APPENDIX I

GEOTECHNICAL ANALYTICAL RESULTS

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S&ME

January 7, 2004

Science Applications International Corporation
P.O. Box 2501
Oak Ridge, Tennessee 37831

ATTENTION: Mr. Kevin Jago

REFERENCE: **GEOTECHNICAL LABORATORY SERVICES**
Erie Burning Grounds Phase II Remedial Investigation
Ravenna Army Ammunition Plant
Subcontract 4400077600
S&ME Project No. 1433-03-616

Dear Mr. Jago:

S&ME has completed laboratory testing for the subject project. The testing program was conducted in general accordance with subcontract No. 4400077600. The purpose of the testing program was to determine the requested properties of the soil samples received. The following report presents the activities and results of the testing program.

RECEIPT INSPECTION

A total of six (6) Shelby tube samples were received on December 1, 2003 from the above referenced project site. A copy of our Receipt Inspection Report as well as a copy of the Chain of Custody record are each enclosed in Appendix A.

SCOPE AND PROCEDURES

The testing program consisted of liquid limits, plastic limits, and plasticity index, grain size with hydrometer, USCS classification, specific gravity, porosity, bulk density and Total Organic Carbon. The tests assigned were performed in general accordance with the

S&ME, Inc., Knoxville Branch
1413 Topside Road
Louisville, Tennessee 37777

(865) 970-0003
(865) 970-2312 fax
www.smeinc.com

following methods: ASTM D4318 for the limits, ASTM D422 for grain size, ASTM D2487 for USCS classification, ASTM D854 for specific gravity, EM-1110-2-1906 for porosity, ASTM D4531 for bulk density, and SW846 9060 for Total Organic Carbon.

RESULTS

A summary of test results and test data sheets are included in Appendix B. Please note that adequate intact material was not available in sample EBG289 / 20'-22' to perform the bulk density for the porosity test. Since porosity was not obtainable without intact material on this sample, the specific gravity analysis was not conducted.

S&ME appreciates the opportunity to be of service in this project. If you have questions or require additional information, please contact us at your convenience.

Sincerely,

S&ME, Inc.

Jeff Rymer
Soils Laboratory Manager

Lloyd R. Monday, P.E.
Construction Services Manager
TN # 104964

JTR/LRM/trb

Attachments

APPENDIX A

Receipt Inspection Report
&
Chain of Custody Record

Inspection Report

☑ RECEIVING ☐ SHIPPING RECEIVED FROM/SHIPPED TO: SAIC – Erie Burning Grounds Phase II RI	DATE: December 1, 2003 PROJECT No.: 1433-03-616 S&ME P.O. No.: N/A CLIENT Subcontract No.: 4400077600 RELEASE/CO/REV No.: N/A	REPORT No.: **QA-INSP-03-220** INSPECTOR: Tracie R. Best PROJECT MANAGER: Jeff Rymer

ITEM No.	QTY	Station No. / Depth	IDENTIFICATION No.	DESCRIPTION	ACCEPTABLE YES	ACCEPTABLE NO
1	1 each		EBG284 – 18-20'	Soil (Shelby Tube)	X	
2	1 each		EBG285 – 22-24'	Soil (Shelby Tube)	X	
3	1 each		EBG288 – 16-18'	Soil (Shelby Tube)	X	
4	1 each		EBG288 – 22-24'	Soil (Shelby Tube)	X	
5	1 each		EBG289 – 20-22'	Soil (Shelby Tube)	X	
6	1 each		EBG290 – 24-24.7'	Soil (Shelby Tube)	X	

PACKAGING: ☐CRATE ☑METAL ~~PLASTIC~~ CONTAINER ☐CARDBOARD ☐DOUBLE PACKED ☐SINGLE PACKED

DOCUMENTATION: ☐MATERIAL CERTIFICATION ☐CERTIFICATE OF CONFORMANCE ☐CERTIFICATE OF CALIBRATION ☐OTHER (specify)

NOTE:

WORK CLASSIFICATION: ☐NUCLEAR ☑SAFETY-RELATED ☑NON-NUCLEAR

COMMENTS/DESCRIPTION OF DESCREPANCIES (continue on reverse):

Inspector Signature 12/1/03 Date

Form 10.1-1 Revision 2

SAIC An Employee-Owned Company
Science Applications International Corporation
151 Layfayette Drive, Oak Ridge, Tennessee 37831(865) 481-4600

COC NO.: EBGS-01
page 1 of 1

CHAIN OF CUSTODY RECORD

PROJECT NAME: ERIE BURNING GROUNDS PHASE II RI
DELIVERY ORDER NUMBER: CY10
PROJECT MANAGER: KEVIN JAGO 865 481 4614
Sampler (Signature): Martha Clough (Printed Name): Martha Clough

LABORATORY NAME: S&ME, Inc.
LABORATORY ADDRESS: 1413 TOPSIDE RD. LOUISVILLE, TN 37777
PHONE NO: 865 970 0003

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	Atterberg Limits	Bulk Density	Porosity	TOC	No. of Containers	
EBG284	10/30/03	1005	SOIL	X	X	X	X	1	18'-20'
EBG285	10/29/03	1310	SOIL	X	X	X	X	1	22'-24'
EBG288	10/29/03	1250	SOIL	X	X	X	X	1	16'-18'
EBG288	10/29/03	1255	SOIL	X	X	X	X	1	22'-24'
EBG289	11/02/03	1340	SOIL	X	X	X	X	1	20'-22'
EBG290	10/30/03	1201	SOIL	X	X	X	X	1	24'-24.7'

RECEIVED DEC 01 2003

RELINQUISHED BY: Martha Clough	Date/Time 11/25/03 1800	RECEIVED BY:	Date/Time	TOTAL NUMBER OF 6	Cooler Temperature: NA
COMPANY NAME: SAIC		COMPANY NAME:		Cooler ID: NA	FEDEX NUMBER: 7925 1820 4452 7925 1820 4441
RECEIVED BY:	Date/Time 12/01/03	RELINQUISHED BY:	Date/Time		7925 1820 4430 7925 1820 4420 7925 1820 4419 7925 1820 4408
COMPANY NAME:	9:00 AM	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	Field Contact: Martha Clough 216 287 0450	
COMPANY NAME:		COMPANY NAME:			

L-7

APPENDIX B

Test Data Summary
&
Laboratory Data Sheets

TEST DATA SUMMARY
Erie Burning Grounds Phase II Remedial Investigation
Ravenna Army Ammunition Plant
S&ME Project No. 1433-03-616

