APPENDIX H

SURVEY RESULTS

TOPOGRAPHIC SURVEY
FOR PHASE II RI AT RVAAP
WINKLEPECK BURNING GROUNDS

TOPOGRAPHIC SURVEY

for

PHASE II REMEDIAL INVESTIGATION

at

RAVENNA ARMY AMMUNITION PLANT
WINKLEPECK BURNING GROUNDS
RAVENNA, OHIO

Prepared For:

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

July, 1998

Prepared By:

ADAMS CRAFT HERZ WALKER, INC.

ARCHITECTS-ENGINEERS-PLANNERS-SURVEYORS

OAK RIDGE, TENNESSEE

ACHW PROJECT NO. 98713

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NARRATIVE

Adams Craft Herz Walker, Inc. began the, second phase of a survey on July 20, 1998 in support of **Science Applications International Corporation** (SAIC) in a Phase II Remedial Investigation Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Ravenna, Ohio. Work on the project was completed July 24, 1998. Temperatures during the survey were in the mid eighties with intermittent showers throughout the week.

Survey efforts to establish coordinates and elevations for 13 new monuments (set by SAIC) were conducted at the Winklepeck Burning Grounds using Global Positioning Systems (GPS) technology. The horizontal and vertical control of this survey is based on the monuments RAV 2 & 3. The coordinates and elevations of these monuments were provided by the US Army Corps of Engineers.

GPS fast static survey techniques were used to establish horizontal and vertical control. The data was collected using 2 Trimble 4600LS GPS receivers. Horizontal data is based on the North American Datum of 1983 (NAD83) State Plane Coordinate System, Ohio North Zone. Vertical datum for the survey is relative to National American Vertical Datum of 1988 (NAVD88).

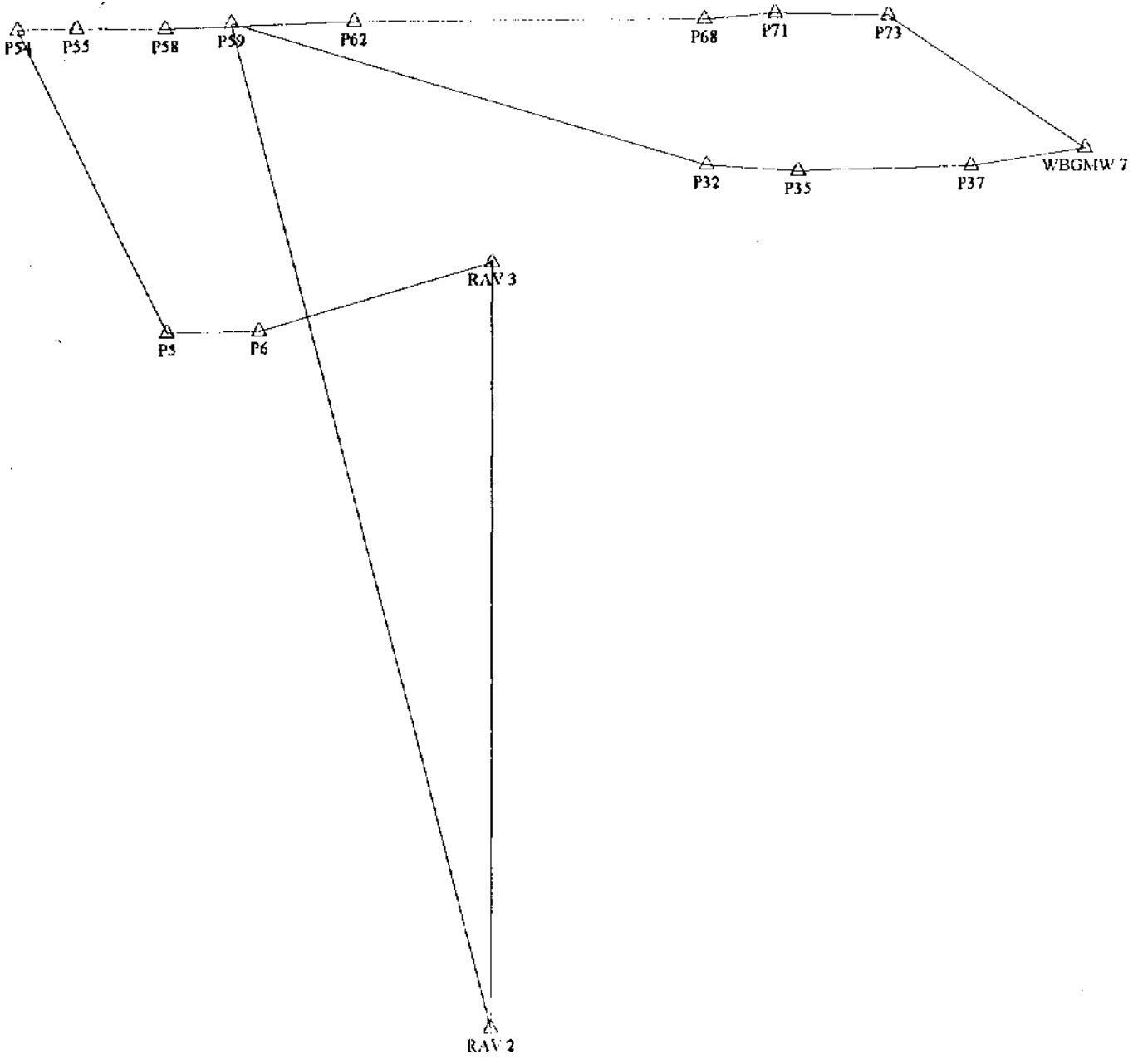
A copy of the GPS data and drawing TS-2 are attached.

Sam Bruner, RLS
Ohio Reg. No. 7781

ACHW Project No. 98713.0
JOB: 987130-3.CR5 TIME: 14:42 DATE: 08-10-1998
Winklepeck Burning Grounds @ RAAP

Point	Northing	Easting	Elevation	Note
1	562386.306000	2358723.830000	1016.680	P32
2	562364.200000	2359137.058000	1012.370	P35
3	562393.950000	2359910.166000	1002.020	P37
4	561606.852000	2356315.360000	1057.730	P5
5	562964.582000	2355631.805000	1075.790	P54
6	562970.419000	2355895.283000	1070.390	P55
7	562974.034000	2356296.026000	1066.720	P58
8	562998.542000	2356590.619000	1065.110	P59
9	561619.024000	2356725.189000	1050.520	P6
10	563010.432000	2357137.928000	1049.800	P62
11	563033.214000	2358705.946000	1016.790	P68
12	563063.886000	2359023.222000	1010.600	P71
13	563059.251000	2359530.036000	1007.610	P73
14	558490.789000	2357792.667000	1061.610	RAV 2
15	561955.073000	2357760.413000	1034.460	RAV 3
16	562479.839000	2360420.411000	998.090	WBGMW 7

Network Map: Gps7130



H-12

200m

Winklepeck Burning Grounds at Ravenna Army Ammunitions Plant

**** Adjusted Coordinates ****

Projection Group: NAD-83 SP Lambert
Zone Name: Ohio North
Linear Units: meter
Angular Units: degrees
Datum Name: NAD-83

Station Short Name	Station ID	North	East	Ortho. Height	Ellip. Height
P32	P32	171415.68865	718940.46195	309.88441	276.13587
P35	P35	171408.95061	719066.41438	308.57076	274.82107
P37	P37	171418.01929	719302.05803	305.41664	271.66470
P5	P5	171178.11147	718206.35863	322.39761	288.65790
P54	P54	171591.94789	717998.01060	327.89985	294.16005
P55	P55	171593.72723	718078.31885	326.25445	292.51390
P58	P58	171594.82948	718200.46591	325.13705	291.39535
P59	P59	171602.29875	718290.25814	324.64729	290.90471
P6	P6	171181.82066	718331.27529	320.19756	286.45667
P62	P62	171605.92251	718457.07823	319.97883	286.23467
P68	P68	171612.86703	718935.01112	309.91938	276.16992
P71	P71	171622.21600	719031.71742	308.03296	274.28255
P73	P73	171620.80346	719186.19405	307.11918	273.36733
RAV 2	RAV 2	170228.33300	718656.64300	323.57900	289.83961
RAV 3	RAV 3	171284.24900	718646.81200	315.30400	281.55963
WBGMW 7	WBGMW 7	171444.19800	719457.58119	304.21880	270.46529

Winklepeck Burning Grounds at Ravenna Army Ammunitions Plant

From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance	Entered Ant. Ht. (From)	Entered Ant. Ht. (To)
P32	P59	L1 fixed	676.688	8.5	4.438	1.597	1.738
P35	P32	L1 fixed	126.154	14.0	1.327	1.674	1.597
P37	P35	L1 fixed	235.866	7.6	2.673	1.675	1.674
P5	P6	L1 fixed	125.007	11.8	3.560	1.742	1.636
P54	P5	L1 fixed	463.408	6.4	4.696	1.538	1.742
P55	P54	L1 fixed	80.349	1.6	8.412	1.764	1.538
P58	P55	L1 fixed	122.166	4.5	5.013	1.573	1.764
P59	RAV 2	L1 fixed	1422.130	6.6	6.965	1.738	1.626
P6	RAV 3	L1 fixed	331.820	4.8	5.841	1.636	1.673
P62	P58	L1 fixed	256.930	15.1	2.763	1.740	1.573
P68	P62	L1 fixed	478.139	19.2	2.156	1.728	1.740
P68	P71	L1 fixed	97.185	47.8	1.078	1.728	1 770
P71	P73	L1 fixed	154.500	19.4	1.432	1.770	1.679
P73	WBGMW 7	L1 fixed	323.836	9.4	2.033	1.614	1.112
RAV 2	RAV 3	L1 fixed	1056.106	13.6	2.880	1.727	1.671
WBGMW 7	P37	L1 fixed	157.734	4.0	3.728	1.112	1.675

****
****
New Closure

From: RAV 3

To:	P6		L1 fixed
	7/22/98 13:54:30	00000357.SSF	
		Slope (m):	331.820
	41°11'58.65033" N	38712030.DAT	
		Total (m):	331.820
	081°05'20.71706" W	38742031.DAT	
	308.5932 m		
To:	P5		L1 fixed
	7/22/98 13:33:15	00000353.SSF	
		Slope (m):	125.007
	41°11'58.59557" N	38742032.DAT	
		Total (m):	456.827
	081°05'26.08052" W	38712030.DAT	
	310.7931 m		
To:	P54		L1 fixed
	7/22/98 14:24:30	00000349.SSF	
		Slope (m):	463.408
	41°12'12.11838" N	38712031.DAT	
		Total (m):	920.234
	081°05'34.73534" W	38742032.DAT	
	316.2891 m		
To:	P55		L1 fixed
	7/22/98 15:05:45	00000345.SSF	
		Slope (m):	80.349
	41°12'12.13405" N	38742033.DAT	
		Total (m):	1000.583
	081°05'31.28770" W	38712031.DAT	
	314.6394 m		
To:	P58		L1 fixed
	7/22/98 15:35:45	00000341.SSF	
		Slope (m):	122.166
	41°12'12.10579" N	38712032.DAT	
		Total (m):	1122.749

	081°05'26.04489" W	38742033.DAT	
	313.5187 m		
To:	P62		L1 fixed
	7/22/98 16:09:00	00000337.SSF	
		Slope (m):	256.930
	41°12'12.33076" N	38742034.DAT	
		Total (m):	1379.679
	081°05'15.02412" W	38712032.DAT	
	308.3633 m		
To:	P68		L1 fixed
	7/22/98 16:36:15	00000329.SSF	
		Slope (m):	478.139
	41°12'12.30441" N	38712033.DAT	
		Total (m):	1857.817
	081°04'54.50771" W	38742034.DAT	
	298.3073 m		
To:	P71		L1 fixed
	7/22/98 17:44:30	00000325.SSF	
		Slope (m):	97.185
	41°12'12.55644" N	38712033.DAT	
		Total (m):	1955.002
	081°04'50.35082" W	38742035.DAT	
	296.4189 m		
To:	P73		L1 fixed
	7/22/98 18:31:15	00000333.SSF	
		Slope (m):	154.500
	41°12'12.42908" N	38742035.DAT	
		Total (m):	2109.503
	081°04'43.72215" W	38712034.DAT	
	295.5001 m		
To:	WBGMW 7		L1 fixed
	7/22/98 19:08:00	00000361.SSF	
		Slope (m):	323.836
	41°12' 6.56124" N	38712035.DAT	
		Total (m):	2433.339
	081°04'32.19882" W	38742036.DAT	
	292.6005 m		

To:	P37		L1 fixed
	7/22/98 19:47:30	00000365.SSF	
		Slope (m):	157.734
	41°12' 5.79502" N	38742036.DAT	
		Total (m):	2591.073
	081°04'38.89173" W	38712036.DAT	
	293.7938 m		
To:	P35		L1 fixed
	7/22/98 20:23:45	00000369.SSF	
		Slope (m):	235.866
	41°12' 5.62550" N	38712036.DAT	
		Total (m):	2826.940
	081°04'49.01109" W	38742037.DAT	
	296.9470 m		
To:	P32		L1 fixed
	7/22/98 21:00:30	00000373.SSF	
		Slope (m):	126.154
	41°12' 5.91031" N	38742037.DAT	
		Total (m):	2953.094
	081°04'54.41184" W	38712037.DAT	
	298.2586 m		
To:	P59		L1 fixed
	7/22/98 21:31:00	00000377.SSF	
		Slope (m):	676.688
	41°12'12.30074" N	38712037.DAT	
		Total (m):	3629.781
	081°05'22.18670" W	38742038.DAT	
	313.0169 m		
To:	RAV 2		L1 fixed
	7/22/98 22:02:30	00000381.SSF	
		Slope (m):	1422.130
	41°11'27.57370" N	38742038.DAT	
		Total (m):	5051.911
	081°05' 7.41917" W	38712038.DAT	
	311.9639 m		
To:	RAV 3		L1 fixed
	6/12/98 11:51:45	00000437.SSF	

		Slope (m):	1056.106
41°12' 1.80448" N		38711630.DAT	
		Total (m):	6108.018
081°05' 7.10601" W		38741630.DAT	
303.6748 m			

Closed

Precision (ppm):	7.2247				
Errors (m) N:	-0.0055	E:	-0.0378	U:	-0.0220

ADJUSTMENT STATISTICS SUMMARY
NETWORK = Gps7130
TIME = Wed Aug 5 10:55:43 1998

ADJUSTMENT SUMMARY

Network Reference Factor = 0.99
Chi-Square Test (α = 95%) = PASS
Degrees of Freedom = 3.00

GPS OBSERVATIONS
Reference Factor = 0.99
r = 3.00

GPS Solution	1	Reference Factor =	1.01	r =	0.04
GPS Solution	2	Reference Factor =	0.83	r =	0.10
GPS Solution	3	Reference Factor =	1.10	r =	0.11
GPS Solution	4	Reference Factor =	0.92	r =	0.12
GPS Solution	5	Reference Factor =	1.05	r =	0.31
GPS Solution	6	Reference Factor =	1.03	r =	0.38
GPS Solution	7	Reference Factor =	1.14	r =	0.21
GPS Solution	8	Reference Factor =	0.98	r =	0.19
GPS Solution	9	Reference Factor =	0.73	r =	0.44
GPS Solution	10	Reference Factor =	0.92	r =	0.12
GPS Solution	11	Reference Factor =	1.03	r =	0.19
GPS Solution	12	Reference Factor =	1.14	r =	0.15
GPS Solution	13	Reference Factor =	1.20	r =	0.08
GPS Solution	14	Reference Factor =	1.06	r =	0.17
GPS Solution	15	Reference Factor =	1.00	r =	0.27
GPS Solution	16	Reference Factor =	0.95	r =	0.12

GEOID MODEL
Reference Factor = 1.44
r = 0.00

Geoid Heights:	Reference Factor =	1.44	r =	0.00
Delta Geoid Heights:	Reference Factor =	1.00	r =	0.00

WEIGHTING STRATEGIES:

GPS OBSERVATIONS:
Scalar Weighting Strategy:
User-Defined Scalar Set Applied Globally = 7.03

No summation weighting strategy was used

Station Error Strategy:
H.I. error = 0.0020
Tribrach error = 0.0010

GEOID MODEL:
No scalar weighting strategy was used

No summation weighting strategy was used

Results of adjusted Geoid model:
Noise in vertical GPS observations: 0.00103999
Variance of geoid model: 0.00009210
Further use of correlated Geoid Model not recommended

GPS Fast Static Survey Field Log

Trimble

Date	Julian Day	Filename	Epoch Rate	Operator(s)	Project Name
7-22	203	3871	15 sec	James J Christ	Ravenna Army Ammo Plant 98713.0
Receiver Type:		4600 IAST.		Antenna Type:	4600 LS

Occ.#	Mark ID	Start Time	Stop Time	Antenna Height Measurements	Point Description & Notes
J1	P6	9:33	10:51	1.636 (m) / (ft)	Brass Cap in Conc
J2	P54	11:05	11:59	1.5375 (m) / (ft)	"
J3	P58	12:09	12:56	1.573 (m) / (ft)	"
JH	P68	13:03	14:25	1.728 (m) / (ft)	"
JE H-20	P73	14:30	14:52	1.679 (m) / (ft)	"
"	"	15:00	15:35	1.614 (m) / (ft)	"
J6	P37	15:47	16:55	1.675 (m) / (ft)	"
J7	P32	17:00	17:53	1.597 (m) / (ft)	"
J8	RAU 2	18:10	18:40	1.626 (m) / (ft)	Brass Cap in Conc (Army Corp of Engineers)

Receiver S/N

Antenna S/N

GPS Fast Static Survey Field Log

Trimble

Date	Julian Day	Filename	Epoch Rate
7-12	203	387H	15 sec

Operator(s): Chet + James

Project Name: Ravenna Army Ammo Plant 987130

Receiver Type: 4600 IAT.

Antenna Type: 4600 LS

Occ.#	Mark ID	Start Time	Stop Time	Antenna Height Measurements	Point Description & Notes
C1	RAV 3	9:53	10:19	1.673 (m) / (ft)	Brass Cap in Conc. (Army Corp of Engineers)
C2	P5	10:24	11:20	1.742 (m) / (ft)	Brass Cap in Conc
C3	P55	11:36	12:30 PM	1.764 (m) / (ft)	"
C4 H-21	P62	12:36 PM	1:38 PM	1.746 (m) / (ft)	"
C5	P71	1:44 PM	3:00 PM	1.776 (m) / (ft)	"
C6	WBG MW-7	3:08 PM	4:19 PM	1.112 (m) / (ft)	Riser Pipe
C7	P35	4:24 PM	5:21 PM	1.674 (m) / (ft)	Brass Cap in Conc.
C8	P59	5:31 PM	6:46 PM	1.738 (m) / (ft)	Brass Cap in Conc.
				(m) / (ft)	

Receiver S/N _____ Antenna S/N _____

TOPOGRAPHIC SURVEY
FOR PHASE II RI AT RVAAP
LOAD LINE 1, WBG, AND
BACKGROUND LOCATIONS

TOPOGRAPHIC SURVEY

for

PHASE II REMEDIAL INVESTIGATION

at

RAVENNA ARMY AMMUNITION PLANT
LOAD LINE 1, WINKLEPECK BURNING GROUNDS
AND BACKGROUND LOCACTIONS
RAVENNA, OHIO

Prepared For:

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

June, 1998

Prepared By:

ADAMS CRAFT HERZ WALKER, INC.

ARCHITECTS-ENGINEERS-PLANNERS-SURVEYORS

OAK RIDGE, TENNESSEE

ACHW PROJECT NO. 98715

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NARRATIVE

Adams Craft Herz Walker, Inc. began the survey on June 8, 1998 in support of **Science Applications International Corporation** (SAIC) in a Phase II Remedial Investigation at Load Line 1, Winklepeck Burning Grounds and Background Locations at Ravenna Army Ammunition Plant, Ravenna, Ohio. Work on the project was completed June 13, 1998. Temperatures during the survey were in the mid seventies with intermittent showers throughout the week.

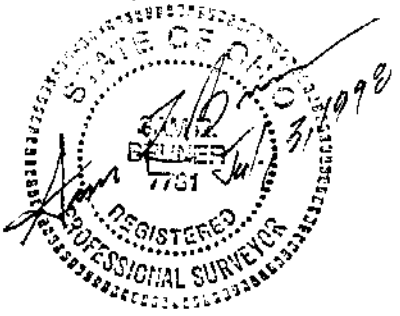
Survey efforts to locate monitoring wells and one ground location at the adjacent Ramsdell Quarry were conducted on various sites scattered throughout the area. A total of 19 monitoring wells and the ground location of a sandstone outcropping were located primarily with GPS survey procedures. Two of the 19 wells located were surveyed with traditional survey methods from GPS control points, all others were occupied with GPS receivers.

Horizontal and vertical control were established at the individual sites using GPS static survey techniques and tying to existing survey control points. Horizontal data is based on the North American Datum of 1983 (NAD 83) State Plane Coordinate System, Ohio North Zone. Vertical datum for the survey is relative to National American Vertical Datum of 1988 (NAVD88).

The field location of data was obtained using 3 Timble 4600LS GPS receivers and a Topcon 303DPG total station. Elevations for monitoring wells not directly occupied by GPS receivers were confirmed using a Topcon GTS3 automatic level.

A copy of the electronic field book, level notes, GPS data and drawings TS-1,TS-2, TS-3 and TS-4 are attached.

Sam Bruner, RLS
Ohio Reg. No. 7781



ACHW PROJECT #98715.0 (SAIC)
JOB: 987150.CR5 TIME: 17:24 DATE: 06-29-1998
AVENNA ARMY AMMUNITIONS PLANT

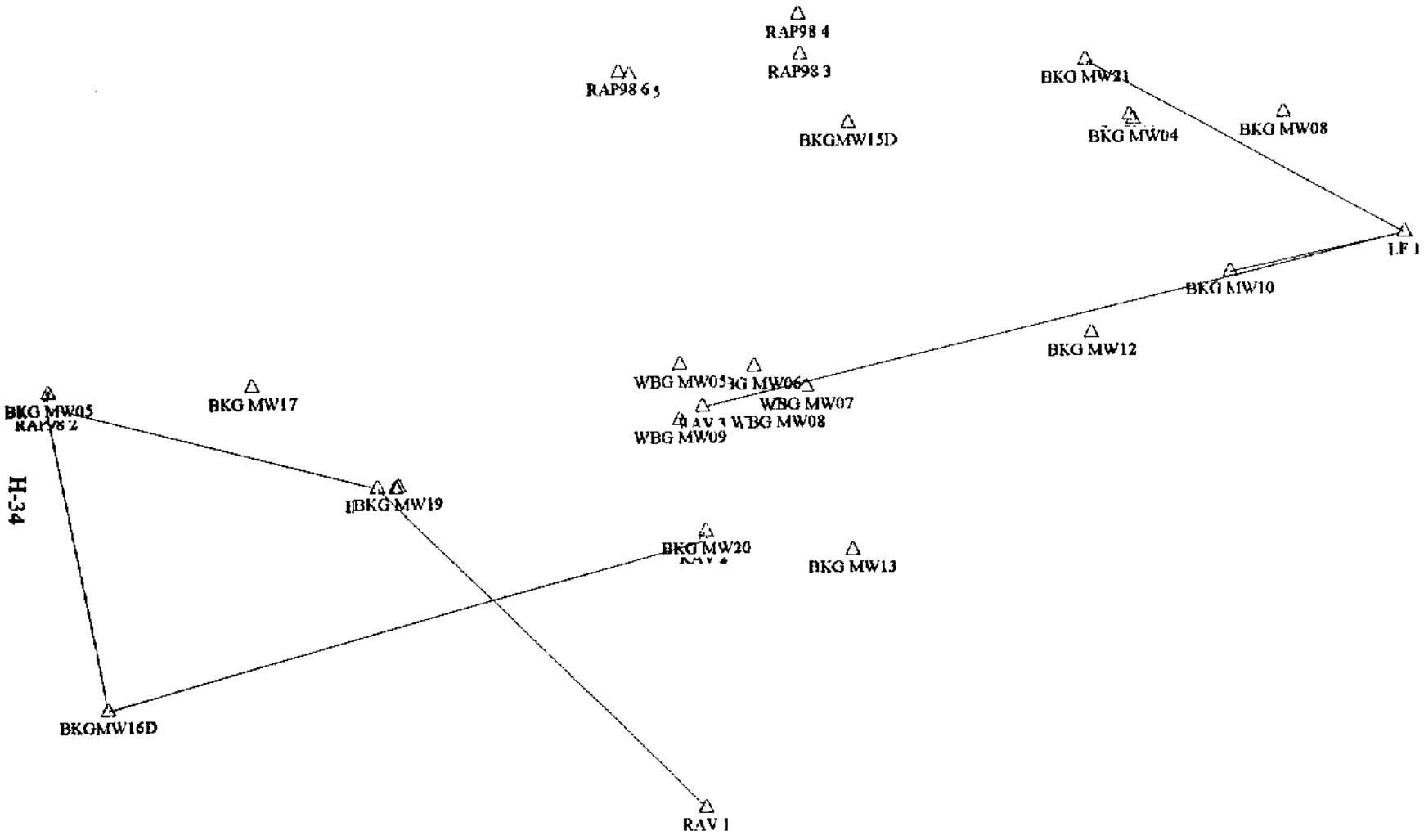
Point	Northing	Easting	Elevation	Note
27	569464.763000	2368852.973000	965.160	BKG MW04
28	562288.445000	2340835.864000	1149.443	BKG MW05
29	569654.231000	2372741.076000	970.397	BKG MW08
30	565540.706000	2371372.945000	1006.293	BKG MW10
31	563918.862000	2367795.226000	997.574	BKG MW12
32	558269.158000	2361627.394000	986.588	BKG MW13
33	569339.868000	2361482.223000	1037.897	BKG MW15
34	553983.501000	2342407.075000	1098.419	BKG MW16
35	562452.044000	2346115.351000	1132.799	BKG MW17
36	559864.549000	2349882.142000	1108.239	BKG MW19
37	558756.241000	2357856.237000	1065.001	BKG MW20
38	571016.748000	2367622.953000	972.159	BKG MW21
41	566551.954000	2375895.144000	963.043	LF 1
42	559831.928000	2349339.646000	1107.392	RAP98 1
43	561946.294000	2340775.995000	1147.391	RAP98 2
44	571128.979000	2360222.531000	1029.649	RAP98 3
45	572142.293000	2360170.028000	1023.406	RAP98 4
46	570583.035000	2355817.412000	1055.902	RAP98 5
47	570652.910000	2355538.174000	1065.622	RAP98 6
48	551472.463000	2357923.326000	1023.920	RAV 1
49	569575.015000	2368754.578000	965.600	RAV 13
50	558490.789000	2357792.667000	1061.610	RAV 2
51	561955.073000	2357760.413000	1034.460	RAV 3
52	563037.177000	2357163.548000	1052.198	WBG MW05
53	563008.867000	2359087.793000	1012.156	WBG MW06
54	562479.865000	2360420.441000	998.091	WBG MW07
55	562010.349000	2359700.573000	1005.709	WBG MW08
56	561603.535000	2357159.204000	1045.029	WBG MW09
63	571939.326000	2358635.109000	1024.480	RAV98-4A
64	571910.470000	2358643.961000	1026.380	BKG-MW-006.RP
65	571911.256000	2358642.522000	1023.870	GND
73	570752.209000	2355091.302000	1049.800	RAV98-6A.N-CH
74	570873.349000	2354993.909000	1043.060	BKG-MW-018.RP
75	570872.831000	2354992.301000	1040.820	GND

Post-it® Fax Note 7671 | Date 7/23 | # of pages ▶ 1
To Kathy Dominic | From Steve Selecman
Co./Dept. | Co.
Phone # | Phone # Next Week
Fax # (937) 431-4496 | Fax #
01-0513-04-8218-420 $500

ACHW PROJECT #98715.0 (SAIC)
JOB: 98715B06 TIME: 17:35 DATE: 06-29-1998
AVENNA ARMY AMMUNITIONS PLANT
JOB: Name 98715B06,Date 6-11-1998,Time 00:26:34.40
Mode Setup: North Azimuth,Dist feet,Scale 1.0000,Earth crv OFF
Store: Pt 1,N 5000.0000,E 5000.0000,Elv 100.0000,RAV98-4
Occupy: Occ 1,N 5000.0000,E 5000.0000,Elv 100.0000,RAV98-4
Backsight: Occ 1,BS Pt 1,BS azm 0.0000,Back circle 0.0000
HI / HR : Inst H 5.4200,Rod H 4.6900
Side Shot: 1-2,Ang-Rt 0.0000,Zenith 89.4135,Slp Dst 1014.7200,RAV98-3
Traverse: 1-3,Ang-Rt 85.2600,Zenith 89.5915,Slp Dst 1548.2800,RAV98-4A
Note: BS point check:3-1
Note: BS point check:3-1
Note: BS point check:3-1
Note: BS point check:3-1
Occupy: Occ 3,N 5123.2725,E 6543.3647,Elv 101.0680,RAV98-4A
Backsight: Occ 3,BS Pt 1,BS azm 265.2600,Back circle 0.0000
HI / HR : Inst H 5.2100,Rod H 4.6900
Note: BS point check:3-1
Side Shot: 3-4,Ang-Rt 80.2845,Zenith 87.5000,Slp Dst 30.2050,BKG-MW-005 RP
Side Shot: 3-5,Ang-Rt 82.4425,Zenith 92.4110,Slp Dst 29.0650,GND
Store: Pt 4,N 5152.5482,E 6536.0180,Elv 102.7297,BKG-MW-006 RP
Store: Pt 5,N 5151.6893,E 6537.4145,Elv 100.2257,GND

ACHW PROJECT #98715.0 (SAIC)
JOB: 98715B18 TIME: 17:35 DATE: 06-29-1998
AVENNA ARMY AMMUNITIONS PLANT
JOB: Name 98715B18,Date 6-12-1998,Time 21:34:44.39
Mode Setup: North Azimuth,Dist feet,Scale 1.0000,Earth crv OFF
Store: Pt 1,N 5000.0000,E 5000.0000,Elv 100.0000,RAV98-6
Occupy: Occ 1,N 5000.0000,E 5000.0000,Elv 100.0000,RAV98-6
Backsight: Occ 1,BS Pt 1,BS azm 0.0000,Back circle 0.0000
HI / HR : Inst H 5.4100,Rod H 4.6900
Side Shot: 1-2,Ang-Rt 0.0000,Zenith 92.0440,Slp Dst 288.0550,RAV98-5
Backsight: Occ 1,BS Pt 2,BS azm 0.0000,Back circle 0.0000
Traverse: 1-3,Ang-Rt 178.2845,Zenith 92.0410,Slp Dst 458.0700,RAV98-6A N-CH
HI / HR : Inst H 5.4000,Rod H 4.6900
Note: BS point check:3-1
Occupy: Occ 3,N 4542.3900,E 5012.1494,Elv 84.1790,RAV98-6A N-CH
Backsight: Occ 3,BS Pt 1,BS azm 358.2845,Back circle 0.0000
Side Shot: 3-4,Ang-Rt 218.4025,Zenith 92.4500,Slp Dst 155.6150,BKG-MW-018
Side Shot: 3-5,Ang-Rt 218.0540,Zenith 93.3350,Slp Dst 156.3500,GND
Store: Pt 4,N 4418.5033,E 4918.2752,Elv 77.4226,BKG-MW-018 RP
???? 93.3350,SD156.3500,--GND

Network Map: Gps7150



Ravenna Army Ammunition Plant

**** Adjusted Coordinates ****

Projection Group: NAD-83 SP Lambert
Zone Name: Ohio North
Linear Units: meter
Angular Units: degrees
Datum Name: NAD-83

Station Short Name	Station ID	North	East	Ortho. Height	Ellip. Height
BKG MW04	BKG MW04	173573.20697	722027.83116	294.18123	260.39570
BKG MW05	BKG MW05	171385.86127	713488.19946	350.35080	316.65102
BKG MW08	BKG MW08	173630.95719	723212.92695	295.77763	261.98273
BKG MW10	BKG MW10	172377.15225	722795.91974	306.71880	272.93330
BKG MW12	BKG MW12	171882.81304	721705.42894	304.06103	270.28675
BKG MW13	BKG MW13	170160.77953	719825.46992	300.71277	266.96361
BKG MW15	BKG MW15	173535.13900	719781.22245	316.35156	282.58476
BKG MW16	BKG MW16	168854.50861	713967.10493	334.79879	301.10786
BKG MW17	BKG MW17	171435.72628	715097.38962	345.27786	311.56518
BKG MW19	BKG MW19	170647.05601	716245.50954	337.79190	304.07358
BKG MW20	BKG MW20	170309.24334	718676.01930	324.61306	290.87614
BKG MW21	BKG MW21	174046.25270	721652.92021	296.31469	262.52978
BKGMW15D	BKGMW15D	173535.40552	719781.48399	315.68554	281.91874
BKGMW16D	BKGMW16D	168854.19648	713966.77220	334.09251	300.40158
LF 1	LF 1	172685.38081	724174.28936	293.53610	259.73837
RAP98 1	RAP98 1	170637.11253	716080.15652	337.53378	303.81693
RAP98 2	RAP98 2	171281.57339	713469.95124	349.72542	316.02634
RAP98 3	RAP98 3	174080.46103	719397.26669	313.83751	280.07136
RAP98 4	RAP98 4	174389.31970	719381.26433	311.93466	278.16709
RAP98 5	RAP98 5	173914.05722	718054.58375	321.83958	288.08722
RAP98 6	RAP98 6	173935.35521	717969.47204	324.80234	291.05065
RAV 1	RAV 1	168089.14280	718696.46790	312.09140	278.36098
RAV 13	RAV 13	173606.81230	721997.83980	294.31550	260.53004
RAV 2	RAV 2	170228.33300	718656.64300	323.57900	289.84291
RAV 3	RAV 3	171284.24900	718646.81200	315.30400	281.55960
WBG MW05	WBG MW05	171614.07534	718464.88708	320.71044	286.96620
WBG MW06	WBG MW06	171605.44601	719051.39803	308.50581	274.75547
WBG MW07	WBG MW07	171444.20624	719457.58953	304.21880	270.46582
WBG MW08	WBG MW08	171301.09714	719238.17355	306.54058	272.79038
WBG MW09	WBG MW09	171177.10016	718463.56302	318.52560	284.78392

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From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance	Entered Ant. Ht. (From)	Entered Ant. Ht. (To)
BKG MW16	BKG MW17	L1 fixed	2818.185	4.9	3.291	0.929	1.097
BKG MW16	RAP98 2	L1 fixed	2477.788	14.0	1.666	0.929	1.754
BKG MW16	RAV 1	L1 fixed	4791.504	3.5	8.525	0.929	1.641
BKGMW16D	BKG MW05	L1 fixed	2576.850	2.2	15.170	1.681	1.123
LF 1	BKG MW04	L1 fixed	2323.073	2.2	16.728	1.787	1.075
LF 1	BKG MW08	L1 fixed	1348.608	1.3	28.185	1.764	1.184
LF 1	BKG MW10	L1 fixed	1412.627	1.6	23.071	1.787	1.090
LF 1	BKG MW10	L1 fixed	1412.621	1.8	15.873	1.764	1.066
LF 1	BKG MW12	L1 fixed	2596.328	1.7	34.478	1.764	1.130
LF 1	BKG MW21	L1 fixed	2865.462	1.6	12.836	1.764	1.132
LF 1	BKG MW21	L1 fixed	2865.503	1.7	11.625	1.787	1.070
LF 1	RAV 13	L1 fixed	2363.718	1.9	19.984	1.787	1.667
RAP98 1	BKG MW05	L1 fixed	2698.278	2.1	18.183	1.738	1.123
RAP98 1	BKG MW15	L1 fixed	4701.254	4.4	9.042	1.738	1.175
RAP98 1	BKG MW16	L1 fixed	2764.851	16.9	4.763	1.769	0.929
RAP98 1	BKG MW17	L1 fixed	1266.506	7.7	2.242	1.769	1.097
RAP98 1	BKGMW15D	L1 fixed	4701.629	2.1	5.761	1.738	1.743
RAP98 1	BKGMW16D	L1 fixed	2765.311	76.1	5.619	1.738	1.681
RAP98 1	RAP98 2	L1 fixed	2688.921	5.9	4.066	1.769	1.754
RAP98 1	RAP98 3	L1 fixed	4781.787	4.2	10.850	1.738	1.714
RAP98 1	RAP98 4	L1 fixed	4998.255	2.0	9.725	1.738	1.740
RAP98 1	RAP98 5	L1 fixed	3826.257	1.9	23.120	1.738	1.705
RAP98 1	RAP98 6	L1 fixed	3801.483	2.0	12.680	1.738	1.664
RAP98 1	RAV 1	L1 fixed	3652.440	1.8	3.061	1.769	1.616
RAP98 1	RAV 2	L1 fixed	2609.046	12.5	4.383	1.769	1.717
RAP98 1	RAV 2	L1 fixed	2609.051	4.2	2.839	1.769	1.717
RAP98 1	RAV 2	L1 fixed	2609.046	98.2	6.083	1.738	1.723
RAV 1	BKG MW13	L1 fixed	2359.599	9.5	1.209	1.616	0.981
RAV 1	BKG MW16	L1 fixed	4791.492	2.5	19.187	1.616	0.929
RAV 1	RAP98 1	L1 fixed	3652.512	13.4	5.350	1.616	1.769
RAV 1	RAV 2	L1 fixed	2139.822	19.3	2.802	1.616	1.717
RAV 13	BKG MW04	L1 fixed	45.048	6.9	3.140	1.667	1.075
RAV 13	BKG MW08	L1 fixed	1215.455	1.8	12.278	1.554	1.184
RAV 13	BKG MW10	L1 fixed	1466.156	1.7	7.846	1.554	1.066
RAV 13	BKG MW12	L1 fixed	1748.845	1.5	24.087	1.554	1.130
RAV 13	BKG MW21	L1 fixed	558.684	3.5	7.554	1.554	1.132
RAV 13	BKG MW21	L1 fixed	558.713	12.2	2.174	1.667	1.070
RAV 13	LF 1	L1 fixed	2363.713	58.1	13.582	1.554	1.764
RAV 2	BKG MW13	L1 fixed	1171.131	2.6	7.656	1.717	0.981
RAV 2	BKG MW15	L1 fixed	3493.197	4.8	8.475	1.723	1.175
RAV 2	BKG MW19	L1 fixed	2447.540	1.5	25.317	1.721	0.963
RAV 2	BKG MW20	L1 fixed	83.215	18.1	4.835	1.721	0.939
RAV 2	BKGMW15D	L1 fixed	3493.536	1.7	7.543	1.723	1.743
RAV 2	BKGMW16D	L1 fixed	4887.590	4.5	6.851	1.723	1.681
RAV 2	LF 1	L1 fixed	6040.785	1.7	11.432	1.721	1.787
RAV 2	RAP98 3	L1 fixed	3923.126	11.2	5.161	1.723	1.714
RAV 2	RAP98 4	L1 fixed	4224.094	2.9	7.323	1.723	1.740
RAV 2	RAP98 5	L1 fixed	3734.988	1.8	25.905	1.723	1.705
RAV 2	RAP98 6	L1 fixed	3770.599	2.3	11.795	1.723	1.664
RAV 2	RAV 1	L1 fixed	2139.822	7.5	3.803	1.717	1.616

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RAV 2	RAV 1	L1 fixed	2139.824	8.7	2.746	1.717	1.616
RAV 2	RAV 3	L1 fixed	1056.120	5.2	9.257	1.727	1.671
RAV 2	RAV 3	L1 fixed	1056.120	36.1	10.745	1.721	1.671
RAV 2	WBG MW05	L1 fixed	1399.120	2.4	12.239	1.721	0.916
RAV 2	WBG MW06	L1 fixed	1432.815	4.3	10.857	1.721	0.937
RAV 2	WBG MW07	L1 fixed	1456.267	1.6	2.033	1.721	0.966
RAV 2	WBG MW08	L1 fixed	1220.503	1.7	12.966	1.721	0.952
RAV 2	WBG MW09	L1 fixed	968.340	5.2	7.032	1.721	0.991
RAV 3	BKG MW19	L1 fixed	2484.783	1.8	23.159	1.671	0.963
RAV 3	BKG MW20	L1 fixed	975.601	9.9	22.358	1.671	0.939
RAV 3	LF 1	L1 fixed	5702.985	2.9	26.707	1.671	1.787
RAV 3	RAV 13	L1 fixed	4077.737	2.2	15.141	1.671	1.667
RAV 3	WBG MW05	L1 fixed	376.748	2.4	12.115	1.671	0.916
RAV 3	WBG MW06	L1 fixed	516.681	3.6	11.078	1.671	0.937
RAV 3	WBG MW07	L1 fixed	826.572	1.5	2.113	1.671	0.966
RAV 3	WBG MW08	L1 fixed	591.733	1.5	12.327	1.671	0.952
RAV 3	WBG MW09	L1 fixed	212.326	4.5	8.586	1.671	0.991

Closure Log

****
New Closure

From: RAV 2

To:	RAP98 1		L1 fixed
	6/11/98 14:40:00	00000097.SSF	
		Slope (m):	2609.046
	41°11'42.01618" N	38711620.DAT	
		Total (m):	2609.046
	081°06'57.92435" W	51751620.DAT	
	13.9185 m		
To:	BKG MW16		L1 fixed
	6/10/98 16:54:30	00000033.SSF	
		Slope (m):	2764.851
	41°10'45.30983" N	38711613.DAT	
		Total (m):	5373.897
	081°08'29.79688" W	38741613.DAT	
	11.1664 m		
To:	RAV 1		L1 fixed
	6/10/98 16:54:30	00000013.SSF	
		Slope (m):	4791.492
	41°10'18.06285" N	51751613.DAT	
		Total (m):	10165.389
	081°05' 7.42111" W	38741613.DAT	
	-11.5089 m		
To:	RAV 2		L1 fixed
	6/10/98 15:57:15	00000017.SSF	
		Slope (m):	2139.822
	41°11'27.42548" N	51751613.DAT	
		Total (m):	12305.211
	081°05' 7.64100" W	38741612.DAT	
	-0.0147 m		

Closed

Precision (ppm):	1.7596				
Errors (m) N:	0.0151	E:	0.0050	U:	-0

.0147

****
New Closure

From: RAP98 1

To:	BKG MW17		L1 fixed
	6/10/98 18:25:15	00000029.SSF	
		Slope (m):	1266.506
	41°12' 8.40834" N	38711613.DAT	
		Total (m):	1266.506
	081°07'39.55199" W	51751614.DAT	
	21.5732 m		
To:	BKG MW16		L1 fixed
	6/10/98 18:25:15	00000057.SSF	
		Slope (m):	2818.185
	41°10'45.31117" N	38741613.DAT	
		Total (m):	4084.691
	081°08'29.78911" W	51751614.DAT	
	11.0966 m		
To:	RAP98 1		L1 fixed
	6/10/98 16:54:30	00000033.SSF	
		Slope (m):	2764.851
	41°11'42.01751" N	38711613.DAT	
		Total (m):	6849.542
	081°06'57.91658" W	38741613.DAT	
	13.8488 m		

Closed

Precision (ppm): 1.0188
Errors (m) N: -0.0057 E: -0.0023 U: -0
.0033

****
New Closure

From: BKGMW16D

To: BKG MW05 L1 fixed

6/11/98 20:34:30 00000129.SSF
Slope (m): 2576.850
41°12' 7.60807" N 38741626.DAT
Total (m): 2576.850
081°08'48.65049" W 51751621.DAT

26.6118 m

To: RAP98 1 L1 fixed
6/11/98 20:34:30 00000065.SSF
Slope (m): 2698.278
41°11'42.01859" N 38711620.DAT
Total (m): 5275.128
081°06'57.91618" W 51751621.DAT

13.8327 m

To: BKGMW16D L1 fixed
6/11/98 19:57:30 00000069.SSF
Slope (m): 2765.311
41°10'45.30216" N 38711620.DAT
Total (m): 8040.440
081°08'29.80330" W 38741626.DAT

10.3631 m

Closed

Precision (ppm): 0.6661
Errors (m) N: 0.0037 E: 0.0037 U: -0
.0013

****
****
New Closure

From: RAV 1

To: BKG MW13 L1 fixed
6/10/98 12:57:00 00000645.SSF
Slope (m): 2359.599
41°11'24.61796" N 51751610.DAT
Total (m): 2359.599
081°04'17.53241" W 38711610.DAT

-22.8908 m

To: RAV 2 L1 fixed

	6/10/98 12:57:00	00000517.SSF	
		Slope (m):	1171.131
	41°11'27.42564" N	38741610.DAT	
		Total (m):	3530.729
	081°05' 7.64098" W	38711610.DAT	
	-0.0640 m		
To:	RAV 1		L1 fixed
	6/10/98 13:06:00	00000513.SSF	
		Slope (m):	2139.824
	41°10'18.06296" N	38741610.DAT	
		Total (m):	5670.553
	081°05' 7.42116" W	51751610.DAT	
	-11.5458 m		

