CC)	10.00
Area After Cons. (sq in)	4.542	Cons. Vol. (CC)	200.68

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00746EBU1 @ 46.15–46.40', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37891	SAMPLED	11-07-91 KM
DEPTH	46.15 - 46.40 FT	TEST STARTED	12-06-91 DCW
SAMPLE NO.	BH00746EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	2P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.870	Init. Area (sq in)	4.479
Consol. Ht. (in)	2.696	Consol. Area (sq in)	4.542
Back Pres. PSI	69.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.542	0	69.00	0.0	1152	0	0.00
125.0	3963	0.01	0.37	4.558	3894	49.50	-2808.0	3960	7854	1.98
165.0	5232	0.02	0.74	4.575	5121	50.00	-2736.0	3888	9009	2.32
187.0	5929	0.03	1.11	4.593	5782	51.00	-2592.0	3744	9526	2.54
193.0	6120	0.04	1.48	4.610	5945	54.50	-2088.0	3240	9185	2.84
190.0	6024	0.05	1.85	4.627	5831	56.80	-1756.8	2909	8740	3.00
185.0	5866	0.06	2.23	4.645	5656	57.00	-1728.0	2880	8536	2.96
180.0	5707	0.07	2.60	4.663	5482	57.40	-1670.4	2822	8305	2.94
176.0	5581	0.08	2.97	4.680	5340	57.60	-1641.6	2794	8134	2.91
172.0	5454	0.09	3.34	4.698	5199	57.70	-1627.2	2779	7978	2.87
167.0	5295	0.10	3.71	4.716	5028	57.80	-1612.8	2765	7793	2.82
151.0	4788	0.15	5.56	4.809	4459	57.80	-1612.8	2765	7224	2.61
140.0	4439	0.20	7.42	4.905	4053	57.80	-1612.8	2765	6818	2.47
139.0	4407	0.25	9.27	5.006	3943	57.80	-1612.8	2765	6708	2.43
150.0	4756	0.30	11.13	5.110	4168	57.80	-1612.8	2765	6933	2.51
157.5	4994	0.35	12.98	5.219	4286	58.00	-1584.0	2736	7022	2.57
164.5	5216	0.40	14.84	5.333	4381	58.40	-1526.4	2678	7059	2.64
175.0	5549	0.45	16.69	5.451	4559	58.70	-1483.2	2635	7194	2.73
149.0	4724	0.50	18.55	5.576	3795	59.20	-1411.2	2563	6358	
140.0	4439	0.55	20.40	5.705	3485	59.50	-1368.0	2520	6005	
140.0	4439	0.60	22.26	5.842	3403	59.70	-1339.2	2491	5895	

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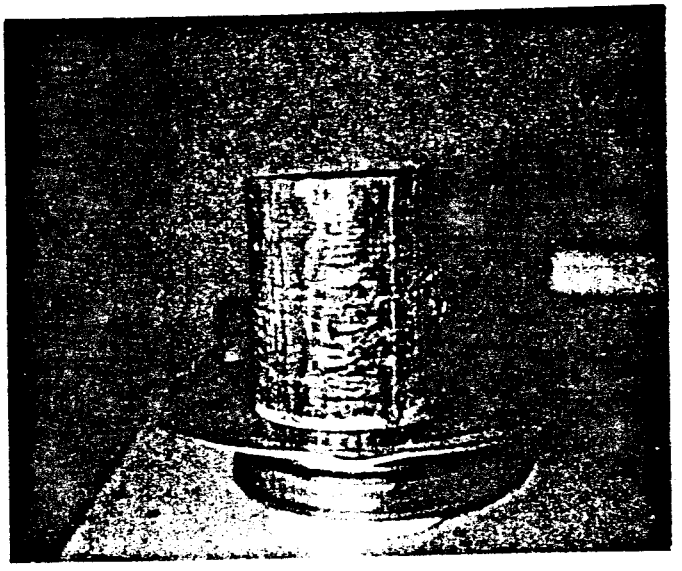
CORE PHOTOGRAPH



37891

BH00746EBUI

46.15–46.40 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37991**
Sample Number:	**BH00720EBU1**
Sample Depth:	**3.00-3.50 feet (Alluvium)**

Data Available:

✔ Grain Size Analysis (Sieve and Hydrometer Test) Data

✔ Atterberg Limits Test Data

__ Specific Gravity Test Data

__ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

__ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-17-91
DEPTH	3.00 - 3.50 FT	DATE TESTED	11-11-91 TNU
SAMPLE NO.	BH00720EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	38.14
Wt. Dry Soil & Pan (g)	37.39
Wt. Lost Moisture (g)	0.75
Wt. of Pan Only (g)	3.69
Wt. of Dry Soil (g)	33.70
Moisture Content %	2.2
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	58.70

WASH SIEVE ANALYSIS

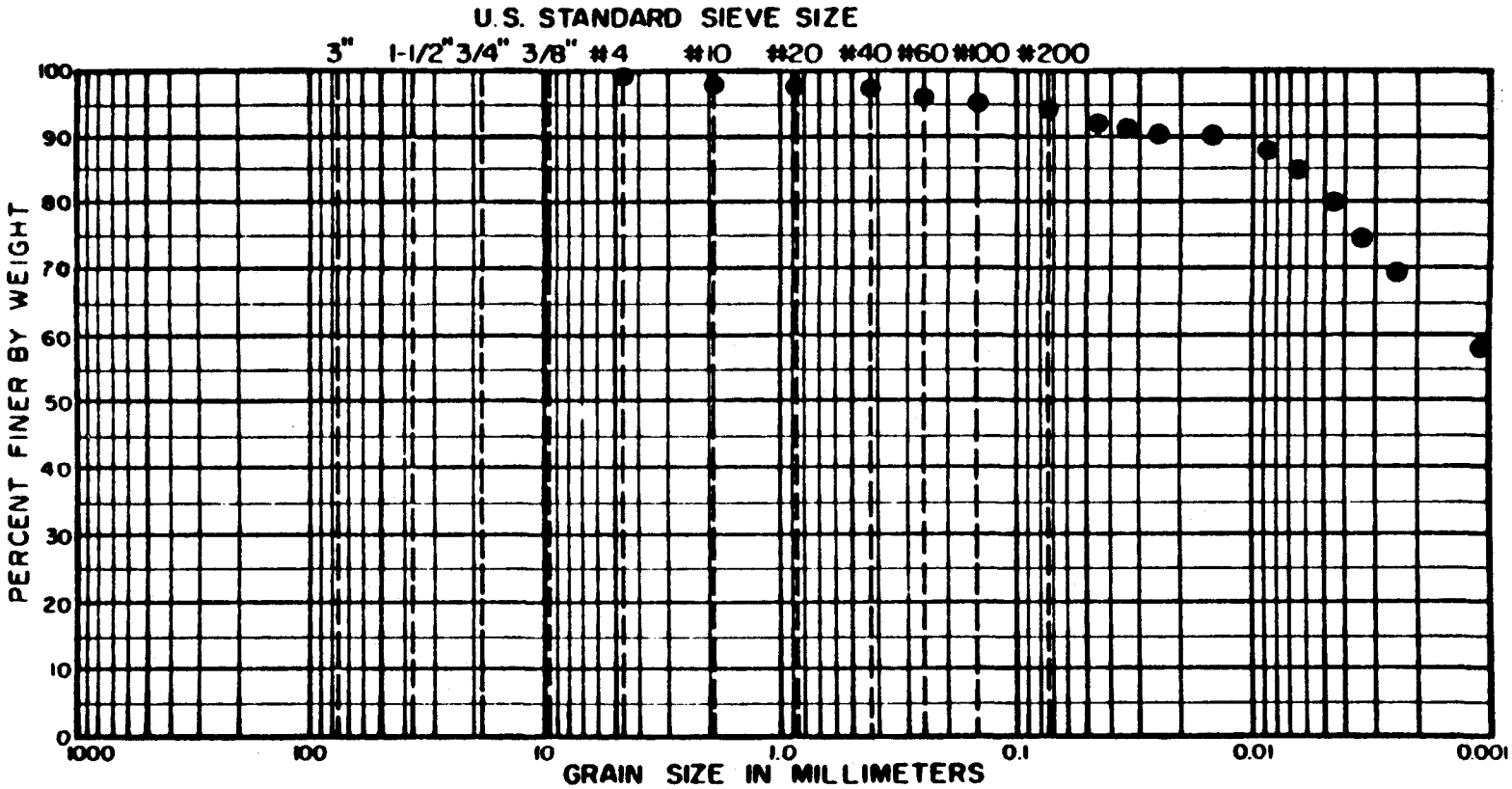
Wt. Total Sample Wet (g)	295.47
Weight of + #10 Before Washing (g)	16.30
Weight of + #10 After Washing (g)	6.42
Weight of - #10 Wet (g)	279.17
Weight of - #10 Dry (g)	282.76
Wt. Total Sample Dry (g)	289.18
Calc. Wt. "W" (g)	60.03
Calc. Mass + #10	1.33

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	2.36	2.36	2.36	0.8	99.2
#10	0.00	4.06	4.06	6.42	2.2	97.8
#20	3.69	3.72	0.03	0.03	2.3	97.7
#40	3.63	3.69	0.06	0.09	2.4	97.6
#60	3.69	4.40	0.71	0.80	3.6	96.4
#100	1.31	1.77	0.46	1.26	4.3	95.7
#200	1.41	1.56	0.15	1.41	4.6	95.4

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37991
DEPTH	3.00 - 3.50 FT
SAMPLE NO.	BH00720EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-17-91
DATE TESTED	11-11-91 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	38.140
Wt. Dry Soil & Pan (g)	37.390
Wt. of Pan Only (g)	3.690
Sieve:	
Wt. Total Sample Wet (g)	295.47
Weight of + #10 Before Washing (g)	16.30
Weight of + #10 After Washing (g)	6.42
Weight of - #10 Wet (g)	279.17

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.003
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
MW00720EBUI	3 - 3.5'	Sample# 379

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-17-91
DEPTH	3.00 - 3.50 FT	DATE TESTED	11-11-91 TNU
SAMPLE NO.	BH00720EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	60.029
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	61.00	56.00	93.3	93.3	6.29	0.0467
1.0	60.00	55.00	91.6	91.6	6.45	0.0334
2.0	59.75	54.75	91.2	91.2	6.49	0.0237
5.0	59.75	54.75	91.2	91.2	6.49	0.0150
15.0	58.00	53.00	88.3	88.3	6.78	0.0089
30.0	56.00	51.00	85.0	85.0	7.11	0.0064
60.0	53.00	48.00	80.0	80.0	7.60	0.0047
120.0	49.50	44.50	74.1	74.1	8.17	0.0034
250.0	46.50	41.50	69.1	69.1	8.66	0.0025
1440.0	39.50	34.50	57.5	57.5	9.81	0.0011

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EBASCO

LOCATION 379

BORING _____ SAMPLE _____ DEPTH 3.0-3.5'

FIELD DENSITY BY _____/_____/_____

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

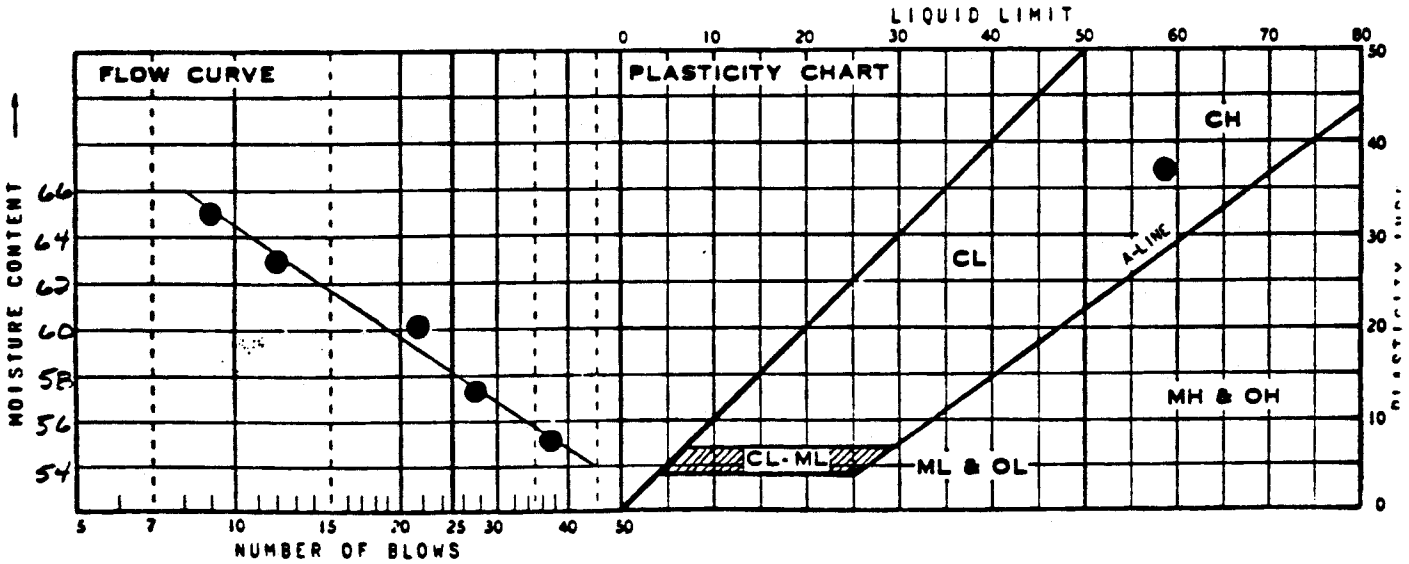
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SR 11/12/91

DETERMINATION	1	2	3	4	5	6
DISH	4	14C	58C			
WT OF DISH + WET SOIL g	6.89	7.23	5.34			
WT OF DISH + DRY SOIL g	5.90	6.20	4.60	—	—	—
WT OF MOISTURE g	.99	1.03	.74			
WT OF DISH g	1.06	1.06	1.06	—	—	—
WT OF DRY SOIL g	4.84	5.14	3.54			
MOISTURE CONTENT %	20.5	20.0	20.9			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	44C	3	62C	6	8	
NUMBER OF BLOWS	39	28	22	11±	9±	
WT OF DISH + WET SOIL g	14.28	15.70	15.64	18.93	18.90	
WT OF DISH + DRY SOIL g	9.58	10.36	10.13	12.00	11.87	—
WT OF MOISTURE g	4.70	5.34	5.51	6.93	7.03	
WT OF DISH g	1.06	1.06	1.05	1.02	1.06	—
WT OF DRY SOIL g	8.52	9.30	9.08	10.98	10.81	
MOISTURE CONTENT %	55.2	57.4	60.7	63.1	65.0	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION
		58.1	20.5	37.6	CH

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37991**
Sample Number:	**BH00719EBU1**
Sample Depth	**3.50-3.75 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-23-91 KM&CB
DEPTH	3.50 - 3.75 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00719EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	3P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	386.1	409.9
Wt. Wet Soil & Pan (g)	395.6	419.3
Wt. Dry Soil & Pan (g)	344.5	344.5
Wt. Lost Moisture (g)	51.1	74.8
Wt. of Pan Only (g)	9.5	9.5
Wt. of Dry Soil (g)	335.1	335.1
Moisture Content %	15.2	22.3
Wet Density PCF	130.8	132.8
Dry Density PCF	113.5	108.5

Init. Diameter (in)	2.385	(cm)	6.058
Init. Area (sq in)	4.468	(sq cm)	28.824
Init. Height (in)	2.518	(cm)	6.396
Vol. Bef. Consol. (cu ft)	0.00651		
Vol. After Consol. (cu ft)	0.00680		
Effective Porosity %	38.83		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
1499.0	89940	49.6	48.7	5.4	1.6E-08
1337.0	80220	48.7	47.9	6.2	1.6E-08
1443.0	86580	47.9	47.0	7.0	1.6E-08
1459.0	87540	47.0	46.2	7.8	1.4E-08
1420.0	85200	46.2	45.4	8.5	1.5E-08
1450.0	87000	45.4	44.7	9.2	1.3E-08
1569.0	94140	44.7	44.0	9.9	1.3E-08
1396.0	83760	44.0	43.3	10.5	1.3E-08

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37991
DEPTH	3.50 - 3.75 FT
SAMPLE NO.	BH00719EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-23-91 KM&CB
TEST STARTED	11-12-91 DCW
TEST FINISHED	11-25-91
SETUP NO.	3P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	386.100
Wt Soil & Moist at	409.890
Wt. Dry Soil & Pan	344.510
Wt. of Pan Only (g)	9.460
Consol Info:	
Init. Diameter in.	2.385
Initial Height in.	2.518
Vol. change (sat. con.) CC	7.250
Cell Exp.	15.600
Height Change in.	0.015
Test info:	
Pore pres @ begin. psi	79.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-23-91 KM&CB
DEPTH	3.50 - 3.75 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00719EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	3P
TEST TYPE	*TX/Pbp*	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	7.5				
50.0	48.0	3.8	5.1	38.0	41.4	3.4	0.34
60.0	58.0	0.6	1.8	48.0	54.2	6.2	0.62
70.0	68.0	0.1	2.0	58.4	66.4	8.0	0.80
80.0	78.0	1.9	3.3	68.2	77.4	9.2	0.92
90.0		3.4	3.6	78.4	87.9	9.5	0.95

CONSOLIDATION DATA

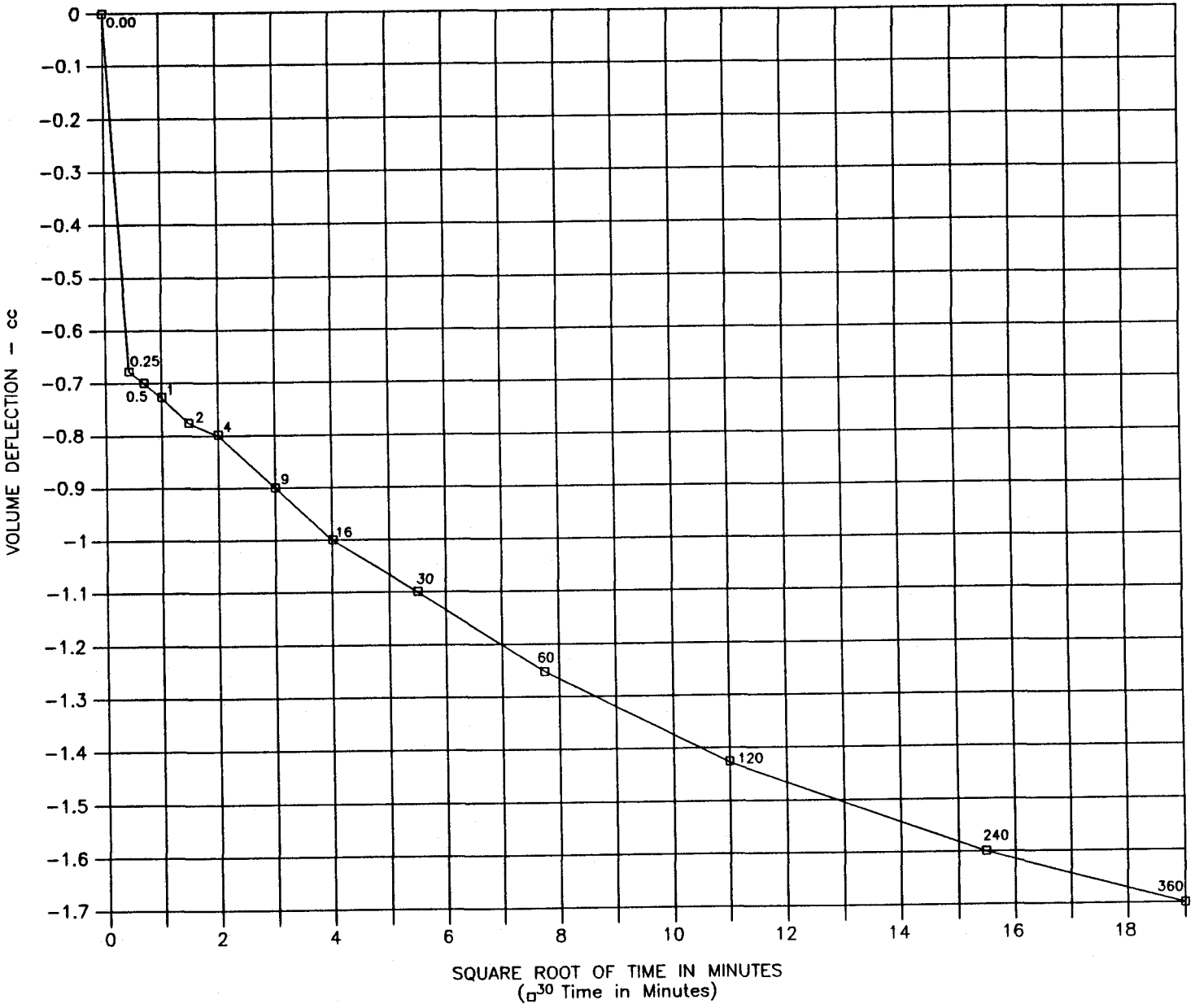
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	3.60	0.00
0.25	0.50	4.28	-0.68
0.5	0.71	4.30	-0.70
1	1.00	4.33	-0.73
2	1.41	4.38	-0.77
4	2.00	4.40	-0.80
9	3.00	4.50	-0.90
16	4.00	4.58	-0.98
30	5.48	4.70	-1.10
60	7.75	4.85	-1.25
120	10.95	5.03	-1.43
240	15.49	5.20	-1.60
360	18.97	5.30	-1.70

Initial Height (in)	2.518	Init. Vol. (CC)	184.37
Height Change (in)	0.015	Vol. Change (CC)	7.25
Ht. After Cons. (in)	2.503	Cell Exp. (CC)	15.60
Initial Area (sq in)	4.468	Net Change (CC)	-8.35
Area After Cons. (sq in)	4.698	Cons. Vol. (CC)	192.72

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00719EBU1 @ 3.50-3.75', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

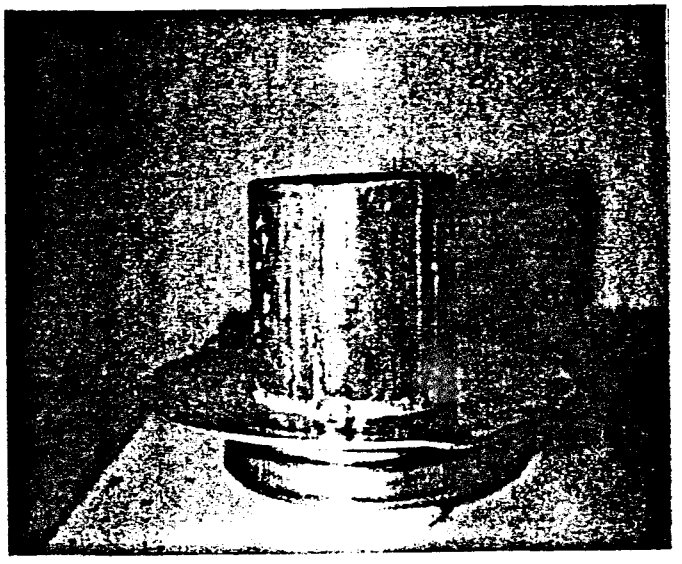
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-23-91 KM&CB
DEPTH	3.50 - 3.75 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00719EBU1	TEST FINISHED	11-25-91
SOIL DESCR.	SS LINER	SETUP NO.	3P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.518	Init. Area (sq in)	4.468
Consol. Ht. (in)	2.503	Consol. Area (sq in)	4.698
Back Pres. PSI	79.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.698	0	79.00	0.0	1152	0	0.00
125.0	3832	0.01	0.40	4.717	3629	49.50	-4248.0	5400	9029	1.67
165.0	5058	0.02	0.80	4.736	4771	50.00	-4176.0	5328	10099	1.90
187.0	5732	0.03	1.20	4.755	5386	51.00	-4032.0	5184	10570	2.04
193.0	5916	0.04	1.60	4.774	5536	54.50	-3528.0	4680	10216	2.18
190.0	5824	0.05	2.00	4.794	5428	56.80	-3196.8	4349	9777	2.25
185.0	5671	0.06	2.40	4.813	5263	57.00	-3168.0	4320	9583	2.22
180.0	5517	0.07	2.80	4.833	5100	57.40	-3110.4	4262	9363	2.20
176.0	5395	0.08	3.20	4.853	4966	57.60	-3081.6	4234	9200	2.17
172.0	5272	0.09	3.60	4.873	4833	57.70	-3067.2	4219	9053	2.15
167.0	5119	0.10	4.00	4.893	4674	57.80	-3052.8	4205	8878	2.11
151.0	4629	0.15	5.99	4.997	4138	57.80	-3052.8	4205	8343	1.98
140.0	4291	0.20	7.99	5.106	3755	57.80	-3052.8	4205	7960	1.89
139.0	4261	0.25	9.99	5.219	3647	57.80	-3052.8	4205	7852	1.87
150.0	4598	0.30	11.99	5.338	3848	57.80	-3052.8	4205	8053	1.92
157.5	4828	0.35	13.98	5.462	3949	58.00	-3024.0	4176	8125	1.95
164.5	5042	0.40	15.98	5.591	4029	58.40	-2966.4	4118	8147	1.98
175.0	5364	0.45	17.98	5.728	4184	58.70	-2923.2	4075	8259	2.03
149.0	4567	0.50	19.98	5.871	3476	59.20	-2851.2	4003	7479	
140.0	4291	0.55	21.97	6.021	3184	59.50	-2808.0	3960	7144	
140.0	4291	0.60	23.97	6.179	3103	59.70	-2779.2	3931	7034	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37991

MW00719EBUI

3.50–3.75 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37991**
Sample Number:	**BH00724EBU1**
Sample Depth:	**11.10-11.40 feet (Bedrock)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-23-91 KM&CB
DEPTH	11.10 - 11.40 FT	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00724EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	34.24
Wt. Dry Soil & Pan (g)	33.65
Wt. Lost Moisture (g)	0.59
Wt. of Pan Only (g)	3.81
Wt. of Dry Soil (g)	29.84
Moisture Content %	2.0
Wt. Hydrom. Sample Wet (g)	60.01
Wt. Hydrom. Sample Dry (g)	58.84

WASH SIEVE ANALYSIS

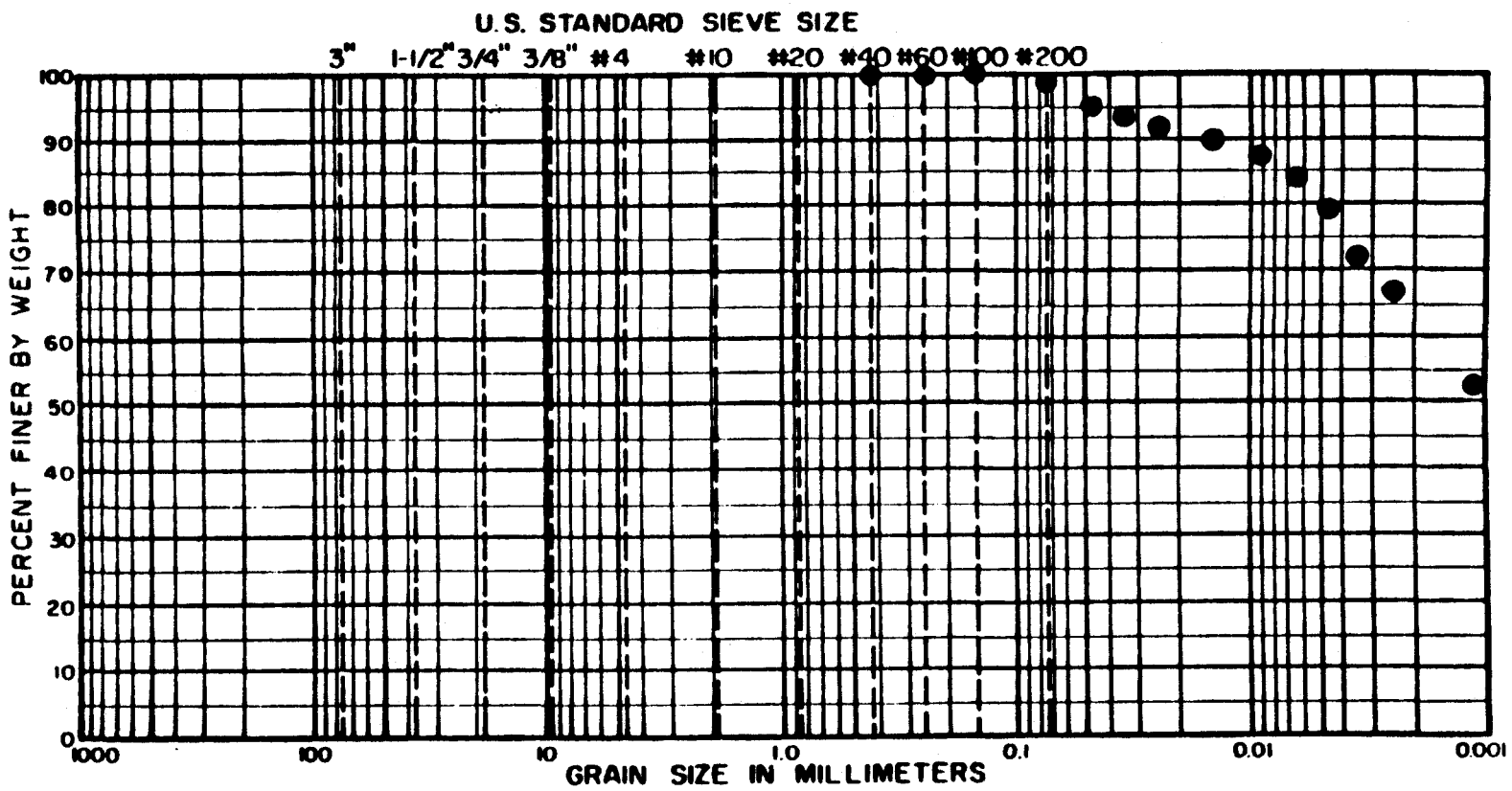
Wt. Total Sample Wet (g)	60.01
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.01
Weight of - #10 Dry (g)	58.84
Wt. Total Sample Dry (g)	58.84
Calc. Wt. "W" (g)	58.84
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	1.31	1.32	0.01	0.01	0.0	100.0
#40	1.32	1.34	0.02	0.03	0.1	99.9
#60	1.32	1.34	0.02	0.05	0.1	99.9
#100	1.31	1.34	0.03	0.08	0.1	99.9
#200	1.29	1.38	0.09	0.17	0.3	99.7

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37991
DEPTH	11.10 - 11.40 FT
SAMPLE NO.	BH00724EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-23-91 KM&CB
DATE TESTED	11-08-91 SR
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	34.240
Wt. Dry Soil & Pan (g)	33.650
Wt. of Pan Only (g)	3.810
Sieve:	
Wt. Total Sample Wet (g)	60.01
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.01

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.650
Value of "a"	1.000
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	23.000
Temp. Coef. K	0.01317
Wt. Wet Hydrom. Samp	60.008
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
MW007241EBUI	11.1 - 11.4'	Sample # 379

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-23-91 KM&CB
DEPTH	11.10 - 11.40 FT	DATE TESTED	11-08-91 SR
SAMPLE NO.	BH00724EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.0
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01317
Value of "a"	1.00	Wt. Dry Sample "W"	58.845
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	60.50	55.50	94.3	94.3	6.37	0.0470
1.0	60.00	55.00	93.5	93.5	6.45	0.0334
2.0	59.00	54.00	91.8	91.8	6.61	0.0240
5.0	58.00	53.00	90.1	90.1	6.78	0.0153
15.0	57.00	52.00	88.4	88.4	6.94	0.0090
30.0	54.25	49.25	83.7	83.7	7.39	0.0065
60.0	51.50	46.50	79.0	79.0	7.84	0.0048
120.0	47.50	42.50	72.2	72.2	8.50	0.0035
250.0	44.25	39.25	66.7	66.7	9.03	0.0025
1440.0	35.75	30.75	52.3	52.3	10.43	0.0011

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION - - - - - - - - - - - - - - - -

LABORATORY CLASSIFICATION - - - - - - - - - - - - -

JOB NO. 2031-05

CLIENT/OWNER EBASCO

LOCATION 379

BORING - - - - SAMPLE - - - - DEPTH 11'-11'4"

FIELD DENSITY BY - - - - - - - - - -

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

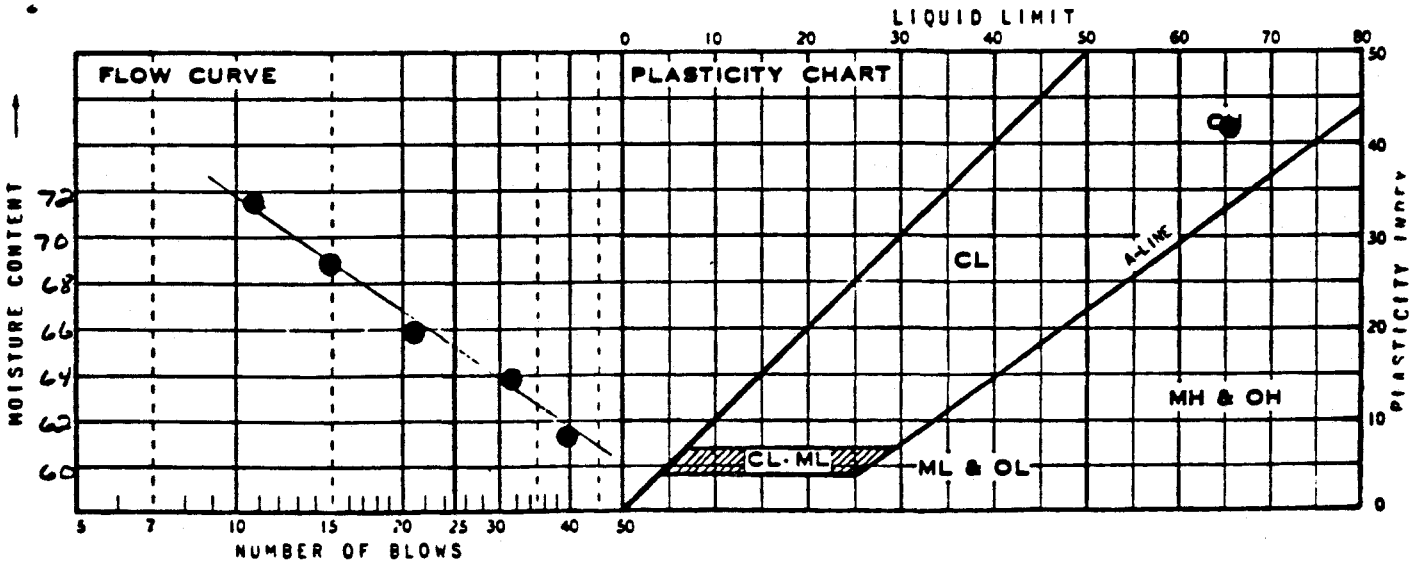
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY S.R. [illegible]

DETERMINATION	1	2	3	4	5	6
DISH	21	20 C	43 C			
WT OF DISH + WET SOIL g	7.61	6.66	6.28			
WT OF DISH + DRY SOIL g	6.39	5.62	5.29	—	—	—
WT OF MOISTURE g	1.22	1.04	.99			
WT OF DISH g	1.06	1.06	1.05	—	—	—
WT OF DRY SOIL g	5.33	4.56	4.24			
MOISTURE CONTENT %	22.9	22.8	23.3			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	23	20	6 C	48 C	17	
NUMBER OF BLOWS	40	33 ±	21	15	10 ±	
WT OF DISH + WET SOIL g	12.85	14.64	14.94	16.74	16.08	
WT OF DISH + DRY SOIL g	8.36	9.34	9.43	10.34	9.81	—
WT OF MOISTURE g	4.49	5.30	5.51	6.40	6.27	
WT OF DISH g	1.05	1.05	1.07	1.05	1.05	—
WT OF DRY SOIL g	7.31	8.29	8.36	9.29	8.76	
MOISTURE CONTENT %	61.4	63.9	65.9	68.9	71.6	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		65.2	22.7	42.5	CH	

ADVANCED TERRA [illegible]

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37991**
Sample Number:	**BH00723EBU1**
Sample Depth:	**11.40-11.65 feet (Bedrock)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-23-91 KM&CB
DEPTH	11.40 - 11.65 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00723EBU1	TEST FINISHED	11-30-91
SOIL DESCR.	SS LINER	SETUP NO.	13S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	393.2	406.3
Wt. Wet Soil & Pan (g)	402.6	415.7
Wt. Dry Soil & Pan (g)	329.9	329.9
Wt. Lost Moisture (g)	72.7	85.8
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	320.5	320.5
Moisture Content %	22.7	26.8
Wet Density PCF	126.8	129.6
Dry Density PCF	103.4	102.2

Init. Diameter (in)	2.391	(cm)	6.073
Init. Area (sq in)	4.490	(sq cm)	28.970
Init. Height (in)	2.630	(cm)	6.680
Vol. Bef. Consol. (cu ft)	0.00683		
Vol. After Consol. (cu ft)	0.00691		
Effective Porosity %	43.83		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
1421.0	85260	48.9	48.6	16.4	6.4E-09
1449.0	86940	48.6	48.3	16.7	6.3E-09
1570.0	94200	48.3	48.1	17.0	3.9E-09
1420.0	85200	48.1	47.8	17.3	6.5E-09
1336.0	80160	47.8	47.6	17.6	4.6E-09
1444.0	86640	47.6	47.3	17.8	6.4E-09
1425.0	85500	47.3	47.1	18.1	5.4E-09
1690.0	101400	47.1	46.8	18.4	5.5E-09

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37991
DEPTH	11.40 - 11.65 FT
SAMPLE NO.	BH00723EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-23-91 KM&CB
TEST STARTED	11-12-91 DCW
TEST FINISHED	11-30-91
SETUP NO.	13S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	393.170
Wt Soil & Moist at	406.270
Wt. Dry Soil & Pan	329.870
Wt. of Pan Only (g)	9.420
Consol Info:	
Init. Diameter in.	2.391
Initial Height in.	2.630
Vol. change (sat. con.) CC	6.750
Cell Exp.	9.000
Height Change in.	0.002
Test info:	
Pore pres @ begin. psi	89.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-23-91 KM&CB
DEPTH	11.40 - 11.65 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00723EBU1	TEST FINISHED	11-30-91
SOIL DESCR.	SS LINER	SETUP NO.	13S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.1	8.0				
50.0	48.0	4.7	5.6	37.8	42.4	4.6	0.46
60.0	58.0	2.2	3.0	47.9	54.5	6.6	0.66
70.0	68.0	1.6		58.1	65.8	7.7	0.77
80.0	78.0	1.9		68.3	77.1	8.8	0.88
90.0	88.0	2.5	3.3	78.4	87.6	9.2	0.92
100.0		3.4	3.4	88.3	97.8	9.5	0.95

CONSOLIDATION DATA

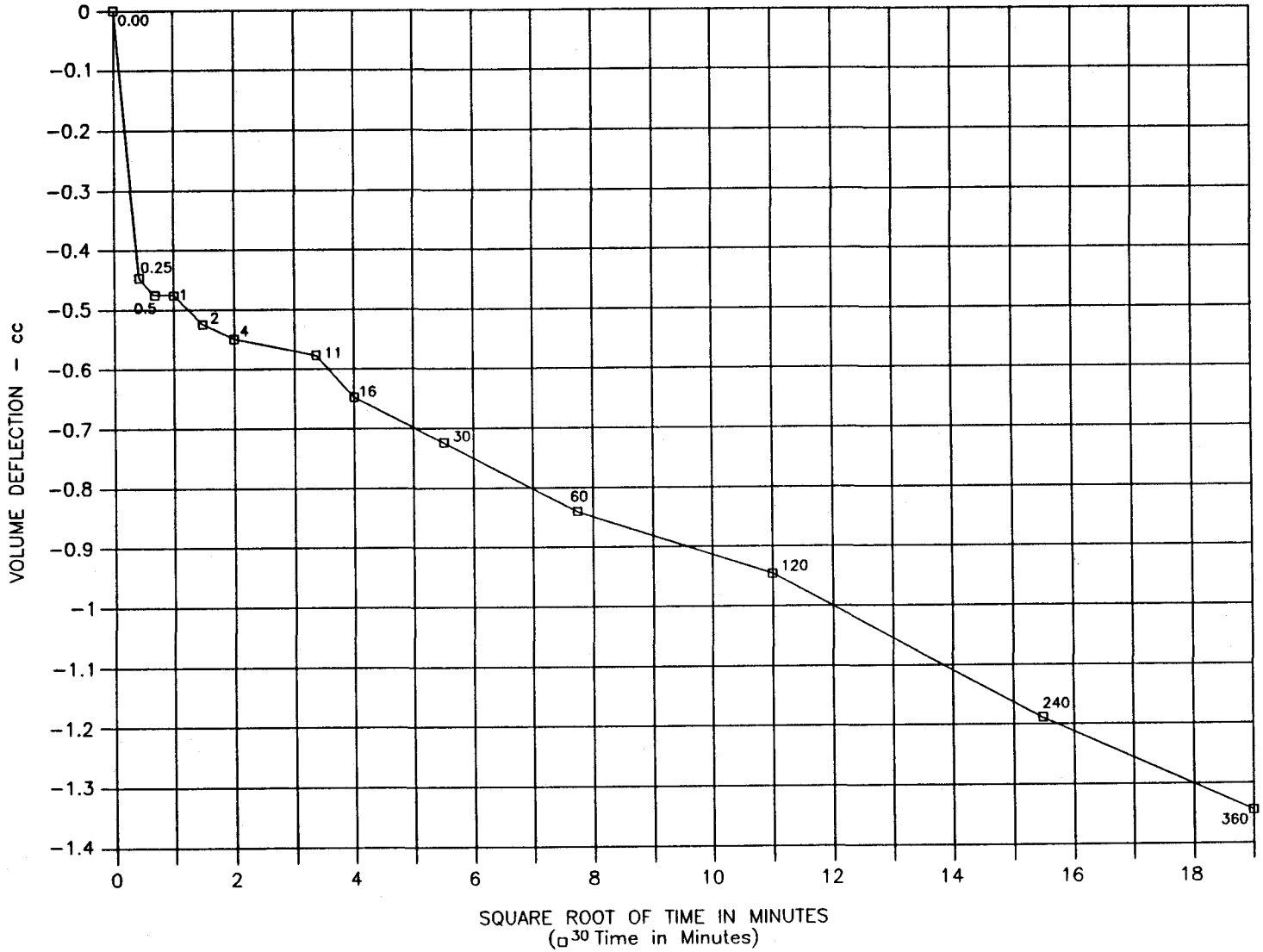
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	3.35	0.00
0.25	0.50	3.80	-0.45
0.5	0.71	3.83	-0.48
1	1.00	3.83	-0.48
2	1.41	3.88	-0.52
4	2.00	3.90	-0.55
11	3.32	3.93	-0.57
16	4.00	4.00	-0.65
30	5.48	4.08	-0.73
60	7.75	4.19	-0.84
120	10.95	4.30	-0.95
240	15.49	4.54	-1.19
360	18.97	4.70	-1.35

Initial Height (in)	2.630	Init. Vol. (CC)	193.55
Height Change (in)	0.002	Vol. Change (CC)	6.75
Ht. After Cons. (in)	2.628	Cell Exp. (CC)	9.00
Initial Area (sq in)	4.490	Net Change (CC)	-2.25
Area After Cons. (sq in)	4.546	Cons. Vol. (CC)	195.80

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00723EBU1 @ 11.40-11.65', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