Sample I.D.	Depth (ft)	Porosity (cm^3/cm^3)	TOC (wt. % dry)	Grain Size Analysis				Atterberg Limits			USCS	Wet Density (lb/ft^3)	Dry Density (lb/ft^3)	Water Content (%)	Specific Gravity
				% Gravel	% Sand	% Silt	% Clay	LL	PL	PI					
EBG284	18-20	.255	<0.10	7.6	53.5	24.1	14.8	16	10	6	SC-SM	140.1	123.2	13.7	2.65
EBG285	22-24	.346	<0.10	0.1	92.1	4.4	3.4	NP	NP	NP	SP-SM	126.3	107.5	17.5	2.64
EBG288	16-18	.353	<0.10	0.0	2.7	61.6	35.7	26	15	11	CL	132.8	109.9	20.9	2.72
EBG288	22-24	.394	<0.10	0.0	11.6	80.6	7.8	23	17	6	CL-ML	127.7	102.6	24.5	2.71
EBG289	20-22	TNP	<0.10	1.9	86.7	8.8	2.6	NP	NP	NP	SW-SM	TNP	TNP	TNP	TNP
EBG290	24-24.7	.266	<0.10	2.8	28.8	40.9	27.5	24	13	11	CL	142.8	122.7	16.4	2.69

TNP=Test Not Performed
NP = Non Plastic

S&ME

INSITU SOIL DENSITY
ASTM D4531

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job Number: 1433-03-616

Operator: DB

Date: 12/10/03

Specimen ID:	EBG284	EBG285	EBG288	EBG288	EBG290
Depth:	18-20'	22-24'	16-18'	22-24'	24-24.7'
Specimen Measurements:					
Diameter (inches):	2.860	2.846	2.855	2.872	2.829
Diameter (inches):	2.839	2.820	2.841	2.855	2.820
Diameter (inches):	2.852	2.821	2.852	2.809	2.808
Length (inches):	3.917	2.950	5.622	5.476	3.508
Length (inches):	3.955	2.941	5.609	5.489	3.505
Length (inches):	3.923	2.945	5.615	5.516	3.566
Spec. Wet weight (grams):	921.6	613.1	1246.5	1175.6	829.1
Spec. Volume:					
Avgerage Dia. (inches):	2.850	2.830	2.850	2.850	2.820
Average Length (inches):	3.930	2.950	5.620	5.490	3.530
Area (square inches):	6.379	6.290	6.379	6.379	6.246
Volume (cubic feet):	0.0145	0.0107	0.0207	0.0203	0.0128
Moisture Data:					
Wt. of wet spec. + tin:	212.80	159.00	163.60	193.80	214.40
Wt. of dry spec. + tin:	191.76	141.08	141.84	162.96	189.36
Wt. of tin:	38.20	38.50	37.60	36.90	36.90
Wt. of solids:	153.56	102.58	104.24	126.06	152.46
Wt. of moist.:	21.04	17.92	21.76	30.84	25.04
Density:					
Wet Density (pcf):	**140.1**	**126.3**	**132.8**	**127.7**	**142.8**
Dry Density (pcf):	**123.2**	**107.5**	**109.9**	**102.6**	**122.7**
Moisture Cont. (%):	**13.7**	**17.5**	**20.9**	**24.5**	**16.4**

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SOIL POROSITY
USACOE EM-1110-2-1906

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job No: 1433-03-616

Date: 01/05/04 Operator: JTR

Sample I.D.:	EBG284	EBG285	EBG288	EBG288	EBG290
Depth/Elevation (ft):	18-20	22-24	16-18	22-24	24-24.7
Wt. of Solids (g):	810.60	521.90	1031.30	944.60	712.20
Sp. Gr. Of Solids:	2.650	2.640	2.720	2.710	2.690
Total Volume (cf):	0.0145	0.0107	0.0207	0.0203	0.0128
Vol. Of Solids (cf):	0.0108	0.0070	0.0134	0.0123	0.0094
Vol. Of Voids (cf):	0.0037	0.0037	0.0073	0.0080	0.0034
Porosity:	0.255	0.346	0.353	0.394	0.266

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SOIL SPECIFIC GRAVITY
ASTM D 854

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job No.: 1433-03-616

Date: 12/19/03 Operator: DB

Spec. I.D.	EBG284	EBG285	EBG288	BEG288	EBG290
Depth, (ft)	18-20	22-24	16-18	22-24	24-24.7
Material	Clay	Sand	Clay	Clay	Clay
Pycnometer ID	28	25	26	20	33
Calibrated Volume (ml)	499.87	499.82	499.76	499.63	499.83
Calibrated of Flask, (g)	171.50	170.00	178.80	169.48	178.48
Wt. of Flask + Dry Soil, (g)	269.90	269.17	265.52	267.80	269.15
Wt. of Dry Soil, (g)	**98.40**	**99.17**	**86.72**	**98.32**	**90.67**
Wt. of Flask + Water, (g)	670.11	668.70	677.39	667.93	677.16
Wt. of Flask, Soil, & Water, (g)	731.39	730.23	732.20	729.92	734.08
Temperature, (C)	23.3	22.1	22.5	22.6	22.3
Density of H20 @ Test Temp (g/ml)	0.99747	0.99775	0.99766	0.99764	0.99770
Temp. Corr. Factor, K	**0.99926**	**0.99954**	**0.99945**	**0.99943**	**0.99950**
Specific Gravity @ Test Temp.	**2.65**	**2.64**	**2.72**	**2.71**	**2.69**
Bulk Specific Gravity @ 20 C	**2.65**	**2.64**	**2.72**	**2.71**	**2.69**