Closed

Precision (ppm): 11.8708
Errors (m) N: 0.0200 E: 0.0053 U: -0
.0640

****
****
New Closure

From: RAP98 1

To:	RAP98 6		L1 fixed
	6/11/98 19:19:45	00000073.SSF	
		Slope (m):	3801.483
	41°13'27.94967" N	38711620.DAT	
		Total (m):	3801.483
	081°05'34.55386" W	38741625.DAT	
	1.1311 m		
To:	RAV 2		L1 fixed
	6/11/98 19:19:45	00000105.SSF	
		Slope (m):	3770.599
	41°11'27.42640" N	51751620.DAT	
		Total (m):	7572.082
	081°05' 7.63349" W	38741625.DAT	
	-0.0650 m		
To:	RAP98 5		L1 fixed

	6/11/98 18:46:15	00000109.SSF	
		Slope (m):	3734.988
	41°13'27.21457" N	51751620.DAT	
		Total (m):	11307.070
	081°05'30.91447" W	38741624.DAT	
	-1.8322 m		
To:	RAP98 1		L1 fixed
	6/11/98 18:46:15	00000077.SSF	
		Slope (m):	3826.257
	41°11'42.01730" N	38711620.DAT	
		Total (m):	15133.327
	081°06'57.91644" W	38741624.DAT	
	13.8517 m		
To:	RAP98 4		L1 fixed
	6/11/98 16:50:00	00000081.SSF	
		Slope (m):	4998.255
	41°13'41.92152" N	38711620.DAT	
		Total (m):	20131.582
	081°04'33.62252" W	38741623.DAT	
	-11.7320 m		
To:	RAV 2		L1 fixed
	6/11/98 16:50:00	00000113.SSF	
		Slope (m):	4224.094
	41°11'27.42619" N	51751620.DAT	
		Total (m):	24355.676
	081°05' 7.63319" W	38741623.DAT	
	-0.0728 m		
To:	RAP98 1		L1 fixed
	6/11/98 14:40:00	00000097.SSF	
		Slope (m):	2609.046
	41°11'42.01738" N	38711620.DAT	
		Total (m):	26964.722
	081°06'57.91634" W	51751620.DAT	
	13.8456 m		

Closed

Precision (ppm):	0.4487				
Errors (m) N:	-0.0097	E:	0.0033	U:	-0

.0064

****
****
New Closure

From: RAP98 1

To:	RAP98 3		L1 fixed
	6/11/98 16:14:15	00000085.SSF	
		Slope (m):	4781.787
	41°13'31.90186" N	38711620.DAT	
		Total (m):	4781.787
	081°04'33.15215" W	38741622.DAT	
	-9.8304 m		
To:	RAV 2		L1 fixed
	6/11/98 16:14:15	00000117.SSF	
		Slope (m):	3923.126
	41°11'27.42656" N	51751620.DAT	
		Total (m):	8704.913
	081°05' 7.63335" W	38741622.DAT	
	-0.0768 m		
To:	BKGMW15D		L1 fixed
	6/11/98 15:39:15	00000121.SSF	
		Slope (m):	3493.536
	41°13'14.03046" N	51751620.DAT	
		Total (m):	12198.449
	081°04'17.03972" W	38741621.DAT	
	-7.9878 m		
To:	RAP98 1		L1 fixed
	6/11/98 15:39:15	00000089.SSF	
		Slope (m):	4701.629
	41°11'42.01782" N	38711620.DAT	
		Total (m):	16900.078
	081°06'57.91662" W	38741621.DAT	
	13.8459 m		
To:	BKG MW15		L1 fixed
	6/11/98 15:05:00	00000093.SSF	
		Slope (m):	4701.254
	41°13'14.02194" N	38711620.DAT	

		Total (m):	21601.332
	081°04'17.05120" W	38741620.DAT	
	-7.3236 m		
To:	RAV 2		L1 fixed
	6/11/98 15:05:00	00000125.SSF	
		Slope (m):	3493.197
	41°11'27.42661" N	51751620.DAT	
		Total (m):	25094.529
	081°05' 7.63353" W	38741620.DAT	
	-0.0840 m		
To:	RAP98 1		L1 fixed
	6/10/98 14:55:45	00000041.SSF	
		Slope (m):	2609.051
	41°11'42.01729" N	38711613.DAT	
		Total (m):	27703.580
	081°06'57.91702" W	38741611.DAT	
	13.8510 m		

Closed

Precision (ppm):	0.6363				
Errors (m) N:	-0.0124	E:	-0.0125	U:	-0.0011

Closure Log

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New Closure

From: RAV 3

To:	WBG MW09		L1 fixed
	6/12/98 15:28:15	00000157.SSF	
		Slope (m):	212.326
	41°11'58.28076" N	38741631.DAT	
		Total (m):	212.326
	081°05'15.26716" W	51751637.DAT	
	-5.0914 m		
To:	RAV 2		L1 fixed
	6/12/98 15:28:15	00000193.SSF	
		Slope (m):	968.340
	41°11'27.42491" N	38711632.DAT	
		Total (m):	1180.666
	081°05' 7.64133" W	51751637.DAT	
	-0.0186 m		
To:	WBG MW05		L1 fixed
	6/12/98 14:55:45	00000537.SSF	
		Slope (m):	1399.120
	41°12'12.44482" N	38711632.DAT	
		Total (m):	2579.786
	081°05'14.90720" W	51751636.DAT	
	-2.9402 m		
To:	RAV 3		L1 fixed
	6/12/98 14:55:45	00000565.SSF	
		Slope (m):	376.748
	41°12' 1.65805" N	38741631.DAT	
		Total (m):	2956.534
	081°05' 7.32890" W	51751636.DAT	
	-8.3428 m		
To:	BKG MW19		L1 fixed
	6/12/98 16:28:00	00000557.SSF	
		Slope (m):	2484.783
	41°11'42.25355" N	38741631.DAT	

		Total (m):	5441.317
	081°06'50.82247" W	51751639.DAT	
	14.1171 m		
To:	RAV 2		L1 fixed
	6/12/98 16:28:00	00000529.SSF	
		Slope (m):	2447.540
	41°11'27.42551" N	38711632.DAT	
		Total (m):	7888.857
	081°05' 7.64208" W	51751639.DAT	
	-0.0647 m		
To:	WBG MW06		L1 fixed
	6/12/98 14:22:45	00000201.SSF	
		Slope (m):	1432.815
	41°12'11.85662" N	38711632.DAT	
		Total (m):	9321.672
	081°04'49.74041" W	51751635.DAT	
	-15.1552 m		
To:	RAV 3		L1 fixed
	6/12/98 14:22:45	00000165.SSF	
		Slope (m):	516.681
	41°12' 1.65828" N	38741631.DAT	
		Total (m):	9838.353
	081°05' 7.32868" W	51751635.DAT	
	-8.3477 m		
To:	WBG MW07		L1 fixed
	6/12/98 13:43:30	00000569.SSF	
		Slope (m):	826.572
	41°12' 6.41524" N	38741631.DAT	
		Total (m):	10664.925
	081°04'32.41977" W	51751634.DAT	
	-19.4317 m		
To:	RAV 2		L1 fixed
	6/12/98 13:43:30	00000541.SSF	
		Slope (m):	1456.267
	41°11'27.42533" N	38711632.DAT	
		Total (m):	12121.192
	081°05' 7.64176" W	51751634.DAT	

-0.0486 m

To:	WBG MW08		L1 fixed
	6/12/98 15:56:45	00000533.SSF	
		Slope (m):	1220.503
	41°12' 1.89245" N	38711632.DAT	
		Total (m):	13341.695
	081°04'41.93691" W	51751638.DAT	

-17.1070 m

To:	RAV 3		L1 fixed
	6/12/98 15:56:45	00000665.SSF	
		Slope (m):	591.733
	41°12' 1.65827" N	38741631.DAT	
		Total (m):	13933.428
	081°05' 7.32864" W	51751638.DAT	

-8.3391 m

To:	BKG MW20		L1 fixed
	6/12/98 16:57:15	00000145.SSF	
		Slope (m):	975.601
	41°11'30.03799" N	38741631.DAT	
		Total (m):	14909.030
	081°05' 6.75405" W	5175163A.DAT	

0.9718 m

To:	RAV 2		L1 fixed
	6/12/98 16:57:15	00000181.SSF	
		Slope (m):	83.215
	41°11'27.42544" N	38711632.DAT	
		Total (m):	14992.244
	081°05' 7.64183" W	5175163A.DAT	

-0.0433 m

To:	RAV 3		L1 fixed
	6/12/98 11:51:45	00000133.SSF	
		Slope (m):	1056.120
	41°12' 1.65835" N	38711630.DAT	
		Total (m):	16048.365
	081°05' 7.32864" W	38741630.DAT	

-8.3252 m

Closed

Precision (ppm): 2.0193
Errors (m) N: 0.0146 E: -0.0142 U: -0
.0252

****
New Closure

From: RAV 2

To: LF 1 L1 fixed
6/12/98 19:15:00 00000649.SSF
Slope (m): 6040.785
41°12'44.10114" N 38711632.DAT
Total (m): 6040.785
081°01' 9.08088" W 5175163B.DAT
-30.1250 m

To: RAV 13 L1 fixed
6/13/98 13:21:00 00000613.SSF
Slope (m): 2363.713
41°13'15.15669" N 38741640.DAT
Total (m): 8404.498
081°02'41.84485" W 51751640.DAT
-29.3476 m

To: RAV 3 L1 fixed
6/12/98 19:55:15 00000549.SSF
Slope (m): 4077.737
41°12' 1.65862" N 38741631.DAT
Total (m): 12482.236
081°05' 7.32672" W 38711633.DAT
-8.3451 m

To: RAV 2 L1 fixed
6/12/98 13:37:00 00000545.SSF
Slope (m): 1056.120
41°11'27.42574" N 38711632.DAT
Total (m): 13538.355
081°05' 7.63990" W 38741631.DAT
-0.0451 m

Closed

Precision (ppm): 4.3777
Errors (m) N: 0.0232 E: 0.0306 U: -0
.0451

****
****
New Closure

From: RAV 13

To: BKG MW21 L1 fixed
6/13/98 14:42:45 00000257.SSF
Slope (m): 558.684
41°13'29.58595" N 38741640.DAT
Total (m): 558.684
081°02'56.33926" W 38711641.DAT
-27.2754 m

To: LF 1 L1 fixed
6/12/98 22:36:45 00000573.SSF
Slope (m): 2865.503
41°12'44.09932" N 5175163B.DAT
Total (m): 3424.188
081°01' 9.08110" W 38741635.DAT
-29.9979 m

To: BKG MW08 L1 fixed
6/13/98 15:45:45 00000661.SSF
Slope (m): 1348.608
41°13'15.27723" N 51751640.DAT
Total (m): 4772.795
081°01'49.66338" W 38711643.DAT
-27.7688 m

To: RAV 13 L1 fixed
6/13/98 15:45:45 00000605.SSF
Slope (m): 1215.455
41°13'15.15543" N 38741640.DAT
Total (m): 5988.251
081°02'41.84518" W 38711643.DAT
-29.2177 m

To: BKG MW10 L1 fixed

	6/13/98 16:19:00	00000601.SSF	
		Slope (m):	1466.156
	41°12'34.86349" N	38741640.DAT	
		Total (m):	7454.407
	081°02' 8.46961" W	38711644.DAT	
	-16.8322 m		
To:	LF 1		L1 fixed
	6/13/98 16:19:00	00000617.SSF	
		Slope (m):	1412.621
	41°12'44.10012" N	51751640.DAT	
		Total (m):	8867.028
	081°01' 9.08111" W	38711644.DAT	
	-29.9722 m		
To:	BKG MW12		L1 fixed
	6/13/98 15:12:00	00000625.SSF	
		Slope (m):	2596.328
	41°12'19.43119" N	51751640.DAT	
		Total (m):	11463.356
	081°02'55.63053" W	38711642.DAT	
	-19.4773 m		
To:	RAV 13		L1 fixed
	6/13/98 15:12:00	00000609.SSF	
		Slope (m):	1748.845
	41°13'15.15623" N	38741640.DAT	
		Total (m):	13212.201
	081°02'41.84523" W	38711642.DAT	
	-29.1994 m		
To:	BKG MW04		L1 fixed
	6/12/98 21:59:15	00000233.SSF	
		Slope (m):	45.048
	41°13'14.05065" N	38711633.DAT	
		Total (m):	13257.249
	081°02'40.58178" W	38741634.DAT	
	-29.3466 m		
To:	LF 1		L1 fixed
	6/12/98 21:59:15	00000213.SSF	
		Slope (m):	2323.073
	41°12'44.10047" N	5175163B.DAT	

		Total (m):	15580.322
	081°01' 9.08116" W	38741634.DAT	
	-29.9635 m		
To:	RAV 13		L1 fixed
	6/12/98 19:55:15	00000585.SSF	
		Slope (m):	2363.718
	41°13'15.15618" N	5175163B.DAT	
		Total (m):	17944.040
	081°02'41.84530" W	38711633.DAT	
	-29.1915 m		

Closed

Precision (ppm): 4.6858
Errors (m) N: 0.0153 E: 0.0229 U: 0
.0794

****
****
New Closure

From: RAV 13

To:	BKG MW21		L1 fixed
	6/13/98 14:42:45	00000257.SSF	
		Slope (m):	558.684
	41°13'29.58595" N	38741640.DAT	
		Total (m):	558.684
	081°02'56.33926" W	38711641.DAT	
	-27.2754 m		
To:	LF 1		L1 fixed
	6/12/98 22:36:45	00000573.SSF	
		Slope (m):	2865.503
	41°12'44.09932" N	5175163B.DAT	
		Total (m):	3424.188
	081°01' 9.08110" W	38741635.DAT	
	-29.9979 m		
To:	BKG MW08		L1 fixed
	6/13/98 15:45:45	00000661.SSF	
		Slope (m):	1348.608
	41°13'15.27723" N	51751640.DAT	

		Total (m):	4772.795
	081°01'49.66338" W	38711643.DAT	
	-27.7688 m		
To:	RAV 13		L1 fixed
	6/13/98 15:45:45	00000605.SSF	
		Slope (m):	1215.455
	41°13'15.15543" N	38741640.DAT	
		Total (m):	5988.251
	081°02'41.84518" W	38711643.DAT	
	-29.2177 m		
To:	BKG MW10		L1 fixed
	6/13/98 16:19:00	00000601.SSF	
		Slope (m):	1466.156
	41°12'34.86349" N	38741640.DAT	
		Total (m):	7454.407
	081°02' 8.46961" W	38711644.DAT	
	-16.8322 m		
To:	LF 1		L1 fixed
	6/13/98 16:19:00	00000617.SSF	
		Slope (m):	1412.621
	41°12'44.10012" N	51751640.DAT	
		Total (m):	8867.028
	081°01' 9.08111" W	38711644.DAT	
	-29.9722 m		
To:	BKG MW12		L1 fixed
	6/13/98 15:12:00	00000625.SSF	
		Slope (m):	2596.328
	41°12'19.43119" N	51751640.DAT	
		Total (m):	11463.356
	081°02'55.63053" W	38711642.DAT	
	-19.4773 m		
To:	RAV 13		L1 fixed
	6/13/98 15:12:00	00000609.SSF	
		Slope (m):	1748.845
	41°13'15.15623" N	38741640.DAT	
		Total (m):	13212.201
	081°02'41.84523" W	38711642.DAT	

-29.1994 m

To: BKG MW04 L1 fixed

6/12/98 21:59:15 00000233.SSF
Slope (m): 45.048

41°13'14.05065" N 38711633.DAT
Total (m): 13257.249

081°02'40.58178" W 38741634.DAT

-29.3466 m

To: LF 1 L1 fixed

6/12/98 21:59:15 00000213.SSF
Slope (m): 2323.073

41°12'44.10047" N 5175163B.DAT
Total (m): 15580.322

081°01' 9.08116" W 38741634.DAT

-29.9635 m

To: RAV 13 L1 fixed

6/12/98 19:55:15 00000585.SSF
Slope (m): 2363.718

41°13'15.15618" N 5175163B.DAT
Total (m): 17944.040

081°02'41.84530" W 38711633.DAT

-29.1915 m

Closed

Precision (ppm): 4.6858
Errors (m) N: 0.0153 E: 0.0229 U: 0
.0794

ADJUSTMENT STATISTICS SUMMARY
NETWORK = Gps7150
TIME = Tue Jun 23 14:22:13 1998

ADJUSTMENT SUMMARY

Network Reference Factor = 1.07
Chi-Square Test (α = 95%) = PASS
Degrees of Freedom = 119.00

GPS OBSERVATIONS

Reference Factor = 1.07
r = 118.58

GPS Solution	1	Reference Factor =	0.60	r =	2.65
GPS Solution	2	Reference Factor =	0.91	r =	2.38
GPS Solution	3	Reference Factor =	1.70	r =	2.43
GPS Solution	4	Reference Factor =	0.20	r =	1.86
GPS Solution	5	Reference Factor =	0.18	r =	1.04
GPS Solution	6	Reference Factor =	0.68	r =	1.22
GPS Solution	7	Reference Factor =	1.18	r =	2.59
GPS Solution	8	Reference Factor =	0.79	r =	2.75
GPS Solution	9	Reference Factor =	5.56	r =	2.75
GPS Solution	10	Reference Factor =	0.96	r =	2.60
GPS Solution	11	Reference Factor =	0.20	r =	0.77
GPS Solution	12	Reference Factor =	0.18	r =	1.54
GPS Solution	13	Reference Factor =	1.10	r =	2.37
GPS Solution	14	Reference Factor =	0.16	r =	1.56
GPS Solution	15	Reference Factor =	0.41	r =	0.60
GPS Solution	16	Reference Factor =	0.30	r =	1.53
GPS Solution	17	Reference Factor =	0.17	r =	1.41
GPS Solution	18	Reference Factor =	0.17	r =	1.67
GPS Solution	19	Reference Factor =	0.25	r =	1.95
GPS Solution	20	Reference Factor =	0.16	r =	1.24
GPS Solution	21	Reference Factor =	0.24	r =	1.51
GPS Solution	22	Reference Factor =	1.60	r =	1.71
GPS Solution	23	Reference Factor =	0.65	r =	2.40
GPS Solution	24	Reference Factor =	0.29	r =	1.42
GPS Solution	25	Reference Factor =	0.16	r =	1.56
GPS Solution	26	Reference Factor =	0.18	r =	1.28
GPS Solution	27	Reference Factor =	0.25	r =	0.93
GPS Solution	28	Reference Factor =	0.16	r =	1.73
GPS Solution	29	Reference Factor =	0.24	r =	1.41
GPS Solution	30	Reference Factor =	0.16	r =	1.31
GPS Solution	31	Reference Factor =	0.30	r =	2.91
GPS Solution	32	Reference Factor =	0.36	r =	2.34
GPS Solution	33	Reference Factor =	0.21	r =	1.63
GPS Solution	34	Reference Factor =	0.13	r =	1.48
GPS Solution	35	Reference Factor =	0.36	r =	0.54
GPS Solution	36	Reference Factor =	0.21	r =	1.33
GPS Solution	37	Reference Factor =	0.13	r =	1.47
GPS Solution	38	Reference Factor =	0.16	r =	2.33
GPS Solution	39	Reference Factor =	0.16	r =	0.50
GPS Solution	40	Reference Factor =	0.75	r =	2.14
GPS Solution	41	Reference Factor =	0.77	r =	2.33
GPS Solution	42	Reference Factor =	0.95	r =	2.60
GPS Solution	43	Reference Factor =	0.63	r =	2.21
GPS Solution	44	Reference Factor =	0.05	r =	1.55
GPS Solution	45	Reference Factor =	0.19	r =	1.50
GPS Solution	46	Reference Factor =	0.43	r =	1.77
GPS Solution	47	Reference Factor =	0.24	r =	1.43
GPS Solution	48	Reference Factor =	0.82	r =	2.76

GPS Solution 49 Reference Factor = 0.80 r = 2.51
GPS Solution 50 Reference Factor = 1.30 r = 2.27
GPS Solution 51 Reference Factor = 0.05 r = 1.44
GPS Solution 52 Reference Factor = 0.29 r = 1.21
GPS Solution 53 Reference Factor = 0.24 r = 1.48
GPS Solution 54 Reference Factor = 0.36 r = 2.53
GPS Solution 55 Reference Factor = 0.29 r = 2.23
GPS Solution 56 Reference Factor = 0.41 r = 2.41
GPS Solution 57 Reference Factor = 0.87 r = 1.47
GPS Solution 58 Reference Factor = 0.11 r = 1.55
GPS Solution 59 Reference Factor = 0.25 r = 1.06
GPS Solution 60 Reference Factor = 0.19 r = 1.35
GPS Solution 61 Reference Factor = 0.52 r = 1.96
GPS Solution 62 Reference Factor = 0.19 r = 2.05
GPS Solution 63 Reference Factor = 0.19 r = 1.58
GPS Solution 64 Reference Factor = 0.85 r = 0.71
GPS Solution 65 Reference Factor = 1.38 r = 2.43
GPS Solution 66 Reference Factor = 0.21 r = 1.85
GPS Solution 67 Reference Factor = 0.20 r = 1.47

GEOID MODEL
Reference Factor = 0.50
r = 0.42

Geoid Heights: Reference Factor = 0.50 r = 0.42
Delta Geoid Heights: Reference Factor = 1.00 r = 0.00

WEIGHTING STRATEGIES:

GPS OBSERVATIONS:
Scalar Weighting Strategy:
User-Defined Scalar Set Applied Globally = 13.96

No summation weighting strategy was used

Station Error Strategy:
H.I. error = 0.0000
Tribrach error = 0.0000

GEOID MODEL:
No scalar weighting strategy was used

No summation weighting strategy was used

Results of adjusted Geoid model:
Noise in vertical GPS observations: 0.00396040
Variance of geoid model: 0.00103085
Further use of correlated Geoid Model not recommended

GPS Fast Static Survey Field Log

Trimble

Date	Julian Day	Filename	Epoch Rate	Operator(s)	Project Name
6-10	161	3871	15 sec	C. Hall J. Jones	98715.0 Ravenna (SAIC) OHIO
Receiver Type:		4600 LS	Rec'd Z	Antenna Type:	INT

Occ.#	Mark ID	Start Time	Stop Time	Antenna Height Measurements	Point Description & Notes
H 2	Rav Z	9:00	9:31	(m) / (ft) 1.717 (m) / 5.635 (m) /	Brass Cap in Conc.
H 6	Rav Z	11:57	12:32	(m) / (ft) 1.717 (m) / 5.635 (m) /	11
H 7	BKG MW16	12:53	17:00	(m) / (ft) .929 (m) / 3.045 (m) /	Riser Pipe
6-11 H 11	Rap 98-1	10:45	17:31	(m) / (ft) 1.738 (m) / 5.705 (m) /	PK NAIL
H-56				(m) / (ft) (m) / (m) /	
				(m) / (ft) (m) / (m) /	
				(m) / (ft) (m) / (m) /	
				(m) / (ft) (m) / (m) /	
				(m) / (ft) (m) / (m) /	

Receiver N ____ Ant a S'' ____

GPS Fast Static Survey Field Log

Trimble

Date	Julian Day	Filename	Epoch Rate	Operator(s)	Project Name
6/10	161	3071	15 sec	Chel + James	98715.0 Ravenna Ohio (SAIC)
Receiver Type:		4600 LS	Rec #1	Antenna Type:	INT

Occ.#	Mark ID	Start Time	Stop Time	Antenna Height Measurements	Point Description & Notes
3	BKG MW13	8:56	9:30	(m) / (ft) 0.981 (m) / 3.215 (m) /	Riser Pipe
11	Rap'98-1	11:37	16:38	(m) / (ft) 1.769 (m) / 5.505 (m) /	PK NAIL
6-11 #12	BKG MW15	11:03	11:33	(m) / (ft) 1.175 (m) / 3.855 (m) /	Riser Pipe
13	BKG MW15D	11:37	11:47	(m) / (ft) 1.743 (m) / 5.72 (m) /	Ground Elev.
14 H-57	Rap'98-3	12:13	12:42	(m) / (ft) 1.714 (m) / 5.62 (m) /	Nail + Ch
15	Rap'98-4	12:48	13:14	(m) / (ft) 1.740 (m) / 5.705 (m) /	Nail + Ch
10	Rap'98-5	14:44	15:10	(m) / (ft) 1.705 (m) / 5.59 (m) /	NAIL + Ch
17	Rap'98-6	15:18	15:38	(m) / (ft) 1.664 (m) / 5.455 (m) /	Nail + Ch
18	BKG MW16D	15:56	17:24	(m) / (ft) 1.681 (m) / 5.515 (m) /	Ground elev.

Receiver # _____ Antenna S/N _____

GPS Fast Static Survey Field Log

Trimble

Date	Julian Day	Filename	Epoch Rate	Operator(s)	Project Name
6 10	161	5175	15 sec	Chiel + James	98715.0 Ravenna OH.O (SAIC)
Receiver Type:		4600 LS	Rec # 3	Antenna Type:	INT

Occ.#	Mark ID	Start Time	Stop Time	Antenna Height Measurements	Point Description & Notes
11 1	Rav 1	9:03	9:33	(m) / (ft) 1.616 (m) / 5.305 (m) /	Brass Cap in Conc.
# 5	Rav 1	11:52	14:03	(m) / (ft) 1.616 (m) / 5.305 (m) /	"
# 8	BKG MW17	14:22	14:49	(m) / (ft) 1.097 (m) / 3.595 (m) /	Riser Pipe
# 9	Rap98-2	15:14	16:12	(m) / (ft) 1.754 (m) / 5.755 (m) /	PK NAIL
6-11 #10	Rav 2	10:37	16:17	(m) / (ft) 1.723 (m) / 5.65 (m) /	Brass Cap in Conc.
# 19	BKG MW05	16:31	17:01	(m) / (ft) 1.123 (m) / 3.30 (m) /	Riser Pipe
				(m) / (ft) (m) /	
				(m) / (ft) (m) /	
				(m) / (ft) (m) /	

H-58

Receiver S/N: Antenna S/N:

GPS Fast Static Survey Field Log

Trimble

Date	Julian Day	Filename	Epoch Rate	Operator(s)	Project Name
6 12	163	3871	15 sec	Chad + James	98715.0 Paducah, KY (SAIC)
Receiver Type:		H600 LS Rec # 2		Antenna Type:	INT

Occ.#	Mark ID	Start Time	Stop Time	Antenna Height Measurements	Point Description & Notes
11 10	Rau 2	9:22	15:42	(m) / (ft) 1.727 (m) / 5.665 (m) /	Brass Cap in Conc.
# 30	Rau 13	15:53	17:09	(m) / (ft) 1.667 (m) / 5.47 (m) /	Brass Cap in Conc.
6-13 #37	BKG MW21	10:39	10:59	(m) / (ft) 1.132 (m) / 3.715 (m) /	Riser Pipe
H-59 #38	BKG MW12	11:10	11:34	(m) / (ft) 1.130 (m) / 3.71 (m) /	Riser Pipe
#39	BKG MW08	11:42	12:02	(m) / (ft) 1.184 (m) / 3.89 (m) /	Riser Pipe
#40	BKG MW 10	12:17	12:42	(m) / (ft) 1.066 (m) / 3.50 (m) /	Riser Pipe
				(m) / (ft) (m) / (m) /	
				(m) / (ft) (m) / (m) /	
				(m) / (ft) (m) / (m) /	

Receiver S/N _____ Antenna S/N _____

GPS Fast Static Survey Field Log

Trimble

Date	Julian Day	Filename	Epoch Rate
6 12	163	3874	15 sec

Receiver Type: 4600 LS Rec # 1

Operator(s): Chet + James

Antenna Type: 1107

Project Name: 78113.0 Raccoon Creek (SAIC)

Occ.#	Mark ID	Start Time	Stop Time	Antenna Height Measurements	Point Description & Notes
11 21	Rav 3	9:35	16:23	1.671 (m) / 5.48 (ft)	Brass Cap in Conc.
# 31	BKG MW08	16:40	17:00	1.125 (m) / 3.69 (ft)	Riser Pipe
# 32	BKG MW10	17:12	17:41	1.090 (m) / 3.575 (ft)	Riser Pipe
# 33	BKG MW04	17:56	18:26	1.075 (m) / 3.525 (ft)	Riser Pipe
# 34	BKG MW21	18:33	19:03	1.070 (m) / 3.51 (ft)	Riser pipe
# 35	6-13 Rav 13	9:09	12:53	1.554 (m) / 5.10 (ft)	Brass Cap in Conc.

Receiver SN _____ Antenna SN _____

GPS Fast Static Survey Field Log

Trimble

Date	Julian Day	Filename	Epoch Rate	Operator(s)	Project Name
6-12	163	5175	15 sec	Chet + James	Revenna OU-D 98715.0 (SAIC)
Receiver Type:		4600LS Rec #3		Antenna Type:	INT

Occ.#	Mark ID	Start Time	Stop Time	Antenna Height Measurements	Point Description & Notes
1 22	WBG MW07	9:40	10:10	(m) / (ft) 0.966 (m) / 3.17 (m) /	Riser Pipe
1 23	WBG MW06	10:19	10:44	(m) / (ft) 0.937 (m) / 3.075 (m) /	Riser pipe
1 24	WBG MW05	10:52	11:17	(m) / (ft) .916 (m) / 3.005 (m) /	Riser Pipe
1 25	WBG MW09	11:25	11:45	(m) / (ft) .991 (m) / 3.25 (m) /	Riser pipe
1 26	WBG MW08	11:53	12:13	(m) / (ft) .952 (m) / 3.125 (m) /	Riser pipe
1 27	BKG MW19	12:25	12:44	(m) / (ft) .963 (m) / 3.16 (m) /	Riser pipe
1 28	BKG MW28	12:54	14:49	(m) / (ft) .939 (m) / 3.08 (m) /	Riser Pipe
1 29	LF-1	15:13	19:15	(m) / (ft) 1.787 (m) / 5.865 (m) /	Rock
(6-13) 1 #36	LF-1	9:19	12:49	(m) / (ft) 1.764 (m) / 5.79 (m) /	Rock

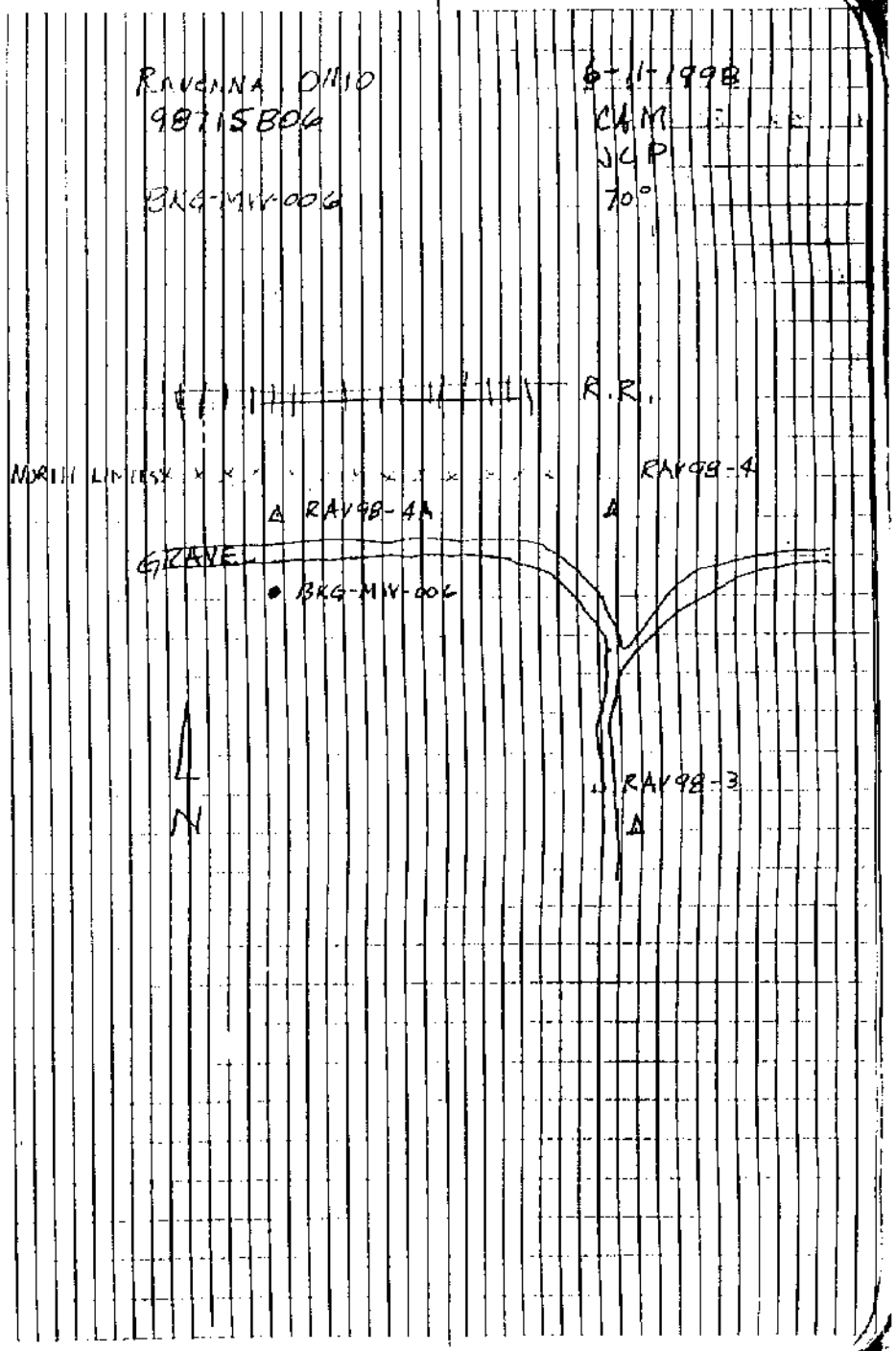
H-61

Receiver S/N

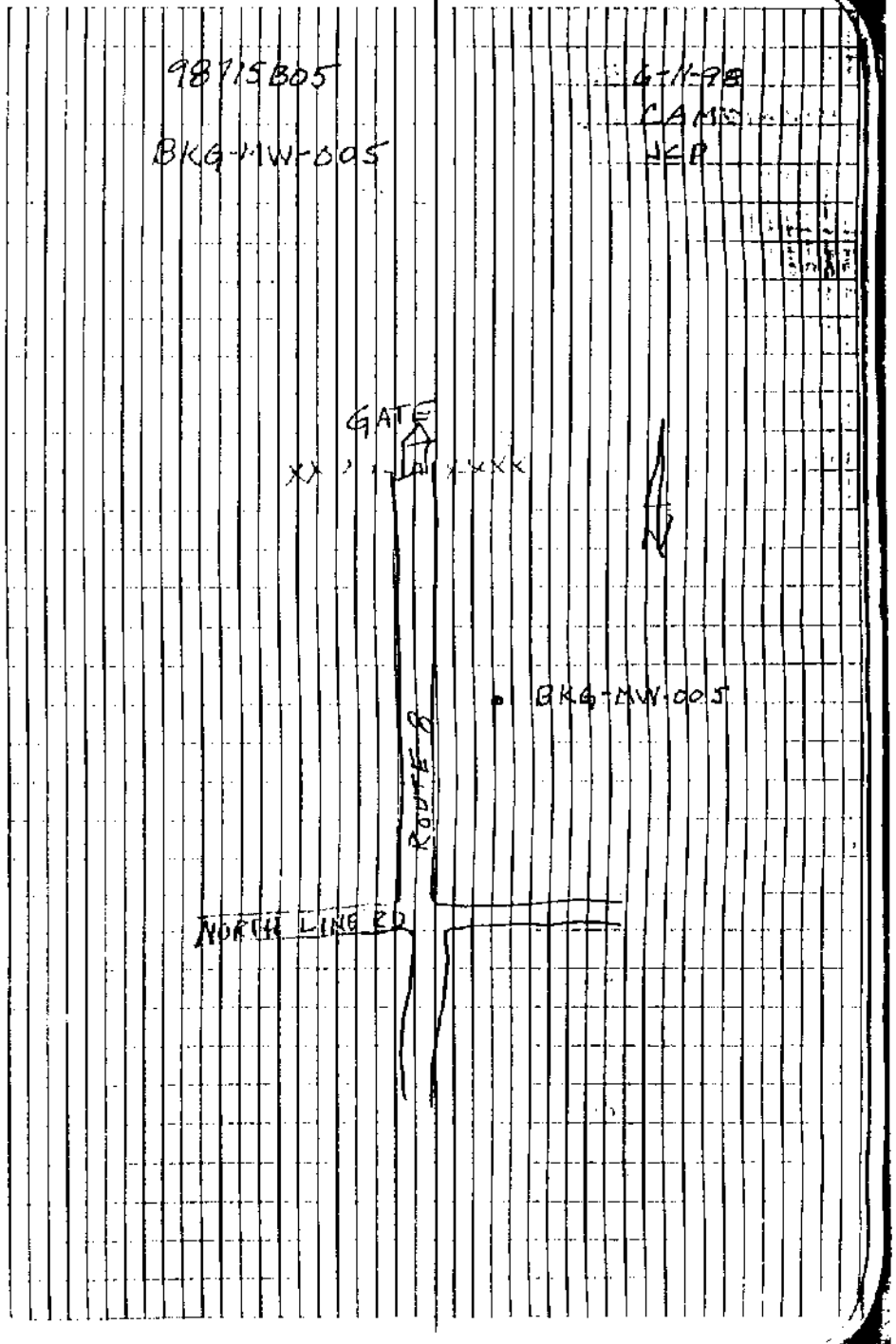
Antenna S/N

OCC	1	RAV98-4	N-CH			
BS	2	RAV98-3	N-CH			
FS	3	RAV98-4A	N-CH			
OCC	3	RAV98-4A				
BS	2	RAV98-4				
FS	4	BKG-MW-006	R.P.			
FS	5	BKG-MW-006	Disk			

STA	FS	HI	FS	SS	ELEV	
					100.00	RAV98-4
	2.18	102.18				
TP1			7.55		94.63	
	5.72	100.35				
TP2			1.27		99.08	
	8.12	107.20				
TP3			8.56		98.64	
	6.03	104.67				
				4.21	100.46	Disk R.P.
TP4			1.70		102.97	BKG-MW-006
	1.20	104.17				
TP5			2.71		101.46	
	4.01	105.47				
TP6			16.30		89.17	
	10.03	99.20				
TP7			2.72		96.48	
	6.92	103.40				
			3.39		106.01	
	44.21		44.20		-0.01	



Sta	BS	HI	FS	SS	Elev	
BKG-MW-005 RP					100.00	
	0	100.00				
			2.35		97.65	Disk



Sta	BS	HI	FS	SS	Elev.	
WBG MW-007					100.00	
	0					
			2.32			Disk
WBG-MW-006						
					100.00	
	0					
			2.23			Disk
WBG-MW-005						
					100.00	
	0					
			2.51			Disk
WBG-MW-009						
					100.00	
	0					
			2.31			Disk
WBG-MW-008						
					100	
	0					
			2.34			Disk
BKG-MW-019						
					100.00	
	0					
			2.39			Disk
BKG-MW-20					100.00	
	0					
			2.32			Disk

98715.0

6-12-1998
KAM
D&E

WBG-MW-007
WBG-MW-006
WBG-MW-005
WBG-MW-009
WBG-MW-008
BKG-MW-019

STA	BS	HI	FS	SS	ELEV	
BKG-MW-013					100.00	
	0					
			2.21			Disk
BKG-MW-017					100.00	
	0					
			2.11			Ground
BKG-MW-021					100.00	
	0					
			2.45			Disk
BKG-MW-004					100.00	
	0					
			2.53			Disk
BKG-MW-008					100.00	
	0					
			2.34			Disk
BKG-MW-010					100.00	
	0					
			2.40			Disk
BKG-MW-012					100.00	
	0					
			2.35			Ground

H-65

98715.0

BKG-MW-013
BKG-MW-017
BKG-MW-021
BKG-MW-004
BKG-MW-008
BKG-MW-010
BKG-MW-012

6-12-98
CAM
JCP

OCC	1	RAV98-6				
BS	2	RAV98-5				
FS	3	RAV98-6A				
OCC	3					
BS	1					
FS	4	BKG-MW-018	RP			
FS	5	BKG-MW-018	DISK			

99-H

	Level Loop				
Sta	BS	HI	FS	SS	Elev
RAV98-6					100.00
	1.41	101.41			
TPI			17.38		84.03
	0.89	84.92			
BKG-MW-018 DISK				9.72	75.20
BKG-MW-018 R.P.			7.48		77.44
	7.72	85.16			
			0.80		84.36
	17.00	101.36			
			1.36		100.00
	27.02		27.02		0.00

98715318

BKG-MW-018

6-13-1998

CAM

J&P

70° RAIN

GEOTECHNICAL INVESTIGATION

June 29, 1998

Science Applications International Corporation
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831

ATTENTION: Mr. Steve Selecman

REFERENCE: **GEOTECHNICAL/PHYSICAL SOIL ANALYTICAL SERVICES**
Phase II Remedial Investigation
Ravenna Army Ammunition Plant
Load Line 1, Winklepeck Burning Grounds, and Background Locations
Ravenna, Ohio
SUBCONTRACT No. 4400001842
S&ME Project No. 1439-98-307

Dear Mr. Selecman:

S&ME, Inc. has completed laboratory testing for the subject project. This testing program was conducted in general accordance with Subcontract No. 4400001842. The purpose of the testing program was to determine the properties of the soil samples received. The following report presents the activities and results of the testing program.

RECEIPT INSPECTION

A total of thirty-nine grab samples were received and inspected on May 15, 1998 in accordance with SLP-3, "Receipt Inspection and Processing of Material for Testing". A total of twelve shelby tube samples were received and inspected on May 27, 1998. Copies of the Chain-Of-Custody Records and the receipt inspection reports are enclosed in Appendix A.

S&ME, Inc.-Knoxville Branch, 1413 Topside Road, Louisville, Tennessee 37777
(423) 970-0003 Fax (423) 970-0004

SCOPE AND PROCEDURES

The testing program consisted of moisture content, grain-size analysis, Atterberg limits, and Unified Soil Classification on the grab samples, while moisture content, grain-size, Atterberg limits, Unified soil classification, bulk density, porosity, hydraulic conductivity, specific gravity, pH, and total organic carbon were performed on selected shelby tube samples. The tests assigned were performed in general accordance with American Society for Testing and Materials (ASTM) Methods D2216 for moisture content, D422 for grain-size analysis, D4318 for Atterberg limits, D2487 for Unified soil classification, D4531 for bulk density, D5084 for hydraulic conductivity, D854 for specific gravity, EPA SW846 Methods 9045 for pH and 9060 for total organic carbon, and EM 110-2-1906 for porosity.

Shelby Tube samples BK 904, BK 906, BK 907 and BK910 contained insufficient suitable material to perform permeability, bulk density, and porosity.

RESULTS

Test results are summarized in the attached tables. Individual test data sheets are enclosed in Attachment A.

S&ME, Inc. appreciates the opportunity to be of service to SAIC in this project. If you wish to conduct further studies or have questions, we would be happy to assist you. Please contact us at your convenience.

Very truly yours,

S&ME, Inc.