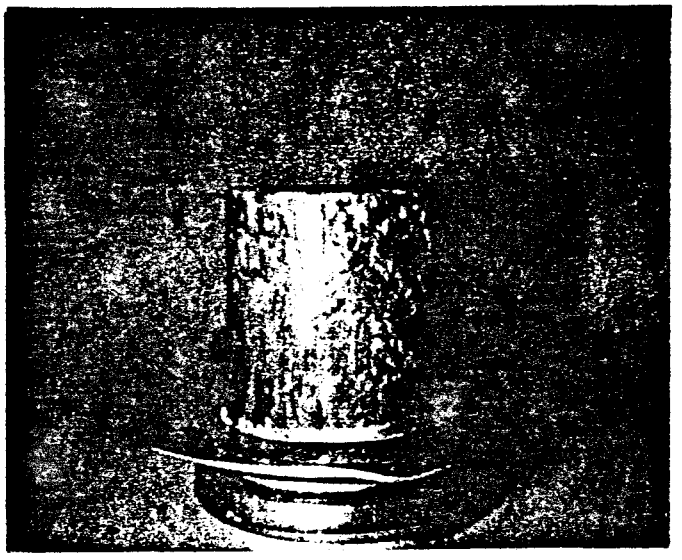
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-23-91 KM&CB
DEPTH	11.4 - 11.65 FT	TEST STARTED	11-12-91 DCW
SAMPLE NO.	BH00723EBU1	TEST FINISHED	11-30-91
SOIL DESCR.	SS LINER	SETUP NO.	13S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.630	Init. Area (sq in)	4.490
Consol. Ht. (in)	2.628	Consol. Area (sq in)	4.546
Back Pres. PSI	89.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.546	0	89.00	0.0	1152	0	0.00
125.0	3960	0.01	0.38	4.563	3896	49.50	-5688.0	6840	10736	1.57
165.0	5227	0.02	0.76	4.581	5124	50.00	-5616.0	6768	11892	1.76
187.0	5924	0.03	1.14	4.598	5785	51.00	-5472.0	6624	12409	1.87
193.0	6114	0.04	1.52	4.616	5947	54.50	-4968.0	6120	12067	1.97
190.0	6019	0.05	1.90	4.634	5832	56.80	-4636.8	5789	11621	2.01
185.0	5861	0.06	2.28	4.652	5657	57.00	-4608.0	5760	11417	1.98
180.0	5702	0.07	2.66	4.670	5482	57.40	-4550.4	5702	11185	1.96
176.0	5575	0.08	3.04	4.688	5339	57.60	-4521.6	5674	11013	1.94
172.0	5449	0.09	3.42	4.707	5198	57.70	-4507.2	5659	10857	1.92
167.0	5290	0.10	3.81	4.725	5027	57.80	-4492.8	5645	10671	1.89
151.0	4783	0.15	5.71	4.821	4455	57.80	-4492.8	5645	10100	1.79
140.0	4435	0.20	7.61	4.920	4047	57.80	-4492.8	5645	9692	1.72
139.0	4403	0.25	9.51	5.024	3936	57.80	-4492.8	5645	9580	1.70
150.0	4752	0.30	11.42	5.131	4158	57.80	-4492.8	5645	9803	1.74
157.5	4989	0.35	13.32	5.244	4272	58.00	-4464.0	5616	9888	1.76
164.5	5211	0.40	15.22	5.362	4364	58.40	-4406.4	5558	9922	1.79
175.0	5544	0.45	17.12	5.485	4538	58.70	-4363.2	5515	10053	1.82
149.0	4720	0.50	19.03	5.614	3775	59.20	-4291.2	5443	9218	
140.0	4435	0.55	20.93	5.749	3464	59.50	-4248.0	5400	8864	
140.0	4435	0.60	22.83	5.891	3381	59.70	-4219.2	5371	8752	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37991

MW00723EBUI

11.40–11.65 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37991**
Sample Number:	**BH00732EBU1**
Sample Depth:	**46.45-46.70 feet (Bedrock)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-29-91 KM
DEPTH	46.45 - 46.70 FT	TEST STARTED	12-15-91 DCW
SAMPLE NO.	BH00732EBU1	TEST FINISHED	01-06-91
SOIL DESCR.	SS LINER	SETUP NO.	11S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	269.2	293.6
Wt. Wet Soil & Pan (g)	278.6	303.0
Wt. Dry Soil & Pan (g)	243.3	243.3
Wt. Lost Moisture (g)	35.3	59.8
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	233.9	233.9
Moisture Content %	15.1	25.5
Wet Density PCF	105.9	136.6
Dry Density PCF	92.0	108.8

Init. Diameter (in)	2.396	(cm)	6.086
Init. Area (sq in)	4.509	(sq cm)	29.091
Init. Height (in)	2.147	(cm)	5.453
Vol. Bef. Consol. (cu ft)	0.00560		
Vol. After Consol. (cu ft)	0.00474		
Effective Porosity %	44.52		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
20.0	1200	49.5	7.2	38.4	6.4E-05
18.0	1080	49.4	1.8	41.4	8.2E-05
20.0	1200	49.6	8.8	37.5	6.1E-05
20.0	1200	49.8	7.9	37.9	6.3E-05
20.0	1200	49.9	7.4	38.1	6.4E-05
19.0	1140	49.5	-0.2	42.4	8.2E-05
20.0	1200	49.6	5.3	39.4	6.8E-05
18.0	1080	49.6	1.2	41.6	8.4E-05
20.0	1200	49.8	-0.4	42.3	7.9E-05
20.0	1200	49.7	0.1	42.1	7.8E-05

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37991
DEPTH	46.45 - 46.70 FT
SAMPLE NO.	BH00732EBU1
SOIL DESCR.	SS LINER
SAMPLED	10-29-91 KM
TEST STARTED	12-15-91 DCW
TEST FINISHED	01-06-91
SETUP NO.	11S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	269.190
Wt Soil & Moist at	293.620
Wt. Dry Soil & Pan	243.290
Wt. of Pan Only (g)	9.420
Consol Info:	
Init. Diameter in.	2.396
Initial Height in.	2.147
Vol. change (sat. con.) CC	32.200
Cell Exp.	7.750
Height Change in.	0.181
Test info:	
Pore pres @ begin. psi	69.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-29-91 KM
DEPTH	46.45 - 46.70 FT	TEST STARTED	12-15-91 DCW
SAMPLE NO.	BH00732EBU1	TEST FINISHED	01-06-91
SOIL DESCR.	SS LINER	SETUP NO.	11S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
50.0	48.0	0.8	15.4				
60.0	58.0	18.0	19.9	48.5	57.5	9.0	0.90
70.0	68.0	21.0	22.7	58.4	67.6	9.2	0.92
80.0		23.5	23.6	68.6	78.1	9.5	0.95

CONSOLIDATION DATA

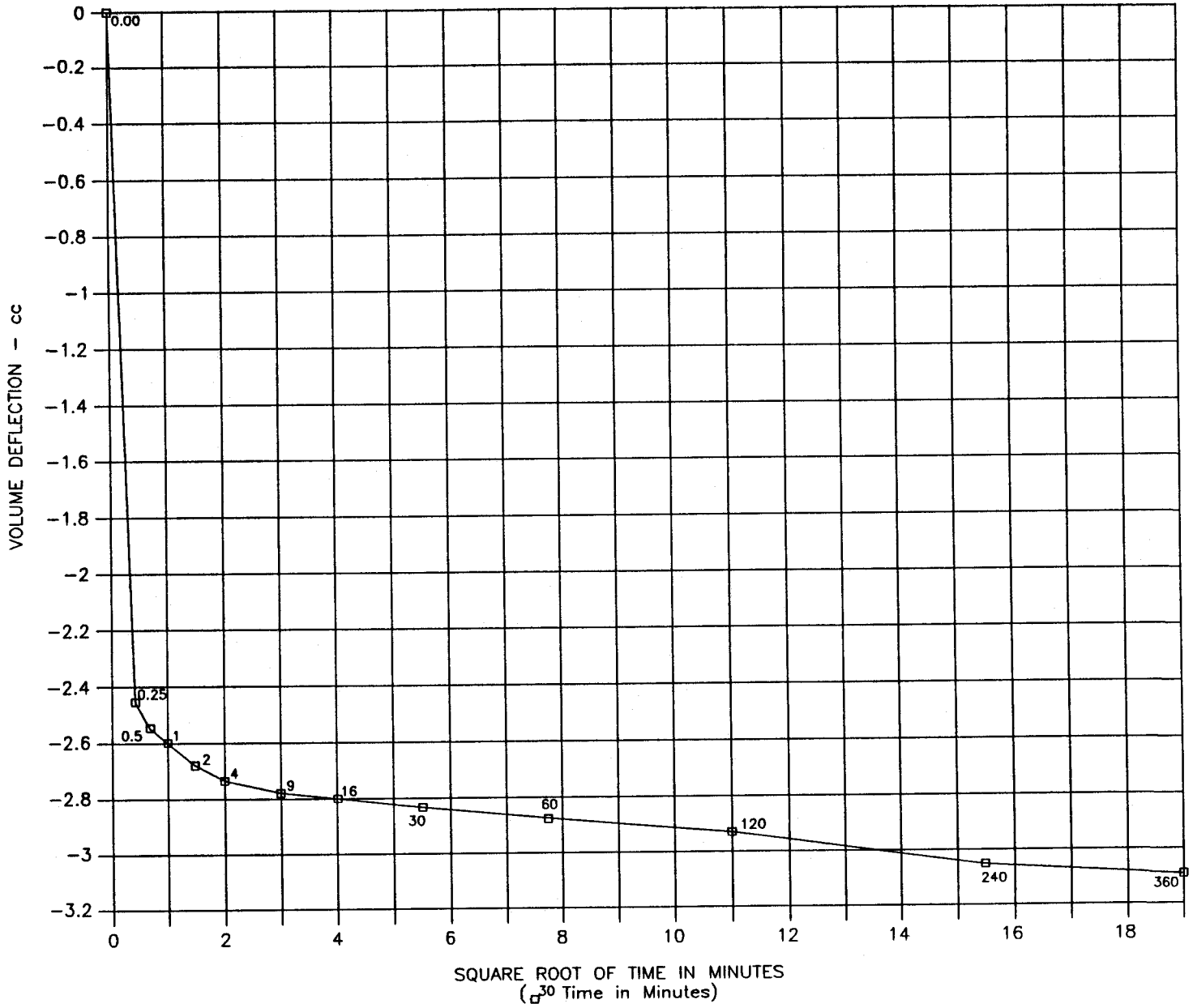
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	24.60	0.00
0.25	0.50	27.05	-2.45
0.5	0.71	27.15	-2.55
1	1.00	27.20	-2.60
2	1.41	27.28	-2.67
4	2.00	27.33	-2.72
9	3.00	27.38	-2.77
16	4.00	27.40	-2.80
30	5.48	27.43	-2.82
60	7.75	27.48	-2.88
120	10.95	27.53	-2.92
240	15.49	27.65	-3.05
360	18.97	27.70	-3.10

Initial Height (in)	2.147	Init. Vol. (CC)	158.66
Height Change (in)	0.181	Vol. Change (CC)	32.20
Ht. After Cons. (in)	1.966	Cell Exp. (CC)	7.75
Initial Area (sq in)	4.509	Net Change (CC)	24.45
Area After Cons. (sq in)	4.165	Cons. Vol. (CC)	134.21

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00732EBU1 @ 46.45-46.70', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

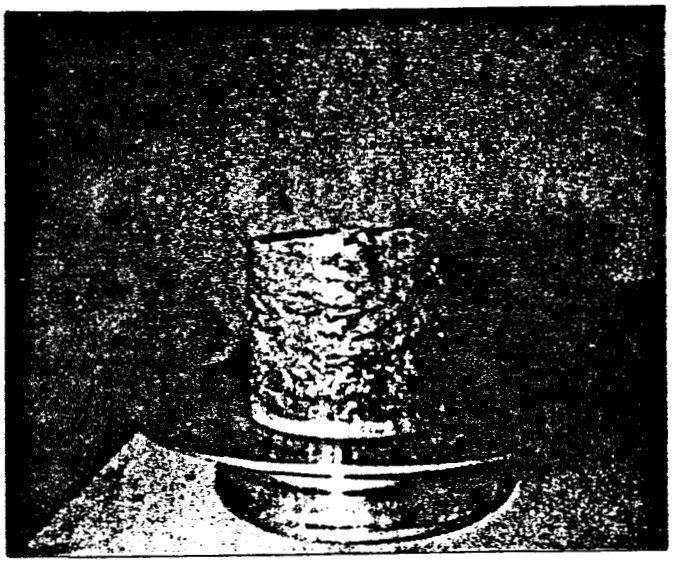
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-29-91 KM
DEPTH	46.45 - 46.70 FT	TEST STARTED	12-15-91 DCW
SAMPLE NO.	BH0073	TEST FINISHED	01-06-91
SOIL DESCR.	SS LINER	SETUP NO.	11S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.147	Init. Area (sq in)	4.509
Consol. Ht. (in)	1.966	Consol. Area (sq in)	4.165
Back Pres. PSI	69.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.165	0	69.00	0.0	1152	0	0.00
125.0	4322	0.01	0.51	4.186	4654	49.50	-2808.0	3960	8614	2.18
165.0	5704	0.02	1.02	4.208	6112	50.00	-2736.0	3888	10000	2.57
187.0	6465	0.03	1.53	4.230	6892	51.00	-2592.0	3744	10636	2.84
193.0	6673	0.04	2.03	4.252	7076	54.50	-2088.0	3240	10316	3.18
190.0	6569	0.05	2.54	4.274	6930	56.80	-1756.8	2909	9839	3.38
185.0	6396	0.06	3.05	4.296	6712	57.00	-1728.0	2880	9592	3.33
180.0	6223	0.07	3.56	4.319	6497	57.40	-1670.4	2822	9319	3.30
176.0	6085	0.08	4.07	4.342	6319	57.60	-1641.6	2794	9112	3.26
172.0	5946	0.09	4.58	4.365	6142	57.70	-1627.2	2779	8922	3.21
167.0	5774	0.10	5.09	4.388	5932	57.80	-1612.8	2765	8697	3.15
151.0	5220	0.15	7.63	4.509	5220	57.80	-1612.8	2765	7985	2.89
140.0	4840	0.20	10.17	4.637	4707	57.80	-1612.8	2765	7471	2.70
139.0	4806	0.25	12.72	4.772	4541	57.80	-1612.8	2765	7305	2.64
150.0	5186	0.30	15.26	4.915	4757	57.80	-1612.8	2765	7522	2.72
157.5	5445	0.35	17.80	5.067	4845	58.00	-1584.0	2736	7581	2.77
164.5	5687	0.40	20.35	5.229	4904	58.40	-1526.4	2678	7582	2.83
175.0	6050	0.45	22.89	5.402	5050	58.70	-1483.2	2635	7686	2.92
149.0	5151	0.50	25.43	5.586	4158	59.20	-1411.2	2563	6721	
140.0	4840	0.55	27.98	5.783	3774	59.50	-1368.0	2520	6294	
140.0	4840	0.60	30.52	5.995	3640	59.70	-1339.2	2491	6132	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



37991

BH00732EBUI

47.00 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**37991**
Sample Number:	**BH00734EBU1**
Sample Depth:	**46.70-48.00 feet (Bedrock)**

Data Available:

✔ Grain Size Analysis (Sieve and Hydrometer Test) Data

✔ Atterberg Limits Test Data

✔ Specific Gravity Test Data

__ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

__ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	37991	SAMPLED	10-29-91 KM,MC
DEPTH	46.70 - 48.00 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00734EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	40.78
Wt. Dry Soil & Pan (g)	40.51
Wt. Lost Moisture (g)	0.27
Wt. of Pan Only (g)	3.66
Wt. of Dry Soil (g)	36.85
Moisture Content %	0.7
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.56

WASH SIEVE ANALYSIS

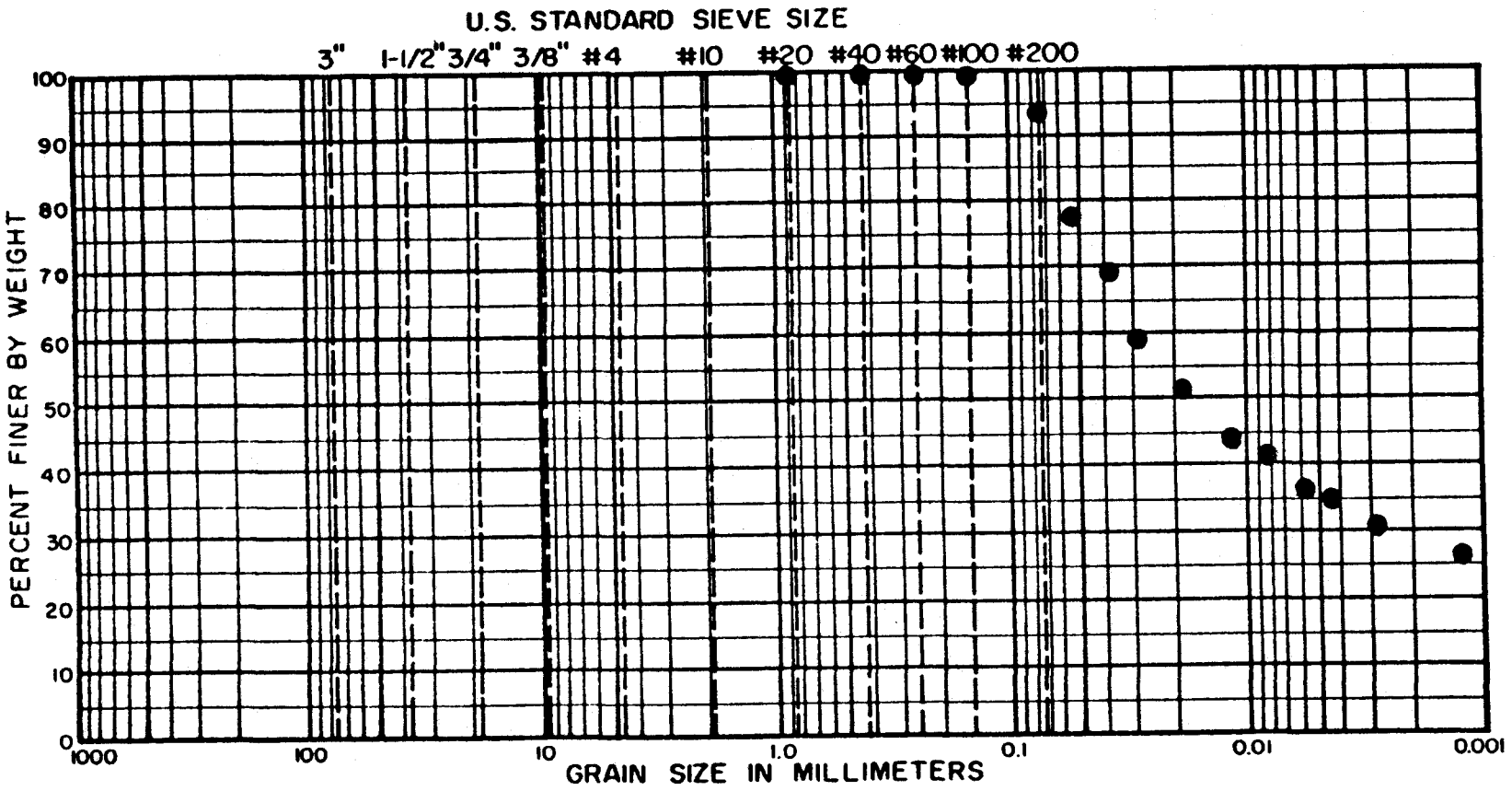
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00
Weight of - #10 Dry (g)	59.56
Wt. Total Sample Dry (g)	59.56
Calc. Wt. "W" (g)	59.56
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	1.29	1.34	0.05	0.05	0.1	99.9
#40	1.32	1.35	0.03	0.08	0.1	99.9
#60	1.30	1.34	0.04	0.12	0.2	99.8
#100	1.31	1.38	0.07	0.19	0.3	99.7
#200	1.31	4.63	3.32	3.51	5.9	94.1

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	37991
DEPTH	46.70 - 48.00 FT
SAMPLE NO.	BH00734EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	10-29-91 KM,MC
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	40.780
Wt. Dry Soil & Pan (g)	40.510
Wt. of Pan Only (g)	3.660
Sieve:	
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.690
Value of "a"	0.992
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.500
Meniscus Corr'n	-1.000
Temp., Deg. C	22.000
Temp. Coef. K	0.01316
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00734 EB UI	46'	#37991

ADVANCED TERRA TESTING INC

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
0.000	37991	SAMPLED	10-29-91 KM,MC
DEPTH	46.70 - 48.00 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00734EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	22.000
Sp. Gr. of Soil	2.690	Temp. Coef. K	0.01316
Value of "a"	0.992	Wt. Dry Sample "W"	59.564
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.500		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	52.00	46.50	77.4	77.4	7.76	0.0519
1.0	47.00	41.50	69.1	69.1	8.58	0.0386
2.0	41.00	35.50	59.1	59.1	9.57	0.0288
5.0	36.00	30.50	50.8	50.8	10.39	0.0190
15.0	32.00	26.50	44.1	44.1	11.04	0.0113
30.0	30.00	24.50	40.8	40.8	11.37	0.0081
60.0	27.50	22.00	36.6	36.6	11.78	0.0058
120.0	26.50	21.00	35.0	35.0	11.94	0.0042
250.0	24.00	18.50	30.8	30.8	12.35	0.0029
1440.0	21.00	15.50	25.8	25.8	12.85	0.0012

Grain Diameter = K*(SQRT(L/T))

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 20[illegible]-05

CLIENT/OWNER EPASCO

LOCATION 37951

BORING BH0734 EB0L SAMPLE ____ DEPTH 46'

FIELD DENSITY BY ___/___/___

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

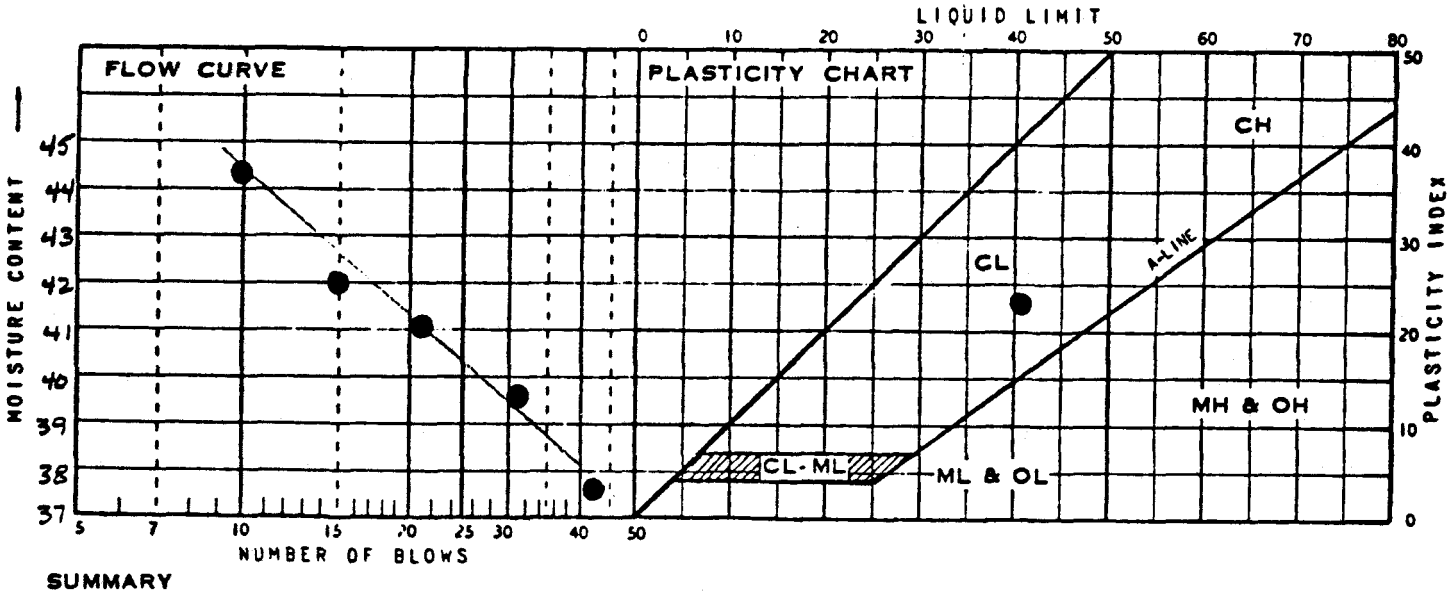
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SR./1/14/92

DETERMINATION	1	2	3	4	5	6
DISH	6	64C	10			
WT OF DISH + WET SOIL g	9.35	11.07	11.32			
WT OF DISH + DRY SOIL g	8.17	9.62	9.81	—	—	—
WT OF MOISTURE g	1.18	1.45	1.51			
WT OF DISH g	1.05	1.06	1.05	—	—	—
WT OF DRY SOIL g	7.12	8.56	8.76			
MOISTURE CONTENT %	16.6	16.9	17.2			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	25C	28C	50C	67C	22C	
NUMBER OF BLOWS	43	31	21	15	10	
WT OF DISH + WET SOIL g	16.43	15.82	13.56	14.92	12.37	
WT OF DISH + DRY SOIL g	12.23	11.63	9.92	10.82	8.89	—
WT OF MOISTURE g	4.20	4.19	3.64	4.10	3.48	
WT OF DISH g	1.07	1.06	1.06	1.05	1.06	—
WT OF DRY SOIL g	11.16	10.57	8.86	9.77	7.83	
MOISTURE CONTENT %	37.6	39.6	41.1	42.0	44.4	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		40.3	16.9	23.4		

ADVANCED TERRA TESTING INC

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00866EB01	BH00741EB01	BH00761EB01	BH00845EB01	BH00833EB01	BH00753EB01
DEPTH	5.0-5.25'	45.7-46.5'	3.0-3.25'	20.9-21.15'	1.5-1.75'	0.5-0.9'
Sample # SAS Tag #	39691	37891	39191	38991	38991	39091
Sampled	11-25-91	11-07-91	11-14-91	11-12-91	11-11-91	11-13-91
BY:	BP & KH	KM & MC	KM & MC	BP & KH	PB & MS	KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry) (W_o) g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.86 g	177.860 g	178.070	178.010 g	177.99	177.730
Temperature °C, (T_x)	22.4	22.8	22.9	22.0	22.8	23.1
Weight of water and flask at T_x (from cal. curve) (W_a)	162.076 g	162.062 g	162.066	162.074 g	162.062	162.061
Specific Gravity = *	2.71	2.72	2.78	2.76	2.75	2.68
PAN #	2C	34+	517	34	80	31

JOB NO. 2031-05 NAME EBASCO

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**38591**
Sample Number:	**BH00812EBU1**
Sample Depth?	**4.80-5.05 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38591	SAMPLED	11-05-91 KH,MC
DEPTH	4.80 - 5.05 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00812EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	44.67
Wt. Dry Soil & Pan (g)	44.58
Wt. Lost Moisture (g)	0.09
Wt. of Pan Only (g)	3.64
Wt. of Dry Soil (g)	40.94
Moisture Content %	0.2
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.87

WASH SIEVE ANALYSIS

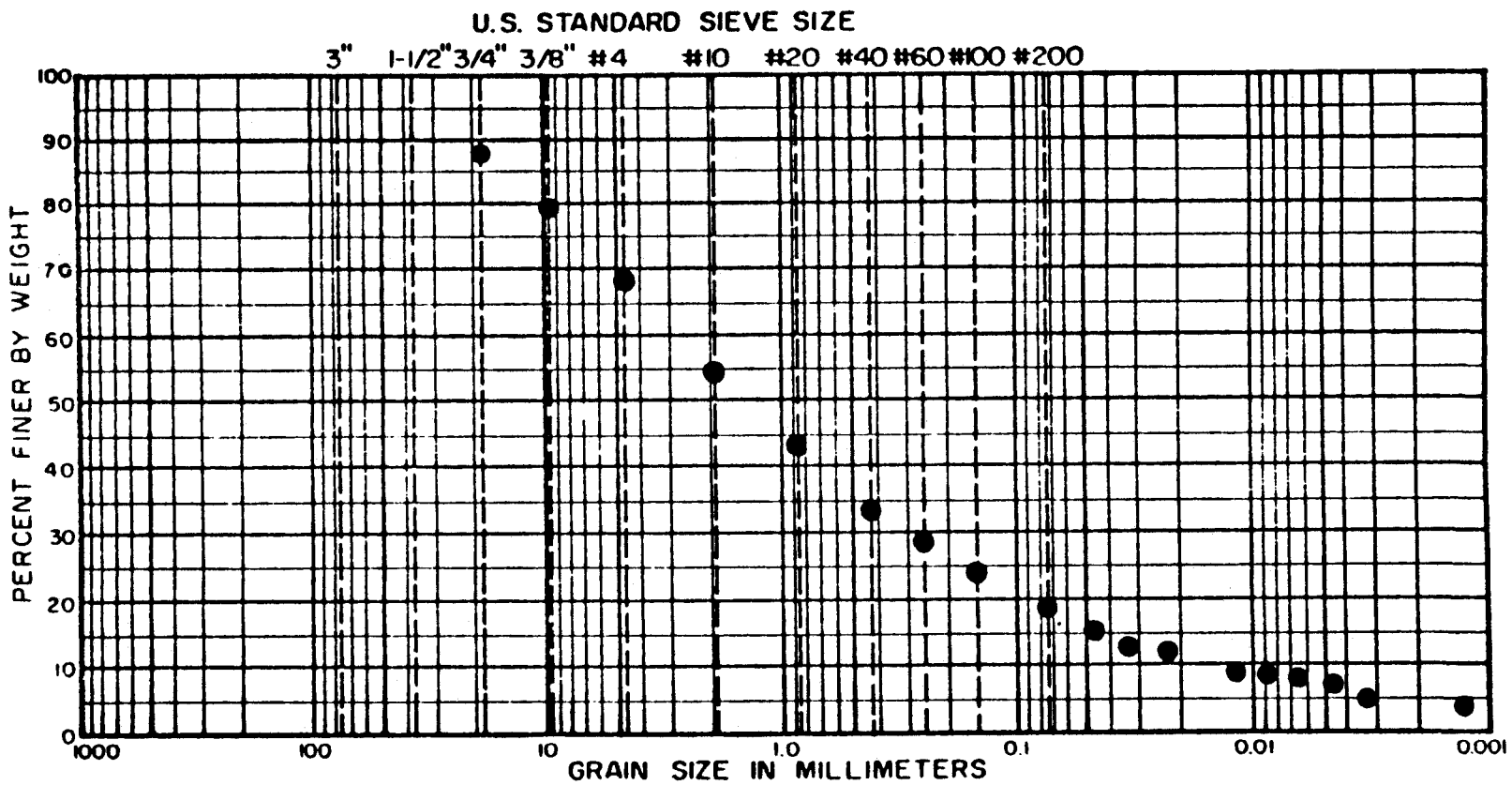
Wt. Total Sample Wet (g)	563.90
Weight of + #10 Before Washing (g)	276.45
Weight of + #10 After Washing (g)	254.28
Weight of - #10 Wet (g)	287.45
Weight of - #10 Dry (g)	308.94
Wt. Total Sample Dry (g)	563.22
Calc. Wt. "W" (g)	109.14
Calc. Mass + #10	49.28

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	63.93	63.93	63.93	11.4	88.6
3/8"	0.00	50.22	50.22	114.15	20.3	79.7
#4	0.00	65.05	65.05	179.20	31.8	68.2
#10	0.00	75.08	75.08	254.28	45.1	54.9
#20	1.30	13.94	12.64	12.64	56.7	43.3
#40	1.30	11.51	10.21	22.85	66.1	33.9
#60	1.31	6.93	5.62	28.47	71.2	28.8
#100	1.29	6.18	4.89	33.36	75.7	24.3
#200	1.32	7.03	5.71	39.07	80.9	19.1

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	38591
DEPTH	4.80 - 5.05 FT
SAMPLE NO.	BH00812EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-05-91 KH,MC
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	44.670
Wt. Dry Soil & Pan (g)	44.580
Wt. of Pan Only (g)	3.640
Sieve:	
Wt. Total Sample Wet (g)	563.90
Weight of + #10 Before Washing (g)	276.45
Weight of + #10 After Washing (g)	254.28
Weight of - #10 Wet (g)	287.45

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.720
Value of "a"	0.986
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	22.000
Temp. Coef. K	0.01305
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00812EBUI	4.8 - 5.05'	#38591

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38591	SAMPLED	11-05-91 KH,MC
DEPTH	4.80 - 5.05 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00812EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	22.000
Sp. Gr. of Soil	2.720	Temp. Coef. K	0.01305
Value of "a"	0.986	Wt. Dry Sample "W"	109.144
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.000		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	23.00	18.00	16.3	16.3	12.52	0.0653
1.0	22.00	17.00	15.4	15.4	12.68	0.0465
2.0	19.50	14.50	13.1	13.1	13.09	0.0334
5.0	18.00	13.00	11.7	11.7	13.34	0.0213
15.0	15.00	10.00	9.0	9.0	13.83	0.0125
30.0	15.00	10.00	9.0	9.0	13.83	0.0089
60.0	13.50	8.50	7.7	7.7	14.08	0.0063
120.0	12.00	7.00	6.3	6.3	14.32	0.0045
250.0	10.50	5.50	5.0	5.0	14.57	0.0032
1440.0	10.00	5.00	4.5	4.5	14.65	0.0013

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EMASCO

LOCATION 38591

BORING SHOOB12 EBDL SAMPLE ____ DEPTH 4.8-5.05'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

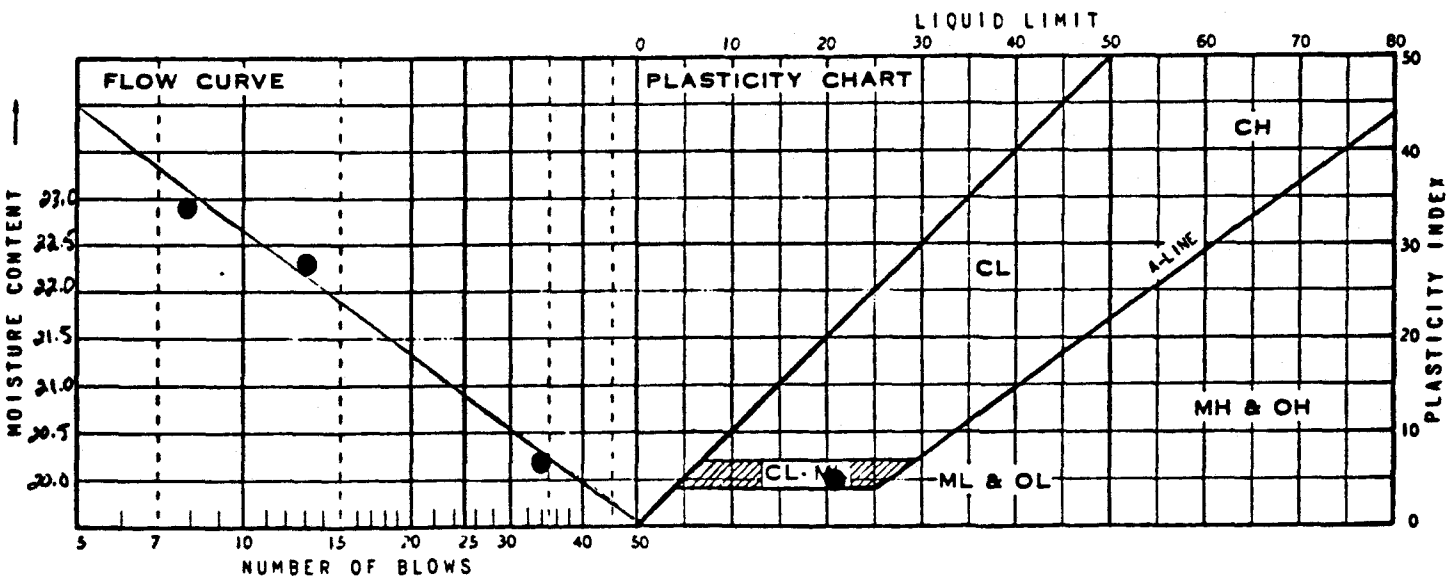
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY ____/__/__

DETERMINATION	1	2	3	4	5	6
DISH	10C	17	58C			
WT OF DISH + WET SOIL g	10.61	9.54	8.51			
WT OF DISH + DRY SOIL g	9.34	8.40	7.46	—	—	—
WT OF MOISTURE g	1.27	1.19	1.05			
WT OF DISH g	1.06	1.06	1.07	—	—	—
WT OF DRY SOIL g	8.28	7.34	6.39			
MOISTURE CONTENT %	15.3	16.2	16.4			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	29C	32C	48C	22		
NUMBER OF BLOWS	34	19	13	8		
WT OF DISH + WET SOIL g	13.77	14.63	13.09	11.95		
WT OF DISH + DRY SOIL g	11.64	12.37	10.90	9.92	—	—
WT OF MOISTURE g	2.13	2.26	2.19	2.03		
WT OF DISH g	1.07	1.04	1.06	1.06	—	—
WT OF DRY SOIL g	10.57	11.33	9.84	8.86		
MOISTURE CONTENT %	20.2	19.9	22.3	22.9		



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		20.9	15.9	5.0	CL-ML	

ADVANCED TERRA TESTING inc

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00734EB01	BH00840EB01	BH00812EB01	BH00738EB01	BH00775EB01	BH00766EB01
DEPTH	46'	11.50-11.75'	4.8-5.05'	10.0-10.2'	41.75-42.25'	11.8-11.75'
Sample # SAS Tag #	37991	38991	38591	37891	39191	39191
Sampled BY:	10-29-91 KM & MC	11-12-91 RP & KH	11-05-91 KH & MC	1-6-91 KM & JN	11-20-91 KM & Nelson	11-14-91 KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry) (W_o) g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask + soil, and water (W_b)	177.82	177.840g	177.89g	177.790g	177.900g	177.690g
Temperature °C, (T_x)	20.7	21.5	22.0	21.6	18.2	19.0
Weight of water and flask at T_x (from cal. curve) (W_a)	162.101g	162.095g	162.084g	162.091g	162.175	162.153
Specific Gravity = *	2.69	2.70	2.72	2.69	2.76	2.64
PAN #	13	21B	27	6C	32	26B

JOB NO. 2031-05 NAME EBASCO

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

Page No. ___ Of ___

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**38991**
Sample Number:	**BH00833EBU1**
Sample Depth:	**1.50-1.75 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-11-91 PB,MS
DEPTH	1.50 - 1.75 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00833EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	35.82
Wt. Dry Soil & Pan (g)	35.57
Wt. Lost Moisture (g)	0.25
Wt. of Pan Only (g)	3.67
Wt. of Dry Soil (g)	31.90
Moisture Content %	0.8
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.53

WASH SIEVE ANALYSIS

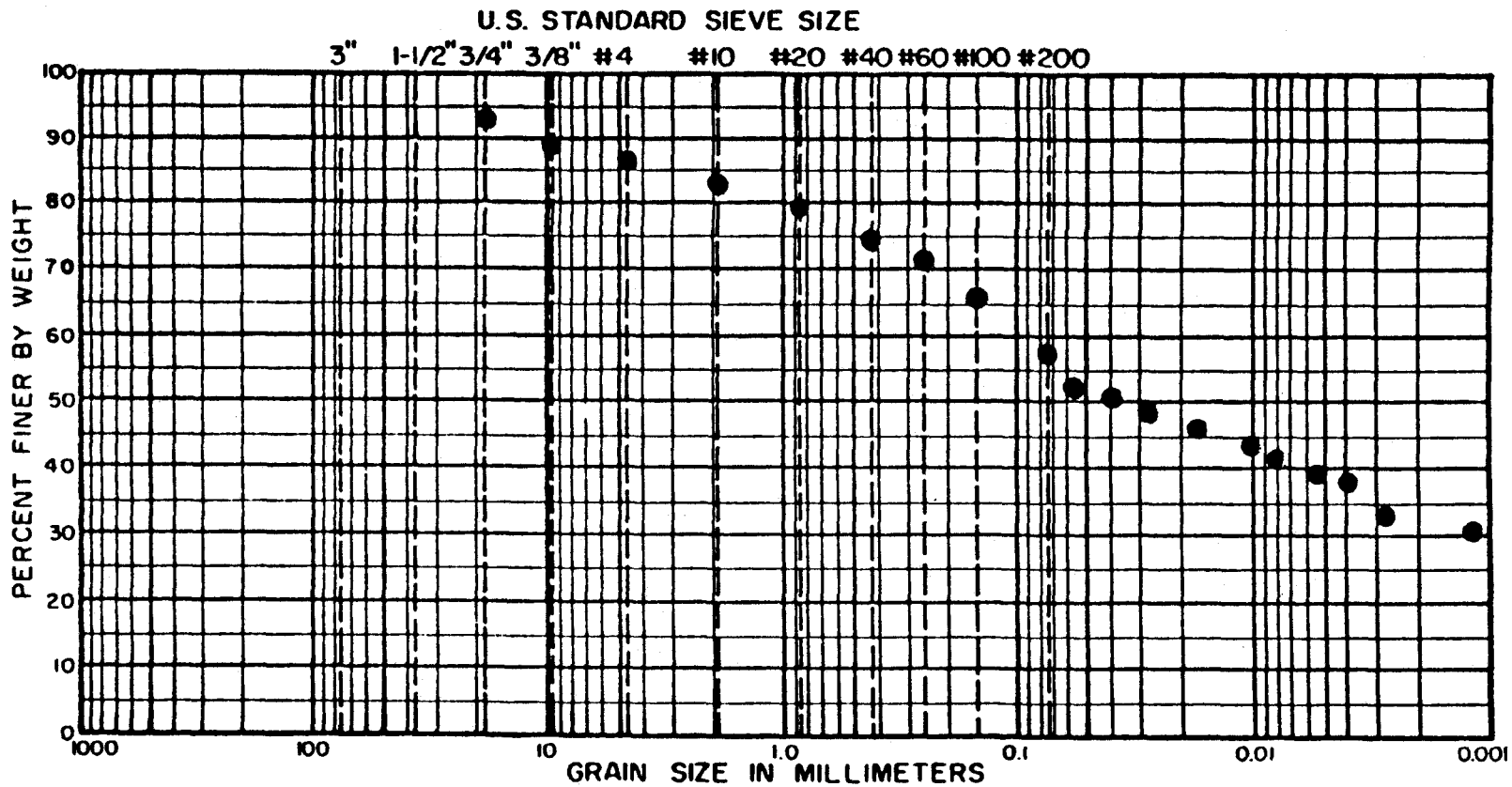
Wt. Total Sample Wet (g)	443.51
Weight of + #10 Before Washing (g)	111.66
Weight of + #10 After Washing (g)	73.09
Weight of - #10 Wet (g)	331.85
Weight of - #10 Dry (g)	367.54
Wt. Total Sample Dry (g)	440.63
Calc. Wt. "W" (g)	71.37
Calc. Mass + #10	11.84

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	32.19	32.19	32.19	7.3	92.7
3/8"	0.00	14.36	14.36	46.55	10.6	89.4
#4	0.00	13.22	13.22	59.77	13.6	86.4
#10	0.00	13.32	13.32	73.09	16.6	83.4
#20	1.31	3.90	2.59	2.59	20.2	79.8
#40	1.31	4.81	3.50	6.09	25.1	74.9
#60	1.31	4.47	3.16	9.25	29.5	70.5
#100	1.31	5.02	3.71	12.96	34.7	65.3
#200	1.46	6.75	5.29	18.25	42.2	57.8

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	38991
DEPTH	1.50 - 1.75 FT
SAMPLE NO.	BH00833EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-11-91 PB,MS
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	35.820
Wt. Dry Soil & Pan (g)	35.570
Wt. of Pan Only (g)	3.670
Sieve:	
Wt. Total Sample Wet (g)	443.51
Weight of + #10 Before Washing (g)	111.66
Weight of + #10 After Washing (g)	73.09
Weight of - #10 Wet (g)	331.85

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.750
Value of "a"	0.980
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.500
Meniscus Corr'n	-1.000
Temp., Deg. C	22.000
Temp. Coef. K	0.01294
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH0083EBUI	1.5' - 1.75'	# 38991

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-11-91 PB,MS
DEPTH	1.50 - 1.75 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00833EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	22.000
Sp. Gr. of Soil	2.750	Temp. Coef. K	0.01294
Value of "a"	0.980	Wt. Dry Sample "W"	71.372
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.500		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	43.50	38.00	52.2	52.2	9.16	0.0554
1.0	42.00	36.50	50.1	50.1	9.40	0.0397
2.0	40.50	35.00	48.1	48.1	9.65	0.0284
5.0	39.00	33.50	46.0	46.0	9.89	0.0182
15.0	38.00	32.50	44.6	44.6	10.06	0.0106
30.0	36.00	30.50	41.9	41.9	10.39	0.0076
60.0	34.50	29.00	39.8	39.8	10.63	0.0054
120.0	33.00	27.50	37.8	37.8	10.88	0.0039
250.0	30.00	24.50	33.6	33.6	11.37	0.0028
1440.0	27.50	22.00	30.2	30.2	11.78	0.0012

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EBASCO

LOCATION 38991

BORING B-00053 EBOL SAMPLE ____ DEPTH 1.5-1.75'

FIELD DENSITY BY ___/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

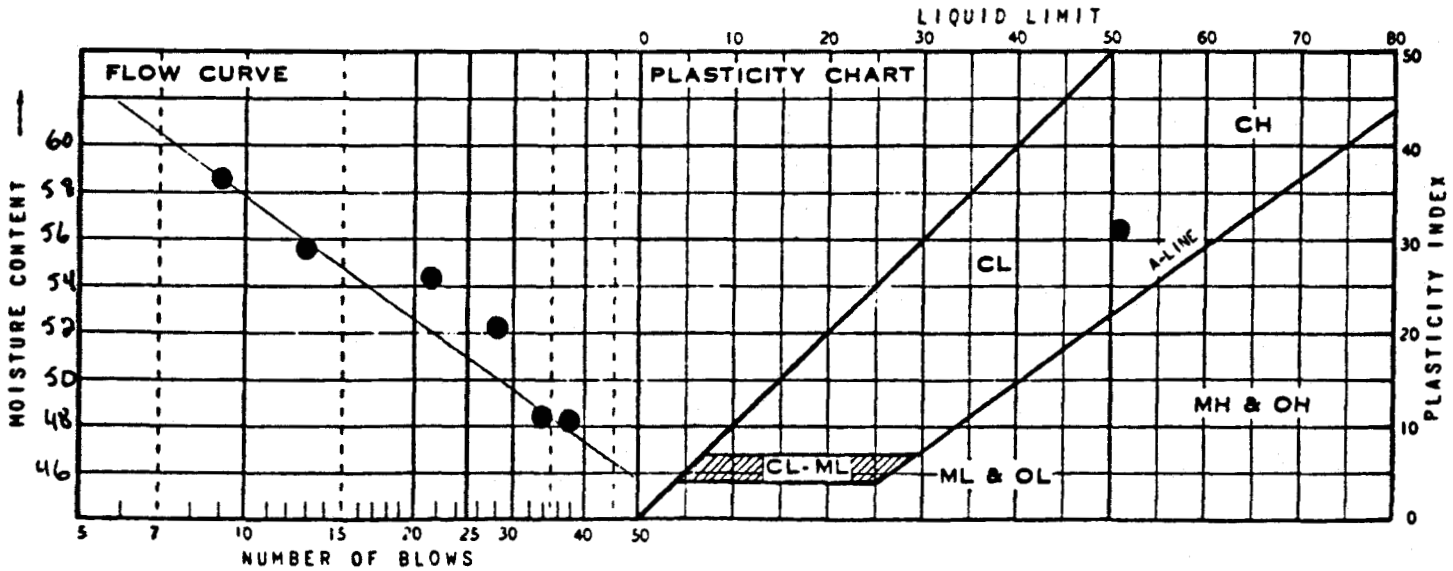
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY DV 1/15/92