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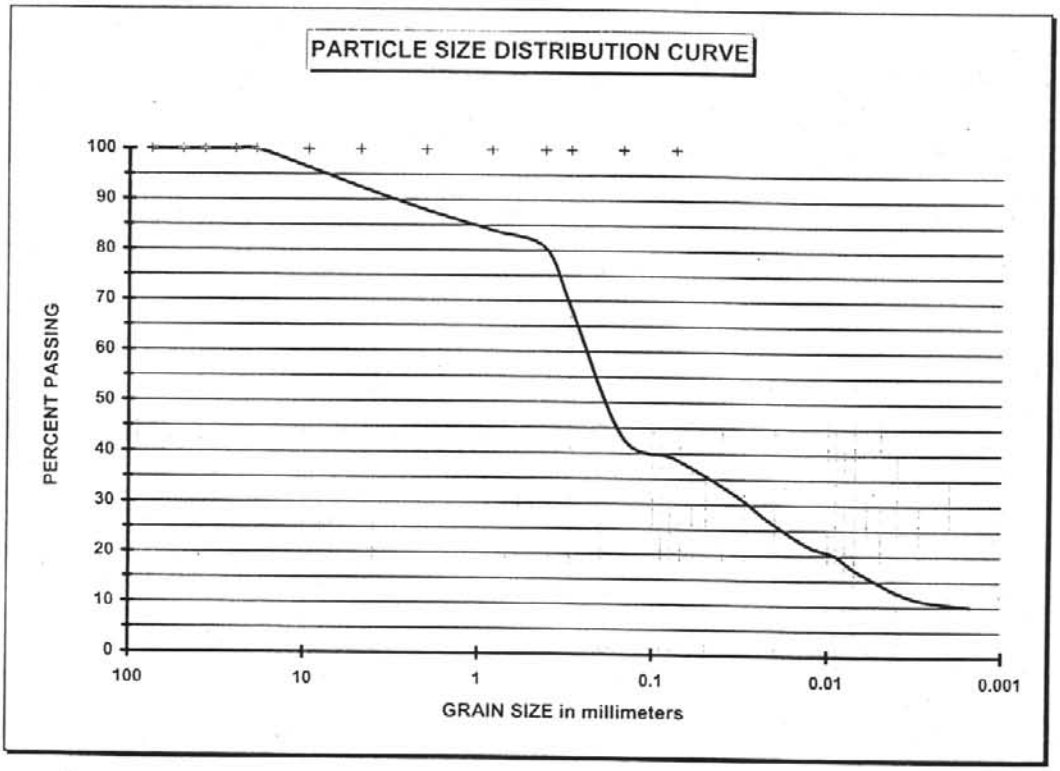
PARTICLE SIZE ANALYSIS
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job Number: 1433-03-616 Date: 12/15/03



Sample ID: EBG284 Depth: 18-20' USCS: SC-SM

Sample Description: Gray, Silty Clayey Sand

GRAIN SIZE DATA	
% GRAVEL	7.6
% SAND	53.5
% SILT	24.1
% CLAY	14.8

Gravel	< 75 mm and > 4.75 mm
Coarse Sand	< 4.75 mm and >2.00 mm
Medium Sand	< 2.00 mm and > 0.425 mm
Fine Sand	< 0.425 mm and > 0.075 mm
Silt	< 0.075 and > 0.005 mm
Clay	< 0.005 mm

ATTERBERG LIMIT DATA	
Liquid Limit	16
Plastic Limit	10
Plasticity Index	6
-#40 Material Group Symbol	CL-ML

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HYDROMETER ANALYSIS DATA
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job # : 1433-03-616 Date: 12/15/03

Sample ID: EBG284 Operator: DB

Depth: 18-20' Log #: NA

Soil Description: Gray, Silty Clayey Sand

Dispersion: 4 % Sodium Hexametaphosphate, Apparatus (A)

Moisture Cont:		**Sample Data:**	
Tare wt:	27.35	Init wt, (g):	555.71
Wet + tare wt:	110.41	Hydro spec wt, (g):	52.64
Dry + tare wt:	110.12	Dry hydro wt, (g):	52.43
Solids wt:	82.77	Rep. total wt:	59.62
Moist. wt:	0.29	Assumed Sp. Gr:	2.65
Percent moisture:	0.4	Sp. Gr. corr, (a):	1.00

Sieve Analysis

Stand Sieve	Open Size (mm)	Cum Wt Ret. (g)	Cum % Ret. (%)	Percent Pass (%)	Req. % Pass (%)
1 in	25	0.00	0.00	100.00	
.75 in	19	0.00	0.00	100.00	
0.375	9.5	20.30	3.65	96.35	
4	4.75	42.04	7.57	92.43	
10	2	67.02	12.06	87.94	
20	0.85	2.34	3.92	84.02	
40	0.425	4.40	7.38	80.56	
60	0.25	11.43	19.17	68.77	
140	0.106	26.67	44.73	43.21	
200	0.075	29.19	48.96	38.98	

Hydrometer Analysis

Elapsed time (min)	Temp (C)	Act Hydro Read	Comp Corr	Corr Hydro Read	Men Corr Hydro	Effect Depth (L)	K value	Dia (mm)	% Finer
2	20	25	6	19	26	12.0	0.01365	0.0334	31.87
5	20	22	6	16	23	12.5	0.01365	0.0216	26.84
15	20	19	6	13	20	13.0	0.01365	0.0127	21.80
30	20	18	6	12	19	13.2	0.01365	0.0091	20.13
60	19	16	6	10	17	13.5	0.01382	0.0066	16.77
250	19	13	6	7	14	14.0	0.01382	0.0033	11.74
1440	19	12	6	6	2	16.0	0.01382	0.0015	10.06

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ATTERBERG LIMITS
ASTM D 4318

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job No: 1433-03-616 Date: 12/16/03

Sample ID : EBG284 Log # : NA

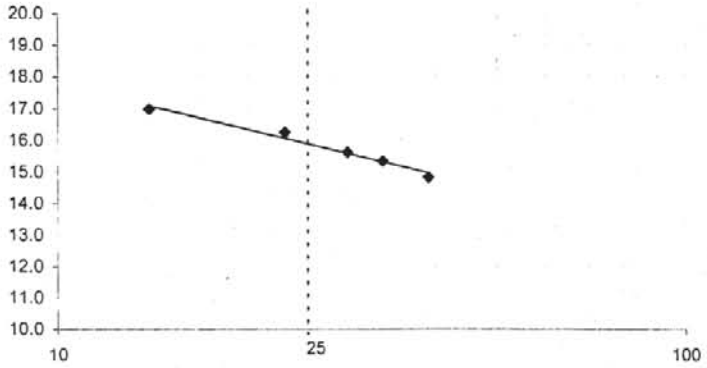
Depth: 18-20' Operator: DB

PLASTIC LIMIT DETERMINATION

Tare Weight	3.82	3.94	4.01		
Wet Soil &Tare	13.74	13.30	13.89		
Dry Soil & Tare	12.82	12.44	12.99		
Moisture Content; %	10.2	10.1	10.0		

LIQUID LIMIT DETERMINATION

Tare Weight	4.01	4.01	3.95	4.00	3.91
No. of Blows; N	14	23	29	33	39
Wet Soil & Tare	16.89	17.32	18.17	19.57	20.26
Dry Soil & Tare	15.02	15.46	16.25	17.50	18.15
Moisture Content; %	17.0	16.2	15.6	15.3	14.8