John B. Pearson, P.E.
Laboratory Manager

Randall A. Neuhaus, P.E.
Branch Manager

JBP/RAN/trb

Attachments

SAIC
Ravenna Army Ammo Plant, Phase II
6-18-98

Sample no.	Grain Size Analysis				Unified Soil Classification		Moist. Cont. (%)	Atterberg Limits	
	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Sym.	Name		Liquid Limit	Plasticity Index
BK 0789	1	21	50	28	CL	Lean Clay w. Sand	27.2	33	10
BK 0790	13	25	40	22	CL	Sandy Lean Clay	34.9	35	12
BK 0793	28	51	14	7	SM	Silty Sand w. Gravel	29.7	NP	NP
BK 0795	30	42	20	8	SM	Silty Sand w. Gravel	19.9	NP	NP
BK 0797	1	16	51	32	CL	Lean Clay w. Sand	36.6	44	17
BK 0800	0	34	41	25	ML	Sandy Silt	166.2	NP	NP
BK 0802	0	88	9	3	SP-SM	Poor graded Sand w. Silt	29.7	NP	NP
BK 0803	28	68	3	1	SP	Poorly graded Sand w. Gravel	19.5	NP	NP
BK 0810	3	16	31	50	CL	Lean Clay w. Sand	18.3	40	23
BK 0811	3	18	35	44	CL	Lean Clay w. Sand	16.1	35	18
BK 0812	0	71	17	12	SC	Clayey Sand	20.9	40	23
BK 0813	0	81	15	4	SM	Silty Sand	21.1	NP	NP
BK 0816	8	34	36	22	CL	Sandy Lean Clay	18.7	28	9
BK 0817	2	17	44	37	ML	Silt w. Sand	5.1	14	2
BK 0828	3	12	50	35	CL	Lean Clay w. Sand	23.5	31	13
BK 0829	4	21	48	27	CL	Lean Clay w. Sand	8.0	30	13
BK 0833	1	12	36	51	CL	Lean Clay	17.2	33	16
BK 0834	15	29	37	19	CL	Sandy Lean Clay w. Gravel	15.4	28	9
BK 0835	0	34	39	27	CL	Sandy Lean Clay	15.3	31	13
BK 0879	0	0	88	12	ML	Silt	28.1	24	3
BK 0953	5	80	11	4	SM	Silty Sand	10.4	NP	NP
BK 0954	0	6	28	66	CL	Lean Clay	19.0	44	26
BK 0955	0	87	8	5	SM	Silty Sand	27.1	NP	NP

NP = NON PLASTIC

SAIC

Ravenna Army Ammo Plant, Phase II

6-24-98

Sample no.	Grain Size Analysis				Unified Soil Classification		Moisture Content (%)	Atterberg Limits	
	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Sym.	Name		Liquid Limit	Plasticity Index
WB 0694	4	31	37	28	CL	Sandy Lean Clay	27.6	37	15
WB 0696	26	21	31	22	CL	Gravely Lean Clay w. Sand	11.0	45	19
WB 0701	5	36	37	22	CL	Sandy Lean Clay	23.5	32	12
WB 0723	5	24	36	35	CL	Lean Clay w. Sand	22.1	38	19
WB 0730	16	54	17	13	SC	Clayey Sand w. Gravel	24.6	31	8
WB 0735	28	52	14	6	SM	Silty Sand w. Gravel	13.9	22	1
WB 0742	100	0	0	0	GP	Poor graded Gravel	0.5	NP	NP
WB 0743	100	0	0	0	GP	Poor graded Gravel	0.5	NP	NP
WB 0749	3	17	33	47	CL	Lean Clay w. Sand	16.1	34	16
WB 0752	0	57	25	18	SC	Clayey Sand	14.7	24	11
WB 0754	5	21	33	41	CL	Lean Clay w. Sand	18.0	34	18
WB 0758	1	31	40	28	CL	Sandy Lean Clay	28.0	30	12
WB 0759	0	74	11	15	SC-SM	Silty Clayey Sand	23.5	20	7
WB 0764	1	77	11	11	SC-SM	Silty Clayey Sand	20.7	19	6
WB 0927	2	17	37	44	CL	Lean Clay w. Sand	17.2	36	18
WB 0928	7	39	35	19	CL	Sandy Lean Clay	17.9	25	10

NP = NON PLASTIC

SAIC
Ravenna Army Ammo Plant, Phase II
6-30-98

Sample no.	Att. Limit		Moist. Cont. (%)	Dens. (pcf)	Spec. Gr.	Poros.	pH	TOC (%)	Hydralic Cond. (cm/sec)	Grain Size Analysis				Unified Soil Classification	
	LL	PI								Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Sym.	Name
BK 0904	NP	NP	9.2	ISS	2.596	ISS	8.67	~~	ISS	47	40	4	9	GM	Silty Gravel w. Sand
BK 0905	NP	NP	9.5	130.9	2.655	0.210	8.63	~~	7.41E-07	4	93	2	1	SP	Poor graded Sand
BK 0906	33	16	17.0	ISS	2.700	ISS	8.71	~~	ISS	3	17	25	55	CL	Lean Clay w. Sand
BK 0907	22	7	9.8	ISS	2.653	ISS	8.28	~~	ISS	7	39	37	17	CL-ML	Sandy Silty Clay
BK 0909	NP	NP	20.7	100.9	2.650	0.390	8.71	~~	2.48E-04	0	88	8	4	SW-SM	Well graded Sand w. Silt
WB 0858	22	4	12.3	125.0	2.673	0.251	8.21	0.60	1.19E-07	2	34	46	18	CL-ML	Sandy Silty Clay
WB 0859	28	11	12.6	125.2	2.720	0.270	8.02	0.51	9.16E-08	2	18	45	35	CL	Lean Clay w. Sand
WB 0860	33	15	13.9	118.3	2.699	0.298	8.61	2.10	3.39E-08	1	18	39	42	CL	Lean Clay w. Sand
WB 0861	NP	NP	13.2	104.2	2.670	0.375	8.51	0.07	2.83E-04	5	66	23	6	SM	Silty Sand
WB 0862	25	9	16.1	115.3	2.683	0.306	8.34	0.25	4.45E-08	2	20	52	26	CL	Lean Clay w. Sand
WB 0910	16	3	10.8	ISS	2.632	ISS	8.37	0.61	ISS	8	79	8	5	SM	Silty Sand
WB 0911	35	16	12.7	126.1	2.673	0.266	8.38	0.48	4.50E-08	5	22	43	30	CL	Lean Clay w. Sand

NP = NON PLASTIC

ISS = INSUFFICIENT SAMPLE

Attachment A

Laboratory Test Data Sheets

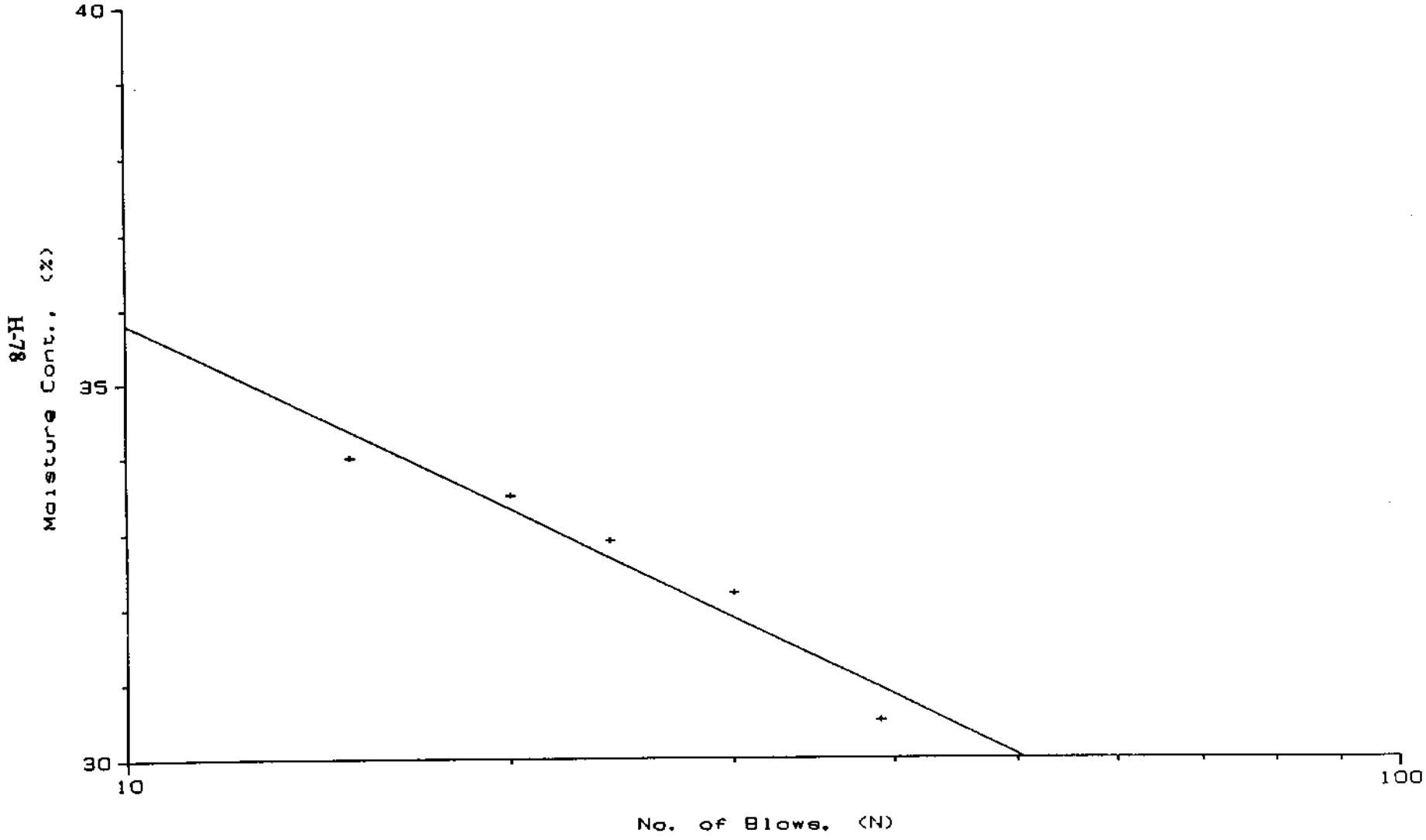
S&ME

ATTERBERG LIMITS

Job No:	**1439-98-307**	**ASTM D:**	**4318**
Job Name:	**SAIC, RVAAP**	**Operator:**	**bd**
Sample No:	**BK 0789**	**Date:**	**06/15/98**

LIQUID LIMIT DETERMINATION					
Tare No.	T	4	39	44	36
Soil & Tare Wet Wt.	20.36	19.21	20.89	18.42	18.92
Soil & Tare Dry Wt.	16.22	15.39	16.66	14.84	15.39
Tare Wt.	4.04	3.97	3.79	3.73	3.81
Moisture Content; %	34.0	33.5	32.9	32.2	30.5
No. of Blows; N	15	20	24	30	39
PLASTIC LIMIT DETERMINATION					
Tare No.	21	47	46		
Soil & Tare Wet Wt.	23.10	21.74	23.01		
Soil & Tare Dry Wt.	19.51	18.44	19.38		
Tare Wt.	4.04	3.77	3.96		
Moisture Content; %	23.2	22.5	23.5		
LL = 33			**PL = 23**		**PI = 10**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
BK 0789



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S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0790	**Date:**	06/16/98

LIQUID LIMIT DETERMINATION

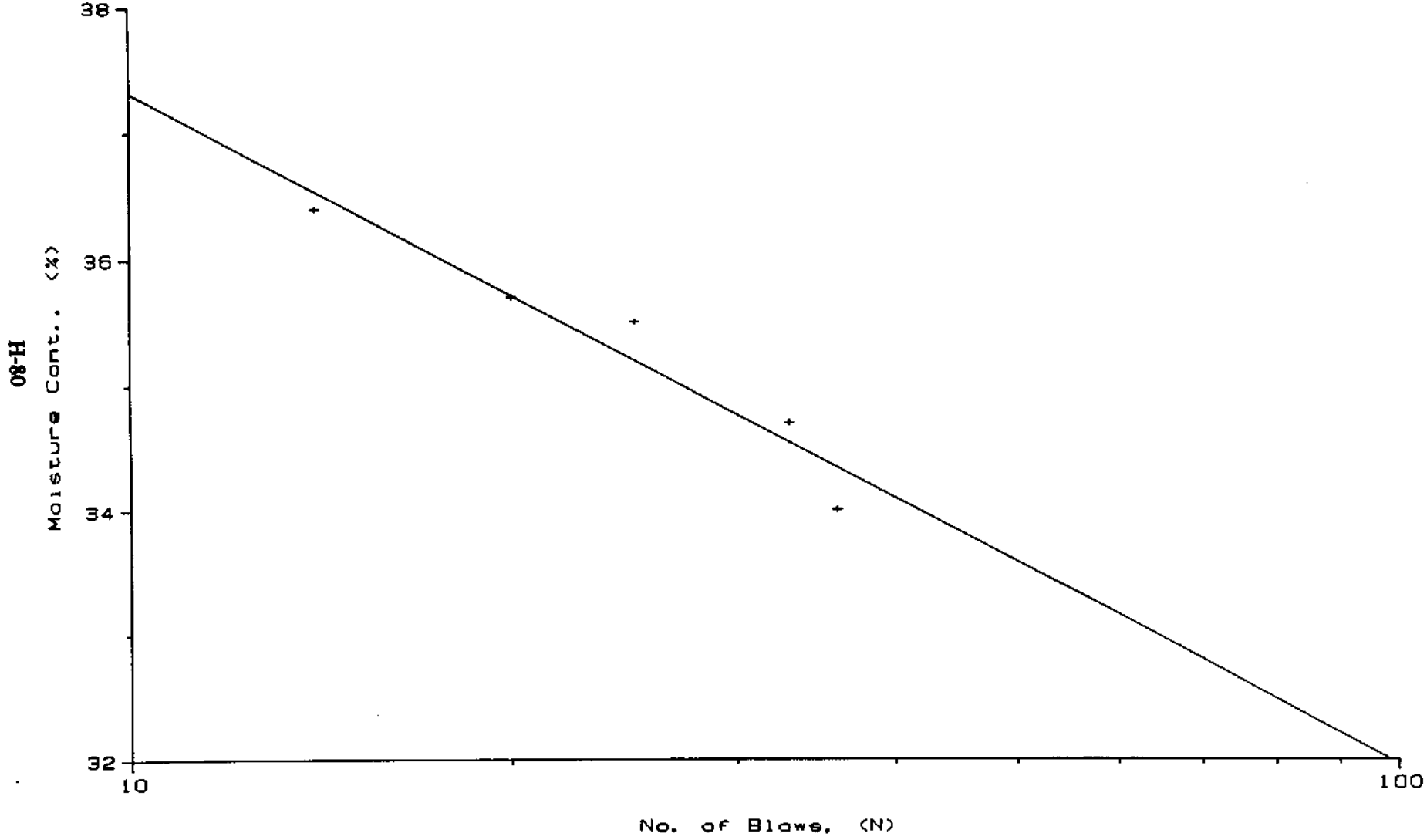
Tare No.	1	1A	12	Z	A19
Soil & Tare Wet Wt.	18.45	18.88	17.55	17.91	19.48
Soil & Tare Dry Wt.	14.63	14.99	14.06	14.36	15.53
Tare Wt.	4.13	4.08	4.24	4.12	3.92
Moisture Content; %	36.4	35.7	35.5	34.7	34.0
No. of Blows; N	14	20	25	33	36

PLASTIC LIMIT DETERMINATION

Tare No.	A	43	31		
Soil & Tare Wet Wt.	19.17	17.94	17.72		
Soil & Tare Dry Wt.	16.26	15.23	15.20		
Tare Wt.	4.13	3.82	4.03		
Moisture Content; %	24.0	23.8	22.6		

LL = 35 **PL = 23** **PI = 12**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
BK 0790



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ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0797	**Date:**	06/15/98

LIQUID LIMIT DETERMINATION

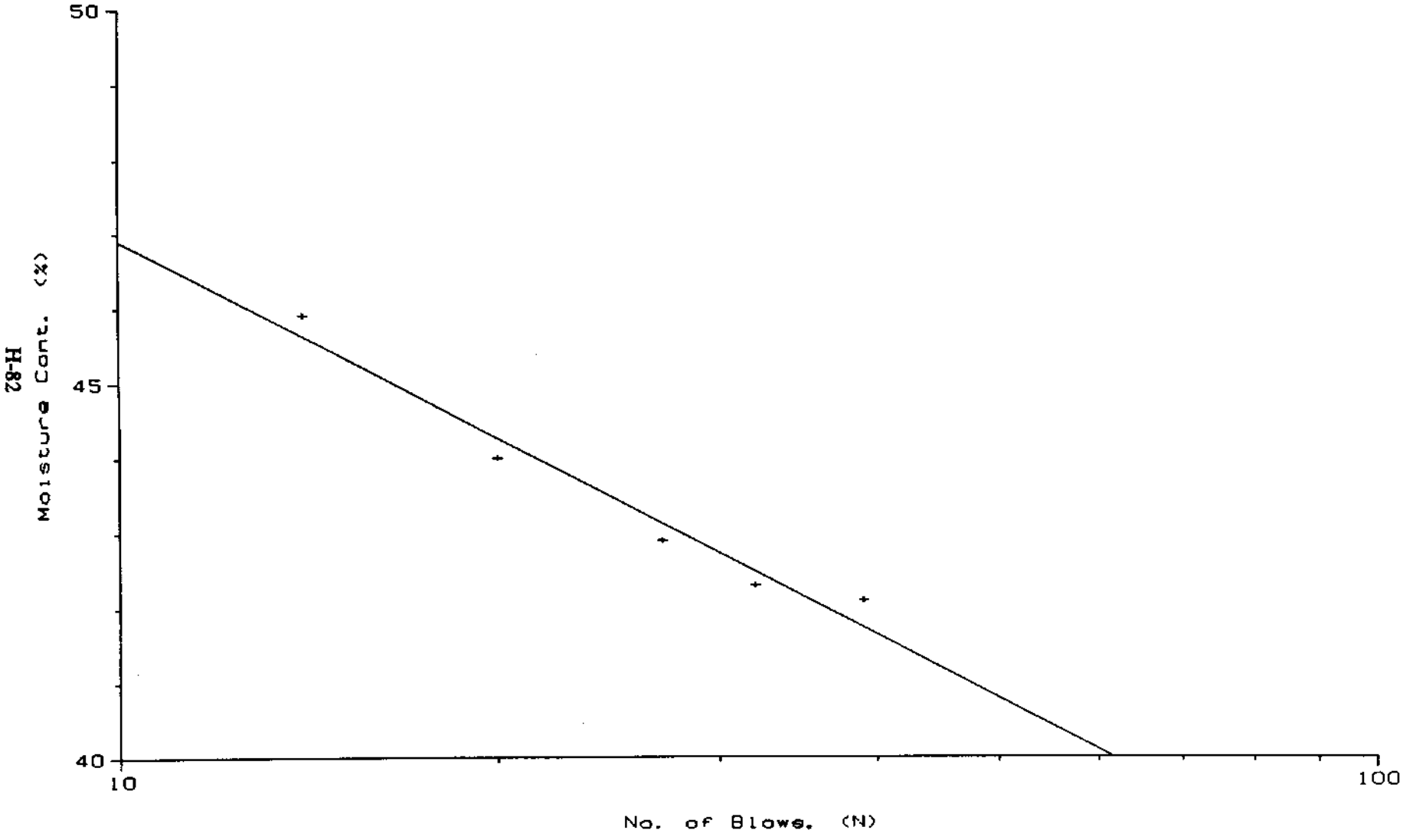
Tare No.	114	A18	Q	D	N
Soil & Tare Wet Wt.	18.63	17.25	19.05	18.56	19.54
Soil & Tare Dry Wt.	14.08	13.19	14.59	14.24	14.94
Tare Wt.	4.16	3.96	4.19	4.02	4.02
Moisture Content; %	45.9	44.0	42.9	42.3	42.1
No. of Blows; N	14	20	27	32	39

PLASTIC LIMIT DETERMINATION

Tare No.	A8	48	A5		
Soil & Tare Wet Wt.	16.55	17.14	18.21		
Soil & Tare Dry Wt.	13.81	14.28	15.24		
Tare Wt.	3.92	3.74	3.95		
Moisture Content; %	27.7	27.1	26.3		

LL = 44 **PL = 27** **PI = 17**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
BK 0797



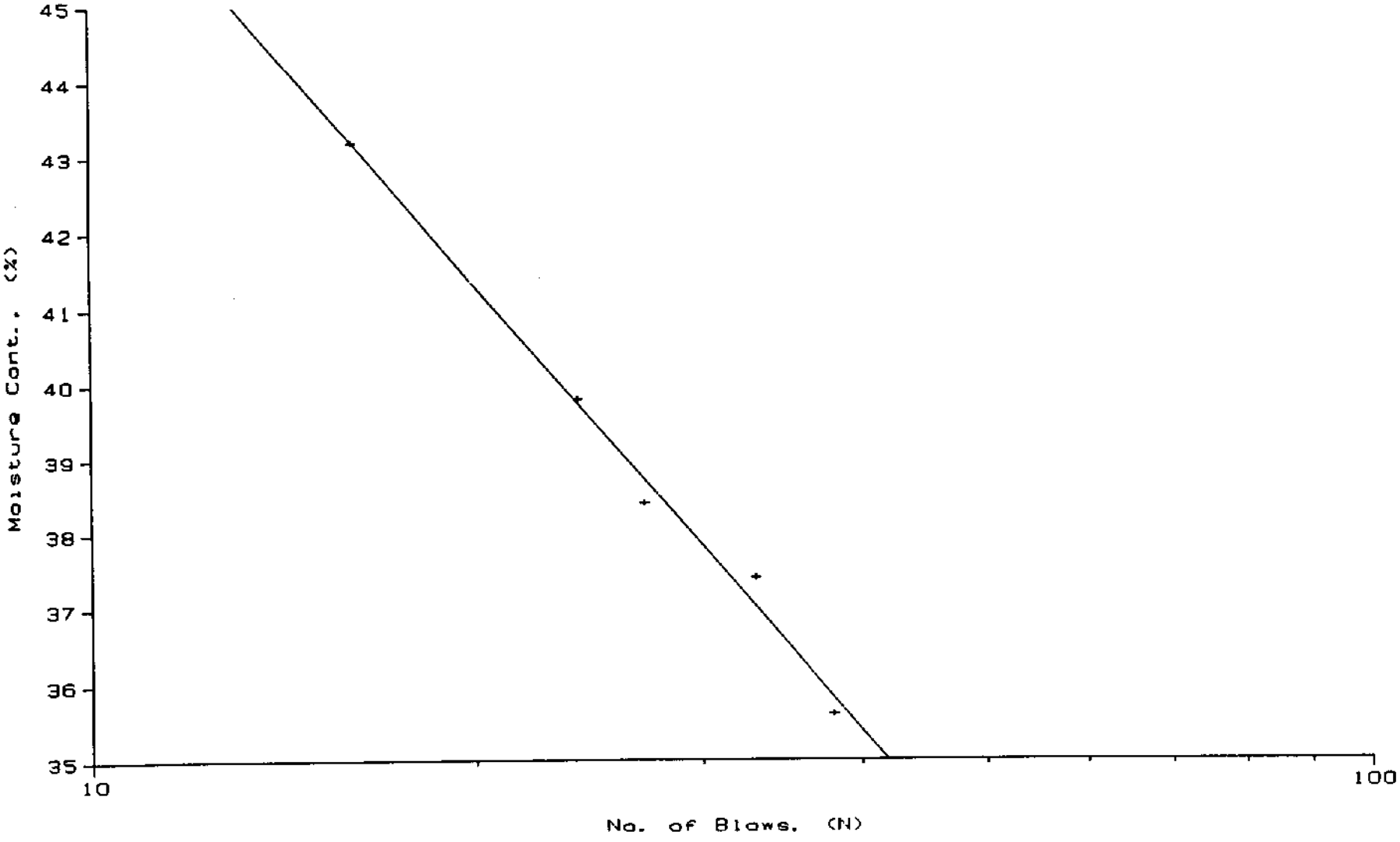
S&ME

ATTERBERG LIMITS

Job No:	**1439-98-307**	**ASTM D:**	**4318**
Job Name:	**SAIC, RVAAP**	**Operator:**	**bd**
Sample No:	**BK 0810**	**Date:**	**06/16/98**

LIQUID LIMIT DETERMINATION					
Tare No.	M	S	A15	C	25
Soil & Tare Wet Wt.	17.16	20.23	20.01	19.87	19.80
Soil & Tare Dry Wt.	13.20	15.64	15.57	15.57	15.62
Tare Wt.	4.03	4.10	4.00	4.06	3.88
Moisture Content; %	43.2	39.8	38.4	37.4	35.6
No. of Blows; N	16	24	27	33	38
PLASTIC LIMIT DETERMINATION					
Tare No.	7	14	Y		
Soil & Tare Wet Wt.	19.30	19.23	18.16		
Soil & Tare Dry Wt.	17.05	16.98	16.09		
Tare Wt.	4.18	4.14	4.19		
Moisture Content; %	17.5	17.5	17.4		
LL = 40			**PL = 17**		**PI = 23**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
BK 0810



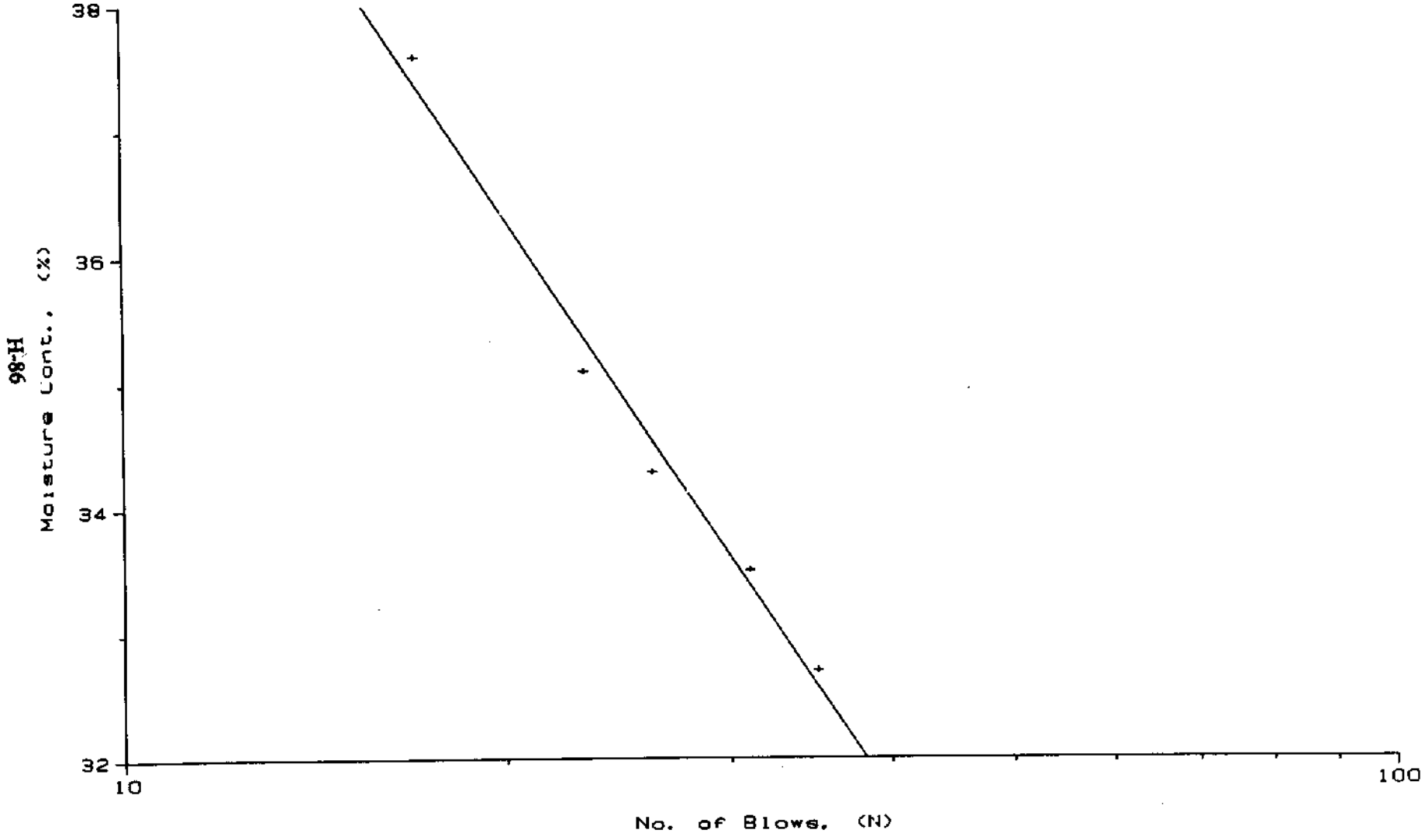
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	ASTM D:	4318
Job Name:	SAIC, RVAAP	Operator:	bd
Sample No:	BK 0811	Date:	06/16/98

LIQUID LIMIT DETERMINATION					
Tare No.	40	A3	11	26	A4
Soil & Tare Wet Wt.	18.00	19.35	19.78	18.44	19.04
Soil & Tare Dry Wt.	14.13	15.36	15.78	14.78	15.31
Tare Wt.	3.83	3.98	4.12	3.87	3.92
Moisture Content; %	37.6	35.1	34.3	33.5	32.7
No. of Blows; N	17	23	26	31	35
PLASTIC LIMIT DETERMINATION					
Tare No.	U	18	20		
Soil & Tare Wet Wt.	21.07	17.52	17.36		
Soil & Tare Dry Wt.	18.73	15.55	15.45		
Tare Wt.	4.05	4.08	3.97		
Moisture Content; %	15.9	17.2	16.6		
LL = 35			**PL = 17**		**PI = 18**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
BK 0811



S&ME

ATTERBERG LIMITS

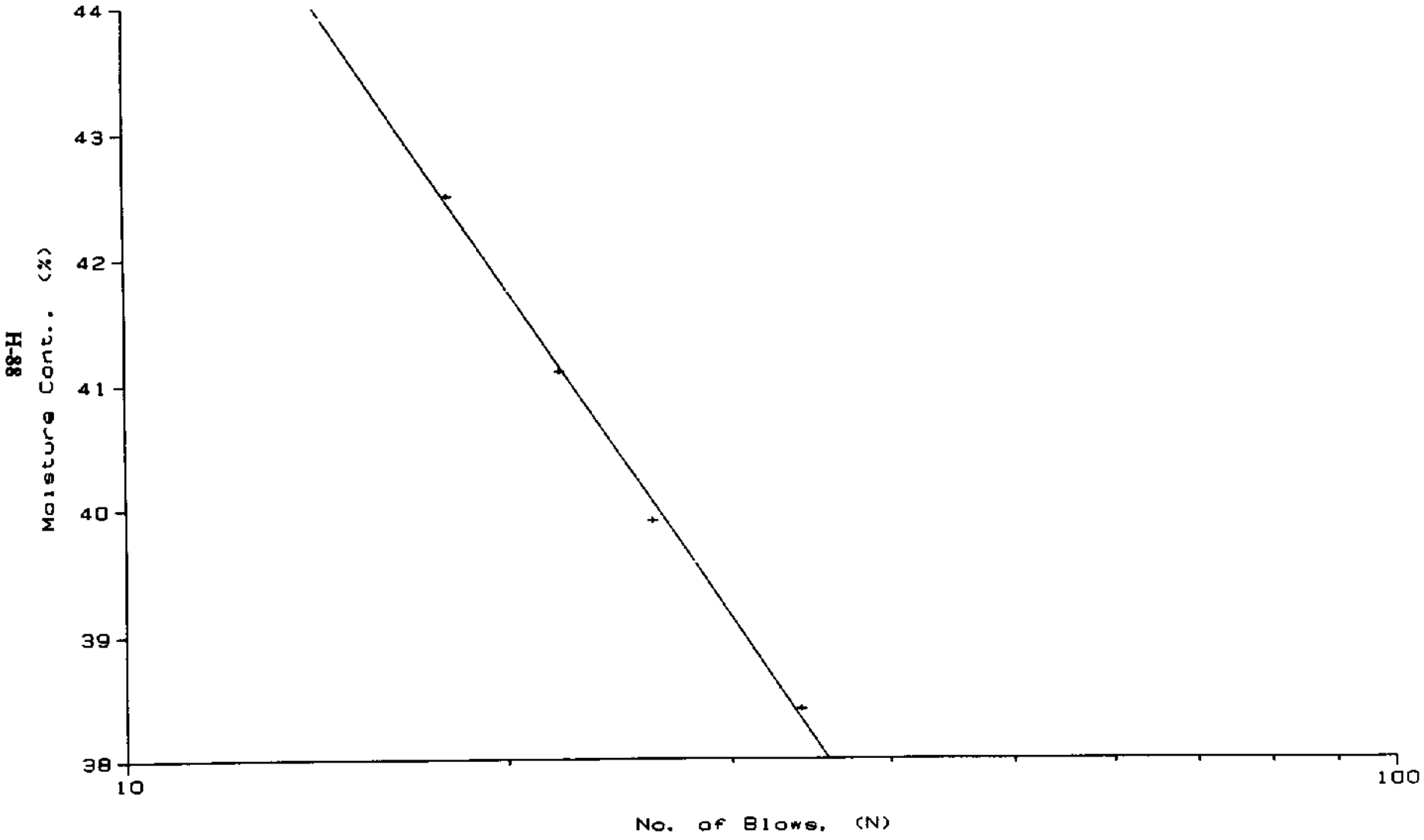
Job No:	1439-98-307	ASTM D:	4318
Job Name:	SAIC, RVAAP	Operator:	bd
Sample No:	BK 0812	Date:	06/19/98

LIQUID LIMIT DETERMINATION					
Tare No.	61	50	A11	A20	
Soil & Tare Wet Wt.	18.35	18.19	19.09	18.47	
Soil & Tare Dry Wt.	13.99	14.01	14.77	14.44	
Tare Wt.	3.73	3.85	3.94	3.95	
Moisture Content; %	42.5	41.1	39.9	38.4	
No. of Blows; N	18	22	26	34	
PLASTIC LIMIT DETERMINATION					
Tare No.	37	15	B6		
Soil & Tare Wet Wt.	18.07	17.74	16.82		
Soil & Tare Dry Wt.	16.00	15.76	14.88		
Tare Wt.	3.83	4.06	4.05		
Moisture Content; %	17.0	16.9	17.9		
LL = 40			**PL = 17**		**PI = 23**

LIQUID LIMIT

1439-98-307, SAIC, Ravenna Army Ammo Plant

BK 0812



S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0816	**Date:**	06/19/98

LIQUID LIMIT DETERMINATION					
Tare No.	B1	401	H	60	16
Soil & Tare Wet Wt.	18.16	19.56	19.84	20.02	18.15
Soil & Tare Dry Wt.	14.84	16.00	16.37	16.59	15.28
Tare Wt.	3.80	3.82	3.98	3.82	4.08
Moisture Content; %	30.1	29.2	28.0	26.9	25.6
No. of Blows; N	14	20	27	32	35

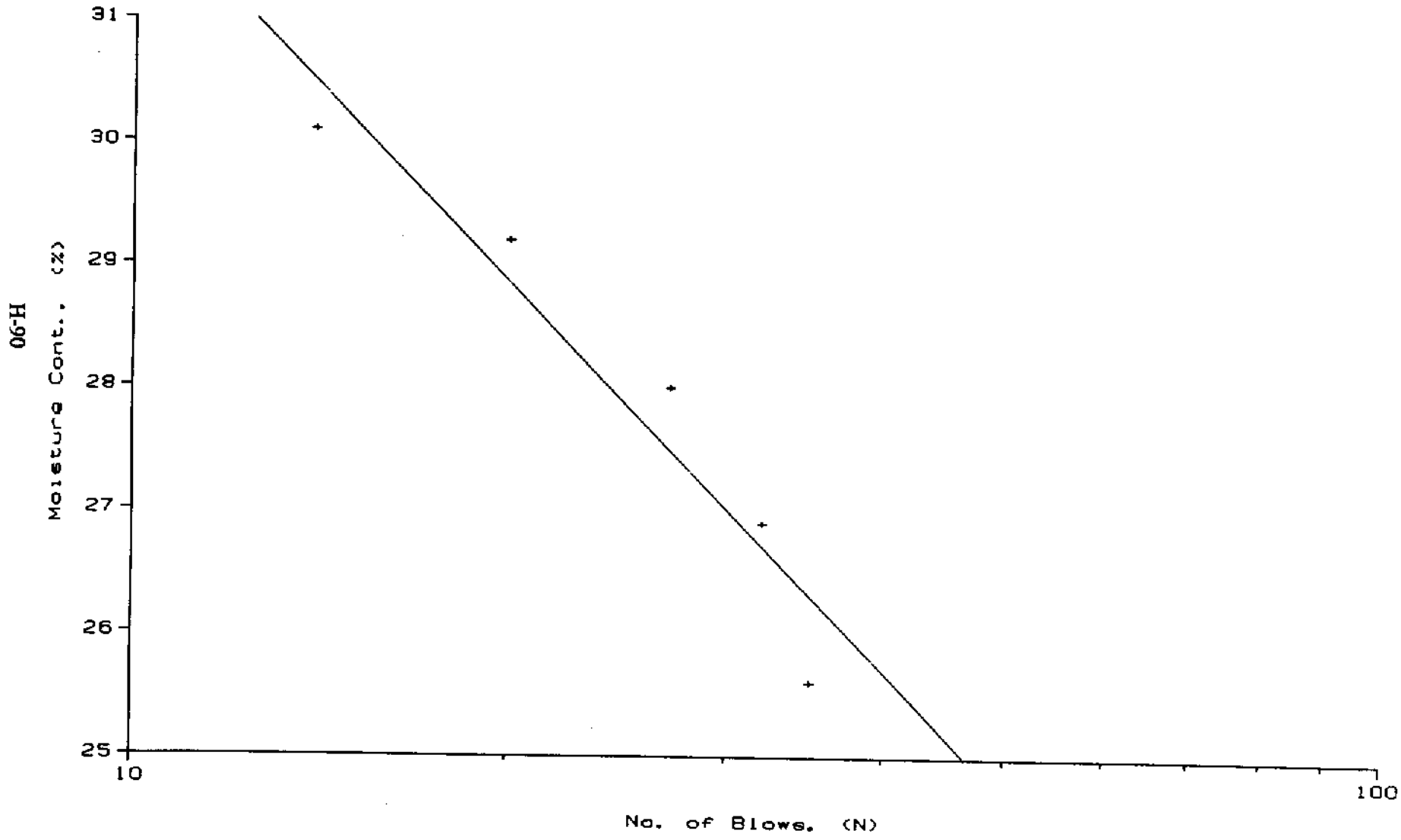
PLASTIC LIMIT DETERMINATION					
Tare No.	10	B10	13		
Soil & Tare Wet Wt.	19.36	20.42	20.13		
Soil & Tare Dry Wt.	16.87	17.72	17.59		
Tare Wt.	4.00	3.92	4.05		
Moisture Content; %	19.3	19.6	18.8		

LL = 28 **PL = 19** **PI = 9**

LIQUID LIMIT

1439-98-307. SAIC. Ravenna Army Ammo Plant

BK 0816



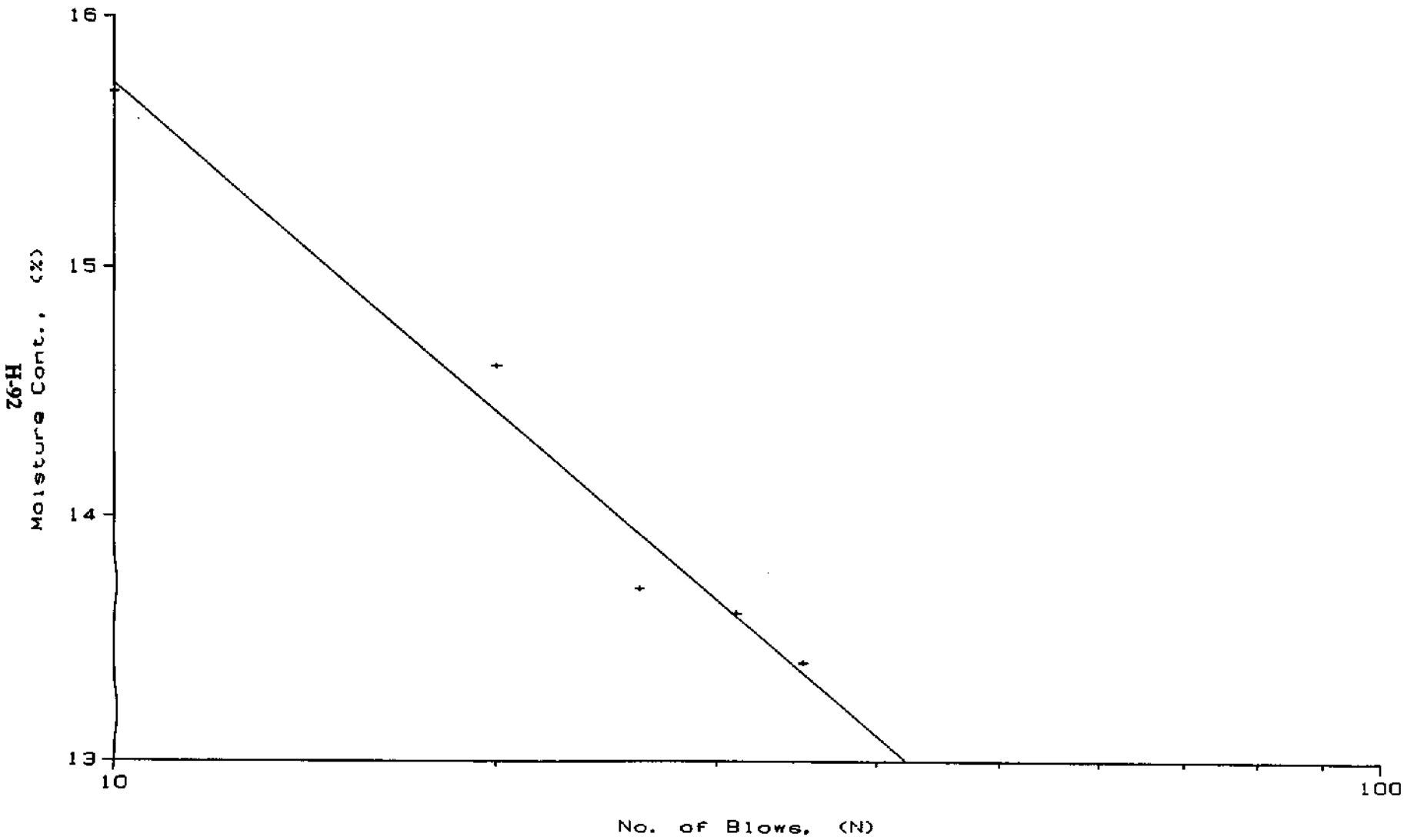
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0817	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION					
Tare No.	36	21	47	46	16
Soil & Tare Wet Wt.	21.07	17.22	19.93	23.54	20.62
Soil & Tare Dry Wt.	18.73	15.54	17.98	21.19	18.67
Tare Wt.	3.80	4.05	3.76	3.96	4.13
Moisture Content; %	15.7	14.6	13.7	13.6	13.4
No. of Blows; N	10	20	26	31	35
PLASTIC LIMIT DETERMINATION					
Tare No.	A20	A11	50		
Soil & Tare Wet Wt.	22.94	24.64	21.86		
Soil & Tare Dry Wt.	20.84	22.30	19.94		
Tare Wt.	3.95	3.95	3.85		
Moisture Content; %	12.4	12.8	11.9		
LL = 14			**PL = 12**		**PI = 2**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
BK 0817



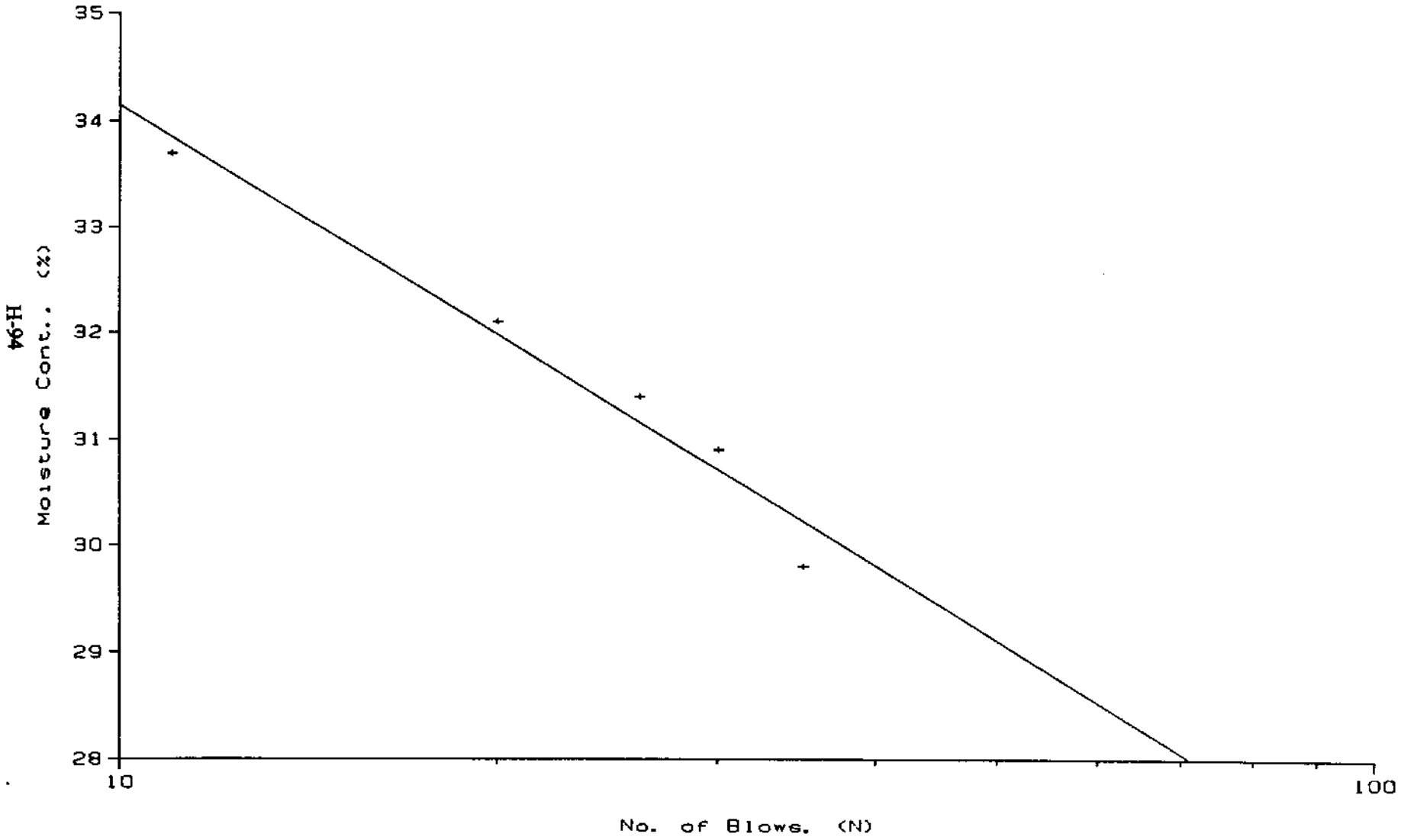
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0828	**Date:**	06/19/98