DETERMINATION	1	2	3	4	5	6
DISH	8	61C	8			
WT OF DISH + WET SOIL g	6.22	7.78	6.22			
WT OF DISH + DRY SOIL g	5.38	6.67	5.38	—	—	—
WT OF MOISTURE g	.84	1.11	.84			
WT OF DISH g	1.09	1.06	1.09	—	—	—
WT OF DRY SOIL g	4.29	5.61	4.29			
MOISTURE CONTENT %	19.6	19.8	19.6			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	4	111C	43C	40	56C	30C
NUMBER OF BLOWS	38	34	28	21	13	9
WT OF DISH + WET SOIL g	13.15	12.53	12.17	11.08	16.06	12.84
WT OF DISH + DRY SOIL g	9.22	8.79	8.36	7.55	10.71	8.50
WT OF MOISTURE g	3.93	3.74	3.81	3.53	5.35	4.34
WT OF DISH g	1.08	1.08	1.08	1.06	1.08	1.09
WT OF DRY SOIL g	8.14	7.71	7.28	6.49	9.63	7.41
MOISTURE CONTENT %	48.3	48.5	52.3	54.4	55.6	58.6



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		50.8	19.7	31.1	CH	

ADVANCED TERRA TESTING INC

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00866EB01	BH00741EB01	BH00761EB01	BH00845EB01	BH00833EB01	BH00753EB01
DEPTH	5.0-5.25'	45.7-46.5'	3.0-3.25'	20.9-21.15'	1.5-1.75'	0.5-0.9'
Sample # SAS Tag #	39691	37891	39191	38991	38991	39091
Sampled	11-25-91	11-07-91	11-14-91	11-12-91	11-11-91	11-13-91
BY:	BP & KH	KM & MC	KM & MC	BP & KH	PB & MS	KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry) (W_o) g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.86g	177.86g	178.070	178.010g	177.99	177.730
Temperature °C, (T_x)	22.4	22.8	22.9	22.0	22.8	23.1
Weight of water and flask at T_x (from cal. curve) (W_a)	162.076g	162.062g	162.066	162.024g	162.062	162.061
Specific Gravity = *	2.71	2.72	2.78	2.76	2.75	2.68
PAN #	2C	34+	517	34	80	31

JOB NO. 2031-05 NAME EBASCO

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

Page No. ____ of ____

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**38991**
Sample Number:	**BH00832EBU1**
Sample Depth:	**1.75–2.00 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✓ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✓ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-11-91 BP
DEPTH	1.75 - 2.00 FT	TEST STARTED	01-13-92 DCW
SAMPLE NO.	BH00832EBU1	TEST FINISHED	01-24-92
SOIL DESCR.	--	SETUP NO.	1P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	365.6	403.6
Wt. Wet Soil & Pan (g)	374.4	412.4
Wt. Dry Soil & Pan (g)	328.1	328.1
Wt. Lost Moisture (g)	46.3	84.3
Wt. of Pan Only (g)	8.8	8.8
Wt. of Dry Soil (g)	319.3	319.3
Moisture Content %	14.5	26.4
Wet Density PCF	111.9	133.0
Dry Density PCF	97.7	105.2

Init. Diameter (in)	2.391	(cm)	6.073
Init. Area (sq in)	4.490	(sq cm)	28.970
Init. Height (in)	2.773	(cm)	7.043
Vol. Bef. Consol. (cu ft)	0.00721		
Vol. After Consol. (cu ft)	0.00669		
Effective Porosity %	44.51		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
40.0	2400	49.2	4.2	26.1	4.1E-05
102.0	6120	49.9	4.6	25.6	1.6E-05
100.0	6000	49.9	3.9	26.0	1.7E-05
106.0	6360	49.8	1.9	26.9	1.7E-05
94.0	5640	49.8	4.6	25.7	1.7E-05
110.0	6600	49.8	0.5	27.6	1.7E-05
103.0	6180	49.9	3.3	26.2	1.7E-05
96.0	5760	49.7	4.9	25.6	1.7E-05
89.0	5340	50.0	7.1	24.4	1.7E-05
105.0	6300	49.6	2.2	26.9	1.7E-05

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	38991
DEPTH	1.75 - 2.00 FT
SAMPLE NO.	BH00832EBU1
SOIL DESCR.	--
SAMPLED	11-11-91 BP
TEST STARTED	01-13-92 DCW
TEST FINISHED	01-24-92
SETUP NO.	1P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	365.570
Wt Soil & Moist at	403.590
Wt. Dry Soil & Pan	328.070
Wt. of Pan Only (g)	8.810
Consol Info:	
Init. Diameter in.	2.391
Initial Height in.	2.773
Vol. change (sat. con.) CC	32.100
Cell Exp.	17.500
Height Change in.	0.058
Test info:	
Pore pres @ begin. psi	89.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-11-91 BP
DEPTH	1.75 - 2.00 FT	TEST STARTED	01-13-92 DCW
SAMPLE NO.	BH00832EBU1	TEST FINISHED	01-24-92
SOIL DESCR.	--	SETUP NO.	1P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.1	11.2				
50.0	48.0	14.7	16.5	38.4	46.0	7.6	0.76
60.0	58.0	17.9	19.5	48.5	56.4	7.9	0.79
70.0	68.0	20.0	21.3	58.3	66.7	8.4	0.84
80.0	78.0	21.7	22.9	68.5	77.3	8.8	0.88
90.0	88.0	23.2	24.5	78.5	87.7	9.2	0.92
100.0		24.8	24.9	88.7	98.2	9.5	0.95

CONSOLIDATION DATA

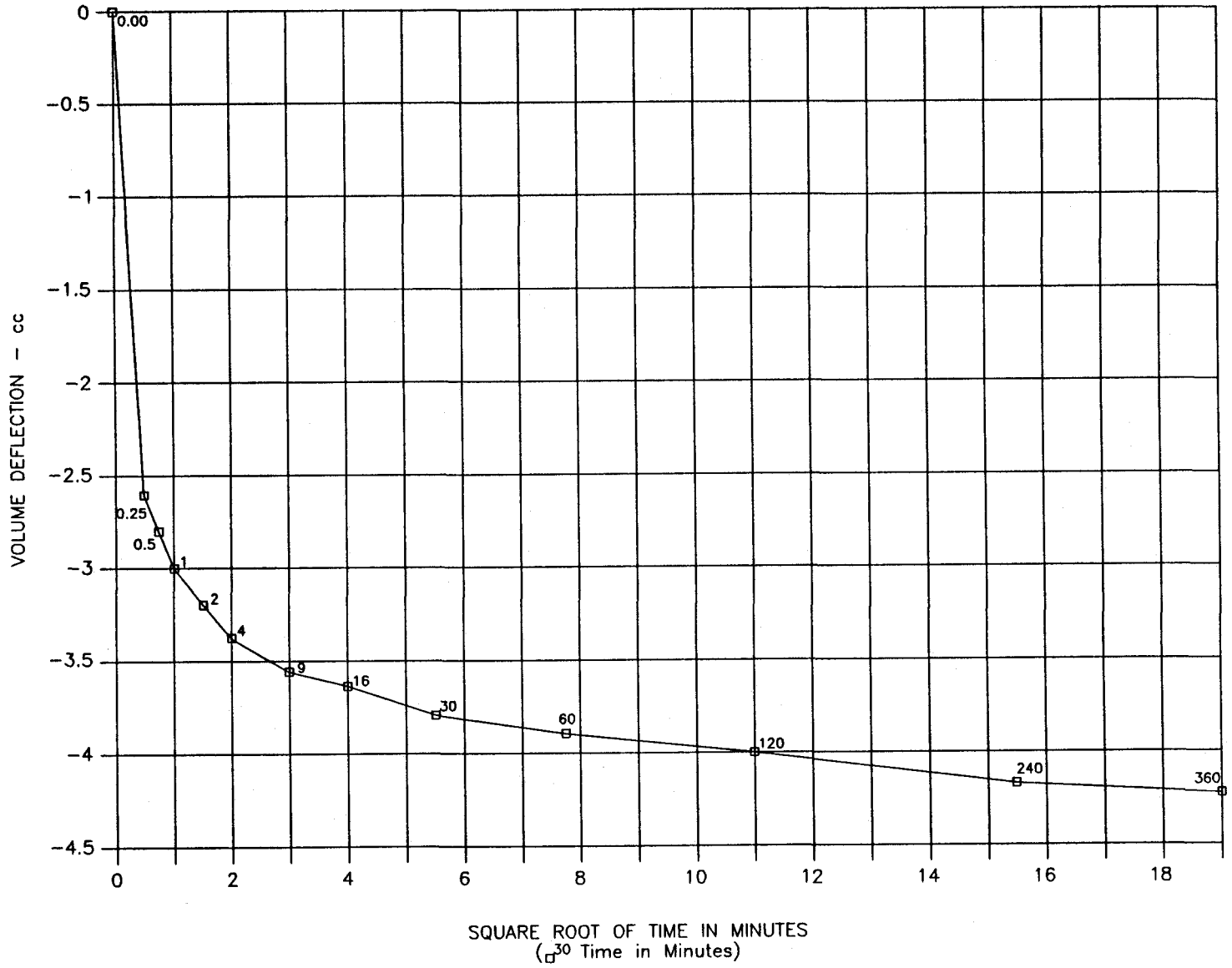
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	24.90	0.00
0.25	0.50	27.50	-2.60
0.5	0.71	27.70	-2.80
1	1.00	27.90	-3.00
2	1.41	28.10	-3.20
4	2.00	28.28	-3.38
9	3.00	28.45	-3.55
16	4.00	28.53	-3.63
30	5.48	28.70	-3.80
60	7.75	28.80	-3.90
120	10.95	28.90	-4.00
240	15.49	29.08	-4.18
360	18.97	29.13	-4.23

Initial Height (in)	2.773	Init. Vol. (CC)	204.07
Height Change (in)	0.058	Vol. Change (CC)	32.10
Ht. After Cons. (in)	2.715	Cell Exp. (CC)	17.50
Initial Area (sq in)	4.490	Net Change (CC)	14.60
Area After Cons. (sq in)	4.258	Cons. Vol. (CC)	189.47

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00832EBU1 @ 1.75–2.00', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

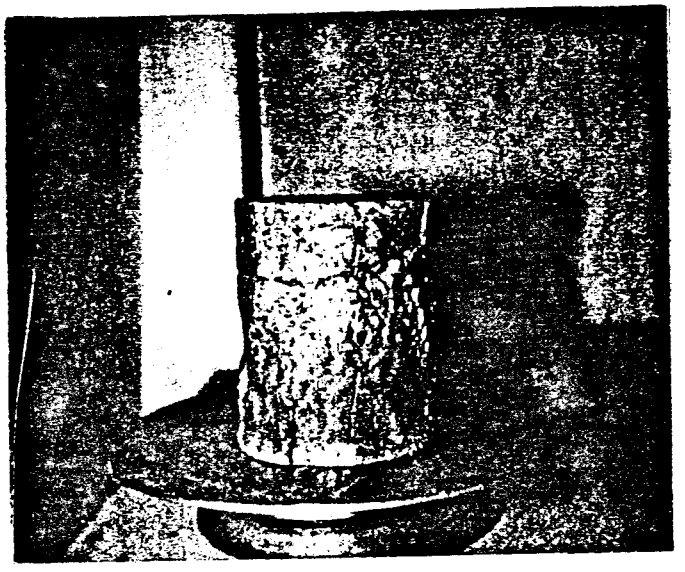
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-11-91 BP
DEPTH	1.75 - 2.00 FT	TEST STARTED	01-13-92 DCW
SAMPLE NO.	BH00832EBU1	TEST FINISHED	01-24-92
SOIL DESCR.	--	SETUP NO.	1P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.773	Init. Area (sq in)	4.490
Consol. Ht. (in)	2.715	Consol. Area (sq in)	4.258
Back Pres. PSI	89.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.258	0	89.00	0.0	1152	0	0.00
125.0	4227	0.01	0.37	4.274	4442	49.50	-5688.0	6840	11282	1.65
165.0	5580	0.02	0.74	4.289	5841	50.00	-5616.0	6768	12609	1.86
187.0	6324	0.03	1.10	4.305	6595	51.00	-5472.0	6624	13219	2.00
193.0	6527	0.04	1.47	4.322	6782	54.50	-4968.0	6120	12902	2.11
190.0	6426	0.05	1.84	4.338	6651	56.80	-4636.8	5789	12440	2.15
185.0	6257	0.06	2.21	4.354	6452	57.00	-4608.0	5760	12212	2.12
180.0	6088	0.07	2.58	4.371	6254	57.40	-4550.4	5702	11956	2.10
176.0	5952	0.08	2.95	4.387	6092	57.60	-4521.6	5674	11766	2.07
172.0	5817	0.09	3.31	4.404	5931	57.70	-4507.2	5659	11590	2.05
167.0	5648	0.10	3.68	4.421	5737	57.80	-4492.8	5645	11381	2.02
151.0	5107	0.15	5.52	4.507	5088	57.80	-4492.8	5645	10733	1.90
140.0	4735	0.20	7.37	4.596	4625	57.80	-4492.8	5645	10270	1.82
139.0	4701	0.25	9.21	4.690	4501	57.80	-4492.8	5645	10146	1.80
150.0	5073	0.30	11.05	4.787	4758	57.80	-4492.8	5645	10403	1.84
157.5	5327	0.35	12.89	4.888	4893	58.00	-4464.0	5616	10509	1.87
164.5	5563	0.40	14.73	4.994	5002	58.40	-4406.4	5556	10561	1.90
175.0	5918	0.45	16.57	5.104	5207	58.70	-4363.2	5515	10722	1.94
149.0	5039	0.50	18.42	5.219	4335	59.20	-4291.2	5443	9779	
140.0	4735	0.55	20.26	5.340	3982	59.50	-4248.0	5400	9382	
140.0	4735	0.60	22.10	5.466	3890	59.70	-4219.2	5371	9261	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



38991

BH00832EBUI

1.75–2.00 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Location Number:	**38991**
Sample Number:	**BH00840EBU1**
Sample Depth:	**11.50-11.75 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT EBASCO

JOB NO. 2031-05

BORING NO.	38991	SAMPLED	11-12-91 BP,KH
DEPTH	11.50 - 11.75 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00840EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	44.49
Wt. Dry Soil & Pan (g)	44.05
Wt. Lost Moisture (g)	0.44
Wt. of Pan Only (g)	3.85
Wt. of Dry Soil (g)	40.20
Moisture Content %	1.1
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.35

WASH SIEVE ANALYSIS

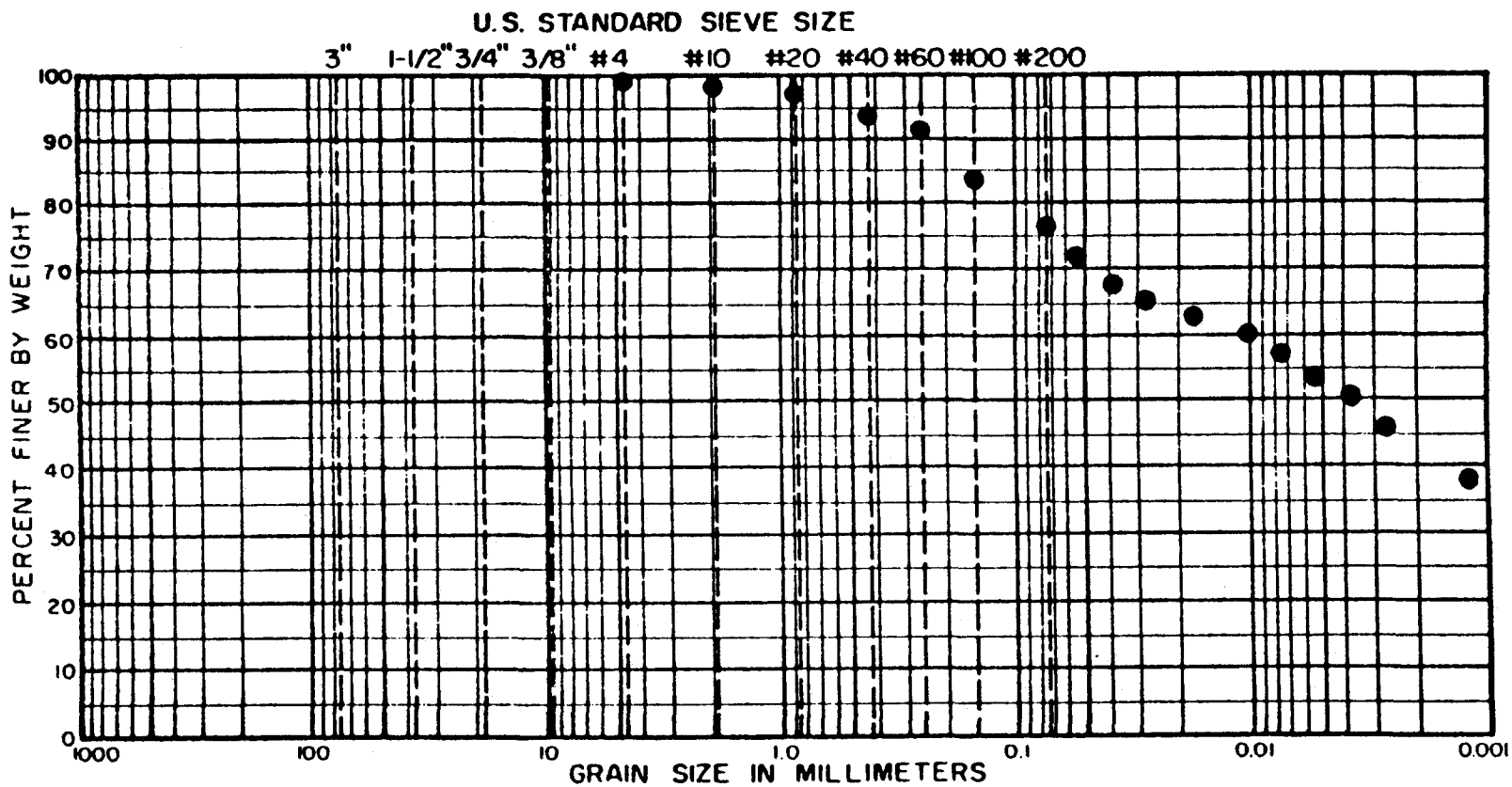
Wt. Total Sample Wet (g)	416.13
Weight of + #10 Before Washing (g)	11.34
Weight of + #10 After Washing (g)	6.05
Weight of - #10 Wet (g)	404.79
Weight of - #10 Dry (g)	405.64
Wt. Total Sample Dry (g)	411.69
Calc. Wt. "W" (g)	60.24
Calc. Mass + #10	0.89

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	3.18	3.18	3.18	0.8	99.2
#10	0.00	2.87	2.87	6.05	1.5	98.5
#20	1.29	2.30	1.01	1.01	3.1	96.9
#40	1.30	2.72	1.42	2.43	5.5	94.5
#60	1.32	3.63	2.31	4.74	9.3	90.7
#100	1.32	5.22	3.90	8.64	15.8	84.2
#200	1.30	6.44	5.14	13.78	24.3	75.7

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	38991
DEPTH	11.50 - 11.75 FT
SAMPLE NO.	BH00840EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-12-91 BP,KH
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	44.490
Wt. Dry Soil & Pan (g)	44.050
Wt. of Pan Only (g)	3.850
Sieve:	
Wt. Total Sample Wet (g)	416.13
Weight of + #10 Before Washing (g)	11.34
Weight of + #10 After Washing (g)	6.05
Weight of - #10 Wet (g)	404.79

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.700
Value of "a"	0.990
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	21.000
Temp. Coef. K	0.01328
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
8N00840EBUI	11.50 - 11.75'	#38991

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-12-91 BP,KH
DEPTH	11.50 - 11.75 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00840EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	21.000
Sp. Gr. of Soil	2.700	Temp. Coef. K	0.01328
Value of "a"	0.990	Wt. Dry Sample "W"	60.236
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.000		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	49.00	44.00	72.3	72.3	8.25	0.0540
1.0	46.25	41.25	67.8	67.8	8.71	0.0392
2.0	44.75	39.75	65.3	65.3	8.95	0.0281
5.0	43.75	38.75	63.7	63.7	9.12	0.0179
15.0	41.50	36.50	60.0	60.0	9.48	0.0106
30.0	40.00	35.00	57.5	57.5	9.73	0.0076
60.0	38.00	33.00	54.2	54.2	10.06	0.0054
120.0	35.50	30.50	50.1	50.1	10.47	0.0039
250.0	33.00	28.00	46.0	46.0	10.88	0.0028
1440.0	28.00	23.00	37.8	37.8	11.70	0.0012

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05
CLIENT/OWNER EIBASCO
LOCATION 38991
BORING BH10&40 EB01 SAMPLE ____ DEPTH 11.50-11.75'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

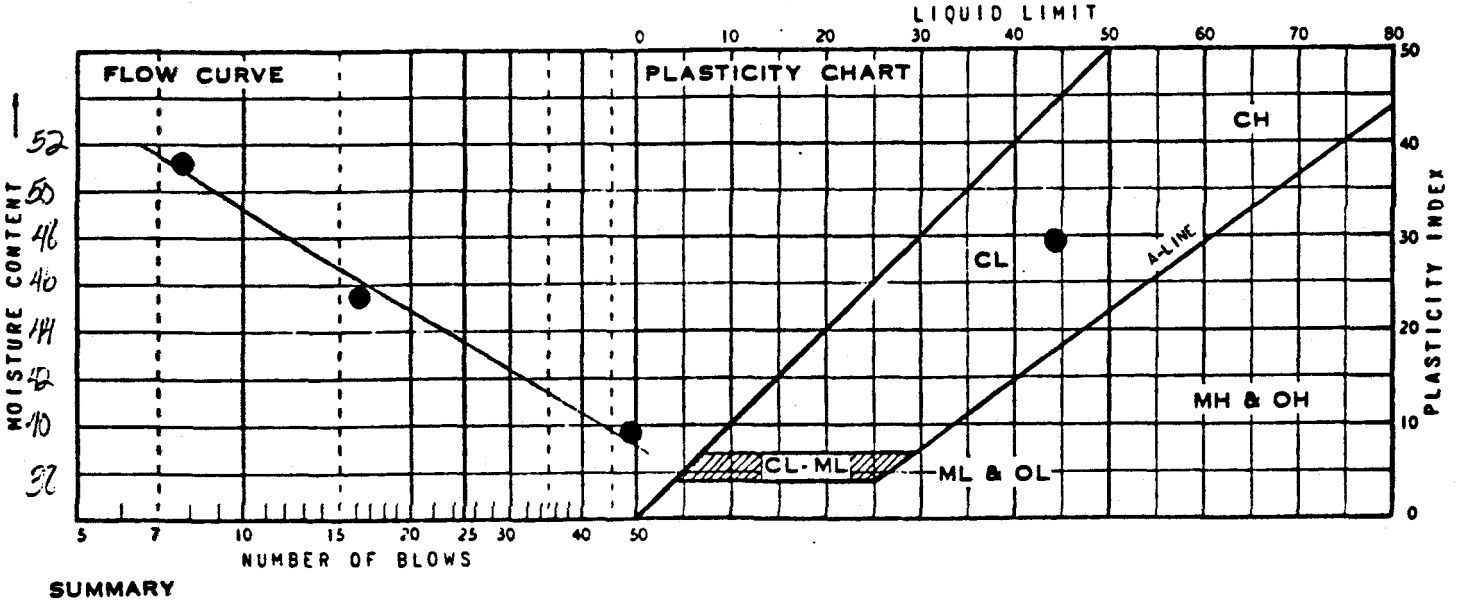
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY JMW 11/11/97

DETERMINATION	1	2	3	4	5	6
DISH	32C	36C	48C			
WT OF DISH + WET SOIL	10.57g	9.06g	8.25g			
WT OF DISH + DRY SOIL	9.36g	8.01g	7.30g	—	—	—
WT OF MOISTURE	1.22g	1.05g	.95g			
WT OF DISH	1.05g	1.07g	1.00g	—	—	—
WT OF DRY SOIL	8.31g	6.94g	6.31g			
MOISTURE CONTENT	14.7%	15.1%	15.2%			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	22	17	59C	10C	29C	
NUMBER OF BLOWS	49	35	25	16	7	
WT OF DISH + WET SOIL	13.21g	19.77g	18.27g	16.55g	18.79g	
WT OF DISH + DRY SOIL	9.75g	13.12g	11.47g	11.54g	12.80g	—
WT OF MOISTURE	3.46g	6.75g	5.80g	4.79g	6.01	
WT OF DISH	1.00g	1.05g	1.00g	1.07g	1.07g	—
WT OF DRY SOIL	8.69g	12.07g	13.41g	10.47g	11.73g	
MOISTURE CONTENT	39.8	55.9	28.5	45.8	51.0	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		43.5	15.0	28.5	CL	

ADVANCED TERRA TESTING inc

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00734EBU1	BH00840EBU1	BH00812EBU1	BH00738EBU1	BH00775EBU1	BH00766EBU1
DEPTH	46'	11.50-11.75'	4.8-5.05'	10.0-10.2'	41.75-42.25'	11.5-11.75'
Sample # SAS Tag #	37991	38991	38591	37891	39191	39191
Sampled	10-29-91	11-12-91	11-05-91	1-6-91	11-20-91	11-14-91
BY:	KM & MC	KM & KH	KH & MC	KM & JN	KM & NELSON	KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry)(W_o)g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.82g	177.840g	177.89g	177.790g	177.960g	177.690g
Temperature °C, (T_x)	20.7	21.5	22.0	21.6	18.2	19.0
Weight of water and flask at T_x (from cal. curve) (W_a)	162.101g	162.095g	162.084g	162.094g	162.175	162.153
Specific Gravity = *	2.69	2.70	2.72	2.69	2.76	2.64
PAN #	13	21B	27	6C	32	26B

JOB NO. 2031-05 NAME EBASCO

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

Page No. ___ Of ___

INDEX OF GEOTECHNICAL DATA

Borehole Location Number:	**38991**
Sample Number:	**BH00839EBU1**
Sample Depth:	**11.75-12.00 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-12-91 KH
DEPTH	11.75 - 12.00 FT	TEST STARTED	12-06-91 DCW
SAMPLE NO.	BH00839EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	10S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	422.0	457.6
Wt. Wet Soil & Pan (g)	430.7	466.4
Wt. Dry Soil & Pan (g)	391.9	391.9
Wt. Lost Moisture (g)	38.8	74.5
Wt. of Pan Only (g)	8.8	8.8
Wt. of Dry Soil (g)	383.1	383.1
Moisture Content %	10.1	19.4
Wet Density PCF	125.8	144.0
Dry Density PCF	114.2	120.5

Init. Diameter (in)	2.391	(cm)	6.073
Init. Area (sq in)	4.490	(sq cm)	28.970
Init. Height (in)	2.845	(cm)	7.226
Vol. Bef. Consol. (cu ft)	0.00739		
Vol. After Consol. (cu ft)	0.00701		
Effective Porosity %	37.53		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
91.0	5460	50.0	49.8	15.2	7.6E-08
1038.0	62280	49.8	47.6	16.5	7.4E-08
1339.0	80340	47.6	45.5	18.8	5.6E-08
1452.0	87120	45.5	43.3	21.1	5.5E-08
1352.0	81120	43.3	41.3	23.4	5.5E-08
1502.0	90120	41.3	39.2	25.6	5.3E-08
1481.0	88860	39.2	37.3	27.7	4.9E-08
1477.0	88620	37.3	35.5	29.7	4.8E-08
1320.0	79200	49.8	47.8	16.4	5.3E-08
1474.0	88440	47.8	45.7	18.6	5.1E-08
1416.0	84960	45.7	43.7	20.8	5.1E-08

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	38991
DEPTH	11.75 - 12.00 FT
SAMPLE NO.	BH00839EBU1
SOIL DESCR.	SS LINER
SAMPLED	11-12-91 KH
TEST STARTED	12-06-91 DCW
TEST FINISHED	12-25-91
SETUP NO.	10S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	421.950
Wt Soil & Moist at	457.590
Wt. Dry Soil & Pan	391.870
Wt. of Pan Only (g)	8.770
Consol Info:	
Init. Diameter in.	2.391
Initial Height in.	2.845
Vol. change (sat. con.) CC	35.400
Cell Exp.	24.500
Height Change in.	0.015
Test info:	
Pore pres @ begin. psi	89.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-12-91 KH
DEPTH	11.75 - 12.00 FT	TEST STARTED	12-06-91 DCW
SAMPLE NO.	BH00839EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	10S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.1	15.3				
50.0	48.0	11.4	13.3	38.2	45.8	7.6	0.76
60.0	58.0	14.9	16.6	48.4	56.2	7.8	0.78
70.0	68.0	17.7	19.3	58.2	66.6	8.4	0.84
80.0	78.0	20.2	22.0	68.2	77.1	8.9	0.89
90.0	88.0	23.3	25.0	78.6	87.8	9.2	0.92
100.0		25.6	25.7	88.7	98.2	9.5	0.95

CONSOLIDATION DATA

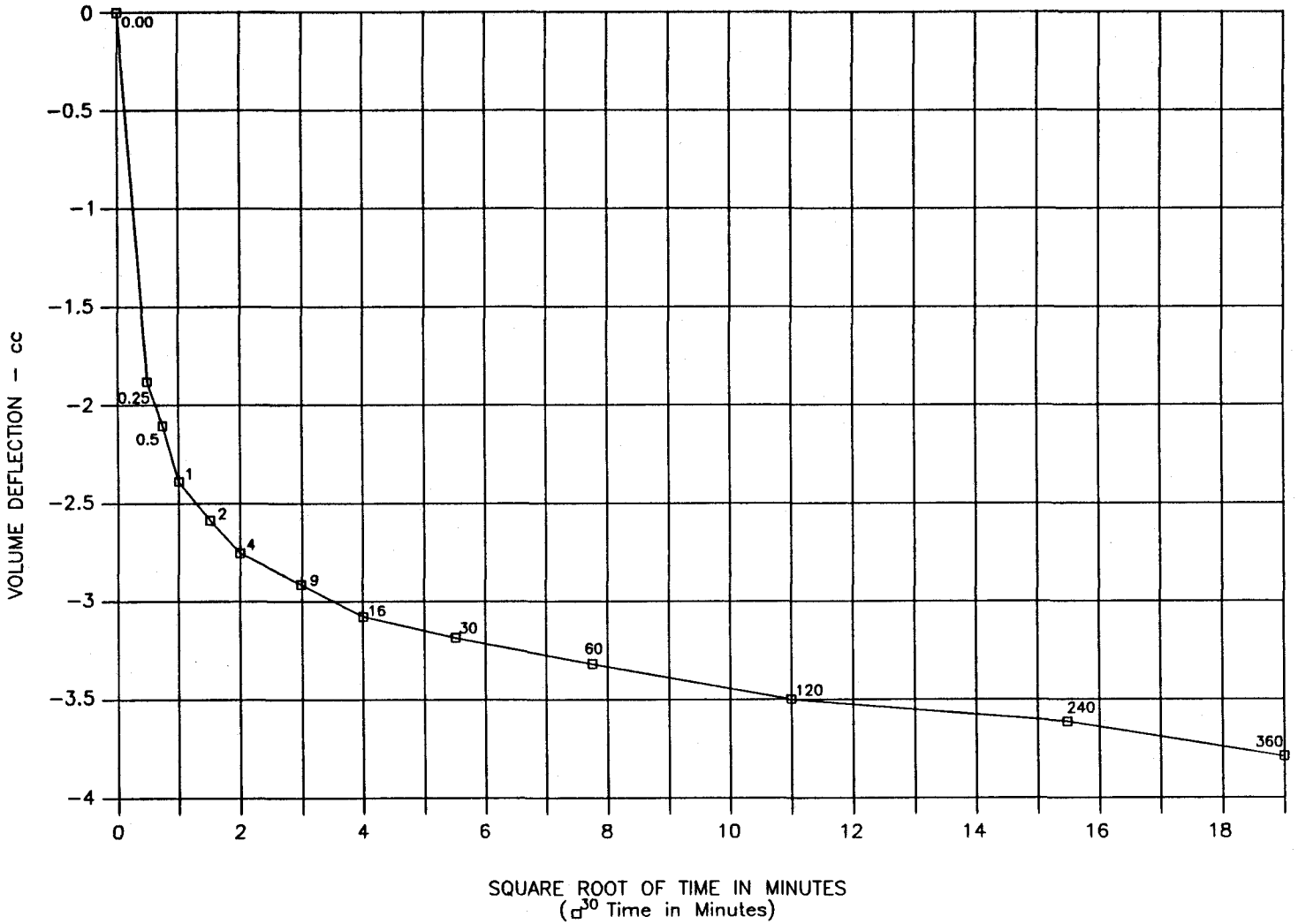
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	25.70	0.00
0.25	0.50	27.60	-1.90
0.5	0.71	27.83	-2.13
1	1.00	28.10	-2.40
2	1.41	28.30	-2.60
4	2.00	28.45	-2.75
9	3.00	28.63	-2.93
16	4.00	28.78	-3.07
30	5.48	28.90	-3.20
60	7.75	29.03	-3.32
120	10.95	29.20	-3.50
240	15.49	29.33	-3.63
360	18.97	29.50	-3.80

Initial Height (in)	2.845	Init. Vol. (CC)	209.37
Height Change (in)	0.015	Vol. Change (CC)	35.40
Ht. After Cons. (in)	2.830	Cell Exp. (CC)	24.50
Initial Area (sq in)	4.490	Net Change (CC)	10.90
Area After Cons. (sq in)	4.279	Cons. Vol. (CC)	198.47

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00839EBU1 @ 11.75-12.00', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

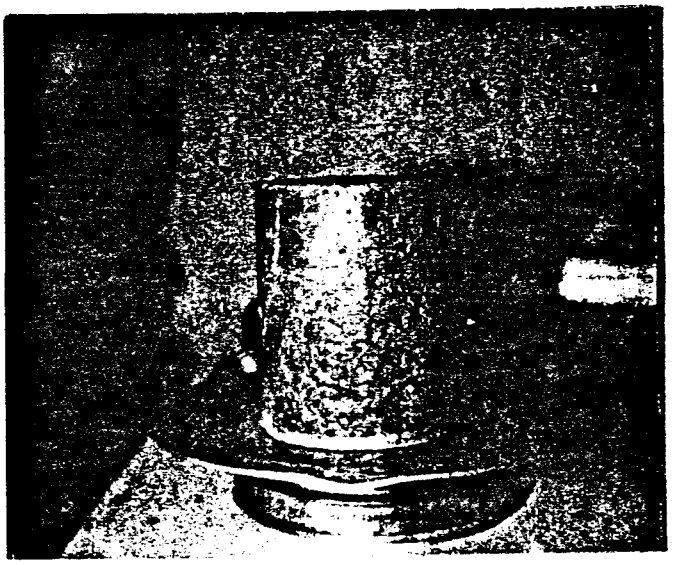
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-12-91 KH
DEPTH	11.75 - 12.00 FT	TEST STARTED	12-06-91 DCW
SAMPLE NO.	BH00839EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	10S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.845	Init. Area (sq in)	4.490
Consol. Ht. (in)	2.830	Consol. Area (sq in)	4.279
Back Pres. PSI	89.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.279	0	89.00	0.0	1152	0	0.00
125.0	4207	0.01	0.35	4.294	4399	49.50	-5688.0	6840	11239	1.64
165.0	5553	0.02	0.71	4.309	5786	50.00	-5616.0	6768	12554	1.85
187.0	6293	0.03	1.06	4.325	6534	51.00	-5472.0	6624	13158	1.99
193.0	6495	0.04	1.41	4.340	6719	54.50	-4968.0	6120	12839	2.10
190.0	6394	0.05	1.77	4.356	6591	56.80	-4636.8	5789	12380	2.14
185.0	6226	0.06	2.12	4.372	6395	57.00	-4608.0	5760	12155	2.11
180.0	6058	0.07	2.47	4.387	6199	57.40	-4550.4	5702	11902	2.09
176.0	5923	0.08	2.83	4.403	6040	57.60	-4521.6	5674	11713	2.06
172.0	5788	0.09	3.18	4.419	5881	57.70	-4507.2	5659	11540	2.04
167.0	5620	0.10	3.53	4.436	5689	57.80	-4492.8	5645	11334	2.01
151.0	5082	0.15	5.30	4.518	5050	57.80	-4492.8	5645	10695	1.89
140.0	4712	0.20	7.07	4.604	4595	57.80	-4492.8	5645	10240	1.81
139.0	4678	0.25	8.83	4.693	4475	57.80	-4492.8	5645	10120	1.79
150.0	5048	0.30	10.60	4.786	4736	57.80	-4492.8	5645	10381	1.84
157.5	5301	0.35	12.37	4.883	4874	58.00	-4464.0	5616	10490	1.87
164.5	5536	0.40	14.13	4.983	4988	58.40	-4406.4	5558	10547	1.90
175.0	5889	0.45	15.90	5.088	5197	58.70	-4363.2	5515	10713	1.94
149.0	5014	0.50	17.67	5.197	4332	59.20	-4291.2	5443	9775	
140.0	4712	0.55	19.43	5.311	3983	59.50	-4248.0	5400	9383	
140.0	4712	0.60	21.20	5.430	3896	59.70	-4219.2	5371	9267	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



38991

BH00839EBUI

11.75–12.00 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**38991**
Sample Number:	**BH00845EBU1**
Sample Depth:	**20.90-21.15 feet (Bedrock)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- __ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-12-91 BP,KH
DEPTH	20.90 - 21.15 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00845EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	47.96
Wt. Dry Soil & Pan (g)	47.37
Wt. Lost Moisture (g)	0.59
Wt. of Pan Only (g)	3.73
Wt. of Dry Soil (g)	43.64
Moisture Content %	1.4
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.20

WASH SIEVE ANALYSIS

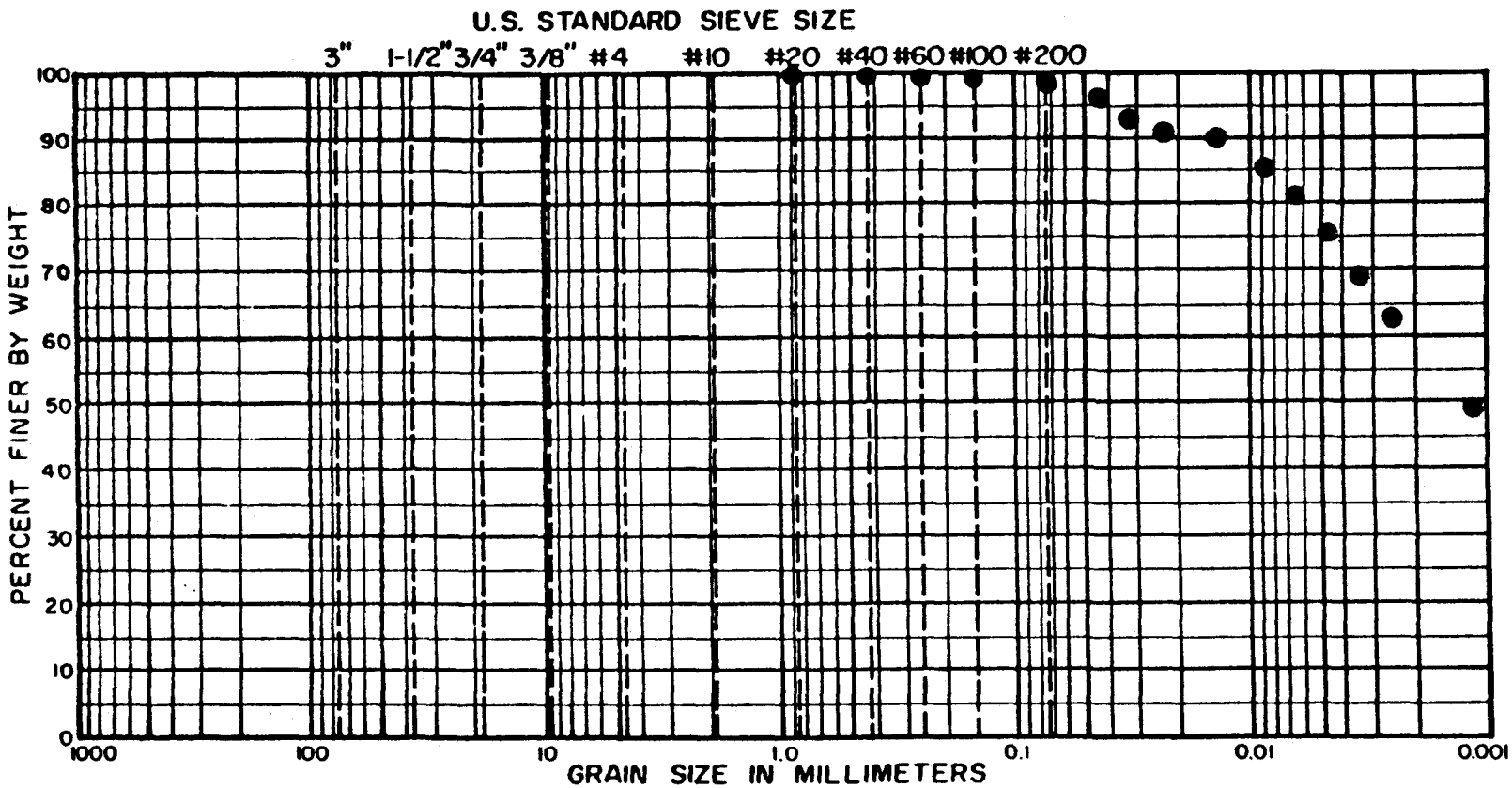
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00
Weight of - #10 Dry (g)	59.20
Wt. Total Sample Dry (g)	59.20
Calc. Wt. "W" (g)	59.20
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	1.32	1.36	0.04	0.04	0.1	99.9
#40	1.30	1.37	0.07	0.11	0.2	99.8
#60	1.32	1.38	0.06	0.17	0.3	99.7
#100	1.31	1.39	0.08	0.25	0.4	99.6
#200	1.32	1.53	0.21	0.46	0.8	99.2

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	38991
DEPTH	20.90 - 21.15 FT
SAMPLE NO.	BH00845EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-12-91 BP,KH
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	47.960
Wt. Dry Soil & Pan (g)	47.370
Wt. of Pan Only (g)	3.730
Sieve:	
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.760
Value of "a"	0.978
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.500
Meniscus Corr'n	-1.000
Temp., Deg. C	22.000
Temp. Coef. K	0.01290
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00845 EBUI	20.9 - 21.15'	#38991

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-12-91 BP,KH
DEPTH	20.90 - 21.15 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00845EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	22.000
Sp. Gr. of Soil	2.760	Temp. Coef. K	0.01290
Value of "a"	0.978	Wt. Dry Sample "W"	59.200
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.500		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	64.00	58.50	96.6	96.6	5.79	0.0439
1.0	62.00	56.50	93.3	93.3	6.12	0.0319
2.0	60.50	55.00	90.9	90.9	6.37	0.0230
5.0	60.00	54.50	90.0	90.0	6.45	0.0147
15.0	57.00	51.50	85.1	85.1	6.94	0.0088
30.0	54.50	49.00	80.9	80.9	7.35	0.0064
60.0	51.00	45.50	75.2	75.2	7.93	0.0047
120.0	47.50	42.00	69.4	69.4	8.50	0.0034
250.0	43.50	38.00	62.8	62.8	9.16	0.0025
1440.0	35.50	30.00	49.6	49.6	10.47	0.0011

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EBASCO

LOCATION 38991

BORING BH00845 E801 SAMPLE ____ DEPTH 20.90-21.15'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD [redacted]