LL= 16 PL = 10 PI = 6

Soil Type= CL-ML

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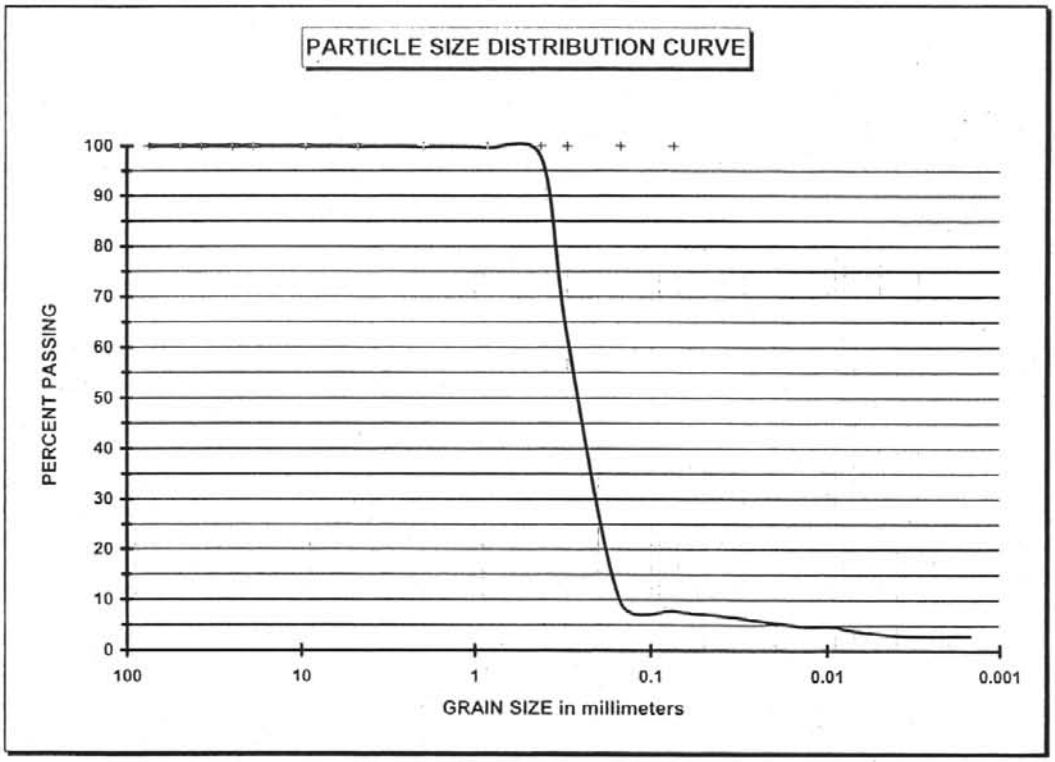
PARTICLE SIZE ANALYSIS
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job Number: 1433-03-616 Date: 12/15/03



Sample ID: EBG285 Depth: 22-24' USCS: SP-SM

Sample Description: Gray, Poorly Graded Sand

GRAIN SIZE DATA	
% GRAVEL	0.1
% SAND	92.1
% SILT	4.4
% CLAY	3.4

Gravel	< 75 mm and > 4.75 mm
Coarse Sand	< 4.75 mm and >2.00 mm
Medium Sand	< 2.00 mm and > 0.425 mm
Fine Sand	< 0.425 mm and > 0.075 mm
Silt	< 0.075 and > 0.005 mm
Clay	< 0.005 mm

ATTERBERG LIMIT DATA	
Liquid Limit	NP
Plastic Limit	NP
Plasticity Index	NP
-#40 Material Group Symbol	NP

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HYDROMETER ANALYSIS DATA
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job # : 1433-03-616 Date: 12/15/03

Sample ID: EBG285 Operator: DB

Depth: 22-24' Log #: NA

Soil Description: Gray, Poorly Graded Sand

Dispersion: 4 % Sodium Hexametaphosphate, Apparatus (A)

Moisture Cont:		Sample Data:	
Tare wt:	38.19	Init wt, (g):	610.78
Wet + tare wt:	120.30	Hydro spec wt, (g):	105.39
Dry + tare wt:	120.15	Dry hydro wt, (g):	105.18
Solids wt:	81.96	Rep. total wt:	105.34
Moist. wt:	0.15	Assumed Sp. Gr:	2.65
Percent moisture:	0.2	Sp. Gr. corr, (a):	1.00

Sieve Analysis

Stand Sieve	Open Size (mm)	Cum Wt Ret. (g)	Cum % Ret. (%)	Percent Pass (%)	Req. % Pass (%)
1 in	25	0.00	0.00	100.00	
.75 in	19	0.00	0.00	100.00	
0.375	9.5	0.00	0.00	100.00	
4	4.75	0.49	0.08	99.92	
10	2	0.89	0.15	99.85	
20	0.85	0.21	0.20	99.65	
40	0.425	2.14	2.03	97.82	
60	0.25	39.52	37.52	62.33	
140	0.106	94.84	90.03	9.82	
200	0.075	96.99	92.07	7.78	

Hydrometer Analysis

Elapsed time (min)	Temp (C)	Act Hydro Read	Comp Corr	Corr Hydro Read	Men Corr Hydro	Effect Depth (L)	K value	Dia (mm)	% Finer
2	20	13	6	7	14	14.0	0.01365	0.0361	6.65
5	20	12	6	6	13	14.2	0.01365	0.0230	5.70
15	20	11	6	5	12	14.3	0.01365	0.0133	4.75
30	20	11	6	5	12	14.3	0.01365	0.0094	4.75
60	19	10	6	4	11	14.5	0.01382	0.0068	3.80
250	19	9	6	3	10	14.7	0.01382	0.0034	2.85
1440	19	9	6	3	2	16.0	0.01382	0.0015	2.85