LIQUID LIMIT DETERMINATION					
Tare No.	507	TEL	515	131	T10
Soil & Tare Wet Wt.	56.62	54.80	52.81	52.17	53.96
Soil & Tare Dry Wt.	52.22	51.03	49.27	48.31	50.30
Tare Wt.	39.15	39.30	37.98	35.81	38.00
Moisture Content; %	33.7	32.1	31.4	30.9	29.8
No. of Blows; N	11	20	26	30	35
PLASTIC LIMIT DETERMINATION					
Tare No.	697	810	B19		
Soil & Tare Wet Wt.	56.20	53.72	53.83		
Soil & Tare Dry Wt.	53.52	51.20	51.34		
Tare Wt.	38.83	37.21	37.51		
Moisture Content; %	18.2	18.0	18.0		
	LL = 31		**PL = 18**		**PI = 13**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
BK 0828



H-94

S&ME

ATTERBERG LIMITS

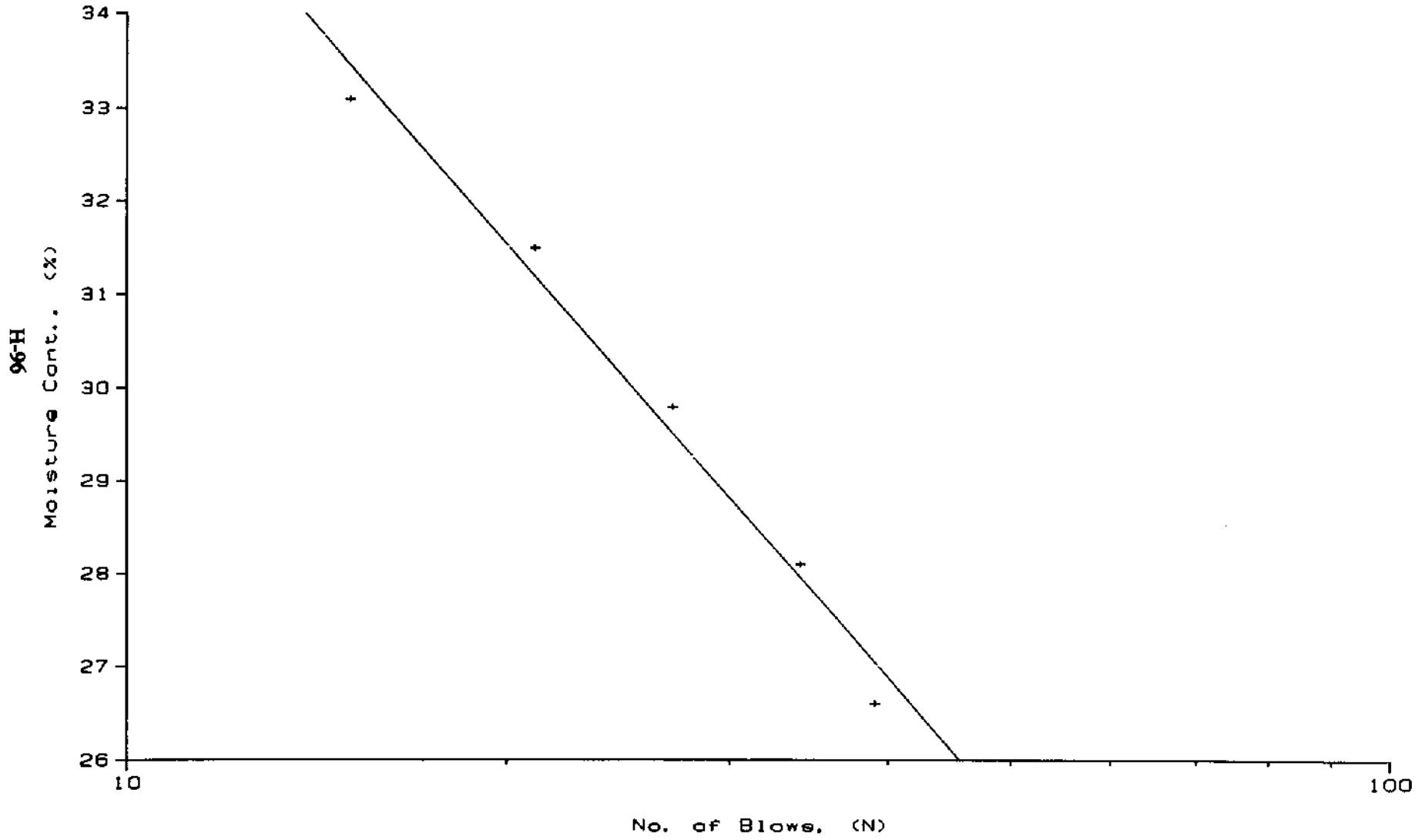
Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0829	**Date:**	06/19/98

LIQUID LIMIT DETERMINATION					
Tare No.	508	E42	809	716	A79
Soil & Tare Wet Wt.	58.78	56.27	55.93	55.78	55.98
Soil & Tare Dry Wt.	54.12	52.21	51.85	51.86	52.43
Tare Wt.	40.03	39.34	38.17	37.89	39.08
Moisture Content; %	33.1	31.5	29.8	28.1	26.6
No. of Blows; N	15	21	27	34	39
PLASTIC LIMIT DETERMINATION					
Tare No.	T8	520	E30		
Soil & Tare Wet Wt.	51.69	55.99	53.85		
Soil & Tare Dry Wt.	49.59	53.38	51.54		
Tare Wt.	37.21	38.52	37.82		
Moisture Content; %	17.0	17.6	16.8		
LL = 30		**PL = 17**		**PI = 13**	

LIQUID LIMIT

1439-98-307, SAIC, Ravenna Army Ammo Plant

BK 0829



S&ME

ATTERBERG LIMITS

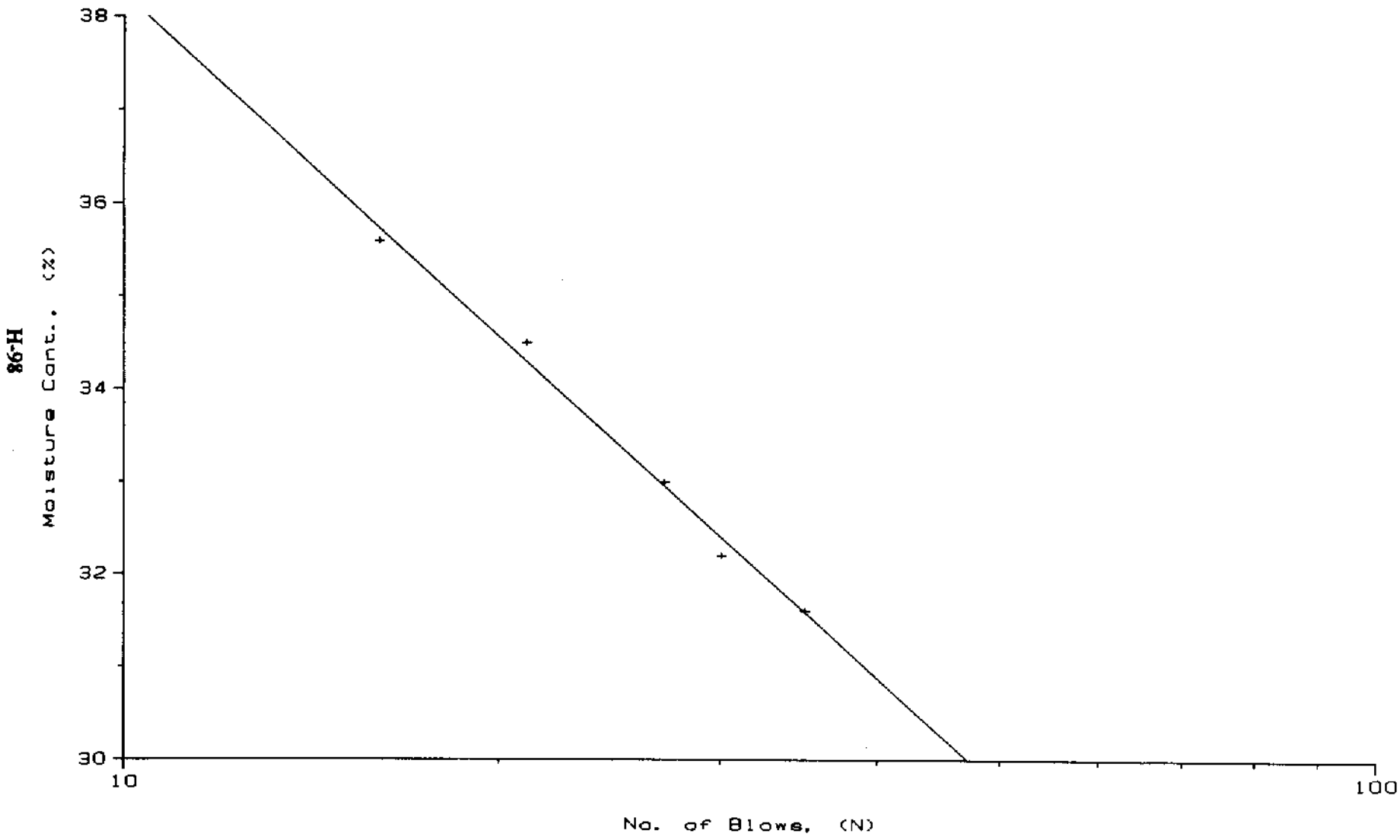
Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0833	**Date:**	06/17/98

LIQUID LIMIT DETERMINATION					
Tare No.	A5	48	A8	N	D
Soil & Tare Wet Wt.	16.62	17.43	17.41	19.37	18.73
Soil & Tare Dry Wt.	13.29	13.91	14.06	15.63	15.19
Tare Wt.	3.93	3.72	3.90	4.00	4.00
Moisture Content; %	35.6	34.5	33.0	32.2	31.6
No. of Blows; N	16	21	27	30	35
PLASTIC LIMIT DETERMINATION					
Tare No.	Q	A18	114		
Soil & Tare Wet Wt.	17.67	18.48	18.63		
Soil & Tare Dry Wt.	15.70	16.44	16.52		
Tare Wt.	4.17	3.93	4.14		
Moisture Content; %	17.1	16.3	17.0		
LL = 33			**PL = 17**		**PI = 16**

LIQUID LIMIT

1439-98-307, SAIC, Rovenna Army Ammo Plant

BK 0833



S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0834	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION

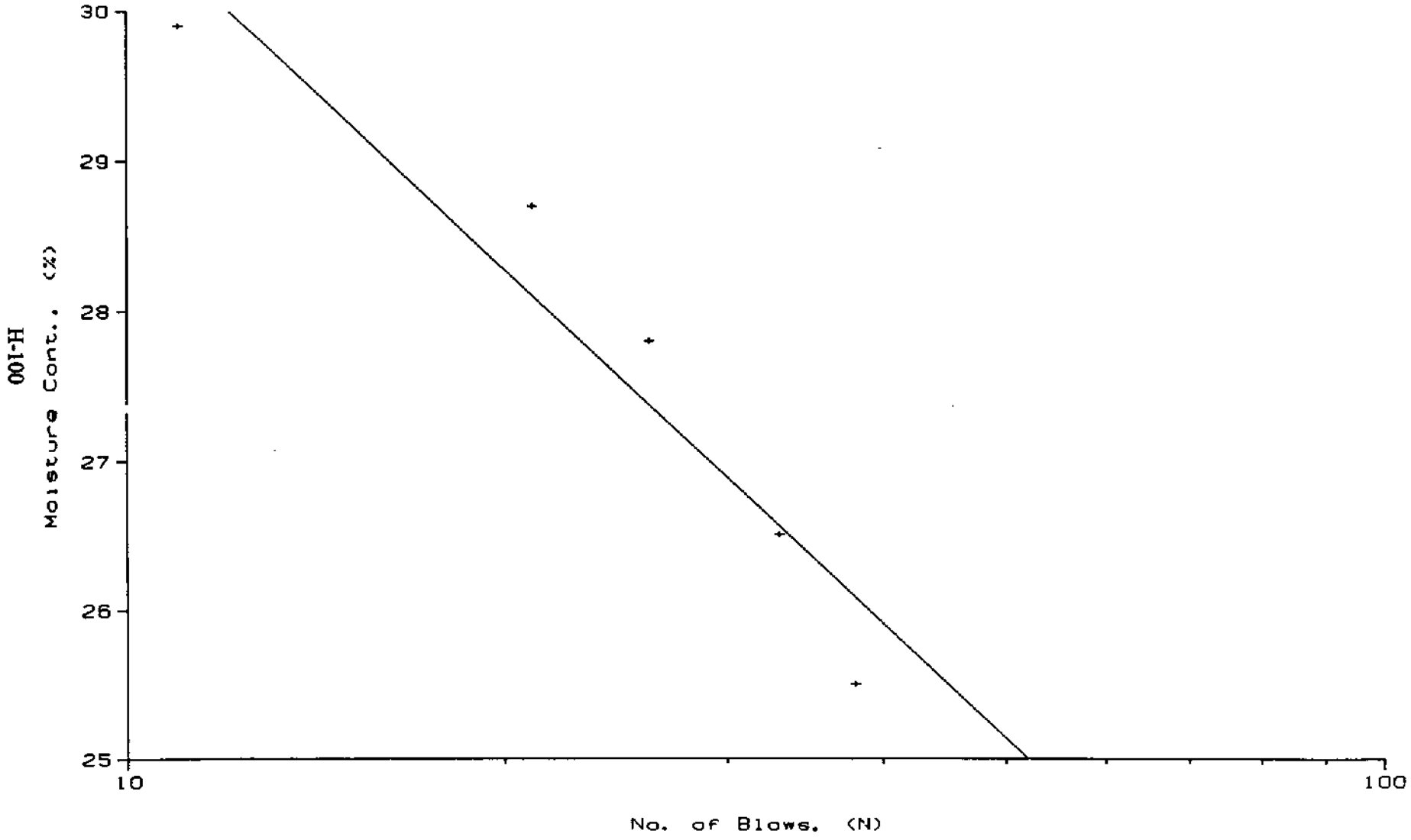
Tare No.	61	37	15	B6	4
Soil & Tare Wet Wt.	16.38	19.20	18.91	16.90	33.22
Soil & Tare Dry Wt.	13.47	15.77	15.68	14.21	30.61
Tare Wt.	3.75	3.83	4.06	4.05	20.37
Moisture Content; %	29.9	28.7	27.8	26.5	25.5
No. of Blows; N	11	21	26	33	38

PLASTIC LIMIT DETERMINATION

Tare No.	3	8	9		
Soil & Tare Wet Wt.	35.42	35.39	37.94		
Soil & Tare Dry Wt.	33.00	32.93	35.22		
Tare Wt.	19.75	19.77	20.51		
Moisture Content; %	18.3	18.7	18.5		

LL = 28 **PL = 19** **PI = 9**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
BK 0834



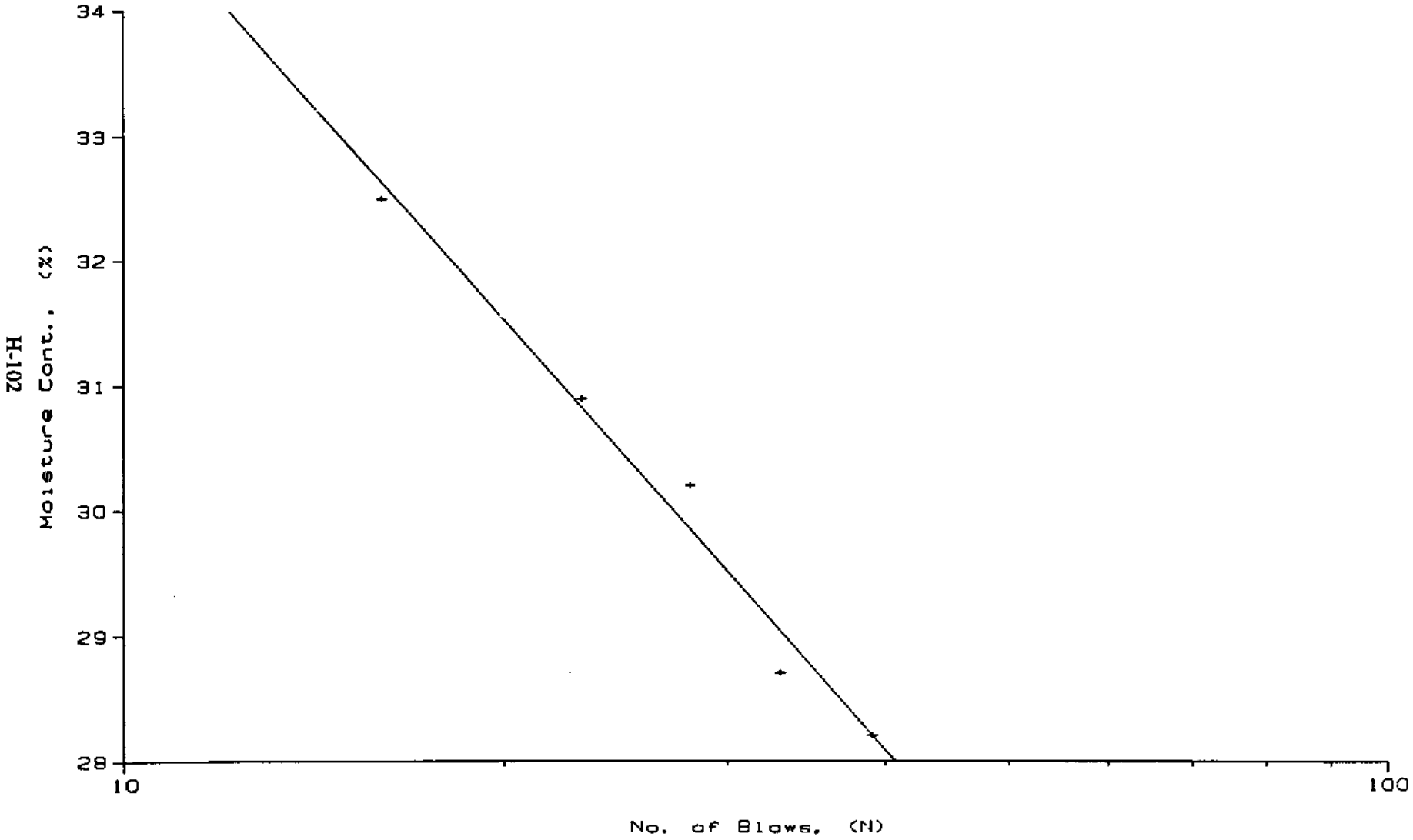
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0835	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION					
Tare No.	508	E42	809	716	A79
Soil & Tare Wet Wt.	54.43	54.24	53.25	54.57	54.27
Soil & Tare Dry Wt.	50.90	50.63	49.76	50.85	50.93
Tare Wt.	40.05	38.95	38.20	37.91	39.09
Moisture Content; %	32.5	30.9	30.2	28.7	28.2
No. of Blows; N	16	23	28	33	39
PLASTIC LIMIT DETERMINATION					
Tare No.	T8	520	E30		
Soil & Tare Wet Wt.	52.46	55.30	54.48		
Soil & Tare Dry Wt.	50.10	52.69	51.91		
Tare Wt.	37.23	38.54	37.85		
Moisture Content; %	18.3	18.4	18.3		
	LL = 31		**PL = 18**		**PI = 13**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
BK 0835



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S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0879	**Date:**	06/17/98

LIQUID LIMIT DETERMINATION

Tare No.	46	47	21	36	44
Soil & Tare Wet Wt.	21.71	16.50	23.18	19.32	19.58
Soil & Tare Dry Wt.	17.98	13.94	19.43	16.37	16.57
Tare Wt.	3.95	3.76	4.04	3.80	3.71
Moisture Content; %	26.6	25.1	24.4	23.5	23.4
No. of Blows; N	11	20	26	31	36

PLASTIC LIMIT DETERMINATION

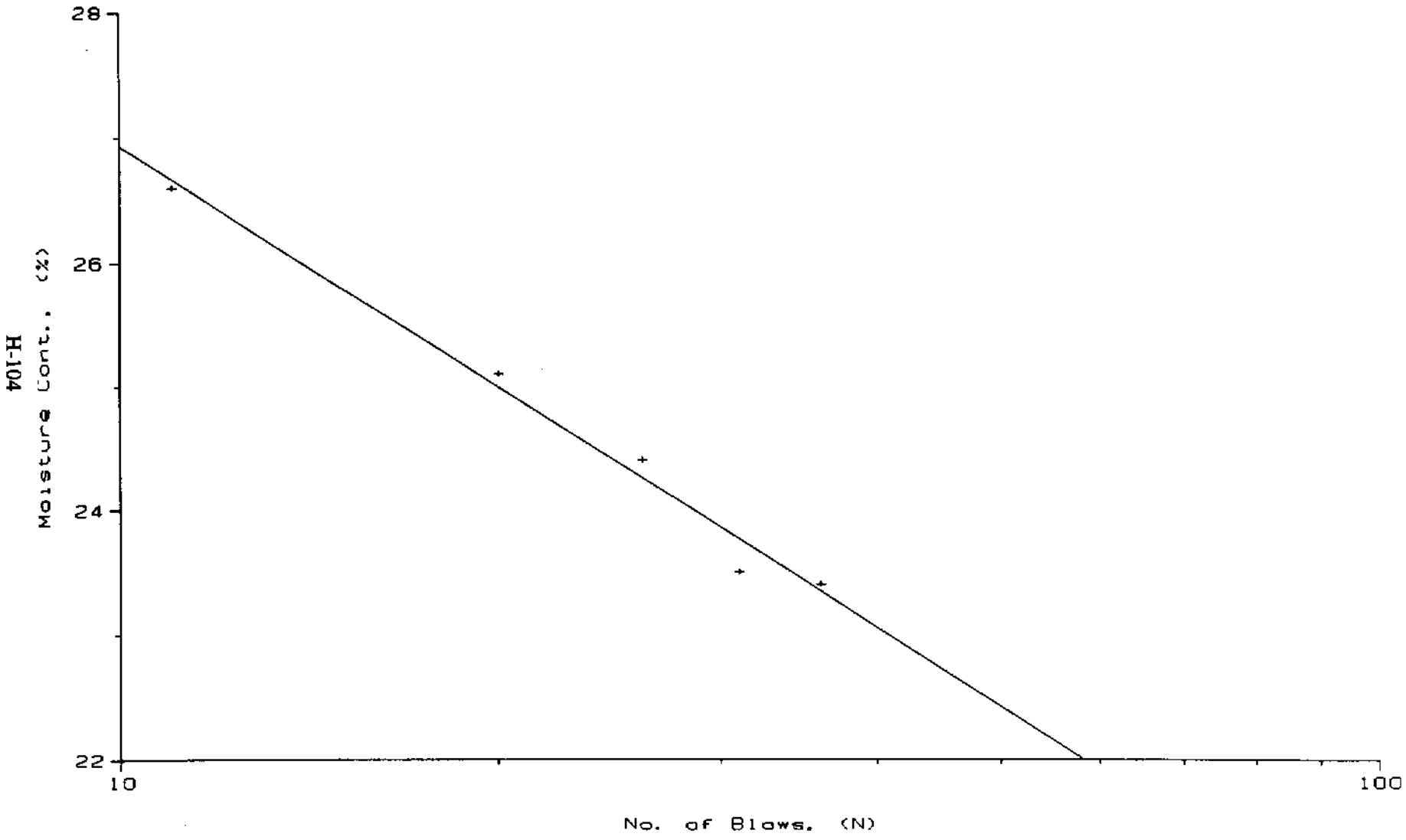
Tare No.	39	4	T		
Soil & Tare Wet Wt.	21.62	22.89	20.19		
Soil & Tare Dry Wt.	18.43	19.69	17.40		
Tare Wt.	3.78	3.95	4.05		
Moisture Content; %	21.8	20.3	20.9		

LL = 24 **PL = 21** **PI = 3**

LIQUID LIMIT

1439-98-307, SAIC, Ravenna Army Ammo Plant

BK 0879



S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	BK 0954	**Date:**	06/17/98

LIQUID LIMIT DETERMINATION

Tare No.	FO	31	G	35	B1
Soil & Tare Wet Wt.	17.67	17.96	18.76	17.66	17.73
Soil & Tare Dry Wt.	13.34	13.59	14.26	13.55	13.75
Tare Wt.	4.05	3.85	3.94	3.93	3.80
Moisture Content; %	46.6	44.9	43.6	42.7	40.0
No. of Blows; N	18	23	29	34	39

PLASTIC LIMIT DETERMINATION

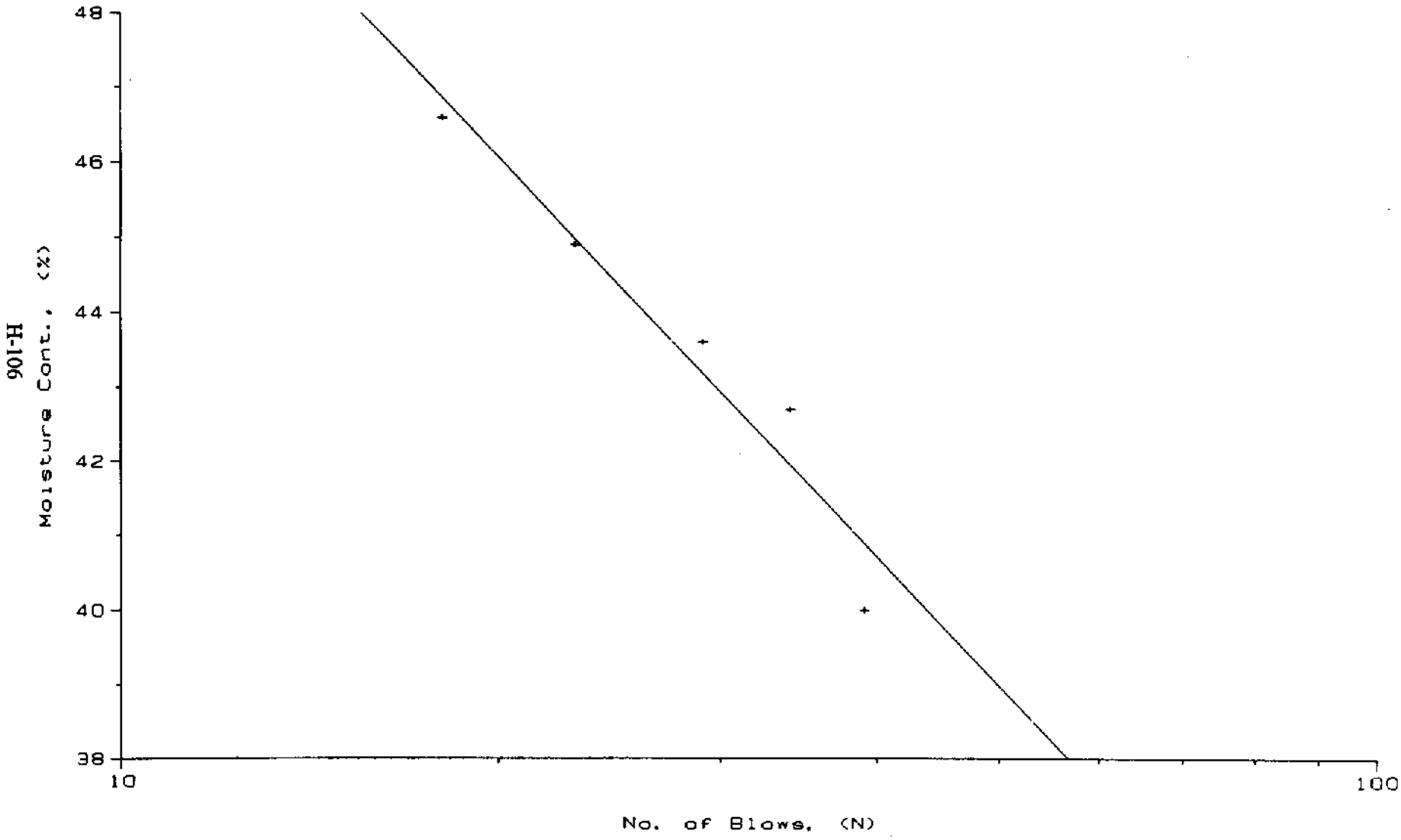
Tare No.	401	H	60		
Soil & Tare Wet Wt.	15.79	15.82	13.95		
Soil & Tare Dry Wt.	14.11	13.85	12.39		
Tare Wt.	3.82	3.98	3.82		
Moisture Content; %	16.3	20.0	18.2		

LL = 44 **PL = 18** **PI = 26**

LIQUID LIMIT

1439-98-307, SAIC, Ravenna Army Ammo Plant

BK 0954



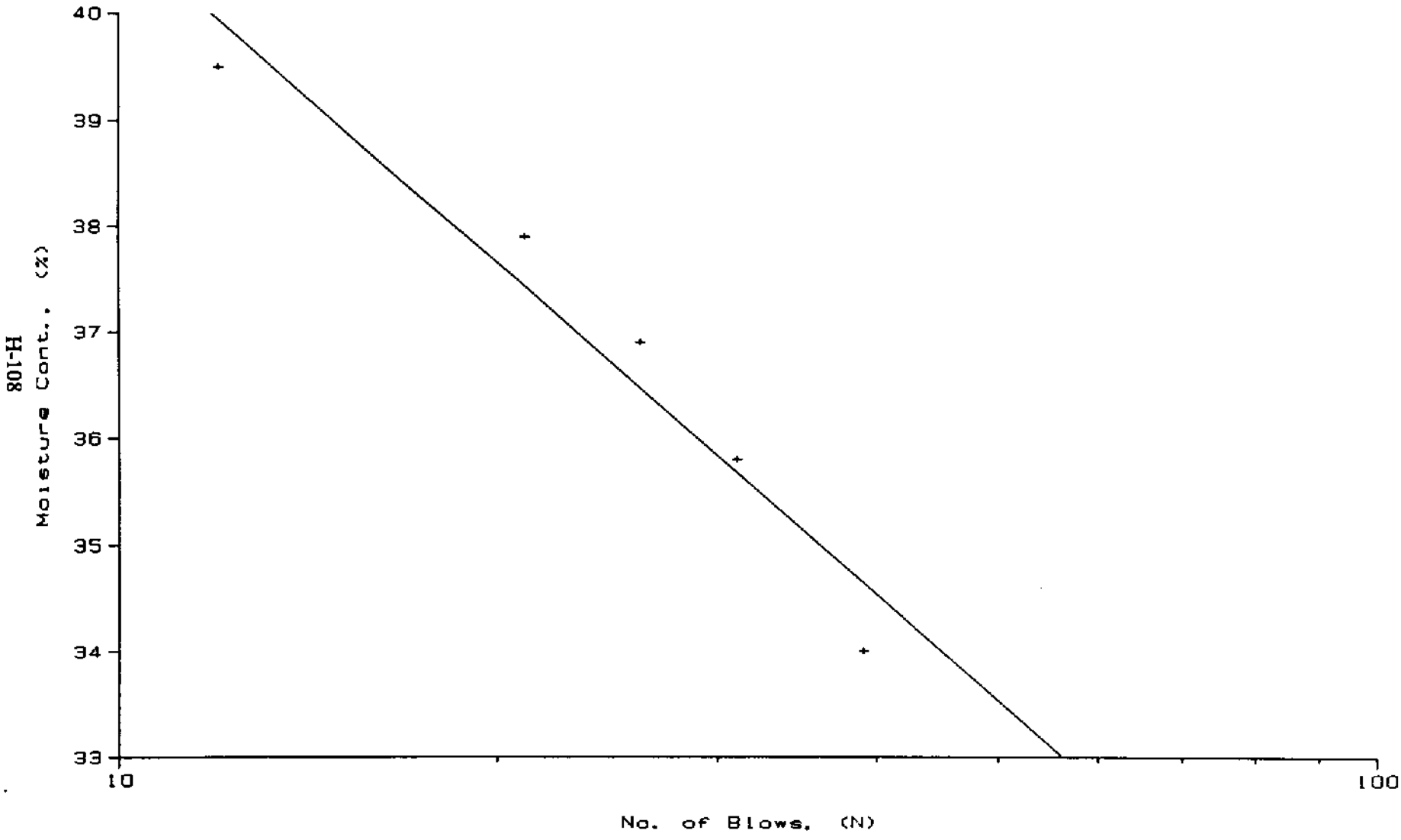
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0694	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION					
Tare No.	13	B10	10	16	60
Soil & Tare Wet Wt.	18.15	16.85	16.51	18.79	18.02
Soil & Tare Dry Wt.	14.16	13.30	13.14	14.91	14.42
Tare Wt.	4.07	3.93	4.01	4.08	3.82
Moisture Content; %	39.5	37.9	36.9	35.8	34.0
No. of Blows; N	12	21	26	31	39
PLASTIC LIMIT DETERMINATION					
Tare No.	H	401	B1		
Soil & Tare Wet Wt.	14.20	11.82	15.60		
Soil & Tare Dry Wt.	12.34	10.40	13.56		
Tare Wt.	3.99	3.83	3.81		
Moisture Content; %	22.3	21.6	20.9		
LL = 37			**PL = 22**		**PI = 15**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0694



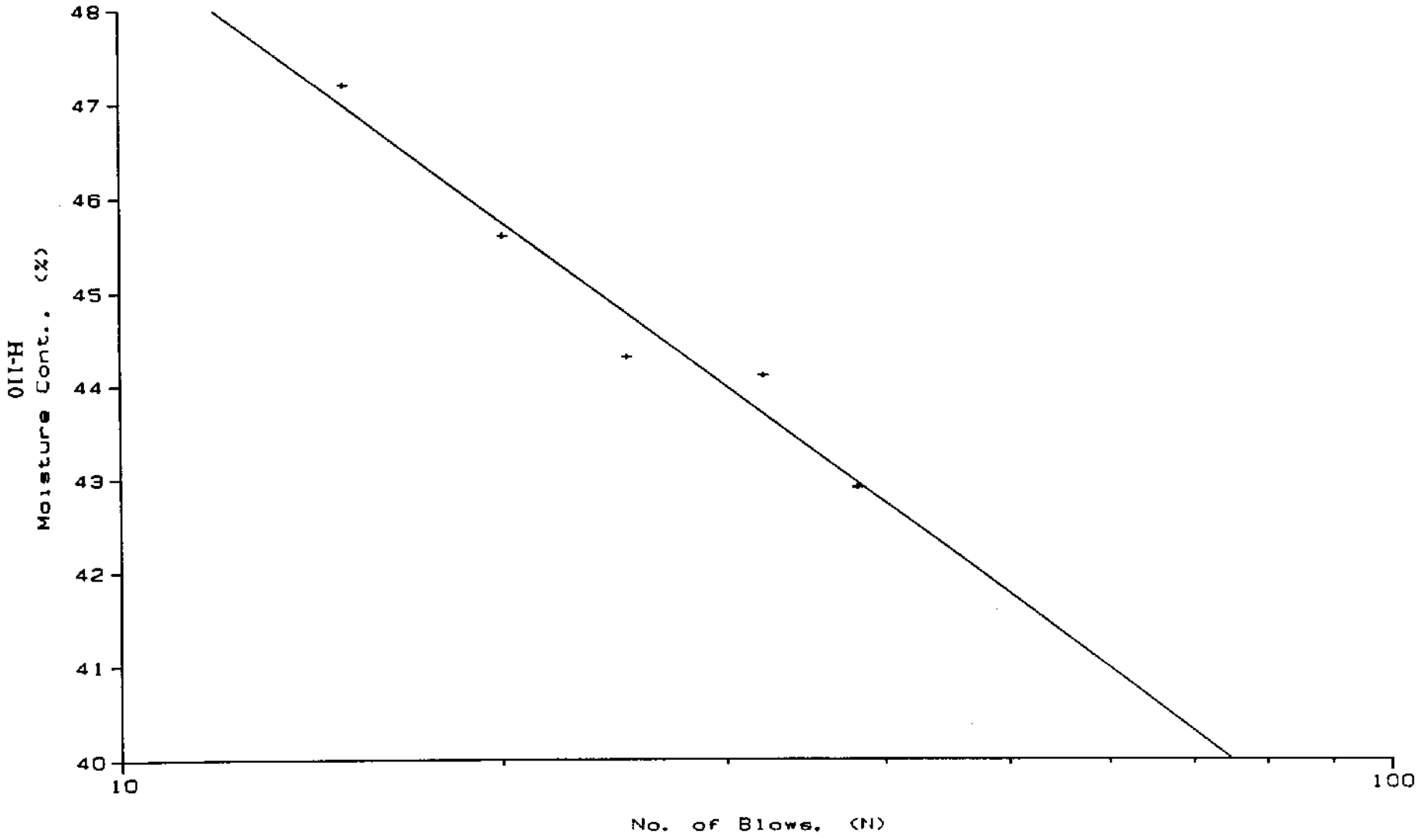
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	ASTM D:	4318
Job Name:	SAIC, RVAAP	Operator:	bd
Sample No:	WB 0696	Date:	06/24/98

LIQUID LIMIT DETERMINATION					
Tare No.	46	47	21	36	44
Soil & Tare Wet Wt.	16.25	13.63	15.06	15.82	15.62
Soil & Tare Dry Wt.	12.31	10.54	11.68	12.14	12.05
Tare Wt.	3.96	3.76	4.05	3.80	3.72
Moisture Content; %	47.2	45.6	44.3	44.1	42.9
No. of Blows; N	15	20	25	32	38
PLASTIC LIMIT DETERMINATION					
Tare No.	39	4	T		
Soil & Tare Wet Wt.	14.92	14.50	15.69		
Soil & Tare Dry Wt.	12.64	12.36	13.25		
Tare Wt.	3.79	3.96	4.05		
Moisture Content; %	25.8	25.5	26.5		
LL = 45			**PL = 26**		**PI = 19**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0696



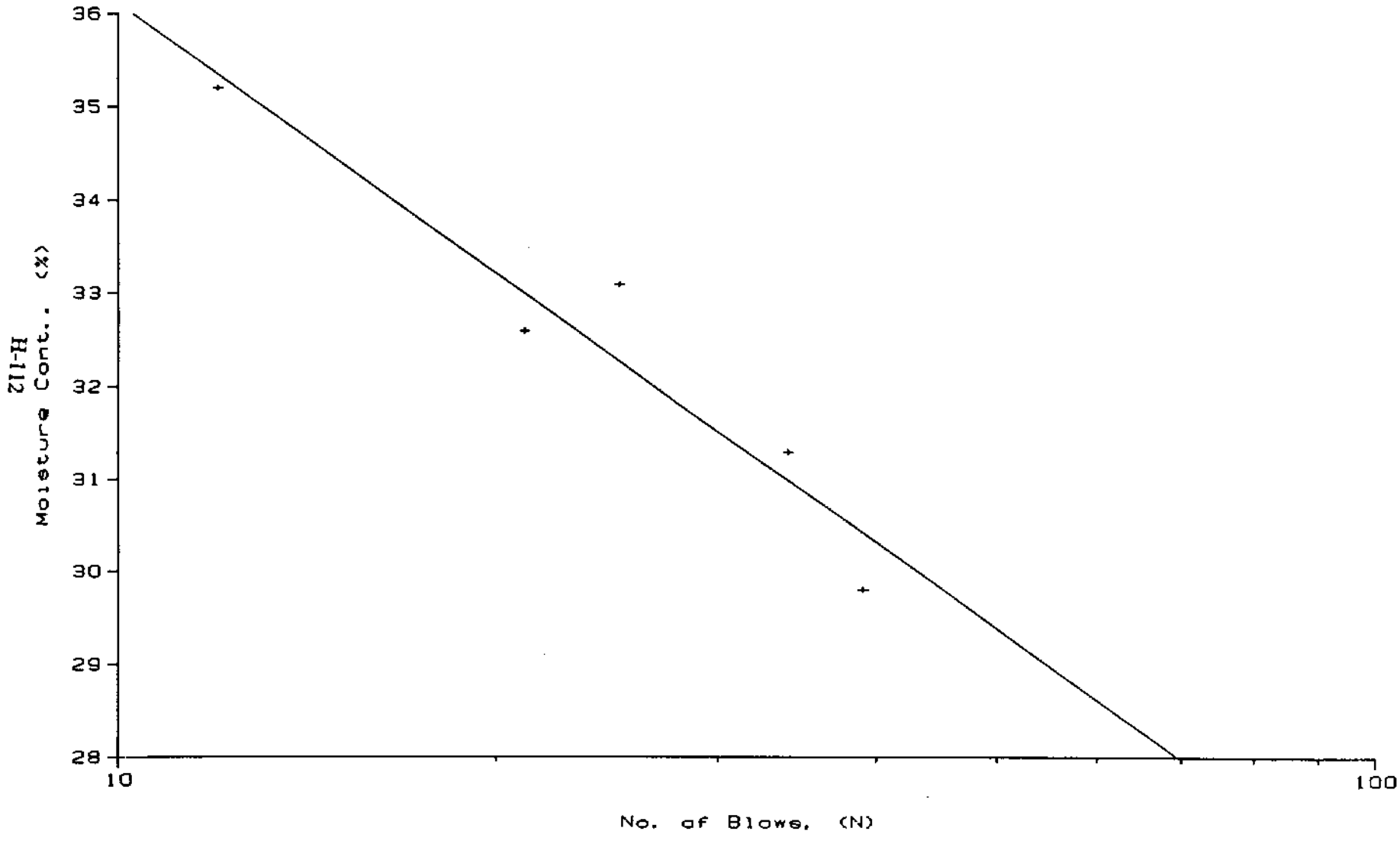
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	ASTM D:	4318
Job Name:	SAIC, RVAAP	Operator:	bd
Sample No:	WB 0701	Date:	06/24/98

LIQUID LIMIT DETERMINATION					
Tare No.	1B	10	B10	13	16
Soil & Tare Wet Wt.	14.67	12.45	12.77	12.46	11.77
Soil & Tare Dry Wt.	11.91	10.37	10.57	10.46	10.01
Tare Wt.	4.08	4.00	3.92	4.08	4.11
Moisture Content; %	35.2	32.6	33.1	31.3	29.8
No. of Blows; N	12	21	25	34	39
PLASTIC LIMIT DETERMINATION					
Tare No.	A20	A11	50		
Soil & Tare Wet Wt.	15.41	16.93	14.87		
Soil & Tare Dry Wt.	13.50	14.76	12.98		
Tare Wt.	3.94	3.94	3.84		
Moisture Content; %	20.0	20.1	20.7		
LL = 32			**PL = 20**		**PI = 12**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0701



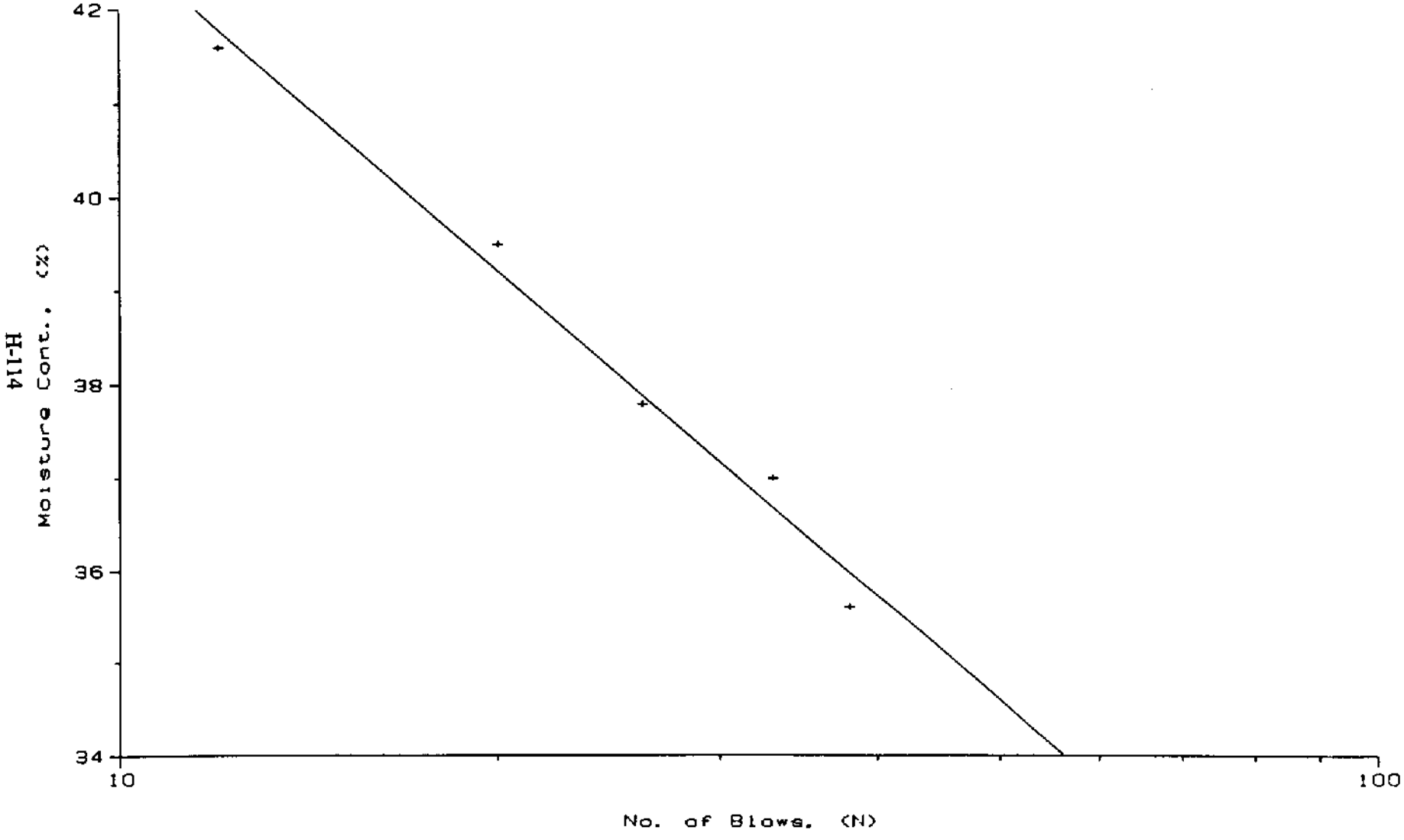
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0723	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION					
Tare No.	A4	40	25	M	U
Soil & Tare Wet Wt.	15.52	16.20	16.09	18.33	17.44
Soil & Tare Dry Wt.	12.11	12.69	12.73	14.46	13.92
Tare Wt.	3.91	3.81	3.85	4.01	4.03
Moisture Content; %	41.6	39.5	37.8	37.0	35.6
No. of Blows; N	12	20	26	33	38
PLASTIC LIMIT DETERMINATION					
Tare No.	A3	7	5		
Soil & Tare Wet Wt.	16.36	16.15	13.55		
Soil & Tare Dry Wt.	14.36	14.11	12.14		
Tare Wt.	3.95	4.15	4.10		
Moisture Content; %	19.2	20.5	17.5		
LL = 38			**PL = 19**		**PI = 19**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0723