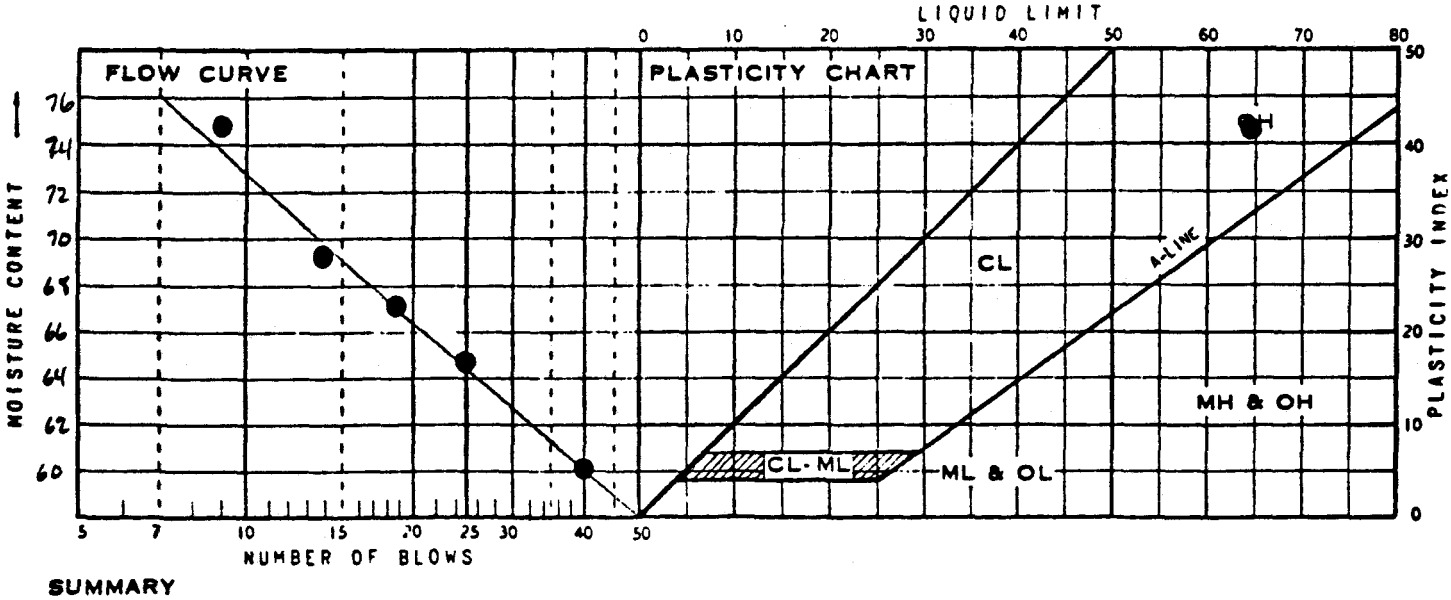
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY DU 1/16/92

DETERMINATION	1	2	3	4	5	6
DISH	19C	69C	4			
WT OF DISH + WET SOIL g	6.10	7.94	8.12			
WT OF DISH + DRY SOIL g	5.12	6.64	6.81	—	—	—
WT OF MOISTURE g	.98	1.30	1.31			
WT OF DISH g	1.05	1.05	1.06	—	—	—
WT OF DRY SOIL g	4.07	5.59	5.75			
MOISTURE CONTENT %	24.1	23.3	22.8			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	49C	36C	59C	2	60C	
NUMBER OF BLOWS	40	25	19	14	9	
WT OF DISH + WET SOIL g	13.93	14.14	15.06	16.37	16.53	
WT OF DISH + DRY SOIL g	9.10	8.99	9.43	10.10	9.91	—
WT OF MOISTURE g	4.83	5.15	5.63	6.27	6.62	
WT OF DISH g	1.06	1.06	1.06	1.06	1.07	—
WT OF DRY SOIL g	8.04	7.93	8.37	9.04	8.84	
MOISTURE CONTENT %	60.1	64.9	67.3	69.4	74.9	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		64.9	23.4	41.5	CH	

ADVANCED TERRA TESTING INC

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00866EB01	BH00741EB01	BH00761EB01	BH00845EB01	BH00833EB01	BH00759EB01
DEPTH	5.0-5.25'	45.7-46.5'	3.0-3.25'	20.9-21.15'	1.5-1.75'	0.5-0.9'
Sample # SAS Tag #	39691	37891	39191	38991	38991	39091
Sampled	11-25-91	11-07-91	11-14-91	11-12-91	11-11-91	11-13-91
BY:	BP & KH	KM & MC	KM & MC	BP & KH	PB & MS	KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry)(W_o)g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.86g	177.860g	178.070	178.010g	177.99	177.730
Temperature °C, (T_x)	22.4	22.8	22.9	22.0	22.8	23.1
Weight of water and flask at T_x (from cal. curve) (W_a)	162.076g	162.062g	162.066	162.024g	162.028	162.061
Specific Gravity = *	2.71	2.72	2.78	2.76	2.75	2.68
PAN #	2C	34+	517	34	80	31

JOB NO. 2031-05 NAME EB

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**38991**
Sample Number:	**BH00844EBU1**
Sample Depth:	**21.15-21.40 feet (Bedrock)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-12-91 KH
DEPTH	21.15 - 21.40 FT	TEST STARTED	12-15-91 DCW
SAMPLE NO.	BH00844EBU1	TEST FINISHED	01-06-91
SOIL DESCR.	SS LINER	SETUP NO.	12S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	404.1	418.4
Wt. Wet Soil & Pan (g)	412.8	427.1
Wt. Dry Soil & Pan (g)	341.4	341.4
Wt. Lost Moisture (g)	71.4	85.7
Wt. of Pan Only (g)	8.7	8.7
Wt. of Dry Soil (g)	332.8	332.8
Moisture Content %	21.4	25.7
Wet Density PCF	129.2	137.1
Dry Density PCF	106.4	109.0

Init. Diameter (in)	2.396	(cm)	6.086
Init. Area (sq in)	4.509	(sq cm)	29.091
Init. Height (in)	2.643	(cm)	6.713
Vol. Bef. Consol. (cu ft)	0.00690		
Vol. After Consol. (cu ft)	0.00673		
Effective Porosity %	44.93		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
1236.0	74160	50.1	49.8	15.2	8.9E-09
1426.0	85560	49.8	49.3	15.6	1.1E-08
1493.0	89580	49.3	49.0	16.0	5.3E-09
1376.0	82560	49.0	48.8	16.3	4.6E-09
1553.0	93180	48.8	48.5	16.5	6.1E-09
1384.0	83040	48.5	48.3	16.8	4.6E-09
1464.0	87840	48.3	48.1	17.0	4.3E-09
2837.0	170220	48.1	47.7	17.3	4.5E-09
1482.0	88920	47.7	47.5	17.7	4.3E-09
1454.0	87240	47.5	47.3	17.9	4.4E-09
1521.0	91260	47.3	47.1	18.1	4.2E-09

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	38991
DEPTH	21.15 - 21.40 FT
SAMPLE NO.	BH00844EBU1
SOIL DESCR.	SS LINER
SAMPLED	11-12-91 KH
TEST STARTED	12-15-91 DCW
TEST FINISHED	01-06-91
SETUP NO.	12S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	404.120
Wt Soil & Moist at	418.420
Wt. Dry Soil & Pan	341.440
Wt. of Pan Only (g)	8.670
Consol Info:	
Init. Diameter in.	2.396
Initial Height in.	2.643
Vol. change (sat. con.) CC	25.200
Cell Exp.	20.500
Height Change in.	0.001
Test info:	
Pore pres @ begin. psi	69.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-12-91 KH
DEPTH	21.15 - 21.40 FT	TEST STARTED	12-15-91 DCW
SAMPLE NO.	BH00844EBU1	TEST FINISHED	01-06-91
SOIL DESCR.	SS LINER	SETUP NO.	12S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	13.4				
50.0	48.0	11.2		38.5	44.8	6.3	0.63
60.0	58.0	10.9	12.8	48.5	57.0	8.5	0.85
70.0	68.0	13.0	14.8	58.3	67.3	9.0	0.90
80.0		15.0	15.2	68.7	78.3	9.6	0.96

CONSOLIDATION DATA

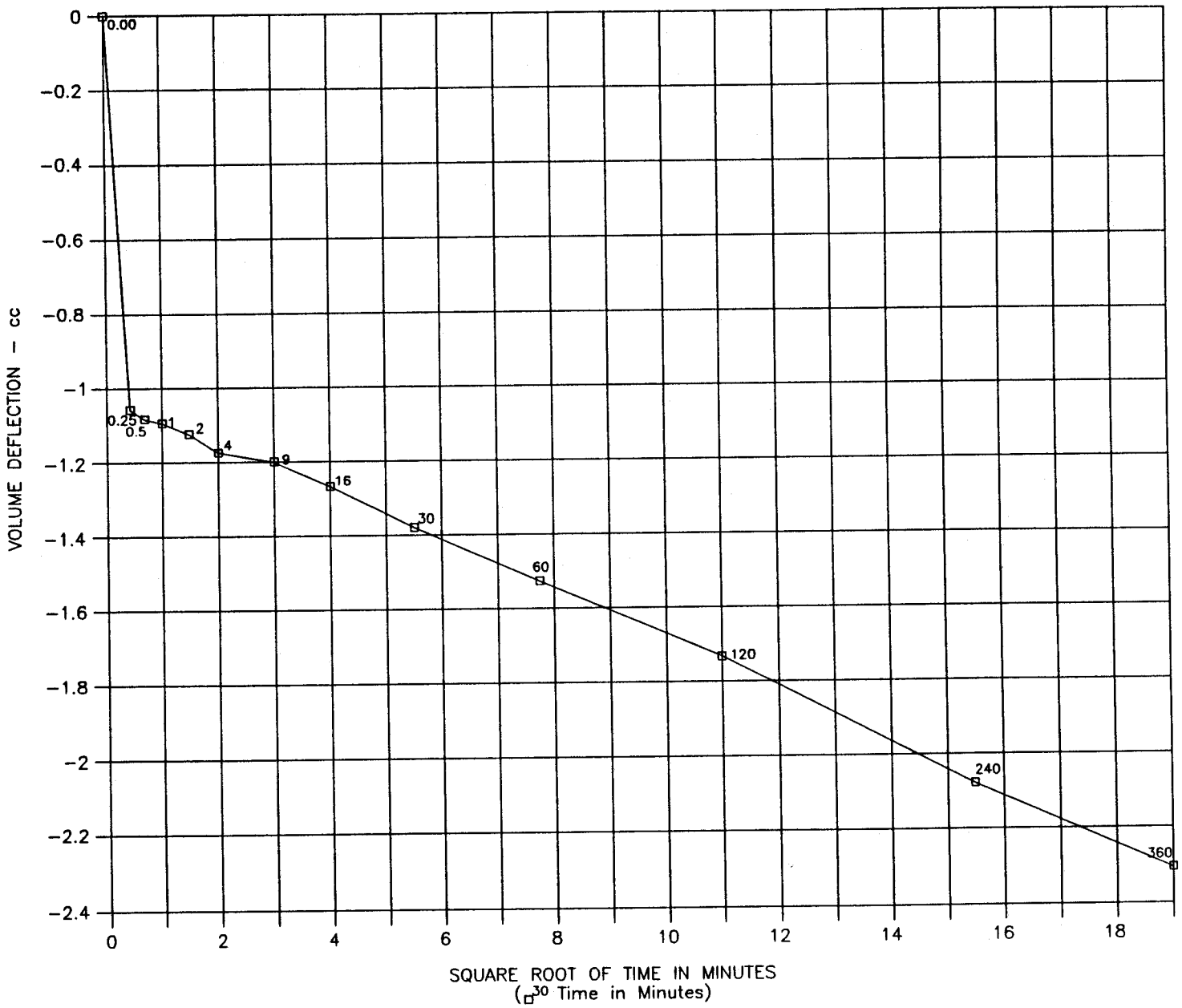
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	16.00	0.00
0.25	0.50	17.05	-1.05
0.5	0.71	17.08	-1.07
1	1.00	17.10	-1.10
2	1.41	17.13	-1.13
4	2.00	17.18	-1.18
9	3.00	17.20	-1.20
16	4.00	17.28	-1.27
30	5.48	17.38	-1.38
60	7.75	17.53	-1.52
120	10.95	17.73	-1.73
240	15.49	18.08	-2.07
360	18.97	18.30	-2.30

Initial Height (in)	2.643	Init. Vol. (CC)	195.32
Height Change (in)	0.001	Vol. Change (CC)	25.20
Ht. After Cons. (in)	2.642	Cell Exp. (CC)	20.50
Initial Area (sq in)	4.509	Net Change (CC)	4.70
Area After Cons. (sq in)	4.402	Cons. Vol. (CC)	190.62

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00844EBU1 @ 21.15–21.40', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

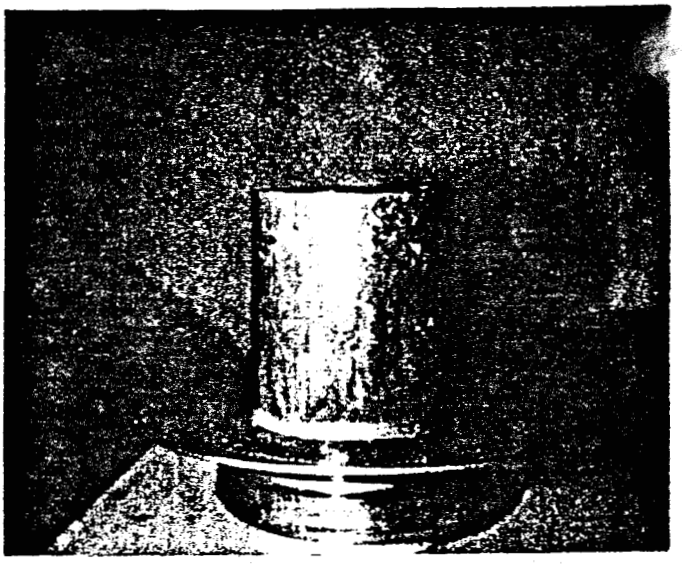
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	38991	SAMPLED	11-12-91 KH
DEPTH	21.15 - 21.40 FT	TEST STARTED	12-15-91 DCW
SAMPLE NO.	BH00844EBU1	TEST FINISHED	01-06-91
SOIL DESCR.	SS LINER	SETUP NO.	12S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.643	Init. Area (sq in)	4.509
Consol. Ht. (in)	2.642	Consol. Area (sq in)	4.402
Back Pres. PSI	69.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.402	0	69.00	0.0	1152	0	0.00
125.0	4089	0.01	0.38	4.419	4172	49.50	-2808.0	3960	8132	2.05
165.0	5398	0.02	0.76	4.436	5487	50.00	-2736.0	3888	9375	2.41
187.0	6117	0.03	1.14	4.453	6195	51.00	-2592.0	3744	9939	2.65
193.0	6314	0.04	1.51	4.470	6369	54.50	-2088.0	3240	9609	2.97
190.0	6215	0.05	1.89	4.487	6246	56.80	-1756.8	2909	9155	3.15
185.0	6052	0.06	2.27	4.504	6058	57.00	-1728.0	2880	8938	3.10
180.0	5888	0.07	2.65	4.522	5871	57.40	-1670.4	2822	8694	3.08
176.0	5757	0.08	3.03	4.539	5719	57.60	-1641.6	2794	8512	3.05
172.0	5627	0.09	3.41	4.557	5567	57.70	-1627.2	2779	8346	3.00
167.0	5463	0.10	3.79	4.575	5384	57.80	-1612.8	2765	8149	2.95
151.0	4940	0.15	5.68	4.667	4772	57.80	-1612.8	2765	7537	2.73
140.0	4580	0.20	7.57	4.763	4336	57.80	-1612.8	2765	7101	2.57
139.0	4547	0.25	9.46	4.862	4217	57.80	-1612.8	2765	6981	2.53
150.0	4907	0.30	11.36	4.966	4455	57.80	-1612.8	2765	7220	2.61
157.5	5152	0.35	13.25	5.074	4578	58.00	-1584.0	2736	7314	2.67
164.5	5381	0.40	15.14	5.187	4677	58.40	-1526.4	2678	7356	2.75
175.0	5725	0.45	17.03	5.306	4865	58.70	-1483.2	2635	7500	2.85
149.0	4874	0.50	18.93	5.430	4048	59.20	-1411.2	2563	6611	
140.0	4580	0.55	20.82	5.559	3714	59.50	-1368.0	2520	6234	
140.0	4580	0.60	22.71	5.695	3626	59.70	-1339.2	2491	6117	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



38991

BH00844EBUI

21.15-21.40 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39091**
Sample Number:	**BH00753EBU1**
Sample Depth:	**0.50-0.90 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39091	SAMPLED	11-13-91 KM,MC
DEPTH	0.50 - 0.90 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00753EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	42.31
Wt. Dry Soil & Pan (g)	42.17
Wt. Lost Moisture (g)	0.14
Wt. of Pan Only (g)	3.70
Wt. of Dry Soil (g)	38.47
Moisture Content %	0.4
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.78

WASH SIEVE ANALYSIS

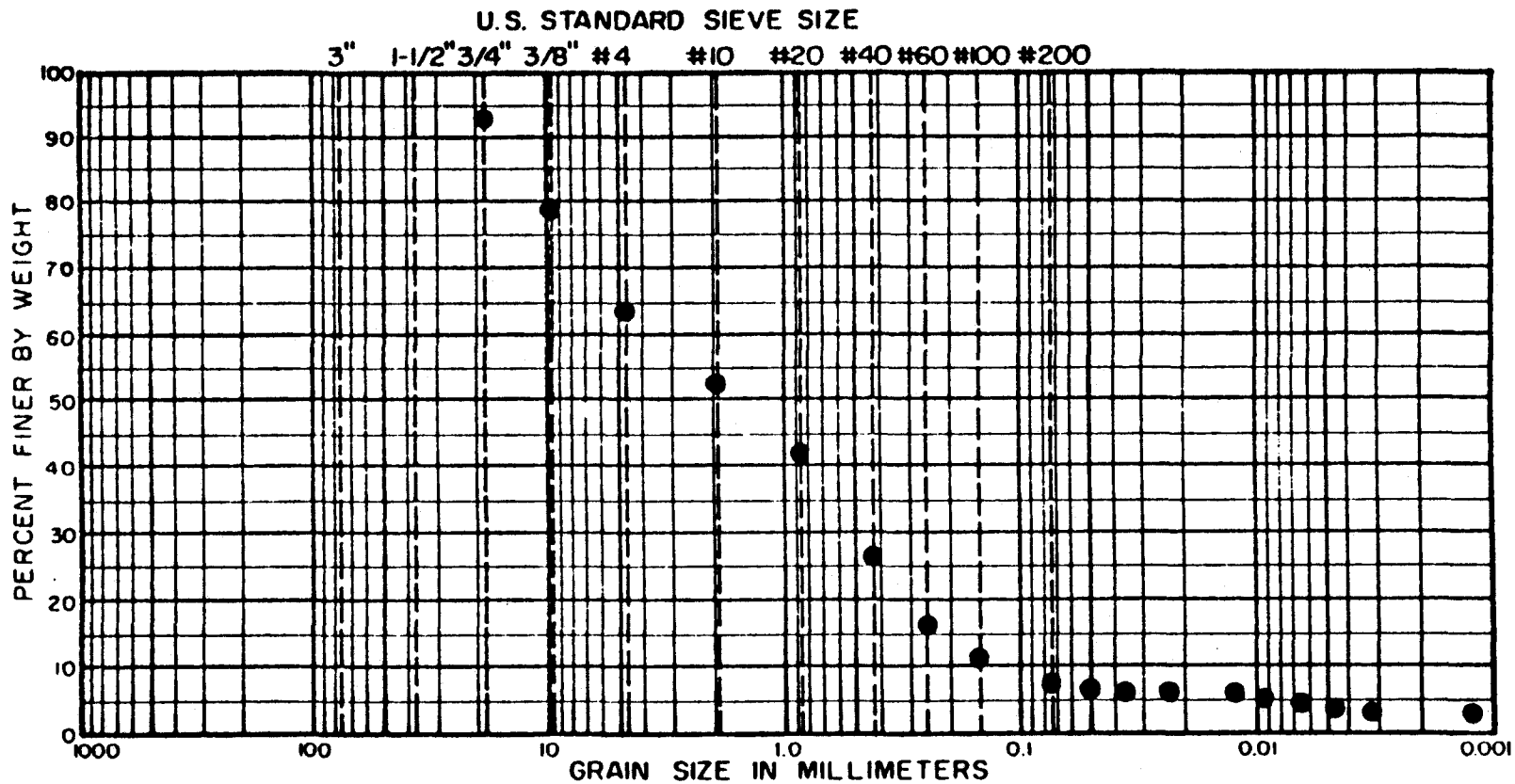
Wt. Total Sample Wet (g)	478.85
Weight of + #10 Before Washing (g)	242.87
Weight of + #10 After Washing (g)	228.76
Weight of - #10 Wet (g)	235.98
Weight of - #10 Dry (g)	249.18
Wt. Total Sample Dry (g)	477.94
Calc. Wt. "W" (g)	114.67
Calc. Mass + #10	54.88

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	35.50	35.50	35.50	7.4	92.6
3/8"	0.00	64.67	64.67	100.17	21.0	79.0
#4	0.00	70.48	70.48	170.65	35.7	64.3
#10	0.00	58.11	58.11	228.76	47.9	52.1
#20	1.29	13.78	12.49	12.49	58.8	41.2
#40	1.29	19.41	18.12	30.61	74.6	25.4
#60	1.31	12.36	11.05	41.66	84.2	15.8
#100	1.30	7.70	6.40	48.06	89.8	10.2
#200	1.30	4.53	3.23	51.29	92.6	7.4

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39091
DEPTH	0.50 - 0.90 FT
SAMPLE NO.	BH00753EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-13-91 KM,MC
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	42.310
Wt. Dry Soil & Pan (g)	42.170
Wt. of Pan Only (g)	3.700
Sieve:	
Wt. Total Sample Wet (g)	478.85
Weight of + #10 Before Washing (g)	242.87
Weight of + #10 After Washing (g)	228.76
Weight of - #10 Wet (g)	235.98

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.680
Value of "a"	0.994
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.500
Meniscus Corr'n	-1.000
Temp., Deg. C	22.000
Temp. Coef. K	0.01320
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00753EBUI	0.5 - 0.9'	#39091

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39091	SAMPLED	11-13-91 KM,MC
DEPTH	0.50 - 0.90 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00753EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	22.000
Sp. Gr. of Soil	2.680	Temp. Coef. K	0.01320
Value of "a"	0.994	Wt. Dry Sample "W"	114.665
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.500		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	12.00	6.50	5.6	5.6	14.32	0.0706
1.0	11.75	6.25	5.4	5.4	14.36	0.0500
2.0	11.50	6.00	5.2	5.2	14.40	0.0354
5.0	11.50	6.00	5.2	5.2	14.40	0.0224
15.0	11.50	6.00	5.2	5.2	14.40	0.0129
30.0	11.25	5.75	5.0	5.0	14.45	0.0092
60.0	11.00	5.50	4.8	4.8	14.49	0.0065
120.0	10.00	4.50	3.9	3.9	14.65	0.0046
250.0	9.50	4.00	3.5	3.5	14.73	0.0032
1440.0	9.00	3.50	3.0	3.0	14.81	0.0013

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EBASCO

LOCATION 39091

BORING BH00753 EB01 SAMPLE ____ DEPTH 0.5-0.9'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

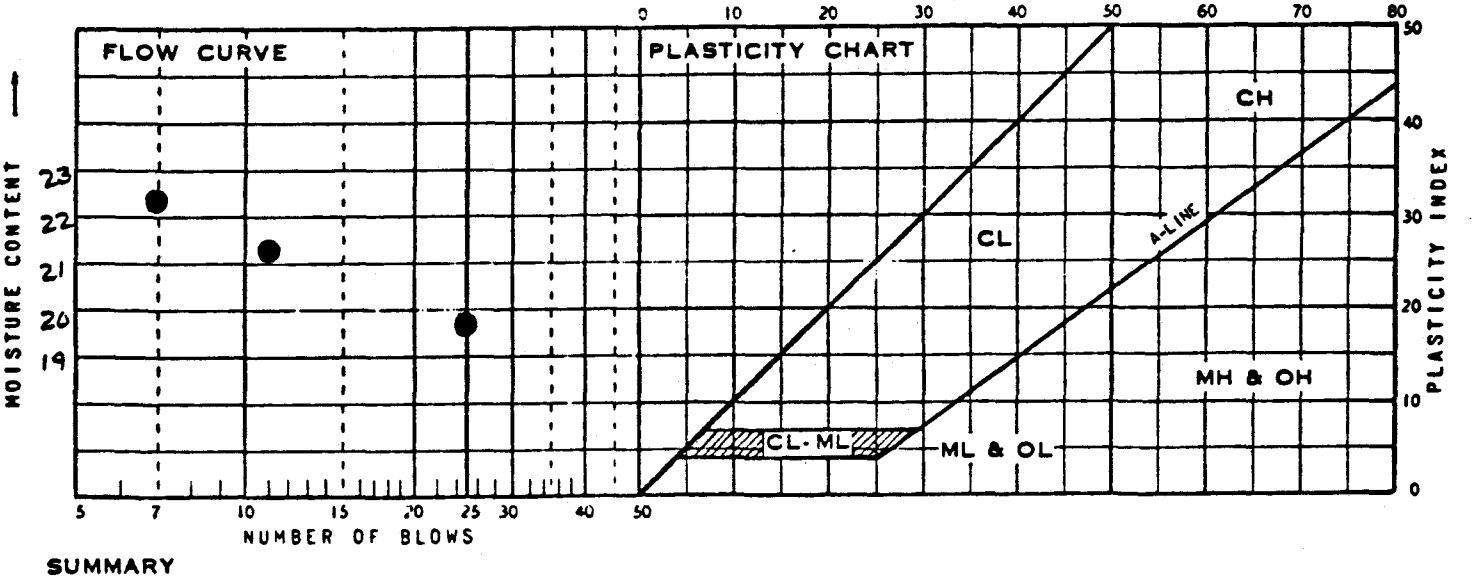
PLASTIC LIMIT BY SR 1/19/92

DETERMINATION	1	2	3	4	5	6
DISH						
WT OF DISH + WET SOIL	NON-PLASTIC!					
WT OF DISH + DRY SOIL	—	—	—	—	—	—
WT OF MOISTURE						
WT OF DISH	—	—	—	—	—	—
WT OF DRY SOIL						
MOISTURE CONTENT						

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	90	69B	22			
NUMBER OF BLOWS	25	11	7			
WT OF DISH + WET SOIL g	15.46	19.67	21.07			
WT OF DISH + DRY SOIL g	13.13	16.46	17.46	—	—	—
WT OF MOISTURE g	2.33	3.21	3.61			
WT OF DISH g	1.32	1.32	1.33	—	—	—
WT OF DRY SOIL g	11.81	15.14	16.13			
MOISTURE CONTENT %	19.7	21.2	22.4			

SLIGHT IN CUT → → NOT ENOUGH MATERIAL



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	

ADVANCED TERRA TESTING INC

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00866EB01	BH00741EB01	BH00761EB01	BH00845EB01	BH00833EB01	BH00759EB01
DEPTH	5.0-5.25'	45.7-46.5'	3.0-3.25'	20.9-21.15'	1.5-1.75'	0.5-0.9'
Sample # SAS Tag #	39691	37891	39191	38991	38991	39091
Sampled	11-25-91	11-07-91	11-14-91	11-12-91	11-11-91	11-13-91
BY:	BP & KH	KM & MC	KM & MC	BP & KH	PB & MS	KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry) (W_o) g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.860g	177.860g	178.070	178.010g	177.99	177.730
Temperature °C, (T_x)	22.4	22.8	22.9	22.0	22.8	23.1
Weight of water and flask at T_x (from cal. curve) (W_a)	162.076g	162.062g	162.066	162.024g	162.062	162.061
Specific Gravity = *	2.71	2.72	2.78	2.76	2.75	2.68
PAN #	2C	34+	517	34	80	31

JOB NO. 2031-05 NAME EB0500

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39091**
Sample Number:	**BH00752EBU1**
Sample Depth:	**0.90-1.15 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✓ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

__ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39091	SAMPLED	11-13-91 KM
DEPTH	0.90 - 1.15 FT	TEST STARTED	02-03-92 DCW
SAMPLE NO.	BH00752EBU1	TEST FINISHED	02-13-92
SOIL DESCR.	SS LINER	SETUP NO.	4P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	253.1	283.4
Wt. Wet Soil & Pan (g)	262.5	292.8
Wt. Dry Soil & Pan (g)	243.3	243.3
Wt. Lost Moisture (g)	19.2	49.5
Wt. of Pan Only (g)	9.4	9.4
Wt. of Dry Soil (g)	233.9	233.9
Moisture Content %	8.2	21.2
Wet Density PCF	105.9	129.8
Dry Density PCF	97.9	107.1

Init. Diameter (in)	2.399	(cm)	6.093
Init. Area (sq in)	4.520	(sq cm)	29.164
Init. Height (in)	2.014	(cm)	5.116
Vol. Bef. Consol. (cu ft)	0.00527		
Vol. After Consol. (cu ft)	0.00481		
Effective Porosity %	36.31		
Constant Head (PSI)	1.00	(cm)	70.39

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
4.0	240	49.8	1.1	41.5	1.3E-03
4.0	240	50.0	3.9	39.9	1.1E-03
4.0	240	50.0	3.1	40.3	1.2E-03
4.0	240	49.9	3.0	40.4	1.2E-03
4.0	240	50.0	2.7	40.5	1.2E-03
4.0	240	49.8	2.0	41.0	1.2E-03
4.0	240	50.0	1.6	41.1	1.2E-03
4.0	240	50.0	1.4	41.2	1.3E-03
4.0	240	50.1	3.5	40.1	1.2E-03
4.0	240	50.0	5.0	39.3	1.1E-03
4.0	240	50.0	4.5	39.6	1.1E-03
4.0	240	50.0	3.6	40.1	1.2E-03
4.0	240	49.9	3.9	40.0	1.1E-03
4.0	240	50.1	3.5	40.1	1.2E-03
4.0	240	49.8	3.5	40.2	1.2E-03

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39091
DEPTH	0.90 - 1.15 FT
SAMPLE NO.	BH00752EBU1
SOIL DESCR.	SS LINER
SAMPLED	11-13-91 KM
TEST STARTED	02-03-92 DCW
TEST FINISHED	02-13-92
SETUP NO.	4P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	253.080
Wt Soil & Moist at	283.360
Wt. Dry Soil & Pan	243.300
Wt. of Pan Only (g)	9.430
Consol Info:	
Init. Diameter in.	2.399
Initial Height in.	2.014
Vol. change (sat. con.) CC	24.200
Cell Exp.	11.300
Height Change in.	0.059
Test info:	
Pore pres @ begin. psi	88.500
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	1.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39091	SAMPLED	11-13-91 KM
DEPTH	0.90 - 1.15 FT	TEST STARTED	02-03-92 DCW
SAMPLE NO.	BH00752EBU1	TEST FINISHED	02-13-92
SOIL DESCR.	SS LINER	SETUP NO.	4P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.1	15.3				
50.0	48.0	16.4	17.5	37.9	43.5	5.6	0.56
60.0	58.0	18.0	18.7	47.6	54.1	6.5	0.65
70.0	68.0	19.0	19.7	57.6	65.3	7.7	0.77
80.0	78.0	19.9	20.6	67.7	76.3	8.6	0.86
90.0	88.0	20.8	21.5	77.6	86.7	9.1	0.91
100.0		21.8	21.8	87.5	97.0	9.5	0.95

CONSOLIDATION DATA

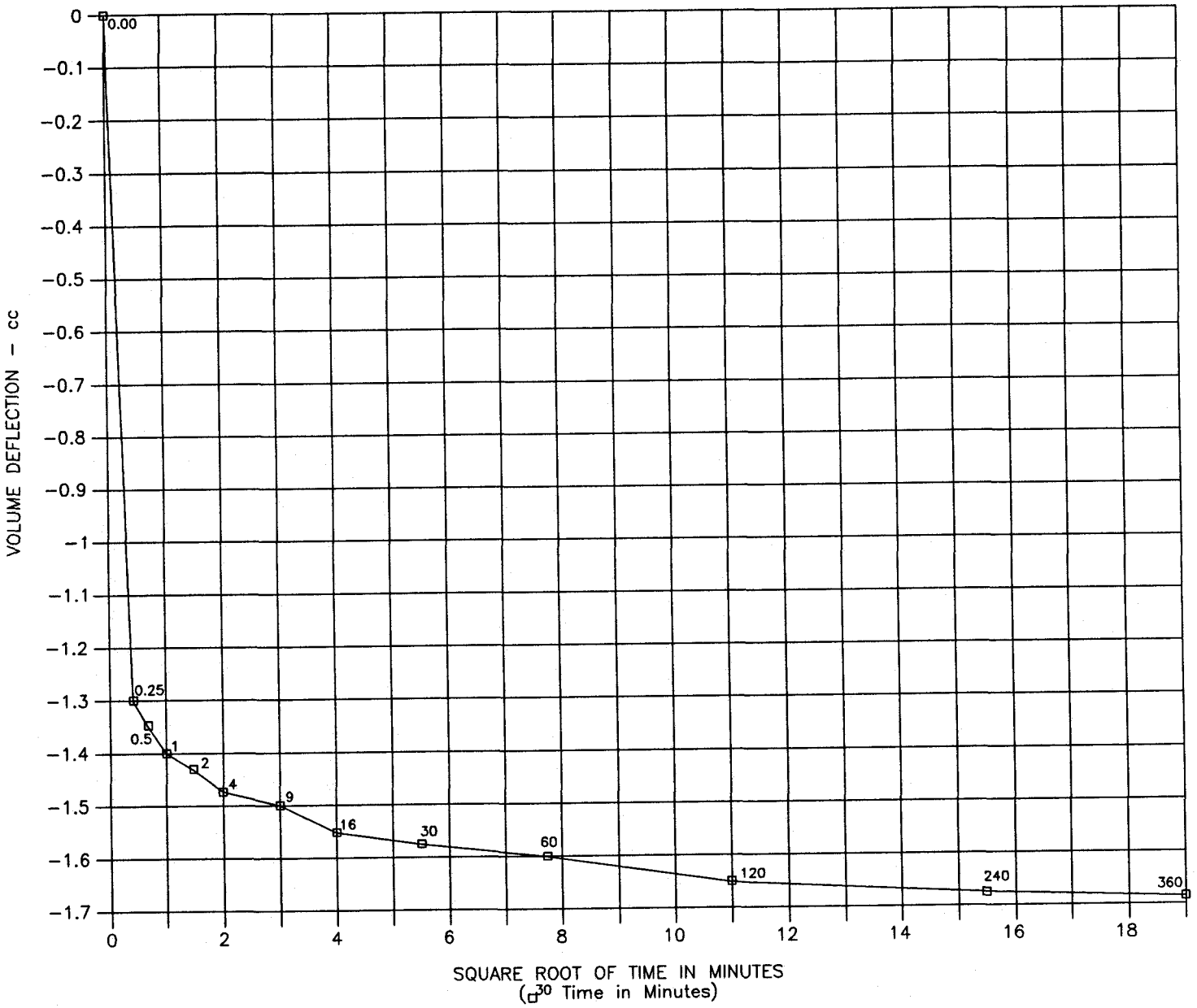
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	21.90	0.00
0.25	0.50	23.20	-1.30
0.5	0.71	23.25	-1.35
1	1.00	23.30	-1.40
2	1.41	23.33	-1.43
4	2.00	23.38	-1.48
9	3.00	23.40	-1.50
16	4.00	23.45	-1.55
30	5.48	23.48	-1.58
60	7.75	23.50	-1.60
120	10.95	23.55	-1.65
240	15.49	23.58	-1.68
360	18.97	23.59	-1.69

Initial Height (in)	2.014	Init. Vol. (CC)	149.21
Height Change (in)	0.059	Vol. Change (CC)	24.20
Ht. After Cons. (in)	1.955	Cell Exp. (CC)	11.30
Initial Area (sq in)	4.520	Net Change (CC)	12.90
Area After Cons. (sq in)	4.254	Cons. Vol. (CC)	136.31

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00752EBU1 @ 0.90–1.15', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39091	SAMPLED	11-13-91 KM
DEPTH	0.90 - 1.15 FT	TEST STARTED	02-03-92 DCW
SAMPLE NO.	BH00752EBU1	TEST FINISHED	02-13-92
SOIL DESCR.	SS LINER	SETUP NO.	4P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.014	Init. Area (sq in)	4.520
Consol. Ht. (in)	1.955	Consol. Area (sq in)	4.254
Back Pres. PSI	88.5	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.254	0	88.50	0.0	1152	0	0.00
125.0	4231	0.01	0.51	4.276	4473	49.50	-5616.0	6768	11241	1.66
165.0	5585	0.02	1.02	4.298	5874	50.00	-5544.0	6696	12570	1.88
187.0	6330	0.03	1.53	4.320	6623	51.00	-5400.0	6552	13175	2.01
193.0	6533	0.04	2.05	4.343	6800	54.50	-4896.0	6048	12848	2.12
190.0	6432	0.05	2.56	4.366	6659	56.80	-4564.8	5717	12376	2.16
185.0	6262	0.06	3.07	4.389	6450	57.00	-4536.0	5688	12138	2.13
180.0	6093	0.07	3.58	4.412	6243	57.40	-4478.4	5630	11873	2.11
176.0	5958	0.08	4.09	4.435	6072	57.60	-4449.6	5602	11673	2.08
172.0	5822	0.09	4.60	4.459	5902	57.70	-4435.2	5587	11489	2.06
167.0	5653	0.10	5.12	4.483	5700	57.80	-4420.8	5573	11272	2.02
151.0	5111	0.15	7.67	4.607	5015	57.80	-4420.8	5573	10587	1.90
140.0	4739	0.20	10.23	4.739	4521	57.80	-4420.8	5573	10093	1.81
139.0	4705	0.25	12.79	4.878	4360	57.80	-4420.8	5573	9933	1.78
150.0	5078	0.30	15.35	5.025	4567	57.80	-4420.8	5573	10140	1.82
157.5	5332	0.35	17.90	5.182	4651	58.00	-4392.0	5544	10195	1.84
164.5	5568	0.40	20.46	5.348	4706	58.40	-4334.4	5486	10193	1.86
175.0	5924	0.45	23.02	5.526	4846	58.70	-4291.2	5443	10289	1.89
149.0	5044	0.50	25.58	5.716	3989	59.20	-4219.2	5371	9360	
140.0	4739	0.55	28.13	5.919	3619	59.50	-4176.0	5328	8947	
140.0	4739	0.60	30.69	6.138	3490	59.70	-4147.2	5299	8789	

ADVANCED TERRA TESTING, INC.

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39191**
Sample Number:	**BH00761EBU1**
Sample Depth:	**3.00-3.25 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 KM,MC
DEPTH	3.00 - 3.25 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00761EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	32.69
Wt. Dry Soil & Pan (g)	32.24
Wt. Lost Moisture (g)	0.45
Wt. of Pan Only (g)	3.76
Wt. of Dry Soil (g)	28.48
Moisture Content %	1.6
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.07

WASH SIEVE ANALYSIS

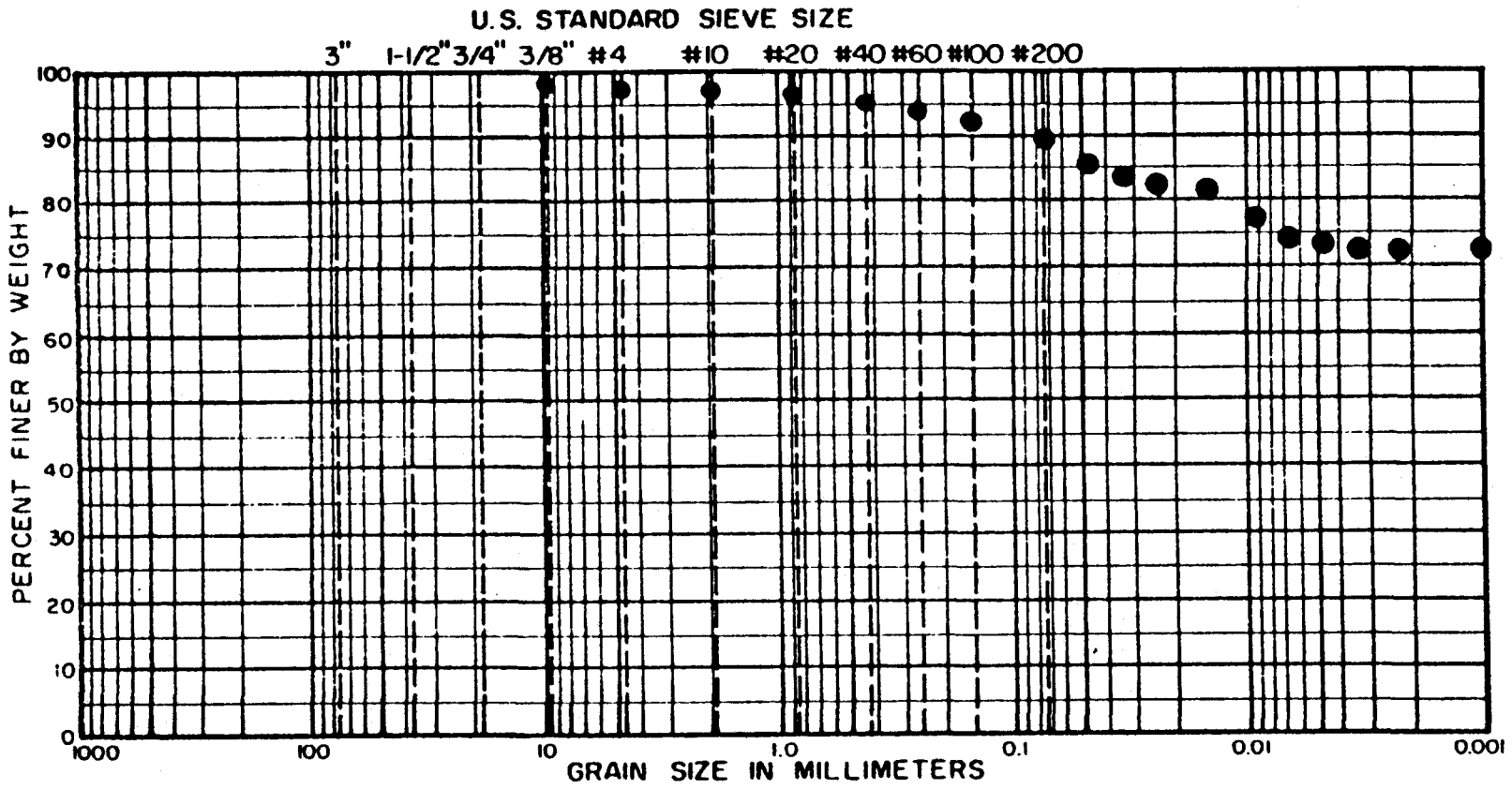
Wt. Total Sample Wet (g)	351.98
Weight of + #10 Before Washing (g)	12.31
Weight of + #10 After Washing (g)	8.79
Weight of - #10 Wet (g)	339.67
Weight of - #10 Dry (g)	337.85
Wt. Total Sample Dry (g)	346.64
Calc. Wt. "W" (g)	60.60
Calc. Mass + #10	1.54

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	5.05	5.05	5.05	1.5	98.5
#4	0.00	2.53	2.53	7.58	2.2	97.8
#10	0.00	1.21	1.21	8.79	2.5	97.5
#20	1.31	2.17	0.86	0.86	4.0	96.0
#40	1.31	1.92	0.61	1.47	5.0	95.0
#60	1.32	2.03	0.71	2.18	6.1	93.9
#100	1.31	2.28	0.97	3.15	7.7	92.3
#200	1.30	2.75	1.45	4.60	10.1	89.9

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39191
DEPTH	3.00 - 3.25 FT
SAMPLE NO.	BH00761EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-14-91 KM,MC
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	32.690
Wt. Dry Soil & Pan (g)	32.240
Wt. of Pan Only (g)	3.760
Sieve:	
Wt. Total Sample Wet (g)	351.98
Weight of + #10 Before Washing (g)	12.31
Weight of + #10 After Washing (g)	8.79
Weight of - #10 Wet (g)	339.67

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.780
Value of "a"	0.974
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.500
Meniscus Corr'n	-1.000
Temp., Deg. C	21.000
Temp. Coef. K	0.01298
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00761EBUI	3.0 - 3.25'	#39191

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 KM,MC
DEPTH	3.00 - 3.25 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00761EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	21.000
Sp. Gr. of Soil	2.780	Temp. Coef. K	0.01298
Value of "a"	0.974	Wt. Dry Sample "W"	60.603
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.500		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	58.50	53.00	85.2	85.2	6.70	0.0475
1.0	57.50	52.00	83.6	83.6	6.86	0.0340
2.0	56.50	51.00	82.0	82.0	7.02	0.0243
5.0	56.00	50.50	81.2	81.2	7.11	0.0155
15.0	53.50	48.00	77.1	77.1	7.52	0.0092
30.0	52.00	46.50	74.7	74.7	7.76	0.0066
60.0	51.50	46.00	73.9	73.9	7.84	0.0047
120.0	51.00	45.50	73.1	73.1	7.93	0.0033
250.0	51.00	45.50	73.1	73.1	7.93	0.0023
1440.0	51.00	45.50	73.1	73.1	7.93	0.0010

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 20[illegible]-05

CLIENT/OWNER EBASCO

LOCATION 39191

BORING BH00721 EB01 SAMPLE ____ DEPTH 3.0-3.25'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