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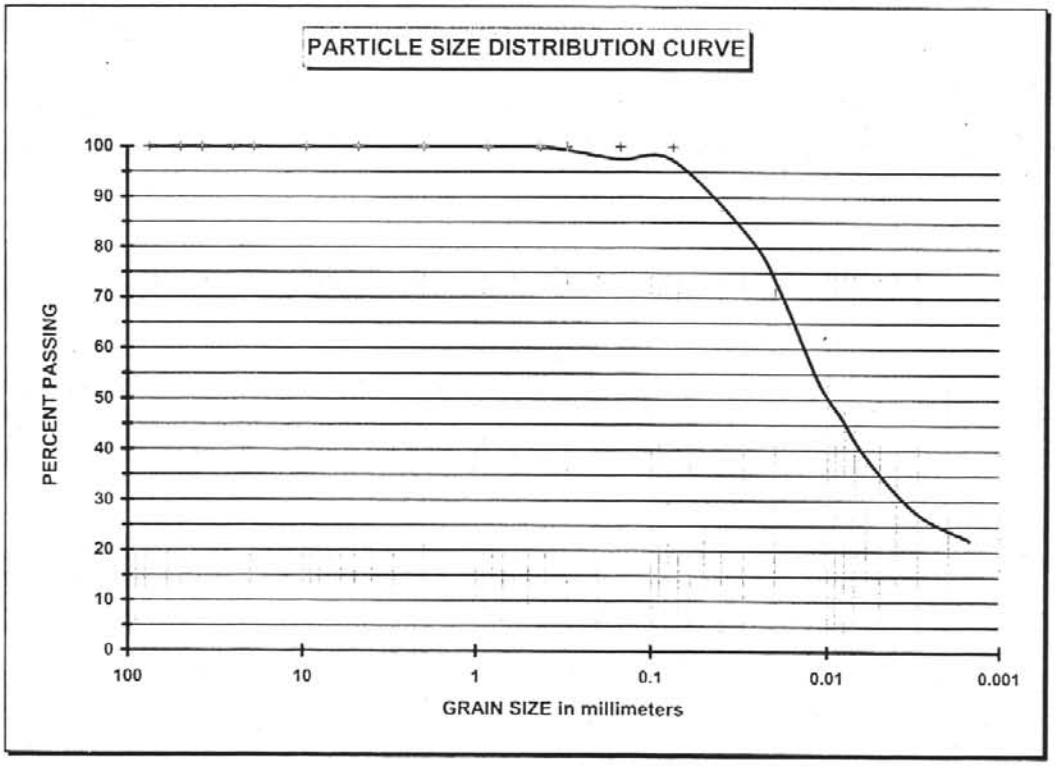
PARTICLE SIZE ANALYSIS
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job Number: 1433-03-616 Date: 12/15/03



Sample ID: EBG288 Depth: 16-18' USCS: CL

Sample Description: Gray, Lean Clay

GRAIN SIZE DATA	
% GRAVEL	0.0
% SAND	2.7
% SILT	61.6
% CLAY	35.7

Gravel	< 75 mm and > 4.75 mm
Coarse Sand	< 4.75 mm and >2.00 mm
Medium Sand	< 2.00 mm and > 0.425 mm
Fine Sand	< 0.425 mm and > 0.075 mm
Silt	< 0.075 and > 0.005 mm
Clay	< 0.005 mm

ATTERBERG LIMIT DATA	
Liquid Limit	26
Plastic Limit	15
Plasticity Index	11
-#40 Material Group Symbol	CL

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HYDROMETER ANALYSIS DATA
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job # : 1433-03-616 Date: 12/15/03

Sample ID: EBG288 Operator: DB

Depth: 16-18' Log #: NA

Soil Description: Gray, Lean Clay

Dispersion: 4 % Sodium Hexametaphosphate, Apparatus (A)

Moisture Cont:		Sample Data:	
Tare wt:	38.50	Init wt, (g):	422.50
Wet + tare wt:	113.42	Hydro spec wt, (g):	54.24
Dry + tare wt:	112.97	Dry hydro wt, (g):	53.92
Solids wt:	74.47	Rep. total wt:	53.92
Moist. wt:	0.45	Assumed Sp. Gr:	2.65
Percent moisture:	0.6	Sp. Gr. corr, (a):	1.00

Sieve Analysis

Stand Sieve	Open Size (mm)	Cum Wt Ret. (g)	Cum % Ret. (%)	Percent Pass (%)	Req. % Pass (%)
1 in	25	0.00	0.00	100.00	
.75 in	19	0.00	0.00	100.00	
0.375	9.5	0.00	0.00	100.00	
4	4.75	0.00	0.00	100.00	
10	2	0.00	0.00	100.00	
20	0.85	0.00	0.00	100.00	
40	0.425	0.04	0.07	99.93	
60	0.25	0.35	0.65	99.35	
140	0.106	1.33	2.47	97.53	
200	0.075	1.44	2.67	97.33	

Hydrometer Analysis

Elapsed time (min)	Temp (C)	Act Hydro Read	Comp Corr	Corr Hydro Read	Men Corr Hydro	Effect Depth (L)	K value	Dia (mm)	% Finer
2	20	50	6	44	51	7.9	0.01365	0.0271	81.60
5	20	44	6	38	45	8.9	0.01365	0.0182	70.47
15	20	35	6	29	36	10.4	0.01365	0.0114	53.78
30	20	31	6	25	32	11.1	0.01365	0.0083	46.36
60	19	27	6	21	28	11.7	0.01382	0.0061	38.95
250	19	21	6	15	22	12.7	0.01382	0.0031	27.82
1440	19	18	6	12	2	16.0	0.01382	0.0015	22.26

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ATTERBERG LIMITS
ASTM D 4318

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job No: 1433-03-616 Date: 12/16/03

Sample ID : EBG288 Log # : NA

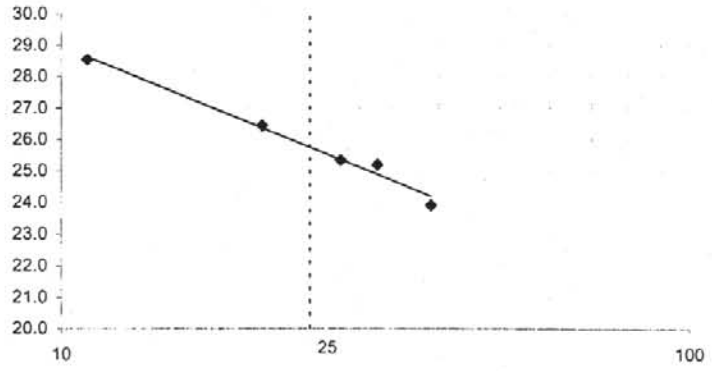
Depth: 16-18' Operator: DB

PLASTIC LIMIT DETERMINATION

Tare Weight	3.94	4.10	3.86		
Wet Soil &Tare	14.90	14.60	14.49		
Dry Soil & Tare	13.43	13.20	13.07		
Moisture Content; %	15.5	15.4	15.4		

LIQUID LIMIT DETERMINATION

Tare Weight	4.07	4.02	3.73	3.93	3.92
No. of Blows; N	11	21	28	32	39
Wet Soil & Tare	13.66	14.59	15.85	16.80	17.81
Dry Soil & Tare	11.53	12.38	13.40	14.21	15.13
Moisture Content; %	28.6	26.4	25.3	25.2	23.9