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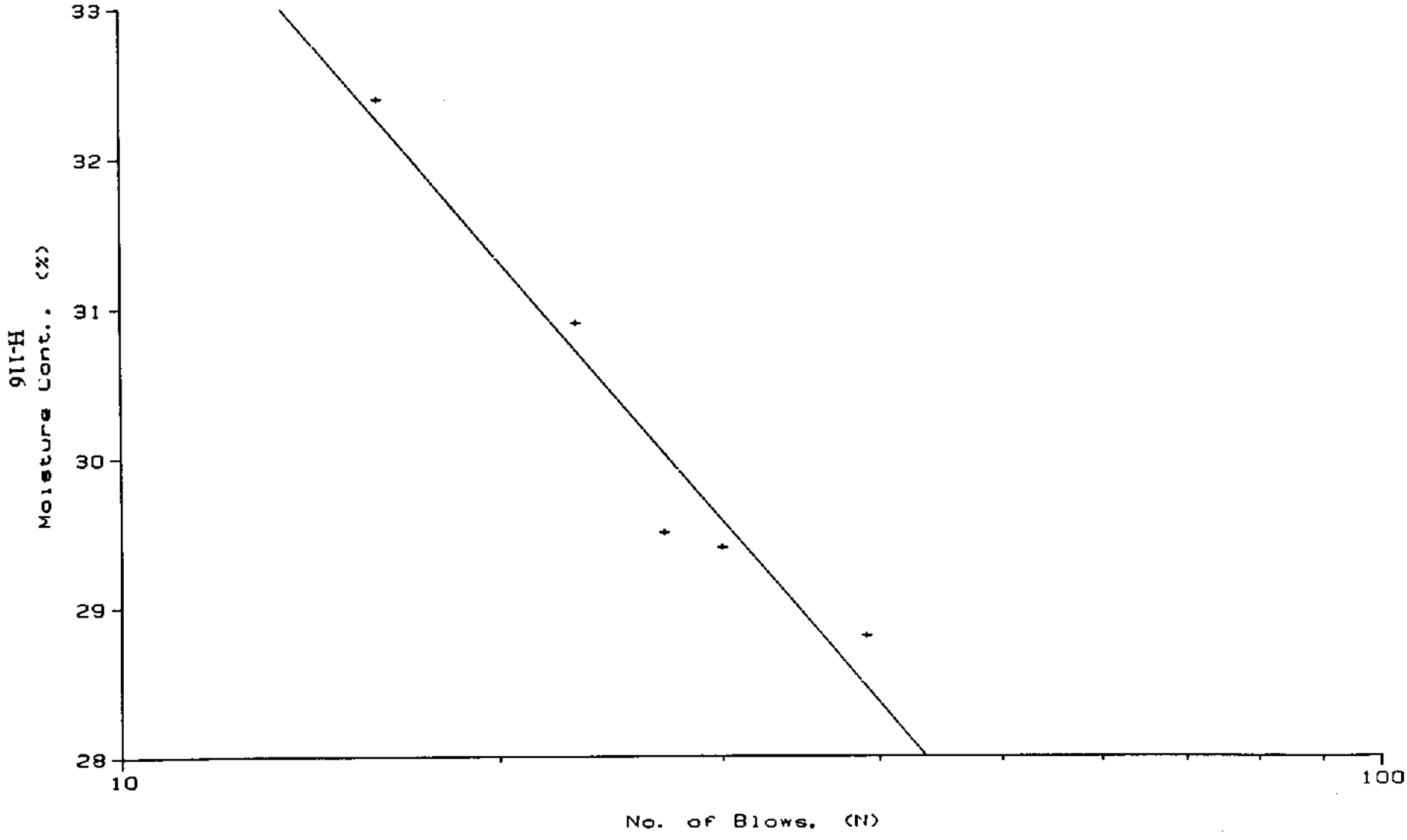
ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0730	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION					
Tare No.	114	A18	Q	D	T
Soil & Tare Wet Wt.	18.05	18.51	18.50	20.21	18.87
Soil & Tare Dry Wt.	14.65	15.07	15.23	16.53	15.55
Tare Wt.	4.14	3.93	4.15	4.00	4.04
Moisture Content; %	32.4	30.9	29.5	29.4	28.8
No. of Blows; N	16	23	27	30	39
PLASTIC LIMIT DETERMINATION					
Tare No.	4	39	44		
Soil & Tare Wet Wt.	21.23	20.24	22.93		
Soil & Tare Dry Wt.	18.02	17.26	19.33		
Tare Wt.	3.95	3.77	3.70		
Moisture Content; %	22.8	22.1	23.0		
	LL = 31		**PL = 23**		**PI = 8**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0730



S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0735	**Date:**	06/24/98

LIQUID LIMIT DETERMINATION

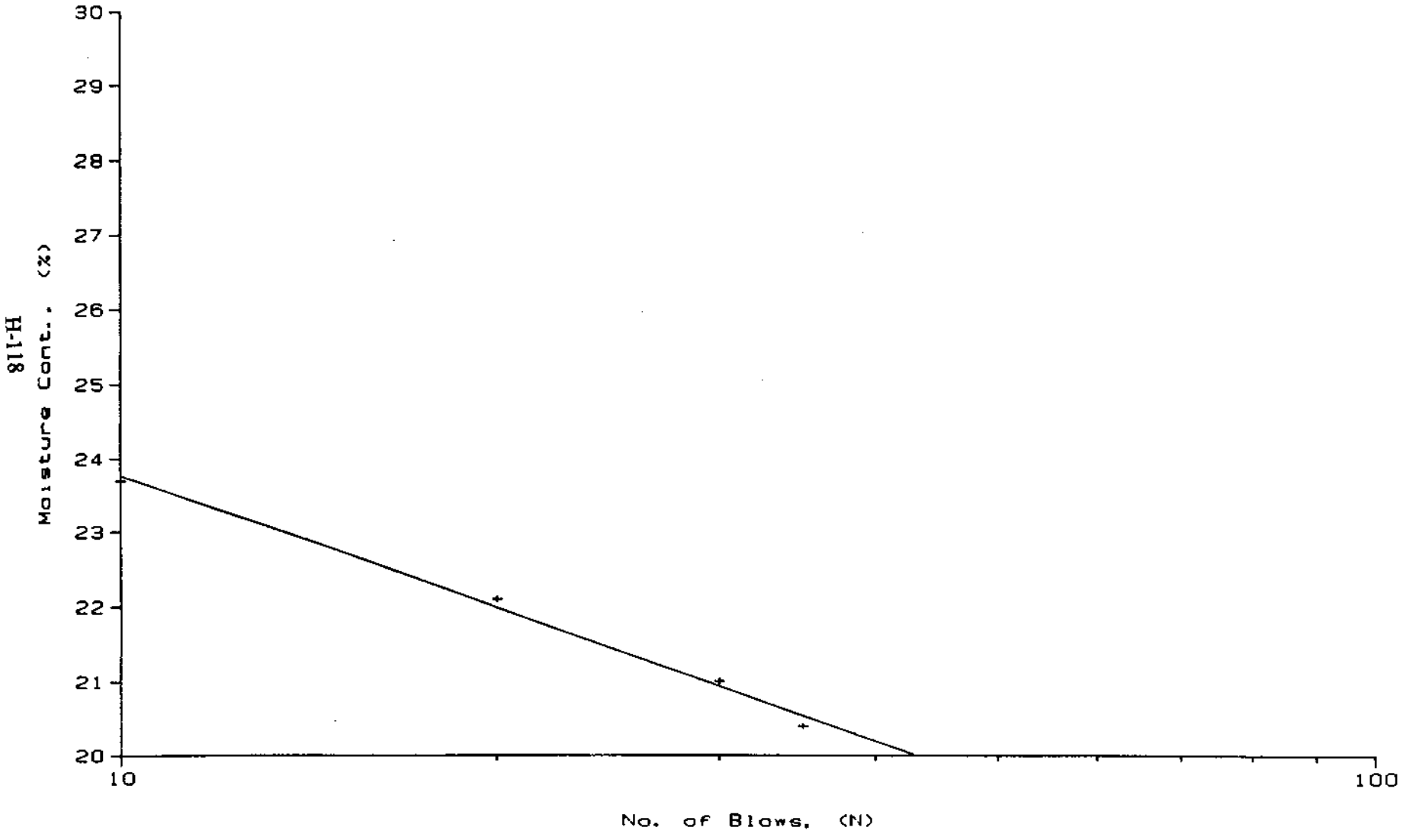
Tare No.	Fo	31	35	B1	
Soil & Tare Wet Wt.	17.73	17.61	14.18	14.57	
Soil & Tare Dry Wt.	15.11	15.12	12.40	12.75	
Tare Wt.	4.07	3.86	3.94	3.81	
Moisture Content; %	23.7	22.1	21.0	20.4	
No. of Blows; N	10	20	30	35	

PLASTIC LIMIT DETERMINATION

Tare No.	401	H	60		
Soil & Tare Wet Wt.	17.30	19.49	21.75		
Soil & Tare Dry Wt.	14.95	16.79	18.71		
Tare Wt.	3.82	3.98	3.81		
Moisture Content; %	21.1	21.1	20.4		

LL = 22 **PL = 21** **PI = 1**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0735



S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0749	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION

Tare No.	18	11	14	A15	20
Soil & Tare Wet Wt.	21.20	18.06	17.86	17.71	19.93
Soil & Tare Dry Wt.	16.48	14.51	14.41	14.29	16.03
Tare Wt.	4.06	4.10	4.11	3.97	3.95
Moisture Content; %	38.0	34.1	33.5	33.1	32.3
No. of Blows; N	13	21	25	30	35

PLASTIC LIMIT DETERMINATION

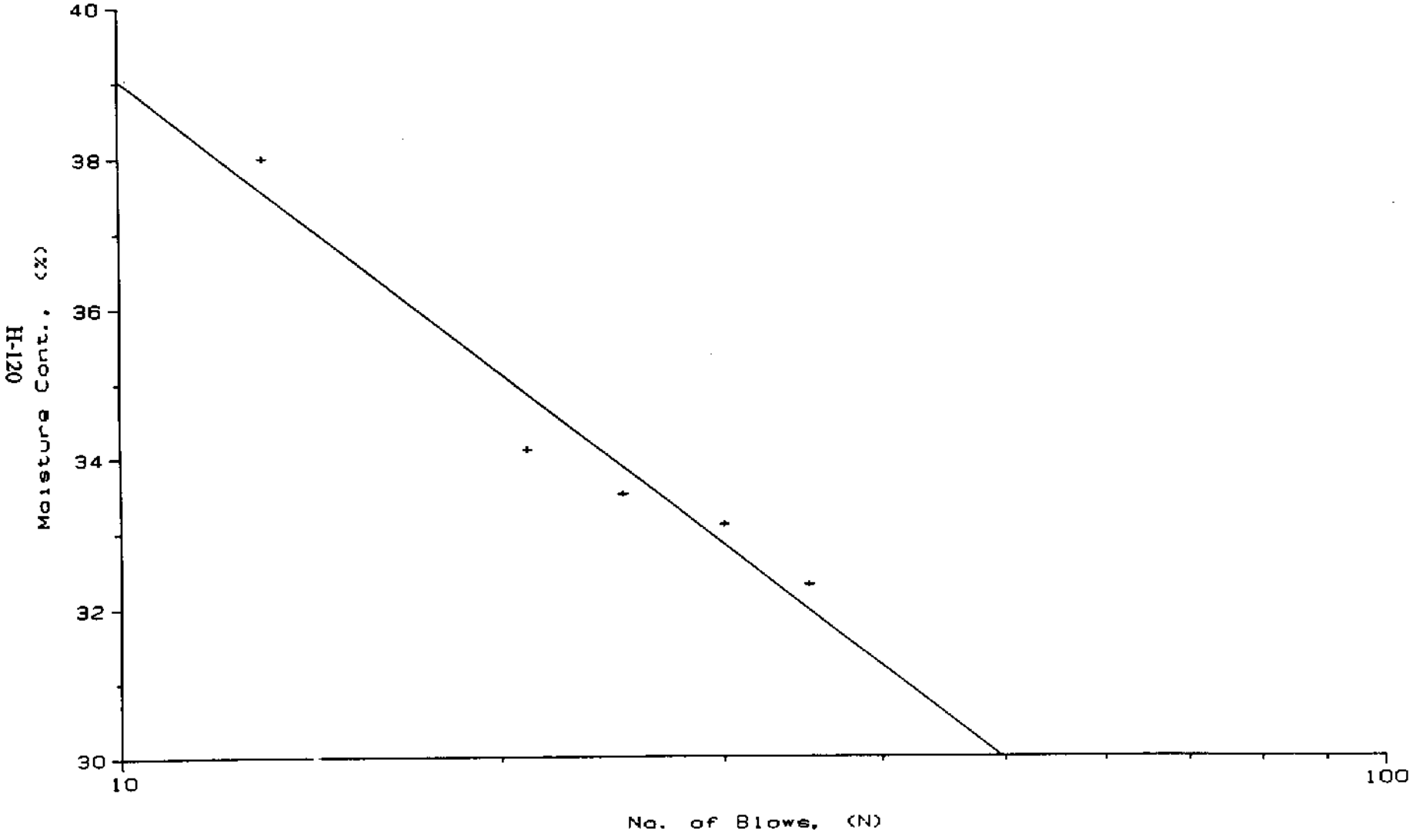
Tare No.	26	Y	C		
Soil & Tare Wet Wt.	13.96	16.03	14.08		
Soil & Tare Dry Wt.	12.47	14.14	12.61		
Tare Wt.	3.85	4.16	4.04		
Moisture Content; %	17.3	18.9	17.2		

LL = 34 **PL = 18** **PI = 16**

LIQUID LIMIT

1439-98-307, SAIC, RVAAP

WB 0749



S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0752	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION

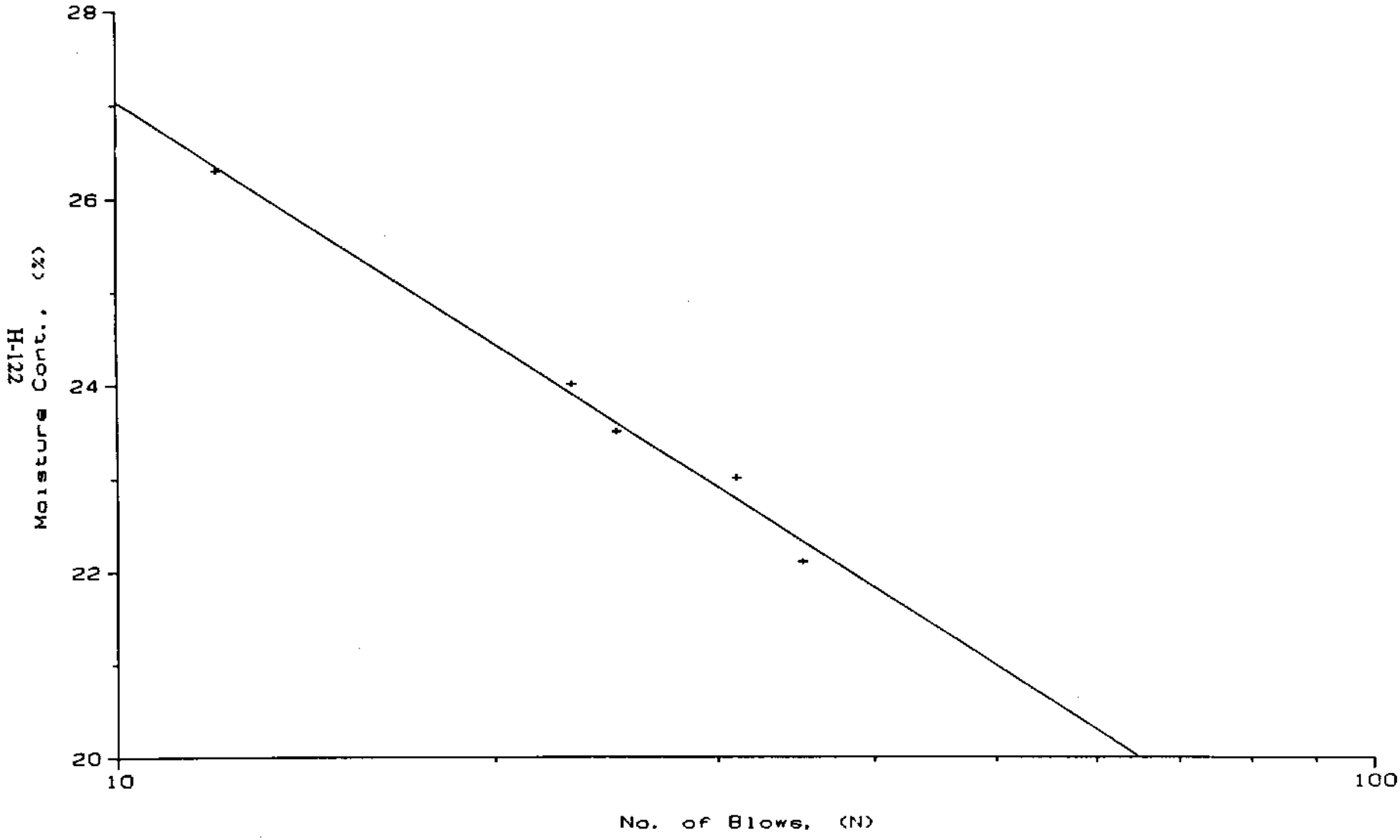
Tare No.	1	3	38	45	E
Soil & Tare Wet Wt.	18.92	19.98	18.61	18.68	19.31
Soil & Tare Dry Wt.	15.84	16.90	15.80	15.89	16.55
Tare Wt.	4.11	4.05	3.82	3.74	4.07
Moisture Content; %	26.3	24.0	23.5	23.0	22.1
No. of Blows; N	12	23	25	31	35

PLASTIC LIMIT DETERMINATION

Tare No.	1A	57	2		
Soil & Tare Wet Wt.	16.62	14.36	17.15		
Soil & Tare Dry Wt.	15.16	13.15	15.64		
Tare Wt.	4.07	3.86	4.01		
Moisture Content; %	13.2	13.0	13.0		

LL = 24 **PL = 13** **PI = 11**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0752



S&ME

ATTERBERG LIMITS

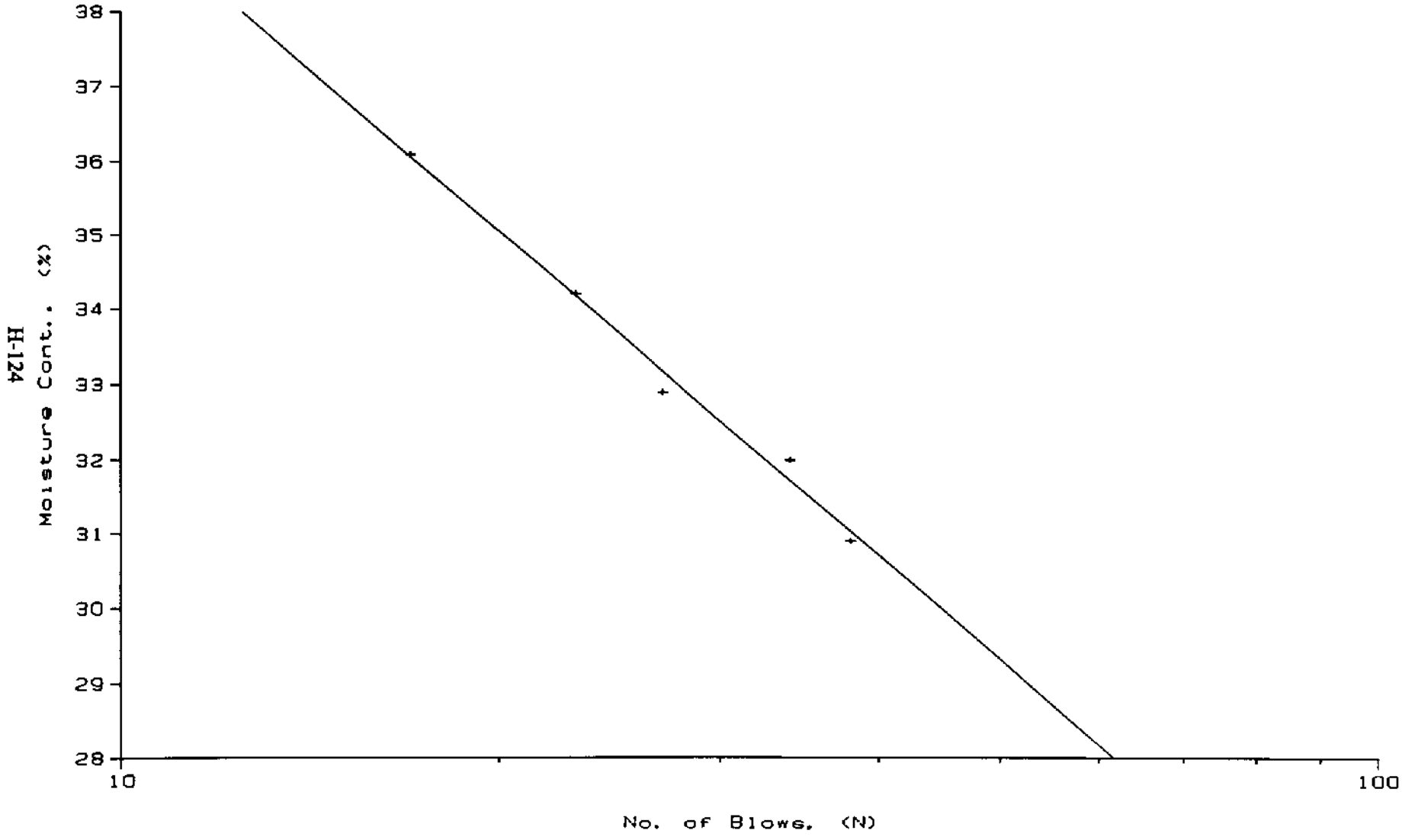
Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0754	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION					
Tare No.	A19	9	A	31	12
Soil & Tare Wet Wt.	18.26	18.94	19.12	18.79	19.47
Soil & Tare Dry Wt.	14.46	15.19	15.41	15.21	15.87
Tare Wt.	3.92	4.24	4.12	4.02	4.23
Moisture Content; %	36.1	34.2	32.9	32.0	30.9
No. of Blows; N	17	23	27	34	38

PLASTIC LIMIT DETERMINATION					
Tare No.	Z	6	43		
Soil & Tare Wet Wt.	16.25	15.45	14.13		
Soil & Tare Dry Wt.	14.54	13.93	12.64		
Tare Wt.	4.10	4.02	3.80		
Moisture Content; %	16.4	15.3	16.9		

LL = 34 **PL = 16** **PI = 18**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0754



S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0758	**Date:**	06/24/98

LIQUID LIMIT DETERMINATION

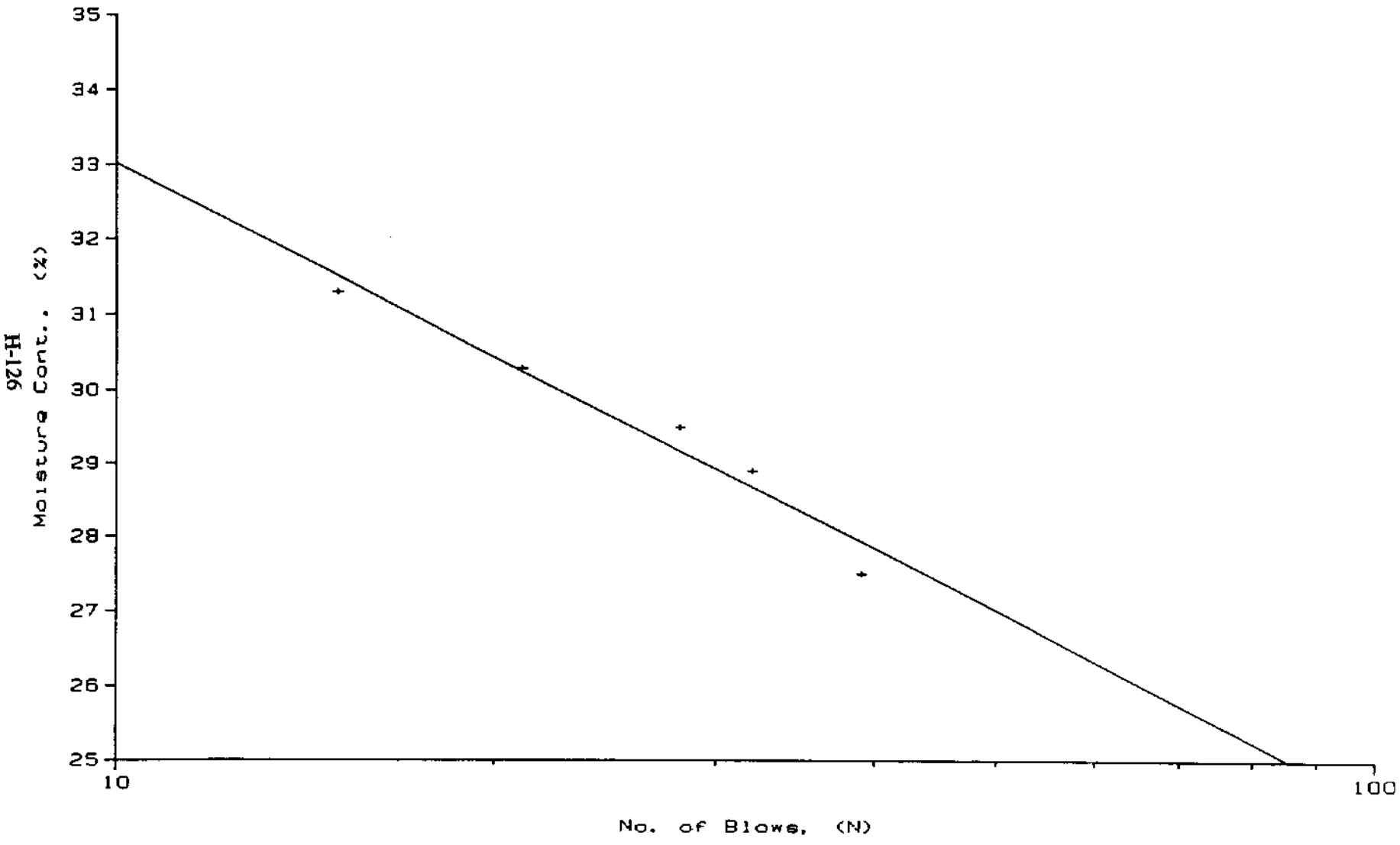
Tare No.	D	Q	A18	114	A5
Soil & Tare Wet Wt.	19.67	20.08	17.52	18.99	19.20
Soil & Tare Dry Wt.	15.94	16.38	14.43	15.66	15.91
Tare Wt.	4.01	4.17	3.94	4.15	3.95
Moisture Content; %	31.3	30.3	29.5	28.9	27.5
No. of Blows; N	15	21	28	32	39

PLASTIC LIMIT DETERMINATION

Tare No.	A8	48	W		
Soil & Tare Wet Wt.	18.43	18.65	18.83		
Soil & Tare Dry Wt.	16.16	16.34	16.54		
Tare Wt.	3.91	3.72	4.00		
Moisture Content; %	18.5	18.3	18.3		

LL = 30 **PL = 18** **PI = 12**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0758



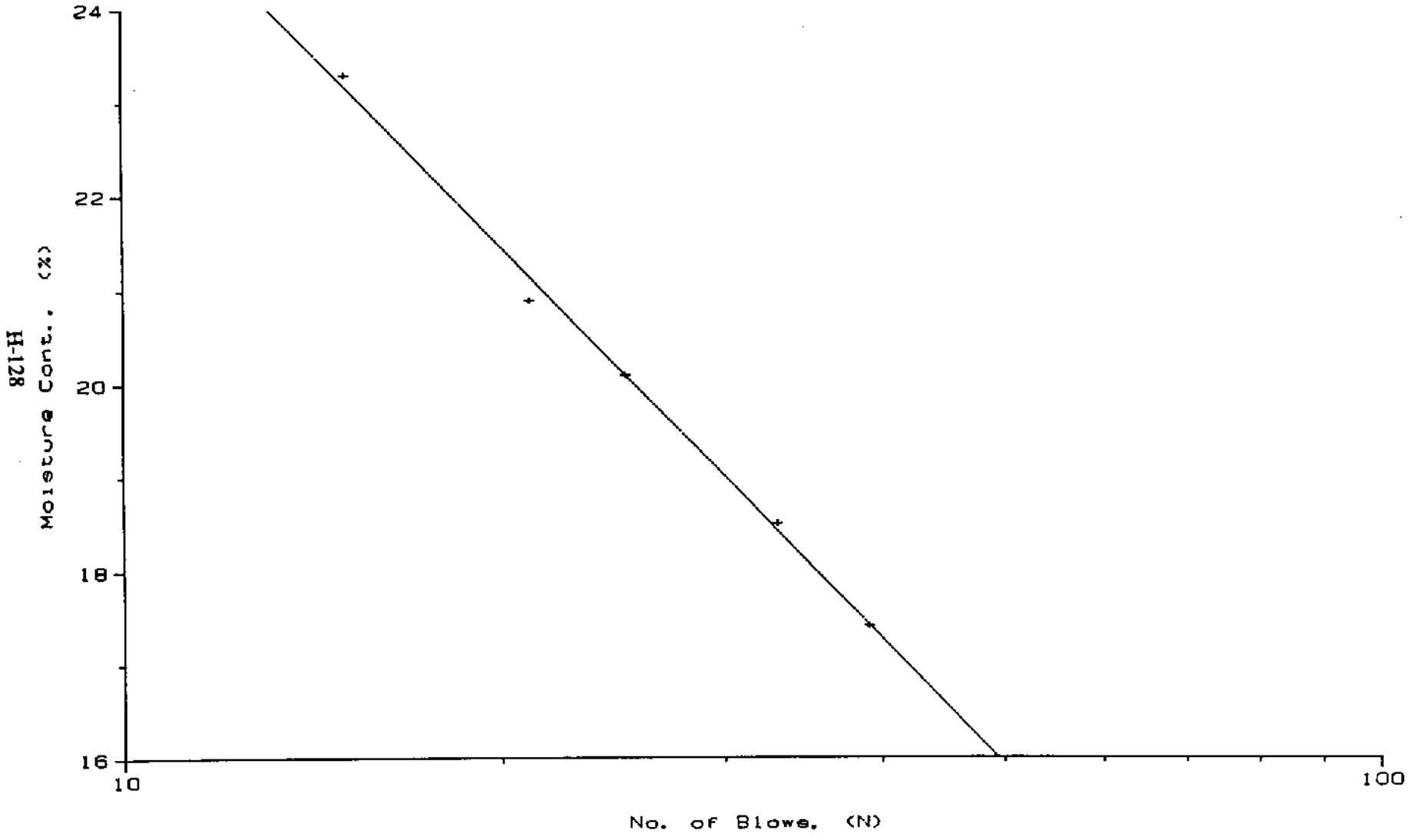
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0759	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION					
Tare No.	547	DK	920	935	B30
Soil & Tare Wet Wt.	53.43	54.15	54.13	49.16	56.17
Soil & Tare Dry Wt.	50.56	51.33	51.46	47.19	53.40
Tare Wt.	38.23	37.85	38.17	36.56	37.52
Moisture Content; %	23.3	20.9	20.1	18.5	17.4
No. of Blows; N	15	21	25	33	39
PLASTIC LIMIT DETERMINATION					
Tare No.	103	598	SM		
Soil & Tare Wet Wt.	60.77	62.40	59.02		
Soil & Tare Dry Wt.	57.81	59.69	56.66		
Tare Wt.	36.50	38.34	37.74		
Moisture Content; %	13.9	12.7	12.5		
LL = 20			**PL = 13**		**PI = 7**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0759



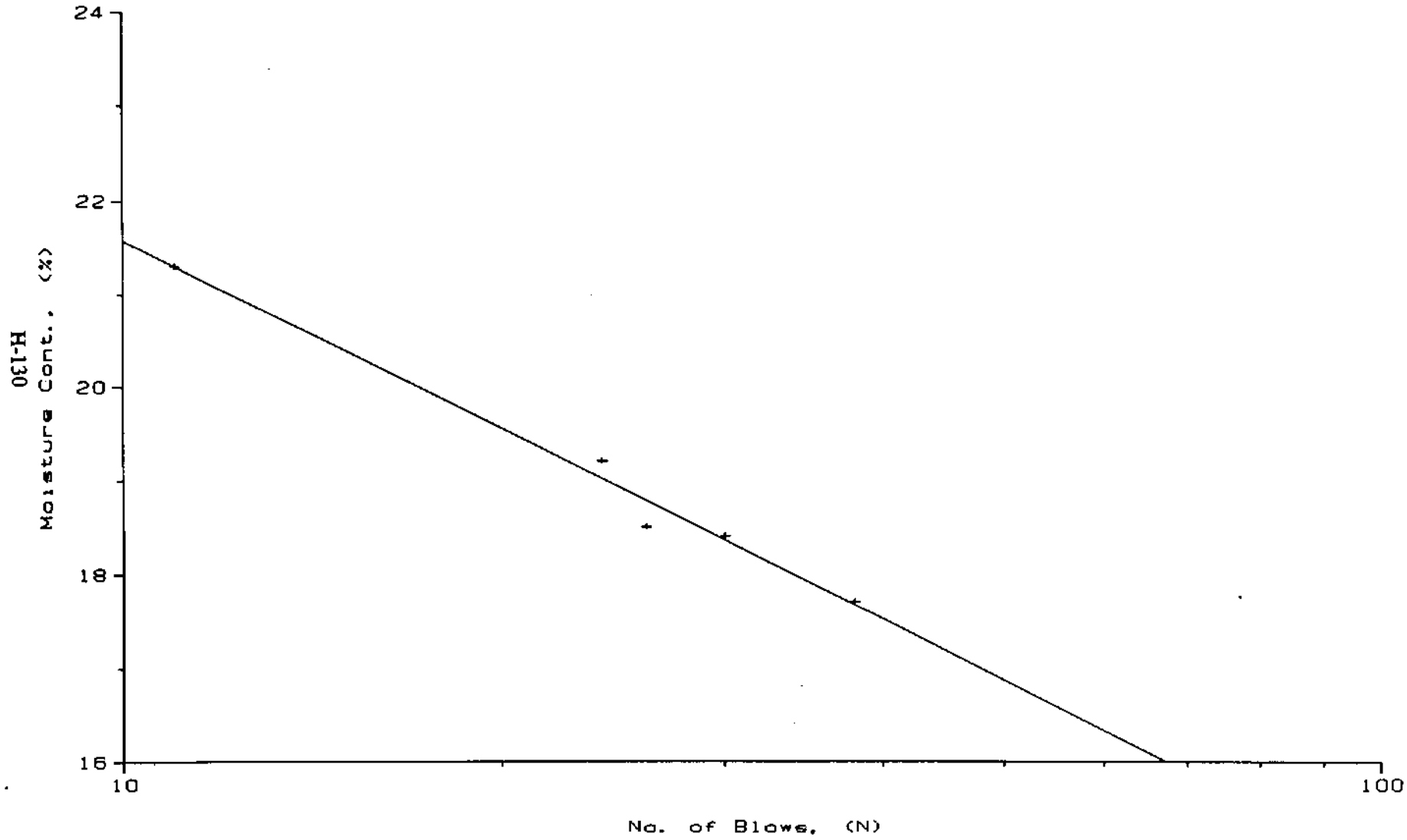
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0764	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION					
Tare No.	725	A57	2	651	695
Soil & Tare Wet Wt.	53.12	53.90	55.05	52.54	58.60
Soil & Tare Dry Wt.	50.49	51.55	52.28	50.45	55.73
Tare Wt.	38.15	39.32	37.28	39.08	39.49
Moisture Content; %	21.3	19.2	18.5	18.4	17.7
No. of Blows; N	11	24	26	30	38
PLASTIC LIMIT DETERMINATION					
Tare No.	522	750	546		
Soil & Tare Wet Wt.	60.33	60.38	59.62		
Soil & Tare Dry Wt.	57.88	58.20	57.27		
Tare Wt.	38.72	39.92	38.90		
Moisture Content; %	12.8	11.9	12.8		
LL = 19			**PL = 13**		**PI = 6**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0764



S&ME

ATTERBERG LIMITS

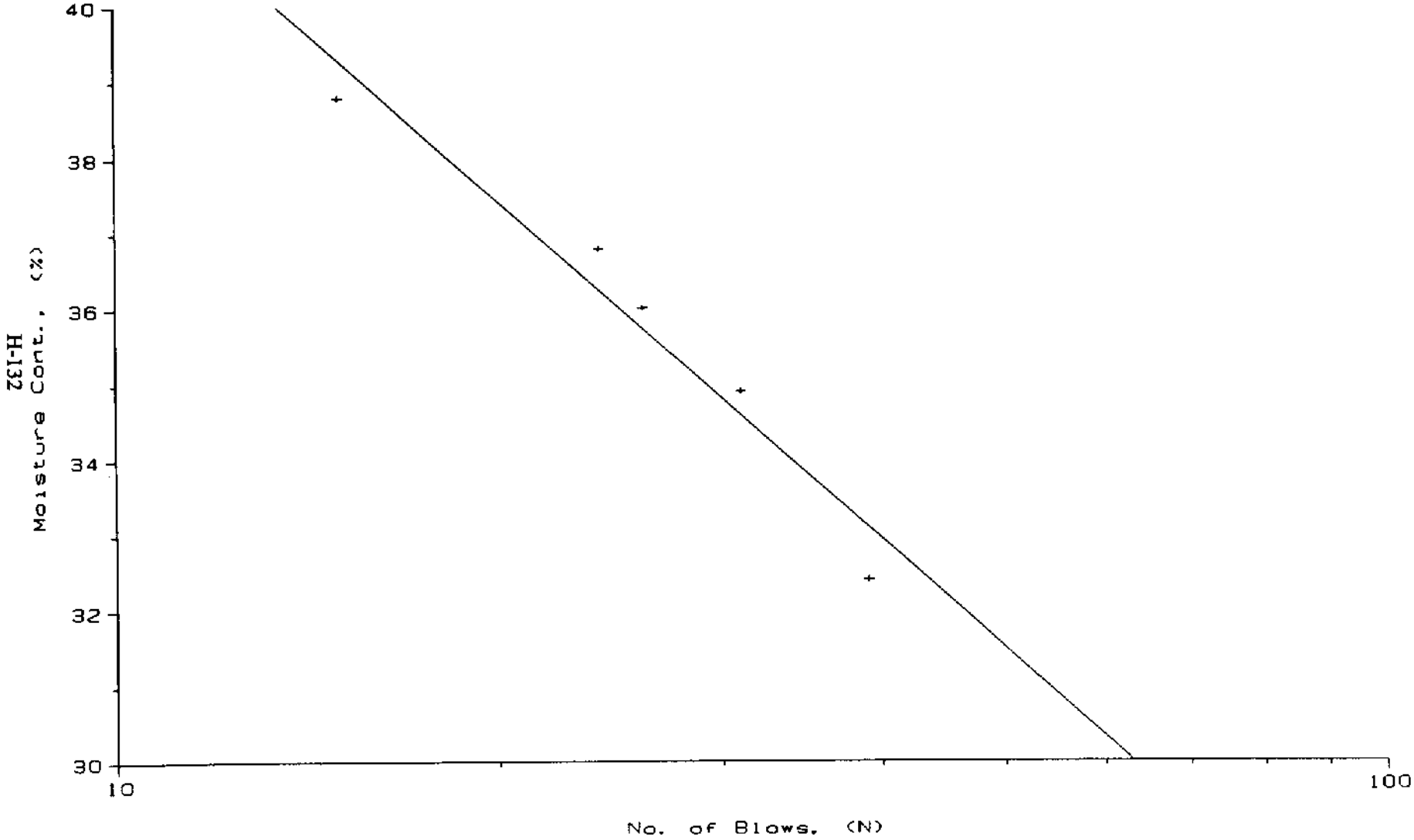
Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0927	**Date:**	06/17/98

LIQUID LIMIT DETERMINATION					
Tare No.	725	A57	2	651	695
Soil & Tare Wet Wt.	52.12	54.24	51.00	54.58	55.26
Soil & Tare Dry Wt.	48.22	50.22	47.37	50.57	51.40
Tare Wt.	38.16	39.30	37.29	39.08	39.48
Moisture Content; %	38.8	36.8	36.0	34.9	32.4
No. of Blows; N	15	24	26	31	39
PLASTIC LIMIT DETERMINATION					
Tare No.	750	522	546		
Soil & Tare Wet Wt.	53.31	53.35	50.64		
Soil & Tare Dry Wt.	51.30	51.16	48.89		
Tare Wt.	39.93	38.74	38.90		
Moisture Content; %	17.7	17.6	17.5		
LL = 36			**PL = 18**		**PI = 18**

LIQUID LIMIT

1439-98-307, SAIC, Ravenna Army Ammo Plant

WB 0927



S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP	**Operator:**	bd
Sample No:	WB 0928	**Date:**	06/22/98

LIQUID LIMIT DETERMINATION

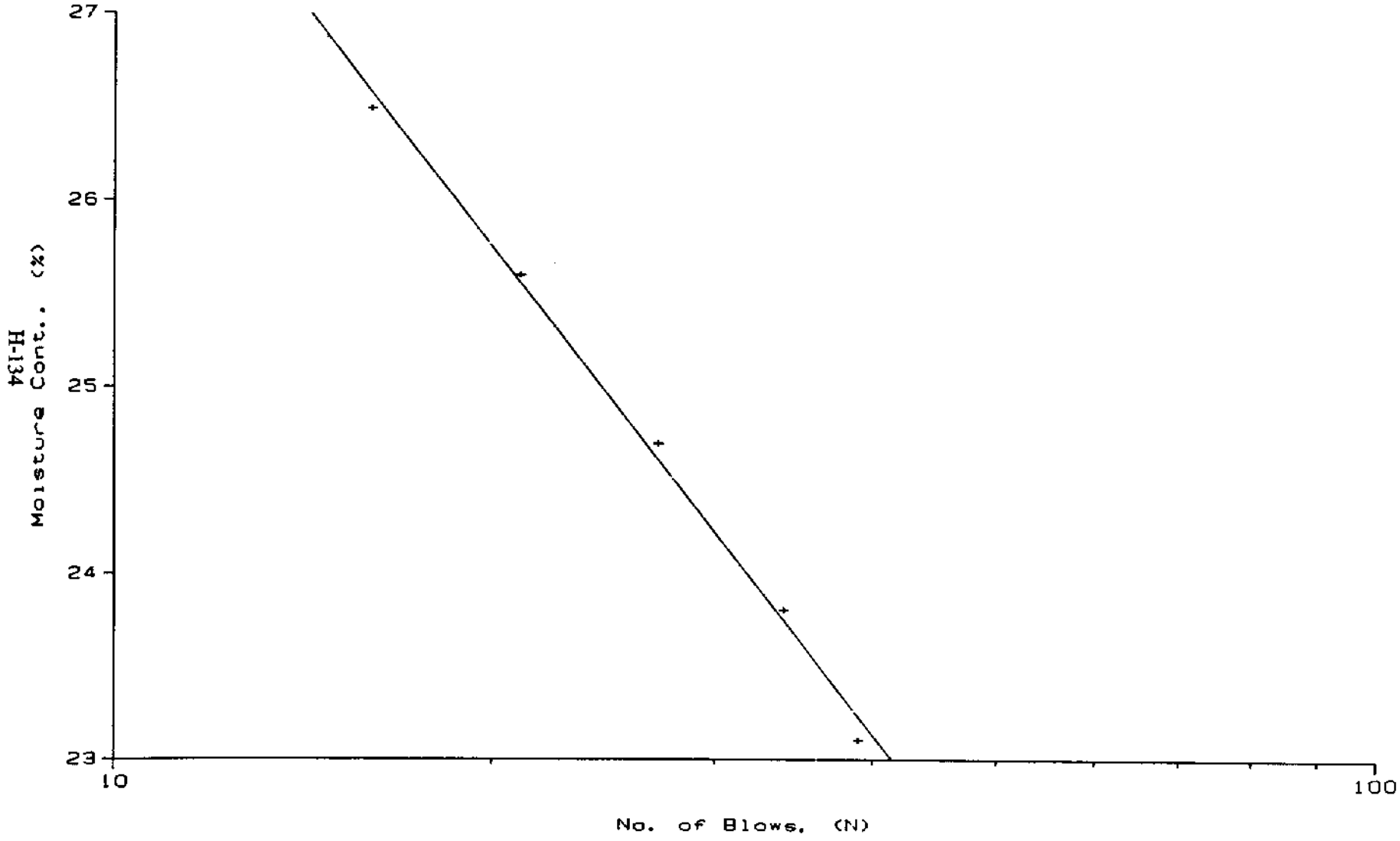
Tare No.	35	G	31	Fo	N
Soil & Tare Wet Wt.	18.98	17.90	20.57	19.23	21.16
Soil & Tare Dry Wt.	15.83	15.06	17.26	16.32	17.94
Tare Wt.	3.94	3.96	3.86	4.07	4.00
Moisture Content; %	26.5	25.6	24.7	23.8	23.1
No. of Blows; N	16	21	27	34	39