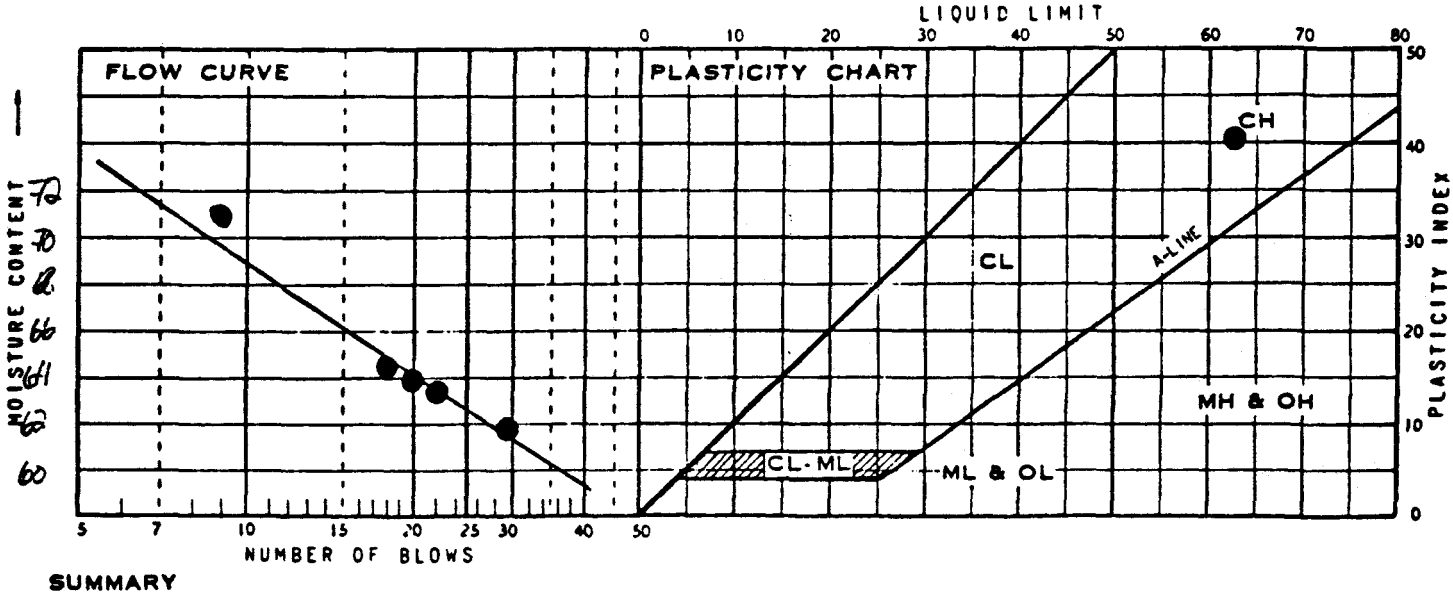
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY ____/__/__

DETERMINATION	1	2	3	4	5	6
DISH	37C	20C	30			
WT OF DISH + WET SOIL	10.10g	8.[illegible]g	7.60g			
WT OF DISH + DRY SOIL	8.47g	7.31g	6.38g	—	—	—
WT OF MOISTURE	1.63g	1.35g	1.22g			
WT OF DISH	1.08g	1.07g	1.06g	—	—	—
WT OF DRY SOIL	7.39g	6.24g	5.32g			
MOISTURE CONTENT	22.1%	21.6%	22.9			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	1	21	20	66C	35C	
NUMBER OF BLOWS	29	23	20	18	9	
WT OF DISH + WET SOIL	16.77g	15.01g	17.45g	15.60g	17.15g	
WT OF DISH + DRY SOIL	10.77g	9.63g	11.05g	9.92g	10.19g	—
WT OF MOISTURE	6.02g	5.43g	6.40g	5.68g	6.66g	
WT OF DISH	1.05g	1.06g	1.03g	1.06g	1.08g	—
WT OF DRY SOIL	9.72g	8.57g	10.02g	8.86g	9.41g	
MOISTURE CONTENT	61.9%	63.4%	63.9%	64.1%	70.8%	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		62.6	22.2	40.4	CH	

ADVANCED TERRA TESTING inc

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00866EB01	BH00741EB01	BH00761EB01	BH00845EB01	BH00833EB01	BH00753EB01
DEPTH	5.0-5.25'	45.7-46.5'	3.0-3.25'	20.9-21.15'	1.5-1.75'	0.5-0.9'
Sample # SAS Tag #	39691	37891	39191	38991	38991	39091
Sampled	11-25-91	11-07-91	11-14-91	11-12-91	11-11-91	11-13-91
BY:	BP & KH	KM & MC	KM & MC	BP & KH	PB & MS	KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry)(W_o)g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.86g	177.86g	178.070	178.010g	177.99	177.730
Temperature °C, (T_x)	22.4	22.8	22.9	22.0	22.8	23.1
Weight of water and flask at T_x (from cal. curve) (W_a)	162.076g	162.062g	162.066	162.024g	162.062	162.061
Specific Gravity = *	2.71	2.72	2.78	2.76	2.75	2.68
PAN #	2C	34+	517	34	80	31

JOB NO. 2031-05 NAME EBASCO

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39191**
Sample Number:	**BH00760EBU1**
Sample Depth:	**3.25-3.50 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 BP
DEPTH	3.25 - 3.50 FT	TEST STARTED	01-13-92 DCW
SAMPLE NO.	BH00760EBU1	TEST FINISHED	01-25-92
SOIL DESCR.	--	SETUP NO.	10S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	344.9	360.9
Wt. Wet Soil & Pan (g)	353.8	369.8
Wt. Dry Soil & Pan (g)	293.8	293.8
Wt. Lost Moisture (g)	59.9	75.9
Wt. of Pan Only (g)	8.9	8.9
Wt. of Dry Soil (g)	285.0	285.0
Moisture Content %	21.0	26.6
Wet Density PCF	123.6	133.9
Dry Density PCF	102.1	105.7

Init. Diameter (in)	2.370	(cm)	6.020
Init. Area (sq in)	4.412	(sq cm)	28.463
Init. Height (in)	2.410	(cm)	6.121
Vol. Bef. Consol. (cu ft)	0.00615		
Vol. After Consol. (cu ft)	0.00594		
Effective Porosity %	45.13		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
992.0	59520	50.0	48.9	5.1	3.0E-08
1397.0	83820	48.9	47.8	6.1	2.1E-08
1473.0	88380	47.8	46.7	7.2	2.1E-08
1408.0	84480	46.7	45.7	8.1	2.0E-08
1458.0	87480	45.7	44.6	9.1	2.1E-08

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39191
DEPTH	3.25 - 3.50 FT
SAMPLE NO.	BH00760EBU1
SOIL DESCR.	--
SAMPLED	11-14-91 BP
TEST STARTED	01-13-92 DCW
TEST FINISHED	01-25-92
SETUP NO.	10S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	344.890
Wt Soil & Moist at	360.900
Wt. Dry Soil & Pan	293.820
Wt. of Pan Only (g)	8.860
Consol Info:	
Init. Diameter in.	2.370
Initial Height in.	2.410
Vol. change (sat. con.) CC	30.000
Cell Exp.	24.000
Height Change in.	0.014
Test info:	
Pore pres @ begin. psi	89.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 BP
DEPTH	3.25 - 3.50 FT	TEST STARTED	01-13-92 DCW
SAMPLE NO.	BH00760EBU1	TEST FINISHED	01-25-92
SOIL DESCR.	--	SETUP NO.	10S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	19.9				
50.0	48.0	15.2	17.4	38.3	46.0	7.7	0.77
60.0	58.0	17.4	19.2	48.6	56.9	8.3	0.83
70.0	68.0	19.4	21.2	58.4	67.1	8.7	0.87
80.0	78.0	21.3	23.0	68.5	77.5	9.0	0.90
90.0	88.0	23.4	25.2	78.5	87.9	9.4	0.94
100.0		25.4	25.5	88.7	98.3	9.6	0.96

CONSOLIDATION DATA

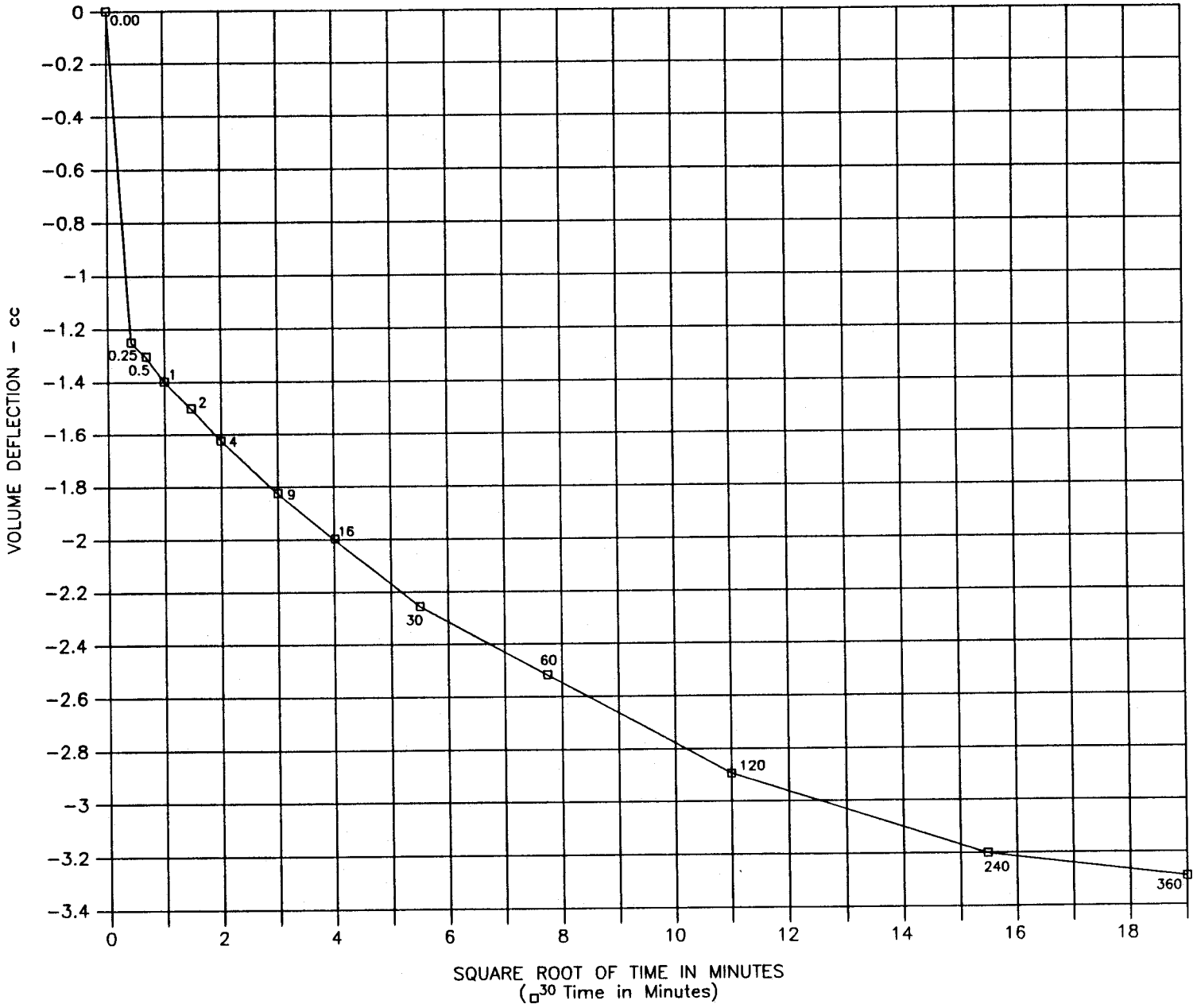
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	25.50	0.00
0.25	0.50	26.75	-1.25
0.5	0.71	26.80	-1.30
1	1.00	26.90	-1.40
2	1.41	27.00	-1.50
4	2.00	27.13	-1.63
9	3.00	27.33	-1.82
16	4.00	27.50	-2.00
30	5.48	27.75	-2.25
60	7.75	28.03	-2.52
120	10.95	28.40	-2.90
240	15.49	28.70	-3.20
360	18.97	28.80	-3.30

Initial Height (in)	2.410	Init. Vol. (CC)	174.25
Height Change (in)	0.014	Vol. Change (CC)	30.00
Ht. After Cons. (in)	2.396	Cell Exp. (CC)	24.00
Initial Area (sq in)	4.412	Net Change (CC)	6.00
Area After Cons. (sq in)	4.284	Cons. Vol. (CC)	168.25

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00760EBU1 @ 3.25–3.50', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

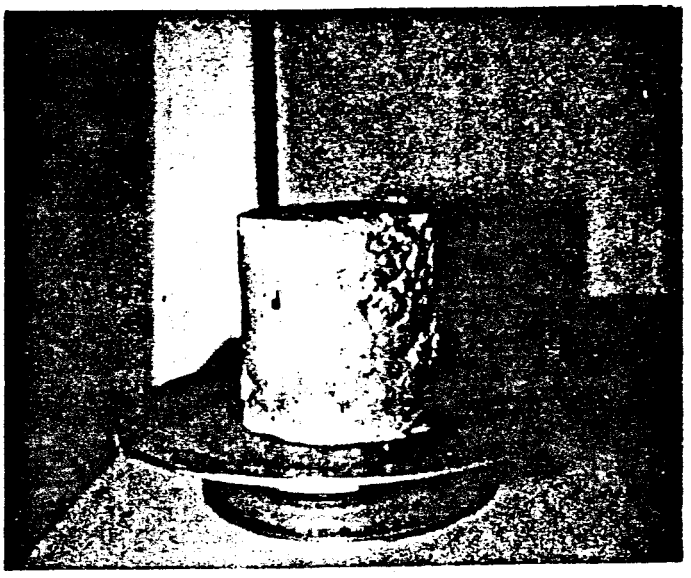
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 BP
DEPTH	3.25 - 3.50 FT	TEST STARTED	01-13-92 DCW
SAMPLE NO.	BH00760EBU1	TEST FINISHED	01-25-92
SOIL DESCR.	--	SETUP NO.	10S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.410	Init. Area (sq in)	4.412
Consol. Ht. (in)	2.396	Consol. Area (sq in)	4.284
Back Pres. PSI	89.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.284	0	89.00	0.0	1152	0	0.00
125.0	4201	0.01	0.42	4.302	4308	49.50	-5688.0	6840	11148	1.63
165.0	5546	0.02	0.83	4.321	5662	50.00	-5616.0	6768	12430	1.84
187.0	6285	0.03	1.25	4.339	6390	51.00	-5472.0	6624	13014	1.96
193.0	6487	0.04	1.67	4.357	6567	54.50	-4968.0	6120	12687	2.07
190.0	6386	0.05	2.09	4.376	6438	56.80	-4636.8	5789	12227	2.11
185.0	6218	0.06	2.50	4.395	6242	57.00	-4608.0	5760	12002	2.08
180.0	6050	0.07	2.92	4.413	6047	57.40	-4550.4	5702	11749	2.06
176.0	5915	0.08	3.34	4.432	5887	57.60	-4521.6	5674	11561	2.04
172.0	5781	0.09	3.76	4.452	5729	57.70	-4507.2	5659	11388	2.01
167.0	5613	0.10	4.17	4.471	5538	57.80	-4492.8	5645	11183	1.98
151.0	5075	0.15	6.26	4.571	4898	57.80	-4492.8	5645	10543	1.87
140.0	4705	0.20	8.35	4.675	4440	57.80	-4492.8	5645	10085	1.79
139.0	4672	0.25	10.43	4.784	4308	57.80	-4492.8	5645	9953	1.76
150.0	5041	0.30	12.52	4.898	4541	57.80	-4492.8	5645	10186	1.80
157.5	5294	0.35	14.61	5.017	4654	58.00	-4464.0	5616	10270	1.83
164.5	5529	0.40	16.69	5.143	4742	58.40	-4406.4	5558	10301	1.85
175.0	5882	0.45	18.78	5.275	4919	58.70	-4363.2	5515	10434	1.89
149.0	5008	0.50	20.87	5.414	4080	59.20	-4291.2	5443	9523	
140.0	4705	0.55	22.95	5.561	3733	59.50	-4248.0	5400	9133	
140.0	4705	0.60	25.04	5.716	3632	59.70	-4219.2	5371	9003	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



39191

BH00760EBUI

3.25-3.50 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39191**
Sample Number:	**BH00766EBU1**
Sample Depth:	**11.50-11.75 feet (Bedrock)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 KM,MC
DEPTH	11.50 - 11.75 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00766EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	57.66
Wt. Dry Soil & Pan (g)	57.21
Wt. Lost Moisture (g)	0.45
Wt. of Pan Only (g)	3.73
Wt. of Dry Soil (g)	53.48
Moisture Content %	0.8
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.50

WASH SIEVE ANALYSIS

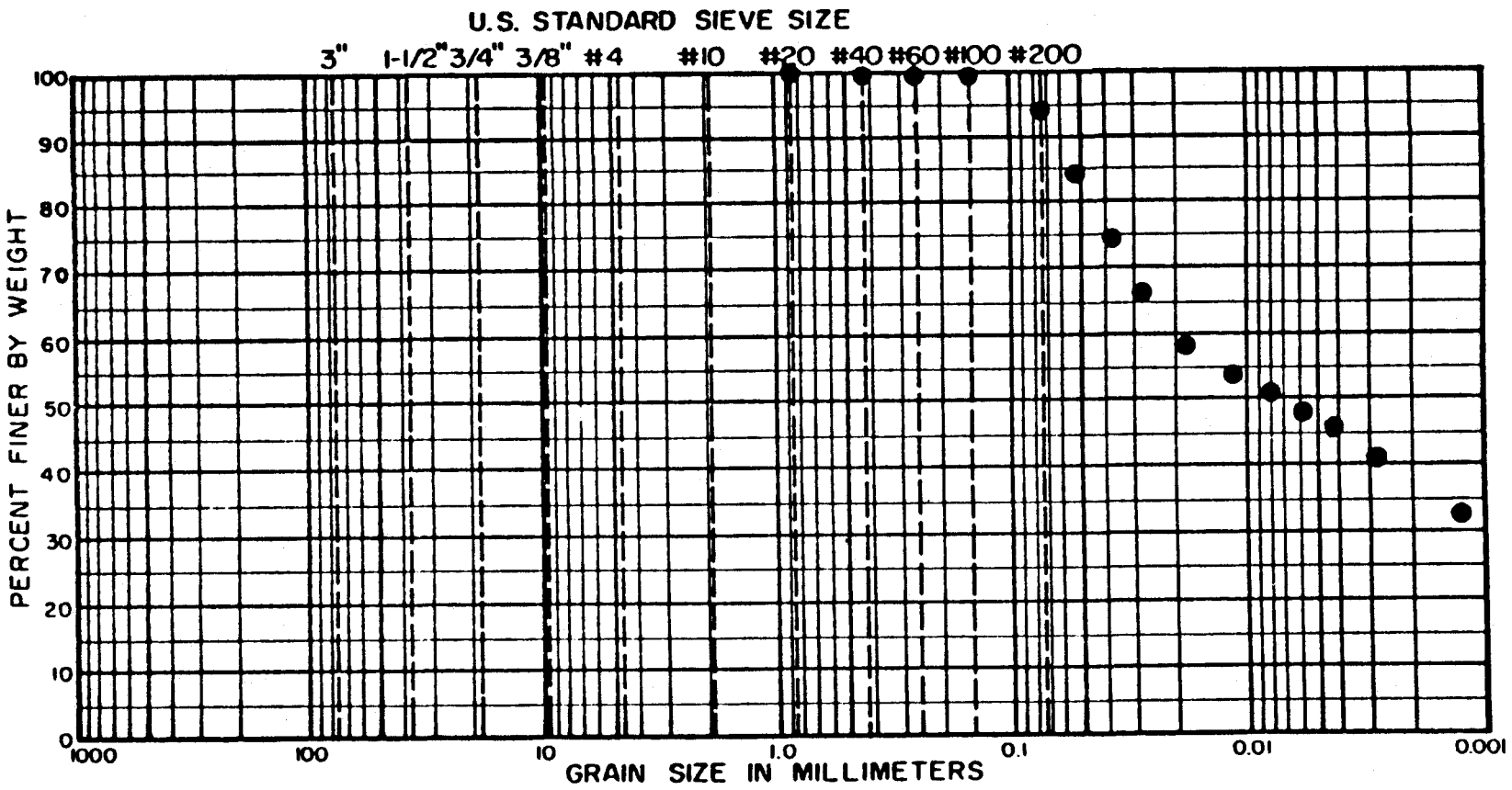
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00
Weight of - #10 Dry (g)	59.50
Wt. Total Sample Dry (g)	59.50
Calc. Wt. "W" (g)	59.50
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	1.31	1.33	0.02	0.02	0.0	100.0
#40	1.43	1.44	0.01	0.03	0.1	99.9
#60	1.31	1.33	0.02	0.05	0.1	99.9
#100	1.30	1.31	0.01	0.06	0.1	99.9
#200	1.29	4.37	3.08	3.14	5.3	94.7

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39191
DEPTH	11.50 - 11.75 FT
SAMPLE NO.	BH00766EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-14-91 KM,MC
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	57.660
Wt. Dry Soil & Pan (g)	57.210
Wt. of Pan Only (g)	3.730
Sieve:	
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.640
Value of "a"	1.002
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	21.000
Temp. Coef. K	0.01352
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00766 EBUI	11.5 - 11.75'	#39191

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 KM,MC
DEPTH	11.50 - 11.75 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00766EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	21.000
Sp. Gr. of Soil	2.640	Temp. Coef. K	0.01352
Value of "a"	1.002	Wt. Dry Sample "W"	59.499
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.000		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	55.00	50.00	84.2	84.2	7.27	0.0516
1.0	49.50	44.50	74.9	74.9	8.17	0.0387
2.0	44.50	39.50	66.5	66.5	8.99	0.0287
5.0	40.00	35.00	58.9	58.9	9.73	0.0189
15.0	37.50	32.50	54.7	54.7	10.14	0.0111
30.0	35.00	30.00	50.5	50.5	10.55	0.0080
60.0	33.50	28.50	48.0	48.0	10.80	0.0057
120.0	32.00	27.00	45.5	45.5	11.04	0.0041
250.0	29.00	24.00	40.4	40.4	11.53	0.0029
1440.0	24.50	19.50	32.8	32.8	12.27	0.0012

Grain Diameter = K*(SQRT(L/T))

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 203-05

CLIENT/OWNER EBASCO

LOCATION 39/91

BORING BH0766 EB01 SAMPLE ____ DEPTH 11.5-11.75'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

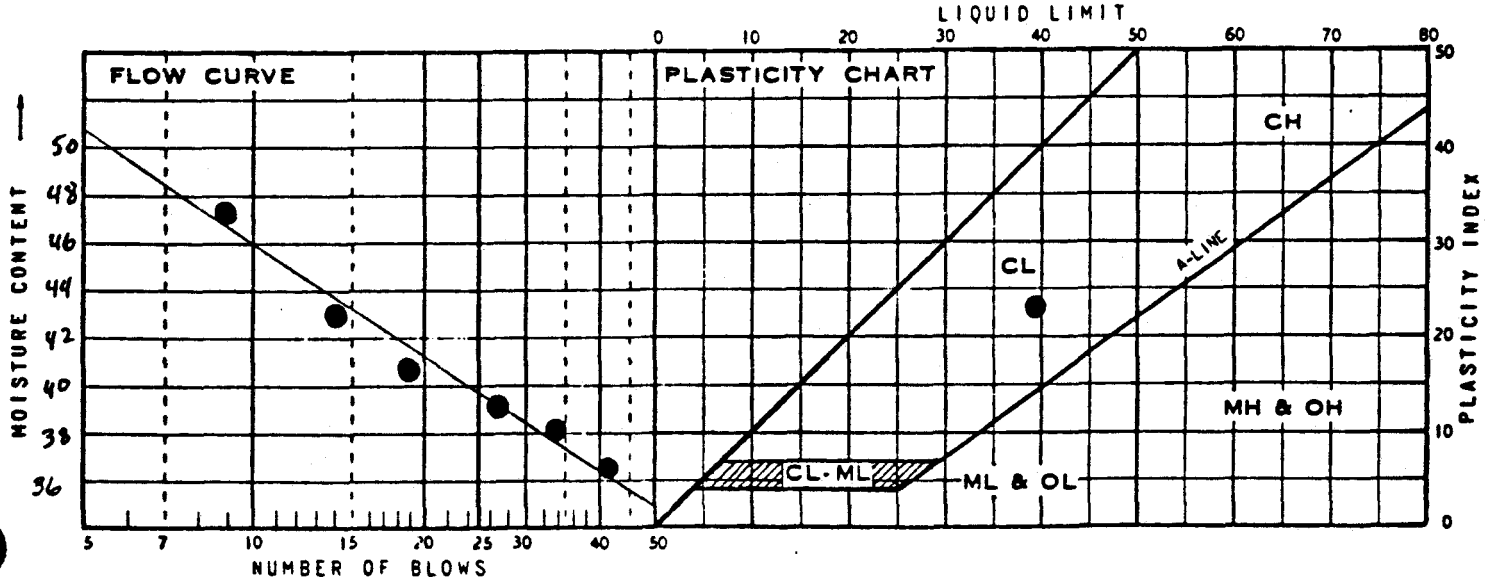
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY DV 1/15/92

DETERMINATION	1	2	3	4	5	6
DISH	14	46C	49C			
WT OF DISH + WET SOIL g	7.78	7.98	9.23			
WT OF DISH + DRY SOIL g	6.88	7.03	8.11	—	—	—
WT OF MOISTURE g	.90	.95	1.12			
WT OF DISH g	1.07	1.07	1.07	—	—	—
WT OF DRY SOIL g	5.81	5.96	7.04			
MOISTURE CONTENT %	15.5	15.9	15.9			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	20	54C	17C	11	45C	6C
NUMBER OF BLOWS	41	34	27	19	14	9
WT OF DISH + WET SOIL g	15.10	14.50	13.91	13.60	15.08	18.05
WT OF DISH + DRY SOIL g	11.34	10.79	10.30	9.90	10.87	12.60
WT OF MOISTURE g	3.76	3.71	3.61	3.70	4.21	5.45
WT OF DISH g	1.07	1.08	1.07	1.06	1.07	1.09
WT OF DRY SOIL g	10.27	9.71	9.23	8.84	9.80	11.51
MOISTURE CONTENT %	36.6	38.2	39.1	41.9	43.0	47.4



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		39.7	15.8	23.9	CL	

ADVANCED TERRA TESTING inc

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00734EBU1	BH00840EBU1	BH00812EBU1	BH00738EBU1	BH00775EBU1	BH00766EBU1
DEPTH	46'	11.50-11.75'	4.8-5.05'	10.0-10.2'	41.75-42.25'	11.8-11.95'
Sample # SAS Tag #	37991	38991	38591	37891	39191	39191
Sampled	10-29-91	11-12-91	11-05-91	1-6-91	11-20-91	11-14-91
BY:	KM & MC	RP & KH	KH & MC	KM & JN	KM & NEILSON	KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry)(W_o)g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.82g	177.840g	177.89g	177.790g	177.920g	177.690g
Temperature °C, (T_x)	20.7	21.5	22.0	21.6	18.2	19.0
Weight of water and flask at T_x (from cal. curve) (W_a)	162.101g	162.095g	162.084g	162.094g	162.175	162.153
Specific Gravity = *	2.69	2.70	2.72	2.69	2.76	2.64
PAN #	13	21B	27	6C	32	26B

JOB NO. 2031-05 NAME EBASCO

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

Page No. ___ Of ___

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39191**
Sample Number:	**BH00765EBU1**
Sample Depth:	**11.75-12.00 feet (Bedrock)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 KM
DEPTH	11.75 - 12.00 FT	TEST STARTED	01-09-92 DCW
SAMPLE NO.	BH00765EBU1	TEST FINISHED	01-24-92
SOIL DESCR.	--	SETUP NO.	11S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	443.4	453.6
Wt. Wet Soil & Pan (g)	452.9	463.1
Wt. Dry Soil & Pan (g)	405.3	405.3
Wt. Lost Moisture (g)	47.5	57.7
Wt. of Pan Only (g)	9.5	9.5
Wt. of Dry Soil (g)	395.9	395.9
Moisture Content %	12.0	14.6
Wet Density PCF	138.9	156.1
Dry Density PCF	124.0	136.3

Init. Diameter (in)	2.388	(cm)	6.066
Init. Area (sq in)	4.479	(sq cm)	28.897
Init. Height (in)	2.715	(cm)	6.896
Vol. Bef. Consol. (cu ft)	0.00704		
Vol. After Consol. (cu ft)	0.00640		
Effective Porosity %	31.82		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
934.0	56040	49.8	47.0	16.8	1.1E-07
1446.0	86760	47.0	41.8	21.1	1.3E-07
1454.0	87240	41.8	37.3	26.3	1.2E-07
1504.0	90240	37.3	33.1	31.0	1.1E-07
1443.0	86580	33.1	29.3	35.3	1.1E-07
1369.0	82140	49.9	45.2	17.7	1.2E-07
1396.0	83760	45.2	41.2	22.4	1.1E-07
1464.0	87840	41.2	37.3	26.7	1.0E-07
1408.0	84480	37.3	33.9	30.6	9.5E-08
1457.0	87420	33.9	30.5	34.2	9.5E-08

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39191
DEPTH	11.75 - 12.00 FT
SAMPLE NO.	BH00765EBU1
SOIL DESCR.	--
SAMPLED	11-14-91 KM
TEST STARTED	01-09-92 DCW
TEST FINISHED	01-24-92
SETUP NO.	11S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	443.410
Wt Soil & Moist at	453.600
Wt. Dry Soil & Pan	405.320
Wt. of Pan Only (g)	9.450
Consol Info:	
Init. Diameter in.	2.388
Initial Height in.	2.715
Vol. change (sat. con.) CC	38.900
Cell Exp.	21.000
Height Change in.	0.006
Test info:	
Pore pres @ begin. psi	69.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 KM
DEPTH	11.75 - 12.00 FT	TEST STARTED	01-09-92 DCW
SAMPLE NO.	BH00765EBU1	TEST FINISHED	01-24-92
SOIL DESCR.	--	SETUP NO.	11S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.1	13.5				
50.0	48.0	14.9	16.9	38.6	47.5	8.9	0.89
60.0	58.0	19.8	21.7	48.5	57.7	9.2	0.92
70.0	68.0	24.7	26.5	58.7	68.0	9.3	0.93
80.0		27.8	27.9	68.6	78.1	9.5	0.95

CONSOLIDATION DATA

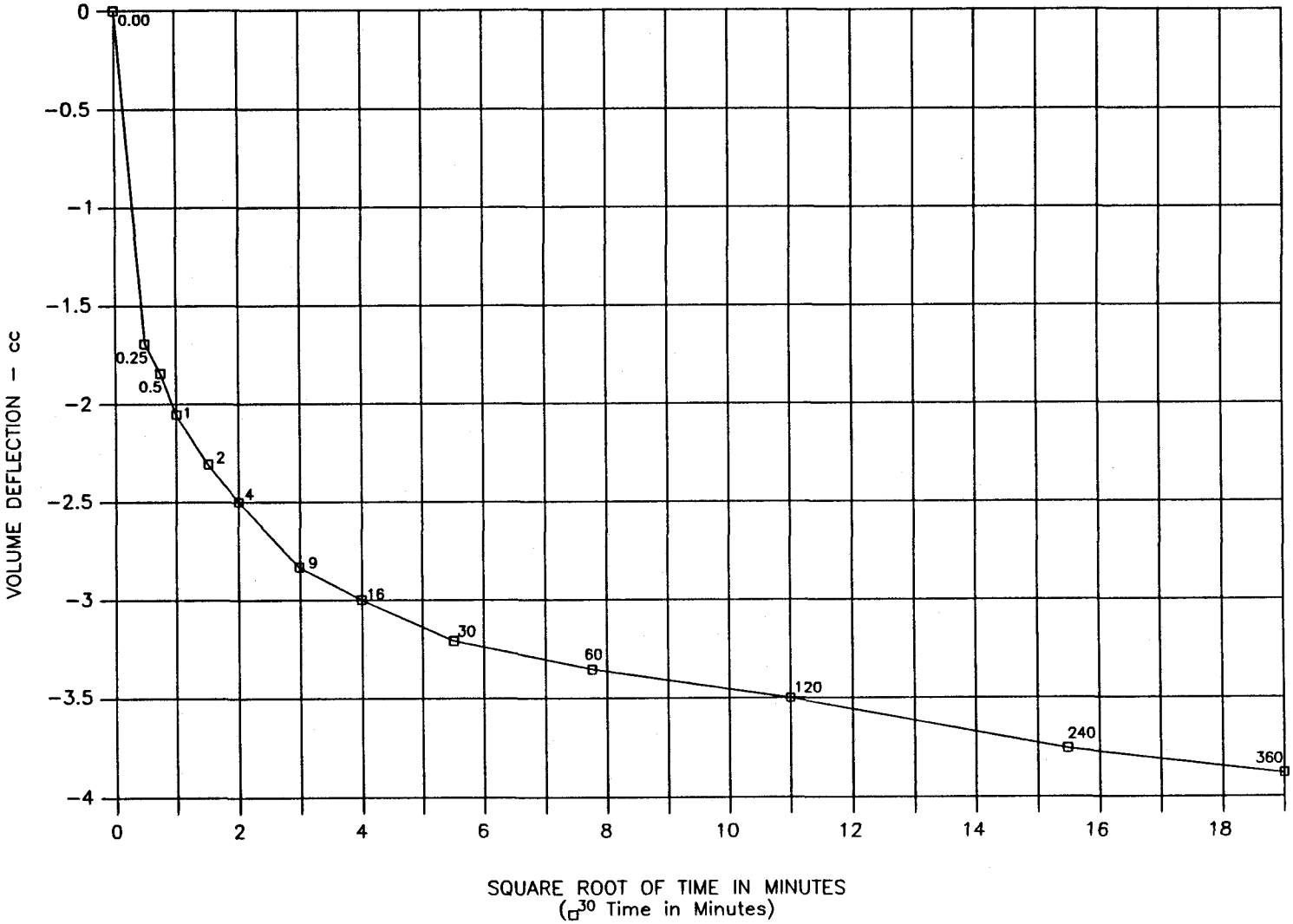
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	27.80	0.00
0.25	0.50	29.50	-1.70
0.5	0.71	29.65	-1.85
1	1.00	29.85	-2.05
2	1.41	30.10	-2.30
4	2.00	30.30	-2.50
9	3.00	30.63	-2.82
16	4.00	30.80	-3.00
30	5.48	31.00	-3.20
60	7.75	31.15	-3.35
120	10.95	31.30	-3.50
240	15.49	31.55	-3.75
360	18.97	31.70	-3.90

Initial Height (in)	2.715	Init. Vol. (CC)	199.30
Height Change (in)	0.006	Vol. Change (CC)	38.90
Ht. After Cons. (in)	2.709	Cell Exp. (CC)	21.00
Initial Area (sq in)	4.479	Net Change (CC)	17.90
Area After Cons. (sq in)	4.086	Cons. Vol. (CC)	181.40

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00765EBU1 @ 11.75–12.00', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

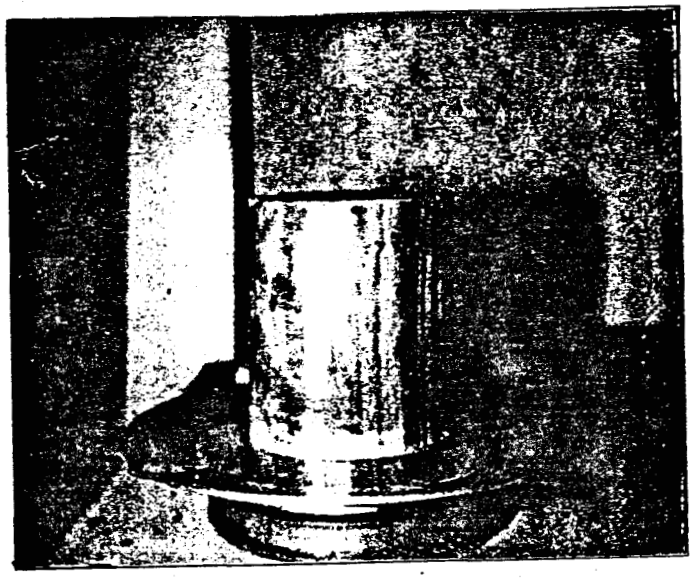
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-14-91 KM
DEPTH	11.75 - 12.00 FT	TEST STARTED	01-09-92 DCW
SAMPLE NO.	BH00765EBU1	TEST FINISHED	01-24-92
SOIL DESCR.	--	SETUP NO.	11S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.715	Init. Area (sq in)	4.479
Consol. Ht. (in)	2.709	Consol. Area (sq in)	4.086
Back Pres. PSI	69.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.086	0	69.00	0.0	1152	0	0.00
125.0	4406	0.01	0.37	4.101	4812	49.50	-2808.0	3960	8772	2.22
165.0	5816	0.02	0.74	4.116	6328	50.00	-2736.0	3888	10216	2.63
187.0	6591	0.03	1.11	4.131	7145	51.00	-2592.0	3744	10889	2.91
193.0	6803	0.04	1.48	4.147	7347	54.50	-2088.0	3240	10587	3.27
190.0	6697	0.05	1.85	4.162	7206	56.80	-1756.8	2909	10115	3.48
185.0	6521	0.06	2.21	4.178	6990	57.00	-1728.0	2880	9870	3.43
180.0	6344	0.07	2.58	4.194	6775	57.40	-1670.4	2822	9598	3.40
176.0	6203	0.08	2.95	4.210	6600	57.60	-1641.6	2794	9393	3.36
172.0	6062	0.09	3.32	4.226	6425	57.70	-1627.2	2779	9204	3.31
167.0	5886	0.10	3.69	4.242	6214	57.80	-1612.8	2765	8979	3.25
151.0	5322	0.15	5.54	4.325	5511	57.80	-1612.8	2765	8276	2.99
140.0	4934	0.20	7.38	4.411	5010	57.80	-1612.8	2765	7775	2.81
139.0	4899	0.25	9.23	4.501	4875	57.80	-1612.8	2765	7640	2.76
150.0	5287	0.30	11.07	4.594	5154	57.80	-1612.8	2765	7919	2.86
157.5	5551	0.35	12.92	4.692	5299	58.00	-1584.0	2736	8035	2.94
164.5	5798	0.40	14.77	4.793	5418	58.40	-1526.4	2678	8096	3.02
175.0	6168	0.45	16.61	4.899	5639	58.70	-1483.2	2635	8274	3.14
149.0	5252	0.50	18.46	5.010	4695	59.20	-1411.2	2563	7258	
140.0	4934	0.55	20.30	5.126	4311	59.50	-1368.0	2520	6831	
140.0	4934	0.60	22.15	5.248	4211	59.70	-1339.2	2491	6703	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



39191

BH00765EBUI

11.75–12.00 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39191**
Sample Number:	**BH00775EBU1**
Sample Depth:	**42.00-42.25 feet (Bedrock)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-20-91 KM,N
DEPTH	42.00 - 42.25 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00775EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	52.17
Wt. Dry Soil & Pan (g)	51.78
Wt. Lost Moisture (g)	0.39
Wt. of Pan Only (g)	3.60
Wt. of Dry Soil (g)	48.18
Moisture Content %	0.8
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.52

WASH SIEVE ANALYSIS

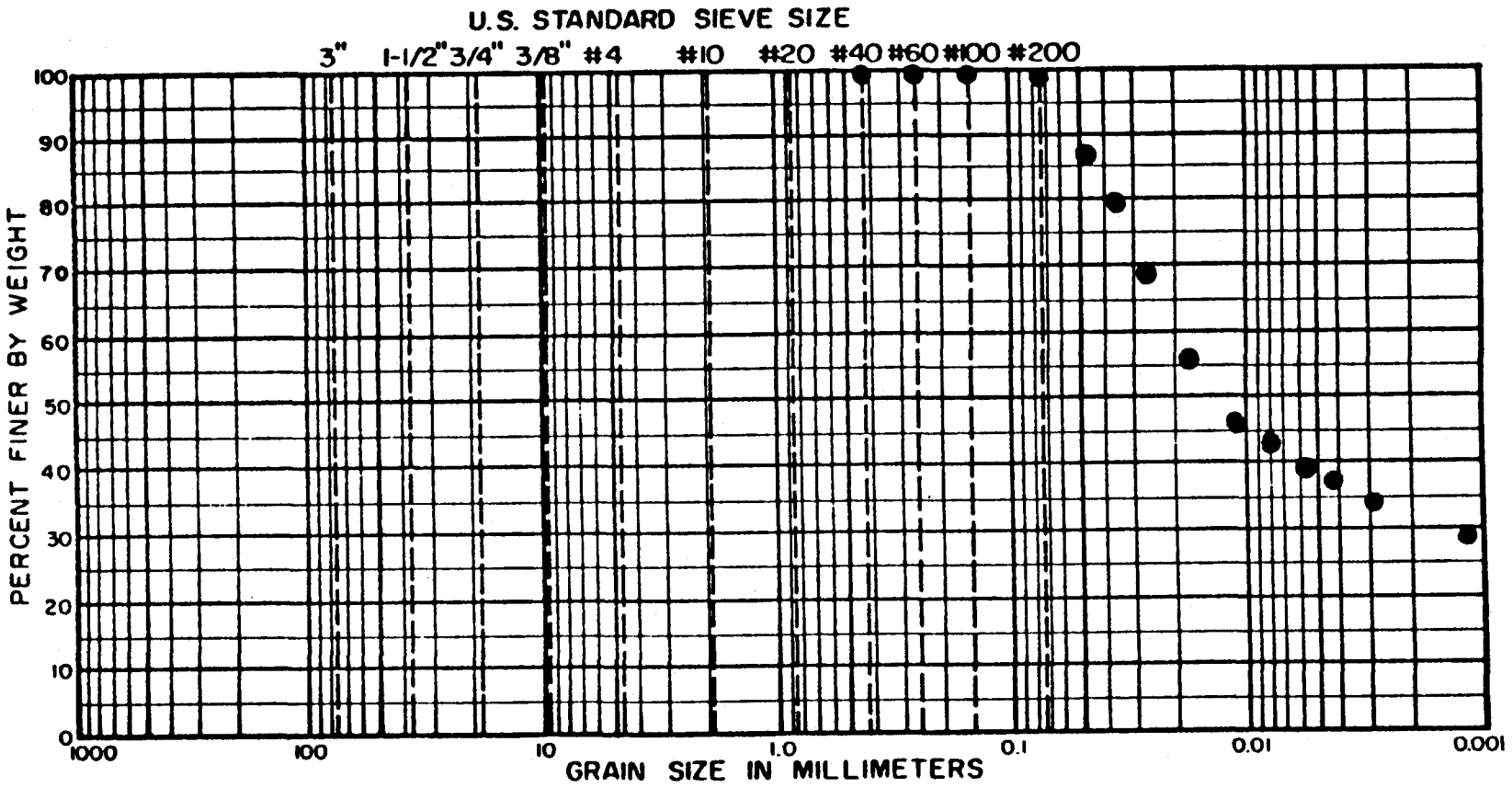
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00
Weight of - #10 Dry (g)	59.52
Wt. Total Sample Dry (g)	59.52
Calc. Wt. "W" (g)	59.52
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	1.31	1.32	0.01	0.01	0.0	100.0
#40	1.31	1.33	0.02	0.03	0.1	99.9
#60	1.31	1.33	0.02	0.05	0.1	99.9
#100	1.31	1.33	0.02	0.07	0.1	99.9
#200	1.32	2.18	0.86	0.93	1.6	98.4

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39191
DEPTH	42.00 - 42.25 FT
SAMPLE NO.	BH00775EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-20-91 KM,N
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	52.170
Wt. Dry Soil & Pan (g)	51.780
Wt. of Pan Only (g)	3.600
Sieve:	
Wt. Total Sample Wet (g)	60.00
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	60.00

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.760
Value of "a"	0.978
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.000
Meniscus Corr'n	-1.000
Temp., Deg. C	21.000
Temp. Coef. K	0.01305
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00775EBUI	41.75 - 42.25'	#39191

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-20-91 KM,N
DEPTH	42.00 - 42.25 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00775EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	21.000
Sp. Gr. of Soil	2.760	Temp. Coef. K	0.01305
Value of "a"	0.978	Wt. Dry Sample "W"	59.518
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.000		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	58.00	53.00	87.1	87.1	6.78	0.0481
1.0	53.00	48.00	78.9	78.9	7.60	0.0360
2.0	46.50	41.50	68.2	68.2	8.66	0.0272
5.0	39.00	34.00	55.9	55.9	9.89	0.0184
15.0	33.00	28.00	46.0	46.0	10.88	0.0111
30.0	31.50	26.50	43.5	43.5	11.12	0.0079
60.0	29.00	24.00	39.4	39.4	11.53	0.0057
120.0	27.50	22.50	37.0	37.0	11.78	0.0041
250.0	25.75	20.75	34.1	34.1	12.07	0.0029
1440.0	22.00	17.00	27.9	27.9	12.68	0.0012

Grain Diameter = K*(SQRT(L/T))

ADVANCED TERRA TESTING, INC.