LL= 26 PL = 15 PI = 11

Soil Type= CL

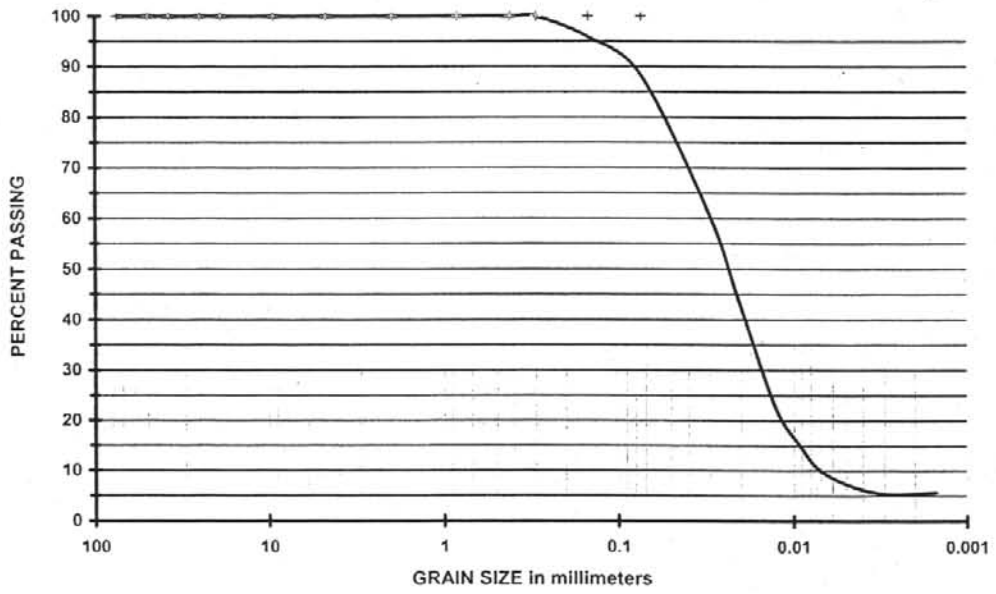
S&ME

PARTICLE SIZE ANALYSIS
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job Number: 1433-03-616 Date: 12/15/03

PARTICLE SIZE DISTRIBUTION CURVE



Sample ID: EBG288 Depth: 22-24' USCS: CL-ML

Sample Description: Gray, Silty Clay

GRAIN SIZE DATA	
% GRAVEL	0.0
% SAND	11.6
% SILT	80.6
% CLAY	7.8

Gravel	< 75 mm and > 4.75 mm
Coarse Sand	< 4.75 mm and >2.00 mm
Medium Sand	< 2.00 mm and > 0.425 mm
Fine Sand	< 0.425 mm and > 0.075 mm
Silt	< 0.075 and > 0.005 mm
Clay	< 0.005 mm

ATTERBERG LIMIT DATA	
Liquid Limit	23
Plastic Limit	17
Plasticity Index	6
#40 Material Group Symbol	CL-ML

S&ME

HYDROMETER ANALYSIS DATA
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job # : 1433-03-616 Date: 12/15/03

Sample ID: EBG288 Operator: DB

Depth: 22-24' Log #: NA

Soil Description: Gray, Silty Clay

Dispersion: 4 % Sodium Hexametaphosphate, Apparatus (A)

Moisture Cont:		Sample Data:	
Tare wt:	37.27	Init wt, (g):	525.80
Wet + tare wt:	113.73	Hydro spec wt, (g):	53.05
Dry + tare wt:	113.35	Dry hydro wt, (g):	52.79
Solids wt:	76.08	Rep. total wt:	52.79
Moist. wt:	0.38	Assumed Sp. Gr:	2.65
Percent moisture:	0.5	Sp. Gr. corr, (a):	1.00

Sieve Analysis

Stand Sieve	Open Size (mm)	Cum Wt Ret. (g)	Cum % Ret. (%)	Percent Pass (%)	Req. % Pass (%)
1 in	25	0.00	0.00	100.00	
.75 in	19	0.00	0.00	100.00	
0.375	9.5	0.00	0.00	100.00	
4	4.75	0.00	0.00	100.00	
10	2	0.00	0.00	100.00	
20	0.85	0.00	0.00	100.00	
40	0.425	0.00	0.00	100.00	
60	0.25	0.00	0.00	100.00	
140	0.106	2.16	4.09	95.91	
200	0.075	6.14	11.63	88.37	

Hydrometer Analysis

Elapsed time (min)	Temp (C)	Act Hydro Read	Comp Corr	Corr Hydro Read	Men Corr Hydro	Effect Depth (L)	K value	Dia (mm)	% Finer
2	20	38	6	32	39	9.9	0.01365	0.0304	60.62
5	20	29	6	23	30	11.4	0.01365	0.0206	43.57
15	20	18	6	12	19	13.2	0.01365	0.0128	22.73
30	20	14	6	8	15	13.8	0.01365	0.0093	15.15
60	19	11	6	5	12	14.3	0.01382	0.0067	9.47
250	19	9	6	3	10	14.7	0.01382	0.0034	5.68
1440	19	9	6	3	2	16.0	0.01382	0.0015	5.68

S&ME

ATTERBERG LIMITS
ASTM D 4318

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job No: 1433-03-616 Date: 12/16/03

Sample ID : EBG288 Log # : NA

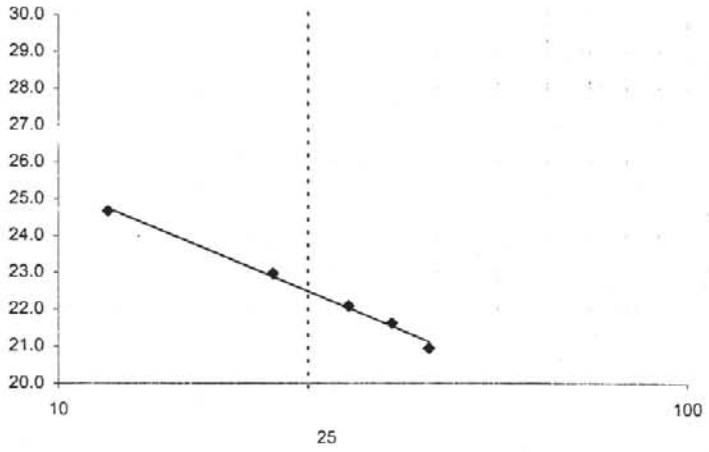
Depth: 22-24' Operator: DB

PLASTIC LIMIT DETERMINATION

Tare Weight	4.08	4.10	4.24		
Wet Soil &Tare	16.64	16.69	16.12		
Dry Soil & Tare	14.82	14.87	14.42		
Moisture Content; %	17.0	16.9	16.7		