PLASTIC LIMIT DETERMINATION

Tare No.	48	A8	A5		
Soil & Tare Wet Wt.	18.51	17.98	18.77		
Soil & Tare Dry Wt.	16.53	16.12	16.84		
Tare Wt.	3.72	3.91	3.96		
Moisture Content; %	15.5	15.2	15.0		

LL = 25 **PL = 15** **PI = 10**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP
WB 0928



S&ME

ATTERBERG LIMITS

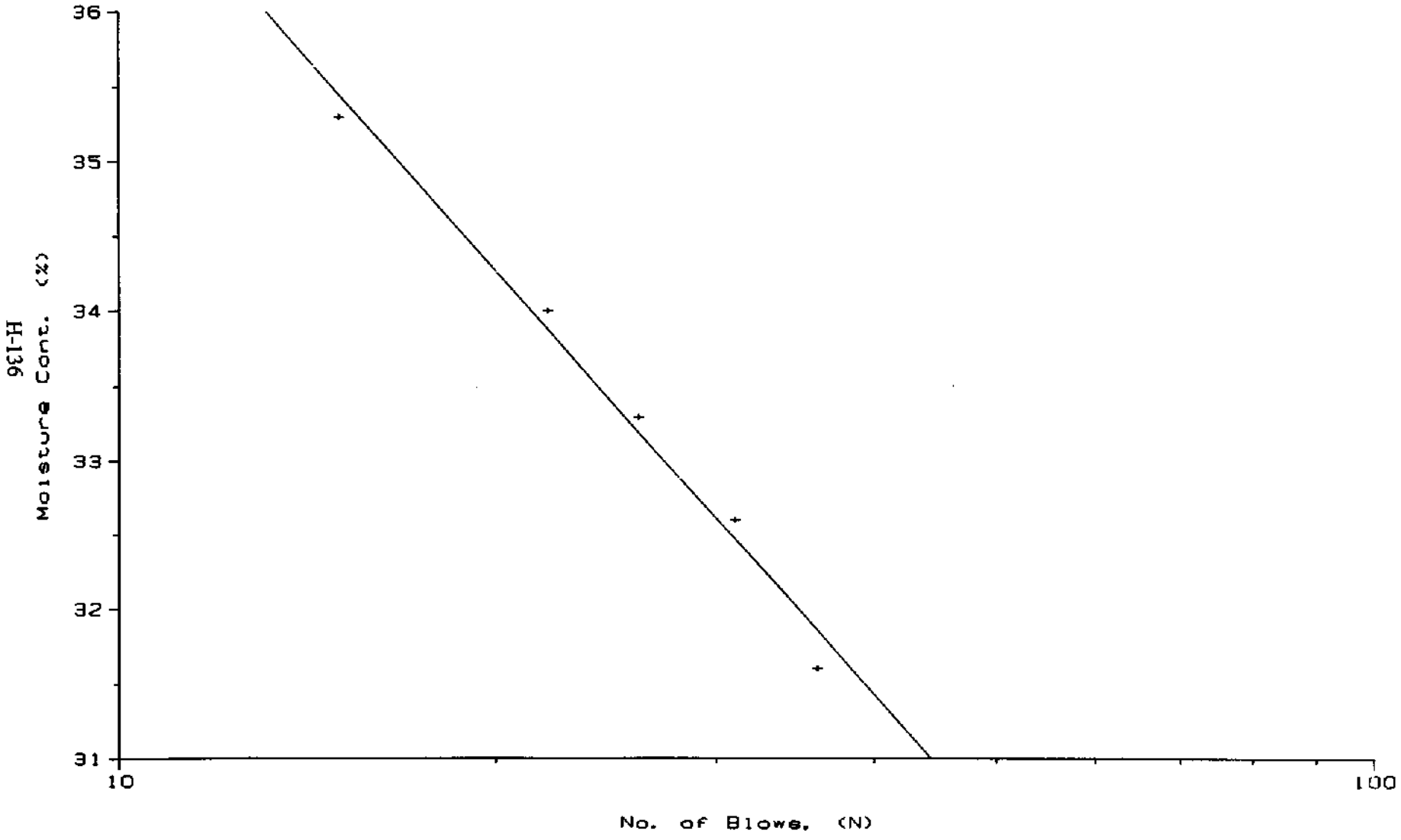
Job No:	**1439-98-307**	**ASTM D:**	**4318**
Job Name:	**SAIC, RVAAP Phase II, RI**	**Operator:**	**bd**
Sample No:	**BK 0906**	**Date:**	**06/09/98**

LIQUID LIMIT DETERMINATION					
Tare No.	B6	15	37	16	A20
Soil & Tare Wet Wt.	19.53	19.91	19.08	19.34	21.71
Soil & Tare Dry Wt.	15.48	15.88	15.27	15.60	17.44
Tare Wt.	4.02	4.03	3.82	4.11	3.93
Moisture Content; %	35.3	34.0	33.3	32.6	31.6
No. of Blows; N	15	22	26	31	36
PLASTIC LIMIT DETERMINATION					
Tare No.	A11	50	61		
Soil & Tare Wet Wt.	19.83	21.50	21.36		
Soil & Tare Dry Wt.	17.48	18.89	18.71		
Tare Wt.	3.93	3.84	3.72		
Moisture Content; %	17.3	17.3	17.7		
LL = 33			**PL = 17**		**PI = 16**

LIQUID LIMIT

1439-98-307, SAIC, RVAAP Phase II

BK 0906



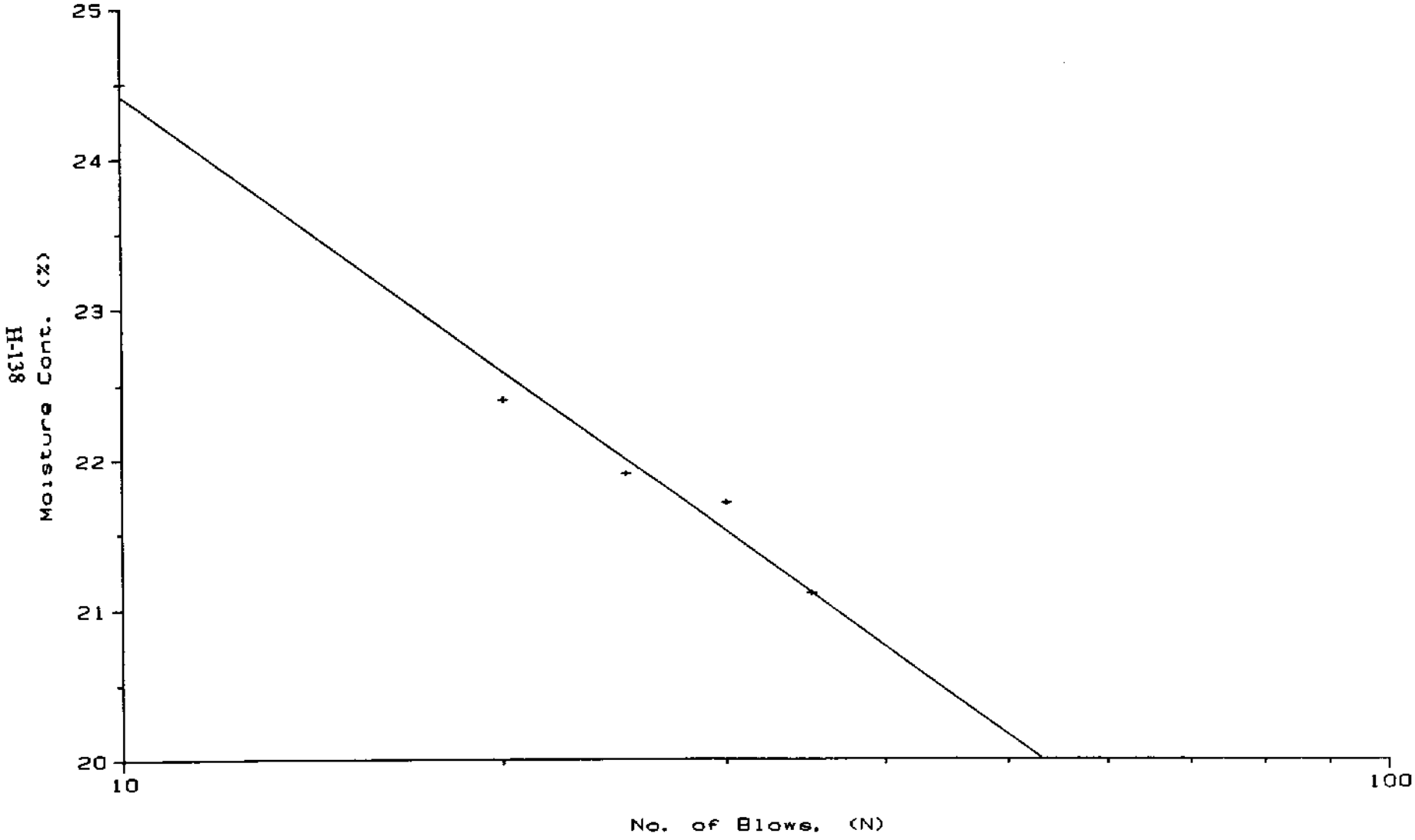
S&ME

ATTERBERG LIMITS

Job No:	**1439-98-307**	**ASTM D:**	**4318**
Job Name:	**SAIC, RVAAP Phase II, RI**	**Operator:**	**bd**
Sample No:	**BK 0907**	**Date:**	**06/09/98**

LIQUID LIMIT DETERMINATION					
Tare No.	A2	E32	809	687	W
Soil & Tare Wet Wt.	49.71	55.12	54.57	54.87	53.35
Soil & Tare Dry Wt.	46.99	52.20	51.63	52.06	50.56
Tare Wt.	35.90	39.18	38.20	39.10	37.35
Moisture Content; %	24.5	22.4	21.9	21.7	21.1
No. of Blows; N	10	20	25	30	35
PLASTIC LIMIT DETERMINATION					
Tare No.	508	E42	A19		
Soil & Tare Wet Wt.	62.60	57.60	58.48		
Soil & Tare Dry Wt.	59.69	55.10	56.00		
Tare Wt.	40.05	38.73	39.00		
Moisture Content; %	14.8	15.3	14.6		
LL = 22			**PL = 15**		**PI = 7**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP Phase II
BK 0907



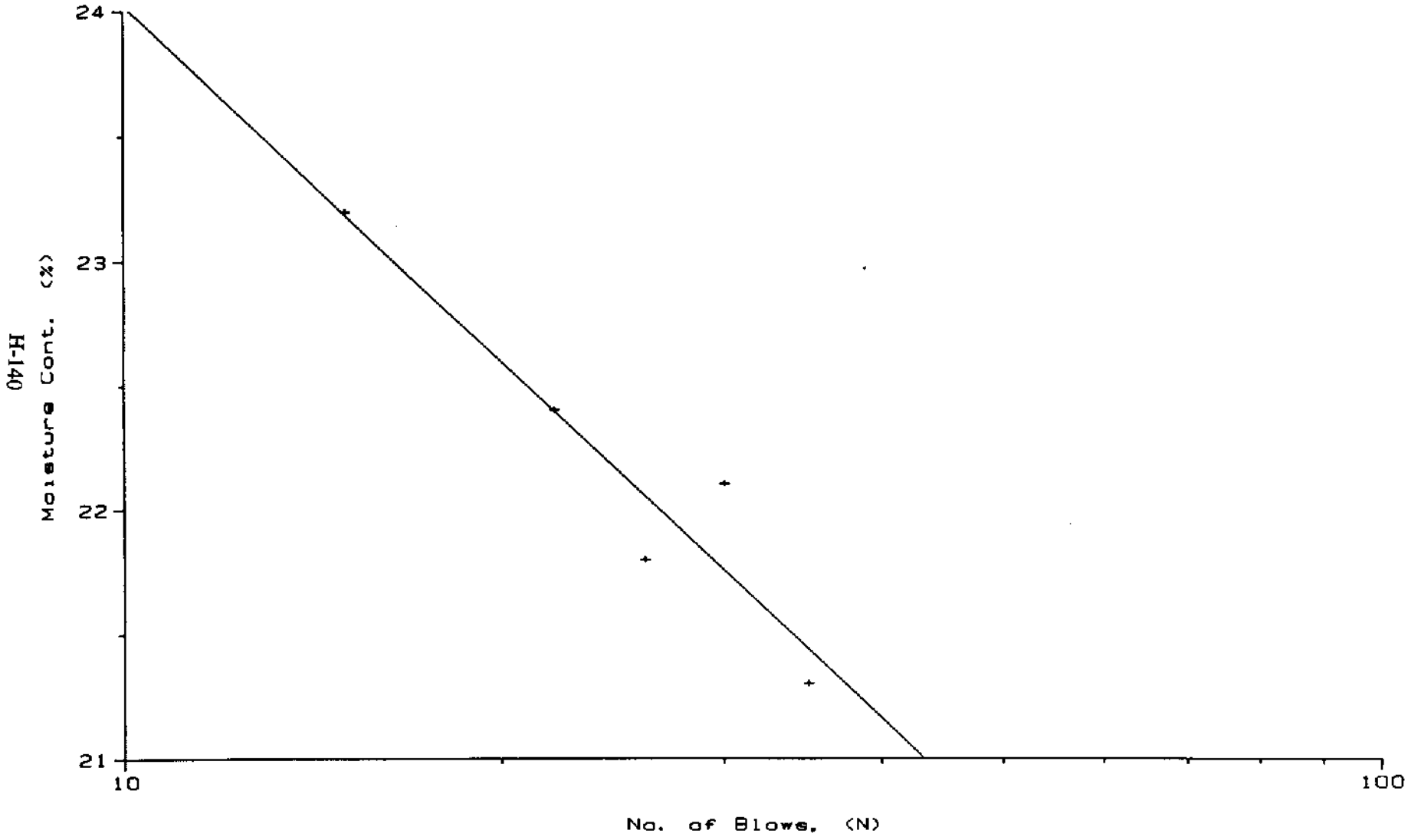
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP Phase II, RI	**Operator:**	bd
Sample No:	WB 0858	**Date:**	06/09/98

LIQUID LIMIT DETERMINATION					
Tare No.	Z	9	57	3	45
Soil & Tare Wet Wt.	22.59	21.39	20.21	20.34	22.02
Soil & Tare Dry Wt.	19.11	18.25	17.28	17.39	18.81
Tare Wt.	4.08	4.23	3.85	4.05	3.73
Moisture Content; %	23.2	22.4	21.8	22.1	21.3
No. of Blows; N	15	22	26	30	35
PLASTIC LIMIT DETERMINATION					
Tare No.	38	E	2		
Soil & Tare Wet Wt.	15.88	17.60	19.02		
Soil & Tare Dry Wt.	14.05	15.54	16.75		
Tare Wt.	3.81	4.06	4.00		
Moisture Content; %	17.9	17.9	17.8		
LL = 22		**PL = 18**		**PI = 4**	

LIQUID LIMIT
1439-98-307. SAIC. RVAAP Phase II
WB 0858



S&ME

ATTERBERG LIMITS

Job No:	**1439-98-307**	**ASTM D:**	**4318**
Job Name:	**SAIC, RVAAP Phase II, RI**	**Operator:**	**bd**
Sample No:	**WB 0859**	**Date:**	**06/09/98**

LIQUID LIMIT DETERMINATION

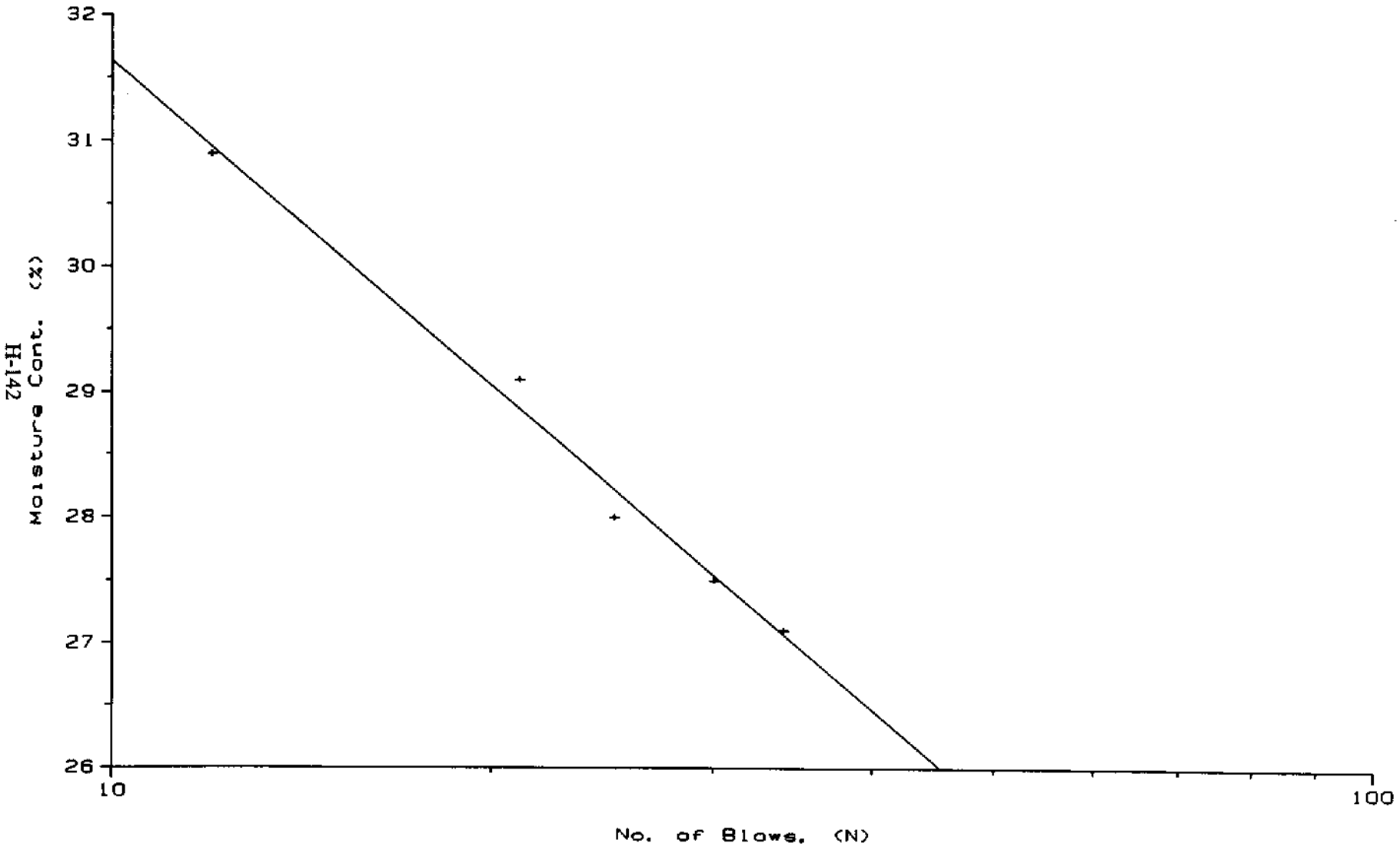
Tare No.	G	FO	31	35	M
Soil & Tare Wet Wt.	20.02	20.15	20.42	21.16	21.16
Soil & Tare Dry Wt.	16.23	16.53	16.80	17.44	17.50
Tare Wt.	3.95	4.07	3.86	3.93	4.01
Moisture Content; %	30.9	29.1	28.0	27.5	27.1
No. of Blows; N	12	21	25	30	34

PLASTIC LIMIT DETERMINATION

Tare No.	S	A15	C		
Soil & Tare Wet Wt.	16.26	16.71	15.64		
Soil & Tare Dry Wt.	14.46	14.82	13.96		
Tare Wt.	4.09	3.98	4.04		
Moisture Content; %	17.4	17.4	16.9		

LL = 28 **PL = 17** **PI = 11**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP Phase II
WB 0859



S&ME

ATTERBERG LIMITS

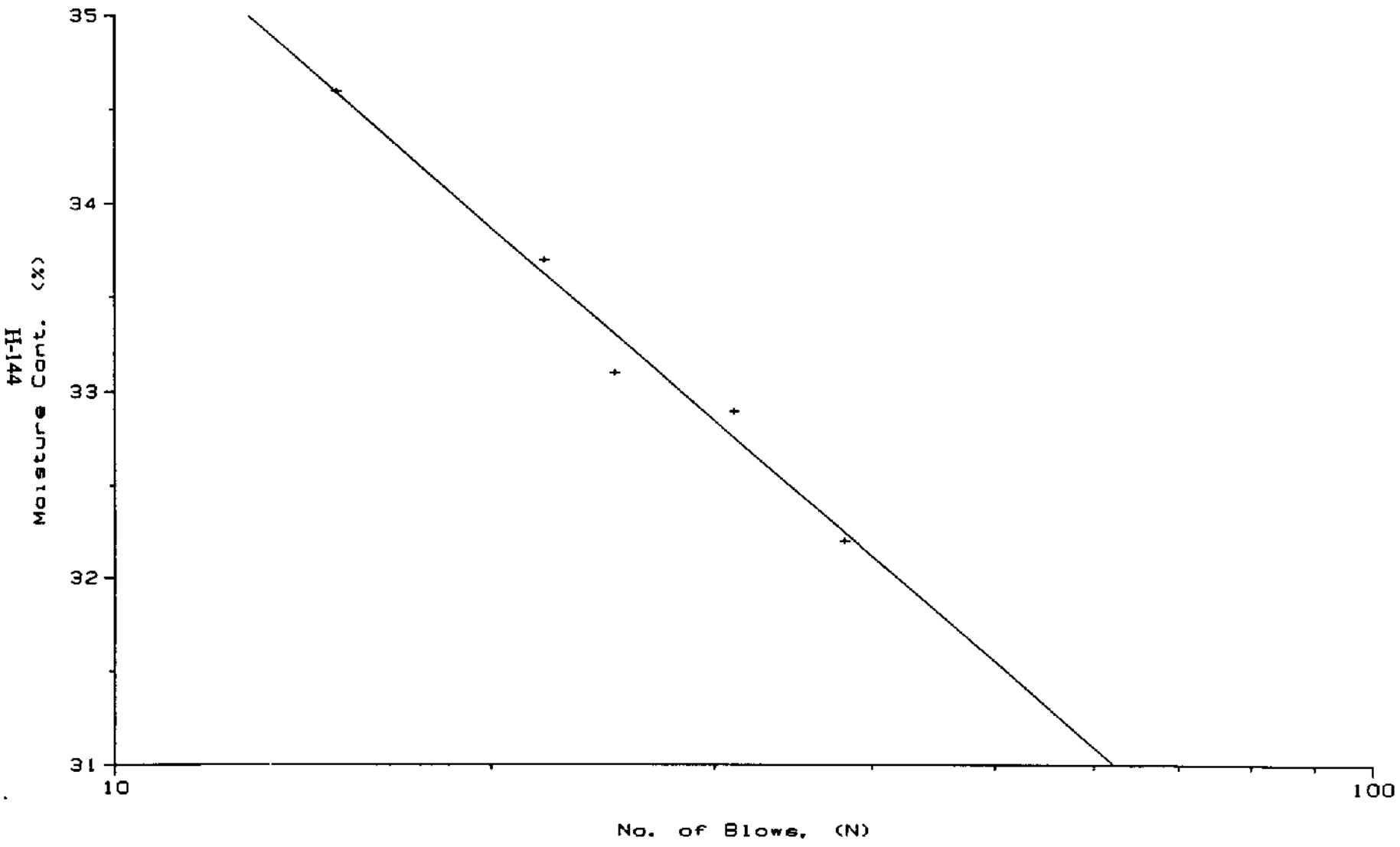
Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP Phase II, RI	**Operator:**	bd
Sample No:	WB 0860	**Date:**	06/09/98

LIQUID LIMIT DETERMINATION					
Tare No.	60	H	11	B 1	B 10
Soil & Tare Wet Wt.	18.21	18.23	20.73	18.87	20.40
Soil & Tare Dry Wt.	14.51	14.64	16.59	15.14	16.38
Tare Wt.	3.81	3.98	4.10	3.80	3.91
Moisture Content; %	34.6	33.7	33.1	32.9	32.2
No. of Blows; N	15	22	25	31	38
PLASTIC LIMIT DETERMINATION					
Tare No.	10	1B	13		
Soil & Tare Wet Wt.	20.48	18.79	16.45		
Soil & Tare Dry Wt.	17.95	16.57	14.58		
Tare Wt.	4.00	4.07	4.06		
Moisture Content; %	18.1	17.8	17.8		
LL = 33		**PL = 18**		**PI = 15**	

LIQUID LIMIT

1439-98-307, SAIC, RVAAP Phase II

WB 0860



H-144

S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP Phase II, RI	**Operator:**	bd
Sample No:	WB 0862	**Date:**	06/09/98

LIQUID LIMIT DETERMINATION					
Tare No.	A3	26	401	U	40
Soil & Tare Wet Wt.	20.93	19.37	20.22	20.31	22.50
Soil & Tare Dry Wt.	17.40	16.23	16.93	17.09	18.84
Tare Wt.	3.94	3.84	3.81	4.03	3.80
Moisture Content; %	26.2	25.3	25.1	24.7	24.3
No. of Blows; N	15	23	26	31	37

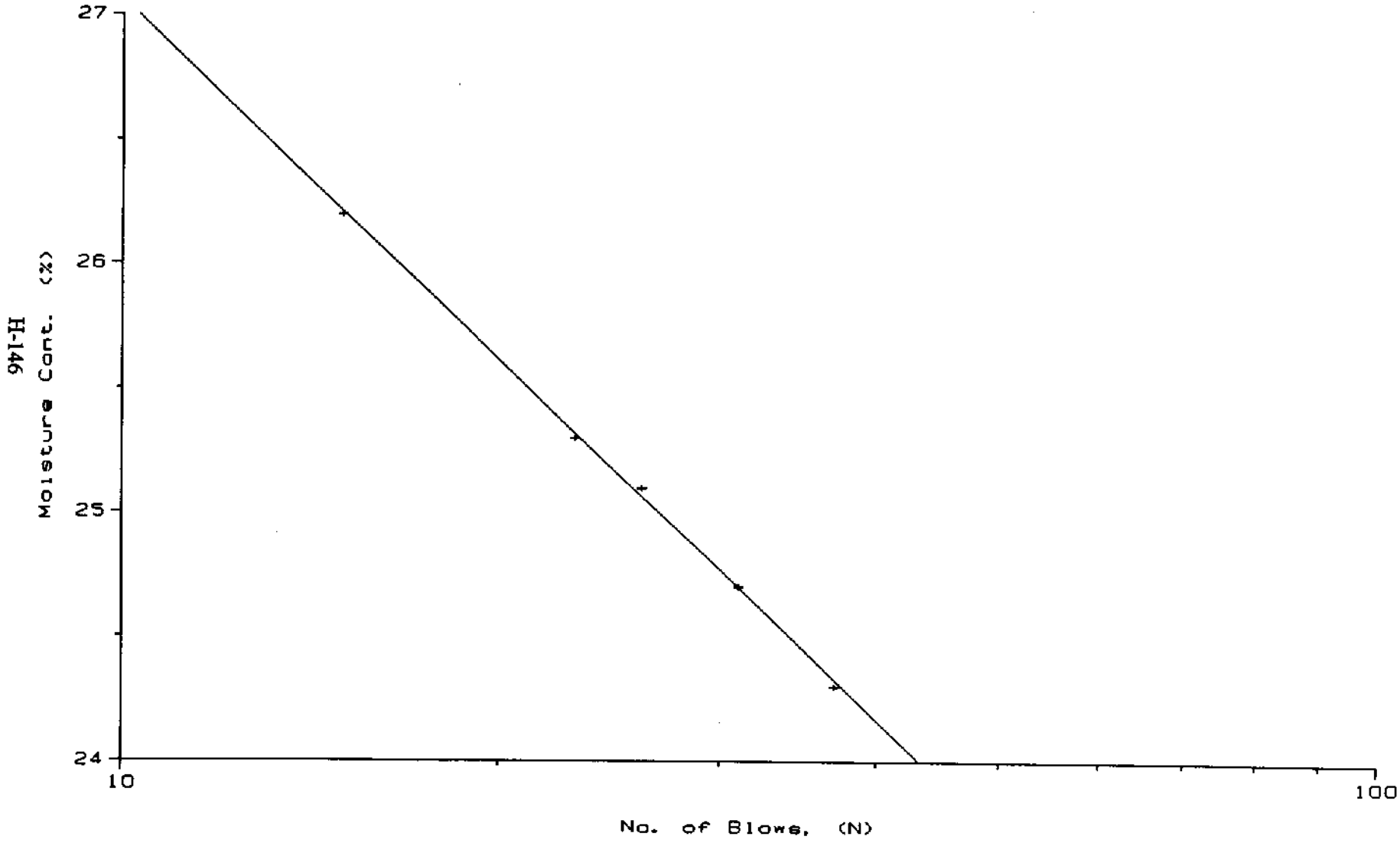
PLASTIC LIMIT DETERMINATION					
Tare No.	18	A4	20		
Soil & Tare Wet Wt.	17.90	20.22	22.01		
Soil & Tare Dry Wt.	15.94	17.95	19.51		
Tare Wt.	4.07	3.91	3.95		
Moisture Content; %	16.5	16.2	16.1		

LL = 25 **PL = 16** **PI = 9**

LIQUID LIMIT

1439-98-307, SAIC, RVAAP Phase II

WB 0862



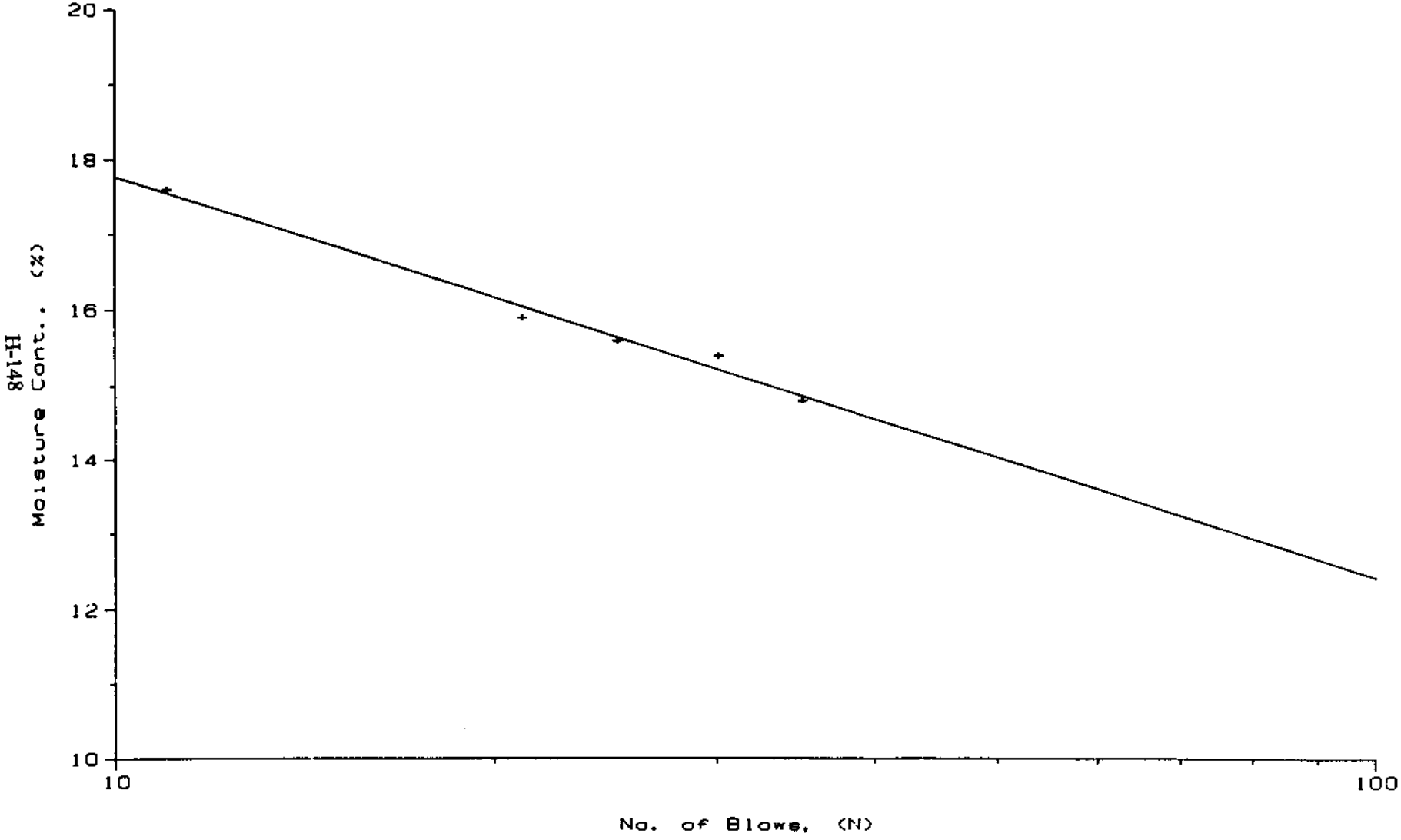
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP Phase II, RI	**Operator:**	bd
Sample No:	WB 0910	**Date:**	06/11/98

LIQUID LIMIT DETERMINATION					
Tare No.	A3	26	401	U	40
Soil & Tare Wet Wt.	14.96	15.20	14.99	12.96	17.57
Soil & Tare Dry Wt.	13.31	13.64	13.48	11.77	15.79
Tare Wt.	3.94	3.85	3.82	4.04	3.80
Moisture Content; %	17.6	15.9	15.6	15.4	14.8
No. of Blows; N	11	21	25	30	35
PLASTIC LIMIT DETERMINATION					
Tare No.	18	A4	20		
Soil & Tare Wet Wt.	17.37	16.26	17.02		
Soil & Tare Dry Wt.	15.86	14.85	15.55		
Tare Wt.	4.07	3.91	3.95		
Moisture Content; %	12.8	12.9	12.7		
LL = 16			**PL = 13**		**PI = 3**

LIQUID LIMIT
1439-98-307, SAIC RVAAP, Phase II
WB 0910



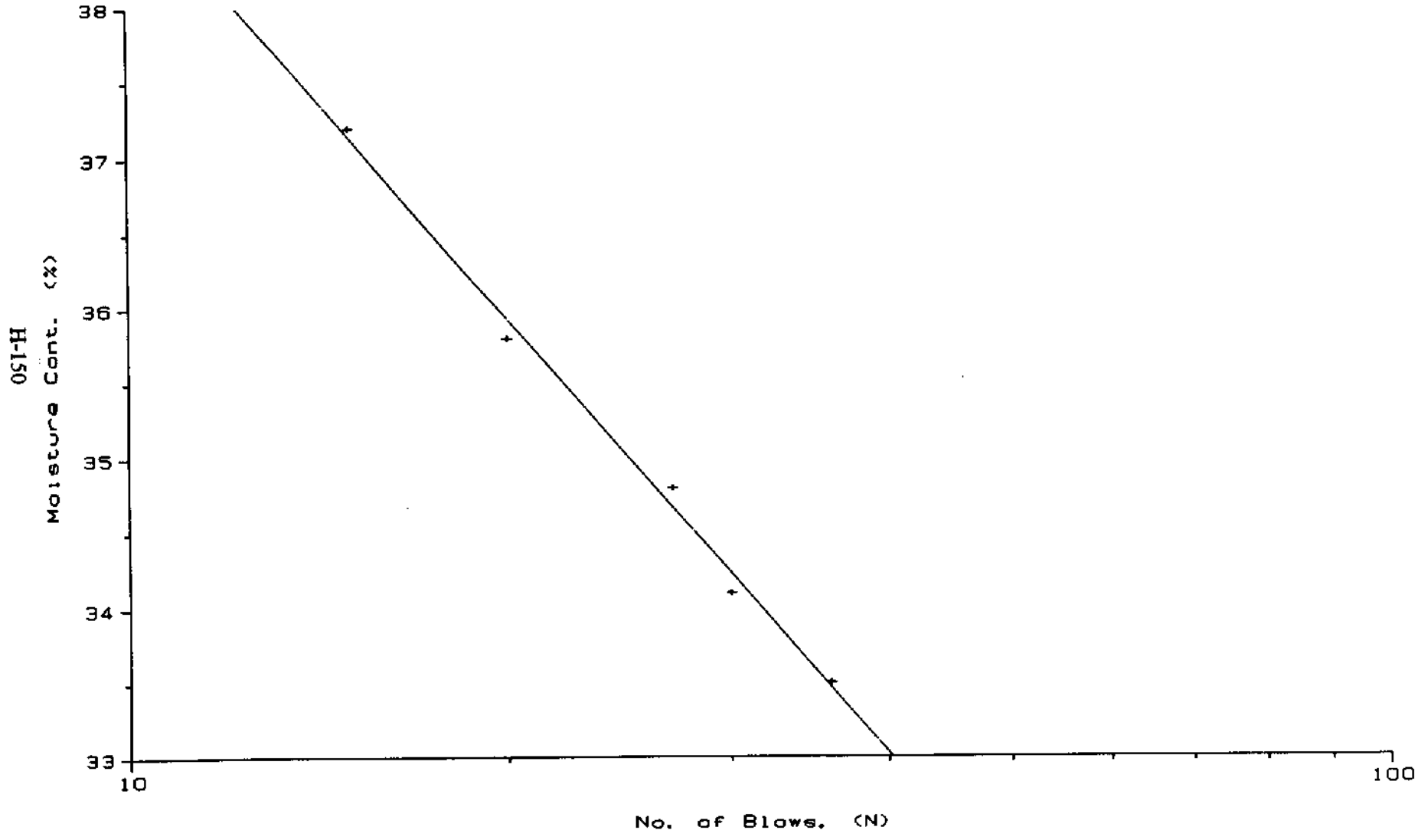
S&ME

ATTERBERG LIMITS

Job No:	1439-98-307	**ASTM D:**	4318
Job Name:	SAIC, RVAAP Phase II, RI	**Operator:**	bd
Sample No:	WB 0911	**Date:**	06/09/98

LIQUID LIMIT DETERMINATION					
Tare No.	43	A	6	1	31
Soil & Tare Wet Wt.	19.87	20.92	20.73	21.71	23.32
Soil & Tare Dry Wt.	15.51	16.49	16.41	17.23	18.48
Tare Wt.	3.78	4.10	4.00	4.10	4.02
Moisture Content; %	37.2	35.8	34.8	34.1	33.5
No. of Blows; N	15	20	27	30	36
PLASTIC LIMIT DETERMINATION					
Tare No.	12	A19	1A		
Soil & Tare Wet Wt.	15.20	16.69	15.26		
Soil & Tare Dry Wt.	13.46	14.61	13.45		
Tare Wt.	4.21	3.90	4.05		
Moisture Content; %	18.8	19.4	19.3		
LL = 35			**PL = 19**		**PI = 16**

LIQUID LIMIT
1439-98-307, SAIC, RVAAP Phase II
WB 0911



Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :
El. :
Sample: BK 0789
Part :

FILE : 368
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-12-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 418.15 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 58.90 Dry Wt.+Tare(gm)= 58.26
Tare Wt(gm) = 26.71 Moisture(%) = 2.03
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 418.15

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	3.5	99.2	4.7500
NO.10	8.4	98.0	2.0000
NO.20	1.1	95.8	0.8500
NO.40	3.1	91.7	0.4250
NO.50	5.0	87.9	0.3000
NO.100	8.1	81.7	0.1500
NO.200	9.8	78.4	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.01

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	41.0	6.0	70.0	0.0399
4 min.	24.0	34.0	6.0	56.0	0.0211
15 min.	24.0	27.0	6.0	42.0	0.0115
1 hour	23.0	21.5	6.0	31.0	0.0060
4 hours	22.0	16.5	6.0	21.0	0.0031

Gravel(%)= 1 Sand(%)=21 Silt(%)= 50 Clay(%)= 28

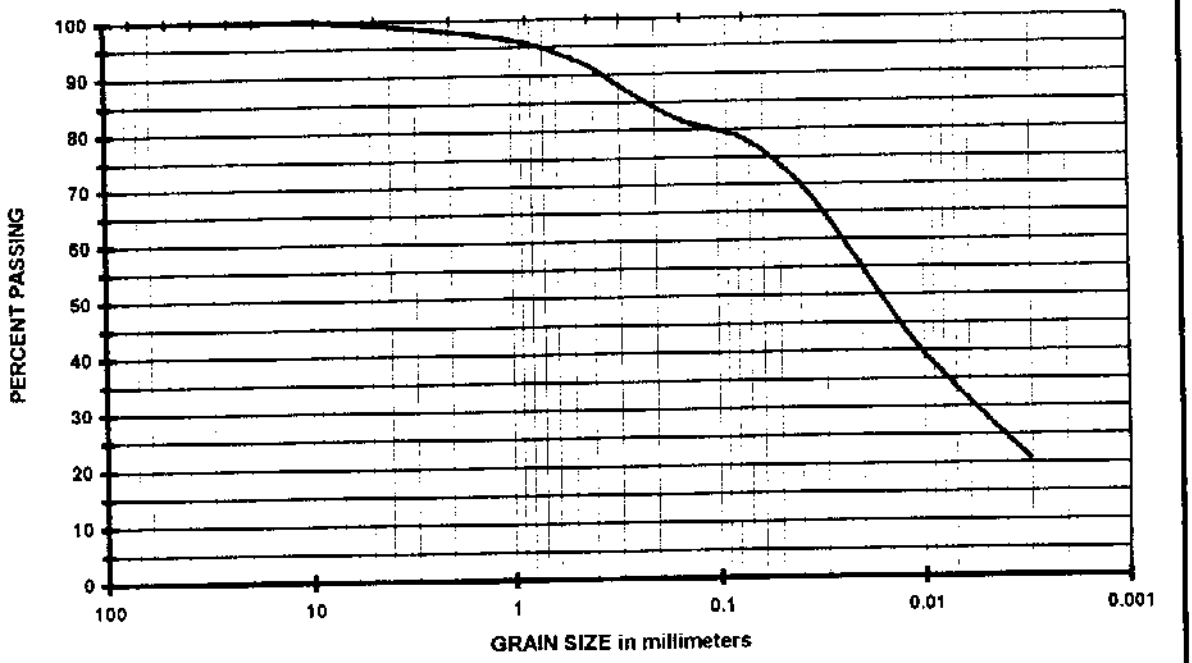
S&ME

GRAIN SIZE DATA SHEET

Job Name: 1439-98-307
Job Number: SAIC, Ravenna Army Ammo Plant

ASTM: D422
Date: 6/12/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0789 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	33
PLASTIC LIMIT	23
PLASTICITY INDEX	10

GRAIN SIZE DATA

% GRAVEL	1
% SAND	21
% SILT	50
% CLAY	28

S&ME, Inc. 1413 Topside Road Louisville Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. :
Sample: BK 0790
Part :

FILE : 384
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-15-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 430.02 Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 82.77 Dry Wt.+Tare(gm)= 81.74
Tare Wt(gm) = 37.62 Moisture(%) = 2.33

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 430.02

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	12.8	97.0	9.5300
NO.4	56.0	87.0	4.7500
NO.10	106.7	75.2	2.0000
NO.20	0.3	74.7	0.8500
NO.40	1.2	73.4	0.4250
NO.50	2.2	71.8	0.3000
NO.100	6.3	65.5	0.1500
NO.200	8.3	62.4	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.86

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	40.0	5.0	53.9	0.0402
4 min.	24.0	34.0	5.0	44.6	0.0211
15 min.	23.0	27.5	5.0	34.6	0.0116
1 hour	23.0	21.0	5.0	24.6	0.0060
4 hours	23.0	16.0	5.0	16.9	0.0031