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05
CLIENT/OWNER ERASCO
LOCATION 39191 BH00775
BORING EB0L SAMPLE ____ DEPTH 41.75-42.25

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

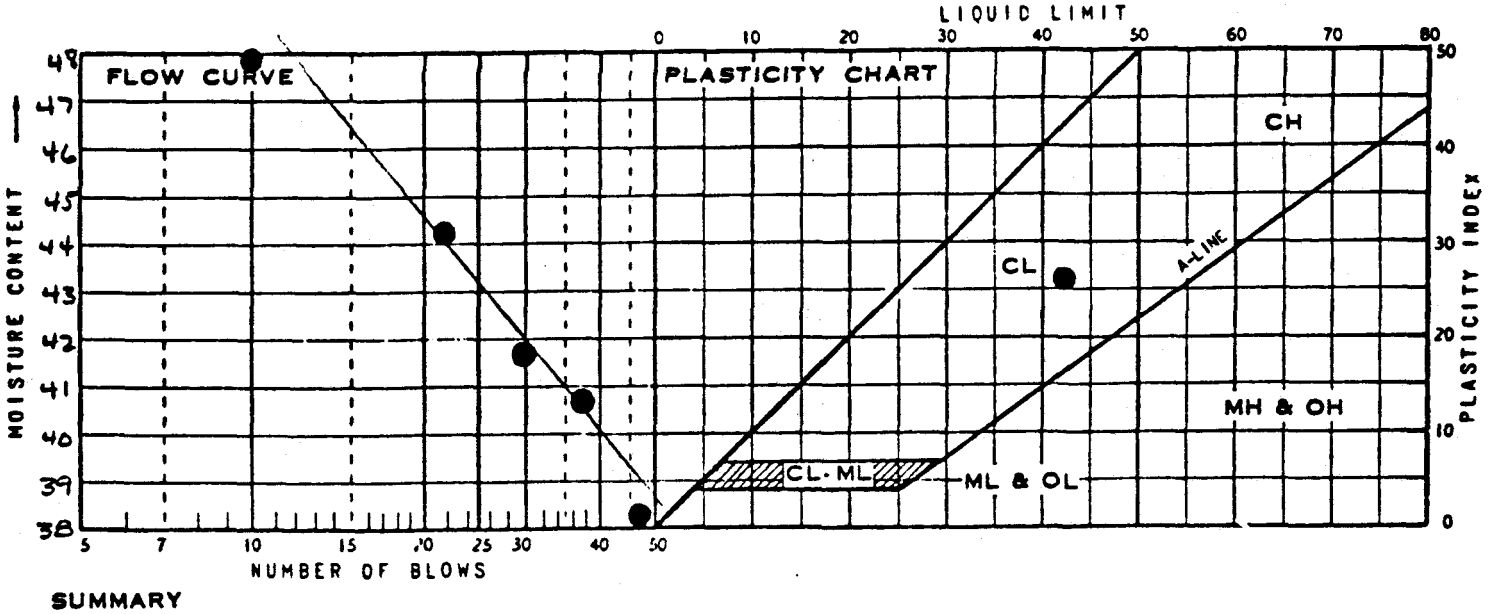
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SR 1/15/92

DETERMINATION	1	2	3	4	5	6
DISH	10	6				
WT OF DISH + WET SOIL g	9.59	8.11				
WT OF DISH + DRY SOIL g	8.26	7.08	—	—	—	—
WT OF MOISTURE g	1.27	1.03				
WT OF DISH g	1.05	1.07	—	—	—	—
WT OF DRY SOIL g	7.21	6.01				
MOISTURE CONTENT %	17.6	17.1				

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	28C	67C	50C	25C	22C	
NUMBER OF BLOWS	49	35	30	22	10	
WT OF DISH + WET SOIL g	16.41	15.23	12.38	13.65	15.97	
WT OF DISH + DRY SOIL g	12.17	11.14	9.06	9.80	11.16	—
WT OF MOISTURE g	4.24	4.09	3.32	3.85	4.83	
WT OF DISH g	1.07	1.02	1.11	1.09	1.08	—
WT OF DRY SOIL g	11.10	10.06	7.95	8.71	10.08	
MOISTURE CONTENT %	38.2	40.7	41.8	44.2	47.9	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		43.2	17.4	25.8	CL	

ADVANCED TERRA TESTING INC

* Specific Gravity = $W_o / [W_o + (W_a - W$

BORING NO.	BH00734EBU1	BH00840EBU1	BH00812EBU1	BH00738EBU1	BH00775EBU1	BH00766EBU1
DEPTH	46'	11.50-11.75'	4.8-5.05'	10.0-10.2'	41.75-42.25'	11.5-11.75'
Sample # SAS Tag #	37991	38991	38591	37891	39191	39191
Sampled BY:	10-29-91 KM & NC	11-12-91 RP & KH	11-05-91 KH & MC	1-6-91 KM & JN	11-20-91 KM & NORSON	11-14-91 KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry) (W_o) g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.82 g	177.840 g	177.89 g	177.790 g	177.960 g	177.690 g
Temperature °C, (T_x)	20.7	21.5	22.0	21.6	18.2	19.0
Weight of water and flask at T_x (from cal. curve) (W_a)	162.101 g	162.095 g	162.084 g	162.094 g	162.175	162.153
Specific Gravity = *	2.69	2.70	2.72	2.69	2.76	2.64
PAN #	13	21B	27	6C	32	26B

JOB NO. 2031-05 NAME EBASCO

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39191**
Sample Number:	**BH00774EBU1**
Sample Depth:	**42.25-42.50 feet (Bedrock)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-20-91 KM
DEPTH	42.25 - 42.50 FT	TEST STARTED	01-09-92 DCW
SAMPLE NO.	BH00774EBU1	TEST FINISHED	01-25-92
SOIL DESCR.	--	SETUP NO.	12S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	356.7	379.0
Wt. Wet Soil & Pan (g)	365.2	387.5
Wt. Dry Soil & Pan (g)	317.1	317.1
Wt. Lost Moisture (g)	48.1	70.4
Wt. of Pan Only (g)	8.6	8.6
Wt. of Dry Soil (g)	308.5	308.5
Moisture Content %	15.6	22.8
Wet Density PCF	126.9	138.0
Dry Density PCF	109.8	112.4

Init. Diameter (in)	2.397	(cm)	6.088
Init. Area (sq in)	4.513	(sq cm)	29.115
Init. Height (in)	2.373	(cm)	6.027
Vol. Bef. Consol. (cu ft)	0.00620		
Vol. After Consol. (cu ft)	0.00605		
Effective Porosity %	41.09		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
308.0	18480	49.9	24.5	28.9	2.5E-06
357.0	21420	49.8	22.0	30.3	2.4E-06
591.0	35460	49.6	11.9	35.8	2.1E-06
838.0	50280	49.8	4.8	39.5	1.8E-06
416.0	24960	50.0	23.1	29.6	2.0E-06
474.0	28440	49.9	21.5	30.5	1.9E-06
615.0	36900	49.9	16.9	33.0	1.7E-06
648.0	38880	48.9	16.8	33.5	1.6E-06
498.0	29880	49.8	24.0	29.2	1.6E-06
507.0	30420	49.6	23.3	29.7	1.6E-06

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39191
DEPTH	42.25 - 42.50 FT
SAMPLE NO.	BH00774EBU1
SOIL DESCR.	--
SAMPLED	11-20-91 KM
TEST STARTED	01-09-92 DCW
TEST FINISHED	01-25-92
SETUP NO.	12S
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	356.650
Wt Soil & Moist at	378.950
Wt. Dry Soil & Pan	317.090
Wt. of Pan Only (g)	8.570
Consol Info:	
Init. Diameter in.	2.397
Initial Height in.	2.373
Vol. change (sat. con.) CC	24.600
Cell Exp.	20.500
Height Change in.	0.039
Test info:	
Pore pres @ begin. psi	69.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-20-91 KM
DEPTH	42.25 - 42.50 FT	TEST STARTED	01-09-92 DCW
SAMPLE NO.	BH00774EBU1	TEST FINISHED	01-25-92
SOIL DESCR.	--	SETUP NO.	12S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	-0.2	14.4				
50.0	48.0	8.3	10.4	38.6	47.4	8.8	0.88
60.0	58.0	10.7	12.7	48.3	57.5	9.2	0.92
70.0	68.0	13.2	15.0	58.5	67.9	9.4	0.94
80.0		15.2	15.3	68.5	78.2	9.7	0.97

CONSOLIDATION DATA

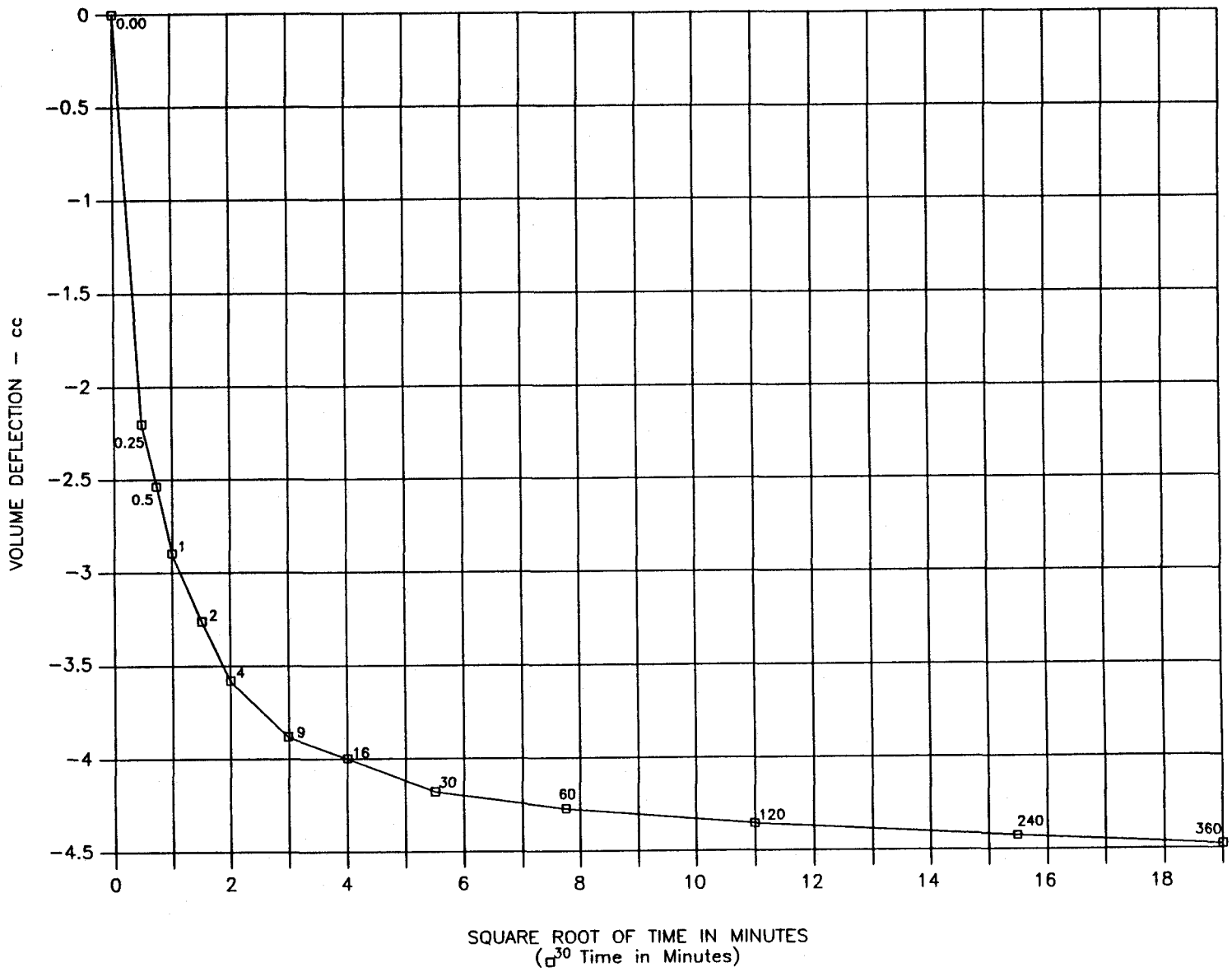
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	15.20	0.00
0.25	0.50	17.40	-2.20
0.5	0.71	17.75	-2.55
1	1.00	18.10	-2.90
2	1.41	18.48	-3.28
4	2.00	18.78	-3.57
9	3.00	19.08	-3.88
16	4.00	19.20	-4.00
30	5.48	19.38	-4.18
60	7.75	19.48	-4.28
120	10.95	19.58	-4.38
240	15.49	19.63	-4.43
360	18.97	19.68	-4.48

Initial Height (in)	2.373	Init. Vol. (CC)	175.51
Height Change (in)	0.039	Vol. Change (CC)	24.60
Ht. After Cons. (in)	2.334	Cell Exp. (CC)	20.50
Initial Area (sq in)	4.513	Net Change (CC)	4.10
Area After Cons. (sq in)	4.481	Cons. Vol. (CC)	171.41

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00774EBU1 @ 42.25–42.50', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

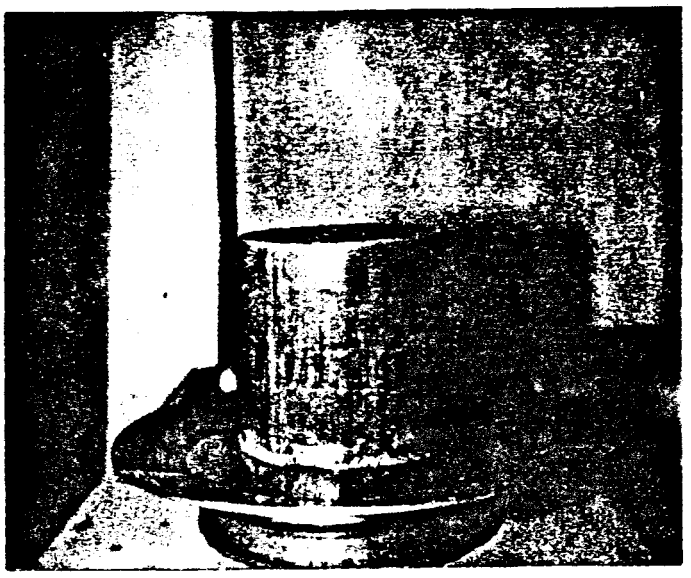
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39191	SAMPLED	11-20-91 KM
DEPTH	42.25 - 42.50 FT	TEST STARTED	01-09-92 DCW
SAMPLE NO.	BH00774EBU1	TEST FINISHED	01-25-92
SOIL DESCR.	--	SETUP NO.	12S
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.373	Init. Area (sq in)	4.513
Consol. Ht. (in)	2.334	Consol. Area (sq in)	4.481
Back Pres. PSI	69.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.481	0	69.00	0.0	1152	0	0.00
125.0	4017	0.01	0.43	4.500	4028	49.50	-2808.0	3960	7988	2.02
165.0	5303	0.02	0.86	4.520	5294	50.00	-2736.0	3888	9182	2.36
187.0	6010	0.03	1.29	4.539	5974	51.00	-2592.0	3744	9718	2.60
193.0	6202	0.04	1.71	4.559	6139	54.50	-2088.0	3240	9379	2.89
190.0	6106	0.05	2.14	4.579	6018	56.80	-1756.8	2909	8926	3.07
185.0	5945	0.06	2.57	4.599	5834	57.00	-1728.0	2880	8714	3.03
180.0	5785	0.07	3.00	4.619	5651	57.40	-1670.4	2822	8473	3.00
176.0	5656	0.08	3.43	4.640	5501	57.60	-1641.6	2794	8295	2.97
172.0	5528	0.09	3.86	4.661	5352	57.70	-1627.2	2779	8131	2.93
167.0	5367	0.10	4.28	4.681	5173	57.80	-1612.8	2765	7938	2.87
151.0	4853	0.15	6.43	4.789	4573	57.80	-1612.8	2765	7338	2.65
140.0	4499	0.20	8.57	4.901	4143	57.80	-1612.8	2765	6908	2.50
139.0	4467	0.25	10.71	5.018	4017	57.80	-1612.8	2765	6782	2.45
150.0	4821	0.30	12.85	5.142	4231	57.80	-1612.8	2765	6996	2.53
157.5	5062	0.35	15.00	5.271	4333	58.00	-1584.0	2736	7069	2.58
164.5	5287	0.40	17.14	5.408	4412	58.40	-1526.4	2678	7090	2.65
175.0	5624	0.45	19.28	5.551	4572	58.70	-1483.2	2635	7207	2.73
149.0	4788	0.50	21.42	5.702	3789	59.20	-1411.2	2563	6352	
140.0	4499	0.55	23.56	5.862	3463	59.50	-1368.0	2520	5983	
140.0	4499	0.60	25.71	6.031	3366	59.70	-1339.2	2491	5857	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



39191

BH00774EBUI

42.25–42.50 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39691**
Sample Number:	**BH00866EBU1**
Sample Depth:	**5.00-5.25 feet (Alluvium)**

Data Available:

- ✔ Grain Size Analysis (Sieve and Hydrometer Test) Data
- ✔ Atterberg Limits Test Data
- ✔ Specific Gravity Test Data
- __ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data
- __ Core Sample Photograph

MECHANICAL ANALYSIS - SIEVE TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39691	SAMPLED	11-25-91 BP,KH
DEPTH	5.00 - 5.25 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00866EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	32.42
Wt. Dry Soil & Pan (g)	32.21
Wt. Lost Moisture (g)	0.21
Wt. of Pan Only (g)	3.80
Wt. of Dry Soil (g)	28.41
Moisture Content %	0.7
Wt. Hydrom. Sample Wet (g)	60.00
Wt. Hydrom. Sample Dry (g)	59.56

WASH SIEVE ANALYSIS

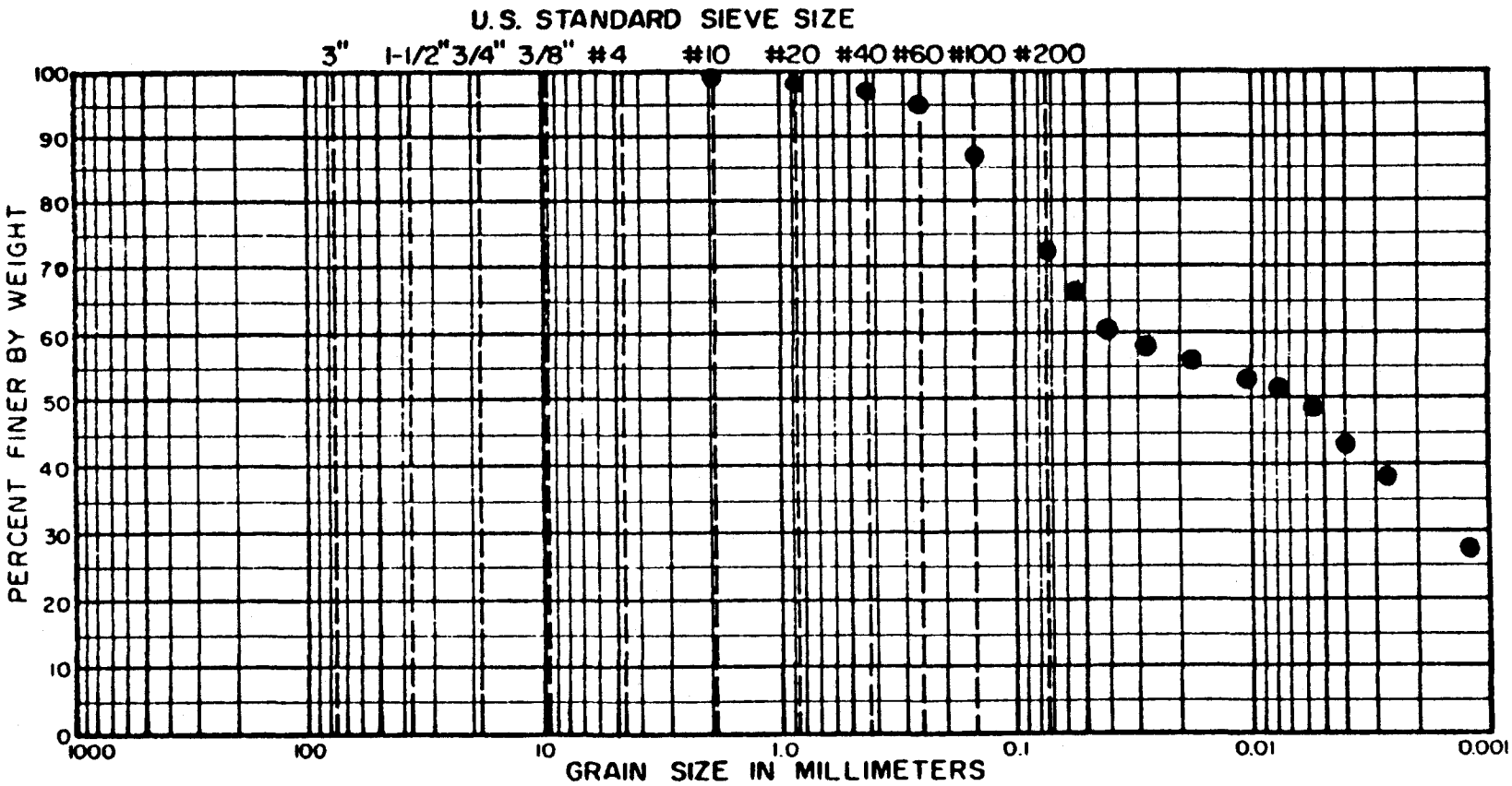
Wt. Total Sample Wet (g)	452.11
Weight of + #10 Before Washing (g)	3.19
Weight of + #10 After Washing (g)	1.67
Weight of - #10 Wet (g)	448.92
Weight of - #10 Dry (g)	447.13
Wt. Total Sample Dry (g)	448.80
Calc. Wt. "W" (g)	59.78
Calc. Mass + #10	0.22

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	1.67	1.67	1.67	0.4	99.6
#20	1.31	1.96	0.65	0.65	1.5	98.5
#40	1.29	2.32	1.03	1.68	3.2	96.8
#60	1.31	2.39	1.08	2.76	5.0	95.0
#100	1.31	6.12	4.81	7.57	13.0	87.0
#200	1.32	10.30	8.98	16.55	28.1	71.9

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39691
DEPTH	5.00 - 5.25 FT
SAMPLE NO.	BH00866EBU1
SOIL DESCR.	EG&G/ROCKY FLATS
SAMPLED	11-25-91 BP,KH
DATE TESTED	1-16-92 TNU
WASH SIEVE	Yes
DRY SIEVE	No
Moisture:	
HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	32.420
Wt. Dry Soil & Pan (g)	32.210
Wt. of Pan Only (g)	3.800
Sieve:	
Wt. Total Sample Wet (g)	452.11
Weight of + #10 Before Washing (g)	3.19
Weight of + #10 After Washing (g)	1.67
Weight of - #10 Wet (g)	448.92

Hydrometer:	
Hydrometer #	ASTM 152 H
Sp. Gr. of Soil	2.710
Value of "a"	0.988
Deflocculant	Sodium Hexametaphosphate
Defloc. Corr'n	4.500
Meniscus Corr'n	-1.000
Temp., Deg. C	22.000
Temp. Coef. K	0.01308
Wt. Wet Hydrom. Samp	60.000
% of Total Sample	100.0



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LOCATION	DEPTH	CLASSIFICATION
BH00866EBUI	5.0 - 5.25'	#39691

ADVANCED TERRA TESTING

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39691	SAMPLED	11-25-91 BP,KH
DEPTH	5.00 - 5.25 FT	DATE TESTED	1-16-92 TNU
SAMPLE NO.	BH00866EBU1	WASH SIEVE	Yes
SOIL DESCR.	EG&G/ROCKY FLATS	DRY SIEVE	No

Hydrometer #	ASTM 152 H	Temp., Deg. C	22.000
Sp. Gr. of Soil	2.710	Temp. Coef. K	0.01308
Value of "a"	0.988	Wt. Dry Sample "W"	59.782
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.500		
Meniscus Corr'n	-1.000		

T Elapsed Time (min)	ometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effecitve Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	45.50	40.00	66.1	66.1	8.83	0.0550
1.0	42.00	36.50	60.3	60.3	9.40	0.0401
2.0	40.50	35.00	57.8	57.8	9.65	0.0287
5.0	39.00	33.50	55.4	55.4	9.89	0.0184
15.0	38.00	32.50	53.7	53.7	10.06	0.0107
30.0	36.50	31.00	51.2	51.2	10.30	0.0077
60.0	34.50	29.00	47.9	47.9	10.63	0.0055
120.0	31.50	26.00	43.0	43.0	11.12	0.0040
250.0	28.50	23.00	38.0	38.0	11.62	0.0028
1440.0	22.00	16.50	27.3	27.3	12.68	0.0012

Grain Diameter = K*(SQRT(L/T))

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 2031-05

CLIENT/OWNER EPASCO

LOCATION 39671

BORING ~~EB01~~ MH00866 SAMPLE ____ DEPTH 5.0-5.25'

FIELD DENSITY BY ____/__/__

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

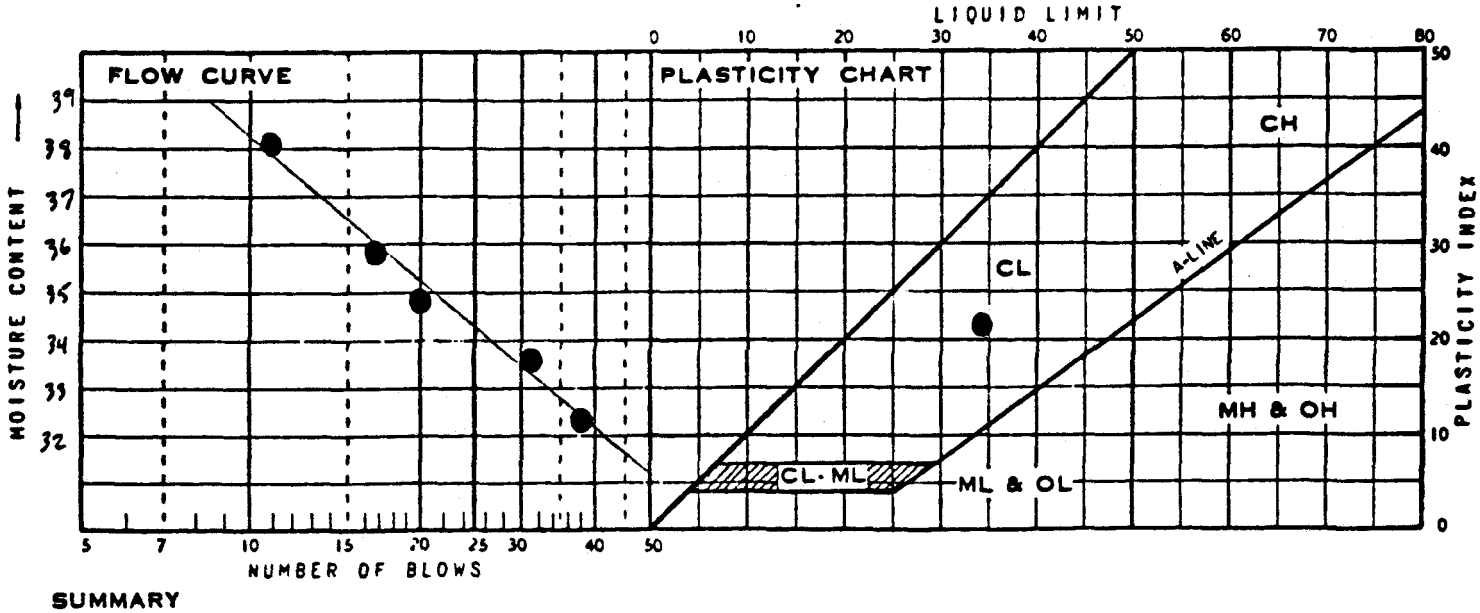
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY SR 1/16/92

DETERMINATION	1	2	3	4	5	6
DISH	22C	25C	64C			
WT OF DISH + WET SOIL g	9.22	9.87	10.13			
WT OF DISH + DRY SOIL g	8.35	8.87	9.10	—	—	—
WT OF MOISTURE g	.87	1.00	1.03			
WT OF DISH g	1.07	1.07	1.07	—	—	—
WT OF DRY SOIL g	7.28	7.80	8.03			
MOISTURE CONTENT %	12.0	12.8	12.8			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	28C	1D	67C	6	50C	
NUMBER OF BLOWS	39	31	20	17±	11	
WT OF DISH + WET SOIL g	11.49	13.25	14.47	14.03	16.09	
WT OF DISH + DRY SOIL g	8.95	10.18	11.01	10.61	11.95	—
WT OF MOISTURE g	2.54	3.07	3.46	3.42	4.14	
WT OF DISH g	1.09	1.07	1.07	1.06	1.07	—
WT OF DRY SOIL g	7.86	9.13	9.94	9.55	10.88	
MOISTURE CONTENT %	32.3	33.6	34.8	35.8	38.1	



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		34.3	12.5	21.8	CL	

ADVANCED TERRA TESTING inc

* Specific Gravity = $W_o / [W_o + (W_a - W_b)]$

BORING NO.	BH00866EB01	BH00741EB01	BH00761EB01	BH00845EB01	BH00833EB01	BH00759EB01
DEPTH	5.0-5.25'	45.7-46.5'	3.0-3.25'	20.9-21.15'	1.5-1.75'	0.5-0.9'
Sample # SAS Tag #	39691	37891	39191	38991	38991	39091
Sampled	11-25-91	11-07-91	11-14-91	11-12-91	11-11-91	11-13-91
BY:	BP & KH	KM & MC	KM & MC	BP & KH	PB & MS	KM & MC
Tested BY:						
Checked BY:						
Specific Gravity Flask #	2	2	2	2	2	2
Weight of Specific Gravity Flask (g)	62.4465	62.4465	62.4465	62.4465	62.4465	62.4465
Weight of soil (Oven dry)(W_o) g	25.000	25.000	25.000	25.000	25.000	25.000
Weight of flask 1, soil, and water (W_b)	177.860g	177.860g	178.070	178.010g	177.99	177.730
Temperature °C, (T_x)	22.4	22.8	22.9	22.0	22.8	23.1
Weight of water and flask at T_x (from cal. curve) (W_a)	162.076g	162.062g	162.066	162.074g	162.068	162.061
Specific Gravity = *	2.71	2.72	2.78	2.76	2.75	2.68
PAN #	2C	34+	517	34	80	31

JOB NO. 203-05 NAME EB4560

ADVANCED TERRA TESTING
SPECIFIC GRAVITY TESTS

Page No. ___ of ___

INDEX OF GEOTECHNICAL DATA

Borehole Number:	**39691**
Sample Number:	**BH00865EBU1**
Sample Depth:	**5.25-5.50 feet (Alluvium)**

Data Available:

__ Grain Size Analysis (Sieve and Hydrometer Test) Data

__ Atterberg Limits Test Data

__ Specific Gravity Test Data

✔ Moisture/Density and Back-pressure Permeability (Triaxial Compression Test) Data

✔ Core Sample Photograph

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39691	SAMPLED	11-25-91 BP
DEPTH	5.25 - 5.50 FT	TEST STARTED	12-06-91 DCW
SAMPLE NO.	BH00865EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	3P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	372.3	379.6
Wt. Wet Soil & Pan (g)	381.6	388.8
Wt. Dry Soil & Pan (g)	326.4	326.4
Wt. Lost Moisture (g)	55.1	62.4
Wt. of Pan Only (g)	9.3	9.3
Wt. of Dry Soil (g)	317.2	317.2
Moisture Content %	17.4	19.7
Wet Density PCF	128.6	137.9
Dry Density PCF	109.5	115.3

Init. Diameter (in)	2.368	(cm)	6.015
Init. Area (sq in)	4.404	(sq cm)	28.415
Init. Height (in)	2.505	(cm)	6.363
Vol. Bef. Consol. (cu ft)	0.00638		
Vol. After Consol. (cu ft)	0.00607		
Effective Porosity %	36.32		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CC	Permeability k cm/sec
875.0	52500	49.9	28.0	27.0	8.3E-07
673.0	40380	50.2	32.3	24.5	8.7E-07
788.0	47280	49.7	29.5	26.3	8.5E-07
679.0	40740	49.8	32.2	24.8	8.5E-07
783.0	46980	49.9	31.2	25.3	7.8E-07
1319.0	79140	49.9	20.9	30.8	7.6E-07
601.0	36060	49.6	35.2	23.3	7.7E-07
851.0	51060	50.2	30.8	25.3	7.5E-07
586.0	35160	49.6	35.3	23.2	7.9E-07
742.0	44520	50.1	32.8	24.3	7.6E-07

ADVANCED TERRA TESTING, INC.

CLIENT	EBASCO
JOB NO.	2031-05
BORING NO.	39691
DEPTH	5.25 - 5.50 FT
SAMPLE NO.	BH00865EBU1
SOIL DESCR.	SS LINER
SAMPLED	11-25-91 BP
TEST STARTED	12-06-91 DCW
TEST FINISHED	12-25-91
SETUP NO.	3P
TEST TYPE	TX/Pbp
CONF. PRES. PSF	1152
SATURATED TEST	Yes
AT FIELD MOIST.	No
Wt Soil & Moist bt	372.310
Wt Soil & Moist at	379.590
Wt. Dry Soil & Pan	326.440
Wt. of Pan Only (g)	9.260
Consol Info:	
Init. Diameter in.	2.368
Initial Height in.	2.505
Vol. change (sat. con.) CC	22.800
Cell Exp.	13.800
Height Change in.	0.047
Test info:	
Pore pres @ begin. psi	69.000
Strain Rate	0.003
Piston Corr. cc/in	0.000
Constant Head (PSI)	2.000

TRIAXAL COMPRESSION TEST DATA

CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39691	SAMPLED	11-25-91 BP
DEPTH	5.25 - 5.50 FT	TEST STARTED	12-06-91 DCW
SAMPLE NO.	BH00865EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	3P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.0	11.3				
50.0	48.0	11.2	12.5	38.5	47.6	9.1	0.91
60.0	58.0	13.1	14.3	48.6	57.9	9.3	0.93
70.0	68.0	14.7	15.9	58.7	68.2	9.5	0.95

CONSOLIDATION DATA

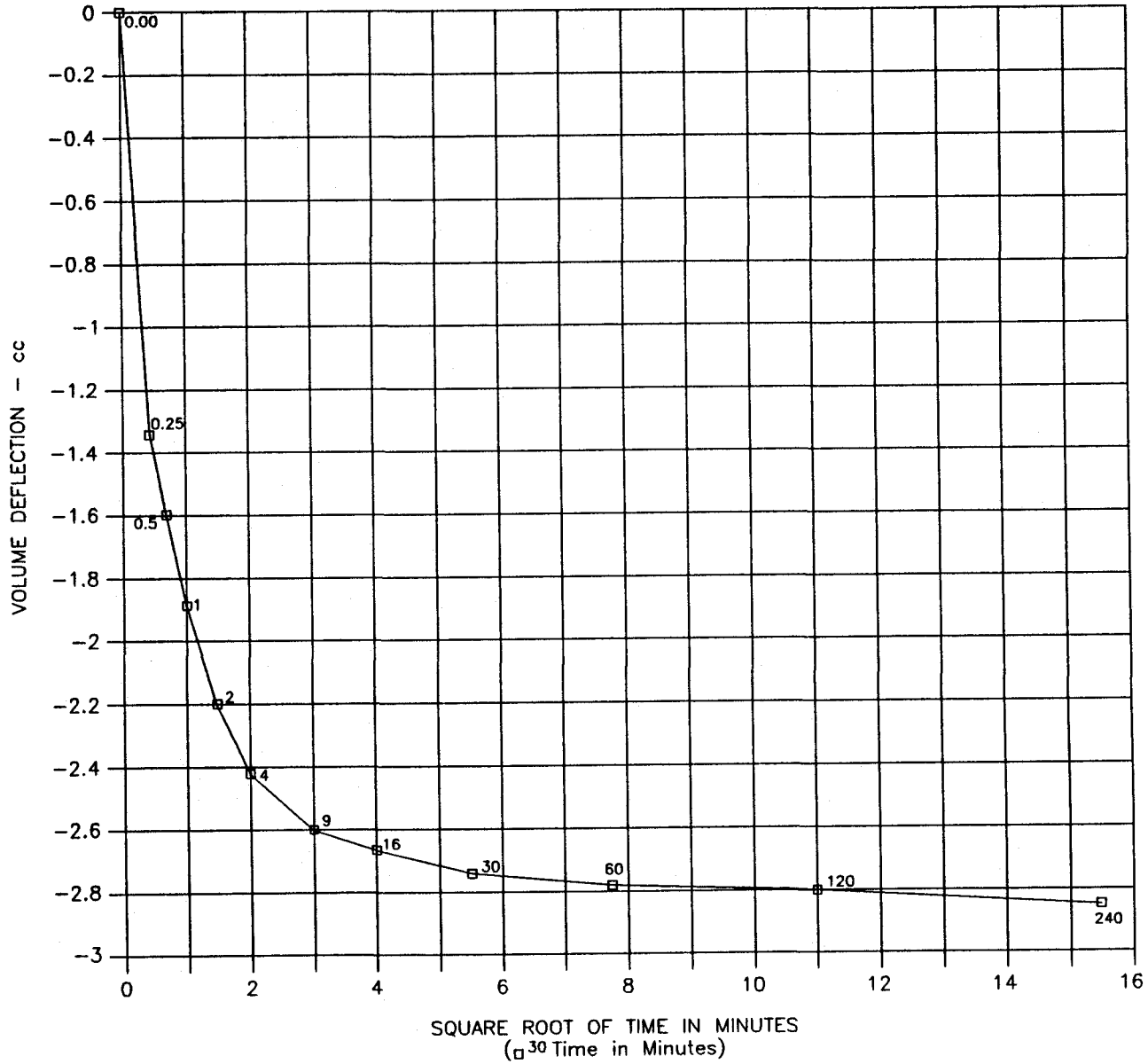
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	16.30	0.00
0.25	0.50	17.65	-1.35
0.5	0.71	17.90	-1.60
1	1.00	18.20	-1.90
2	1.41	18.50	-2.20
4	2.00	18.73	-2.43
9	3.00	18.90	-2.60
16	4.00	18.98	-2.68
30	5.48	19.03	-2.72
60	7.75	19.08	-2.77
120	10.95	19.10	-2.80
240	15.49	19.15	-2.85

Initial Height (in)	2.505	Init. Vol. (CC)	180.82
Height Change (in)	0.047	Vol. Change (CC)	22.80
Ht. After Cons. (in)	2.458	Cell Exp. (CC)	13.80
Initial Area (sq in)	4.404	Net Change (CC)	9.00
Area After Cons. (sq in)	4.265	Cons. Vol. (CC)	171.82

ADVANCED TERRA TESTING, INC.

CONSOLIDATION DATA

BH00865EBU1 @ 5.25-5.50', 1152 psf (confining pressure)



TRIAXAL COMPRESSION TEST DATA

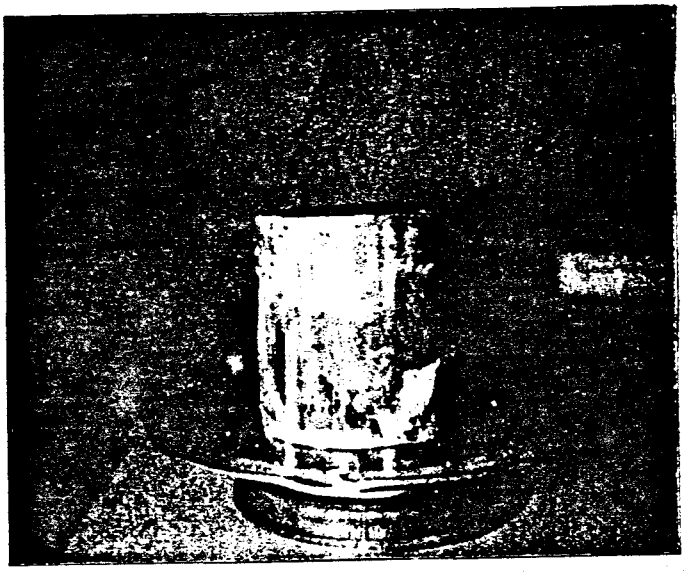
CLIENT	EBASCO	JOB NO.	2031-05
BORING NO.	39691	SAMPLED	11-25-91 BP
DEPTH	5.25 - 5.50 FT	TEST STARTED	12-06-91 DCW
SAMPLE NO.	BH00865EBU1	TEST FINISHED	12-25-91
SOIL DESCR.	SS LINER	SETUP NO.	3P
TEST TYPE	TX/Pbp	SATURATED TEST	Yes
CONF. PRES. PSF	1152	AT FIELD MOIST.	No

Init. Ht. (in)	2.505	Init. Area (sq in)	4.404
Consol. Ht. (in)	2.458	Consol. Area (sq in)	4.265
Back Pres. PSI	69.0	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3 PSF	Sigma 1 PSF	Eff. Stress Ratio
0.0	0	0.00	0.00	4.265	0	69.00	0.0	1152	0	0.00
125.0	4221	0.01	0.41	4.282	4341	49.50	-2808.0	3960	8301	2.10
165.0	5571	0.02	0.81	4.300	5706	50.00	-2736.0	3888	9594	2.47
187.0	6314	0.03	1.22	4.318	6440	51.00	-2592.0	3744	10184	2.72
193.0	6516	0.04	1.63	4.335	6620	54.50	-2088.0	3240	9860	3.04
190.0	6415	0.05	2.03	4.353	6490	56.80	-1756.8	2909	9399	3.23
185.0	6246	0.06	2.44	4.372	6293	57.00	-1728.0	2880	9173	3.18
180.0	6078	0.07	2.85	4.390	6097	57.40	-1670.4	2822	8920	3.16
176.0	5942	0.08	3.25	4.408	5937	57.60	-1641.6	2794	8730	3.13
172.0	5807	0.09	3.66	4.427	5777	57.70	-1627.2	2779	8557	3.08
167.0	5639	0.10	4.07	4.446	5586	57.80	-1612.8	2765	8351	3.02
151.0	5098	0.15	6.10	4.542	4944	57.80	-1612.8	2765	7708	2.79
140.0	4727	0.20	8.14	4.643	4484	57.80	-1612.8	2765	7249	2.62
139.0	4693	0.25	10.17	4.748	4353	57.80	-1612.8	2765	7118	2.57
150.0	5065	0.30	12.21	4.858	4592	57.80	-1612.8	2765	7356	2.66
157.5	5318	0.35	14.24	4.973	4709	58.00	-1584.0	2736	7445	2.72
164.5	5554	0.40	16.27	5.094	4802	58.40	-1526.4	2678	7481	2.79
175.0	5909	0.45	18.31	5.221	4985	58.70	-1483.2	2635	7620	2.89
149.0	5031	0.50	20.34	5.354	4138	59.20	-1411.2	2563	6701	
140.0	4727	0.55	22.38	5.494	3789	59.50	-1368.0	2520	6309	
140.0	4727	0.60	24.41	5.642	3690	59.70	-1339.2	2491	6181	

ADVANCED TERRA TESTING, INC.

CORE PHOTOGRAPH



39691

BH00865EBUI

5.25–5.50 foot depth interval

Confining Pressure (σ_3)=1152 pounds per square foot

Appendix A3 · Text

Surveying Data

Phase III
RFI/RI Report

U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881
1 OU1 OU1
side 881 Hill
U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881

A3 SURVEYING DATA

All boreholes and wells, and several other key locations, were surveyed at the conclusion of the Phase III RFI/RI field investigation. This appendix includes a brief summary of the surveying program, tabulations of well/borehole coordinates and elevations, and a location map, as well as field notes, and daily crew reports.

A3.1 SURVEYING PROGRAM SUMMARY

In June 1991, Merrick & Company was contracted by EBASCO to survey locations of the 157 test wells and boreholes planned for the OU1 area at RFP. The field surveying activities took place from November 18 to 26 and December 16 to 18, 1991. The final number of wells and boreholes surveyed was 121. All well locations were surveyed from control points included in the plant-wide survey control verification done by Merrick & Company as Task 9 of the Phase II Geologic Characterization Data Acquisition (EG&G 1992).

A quality assurance check was performed on the surveying data in December 1991. Errors found were corrected and the data were reprocessed and resubmitted in January 1992.

Coordinates for well and borehole locations in state planar, modified state planar, and RFP coordinate systems are presented in Tables A3-1, A3-2, and A3-3, respectively. Plate A-1 shows the locations of surveyed wells and boreholes at OU1. The field notes and daily crew reports prepared during the course of this work are included in Attachments A3-1 and A3-2.

A3.2 REFERENCES

EG&G, 1992. Well Resurvey Report, Phase II Geologic Characterization Data Acquisition, Prepared by Merrick & Company for EG&G Rocky Flats, Inc., February 1992.