LIQUID LIMIT DETERMINATION

Tare Weight	4.06	3.72	3.83	4.07	4.18
No. of Blows; N	12	22	29	34	39
Wet Soil & Tare	12.65	13.25	14.33	15.60	16.48
Dry Soil & Tare	10.95	11.47	12.43	13.55	14.35
Moisture Content; %	24.7	23.0	22.1	21.6	20.9



LL= 23 PL = 17 PI = 6

Soil Type= CL-ML

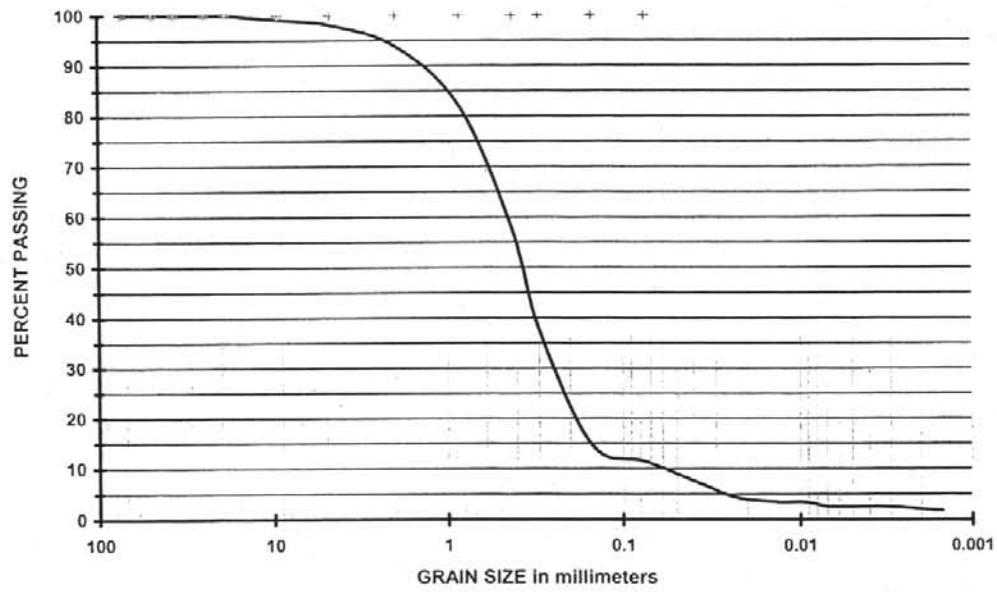
S&ME

PARTICLE SIZE ANALYSIS
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job Number: 1433-03-616 Date: 12/15/03

PARTICLE SIZE DISTRIBUTION CURVE



Sample ID: EBG289 Depth: 20-22' USCS: SW-SM

Sample Description: Gray, Well Graded Sand

GRAIN SIZE DATA	
% GRAVEL	1.9
% SAND	86.7
% SILT	8.8
% CLAY	2.6

Gravel	< 75 mm and > 4.75 mm
Coarse Sand	< 4.75 mm and >2.00 mm
Medium Sand	< 2.00 mm and > 0.425 mm
Fine Sand	< 0.425 mm and > 0.075 mm
Silt	< 0.075 and > 0.005 mm
Clay	< 0.005 mm

ATTERBERG LIMIT DATA	
Liquid Limit	NP
Plastic Limit	NP
Plasticity Index	NP
-#40 Material Group Symbol	NP

S&ME

HYDROMETER ANALYSIS DATA
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job # : 1433-03-616 Date: 12/15/03

Sample ID: EBG289 Operator: DB

Depth: 20-22' Log #: NA

Soil Description: Gray, Well Graded Sand

Dispersion: 4 % Sodium Hexametaphosphate, Apparatus (A)

Moisture Cont:		**Sample Data:**	
Tare wt:	39.26	Init wt, (g):	580.97
Wet + tare wt:	117.65	Hydro spec wt, (g):	108.82
Dry + tare wt:	117.43	Dry hydro wt, (g):	108.49
Solids wt:	78.17	Rep. total wt:	115.57
Moist. wt:	0.22	Assumed Sp. Gr:	2.65
Percent moisture:	0.3	Sp. Gr. corr, (a):	1.00

Sieve Analysis

Stand Sieve	Open Size (mm)	Cum Wt Ret. (g)	Cum % Ret. (%)	Percent Pass (%)	Req. % Pass (%)
1 in	25	0.00	0.00	100.00	
.75 in	19	0.00	0.00	100.00	
0.375	9.5	5.10	0.88	99.12	
4	4.75	11.16	1.92	98.08	
10	2	35.59	6.13	93.87	
20	0.85	13.71	11.86	82.01	
40	0.425	41.94	36.29	57.58	
60	0.25	64.92	56.17	37.70	
140	0.106	91.60	79.26	14.61	
200	0.075	95.28	82.44	11.43	

Hydrometer Analysis

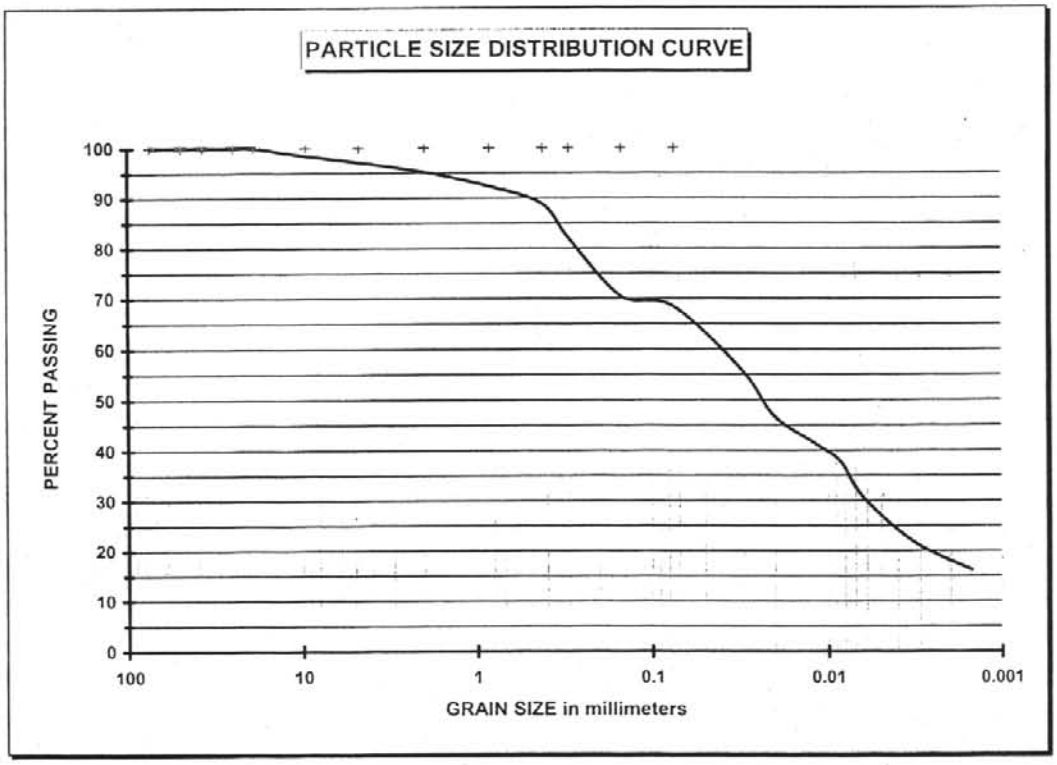
Elapsed time (min)	Temp (C)	Act Hydro Read	Comp Corr	Corr Hydro Read	Men Corr Hydro	Effect Depth (L)	K value	Dia (mm)	% Finer
2	20	14	6	8	15	13.8	0.01365	0.0359	6.92
5	20	11	6	5	12	14.3	0.01365	0.0231	4.33
15	20	10	6	4	11	14.5	0.01365	0.0134	3.46
30	20	10	6	4	11	14.5	0.01365	0.0095	3.46
60	19	9	6	3	10	14.7	0.01382	0.0068	2.60
250	19	9	6	3	10	14.7	0.01382	0.0034	2.60
1440	19	8	6	2	2	16.0	0.01382	0.0015	1.73