Gravel(%)=13 Sand(%)=25 Silt(%)= 40 Clay(%)= 22

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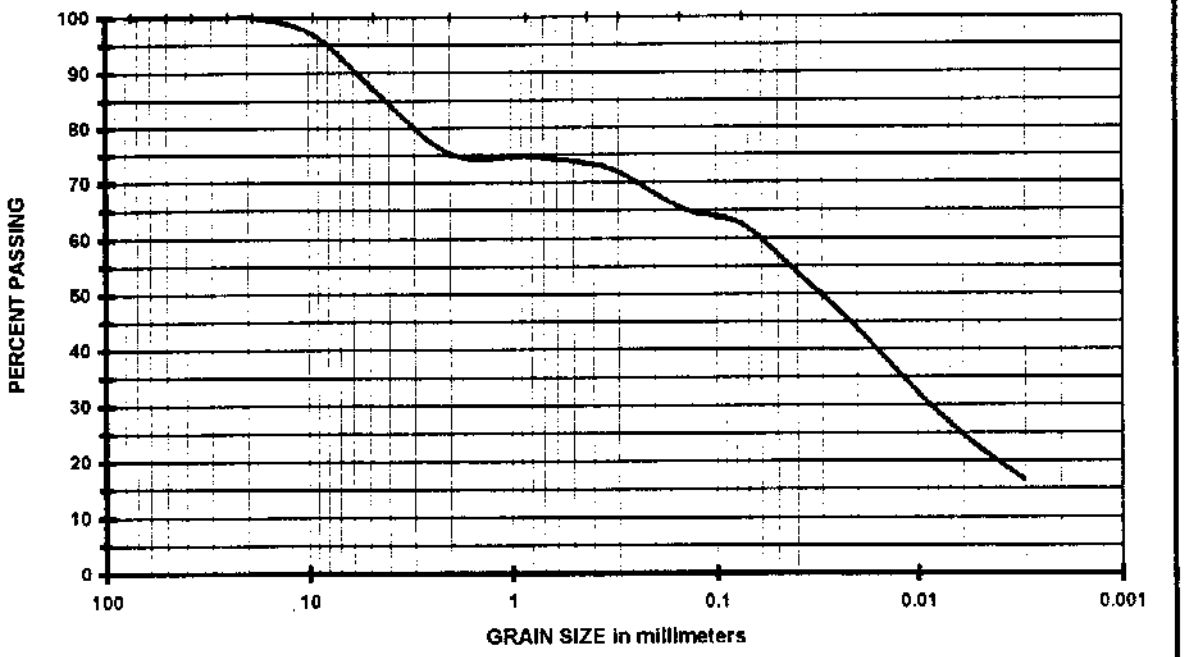
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/15/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **BK 0790** Depth (in): _____

Log No.: _____ Soil Classification: **Sandy Lean Clay (CL)**

ATTERBERG LIMITS (-#40 Material)

Liquid Limit	**35**
Plastic Limit	**23**
Plasticity Index	**12**

GRAIN SIZE DATA

% GRAVEL	**13**
% SAND	**25**
% SILT	**40**
% CLAY	**22**

S&ME Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. :
Sample: BK 0793
Part :

FILE : 371
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:07-01-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 482.92 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 67.66 Dry Wt.+Tare(gm)= 57.30
Tare Wt(gm) = 37.22 Moisture(%) = 1.20
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 482.92

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	67.4	86.1	9.5300
NO.4	137.0	71.6	4.7500
NO.10	161.2	66.6	2.0000
NO.20	1.2	65.0	0.8500
NO.40	2.2	63.6	0.4250
NO.50	3.4	62.0	0.3000
NO.100	25.3	32.5	0.1500
NO.200	34.3	20.3	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.41

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	16.0	6.0	13.5	0.0478
4 min.	24.0	15.0	6.0	12.1	0.0240
15 min.	24.0	14.5	6.0	11.5	0.0124
1 hour	23.0	11.0	6.0	6.7	0.0064
4 hours	22.5	10.0	6.0	5.4	0.0033

D10(mm) =0.0101 D30(mm)= 0.1303 D60(mm)= 0.2861
Gravel(%)=28 Sand(%)=51 Silt(%)= 14 Clay(%)= 7

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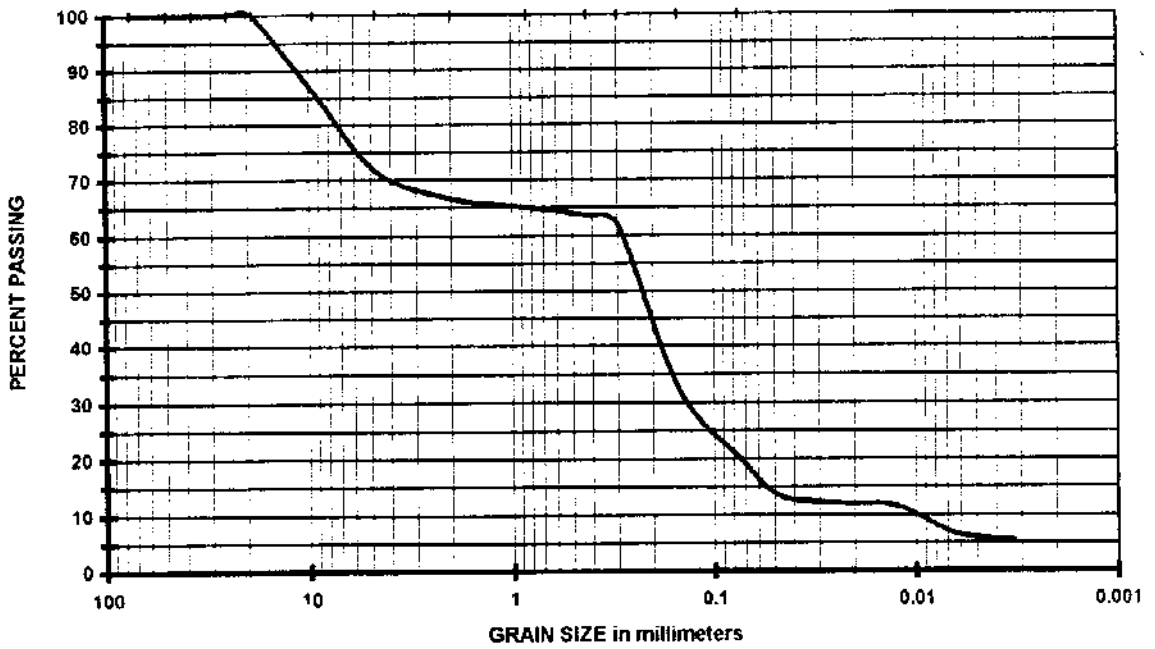
GRAIN SIZE DATA SHEET

Job Name: 1439-98-307
Job Number: SAIC, Ravenna Army Ammo Plant

ASTM: D422
Date: 6/12/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **BK 0793** Depth (in): _____

Log No.: _____ Soil Classification: **Silty Sand with Gravel (SM)**

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	**NP**
PLASTIC LIMIT	**NP**
PLASTICITY INDEX	**NP**

GRAIN SIZE DATA

% GRAVEL	**28**
% SAND	**61**
% SILT	**14**
% CLAY	**7**

S&ME, Inc. 1413 Topside Road Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 370
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0795 Checked By :
Boring : Part : Report Date:07-01-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 454.54 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 53.36 Dry Wt.+Tare(gm)= 52.66
Tare Wt(gm) = 27.50 Moisture(%) = 2.78
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 454.54

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	26.3	94.2	25.4000
3/4 in.	26.3	94.2	19.0500
3/8 in.	69.4	84.7	9.5300
NO.4	134.2	70.5	4.7500
NO.10	189.6	58.3	2.0000
NO.20	8.0	48.7	0.8500
NO.40	13.8	41.8	0.4250
NO.50	16.6	38.4	0.3000
NO.100	22.0	31.9	0.1500
NO.200	25.1	28.2	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.65

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	23.0	6.0	20.4	0.0457
4 min.	24.0	21.0	6.0	18.0	0.0232
15 min.	23.5	16.0	6.0	12.0	0.0124
1 hour	23.0	13.5	6.0	9.0	0.0063
4 hours	22.0	11.5	6.0	6.6	0.0032

D10(mm) =0.0080 D30(mm)= 0.1048 D60(mm)= 2.2571
Gravel(%)=30 Sand(%)=42 Silt(%)= 20 Clay(%)= 8

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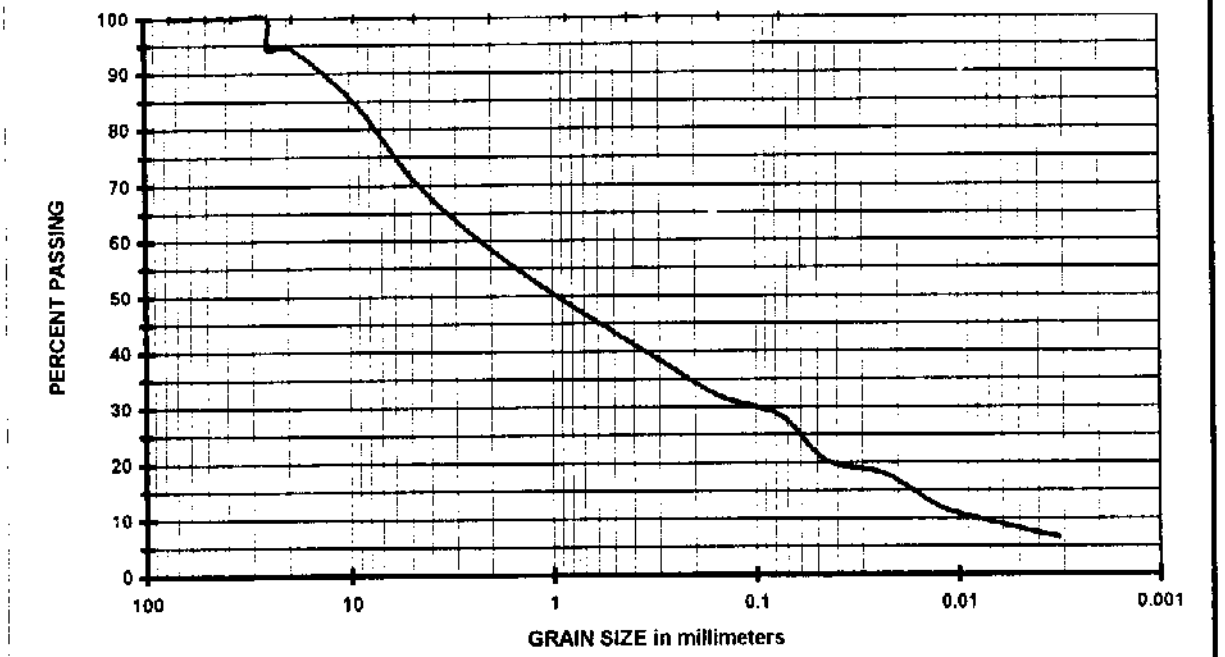
GRAIN SIZE DATA SHEET

Job Name: 1439-98-307
Job Number: SAIC, Ravenna Army Ammo Plant

ASTM: D422
Date: 6/12/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **BK 0795** Depth (in): _____

Log No.: _____ Soil Classification: **Silty Sand with Gravel (SM)**

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	30
% SAND	42
% SILT	20
% CLAY	8

S&ME Inc. 1413 Topside Road Louisville Tennessee 37777 (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :
El. :
Sample: BK 0797
Part :

FILE : 372
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-12-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 512.47 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 86.86 Dry Wt.+Tare(gm)= 85.66
Tare Wt(gm) = 35.82 Moisture(%) = 2.41
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 512.47

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	2.9	99.4	4.7500
NO.10	9.5	98.1	2.0000
NO.20	0.8	96.6	0.8500
NO.40	2.1	93.9	0.4250
NO.50	3.2	91.7	0.3000
NO.100	5.6	86.9	0.1500
NO.200	7.2	83.6	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.82

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	41.0	6.0	70.4	0.0399
4 min.	23.5	36.0	6.0	60.3	0.0209
15 min.	23.0	29.0	6.0	46.2	0.0115
1 hour	22.5	23.5	6.0	35.2	0.0060
4 hours	22.5	19.0	6.0	26.1	0.0031

Gravel(%)= 1 Sand(%)=16 Silt(%)= 51 Clay(%)= 32

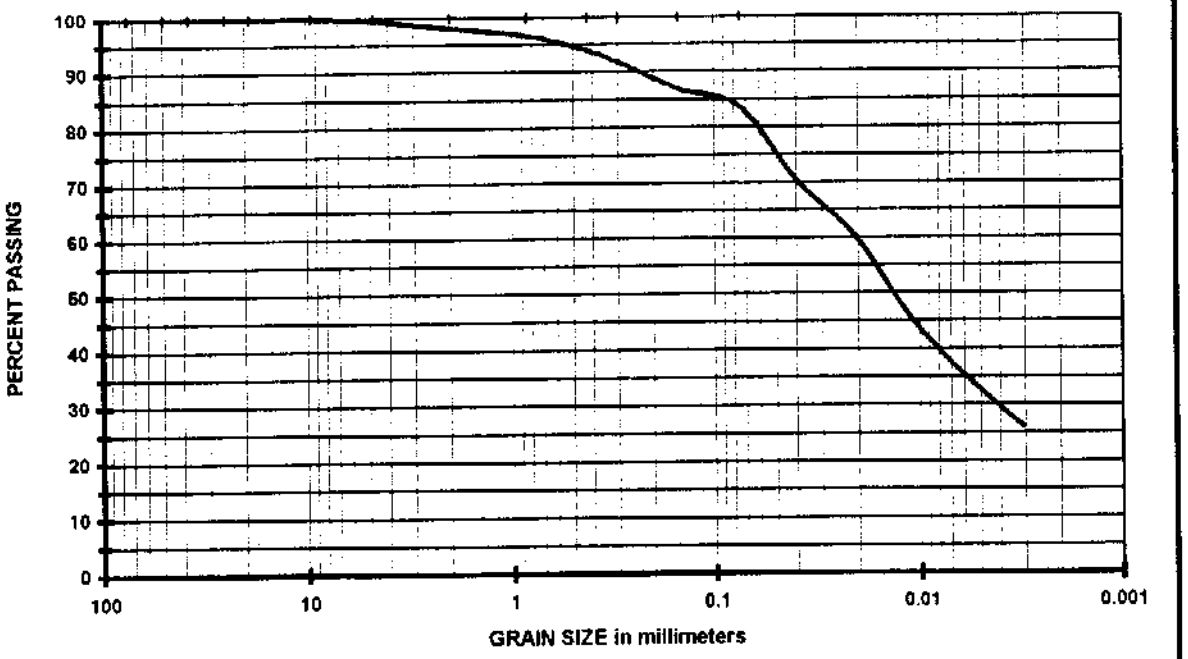
S&ME

GRAIN SIZE DATA SHEET

Job Name: 1439-98-307
Job Number: SAIC, Ravenna Army Ammo Plant

ASTM: D422
Date: 6/12/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0797 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	44
PLASTIC LIMIT	27
PLASTICITY INDEX	17

GRAIN SIZE DATA

% GRAVEL	1
% SAND	16
% SILT	51
% CLAY	32

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 369
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0800 Checked By :
Boring : Part : Report Date:06-12-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 208.68 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 56.85 Dry Wt.+Tare(gm)= 55.99
Tare Wt(gm) = 37.87 Moisture(%) = 4.75
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 208.68

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	0.5	99.7	4.7500
NO.10	1.6	99.2	2.0000
NO.20	0.7	97.8	0.8500
NO.40	4.5	89.9	0.4250
NO.50	7.9	82.8	0.3000
NO.100	13.7	70.8	0.1500
NO.200	16.2	65.6	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 47.73

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	23.5	31.5	6.0	53.0	0.0433
4 min.	23.5	29.0	6.0	47.8	0.0221
15 min.	23.0	24.0	6.0	37.4	0.0119
1 hour	23.0	19.0	6.0	27.0	0.0061
4 hours	22.5	15.0	6.0	18.7	0.0032

Gravel(%)= 0 Sand(%)=34 Silt(%)= 41 Clay(%)= 25

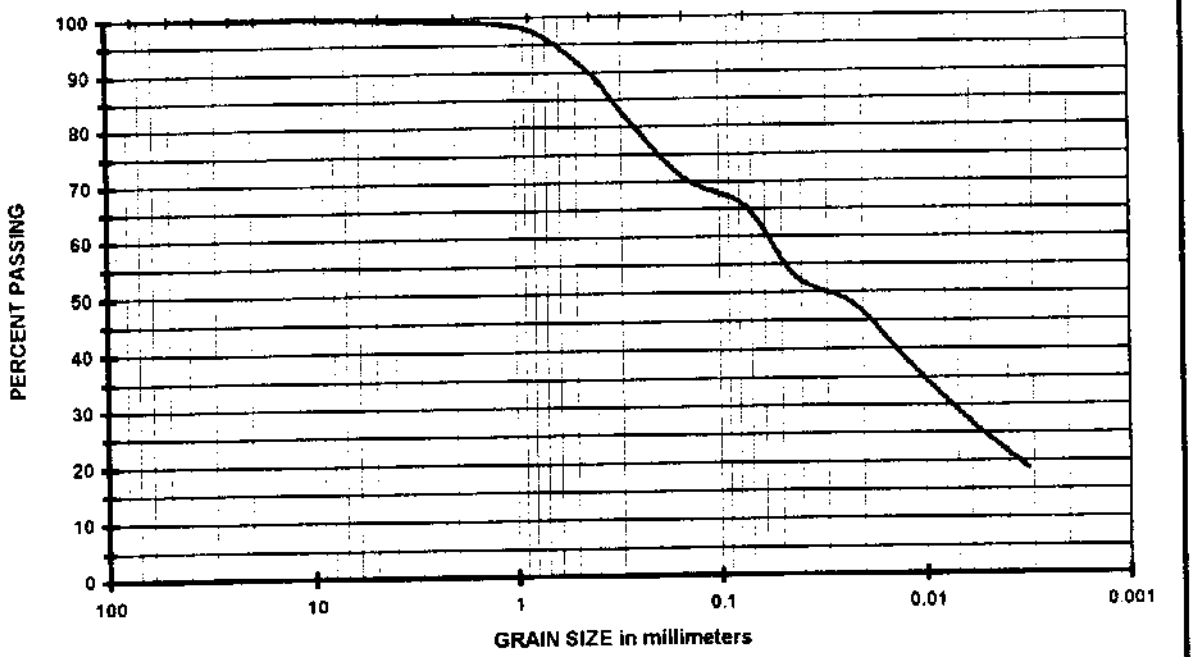
S&ME

GRAIN SIZE DATA SHEET

Job Name: 1439-98-307
Job Number: SAIC, Ravenna Army Ammo Plant

ASTM: D422
Date: 6/12/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **BK 0800** Depth (in): _____

Log No.: _____ Soil Classification: **Sandy Silt (ML)**

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	0
% SAND	34
% SILT	41
% CLAY	25

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Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 373
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0802 Checked By :
Boring : Part : Report Date:06-12-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 435.99 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 92.21 Dry Wt.+Tare(gm)= 92.01
Tare Wt(gm) = 39.10 Moisture(%) = 0.38
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 435.99

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	0.0	100.0	4.7500
NO.10	0.0	100.0	2.0000
NO.20	0.2	99.5	0.8500
NO.40	4.5	91.0	0.4250
NO.50	15.0	69.9	0.3000
NO.100	37.5	24.7	0.1500
NO.200	43.9	11.8	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.81

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	9.0	6.0	6.0	0.0498
4 min.	24.0	8.5	6.0	5.0	0.0250
15 min.	23.0	8.0	6.0	4.0	0.0131
1 hour	23.0	7.5	6.0	3.0	0.0066
4 hours	22.0	7.0	6.0	2.0	0.0033

D10(mm) =0.0659 D30(mm)= 0.1628 D60(mm)= 0.2578
Gravel(%)= 0 Sand(%)=88 Silt(%)= 9 Clay(%)= 3

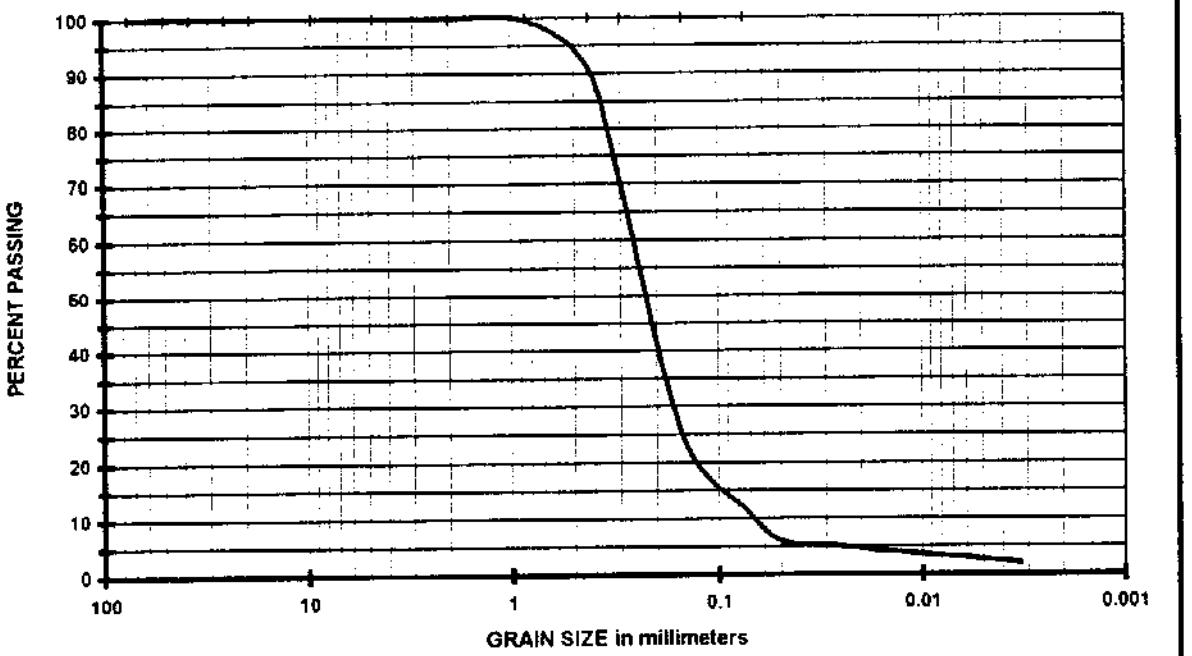
S&ME

GRAIN SIZE DATA SHEET

Job Name: 1439-98-307
Job Number: SAIC, Ravenna Army Ammo Plant

ASTM: D422
Date: 6/12/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **BK 0802** Depth (in): _____

Log No.: _____ Soil Classification: **Poor Graded Sand with Silt (SP-SM)**

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	0
% SAND	88
% SILT	9
% CLAY	3

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 | FILE : 382
Feature: SAIC, Ravenna Army Ammo Plant | TESTED BY : bd
Station: | El. : | Computed By:bd
Range : | Sample: BK 0803 | Checked By :
Boring : | Part : | Report Date:06-15-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 759.63 | Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 107.98 | Dry Wt.+Tare(gm)= 107.67
Tare Wt(gm) = 36.54 | Moisture(%) = 0.44
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 759.63

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	29.5	96.1	19.0500
3/8 in.	103.6	86.4	9.5300
NO.4	213.9	71.8	4.7500
NO.10	376.0	50.5	2.0000
NO.20	10.9	39.4	0.8500
NO.40	28.2	21.9	0.4250
NO.50	38.3	11.6	0.3000
NO.100	44.7	5.2	0.1500
NO.200	46.0	3.9	0.0750

Air Dry Weight(gm)= 50.00 | Corrected Weight(gm)= 49.78

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	8.0	5.0	3.0	0.0501
4 min.	24.0	8.0	5.0	3.0	0.0250
15 min.	23.5	7.0	5.0	2.0	0.0131
1 hour	23.0	6.5	5.0	1.5	0.0066
4 hours	23.0	6.0	5.0	1.0	0.0033

D10(mm) =0.2526 | D30(mm)= 0.5864 | D60(mm)= 2.9395
Gravel(%)=28 | Sand(%)=68 | Silt(%)= 3 | Clay(%)= 1

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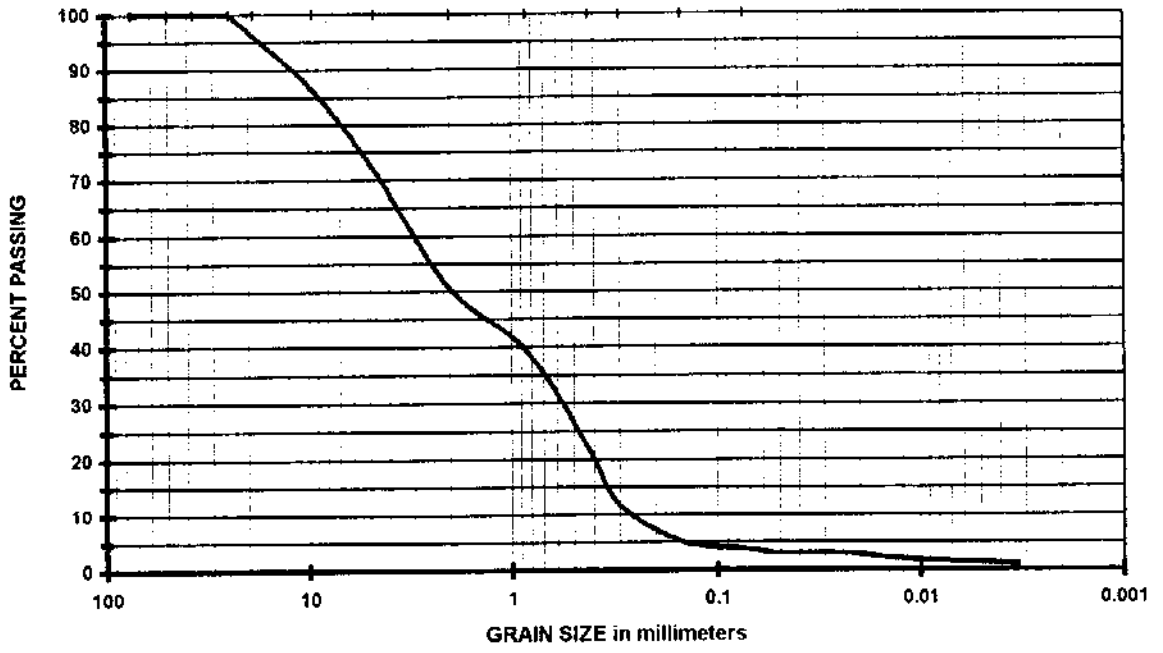
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/15/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0803 Depth (in): _____

Log No.: _____ Soil Classification: Poorly Graded Sand with Gravel (SP)

ATTERBERG LIMITS (#40 Material)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	28
% SAND	68
% SILT	3
% CLAY	1

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 385
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0810 Checked By :
Boring : Part : Report Date:06-15-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 656.99 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 123.07 Dry Wt.+Tare(gm)= 120.51
Tare Wt(gm) = 37.83 Moisture(%) = 3.10
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 656.99

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	12.5	98.1	19.0500
3/8 in.	12.5	98.1	9.5300
NO.4	20.2	96.9	4.7500
NO.10	27.9	95.7	2.0000
NO.20	0.7	94.4	0.8500
NO.40	1.8	92.3	0.4250
NO.50	2.8	90.1	0.3000
NO.100	5.6	84.8	0.1500
NO.200	7.7	80.5	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.50

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	42.5	5.0	74.0	0.0394
4 min.	24.0	40.0	5.0	69.1	0.0201
15 min.	23.0	35.0	5.0	59.2	0.0109
1 hour	23.0	31.0	5.0	51.3	0.0056
4 hours	23.0	25.5	5.0	40.5	0.0029

Gravel(%)= 3 Sand(%)=16 Silt(%)= 31 Clay(%)= 50

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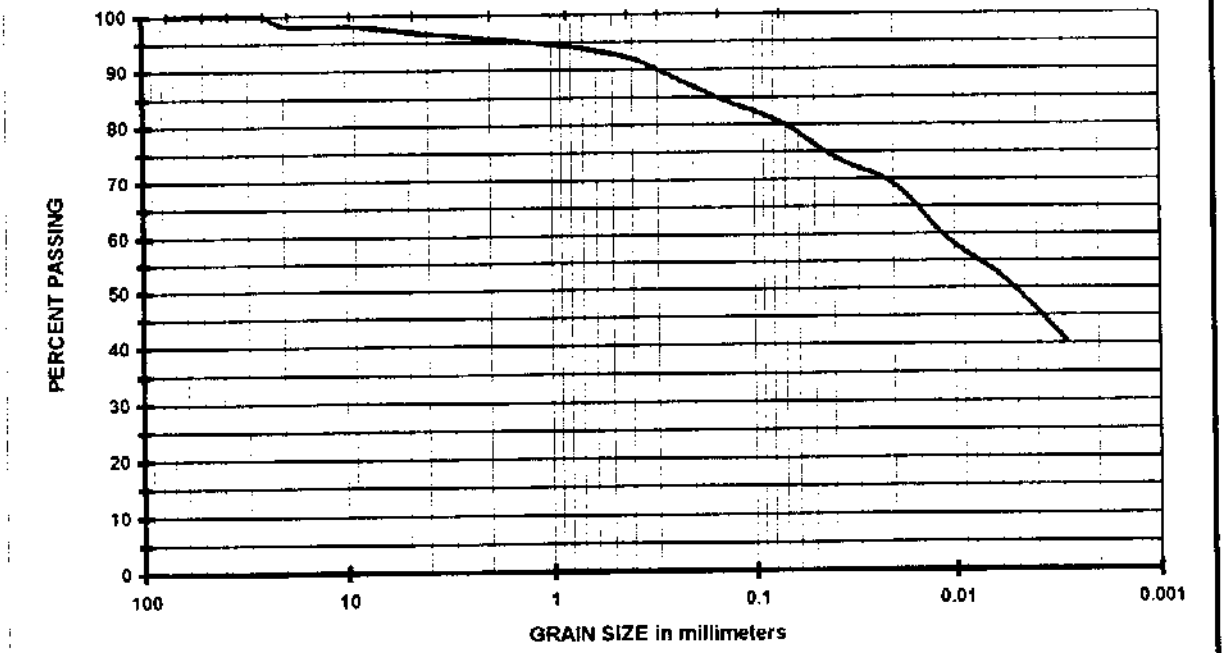
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/15/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0810 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTRERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	40
PLASTIC LIMIT	17
PLASTICITY INDEX	23

GRAIN SIZE DATA

% GRAVEL	3
% SAND	16
% SILT	31
% CLAY	50

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Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. :
Sample: BK 0811
Part :

FILE : 383
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-15-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 952.35 Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 136.50 Dry Wt.+Tare(gm)= 133.99
Tare Wt(gm) = 37.93 Moisture(%) = 2.61

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 952.35

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	8.4	99.1	19.0500
3/8 in.	21.4	97.8	9.5300
NO.4	31.4	96.7	4.7500
NO.10	45.8	95.2	2.0000
NO.20	0.9	93.4	0.8500
NO.40	2.2	90.9	0.4250
NO.50	3.3	88.7	0.3000
NO.100	5.9	83.7	0.1500
NO.200	8.5	78.6	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.73

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	42.0	5.0	72.3	0.0395
4 min.	24.0	40.0	5.0	68.4	0.0201
15 min.	23.0	33.5	5.0	55.7	0.0111
1 hour	23.0	28.0	5.0	44.9	0.0058
4 hours	23.0	24.5	5.0	38.1	0.0030

Gravel(%)= 3 Sand(%)=18 Silt(%)= 35 Clay(%)= 44

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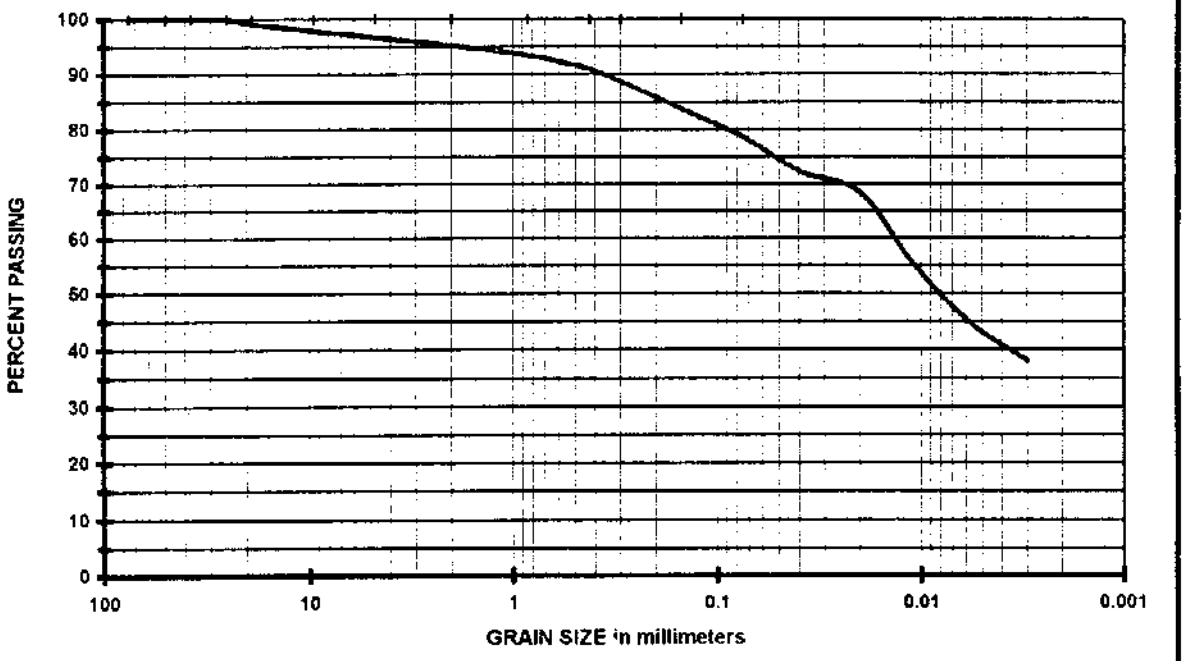
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/15/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0811 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	35
PLASTIC LIMIT	17
PLASTICITY INDEX	18

GRAIN SIZE DATA

% GRAVEL	3
% SAND	18
% SILT	36
% CLAY	44

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 390
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0812 Checked By :
Boring : Part : Report Date:06-16-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 598.10 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 93.42 Dry Wt.+Tare(gm)= 91.54
Tare Wt(gm) = 38.85 Moisture(%) = 3.57
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 598.1

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	0.0	100.0	4.7500
NO.10	0.2	100.0	2.0000
NO.20	0.2	99.6	0.8500
NO.40	12.6	74.0	0.4250
NO.50	23.8	50.7	0.3000
NO.100	30.6	36.6	0.1500
NO.200	34.4	28.8	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.28

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.5	16.5	5.0	23.8	0.0474
4 min.	24.5	15.0	5.0	20.7	0.0239
15 min.	24.5	13.0	5.0	16.6	0.0125
1 hour	24.0	11.0	5.0	12.4	0.0064
4 hours	24.5	10.0	5.0	10.4	0.0032

D10(mm) =0.0028 D30(mm)= 0.0833 D60(mm)= 0.3349
Gravel(%)= 0 Sand(%)=71 Silt(%)= 17 Clay(%)= 12

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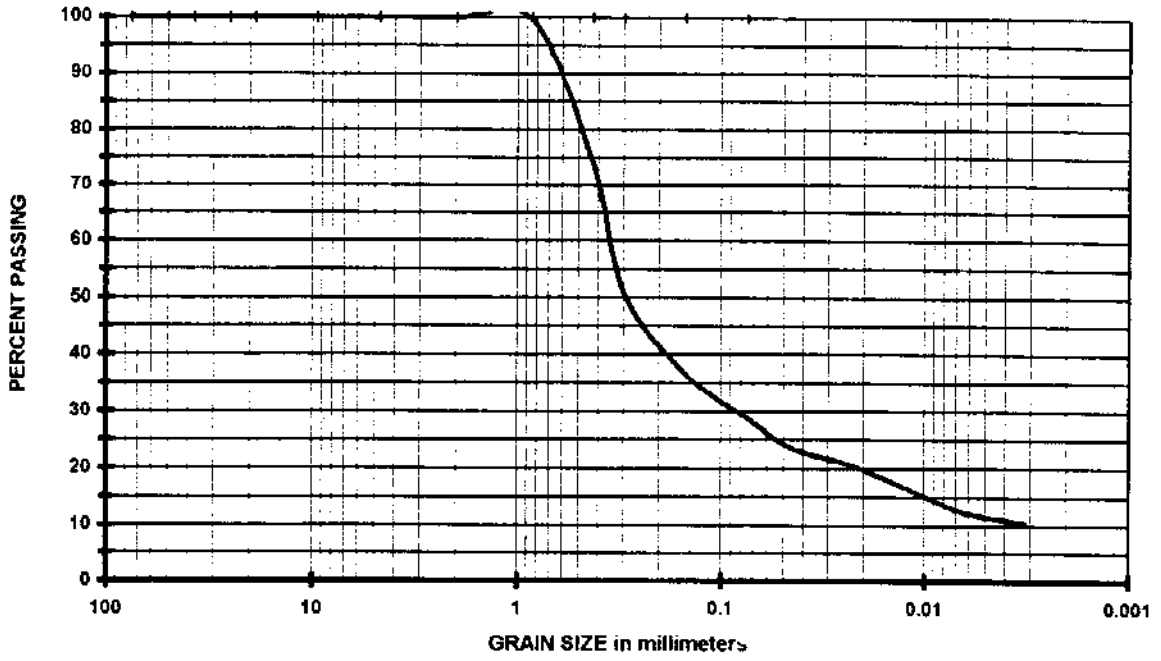
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/16/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **BK 0812** Depth (in): _____

Log No.: _____ Soil Classification: **Clayey Sand (SC)**

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	40
PLASTIC LIMIT	17
PLASTICITY INDEX	23

GRAIN SIZE DATA

% GRAVEL	0
% SAND	71
% SILT	17
% CLAY	12

S&ME, Inc . 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 391
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0813 Checked By :
Boring : Part : Report Date:06-16-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 705.41 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 99.31 Dry Wt.+Tare(gm)= 99.02
Tare Wt(gm) = 39.81 Moisture(%) = 0.49
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 705.41

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	0.0	100.0	4.7500
NO.10	0.2	100.0	2.0000
NO.20	0.0	99.9	0.8500
NO.40	0.6	98.8	0.4250
NO.50	6.4	87.1	0.3000
NO.100	26.4	46.8	0.1500
NO.200	40.3	18.9	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.76

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	25.0	10.0	5.0	10.0	0.0489
4 min.	25.0	8.0	5.0	6.0	0.0247
15 min.	25.0	7.5	5.0	5.0	0.0128
1 hour	24.0	7.0	5.0	4.0	0.0065
4 hours	24.0	7.0	5.0	4.0	0.0032

D10(mm) =0.0485 D30(mm)= 0.0987 D60(mm)= 0.1881
Gravel(%)= 0 Sand(%)=81 Silt(%)= 15 Clay(%)= 4

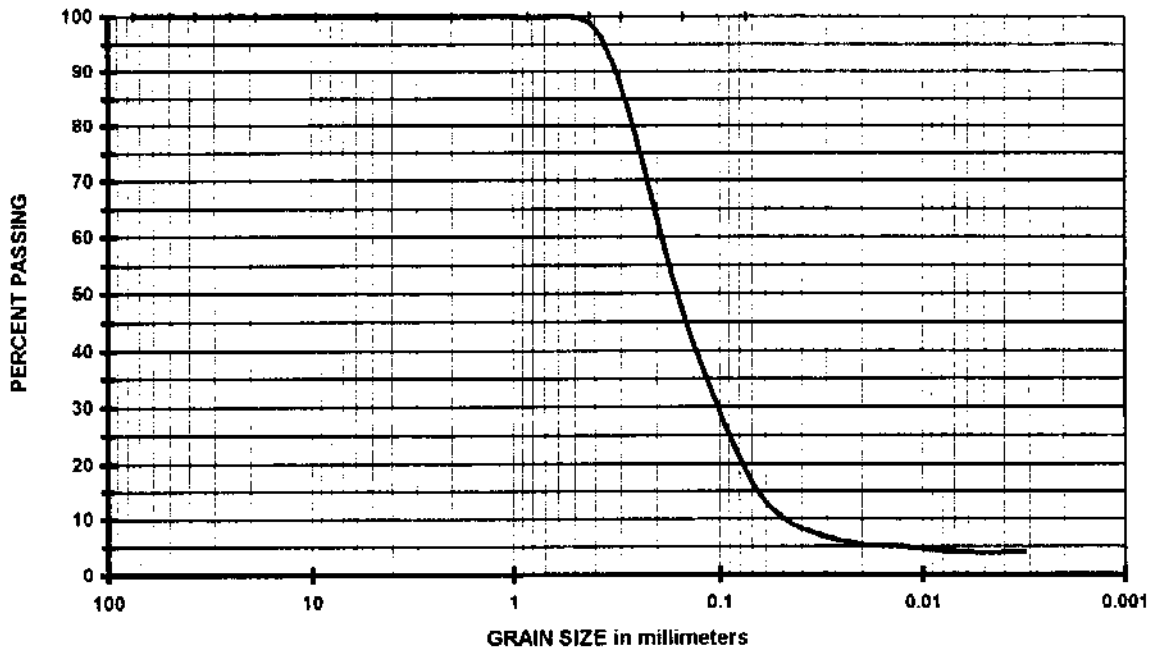
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/16/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0813 Depth (in): _____

Log No.: _____ Soil Classification: Silty Sand (SM)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	0
% SAND	81
% SILT	16
% CLAY	4

S&ME, Inc , 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 392
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0816 Checked By :
Boring : Part : Report Date:06-

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 812.64 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 66.63 Dry Wt.+Tare(gm)= 66.05
Tare Wt(gm) = 38.51 Moisture(%) = 2.11
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 812.64

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	26.6	96.7	9.5300
NO.4	63.8	92.1	4.7500
NO.10	103.8	87.2	2.0000
NO.20	1.9	83.9	0.8500
NO.40	6.8	75.2	0.4250
NO.50	10.4	68.8	0.3000
NO.100	14.6	61.2	0.1500
NO.200	16.5	57.9	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.97

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	25.0	31.0	5.0	46.3	0.0427
4 min.	25.0	26.0	5.0	37.4	0.0221
15 min.	25.0	23.0	5.0	32.1	0.0117
1 hour	24.0	18.0	5.0	23.2	0.0061
4 hours	24.0	16.0	5.0	19.6	0.0031

Gravel(%)= 8 Sand(%)=34 Silt(%)= 36 Clay(%)

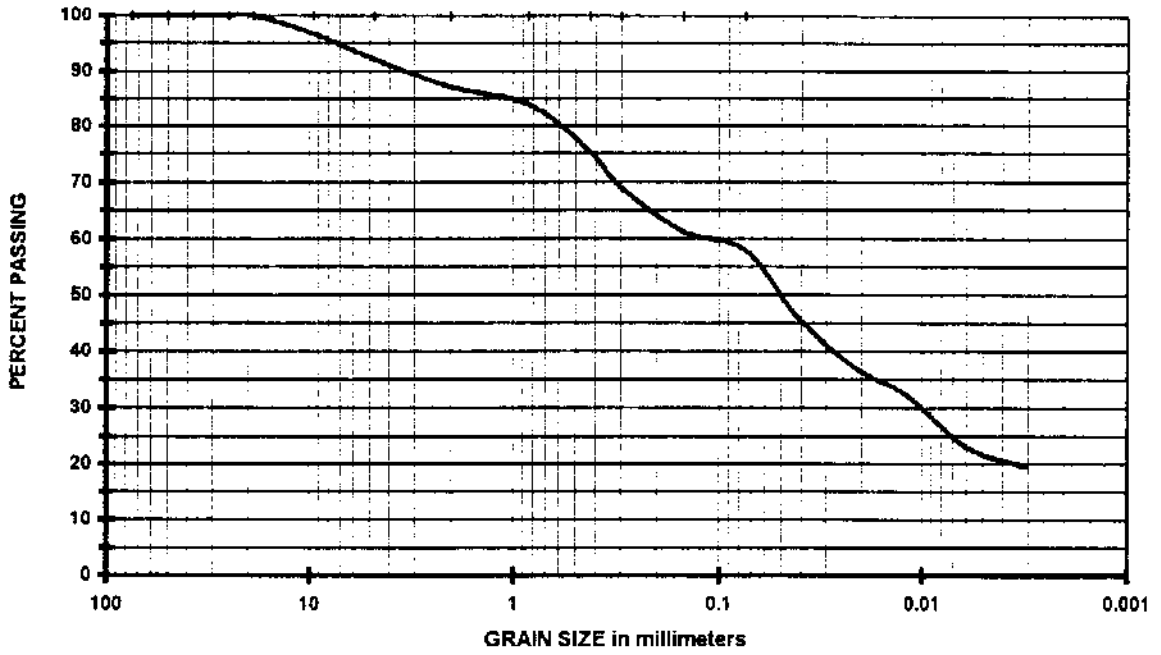
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/16/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0816 Depth (in): _____

Log No.: _____ Soil Classification: Sandy Lean Clay (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	28
PLASTIC LIMIT	19
PLASTICITY INDEX	9

GRAIN SIZE DATA

% GRAVEL	8
% SAND	34
% SILT	36
% CLAY	22

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 393
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0817 Checked By :
Boring : Part : Report Date:06-16-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 809.17 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 94.20 Dry Wt.+Tare(gm)= 94.04
Tare Wt(gm) = 38.41 Moisture(%) = 0.29
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 809.17