Appendix A3 · Tables

Surveying Data

Phase III
RFI/RI Report

U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881
1 OU1 OU1
side 881 Hill
U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881

Borehole/ Well Number	PT Number	State Planar Coordinate System		Elevation
		Northing (feet)	Easting (feet)	Ground or Steel/PVC/Concrete (feet above mean sea level)
30091	7300	747691.3770	2085362.1933	5843.56
30191	7301	747541.0822	2084661.8936	5872.51
30291	7302	747573.8760	2084244.6005	5902.74
30391	7303	747533.6392	2083891.7857	5910.79
30491	7304	747528.8807	2083900.2076	5909.74
30591	7305	747683.0670	2083557.7737	5942.18
30691	7306	747402.8729	2084301.3559	5873.56
30791	7307	747414.1648	2084267.2437	5876.48
30891	7308	747450.1845	2084284.6342	5879.04
30991	7309	747744.7518	2085294.5935	5852.37/5851.82/5849.77
31091	7310	747622.4344	2084216.9949	5907.01
31191	7311	747967.1845	2085732.9142	5878.37

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	State Planar Coordinate System		Elevation
		Northing (feet)	Easting (feet)	Ground or Steel/PVC/Concrete (feet above mean sea level)
31291	7312	747616.1446	2084145.7521	5907.54
31391	7313	747821.1132	2085129.6001	5884.52
31491	7314	747749.2184	2084648.5230	5905.38/5905.03/5903.15
31591	7315	747720.4135	2084238.3968	5915.07
31691	7316	747619.7720	2084197.9758	5906.76
31791	7317	747424.7431	2084275.9940	5880.06/5879.80/5877.68
31891	7318	747661.1305	2084142.4159	5919.81/5919.52/5917.71
31991	7319	748180.6706	2083665.6052	5993.91
32091	7320	748141.4625	2084047.7281	5967.14
32191	7321	748108.2001	2084149.2505	5965.04
32291	7322	747252.2589	2083794.6382	5887.99
32391	7323	748247.0111	2083677.6739	5997.96

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Table A3-1. Well, Well Point, and Borehole Locations in State Planar Coordinate System.

Borehole/ Well Number	PT Number	State Planar Coordinate System		Elevation
		Northing (feet)	Easting (feet)	Ground or Steel/PVC/Concrete (feet above mean sea level)
32491	7324	748053.3603	2083799.7633	5968.19
32591	7325	747976.3544	2084852.3592	5917.61/5917.41/5915.30
32691	7326	748456.3275	2085465.8111	5962.42
32791	7327	747917.7825	2084756.8288	5915.34
32891	7328	748362.5242	2085362.9826	5960.63
32991	7329	748272.8840	2085381.8933	5949.07
33091	7330	748010.0012	2084927.5025	5916.29
33191	7331	748526.4282	2085641.6684	5958.55
33291	7332	748539.1630	2085561.2070	5966.85
33391	7333	748078.4027	2084925.7277	5924.42
33491	7334	748079.7679	2084882.8818	5929.16/5928.59/5926.57
33591	7335	748395.0245	2085493.9863	5955.48

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

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Borehole/ Well Number	PT Number	State Planar Coordinate System Northing (feet)	State Planar Coordinate System Easting (feet)	Elevation Ground or Steel/PVC/Concrete (feet above mean sea level)
33691	7336	748111.6859	2084994.4826	5929.89/5929.24/5927.30
33791	7337	748625.9192	2085623.9261	5974.99
33891	7338	747960.6244	2084640.6464	5930.54/5929.94/5927.93
33991	7339	748183.6610	2085080.8429	5934.23
34091	7340	748089.6396	2084959.0443	5924.86
34191	7341	748089.2488	2084707.4489	5935.82
34291	7342	748117.5392	2084882.1606	5932.03
34391	7343	748165.5071	2085115.8603	5930.29
34491	7344	748183.5403	2084857.3514	5939.73
34591	7345	748462.1375	2085620.5622	5955.19/5954.63/5952.79
34691	7346	748057.0585	2084846.3498	5925.03
34791	7347	748376.5147	2085521.1555	5954.39/5953.91/5951.84

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	State Planar Coordinate System Northing (feet)	State Planar Coordinate System Easting (feet)	Elevation Ground or Steel/PVC/Concrete (feet above mean sea level)
34891	7348	748057.2738	2084789.0313	5927.67
34991	7349	748002.4202	2084742.3008	5924.78
35091	7350	747918.0357	2084494.7431	5936.97
35191	7351	747844.9333	2083815.8423	5951.10
35291	7352	747985.3357	2084691.6275	5926.30
35391	1899	748010.7312	2083910.7103	5960.52
35391	7353	748010.7387	2083907.0046	5963.83/5963.03/5960.73
35491	7354	748013.1023	2084643.4612	5932.85
35591	7355	748138.3010	2084682.4359	5944.04
35691	7356	747796.9597	2084005.3620	5941.86/5941.36/5939.21
35791	7357	748207.2497	2084585.6676	5958.97
35891	7358	748264.8729	2084433.3302	5975.90

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	State Planar Coordinate System		Elevation
		Northing (feet)	Easting (feet)	Ground or Steel/PVC/Concrete (feet above mean sea level)
35991	7359	748056.6558	2083755.8410	5976.82/5976.45/5974.15
36091	7360	748163.6182	2084407.8977	5969.83
36191	7361	748090.9342	2084198.4737	5965.69/5965.17/5963.29
36291	7362	748202.5305	2084366.9110	5971.90
36391	7363	748042.1118	2084293.9581	5967.57/5967.01/5965.00
36491	7364	747740.3904	2084094.2560	5929.83
36591	7365	748333.7069	2084367.5695	5987.86
36691	7366	748026.7638	2084421.0591	5952.26/5951.52/5950.06
36791	7367	748155.0229	2084171.1763	5969.84
36891	7368	748146.6516	2084150.5812	5970.09
36991	7369	748179.7430	2084177.3669	5972.88/5972.31/5970.73
37091	7370	748283.6579	2084366.5219	5977.18

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	State Planar Coordinate System Northing (feet)	State Planar Coordinate System Easting (feet)	Elevation Ground or Steel/PVC/Concrete (feet above mean sea level)
37191	7371	748036.4145	2084533.4608	5948.66/5948.29/5946.11
37291	7372	747803.4909	2083817.1256	5947.41
37391	7373	747744.0258	2084193.7345	5922.50
37491	7374	748190.2935	2084273.7258	5964.99
37591	7375	748579.7152	2084610.4271	5993.82/5993.45/5991.63
37691	7376	748691.9137	2085217.1390	5987.16/5985.24/5984.45
37791	7377	748591.7685	2083753.4178	6004.66/6004.18/6001.92
37891	7378	748075.0260	2084915.4356	5927.02/5926.29/5924.98
37991	7379	748063.0664	2084731.0135	5934.15/5933.55/5931.58
38091	7380	748343.4064	2083628.5630	6003.71
38191	7381	748013.7967	2084765.2122	5926.97/5926.40/5924.73
38291	7382	748031.5099	2084801.0737	5927.14/5926.71/5924.79

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	State Planar Coordinate System Northing (feet)	State Planar Coordinate System Easting (feet)	Elevation Ground or Steel/PVC/Concrete (feet above mean sea level)
38391	7383	747346.5773	2084371.3320	5870.76
38491	7384	747364.6855	2084349.8830	5871.49
38591	7385	747407.9024	2084658.8764	5867.42/5866.62/5865.08
38691	7386	747488.0544	2084887.6630	5856.98
38791	7387	747506.3035	2084879.6475	5857.60
38891	7388	747830.4462	2085051.1201	5893.61/5893.24/5891.72
38991	7389	747820.4241	2085024.0557	5895.93/5895.49/5893.36
39091	7390	747694.9474	2085460.7820	5839.79
39191	7391	748009.1771	2084920.9155	5919.36/5918.32/5916.94
39291	7392	747948.5072	2084973.7217	5910.68/5910.21/5908.74
39391	7393	747865.4715	2086969.4524	5801.64
39491	1846	747848.8695	2083935.1714	5938.11

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	State Planar Coordinate System Northing (feet)	State Planar Coordinate System Easting (feet)	Elevation Ground or Steel/PVC/Concrete (feet above mean sea level)
39591	7395	747798.8244	2083932.5496	5938.00
39691	7396	748356.9583	2083634.4566	6008.76/6008.37/6006.60
39791	7397	747350.6710	2089761.1999	5730.37
39891	7398	747694.5020	2085490.0741	5840.55/ /5839.60
E-1	1839	747687.6940	2085477.0626	5840.69/ /5839.59
E-2	1840	747690.1336	2085477.4005	5840.44/ /5839.44
E-3	1835	747692.2385	2085478.3770	5840.69/ /5839.79
E-4	1836	747694.6276	2085478.2111	5840.89/ /5839.90
E-5	1837	747696.8983	2085478.3975	5840.72/ /5839.97
I-1	1851	747688.1713	2085472.3106	5840.71/ /5839.89
I-2	1852	747690.8963	2085472.4142	5840.84/ /5839.92
I-3	1853	747693.1271	2085472.5959	5840.91/ /5839.86

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	State Planar Coordinate System Northing (feet)	State Planar Coordinate System Easting (feet)	Elevation Ground or Steel/PVC/Concrete (feet above mean sea level)	
I-4	1848	747695.3232	2085473.2138	5841.01/	/5839.95
I-5	1849	747697.8299	2085473.7358	5841.07/	/5840.04
O-1	1850	747688.0972	2085474.5671	5840.60/	/5839.80
O-2	1838	747690.3744	2085475.3225	5840.55/	/5839.75
O-3	1834	747692.5909	2085474.9550	5840.72/	/5839.75
O-4	1833	747694.7528	2085476.2696	5840.78/	/5839.78
O-5	1832	747697.5084	2085475.7735	5840.78/	/5839.88
MS-1*	1841	747584.5619	2084212.5230	5903.91	
MS-2†	1845	747392.5446	2084328.4608	5875.05	
MS-3*	1844	747367.3243	2084326.3272	5876.45	
MS-4†	1843	747350.6346	2084244.8474	5878.62	
MS-5†	1842	747429.6288	2084228.1386	5880.44	

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Modified State Plane Coordinate System Northing (feet)	Easting (feet)
30091	7300	747882.6847	2085895.7632
30191	7301	747732.3515	2085195.2843
30291	7302	747765.1537	2084777.8844
30391	7303	747724.9065	2084424.9794
30491	7304	747720.1468	2084433.4035
30591	7305	747874.3726	2084090.8819
30691	7306	747594.1068	2084834.6544
30791	7307	747605.4016	2084800.5335
30891	7308	747641.4305	2084817.9284
30991	7309	747936.0731	2085828.1462
31091	7310	747813.7245	2084750.2718
31191	7311	748158.5627	2086266.5790
31291	7312	747807.4330	2084679.0108
31391	7313	748012.4540	2085663.1105
31491	7314	747940.5408	2085181.9103
31591	7315	747911.7286	2084771.6792

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Modified State Plane Coordinate System Northing (feet)	Easting (feet)
31691	7316	747811.0613	2084731.2478
31791	7317	747615.9825	2084809.2860
31891	7318	747852.4305	2084675.6737
31991	7319	748372.1035	2084198.7410
32091	7320	748332.8853	2084580.9618
32191	7321	748299.6144	2084682.5101
32291	7322	747443.4542	2084327.8071
32391	7323	748438.4609	2084210.8129
32491	7324	748244.7606	2084332.9335
32591	7325	748167.7350	2085385.7987
32691	7326	748647.8309	2085999.4076
32791	7327	748109.1481	2085290.2438
32891	7328	748554.0036	2085896.5528
32991	7329	748464.3405	2085915.4683
33091	7330	748201.3904	2085460.9612
33191	7331	748717.9496	2086175.3098

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Modified State Plane Coordinate System Northing (feet)	Easting (feet)
33291	7332	748730.6876	2086094.8278
33391	7333	748269.8094	2085459.1860
33491	7334	748271.1750	2085416.3291
33591	7335	748586.5122	2086027.5900
33691	7336	748303.1011	2085527.9585
33791	7337	748817.4660	2086157.5630
33891	7338	748152.0010	2085174.0317
33991	7339	748375.0946	2085614.3408
34091	7340	748281.0492	2085492.5111
34191	7341	748280.6583	2085240.8513
34291	7342	748308.9559	2085415.6077
34391	7343	748356.9360	2085649.3672
34491	7344	748374.9739	2085390.7922
34591	7345	748653.6424	2086154.1982
34691	7346	748248.4597	2085379.7878
34791	7347	748567.9977	2086054.7662

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Modified State Plane Coordinate System Northing (feet)	Easting (feet)
34891	7348	748248.6751	2085322.4546
34991	7349	748193.8075	2085275.7121
35091	7350	748109.4014	2085028.0910
35191	7351	748036.2803	2084349.0166
35291	7352	748176.7186	2085225.0259
35391	BORE899	748202.1206	2084443.9088
35391	7353	748202.1281	2084440.2022
35491	7354	748204.4923	2085176.8472
35591	7355	748329.7231	2085215.8320
35691	7356	747988.2944	2084538.5848
35791	7357	748398.6894	2085119.0388
35891	7358	748456.3273	2084966.6625
35991	7359	748248.0569	2084288.9999
36091	7360	748355.0467	2084941.2235
36191	7361	748282.3441	2084731.7459
36291	7362	748393.9690	2084900.2263

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Modified State Plane Coordinate System Northing (feet)	Easting (feet)
36391	7363	748233.5092	2084827.2547
36491	7364	747931.7107	2084627.5015
36591	7365	748525.1789	2084900.8849
36691	7366	748218.1573	2084954.3883
36791	7367	748346.4492	2084704.4416
36891	7368	748338.0758	2084683.8411
36991	7369	748371.1756	2084710.6337
37091	7370	748475.1172	2084899.8371
37191	7371	748227.8104	2085066.8187
37291	7372	747994.8273	2084350.3002
37391	7373	747935.3469	2084727.0055
37491	7374	748381.7288	2084807.0172
37591	7375	748771.2502	2085143.8047
37691	7376	748883.4774	2085750.6718
37791	7377	748783.3065	2084286.5762
37891	7378	748266.4319	2085448.8912

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Modified State Plane Coordinate System Northing (feet)	Easting (feet)
37991	7379	748254.4692	2085264.4220
38091	7380	748534.8809	2084161.6894
38191	7381	748205.1868	2085298.6294
38291	7382	748222.9046	2085334.5001
38391	7383	747537.7967	2084904.6484
38491	7384	747555.9096	2084883.1940
38591	7385	747599.1376	2085192.2664
38691	7386	747679.3101	2085421.1116
38791	7387	747697.5638	2085413.0940
38891	7388	748021.7894	2085584.6104
38991	7389	748011.7648	2085557.5391
39091	7390	747886.2560	2085994.3771
39191	7391	748200.5661	2085454.3726
39291	7392	748139.8807	2085507.1922
39391	7393	748056.8238	2087503.4336
39591	7395	747990.1596	2084465.7538

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Modified State Plane Coordinate System Northing (feet)	Easting (feet)
39691	7396	748548.4363	2084167.5845
39791	7397	747541.8915	2090295.8954
39891	7398	747885.8105	2086023.6768
BH21	1846	748040.2175	2084468.3762
E-1	1839	747879.0008	2086010.6619
E-2	1840	747881.4409	2086010.9999
E-3	1835	747883.5463	2086011.9767
E-4	1836	747885.9361	2086011.8107
E-5	1837	747888.2073	2086011.9972
I-1	1851	747879.4782	2086005.9087
I-2	1852	747882.2039	2086006.0124
I-3	1853	747884.4353	2086006.1941
I-4	1848	747886.6319	2086006.8122
I-5	1849	747889.1393	2086007.3343
O-1	1850	747879.4040	2086008.1658
O-2	1838	747881.6819	2086008.9214

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Modified State Plane Coordinate System Northing (feet)	Modified State Plane Coordinate System Easting (feet)
O-3	1834	747883.8989	2086008.5538
O-4	1833	747886.0613	2086009.8688
O-5	1832	747888.8177	2086009.3725
MS-1*	1841	747775.8423	2084745.7988
MS-2†	1845	747583.7758	2084861.7662
MS-3*	1844	747558.5490	2084859.6321
MS-4†	1843	747541.8551	2084778.1315
MS-5†	1842	747620.8695	2084761.4184

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Plant Coordinate System Northing (feet)	Plant Coordinate System Easting (feet)	Elevation Ground or Out Pipe/In Pipe/Concrete (feet above mean sea level)
30091	7300	34703.7916	22248.8341	5843.56
30191	7301	34555.7719	21547.8627	5872.51
30291	7302	34589.9520	21130.5734	5902.74
30391	7303	34550.8702	20777.5374	5910.79
30491	7304	34546.0827	20785.9457	5909.74
30591	7305	34701.4385	20443.9352	5942.18
30691	7306	34418.7186	21186.7783	5873.56
30791	7307	34430.1260	21152.6949	5876.48
30891	7308	34466.0973	21170.2087	5879.04
30991	7309	34757.4030	22181.3937	5852.37/5851.82/5849.77
31091	7310	34638.6137	21103.1213	5907.01
31191	7311	34978.4439	22620.5587	5878.37
31291	7312	34632.5576	21031.8399	5907.54
31391	7313	34834.3284	22016.6111	5884.52
31491	7314	34764.0043	21535.1761	5905.38/5905.03/5903.15

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Plant Coordinate System Northing (feet)	Plant Coordinate System Easting (feet)	Elevation Ground or Out Pipe/In Pipe/Concrete (feet above mean sea level)
31591	7315	34736.5466	21124.8521	5915.07
31691	7316	34636.0134	21084.0886	5906.76
31791	7317	34440.6780	21161.4823	5880.06/5879.80/5877.68
31891	7318	34677.5658	21028.6514	5919.81/5919.52/5917.71
31991	7319	35198.8106	20553.4370	5993.91
32091	7320	35158.3307	20935.5262	5967.14
32191	7321	35124.7247	21036.9641	5965.04
32291	7322	34269.7403	20679.4364	5887.99
32391	7323	35265.1278	20565.7279	5997.96
32491	7324	35071.0254	20687.2083	5968.19
32591	7325	34990.5241	21739.8135	5917.61/5917.41/5915.30
32691	7326	35468.5915	22355.0041	5962.42
32791	7327	34932.2530	21644.0657	5915.34
32891	7328	35375.1043	22251.8401	5960.63
32991	7329	35285.3792	22270.4595	5949.07

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Plant Coordinate System Northing (feet)	Plant Coordinate System Easting (feet)	Elevation Ground or Out Pipe/In Pipe/Concrete (feet above mean sea level)
33091	7330	35023.9311	21815.0867	5916.29
33191	7331	35538.1290	22531.1369	5958.55
33291	7332	35551.1327	22450.6974	5966.85
33391	7333	35092.3556	21813.5374	5924.42
33491	7334	35093.8627	21770.6852	5929.16/5928.59/5926.57
33591	7335	35407.1801	22382.9839	5955.48
33691	7336	35125.4201	21882.4194	5929.89/5929.24/5927.30
33791	7337	35637.7035	22513.7187	5974.99
33891	7338	34975.4893	21527.9957	5930.54/5929.94/5927.93
33991	7339	35197.1280	21969.0390	5934.23
34091	7340	35103.4853	21846.8994	5924.86
34191	7341	35103.9253	21595.2397	5935.82
34291	7342	35131.6458	21770.0886	5932.03
34391	7343	35178.8539	22004.0052	5930.29
34491	7344	35197.7454	21745.4912	5939.73

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Plant Coordinate System Northing (feet)	Plant Coordinate System Easting (feet)	Elevation Ground or Out Pipe/In Pipe/Concrete (feet above mean sea level)
34591	7345	35473.8919	22509.8131	5955.19/5954.63/5952.79
34691	7346	35071.2682	21734.0691	5925.03
34791	7347	35388.5759	22410.0988	5954.39/5953.91/5951.84
34891	7348	35071.6729	21676.7370	5927.67
34991	7349	35016.9599	21629.8136	5924.78
35091	7350	34933.3718	21381.9152	5936.97
35191	7351	34862.4931	20702.6030	5951.10
35291	7352	35000.0384	21579.0712	5926.30
35391	7353	35028.0389	20794.3357	5963.83/5963.03/5960.73
35391BORE	1899	35028.0192	20798.0423	5960.52
35491	7354	35027.9710	21530.9845	5932.85
35591	7355	35153.0724	21570.3825	5944.04
35691	7356	34813.8816	20892.0118	5941.86/5941.36/5939.21
35791	7357	35222.3579	21473.8176	5958.97
35891	7358	35280.4986	21321.6324	5975.90

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Plant Coordinate System Northing (feet)	Plant Coordinate System Easting (feet)	Elevation Ground or Out Pipe/In Pipe/Concrete (feet above mean sea level)
35991	7359	35074.4667	20643.2859	5976.82/5976.45/5974.15
36091	7360	35179.3026	21295.8591	5969.83
36191	7361	35107.2920	21086.1426	5965.69/5965.17/5963.29
36291	7362	35218.3600	21254.9907	5971.90
36391	7363	35058.1420	21181.4897	5967.57/5967.01/5965.00
36491	7364	34757.0046	20980.7412	5929.83
36591	7365	35349.5670	21256.0825	5987.86
36691	7366	35042.3704	21308.5719	5952.26/5951.52/5950.06
36791	7367	35171.4869	21059.0501	5969.84
36891	7368	35163.1815	21038.4221	5970.09
36991	7369	35196.1927	21065.3238	5972.88/5972.31/5970.73
37091	7370	35299.5090	21254.8694	5977.18
37191	7371	35051.6523	21421.0336	5948.66/5948.29/5946.11
37291	7372	34821.0361	20703.7498	5947.41
37391	7373	34760.3123	21080.2566	5922.50

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Plant Coordinate System Northing (feet)	Plant Coordinate System Easting (feet)	Elevation Ground or Out Pipe/In Pipe/Concrete (feet above mean sea level)
37491	7374	35206.4276	21161.7417	5964.99
37591	7375	35594.8349	21499.8134	5993.82/5993.45/5991.63
37691	7376	35705.0579	22107.0477	5987.16/5985.24/5984.45
37791	7377	35609.7214	20642.6293	6004.66/6004.18/6001.92
37891	7378	35089.0121	21803.2315	5927.02/5926.29/5924.98
37991	7379	35077.6585	21618.7238	5934.15/5933.55/5931.58
38091	7380	35361.7095	20516.9230	6003.71
38191	7381	35028.2635	21652.7683	5926.97/5926.40/5924.73
38291	7382	35045.8627	21688.6973	5927.14/5926.71/5924.79
38391	7383	34362.1778	21256.5860	5870.76
38491	7384	34380.3614	21235.1915	5871.49
38591	7385	34422.5687	21544.4050	5867.42/5866.62/5865.08
38691	7386	34501.9852	21773.5136	5856.98
38791	7387	34520.2653	21765.5563	5857.60
38891	7388	34843.9229	21938.1423	5893.61/5893.24/5891.72

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Plant Coordinate System Northing (feet)	Plant Coordinate System Easting (feet)	Elevation Ground or Out Pipe/In Pipe/Concrete (feet above mean sea level)
38991	7389	34833.9877	21911.0380	5895.93/5895.49/5893.36
39091	7390	34707.0373	22347.4593	5839.79
39191	7391	35023.1286	21808.4954	5919.36/5918.32/5916.94
39291	7392	34962.2691	21861.1144	5910.68/5910.21/5908.74
39391	7393	34872.6219	23857.0707	5801.64
39591	7395	34815.9872	20819.1873	5938.00
39691	7396	35375.2453	20522.8628	6008.76/6008.37/6006.60
39791	7397	34348.4729	26647.8172	5730.37
39891	7398	34706.4951	22376.7573	5840.55//5839.60
BH21	1846	34866.0362	20821.9750	5938.11
E-1	1839	34699.7284	22363.7200	5840.69/ /5839.59
E-2	1840	34702.1674	22364.0661	5840.44/ /5839.44
E-3	1835	34704.2696	22365.0498	5840.69/ /5839.79
E-4	1836	34706.6599	22364.8917	5840.89/ /5839.90
E-5	1837	34708.9305	22365.0857	5840.72/ /5839.97

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Borehole/ Well Number	PT Number	Plant Coordinate System Northing (feet)	Plant Coordinate System Easting (feet)	Elevation Ground or Out Pipe/In Pipe/Concrete (feet above mean sea level)	
I-1	1851	34700.2215	22358.9684	5840.71/	/5839.89
I-2	1852	34702.9468	22359.0811	5840.84/	/5839.92
I-3	1853	34705.1776	22359.2702	5840.91/	/5839.86
I-4	1848	34707.3722	22359.8955	5841.01/	/5839.95
I-5	1849	34709.8778	22360.4259	5841.07/	/5840.04
O-1	1850	34700.1399	22361.2253	5840.60/	/5839.80
O-2	1838	34702.4152	22361.9884	5840.55/	/5839.75
O-3	1834	34704.6334	22361.6281	5840.72/	/5839.75
O-4	1833	34706.7915	22362.9502	5840.78/	/5839.78
O-5	1832	34709.5495	22362.4630	5840.78/	/5839.88
MS-1*	1841	34600.7465	21098.5232	5903.91	
MS-2†	1845	34408.2982	21213.8559	5875.05	
MS-3*	1844	34383.0786	21211.6385	5876.45	
MS-4†	1843	34366.6538	21130.0832	5878.62	
MS-5†	1842	34445.7230	21113.6311	5880.44	

PT Number = Merrick designation for survey purposes
Elevation = Ground elevation for boreholes; top of steel protective casing, top of PVC, and top of concrete for monitoring wells
PVC = Polyvinyl chloride casing
I = Injection well
O = Observation well
E = Extraction well
* = Outfall pipe
† = Corner of retention pond

Appendix A3 · Plates

Surveying Data

Phase III
RFI/RI Report

U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881
1 OU1 OU1
side 881 Hill
U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881

NOTICE

This document (or documents) is oversized for 16mm microfilming, but is available in its entirety on the 35mm fiche card referenced below:

Document # 000442

Titled: EBASCO ENVIRONMENTAL 881 HILLSIDE (OPERABLE UNIT NO. 1) PLOT OF WELLS LOCATED

Fiche location: A-OU01-M1

Appendix A3
Attachments

Surveying Data

Phase III
RFI/RI Report

U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881
1 OU1 OU1
side 881 Hill
U1 OU1 OU
881 Hillside
OU1 OU1 O
Hillside 881

ATTACHMENT A3-1
SURVEY CREW DAILY REPORTS

MERRICK
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(10855 E. Bethany Drive • Aurora, Colorado 80014)
Post Office Box 22026 • Denver, Colorado 80222

ROUTE TO RCORDA

SURVEY CREW DAILY REPORT

JOB NO. 282-7590
DATE 11-18-91 WESTON
PROJECT TITLE RFP / OU1 / WELL LOCATIONS
PARTY CHIEF
ARRV. SITE CK'D IN W/ SUPT.
DEPART SITE CK'D OUT W/ SUPT.

CREW MEMBERS	HOURS
R. BATEMAN	8.5
D. DOHERTY	8.5

DESCRIPTION, QUANTITY, LOCATION & ETC. OF WORK PERFORMED AND COMMENTS	CODE	HOURS/ CREW	WORK CK'D
TRAVEL	D-1	2/2.0	
MET AT WESTON TRAILOR, ORIENTATION	C-1	2/3.5	
LOCATED BOREHOLES 303, 302, 310, 316 #2, 316 #1,	B-1	2/3.0	
322, 308, 301, 300			
WELLS 318, 385, 309			

PERCENT OF ASSIGNED WORK COMPLETED
MATERIALS & EQUIP.

CLIENT COPY RECEIVED BY _____ SIGNATURE - CLIENT'S REPRESENTATIVE _____ DATE
COMMENTS

CONTRACT DATE _____ TERMS: FIXED FEE _____ T. & M. _____ EXTRA SERVICES _____

ASST. P.M. (SURVEYING) APPROVAL & COMMENTS

ORIGINAL/PROJECT MANAGER/CENTRAL RECORDS

Merrick
Form 72
Rev. 4/82

MERRICK
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(10855 E. Bethany Drive • Aurora, Colorado 80014)
Post Office Box 22026 • Denver, Colorado 80222

ROUTE TO RODRDA

SURVEY CREW DAILY REPORT

JOB NO. 282-7590
DATE 11-20-91
PROJECT TITLE OUI / RFP
PARTY CHIEF
ARRV. SITE CK'D IN W/ SUPT.
DEPART SITE CK'D OUT W/ SUPT.

CREW MEMBERS	HOURS
R. BATEMAN	8.5
D. DOHERTY	8.5

DESCRIPTION, QUANTITY, LOCATION & ETC. OF WORK PERFORMED AND COMMENTS	CODE	HOURS/ CREW	WORK CK'D
TRAVEL		2/2.5	
LOCATED #'S 31791, 30691, 38491, 38791,		2/6.0	
31191, 30591, 31991, [redacted] 36191, 37691,			
33291, 33191, 32691, 32891, 32991, 33591,			
34791, 34591,			

PERCENT OF ASSIGNED WORK COMPLETED
MATERIALS & EQUIP.

CLIENT COPY RECEIVED BY
SIGNATURE - CLIENT'S REPRESENTATIVE DATE
COMMENTS

CONTRACT DATE TERMS: FIXED FEE T. & M. EXTRA SERVICES

ASST. P.M. (SURVEYING) APPROVAL & COMMENTS

ORIGINAL/PROJECT MANAGER/CENTRAL RECORDS

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ROUTE TO ROORDA

SURVEY CREW DAILY REPORT

JOB NO. 282-7590
DATE 11-21-91
PROJECT TITLE OU1 / RFP
PARTY CHIEF
ARRV. SITE CK'D IN W/ SUPT.
DEPART SITE CK'D OUT W/ SUPT.

CREW MEMBERS	HOURS
R. BATEMAN	8.0
D. DOHERTY	8.0

DESCRIPTION, QUANTITY, LOCATION & ETC. OF WORK PERFORMED AND COMMENTS	CODE	HOURS/ CREW	WORK CK'D
TRAVEL		2/2.0	
LOCATED #'S 34391, 33991, 33691, 34091, 37891,		2/6.0	
33491, 34291, 38291, 34891, 38191, 34991, 34991 OFFSET			
35291, 33891, 35491, 37991, 34191, 35591, 34491,			
37291, 35391 BH, 35391 W			

PERCENT OF ASSIGNED WORK COMPLETED
MATERIALS & EQUIP.

CLIENT COPY RECEIVED BY
SIGNATURE - CLIENT'S REPRESENTATIVE DATE
COMMENTS

CONTRACT DATE TERMS: FIXED FEE T. & M. EXTRA SERVICES

ASST. P.M. (SURVEYING) APPROVAL & COMMENTS

ORIGINAL/PROJECT MANAGER/CENTRAL RECORDS

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ROUTE TO ROORDA

SURVEY CREW DAILY REPORT

JOB NO. 282-7590
DATE 11-22-91
PROJECT TITLE OU1 / RFP
PARTY CHIEF
ARRV. SITE CK'D IN W/ SUPT.
DEPART SITE CK'D OUT W/ SUPT.

CREW MEMBERS	HOURS
R. BATEMAN	8
D. DOHERTY	8

DESCRIPTION, QUANTITY, LOCATION & ETC. OF WORK PERFORMED AND COMMENTS	CODE	HOURS/ CREW	WORK CK'D
TRAVEL	A-1	2.5	
LOCATED #s - 37491 - 36291 - 35891 -	B-1		5.5
37091 - 36591 - 36091 - 35791 - 36391 -			
36691 - 37191 - 30491 - 35691			

PERCENT OF ASSIGNED WORK COMPLETED
MATERIALS & EQUIP.

CLIENT COPY RECEIVED BY _____ SIGNATURE - CLIENT'S REPRESENTATIVE _____ DATE
COMMENTS

CONTRACT DATE _____ TERMS: FIXED FEE _____ T. & M. _____ EXTRA SERVICES _____

ASST. P.M. (SURVEYING) APPROVAL & COMMENTS

ORIGINAL/PROJECT MANAGER/CENTRAL RECORDS

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ROUTE TO ROORDA

SURVEY CREW DAILY REPORT

JOB NO. 282-7590
DATE 11-25-91
PROJECT TITLE OU1 / RFP
PARTY CHIEF
ARRV. SITE CK'D IN W/ SUPT.
DEPART SITE CK'D OUT W/ SUPT.

CREW MEMBERS	HOURS
R. BATEMAN	8
D. DOHERTY	8

DESCRIPTION, QUANTITY, LOCATION & ETC. OF WORK PERFORMED AND COMMENTS	CODE	HOURS/ CREW	WORK CK'D
TRAVEL + MOBILIZATION	A-1	2/2.5	
LOCATED #'S MS1, MS2, MS3, MS4, MS5, 36991, 36791, 36891, 32191, 32091, 37791, 32391, 32491, 35991, 34691, 38391, 33791	B-1	2/5.5	

PERCENT OF ASSIGNED WORK COMPLETED
MATERIALS & EQUIP.

CLIENT COPY RECEIVED BY _____ SIGNATURE - CLIENT'S REPRESENTATIVE _____ DATE
COMMENTS

CONTRACT DATE _____ TERMS: FIXED FEE _____ T. & M. _____ EXTRA SERVICES _____

ASST. P.M. (SURVEYING) APPROVAL & COMMENTS

ORIGINAL/PROJECT MANAGER/CENTRAL RECORDS

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ROUTE TO ROORDA

SURVEY CREW DAILY REPORT

JOB NO. 282-7596
DATE 11-26-91
PROJECT TITLE OU1 / RFP
PARTY CHIEF
ARRV. SITE CK'D IN W/ SUPT.
DEPART SITE CK'D OUT W/ SUPT.

CREW MEMBERS	HOURS
R. BATEMAN	8
D. DOHERTY	8

DESCRIPTION, QUANTITY, LOCATION & ETC. OF WORK PERFORMED AND COMMENTS	CODE	HOURS/ CREW	WORK CK'D
TRAVEL	A-1	2/20	
LOCATED #s 38891, 32591, 32791, 31491		2/3.5	
37391, 37591, 35091, 39421, 39521, 31591,			
36491			
STANDBY - WE WERE NOT ABLE TO FIND			
#s 35191 AND 31391. MET WITH DENNIS		2/2.5	
TO HELP LOCATE WELLS			

PERCENT OF ASSIGNED WORK COMPLETED
MATERIALS & EQUIP.

CLIENT COPY RECEIVED BY _____ SIGNATURE - CLIENT'S REPRESENTATIVE _____ DATE
COMMENTS

CONTRACT DATE _____ TERMS: FIXED FEE _____ T. & M. _____ EXTRA SERVICES _____

ASST. P.M. (SURVEYING) APPROVAL & COMMENTS

ORIGINAL/PROJECT MANAGER/CENTRAL RECORDS

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ROUTE TO ROORDA

SURVEY CREW DAILY REPORT

JOB NO. 282-7590
DATE 12-16-91
PROJECT TITLE EBASCO / OU1
PARTY CHIEF R. BATEMAN
ARRV. SITE _____ CK'D IN W/ SUPT. _____
DEPART SITE _____ CK'D OUT W/ SUPT. _____

CREW MEMBERS	HOURS
R. BATEMAN	9
D. DOHERTY	9

DESCRIPTION, QUANTITY, LOCATION & ETC. OF WORK PERFORMED AND COMMENTS	CODE	HOURS/ CREW	WORK CK'D
TRAVEL + MOBILIZATION	A-1	2	
LOCATED PIPES I-1/I-5, O-1/O-5, E-1/E-5, WELLS + BH'S 39891, 39091, 39391, 38691, 30791, 35191	B-1	7	

PERCENT OF ASSIGNED WORK COMPLETED _____
MATERIALS & EQUIP. _____

CLIENT COPY RECEIVED BY _____ SIGNATURE - CLIENT'S REPRESENTATIVE _____ DATE
COMMENTS _____

CONTRACT DATE _____ TERMS: FIXED FEE _____ T. & M. _____ EXTRA SERVICES _____

ASST. P.M. (SURVEYING) APPROVAL & COMMENTS _____

ORIGINAL/PROJECT MANAGER/CENTRAL RECORDS

Merrick
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MERRICK
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ROUTE TO ROORDA

SURVEY CREW DAILY REPORT

JOB NO. 282-7590
DATE 12-17-91
PROJECT TITLE EBASCO /OU1
PARTY CHIEF R. BATEMAN
ARRV. SITE _____ CK'D IN W/ SUPT. _____
DEPART SITE _____ CK'D OUT W/ SUPT. _____

CREW MEMBERS	HOURS
R. BATEMAN	4
D. DOHERTY	4

DESCRIPTION, QUANTITY, LOCATION & ETC. OF WORK PERFORMED AND COMMENTS	CODE	HOURS/ CREW	WORK CK'D
TRAVEL & MOBILIZATION	A-1	1.0	
LOCATED WELLS & BH's 38991, 31391, 38091			
39691, 33391, 39291, 39191, 33091, 39791	B-1	3.0	

PERCENT OF ASSIGNED WORK COMPLETED _____
MATERIALS & EQUIP. _____

CLIENT COPY RECEIVED BY _____ SIGNATURE - CLIENT'S REPRESENTATIVE _____ DATE
COMMENTS _____

CONTRACT DATE _____ TERMS: FIXED FEE _____ T. & M. _____ EXTRA SERVICES _____

ASST. P.M. (SURVEYING) APPROVAL & COMMENTS _____

ORIGINAL/PROJECT MANAGER/CENTRAL RECORDS

Merrick
Form 72
Rev. 4/82

ATTACHMENT A3-2
SURVEY CREW FIELD NOTES

1849/19

ROCKY FLATS (EBASCO)
WELL + BORING LOCATIONS
282-7590

11/18/91
CLOUDY / 35°

RICH BATEMAN
DAN DOHERTY

T @ 4 5997.15 HI = 4 70

BS @ 202 W/ 00°00'00"

FS (30391)
1) 283 33 15
2) 207 06 13
M) 283 33 07

T @ 4
ZEN. ∡ TO 30391 D 92 57 12
SLOPE TO 30391 R 267 03 00
1652.88 FT. T 360 00 12
503.798 M. M 92 57 06
HI = 4 70 HT = 6 00
5910.79

FS (30291)
1) 293 49 02
2) 227 37 48
M) 293 48 54

T @ 4
ZEN. ∡ TO 30291 D 93 44 35
SLOPE TO 30291 R 266 15 48
1428.15 FT. T 360 00 23
435.298 M. M 93 44 23
HI = 4 70 HT = 6 00

FS (31091)
1) 294 13 51
2) 228 27 19
M) 294 13 39

T @ 4
ZEN. ∡ TO 31091 D 93 26 25
SLOPE TO 31091 R 266 33 58
1482.66 FT. T 360 00 23
451.920 M. M 93 26 13
HI = 4 70 HT = 6 00

ROCKY FLATS (EBASCO)
WELL + BORING LOCATIONS
282.7590

11.18.91
CLOUDY 35°

20/1849

R.B.
D.D.

T@4
BS 202 W/00°
HI = 4.70

FS (31691)
OFFSET #2
1) 293.36.21
2) 227.12.21
M) 293.36.10

T@4
ZEN. ∡ TO 31691
SLOPE TO 31691
1492.99 FT.
455.072 M.
HI = 4.70

D 93.25.30
R 266.34.45
T 360.00.15
M 93.25.22
HT = 6.00

FS (31291)
OFFSET #1
1) 292.01.37
2) 224.03.04
M) 292.01.32

T@4
ZEN. ∡ TO 31291
SLOPE TO 31291
1524.87
464.768
HI = 4.70

D 93.19.27
R 266.40.48
T 360.00.15
M 93.19.19
HT = 6.00

FS (31891)
1) 293.03.12
2) 226.06.06
M) 293.03.03

T@4
ZEN. ∡ TO 31891
SLOPE TO 31891
1560.18 FT.
475.545 M.

D 93.00.18
R 266.59.45
T 360.00.03
M 93.00.17

(31891) OUTSIDE CASING (TOP)
TOP OF P.V.C.
TOP OF CONC.

H.T.
03
06
241

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·18·91
35° CLOUDY

21/1849

R.B.
D.D.

TC 4
BS 202 W/00°

HI = 4 70

FS (32291)
D) 273·18·53
2) 186·37·44
M) 273·18·52

TC 4
ZEN. ∡ TO 32291 D 93·55·19
SLOPE TO 32291 R 266·04·30
1577.22 FT. T 359·59·49
480.735 M. M 93·55·24
HI = 4 70 HT = 6 00

FS (30891)
1) 291·37·01
2) 223·13·49
M) 291·36·54

TC 4
ZEN. ∡ TO 30891 D 95·06·57
SLOPE TO 30891 R 264·53·28
1311.30 FT. T 360·00·25
399.685 M. M 95·06·44
HI = 4 70 HT = 6 00

FS (30191)
1) 308·29·32
2) 256·58·41
M) 308·29·20

TC 4
ZEN. ∡ TO 30191 D 96·02·12
SLOPE TO 30191 R 263·57·48
1173.06 FT T 360·00·00
357.540 M. M 96·02·12
HI = 4 70 HT = 6 00

22/1849

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11.18.91
35° CLOUDY

R.B.
D.D.

TC 4 HI = 4 70
BS 202 W/00°

FS (38591)
D) 305.09.38
2) 250.19.04
M) 305.09.32

H.T.
(38591) OUTSIDE CASING (TOP) 0 3
TOP OF P.V.C. 1 1
TOP OF CONC. 2 64

TC 4
ZEN. ∡ TO 38591 D 97.17.00
SLOPE TO 38591 R 262.43.10
1058.39 FT. T 360.00.10
322.599 M. M 97.16.55
HI = 4 70

FS (30991)
1) 340.01.09
2) 320.02.03
M) 340.01.01

H.T.
(30991) OUTSIDE CASING (TOP) 0 3
TOP OF P.V.C. 0 85
TOP CONC. 2 90

TC 4
ZEN. ∡ TO 30991 D 96.45.44
SLOPE TO 30991 R 263.14.30
1267.56 FT. T 360.00.14
386.353 M. M 96.45.37
HI = 4 70

FS (30091)
1) 343.26.26
2) 326.52.45
M) 343.26.22

TC 4
ZEN. ∡ TO 30091 D 97.09.00
SLOPE TO 30091 R 262.51.05
1223.88 FT. T 360.00.05
373.042 M. M 97.08.58
HI = 4 70
HT = 6 00

1849/23

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11.20.91
CLEAR 30°

R.B.
D.D.

T@4 HI = 4 69

BS 202 W/00°

FS 31791
1) 290.34.21
2) 221.08.09
M) 290.34.05 (H.T.)

31791 TOP OUTSIDE CASING 0 3
TOP P.V.C. 0 56
TOP CONC. 2 68

T@4
ZEN. ∡ TO 31791 D 95.22.08
SLOPE TO 31791 R 264.38.08
1299.20 FT T 360.00.16
395.998 M. M 95.22.00
HI = 4 69

FS 30691
1) 290.42.55
2) 221.25.15
M) 290.42.38

T@4
ZEN. ∡ TO 30691 D 95.32.42
SLOPE TO 30691 R 264.27.25
1266.08 FT T 360.00.07
385.912 M. M 95.32.38
HI = 4 69
HT = 6 00

FS 38491
1) 291.07.42
2) 222.15.04
M) 291.07.32

T@4
ZEN. ∡ TO 38491 D 95.55.18
SLOPE TO 38491 R 264.04.37
1205.47 FT T 359.59.55
367.422 M. M 95.55.20
HI = 4 69
HT = 6 00

1849/24

ROCKY FLATS EBASCO
WELL & BORING LOCATIONS

11·20·91
CLEAR 50°

R.B.
D.D.

T@ 4 HI = 4.69
BS 202 W/00°
FS 38791
1) 318·20·45
2) 276·41·10
M) 318·20·35

T@ 4
ZEN. ∡ TO 38791
SLOPE TO 38791
1064.59 FT.
324.483 M.
HI = 4.69

D 97·27·40
R 262·32·12
T 359·59·52
M 97·27·44
HT = 6.00

FS 31191
1) 355·15·03
2) 350·29·54
M) 355·14·57

T@ 4
ZEN. ∡ TO 31191
SLOPE TO 31191
1582.70 FT
482.405 M.
HI = 4.69

D 94·15·24
R 265·44·24
T 359·59·48
M 94·15·30
HT = 6.00

FS 30591
1) 280·50·39
2) 201·41·02
M) 280·50·31

T@ 4
ZEN. ∡ TO 30591
SLOPE TO 30591
2007.15 FT.
611.778 M.
HI = 4.69

D 91·31·54
R 268·27·45
T 359·59·39
M 91·32·04
HT = 6.00

1849/25

ROCKY FLATS EBASCO
WELL & BORING LOCATIONS

11·20·91
CLEAR 50°

R. B.
D. D.

π @ 4 HI = 4 69
BS 202 W/00°
FS 31991
1) 292·41·26
2) 225·22·25
M) 292·41·13

π @ 4
ZEN. ∡ TO 31991
SLOPE TO 31991
2263.29 FT.
689.855 M.
HI = 4 69

D 90·02·56
R 269·56·45
T 359·59·41
M 90·03·06
HT = 6 00

FS 36191
1) 303·05·15
2) 246·10·21
M) 303·05·11

π @ 4
ZEN. ∡ TO 36191
SLOPE TO 36191
1872.56 FT.
570.754 M.
HI = 4 69

D 91·05·48
R 268·53·54
T 359·59·42
M 91·05·57
HT = ——

		H.T.
36191	TOP OUTSIDE CASING	0 30
	TOP P.V.C.	0 82
	TOP CONC.	2 70

FS 37691
1) 335·36·15
2) 311·12·17
M) 335·36·09

π @ 4
ZEN. ∡ TO 37691
SLOPE TO 37691
2200.64 FT.
670.756 M.
HI = 4 69

D 90·10·36
R 269·49·05
T 359·59·41
M 90·10·46
HT = ——

		H.T.	
37691	TOP OUTSIDE CASING	7 89	0.71
	TOP P.V.C.	9 81	0.79
	TOP CONC.	10 60	

1849/26

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·20·91
50° CLEAR

R.B.
D.D.