S&ME

PARTICLE SIZE ANALYSIS
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job Number: 1433-03-616 Date: 12/15/03



Sample ID: EBG290 Depth: 24-24.7' USCS: CL

Sample Description: Gray, Sandy Lean Clay

GRAIN SIZE DATA	
% GRAVEL	2.8
% SAND	28.8
% SILT	40.9
% CLAY	27.5

Gravel	< 75 mm and > 4.75 mm
Coarse Sand	< 4.75 mm and >2.00 mm
Medium Sand	< 2.00 mm and > 0.425 mm
Fine Sand	< 0.425 mm and > 0.075 mm
Silt	< 0.075 and > 0.005 mm
Clay	< 0.005 mm

ATTERBERG LIMIT DATA	
Liquid Limit	24
Plastic Limit	13
Plasticity Index	11
#40 Material Group Symbol	CL

S&ME

HYDROMETER ANALYSIS DATA
ASTM D 422

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job # : 1433-03-616 Date: 12/15/03

Sample ID: EBG290 Operator: DB

Depth: 24-24.7' Log #: NA

Soil Description: Gray, Sandy Lean Clay

Dispersion: 4 % Sodium Hexametaphosphate, Apparatus (A)

Moisture Cont:	
Tare wt:	37.50
Wet + tare wt:	116.03
Dry + tare wt:	115.66
Solids wt:	78.16
Moist. wt:	0.37
Percent moisture:	0.5

Sample Data:	
Init wt, (g):	531.76
Hydro spec wt, (g):	53.23
Dry hydro wt, (g):	52.97
Rep. total wt:	55.62
Assumed Sp. Gr:	2.65
Sp. Gr. corr, (a):	1.00

Sieve Analysis

Stand Sieve	Open Size (mm)	Cum Wt Ret. (g)	Cum % Ret. (%)	Percent Pass (%)	Req. % Pass (%)
1 in	25	0.00	0.00	100.00	
.75 in	19	0.00	0.00	100.00	
0.375	9.5	8.23	1.55	98.45	
4	4.75	15.09	2.84	97.16	
10	2	25.39	4.77	95.23	
20	0.85	1.60	2.88	92.35	
40	0.425	3.58	6.44	88.79	
60	0.25	7.35	13.21	82.02	
140	0.106	13.77	24.76	70.47	
200	0.075	14.92	26.82	68.41	

Hydrometer Analysis

Elapsed time (min)	Temp (C)	Act Hydro Read	Comp Corr	Corr Hydro Read	Men Corr Hydro	Effect Depth (L)	K value	Dia (mm)	% Finer
2	20	37	6	31	38	10.1	0.01365	0.0307	55.74
5	20	32	6	26	33	10.9	0.01365	0.0202	46.75
15	20	29	6	23	30	11.4	0.01365	0.0119	41.35
30	20	27	6	21	28	11.7	0.01365	0.0085	37.76
60	19	23	6	17	24	12.4	0.01382	0.0063	30.56
250	19	18	6	12	19	13.2	0.01382	0.0032	21.57
1440	19	15	6	9	2	16.0	0.01382	0.0015	16.18

S&ME

ATTERBERG LIMITS
ASTM D 4318

Job Name: SAIC - Erie Burning Grounds Phase II RI

Job No: 1433-03-616 Date: 12/16/03

Sample ID : EBG290 Log # : NA

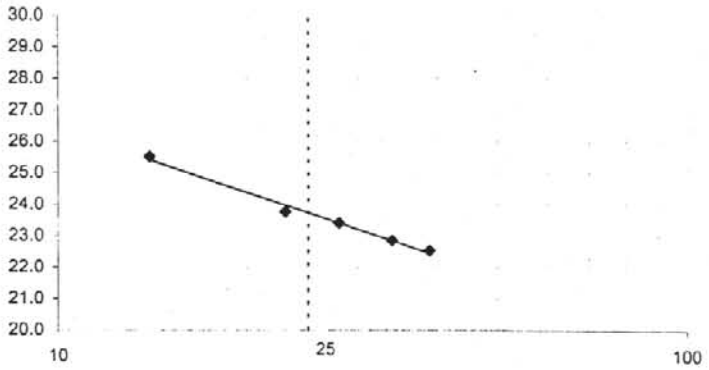
Depth: 24-24.7' Operator: DB

PLASTIC LIMIT DETERMINATION

Tare Weight	3.86	4.07	3.81		
Wet Soil &Tare	14.69	13.46	13.04		
Dry Soil & Tare	13.41	12.36	11.97		
Moisture Content; %	13.4	13.3	13.1		

LIQUID LIMIT DETERMINATION

Tare Weight	3.82	3.81	4.07	4.17	3.94
No. of Blows; N	14	23	28	34	39
Wet Soil & Tare	14.59	15.63	16.51	17.18	18.40
Dry Soil & Tare	12.40	13.36	14.15	14.76	15.74
Moisture Content; %	25.5	23.8	23.4	22.9	22.5



LL= 24 PL = 13 PI = 11

Soil Type= CL