TC 4 HI = 4 69
ES 202 V1/00"
FS 33291
1) 345·11·36
2) 330·23·09
M) 345·11·35

TC 4
ZEN. ∠ TO 33291 D 90·47·54
SLOPE TO 33291 R 269·11·58
2084.26 FT T 359·59·52
635.288 M M 90·47·58
HI = 4 69 HT = 6 00

FS 33191
1) 347·25·45
2) 334·51·24
M) 347·25·42

TC 4
ZEN. ∠ TO 33191 D 91·01·24
SLOPE TO 33191 R 268·58·20
2088.50 FT T 359·59·44
636.577 M. M 91·01·32
HI = 4 69 HT = 6 00

FS 32691
1) 342·56·13
2) 325·52·12
M) 342·56·06

TC 4
ZEN. ∠ TO 32691 D 90·57·54
SLOPE TO 32691 R 269·01·55
1986.66 FT T 359·59·49
605.546 M. M 90·57·59
HI = 4 69 HT = 6 00

1849/27

ROCKY FLATS (LBASCO)
WELL & BORING LOCATIONS

11.20.91
50° ~~CLEAR~~ P. CLOUDY

R.B.
D.D.

π @ 4
BS 202 HI = 4 69
W/00°

FS 32891
1) 340.15.30
2) 320.30.53
M) 340.15.27

π @ 4
ZEN. ∡ TO 32891
SLOPE TO 32891
1880.75 FT.
573.249 M.
HI = 4 69

D 91.04.24
R 268.55.24
T 359.59.48
M 91.04.30
HT = 6 00

FS 32991
1) 341.09.00
2) 322.17.57
M) 341.08.59

π @ 4
ZEN. ∡ TO 32991
SLOPE TO 32991
1793.97 FT.
546.807 M.
HI = 4 69

D 91.29.42
R 268.30.10
T 359.59.52
M 91.29.46
HT = 6 00

FS 33591
1) 344.02.00
2) 328.03.48
M) 344.01.54

π @ 4
ZEN. ∡ TO 33591
SLOPE TO 33591
1930.68 FT.
588.471 M.
HI = 4 69

D 91.11.58
R 268.47.55
T 359.59.53
M 91.12.01
HT = 6 00

1849/28

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·20·91
45° CLOUDY

R.B.
D.D.

π @ 4
BS 202 W/00°
HI = 4 69

π @ 4
ZEN. ∡ TO 34791
SLOPE TO 34791
1917.35 FT.
584.411 M.
HI = 4 69

D 91·24·38
R 268·35·15
T 359·59·53
M 91·24·41
HT = ____

FS 34791
1) 344·55·36
2) 329·51·00
M) 344·55·30 (H.T.)

34791 TOP OUTSIDE CASING 0 3
TOP P.V.C. 0 73
TOP CONC. Z 85

FS 34591
1) 347·15·23
2) 334·30·37
M) 347·15·19 (H.T.)

34591 TOP OUTSIDE CASING 0 3
TOP P.V.C. 0 86
TOP CONC. Z 70

π @ 4
ZEN. ∡ TO 34591
SLOPE TO 34591
2021.30 FT
616.095 M.
HI = 4 69

D 91·19·00
R 268·41·02
T 359·00·02
M 91·18·59
HT = ____

FS
1)
2)
M)

π @ 4
ZEN. ∡ TO
SLOPE TO
FT.
M.
HI =

D
R
T
M
HT =

1849/29

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·21·91
50° P. CLOUDY

R.B.
D.D.

T@ 4
BS 202 W/ 00°

T@ 4
ZEN. ∡ TO 34391 — D 92·14·35
SLOPE TO 34391 — R 267·45·36
1675.85 FT. — T 360·00·11
510.801 M. — M 92·14·30
HI = 4 63 — HT = 6 00

FS 34391
1) 332·30·33
2) 305·00·36
M) 332·30·18

T@ 4
ZEN. ∡ TO 33991 — D 92·05·00
SLOPE TO 33991 — R 267·55·06
1695.36 FT. — T 360·00·06
516.753 M. — M 92·04·57
HI = 4 63 — HT = 6 00

FS 33991
1) 331·20·36
2) 302·41·00
M) 331·20·30

T@ 4
ZEN. ∡ TO 33691 — D 92·31·06
SLOPE TO 33691 — R 267·29·00
1631.07 FT. — T 360·00·06
497.152 M. — M 92·31·03
HI = 4 63

FS 33691
1) 328·10·18
2) 296·20·30
M) 328·10·15

33691 TOP OUTSIDE CASING — H.T. 0 3
TOP P.V.C. — 0 95
TOP CONC. — 2 89

1849/30

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·21·91
50° P. CLOUDY

R.B.
D.D.

π @ 4			π @ 4	
BS	202	W/00°	ZEN. ∡ TO 34091	D 92·31·24
			SLOPE TO 34091	R 267·28·50
FS	34091	D 326·50·02	1613.44 FT.	T 360·00·14
		2) 293·39·55	491.764 M.	M 92·31·17
		M) 326·49·58	HI = 4 63	HT = 6 00
FS	37891	1) 325·13·08	π @ 4	
		2) 290·26·15	ZEN. ∡ TO 37891	D 92·39·42
		M) 325·13·08 (H.T.)	SLOPE TO 37891	R 267·20·30
		TOP OUTSIDE CASING 0 3	1605.52 FT.	T 360·00·12
		TOP P.V.C. 1 03	489.364 M.	M 92·39·36
		TOP CONC. 2 34	HI = 4 63	~~HT~~
FS	33491	1) 324·06·27	π @ 4	
		2) 288·12·34	ZEN. ∡ TO 33491	D 92·34·07
		M) 324·06·17 (H.T.)	SLOPE TO 33491	R 267·26·00
33491		TOP OUTSIDE CASING 0 3	1615.61 FT.	T 360·00·07
		TOP P.V.C. 0 87	492.438 M.	M 92·34·03
		TOP CONC. 2 89	HI = 4 63	HT =

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11.21.91
50° P.CLOUDY

R.B.
D.D.

T@4
BS 202 W/00°

T@4
ZEN. ∡ TO 34291 D 92.12.48
SLOPE TO 34291 R 267.47.15
1652.53 FT. T 360.00.03
503.704 M. M 92.12.46
HI = 4 63 HT = 6 00

FS 34291
1) 324.19.00
2) 288.37.48
M) 324.18.54

FS 38291
1) 320.52.44
2) 281.45.18
M) 320.52.39

38291 TOP OUTSIDE CASING 0 3
TOP P.V.C. 0 73
TOP CONC. 2 65

H.T.

T@4
ZEN. ∡ TO 38291 D 92.41.21
SLOPE TO 38291 R 267.18.36
1585.42 FT. T 359.57.57
483.235 M. M 92.41.22
HI = 4 63 ~~HT =~~

FS 34891
1) 320.40.40
2) 281.21.06
M) 320.40.33

T@4
ZEN. ∡ TO 34891 D 92.25.12
SLOPE TO 34891 R 267.34.34
1613.00 FT. T 359.59.46
491.638 M. M 92.25.19
HI = 4 63 HT = 6 00

1849/32

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·21·91
50° P. CLOUDY

R.B.
D.D.

T@ 4
BS 202 11/00°

T@ 4
ZEN. ∡ TO 38191 — D 92·42·25
SLOPE TO 38191 — R 267·17·16
1577.10 FT — T 359·59·41
480.699 M. — M 92·42·35
HI = 4 63 — ~~HT =~~

FS 38191
1) 319·27·33
2) 279·54·57
M) 319·27·29 (H.T.)

38191 TOP OUTSIDE CASING 0 3
TOP P.V.C. 0 87
TOP CONC. 2 54

FS 34991
1) 318·32·36
2) 277·05·09
M) 318·32·35

T@ 4
ZEN. ∡ TO 34991 — D 92·35·30
SLOPE TO 34991 — R 267·24·37
1572.07 FT — T 360·00·07
479.165 M. — M 92·35·26
HI = 4 63 — HT = 6 00

1847
FS 34991 OFFSET
1) 318·38·03
2) 277·15·50
M) 318·37·55

T@ 4
ZEN. ∡ TO — D 92·36·54
SLOPE TO — R 267·24·00
1571.91 FT. — T 359·59·54
479.125 M. — M 92·35·57
HI = 4 63 — HT = 6 00

1849/33

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·21·91
50° P. CLOUDY

R.B.
D.D.

π @ 4
BS 202 W/00°

FS 35291
1) 316·35·39
2) 273·10·58
M) 316·35·29

π @ 4
ZEN. ∡ TO 35291
SLOPE TO 35291
1570.35 FT
478.643 M.
HI = 4 63

D 92·32·14
R 267·27·42
T 359·59·56
M 92·32·16
HT = 6 00

FS 33891
1) 314·32·07
2) 269·03·53
M) 314·31·57

H.T.
0 3
0 90
2 91

33891 TOP OUTSIDE CASING
TOP P.V.C.
TOP CONC.

π @ 4
ZEN. ∡ TO 33891
SLOPE TO 33891
1563.52 FT.
476.562 M.
HI = 4 63

D 92·36·08
R 267·23·51
T 359·59·59
M 92·36·08
~~HT =~~

FS 35491
1) 315·15·55
2) 270·31·27
M) 315·15·44

π @ 4
ZEN. ∡ TO 35491
SLOPE TO 35491
1611.67 FT
491.234 M.
HI = 4 63

D 92·14·18
R 267·45·33
T 359·59·51
M 92·14·23
HT = 6 00

1849/34

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·21·91
50° P. CLOUDY

R.B.
D.D.

T@ 4
BS 202 W/00°

T@ 4
ZEN. ∡ TO 37991
SLOPE TO 37991
1633.30 FT.
497.831 M.
HI = 4 63

D 92·21·56
R 267·38·10
T 360·00·06
M 92·21·53
~~HT =~~

FS 37991
1) 318·44·52
2) 277·29·22
M) 318·44·41

H.T.
37991 TOP OUTSIDE CASING 0 3
TOP P.V.C. 0 20
TOP CONC. 2 87

FS 34191
1) 318·12·33
2) 276·24·50
M) 318·12·25

T@ 4
ZEN. ∡ TO 34191
SLOPE TO 34191
1664.65 FT.
507.388 M.
HI = 4 63

D 92·03·55
R 267·55·58
T 359·59·53
M 92·03·58
HT = 6 00

FS 35591
1) 317·51·54
2) 275·43·31
M) 317·51·46

T@ 4
ZEN. ∡ TO 35591
SLOPE TO 35591
1718.48 FT.
523.805 M.
HI = 4 63

D 91·43·42
R 268·16·26
T 360·00·08
M 91·43·38
HT = 6 00

1849/35

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11.21.91
50° P. CLOUDY

R.B.
D.D.

T@ 4
BS 202 W/00°

FS 34491
1) 323.53.20
2) 287.46.30
M) 323.53.15

T@ 4
ZEN. ∡ TO 34491
SLOPE TO 34491
1721.61 FT.
524.728 M.
HI = 4.63

D 91.52.02
R 268.07.54
T 359.59.56
M 91.52.04
HT = 6.00

FS 37291
1) 288.29.24
2) 216.58.33
M) 288.29.17

T@ 4
ZEN. ∡ TO 37291
SLOPE TO 37291
1886.56 FT.
575.040 M.
HI = 4.63

D 91.28.22
R 268.31.48
T 360.00.10
M 91.28.17
HT = 6.00

FS 35391
BORING
1) 294.42.53
2) 229.25.26
M) 294.42.43

T@ 4
ZEN. ∡ TO 35391
SLOPE TO 35391
1974.78 FT
601.913 M
HI = 4.63

D 91.01.32
R 268.58.27
T 359.59.59
M 91.01.32
HT = 6.00

1849/36

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11.21.91
50° P. CLOUDY

R.B.
D.D.

Π@ 4
BS 202 W/00°

FS (35391 WELL) 1) 294.38.01
2) 229.15.31
M) 294.37.46 — (H.T.)

(35391 WELL) TOP OUTSIDE CASING 0 30
TOP P.V.C. 1 10
TOP CONC. 3 40

Π@ 4
ZEN. ∡ TO 35391 — D 91.05.42
SLOPE TO 35391 — R 268.54.28
1977.20 FT. — T 360.00.10
602.652 M. — M 91.05.37
HI = 4 63 — HT = ____

FS
1)
2)
M)

FS
1)
2)
M)

1849/37

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·22·91
P. CLOUDY 35°

R.P.
D.L.

T@ 4
BS 202 W/00°

T@ 4
ZEN. ∡ TO 37491 D 90 55 06
SLOPE TO 37491 R 269·04·25
1921.70 FT. T 359·59·31
585.735 M. M 90·55·21
HI = 4 70 HT 6 00

FS 37491
1) 306·32·55
2) 253·05·37
M) 306·32·49

T@ 4
ZEN. ∡ TO 36291 D 90·43·36
SLOPE TO 36291 R 269·16·13
1890.89 FT T 359·59·49
576.347 M. M 90·43·41
HI = 4 70 HT = 6 00

FS 36291
1) 309·13·08
2) 258·26·10
M) 309·13·05

T@ 4
ZEN. ∡ TO 35891 D 90·33·43
SLOPE TO 35891 R 269·24·02
1920.92 FT. T 359·59·45
585.476 M. M 90·33·50
HI = 4 70 HT = 6 00

FS 35891
1) 311·47·19
2) 263·36·29
M) 311·48·15

1849/38

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·22·91
35° WINDY, CLOUDY

R. B.
D. L.

T @ 4
BS 202 w/00°

IS 37091
1) 310·13·00
2) 260·25·53
M) 310·12·57

T @ 4
ZEN. ∡ TO 37091 D 90·32·44
SLOPE TO 37091 R 269·27·07
1964.71 FT T 359·59·51
598.834 M. M 90·32·49
HI = 4.70 HT = 6.00

FS 36591
1) 310·49·45
2) 261·39·24
M) 310·49·42

T @ 4
ZEN. ∡ TO 36591 D 90·13·49
SLOPE TO 36591 R 269·46·07
2009.98 FT. T 359·59·53
612.638 M. M 90·13·49
HI = 4.70 HT = 6.00

FS 36091
1) 309·51·29
2) 259·42·53
M) 309·51·27

T @ 4
ZEN. ∡ TO 36091 D 90·48·37
SLOPE TO 36091 R 269·11·03
1838.36 FT. T 359·59·40
560.361 M. M 90·48·47
HI = 4.70 HT = 6.00

1849/39

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

1·22·91
35° WINDY, CLOUDY

R.B.
D.D.

TC 4
BS 2-2 W/00'

FS 35791
1) 315·33·11
2) 271·06·10
M) 315·33·05

TC 4
ZEN. ∡ TO 35791 — D 91·09·54
SLOPE TO 35791 — R 268·47·48
1813.25 FT — T [illegible]
552.881 M. — M 91·[illegible]
HI = 4.70 — HT- 6.00

FS 36391
1) 304·53·36
2) 249·47·09
M) 304·52·35

H.T.
36391 TOP OUTSIDE CASING 0.3
TOP P.V.C. 0.86
TOP CONC. 2.87

TC 4
ZEN. ∡ TO 36391 — D 91·05·41
SLOPE TO 36391 — R 268·54·18
1782.04 FT. — T 359·59·58
543.167 M. — M 91·05·41
HI = 4.70 — HT-

FS 36691
1) 308·21·09
2) 256·42·02
M) 308·21·01

H.T.
3669 1 TOP OUTSIDE CASING 0.3
TOP P.V.C. 1.04
TOP CONC. 2.50

TC 4
ZEN. ∡ TO 36691 — D 91·39·21
SLOPE TO 36691 — R 268·20·51
1709.51 FT — T 360·00·12
521.059 M — M 91·39·15
HI = 4.70 — HT-

1849/40

ROCKY FLATS (EPICA)
WELL & BORING LOCATIONS

11·22·91
35° CLOUDY

R.B.
D.D.

π @ 4 BS 202 W/00°		π @ 4 ZEN. ∡ TO 37191 SLOPE TO 37191 1672.20 FT. 509.690 M. HI = 4 70	D 91·48·57 R 268·11·12 T 360·00·09 M 91·48·52 HT
FS 37191	1) 311·57·43 2) 263·55·12 M) 311·57·36 TOP OUTSIDE CASING TOP P.V.C. TOP CONC.	H.T. 03 067 295	
FS 30491	1) 283·36·37 2) 207·13·03 M) 283·36·31	π @ 4 ZEN. ∡ TO 30491 SLOPE TO 30491 1643.41 FT. 500.918 M. HI = 4 70	D 93·00·04 R 266·57·23 T 359·59·27 M 93·00·20 HT = 6 00
FS 35691	1) 292·37·33 2) 225·14·43 M) 292·37·24 35691 TOP OUTSIDE CASING TOP P.V.C. TOP CONC.	H.T. 03 080 295	π @ 4 ZEN. ∡ TO 35691 SLOPE TO 35691 1751.67 FT. 533.908 M HI = 4 70	D 91·57·09 R 268·[illegible] T 359·59·42 M 91·57·18 HT

1849/41

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

11·25·91
CLEAR 45°

R.B.
M.D.

TP 4 BS 202 W/00'			TP 4 ZEN. ∡ TO 36991 SLOPE TO 36991 1959.48 FT 597.251 M. HI = 4.71	D 90·50·33 R 269·09·36 T 360·00·09 M 90·50·28 HT =
FS 36991	1) 303·54·42 2) 247·49·13 M) 303·54·37	H.T.		
36991	TOP OUTSIDE CASING	0.3		
	TOP P.V.C.	0.87		
	TOP CONC.	2.45		
FS 36791	1) 303·23·01 2) 246·45·51 M) 303·22·56		TP 4 ZEN. ∡ TO 36791 SLOPE TO 36791 1941.37 FT. 591.732 M. HI = 4.71	D 90·46·13 R 269·13·48 T 360·00·01 M 90·46·13 HT = 6.55
FS 36891	1) 302·44·07 2) 245·28·11 M) 302·44·06		TP 4 ZEN. ∡ TO 36891 SLOPE TO 36891 1944.94 FT 592.814 M. HI = 4.71	D 90·45·41 R 269·14·18 T 359·59·59 M 90·45·41 HT = 6.22

1849/42

ROCKY FLATS (LPA)
WELL & BORING LOCATIONS

11.25.91
CLEAR 45°

R.B
D.D.

T@ 4 BS 202 W/00°			T@ 4 ZEN. & TO 32191 SLOPE TO 32191 1913.11 FT. 583.112 M. HI = 4 71	D 90 55 28 R 269 04 25 T 359 59 53 M 90 55 31 HT = 6 00
FS 32191	D 302 05 47 2) 244 11 30 M) 302 05 45			
FS 32091	D 300 08 35 2) 240 17 14 M) 300 08 37		T@ 4 ZEN. & TO 32091 SLOPE TO 32091 1996.65 FT. 608.583 M. HI = 4 71	D 90 49 36 R 269 10 23 T 359 59 59 M 90 49 36 HT = 6 00
FS 37791	D 300 22 57 2) 240 45 40 M) 300 22 50		T@ 4 ZEN. & TO 37791 SLOPE TO 37791 2534.57 FT. 772.513 M. HI = 4 71	D [illegible] R 270 33 09 T 360 00 11 M 89 26 56 HT =
37791	TOP OUTSIDE CASING TOP P.V.C. TOP CONC.	21 71 274 22 19 [illegible] 24 45		

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

1849/43

11·25·91
CLEAR 45°

R.B.
D.L.

TC 4
BS 202 W/00°

FS 32391
1) 294·00·42
2) 228·01·04
M) 294·00·32

TC 4
ZEN. X. TO 32391 D 89·57·03
SLOPE TO 32391 R 270·[illegible]
2305.38 FT. T 360·[illegible]
702.673 M. M 89·57·02
HI = 4.71 HT 6.00

FS 32491
1) 293·06·45
2) 226·13·12
M) 293·06·26

TC 4
ZEN. X. TO 32491 D 90·30·45
SLOPE TO 32491 R 269·29·12
2079.07 FT. T 359·[illegible]
633.695 M. M 90·[illegible]
HI = 4.71 HT = 15.15

FS 35991
1) 292·16·27
2) 224·32·46
M) 292·16·24 (HT.)
TOP OUTSIDE CASING 0.3
TOP P.V.C. 0.67
TOP CONC. 2.97

TC 4
ZEN. X. TO 35991 D 90·40·30
SLOPE TO 35991 R 269·19·36
2110.84 FT. T 360·00·06
643.385 M. M 90·40·27
HI = 4.71 ~~HT~~

ROCKY FLATS (BASE)
WELL & BORING LOCATIONS

11-25-91 "WINDY" R.B.
CLEAR 45° O.L.

TC 4
BS 202 W/00°

FS 34691
1) 322.40.27
2) 225.20.26
M) 322.40.13

TC 4
ZEN. ∠ TO 34691 D 92.32.14
SLOPE TO 34691 R 267.27.36
1600.26 FT T 359.39.50
487.783 M M 92.32.19
HI: 4.71 HT: 6.00

PT# 1841
FS TOP OF A 10' METAL PIPE MS-1
1) 293.08.07
2) 226.15.32
M) 293.07.46

TC 4
ZEN. ∠ TO MS-1 D 93.37.06
SLOPE TO MS-1 R 266.22.44
1457.12 FT T 359.59.51
444.122 M M 93.37.11
HI: 4.71 HT: 6.00

1842
FS ~~[illegible]~~
MS-5
1) 299.13.57
2) 218.27.18
M) 299.13.39

TC 4
ZEN. ∠ TO MS-5 D 94.57.26
SLOPE TO MS-5 R 265.02.17
1335.56 FT T 359.57.43
407.162 M M 94.57.34
HI: 4.71 HT: 6.00

1849/45

ROCKY FLATS ERASCO
WELL & BORING LOCATIONS

R.B.
L.D.

TC 4
BS 200 [illegible]

FS MS-4 1843
1) 287.13.24
2) 214.26.18
m) 287.13.09

"4.25.91"
"HINLY"

TC 4
ZEN. ∡ TO MS-4 D 95.18.05
SLOPE TO MS-4 R 264.41.56
1269.23 FT T 360.00.01
386.828 M M 95.18.05
HI = 4.71 HT = 6.00

FS MS-3 1844
1) 290.24.27
2) 220.48.25
m) 290.24.13

TC 4
ZEN. ∡ TO MS-3 D 95.36.19
SLOPE TO MS-3 R 264.23.47
1223.06 FT. T 360.00.06
372.791 M. M 95.36.16
HI = 4.71 HT = 6.00

FS TOP OF 1.0' METAL PIPE MS-2 1845
1) 291.17.30
2) 222.34.39
m) 291.17.20

TC 4
ZEN ∡ TO MS-2 D 95.35.32
SLOPE TO MS-2 R 264.24.21
1239.92 FT. T 359.59.53
377.927 M M 95.35.~~29~~ 35
HI = 4.71 HT = 6.00

1849/46

ROCKY FLATS (BASC)
WELL & BORING LOCATIONS

"25.91"
WINLY

R.B.
D.L.

⊼ @ 4		⊼ @ 4	
BS 202 W/00'		ZEN. ∡ TO 38391	D 96·00·54
		SLOPE TO 38391	R 263·54·06
FS 38391	1) 291·17·02	1177.81 FT.	T 360·00·00
	2) 222·33·48	358.989 M.	M 96·05·54
	M) 291·16·54	HI = 4 71	HT 6 00
FS 33791	1) 346·23·17	⊼ @ 4	
	2) 332·46·20	ZEN. ∡ TO 33791	D 90·53·06
	M) 346·23·10	SLOPE TO 33791	R 269·27·02
		2181.60 FT.	T 360·00·08
		664.957 M	M 90·33·02
		HI = 4 71	HT 6 00
FS	1)	⊼ @ 4	
	2)	ZEN. ∡ TO	D
	M)	SLOPE TO	R
		FT	T
		M	M
		HI = 4 71	HT

1849/47

R.B.
D.D.

ROCKY FLATS (EBASCO)
WELL & BORING LOCATIONS

"11·26·91"
"WINDY 45°"

T@4				T@4	
BS	202	W/00°		ZEN. ∠ TO 38891	D 94·35·24
				SLOPE TO 38891	R Z65·24·15
FS	38891	D 329·15·58		1348.26 FT.	T 359·59·39
		Z 298·31·46		410.952 M.	M 94·35·34
		M 329·15·53	H.T.	HI = 4 68	~~HT=~~
38891	TOP	OUTSIDE CASING	0 3		
	TOP	P.V.C.	0 62		
	TOP	CONC.	2 19		
FS	32591	D 322·16·28		T@4	
		Z 284·32·36		ZEN. ∠ TO 32591	D 93·07·42
		M 322·16·18	H.T.	SLOPE TO 32591	R Z66·49·54
	TOP	OUTSIDE CASING	0 3	1520.79 FT	T 359·59·57
	TOP	P.V.C.	0 50	463.537 M.	M 93·07·54
	TOP	CONC.	2 61	HI = 4 68	
FS	32791	D 318·11·24		T@4	
		Z 276·22·35		ZEN ∠ TO 32791	D 93·06·12
		M 318·11·18		SLOPE TO 32791	R Z66·59·42
				1487.27 FT	T 359·59·54
				453.310 M.	M 93·06·17
				HI = 4 68	HT = [illegible]

1849/48

ROCKY FLATS (EERCO)
WELL & PORTS LOCATIONS

11·26·91
"WINDY"

R.B.
D.D.

π@4				π@4	
BS	202 W/00'			ZEN. & TO 31491	D 94·02·18
				SLOPE TO 31491	R 265·57·30
FS	31491	b) 311·49·09		1365.31 FT.	T 359·59·48
		2) 263·57·54		416.148 M.	M 94·02·24
		M) 311·48·57		HI = 4.68	~~HT~~
	TOP OUTSIDE CASING		0.[illegible]		
	TOP P.V.C.		0.65		
	TOP CONC.		2.53		
FS	37391	b) 296·25·14		π@4	
		2) 232·50·07		ZEN. & TO 37391	D 92·38·37
		M) 296·25·04		SLOPE TO 37391	R 267·21·18
				1590.76 FT.	T 359·59·55
				484.970 M.	M 92·33·39
				HI = 4.68	HT 6.00
FS	37591	b) 319·22·18		π@4	
		2) 278·44·18		ZEN. & TO 37591	D 89·52·21
		M) 319·22·09		SLOPE TO 37591	R 270·07·37
37591	TOP OUTSIDE CASING		12.91 2.19	2162.19 FT.	T 359·59·53
	TOP P.V.C.		13.28 2.[illegible]	659.023 M.	M 89·52·27
	TOP CONC.		15.10	HI = 4.68	~~HT~~

1849/49

R.B.
D.D.

Rocky Flats (EEACO)
Well & Borings Location

1-26-91
"Windy" 45°

TC 4			TC 4	
BS 202	00/00°		ZEN. ∠ to 35091	D 92·08·07
			SLOPE to 35091	R 267·51·40
FS 35091		D 307·01·07	1579.92 FT.	T 359·59·47
		2) 258·12·08	481.561 M.	M 92·08·13
		M) 307·01·04	HI = 4.68	HT = 6.00
FS BORE HOLE #21 (1846)		D 292·04·24	TC 4	
		2) 224·08·26	ZEN. ∠ to B.H. #21	D 91·49·17
		M) 292·04·13	SLOPE to B.H. #21	R 262·11·42
			1837.15 FT.	T 359·59·44
			559.981 M.	M 91·49·10
			HI = 4.68	HT = 6.00
FS 39591		D 290·56·21	TC 4	
		2) 221·52·18	ZEN. ∠ to 39591	D 91·50·16
		M) 290·56·09	SLOPE to 39591	R 268·09·21
			1802.30 FT.	T 359·59·37
			549.330 M.	M 91·50·27
			HI = 4.68	HT = 6.00

1849/50

11·26·91

"WINDY" 40°

R.B.
D.D.

[illegible]	[illegible]	[illegible]	[illegible]
WELL & BYNS [illegible]			
AT @ 4			
BS 200 [illegible]			
FS 31591	1) 297·11·19		
	2) 234·22·10		
	M) 297·11·05		
IS 36491	1) 293·37·24		
	2) 227·13·51		
"WINDY" & THRU TREES	M) 293·36·56		
FS	1		
	2		
	M		

AT @ 4
ZEN. & TO 31591 — D 92·59·42
SLOPE TO 31591 — R 266·59·58
1545.20 FT. — T 359·59·40
470.967 M. — M 92·59·59
HI = 4.68 — HT = 6.00

AT @ 4
ZEN. & TO 36491 — D 92·17·36
SLOPE TO 36491 — R 267·42·24
1650.77 FT — T 360·00·00
503.173 M. — M 92·17·36
HI = 4.68 — HT = 6.00

AT @ 4
ZEN [illegible] — D
SLOPE [illegible] — R
FT — T
M. — M
HI: 4.68 — HT: [illegible]

R.F.P. (EBASCO) LOCATE WELLS & BORE HOLES

12·16·91
50° CLEAR, "WINDY"
T-1 WILD = π

R. B.
D. D.

π #4
BS 202 W/0°00'00"

FS	I-1	1) 348·31·38 2) 337·02·48 M) 348·31·24	H.T.	π @ 4 ZEN ∡ TO I-1 SLOPE TO I-1 1243.77 FT. 379.099 M. HI = 4 75	D 97·26·02 R 262·33·24 T 359·59·26 M 97·26·19 ~~HT =~~
	TOP OF PIPE		0 20		
	TOP OF GROUND		1 02		
FS	I-2	1) 348·29·25 2) 336·59·40 M) 348·29·50	H.T.	π @ 4 ZEN. ∡ TO I-2 SLOPE TO I-2 1246.40 FT. 379.903 M. HI = 4 75	D 97·24·54 R 262·34·52 T 359·59·46 M 97·25·01 ~~HT =~~
	TOP OF PIPE		0 20		
	TOP OF GROUND		1 12		
FS	I-3	1) 348·29·03 2) 336·57·37 M) 348·28·49	H.T.	π @ 4 ZEN. ∡ TO I-3 SLOPE TO I-3 1248.58 FT. 380.568 M. HI = 4 75	D 97·23·53 R 262·35·51 T 359·59·44 M 97·24·01 ~~HT =~~
	TOP OF PIPE		0 20		
	TOP OF GROUND		1 25		

1851/12

R.B.
D.D.

R.F.P. (EBASCO) LOCATE WELLS & BOREHOLES

12.16.91
50°

TE 4
BS 202 W/00°

FS	I-4	D) 348.29.12 2) 336.58.00 M) 348.29.00	H.T.	TE 4 ZEN. ∡ TO I-4 SLOPE TO I-4 1250.83 FT 381.254 M HI = 4 75	D 97.22.42 R 262.36.48 T 359.59.30 M 97.22.57 ~~HT =~~
	TOP OF PIPE GROUND		0 20 1 26		
FS	I-5	1) 348.28.54 2) 336.57.25 M) 348.28.43	H.T.	TE 4 ZEN. ∡ TO I-5 SLOPE TO I-5 1253.36 FT. 382.026 M. HI = 4 75	D 97.21.38 R 262.37.51 T 359.59.29 M 97.21.53 ~~HT =~~
	TOP OF PIPE GROUND		0 20 1 23		
FS	O-1	1) 348.37.45 2) 337.15.06 M) 348.37.33	H.T.	TE 4 ZEN ∡ TO O-1 SLOPE TO O-1 1244.26 379.251 HI = 4 75	D 97.26.14 R 262.33.19 T 359.59.33 M 97.26.27 ~~HT =~~
	TOP OF PIPE GROUND		0 20 1 00		

1851/13

R.F.P. (EBASCO) LOCATE WELLS & BORE HOLES

12.16.91
50°

R. B.
D.D.

Tc 4
BS 202 W/00°

FS O-2
1) 348.38.10
2) 337.16.03
M) 348.38.02 H.T
TOP OF PIPE 0 20
GROUND 1 00

Tc 4
ZEN. & TO O-2
SLOPE TO O-2
1246.64 FT
379.976 M.
HI = 4 75

D 97.25.33
R 262.34.05
T 359.59.38
M 97.25.44
HT =

FS E-1
1) 348.44.48
2) 337.29.07
M) 348.44.34 H.T.
TOP OF PIPE 0 20
GROUND 1 30

Tc 4
ZEN. & TO E-1
SLOPE TO E-1
1244.47 FT
379.313 M
HI = 4 75

D 97.25.48
R 262.33.34
T 359.59.22
M 97.26.07
HT =

FS E-2
1) 348.43.58
2) 337.27.36
M) 348.43.48 H.T.
TOP OF PIPE 0 20
GROUND 1 20

Tc 4
ZEN. & TO E-2
SLOPE TO E-2
1246.93 FT
380.068 M
HI = 4 75

D 97.25.39
R 262.33.46
T 359.59.25
M 97.25.56
HT =

1851/14

R.F.P. (EBASCO) LOCATE WELLS & BORE HOLES

12.16.91
50°

P.B.
D.D.

Te 4
BS 202 W/00°

Te 4
ZEN. ∡ TO E-3 D 97.24.08
SLOPE TO E-3 R 262.35.15
1249.16 FT T 359.59.23
380.745 M M 97.24.26
HI = 4 75 ~~HT=~~

FS E-3
1) 348.45.09
2) 337.29.57 H.T.
M) 348.44.59
TOP OF PIPE 0 20
GROUND 1 10

FS E-4
1) 348.43.00
2) 337.25.47
M) 348.42.54 H.T.
TOP OF PIPE 0 20
GROUND 1 18

Te 4
ZEN. ∡ TO E-4 D 97.22.54
SLOPE TO E-4 R 262.36.43
1251.39 FT T 359.59.37
381.426 M M 97.23.05
HI = 4 75 ~~HT=~~

FS E-5
1) 348.42.00
2) 337.23.42 H.T.
M) 348.41.51
TOP OF PIPE 0 20
GROUND D 95

Te 4
ZEN. ∡ TO E-5 D 97.22.22
SLOPE TO E-5 R 262.36.51
1253.64 FT T 359.59.13
382.112 M M 97.22.45
HI = 4 75 ~~HT=~~

R.F.P. (EBASCO) LOCATE WELLS & BORE HOLES

12.16.91
50°

1851/15
R.B.
D.D.

TE 4
BS 202 W/00°

TE 4
ZEN. ∡ TO 0-5
SLOPE TO 0-5
1253.58 FT
382.094 M
HI = 4 75

D 97.22.22
R 262.37.10
T 359.59.32
M 97.22.36
~~HI =~~

FS 0-5
1) 348.34.30
2) 337.08.48
M) 348.34.24
TOP OF PIPE 0 20
GROUND 1 10
H.T.

FS 0-4
1) 348.37.48
2) 337.15.12
M) 348.37.36
TOP OF PIPE 0 20
GROUND 1 20
H.T.

TE 4
ZEN. ∡ TO 0-4
SLOPE TO 0-4
1251.05 FT
381.321 M
HI = 4 75

D 97.23.12
R 262.36.12
T 359.59.24
M 97.23.30
~~HI =~~

FS 0-3
1) 348.35.45
2) 337.11.03
M) 348.35.32
TOP OF PIPE 0 20
GROUND 1 17
H.T.

TE 4
ZEN. ∡ TO 0-3
SLOPE TO 0-3
1248.66 FT
380.592 M
HI = 4 75

D 97.24.17
R 262.35.12
T 359.59.29
M 97.24.32
~~HI =~~

R.F.P. (EBASCO) LOCATE WELLS & BOREHOLES

12.16.91
50° "WINDY"

1851/16
R.B.
D.D.

T@4
BS 202 W/00°

T@4
ZEN. ∡ TO 39891 — D 97.22.45
SLOPE TO 39891 — R 262.36.46
1254.27 FT — T 359.59.31
382.300 M — M 97.23.00
HI = 4 75 — ~~HT~~

FS 39891
1) 349.14.51
2) 338.29.32
M) 349.14.46 H.T.

TOP OF PIPE 0 20
GROUND 1 15

FS 39091
BORE HOLE
1) 347.56.02
2) 335.51.27 H.T.
M) 347.55.44

GROUND 5 75

T@4
ZEN. ∡ TO 39091 — D 97.12.04
SLOPE TO 39091 — R 262.47.30
1246.98 FT — T 359.59.34
380.073 M — M 97.12.17
HI = 4 75 — ~~HT~~

FS 39391
1) 27.03.07
2) 54.05.54
M) 27.02.57

T@4
ZEN. ∡ TO 39391 — D 94.54.14
SLOPE TO 39391 — R 265.05.06
2270.84 FT — T 359.59.20
692.185 M — M 94.54.34
HI = 4 75 — HT = 6 03

1851/17

R.F.P. (EBASCO) LOCATE WELLS & PIPELINES

12.16.91
"WINDY" 50° F.

R.B.
D.D.

TC 4
BS 202 W/00°

FS 38691
1) 318.29.36
2) 276.58.43
M) 318.29.22

TC 4
ZEN. ∡ TO 38691 | D 97.37.57
SLOPE TO 38691 | R 262.21.21
1045.09 FT | T 359.59.18
318.545 M | M 97.38.18
HI = 4 75 | HT = 6 03

FS 30791
1) 289.57.54
2) 219.55.33
M) 289.57.47

TC 4
ZEN. ∡ TO 30791 | D 95.16.32
SLOPE TO 30791 | R 264.42.48
1297.52 FT | T 359.59.20
395.494 M | M 95.16.52
HI = 4 75 | HT = 6 03

FS 35191
1) 289.21.24
2) 218.42.15
M) 289.21.08

TC 4
ZEN. ∡ TO 35191 | D 91.20.19
SLOPE TO 35191 | R 268.39.24
1916.43 FT | T 359.59.43
584.130 M | M 91.20.27
HI = 4 75 | HT = 6 03

R.F.P. (EBASCO) LOCATE WELLS & BOREHOLES

12-17-91 "WIND"
35°
π = G.T.'s T-2

1851/18
R.B.
D.D.

π @ 4
BS 202
FS 38991

1) 00°00'23" } 12.5
4) 180·00·02
2) 328·04·40 } 26
3) 148·04·12
M)

H.T.
0 30
0 74
2 87

Top OUTSIDE CASING
TOP P.V.C.
TOP CONC.

π @ 4
ZEN. ∡ TO 38991
SLOPE TO 38991
1340.84 FT
408.688 M
HI = 4 67

D 94·30·36
R 265·28·24
T 359·59·00
M 94-31-06 KH
HT = ---

FS 31391

2) 332·36·20 } 09
3) 152·35·58
M)

π @ 4
ZEN. ∡ TO 31391
SLOPE TO 31391
1334.47 FT
406.766 M
HI = 4 67

D 94·46·31
R 265·12·22
T 359·58·53
M 94-47-04.5 KH
HT = 6 03

FS 38091

2) 294·36·48 } 34
3) 114·36·20
M)

π @ 4
ZEN. ∡ TO 38091
SLOPE TO 38091
2410.78 FT
734.812 M
HI = 4.67

D 89·48·17
R 270·10·33
T 359·58·50
M 89-48-51.9 KH
HT = 6 03

1851/19

R.B.

R.F.F. (EBASCO) LOCATE WELLS & BOREHOLES

12·17·91
35°

TC 4
BS 202
FS 39691

1) 00·00·23 } 12.5 H.T.
4) 180·00·02
2) 294·55·32 } 20.5
3) 114·55·09
M)

TOP OUTSIDE CASING 0 30
TOP P.V.C. 0 70
TOP CONC. 2 41

TC 4
ZEN. ∡ TO 39691
SLOPE TO 39691
2417.45 FT
736.842 M
HI = 4 67

D 89·49·21
R 270·09·37
T 359·58·58
M 89-49-52
~~HT=~~

6006.60

FS 33391

2) 325·36·28 } 15
3) 145·36·02
M)

TC 4
ZEN. ∡ TO 33391
SLOPE TO 33391
1607.10 FT
489.845 M
HI = 4 67

D 92·32·15
R 267·26·36
T 359·58·51
M M
HT = 6 03

FS 39291

2) 326·40·45 } 35 H.T.
3) 146·40·25
M)

TOP OUTSIDE CASING 0 30
TOP P.V.C. 0 77
TOP CONC. 2 24

TC 4
ZEN. ∡ TO 39291
SLOPE TO 39291
1472.82 FT
448.917 M
HI = 4.67

D 93·31·42
R 266·27·09
T 359·58·51
M 93-32-16
~~HT=~~

1851/20

R.F.P. (EBASCO) LOCATE WELLS & BORE HOLES

12·17·91
35° "WINDY"

R.B.
D.D.

TC 4 5997.15 (T)

BS 202
1) 00·00·23
4) 180·00·02 } 12.5

FS 39191
2) 325·02·00
3) 145·01·46 } 53
M)

TOP OUTSIDE CASING
TOP P.V.C.
TOP CONC.

H.T.
0 30
1 34
2 72

TC 4
ZEN. ∡ TO 39191
SLOPE TO 39191
1540.10 FT
469.425 M
HI = 4 67

D 93·03·01
R 266·55·50
T 359·58·51
M ~~93·03·06~~ 93·03·36
~~HT~~

5916.94

FS 33091
2) 325·16·55
3) 145·16·30 } 42.5
M)

TC 4
ZEN. ∡ TO 33091
SLOPE TO 33091
1539.71 FT
469.309 M
HI = 4 67

D 92·57·06
R 267·01·50
T 359·58·50
M 92·57·41
HT = 6 03 5916.29

FS
2)
3)
M)

TC 4
ZEN. ∡ TO
SLOPE TO
FT
M

D
R
T
M

HI = 4 67
HT =

1851/21

TRIG ROCKY POINT ELEV. TO #567

12-17-91
40° WINDY

R.B.
D.D.

(VERTICLE CONTROL FOR #567)

AT @ 303
ZEN. ∡ TO 567
SLOPE TO 567
4523.38 FT.
1378.727 M.
HI = 4 67
HD = 4520.363

D 92·05·06
R 267·53·57
T 359·59·03
M 92·05·34
HT = 4 33
ΔEl = −164.414

RECIPS

AT @ 567
ZEN. ∡ TO 303

D 87·55·39
R 272·03·11
T 359·58·49
M 87·56·13
HI = 5 03
HT = 3 97
ΔEl = +164.328
MΔEl = −164.371

ROCKY FLATS
CHECK INTO 302 FOR ELEV. CK.

12·17·91

1851/22
R.B.
D.D.

(VERTICLE CONTROL FOR #567)

AT @ 567
ZEN. ∡ TO 302 — D 87·37·37
SLOPE TO 302 — R 272·21·16
4037.21 FT. — T 359·58·53
1230.543 M. — M 87·38·10
HI = 5 03 — HT = 3 83
HD = 4033.7744 — ΔEl = +168.060

RECIPS

AT @ 302
ZEN. ∡ TO 567 — D 92·23·07
R 267·35·45
T 359·58·52
M 92·23·41
HI = 4 52 — HT = 4 34
ΔEl = −168.168
MΔEl = +168.114

R.F.P. (EBASCO) LOCATE WELL OR BORE HOLES

12·17·91

1351/23

R.B.
D.D.

T@	303	5912/30			
BS	302	1) 00·00·18	05		
		4) 179·59·52			
FS	39791	2) 45·00·58	47.5		
		3) 225·00·37			
		M) 45·00·42.5			

T@ 303

BFN. X TO 39791 D 95·17·00

SLOPE TO 39791 R 264·41·55

1958.56 FT T 359·58·55

596.976 M M 95·17·32

HI = 4 67 HT = 6 03

5730.37

2084000 E

749000 N

2086000 E

749000 N

7376
37691

7337
33791

7377
37791

7375
37591

7332
33291

7331
33191

7326
32691

7345
34591

7335
33591

7347
34791

7328
32891

7329
32991

7380
38091

7396
39691

7365
36591

7370
37091

7358
35891

7323
32391

7319
31991

7369
36991

7374
37491

7362
36291

7357
35791

7344
34491

7339
33991

7343
34391

7368
36891

7367
36791

7360
36091

7320
32091

7355
35591

7342
34291

7340
34091

7336
33691

7334
33491

7341
34191

7379
37991

7348
34891

7333
33391

7321
32191

7361
36191

7346
34691

7378
37891

7359
35991

7324
32491

7363
36391

7366
36691

7371
37191

7354
35491

7381
38191

7382
38291

1899
35391BORE

7353
35391

1847
353910/S

7330
33091

7338
33891

7352
35291

7349
34991

7325
32591

7391
39191

7392
39291

7327
32791

7350
35091

7351
35191

1846
BH21

7372
37291

7395
39591

7356
35691

7389
38991

7388
38891

7391
31391

7364
36491

7373
37391

7315
31591

7314
31491

7309
30991

7310
30991

SEE DETAIL "A"

7312
31291

1841
MS-1

7302
30291

7303
30391

7304
30491

7301
30191

7387
38791

7386
38691

7307
30791

7308
30891

7317
31791

1842
MS-5

7306
30691

1845
MS-2

7384
38491

1843
MS-4

1844
MS-3

7383
38391

7385
38591

DETAIL "A"

SCALE: 1"=10'

2084000 E

747000 N

NOTE

GRID TICKS ARE COLORADO STATE PLANE, CENTRAL ZONE (NAD 1927)

LEGEND

FOUND#

WELL#

0 100 200

SCALE 1 INCH = 100 FEET

EBASCO ENVIRONMENTAL

881

(OPERABLE UNIT 4)

PLOT OF WELL LOCATIONS

MERRICK