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	10.3	98.7	9.5300
NO.4	14.6	98.2	4.7500
NO.10	18.5	97.7	2.0000
NO.20	0.0	97.7	0.8500
NO.40	0.7	96.4	0.4250
NO.50	2.0	93.7	0.3000
NO.100	6.7	84.6	0.1500
NO.200	8.5	81.1	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.86

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	25.0	39.0	5.0	66.6	0.0401
4 min.	25.0	34.5	5.0	57.8	0.0208
15 min.	25.0	29.0	5.0	47.0	0.0112
1 hour	24.5	24.5	5.0	38.2	0.0058
4 hours	24.0	22.0	5.0	33.3	0.0030

Gravel(%)= 2 Sand(%)=17 Silt(%)= 44 Clay(%)= 37

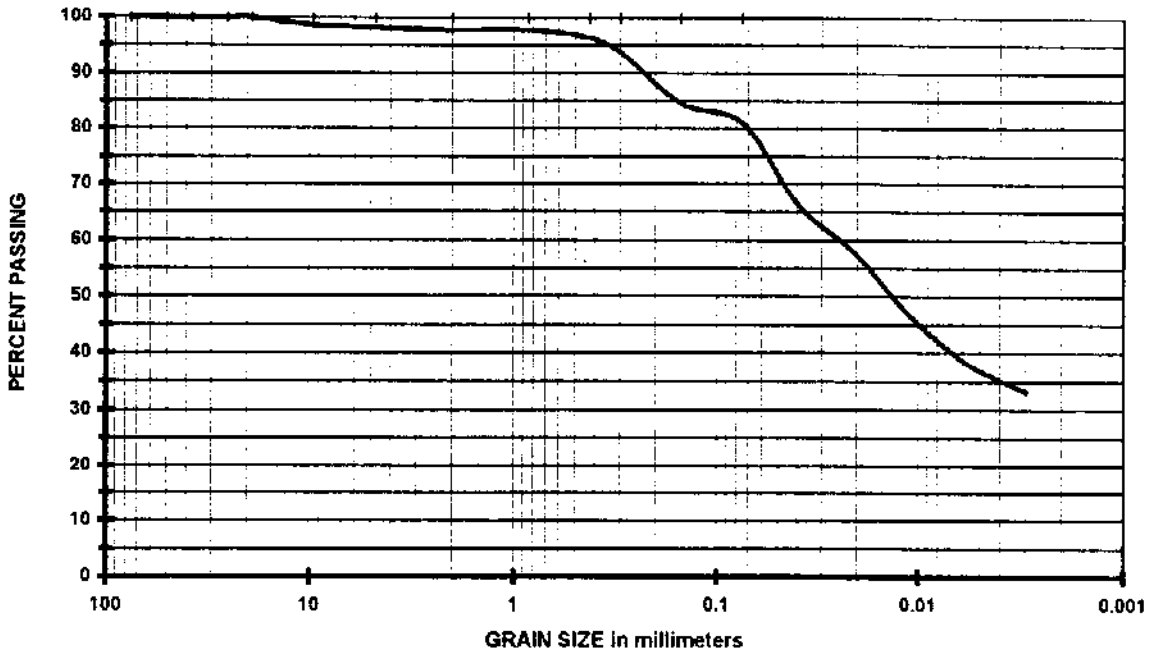
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/16/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0817 Depth (in): _____

Log No.: _____ Soil Classification: Silt with Sand (ML)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	14
PLASTIC LIMIT	12
PLASTICITY INDEX	2

GRAIN SIZE DATA

% GRAVEL	2
% SAND	17
% SILT	44
% CLAY	37

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 394
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0828 Checked By :
Boring : Part : Report Date:06-16-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 790.60 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 74.45 Dry Wt.+Tare(gm)= 73.54
Tare Wt(gm) = 38.24 Moisture(%) = 2.58
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 790.6

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	1.7	99.8	9.5300
NO.4	21.1	97.3	4.7500
NO.10	47.2	94.0	2.0000
NO.20	1.2	91.7	0.8500
NO.40	2.1	90.0	0.4250
NO.50	2.5	89.1	0.3000
NO.100	3.5	87.4	0.1500
NO.200	4.4	85.5	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.74

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	40.0	5.0	67.5	0.0402
4 min.	24.0	32.0	5.0	52.1	0.0214
15 min.	24.0	28.0	5.0	44.4	0.0114
1 hour	24.0	24.0	5.0	36.7	0.0059
4 hours	24.0	21.0	5.0	30.9	0.0030

Gravel(%)= 3 Sand(%)=12 Silt(%)= 50 Clay(%)= 35

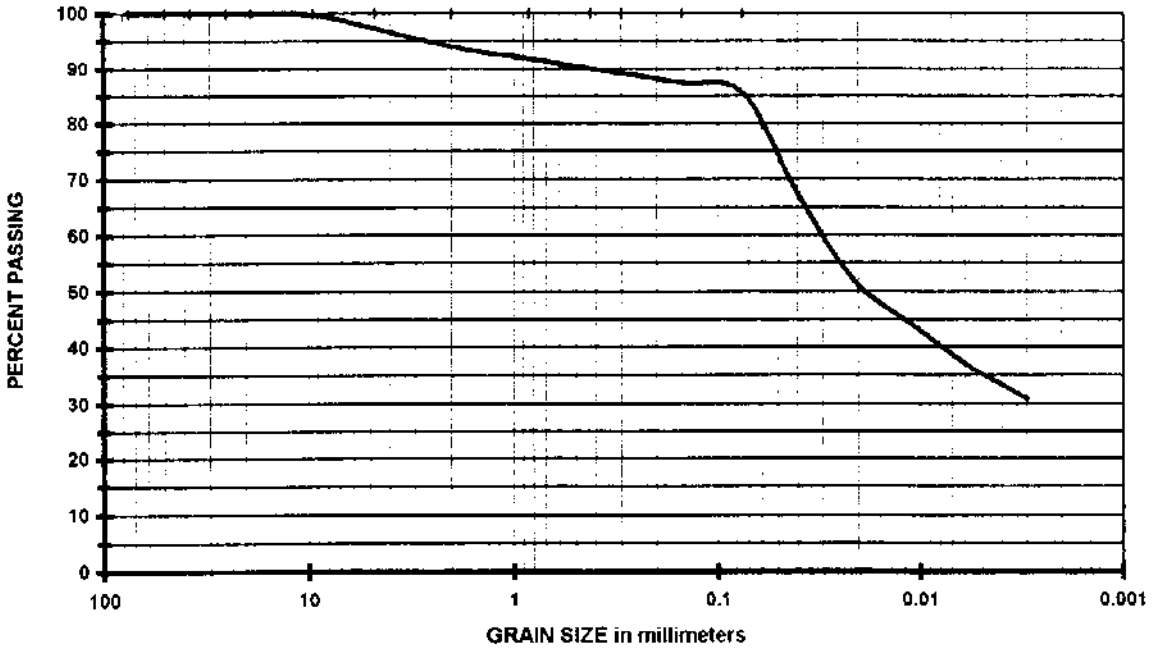
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/16/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **BK 0828** Depth (in): _____

Log No.: _____ Soil Classification: **Lean Clay with Sand (CL)**

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	**31**
PLASTIC LIMIT	**18**
PLASTICITY INDEX	**13**

GRAIN SIZE DATA

% GRAVEL	**3**
% SAND	**12**
% SILT	**50**
% CLAY	**35**

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. :
Sample: BK 0829
Part :

FILE : 395
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-16-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 807.63 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 65.39 Dry Wt.+Tare(gm)= 64.76
Tare Wt(gm) = 39.64 Moisture(%) = 2.51
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 807.63

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	1.0	99.9	9.5300
NO.4	30.6	96.2	4.7500
NO.10	100.1	87.6	2.0000
NO.20	2.6	82.9	0.8500
NO.40	4.1	80.2	0.4250
NO.50	4.7	79.2	0.3000
NO.100	5.8	77.3	0.1500
NO.200	7.1	74.9	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.78

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	25.0	36.0	5.0	55.7	0.0411
4 min.	25.0	26.5	5.0	38.6	0.0221
15 min.	25.0	23.0	5.0	32.3	0.0117
1 hour	24.0	20.5	5.0	27.8	0.0060
4 hours	24.0	17.5	5.0	22.5	0.0031

Gravel(%)= 4 Sand(%)=21 Silt(%)= 48 Clay(%)= 27

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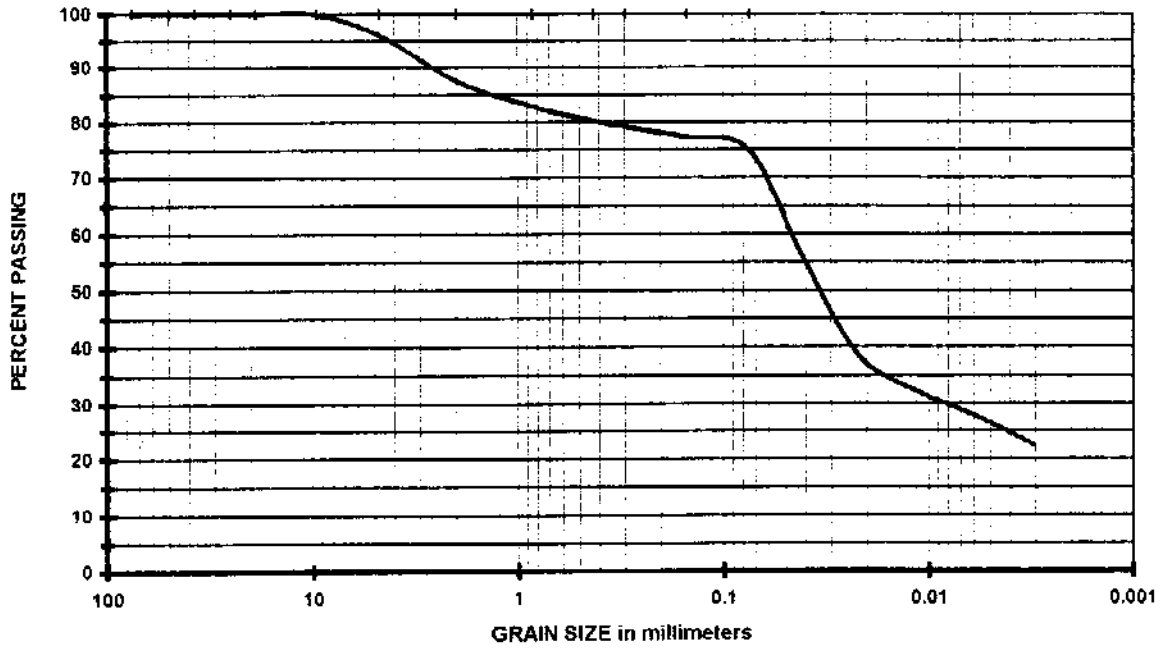
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/16/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0829 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	30
PLASTIC LIMIT	17
PLASTICITY INDEX	13

GRAIN SIZE DATA

% GRAVEL	4
% SAND	21
% SILT	48
% CLAY	27

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Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 401
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0833 Checked By :
Boring : Part : Report Date:06-17-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 818.65 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 98.30 Dry Wt.+Tare(gm)= 97.20
Tare Wt(gm) = 38.40 Moisture(%) = 1.87
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 818.65

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	6.4	99.2	9.5300
NO.4	11.4	98.6	4.7500
NO.10	18.8	97.7	2.0000
NO.20	0.5	96.6	0.8500
NO.40	1.4	94.8	0.4250
NO.50	2.2	93.3	0.3000
NO.100	4.1	89.5	0.1500
NO.200	5.7	86.4	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.08

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.5	44.5	5.0	78.6	0.0384
4 min.	24.5	41.0	5.0	71.7	0.0198
15 min.	24.0	36.5	5.0	62.7	0.0107
1 hour	24.0	31.0	5.0	51.8	0.0056
4 hours	23.5	25.5	5.0	40.8	0.0029

Gravel(%)= 1 Sand(%)=12 Silt(%)= 36 Clay(%)= 51

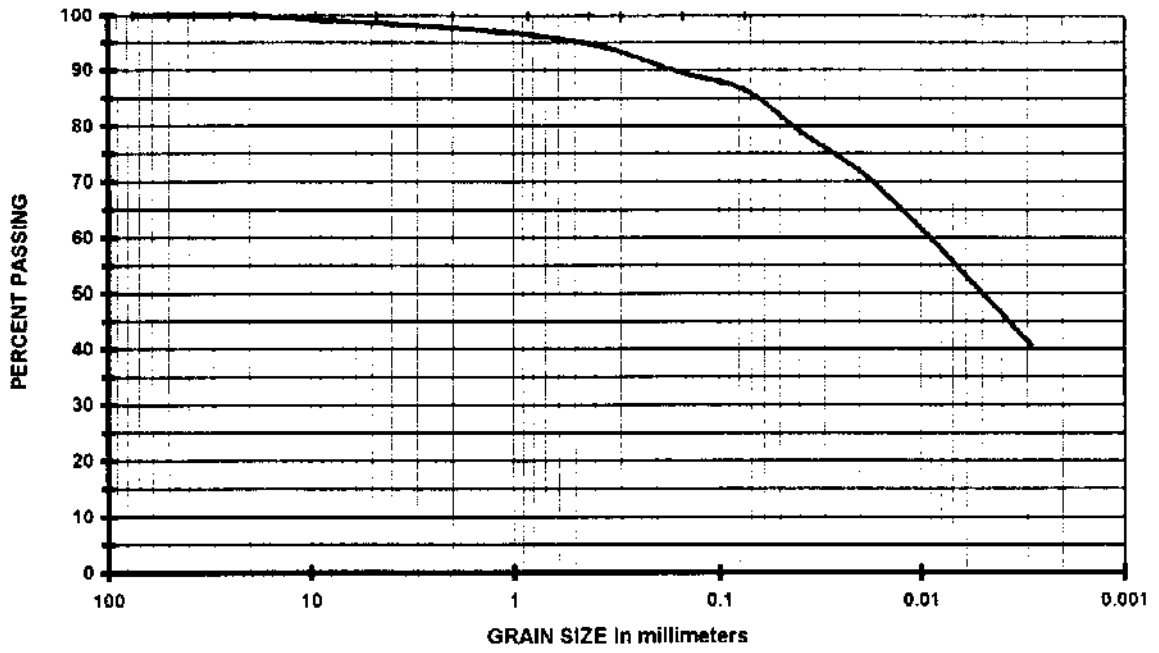
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/17/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0833 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	33
PLASTIC LIMIT	17
PLASTICITY INDEX	16

GRAIN SIZE DATA

% GRAVEL	1
% SAND	12
% SILT	36
% CLAY	51

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 400
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0834 Checked By :
Boring : Part : Report Date:06-17-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 751.54 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 106.00 Dry Wt.+Tare(gm)= 104.80
Tare Wt(gm) = 37.20 Moisture(%) = 1.78
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 751.54

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	30.2	96.0	19.0500
3/8 in.	71.0	90.5	9.5300
NO.4	116.3	84.5	4.7500
NO.10	166.3	77.9	2.0000
NO.20	3.7	72.0	0.8500
NO.40	6.3	67.9	0.4250
NO.50	7.6	65.9	0.3000
NO.100	10.8	60.8	0.1500
NO.200	14.1	55.5	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.13

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	25.0	32.0	5.0	42.8	0.0424
4 min.	24.5	26.0	5.0	33.3	0.0223
15 min.	24.5	22.0	5.0	26.9	0.0118
1 hour	24.0	18.0	5.0	20.6	0.0061
4 hours	24.0	14.0	5.0	14.3	0.0031

Gravel(%)=15 Sand(%)=29 Silt(%)= 37 Clay(%)= 19

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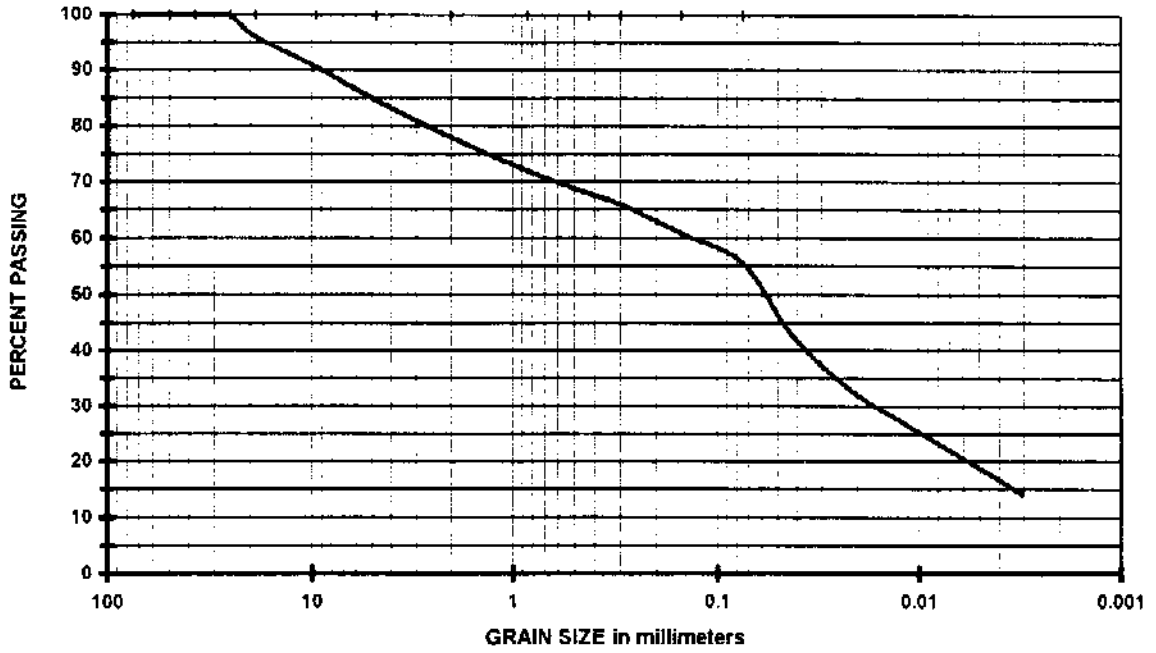
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/17/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0834 Depth (in): _____

Log No.: _____ Soil Classification: Sandy Lean Clay with Gravel (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	28
PLASTIC LIMIT	19
PLASTICITY INDEX	9

GRAIN SIZE DATA

% GRAVEL	15
% SAND	29
% SILT	37
% CLAY	19

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Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 405
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0835 Checked By :
Boring : Part : Report Date:06-17-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 488.57 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 93.30 Dry Wt.+Tare(gm)= 92.30
Tare Wt(gm) = 38.60 Moisture(%) = 1.86
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 488.57

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	1.1	99.8	4.7500
NO.10	3.0	99.4	2.0000
NO.20	4.7	89.9	0.8500
NO.40	8.0	83.2	0.4250
NO.50	9.6	79.9	0.3000
NO.100	13.1	73.0	0.1500
NO.200	16.5	65.9	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.09

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.5	31.5	5.0	53.7	0.0428
4 min.	24.5	27.0	5.0	44.5	0.0221
15 min.	24.5	23.0	5.0	36.4	0.0117
1 hour	24.0	19.0	5.0	28.3	0.0061
4 hours	23.5	16.0	5.0	22.3	0.0031

Gravel(%)= 0 Sand(%)=34 Silt(%)= 39 Clay(%)= 27

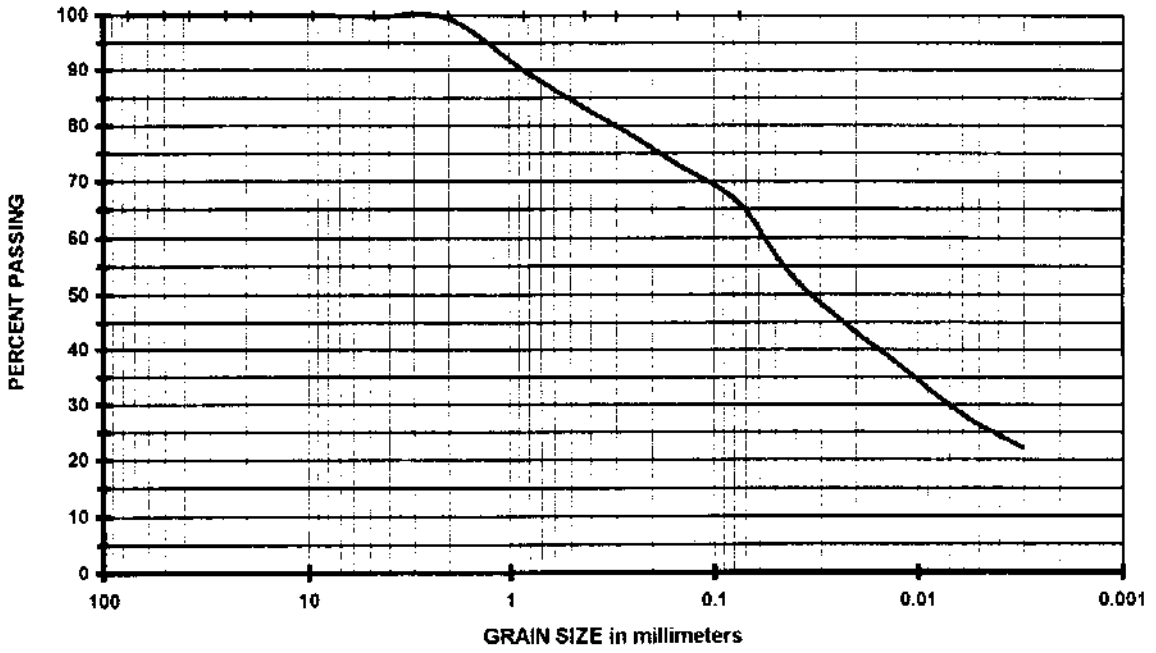
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/17/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0835 Depth (in): _____

Log No.: _____ Soil Classification: Sandy Lean Clay (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	31
PLASTIC LIMIT	18
PLASTICITY INDEX	13

GRAIN SIZE DATA

% GRAVEL	0
% SAND	34
% SILT	39
% CLAY	27

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 402
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0879 Checked By :
Boring : Part : Report Date:06-17-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 850.72 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 90.20 Dry Wt.+Tare(gm)= 89.90
Tare Wt(gm) = 37.90 Moisture(%) = 0.58
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 850.72

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	0.0	100.0	4.7500
NO.10	0.0	100.0	2.0000
NO.20	0.0	100.0	0.8500
NO.40	0.0	100.0	0.4250
NO.50	0.0	100.0	0.3000
NO.100	0.0	100.0	0.1500
NO.200	0.1	99.9	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.71

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.5	47.0	5.0	84.5	0.0375
4 min.	24.5	37.0	5.0	64.4	0.0205
15 min.	24.0	24.0	5.0	38.2	0.0117
1 hour	24.0	12.0	5.0	14.1	0.0063
4 hours	23.5	9.5	5.0	9.1	0.0032

Gravel(%)= 0 Sand(%)= 0 Silt(%)= 88 Clay(%)= 12

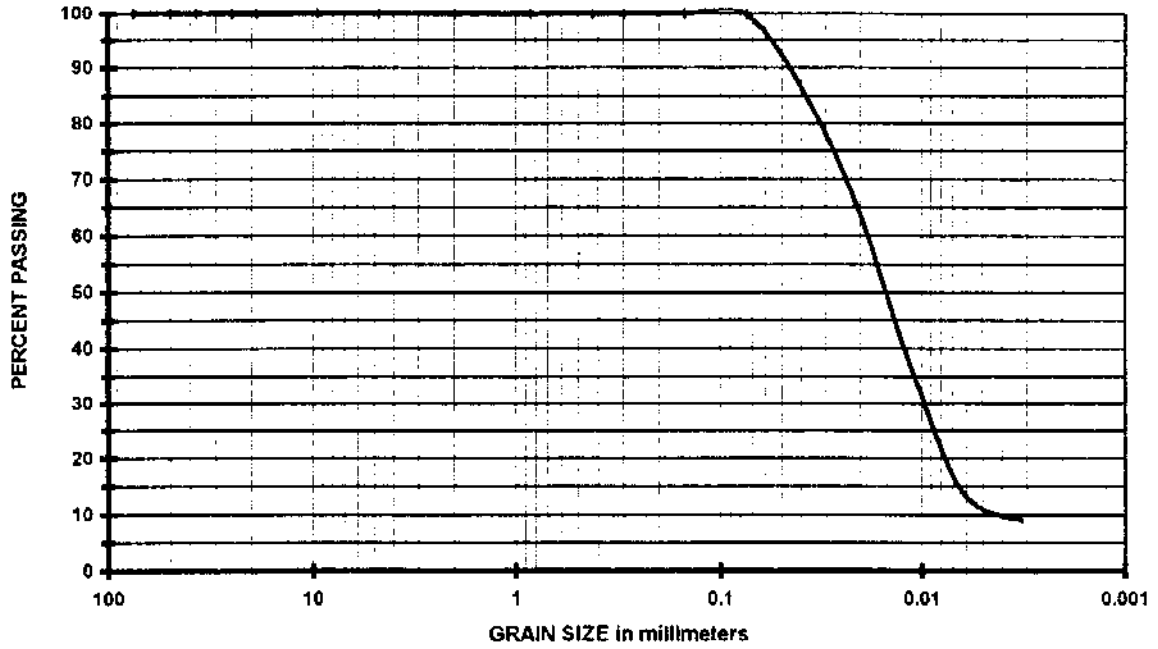
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/17/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **BK 0879** Depth (in): _____

Log No.: _____ Soil Classification: **Silt (ML)**

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	**24**
PLASTIC LIMIT	**21**
PLASTICITY INDEX	**3**

GRAIN SIZE DATA

% GRAVEL	**0**
% SAND	**0**
% SILT	**88**
% CLAY	**12**

S&ME, Inc. 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 404
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: BK 0953 Checked By :
Boring : Part : Report Date:06-17-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 322.91 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 108.90 Dry Wt.+Tare(gm)= 108.60
Tare Wt(gm) = 37.50 Moisture(%) = 0.42
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 322.91

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	4.6	98.6	9.5300
NO.4	14.9	95.4	4.7500
NO.10	23.1	92.9	2.0000
NO.20	1.9	89.3	0.8500
NO.40	9.5	75.1	0.4250
NO.50	21.4	53.0	0.3000
NO.100	37.7	22.5	0.1500
NO.200	41.7	15.2	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.79

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	25.0	11.0	5.0	11.2	0.0487
4 min.	25.0	9.5	5.0	8.4	0.0245
15 min.	24.5	8.0	5.0	5.6	0.0128
1 hour	24.0	7.0	5.0	3.7	0.0065
4 hours	23.5	7.0	5.0	3.7	0.0033

D10(mm) =0.0364 D30(mm)= 0.1777 D60(mm)= 0.3349
Gravel(%)= 5 Sand(%)=80 Silt(%)= 11 Clay(%)= 4

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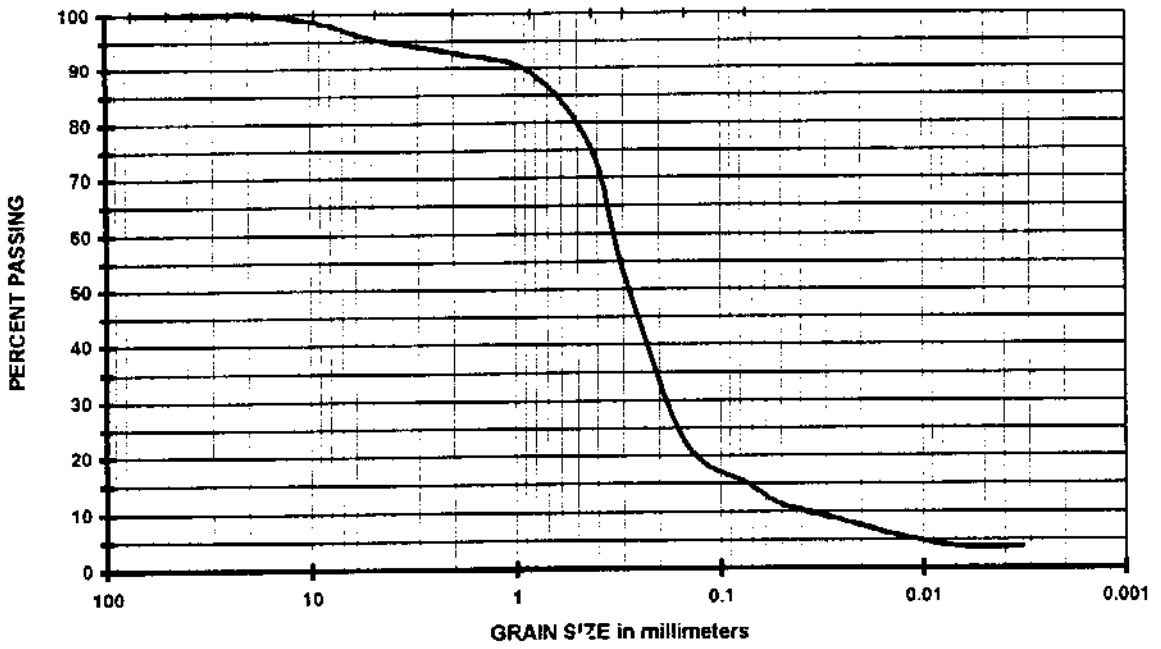
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/17/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0953 Depth (in): _____

Log No.: _____ Soil Classification: Silty Sand (SM)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	5
% SAND	80
% SILT	11
% CLAY	4

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :
El. :
Sample: BK 0954
Part :

FILE : 403
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-17-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 776.19 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 92.00 Dry Wt.+Tare(gm)= 90.50
Tare Wt(gm) = 38.70 Moisture(%) = 2.90
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 776.19

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	2.3	99.7	4.7500
NO.10	6.3	99.2	2.0000
NO.20	0.4	98.3	0.8500
NO.40	0.8	97.6	0.4250
NO.50	1.1	97.0	0.3000
NO.100	1.9	95.4	0.1500
NO.200	2.5	94.1	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.59

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	25.0	50.0	5.0	91.9	0.0362
4 min.	24.5	46.0	5.0	83.7	0.0189
15 min.	24.0	43.5	5.0	78.6	0.0101
1 hour	24.0	38.0	5.0	67.4	0.0053
4 hours	24.0	33.0	5.0	57.2	0.0027

Gravel(%)= 0 Sand(%)= 6 Silt(%)= 28 Clay(%)= 66

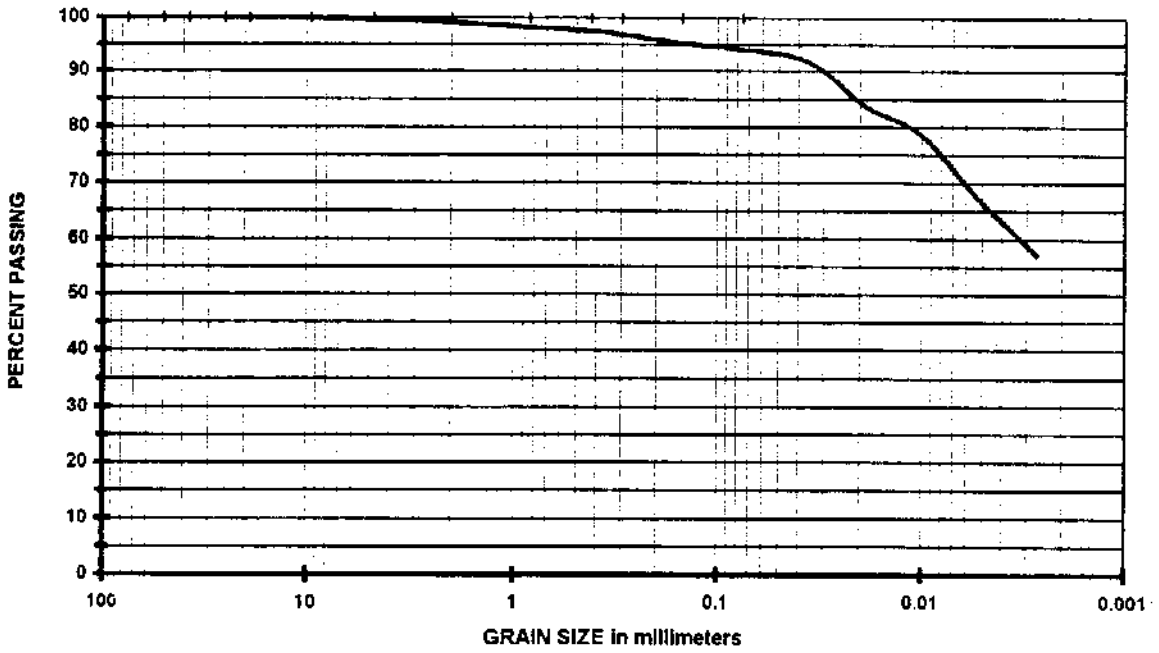
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/17/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **BK 0954** Depth (in): _____

Log No.: _____ Soil Classification: **Lean Clay (CL)**

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	**44**
PLASTIC LIMIT	**18**
PLASTICITY INDEX	**26**

GRAIN SIZE DATA

% GRAVEL	**0**
% SAND	**6**
% SILT	**28**
% CLAY	**66**

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. :
Sample: BK 0955
Part :

FILE : 411
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-18-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 848.60 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 113.30 Dry Wt.+Tare(gm)= 112.90
Tare Wt(gm) = 39.10 Moisture(%) = 0.54
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 848.6

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	1.1	99.9	4.7500
NO.10	3.1	99.6	2.0000
NO.20	0.2	99.2	0.8500
NO.40	4.7	90.3	0.4250
NO.50	17.3	65.0	0.3000
NO.100	40.5	18.6	0.1500
NO.200	43.3	12.8	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.73

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	11.0	5.0	12.0	0.0492
4 min.	24.0	9.0	5.0	8.0	0.0249
15 min.	23.5	9.0	5.0	8.0	0.0129
1 hour	23.0	8.0	5.0	6.0	0.0065
4 hours	22.5	7.0	5.0	4.0	0.0033

D10(mm) =0.0349 D30(mm)= 0.1779 D60(mm)= 0.2783
Gravel(%)= 0 Sand(%)=87 Silt(%)= 8 Clay(%)= 5

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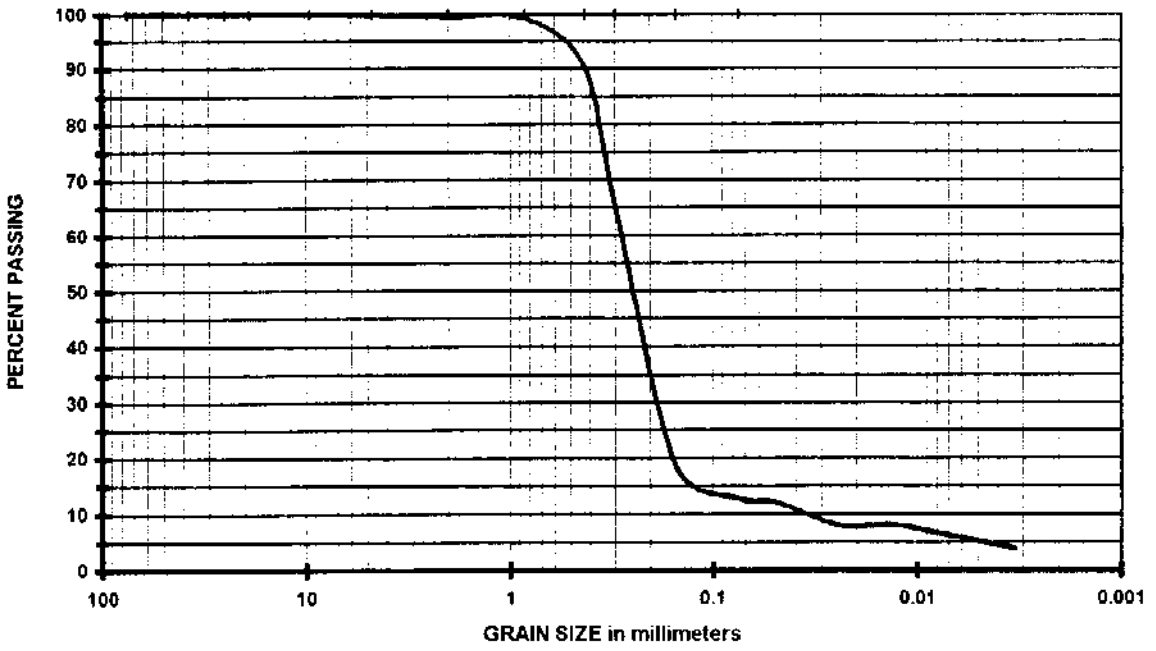
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/18/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0955 Depth (in): _____

Log No.: _____ Soil Classification: Silty Sand (SM)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	0
% SAND	87
% SILT	8
% CLAY	5

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 408
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0694 Checked By :
Boring : Part : Report Date:06-18-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 366.85 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 93.50 Dry Wt.+Tare(gm)= 92.12
Tare Wt(gm) = 39.90 Moisture(%) = 2.64
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 366.85

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	8.0	97.8	9.5300
NO.4	16.0	95.6	4.7500
NO.10	22.3	93.9	2.0000
NO.20	1.3	91.4	0.8500
NO.40	3.7	86.8	0.4250
NO.50	6.3	81.8	0.3000
NO.100	12.2	70.5	0.1500
NO.200	15.2	64.6	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.71

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	34.0	5.0	55.9	0.0422
4 min.	24.0	30.0	5.0	48.2	0.0218
15 min.	24.0	25.0	5.0	38.6	0.0116
1 hour	23.0	20.0	5.0	28.9	0.0061
4 hours	22.5	17.0	5.0	23.1	0.0031

Gravel(%)= 4 Sand(%)=31 Silt(%)= 37 Clay(%)= 28

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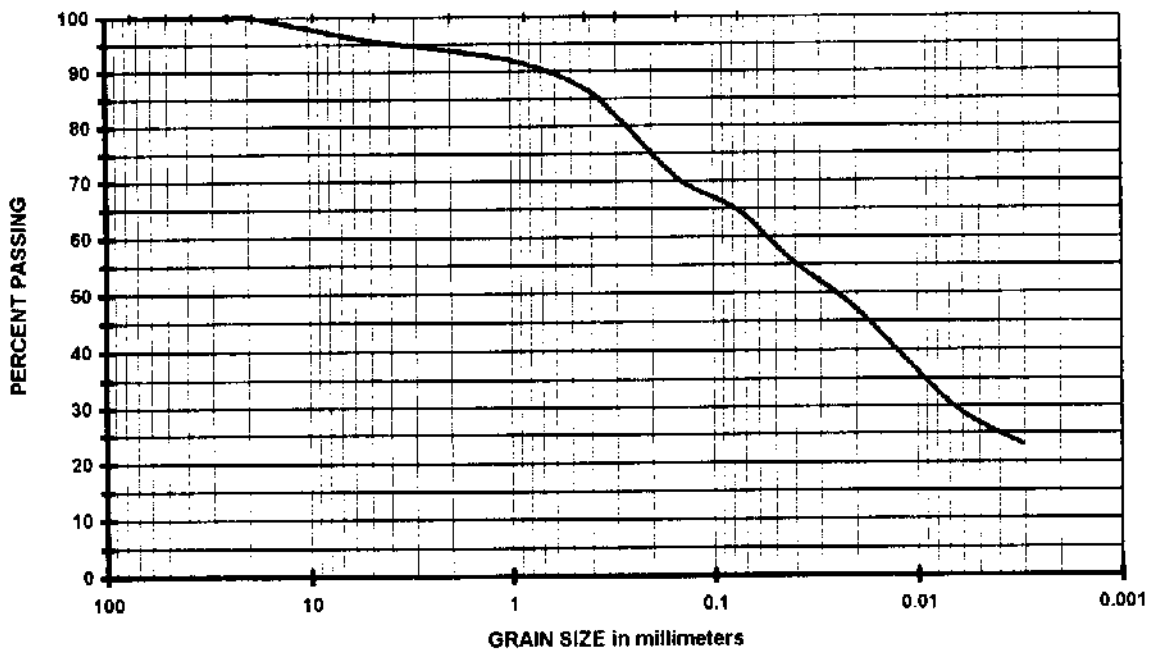
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/18/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0694 Depth (in): _____

Log No.: _____ Soil Classification: Sandy Lean Clay (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	37
PLASTIC LIMIT	22
PLASTICITY INDEX	15

GRAIN SIZE DATA

% GRAVEL	4
% SAND	31
% SILT	37
% CLAY	28

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 409
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0696 Checked By :
Boring : Part : Report Date:06-18-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 404.26 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 91.30 Dry Wt.+Tare(gm)= 89.80
Tare Wt(gm) = 37.80 Moisture(%) = 2.88
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 404.26

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	11.0	97.3	19.0500
3/8 in.	61.6	84.8	9.5300
NO.4	105.6	73.9	4.7500
NO.10	120.1	70.3	2.0000
NO.20	2.2	67.1	0.8500
NO.40	4.5	63.7	0.4250
NO.50	6.5	61.0	0.3000
NO.100	10.2	55.5	0.1500
NO.200	12.3	52.5	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.60

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	37.0	5.0	46.3	0.0412
4 min.	23.5	32.0	5.0	39.0	0.0216
15 min.	23.5	27.0	5.0	31.8	0.0116
1 hour	23.0	21.0	5.0	23.1	0.0060
4 hours	23.0	18.0	5.0	18.8	0.0031

Gravel(%)=26 Sand(%)=21 Silt(%)= 31 Clay(%)= 22

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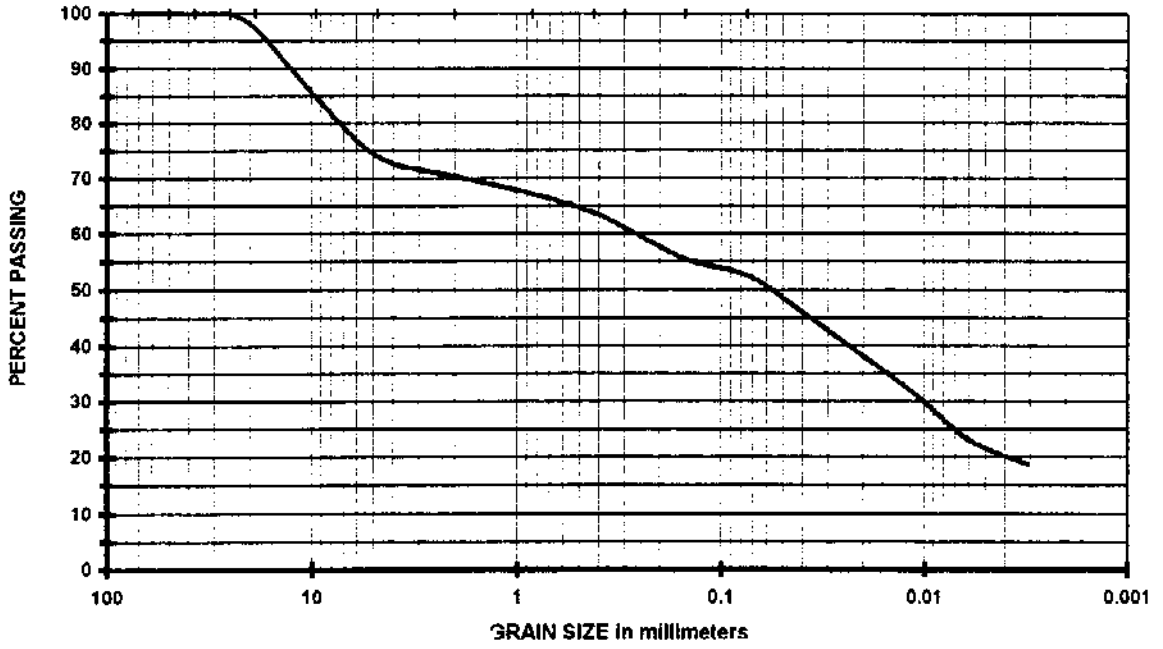
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/18/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **WB 0696** Depth (in): _____

Log No.: _____ Soil Classification: **Gravely Lean Clay with Sand (CL)**

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	**45**
PLASTIC LIMIT	**26**
PLASTICITY INDEX	**19**

GRAIN SIZE DATA

% GRAVEL	**26**
% SAND	**21**
% SILT	**31**
% CLAY	**22**

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 410
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0701 Checked By :
Boring : Part : Report Date:06-18-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 320.88 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 106.20 Dry Wt.+Tare(gm)= 104.80
Tare Wt(gm) = 38.90 Moisture(%) = 2.12
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 320.88

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	6.0	98.1	9.5300
NO.4	16.4	94.9	4.7500
NO.10	28.6	91.1	2.0000
NO.20	2.3	86.8	0.8500
NO.40	5.5	80.9	0.4250
NO.50	8.4	75.5	0.3000
NO.100	13.9	65.2	0.1500
NO.200	17.1	59.3	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.96

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	32.0	5.0	50.2	0.0429
4 min.	24.0	27.0	5.0	40.9	0.0222
15 min.	23.0	21.0	5.0	29.8	0.0121
1 hour	23.0	17.5	5.0	23.3	0.0062
4 hours	23.0	15.0	5.0	18.6	0.0031

Gravel(%)= 5 Sand(%)=36 Silt(%)= 37 Clay(%)= 22

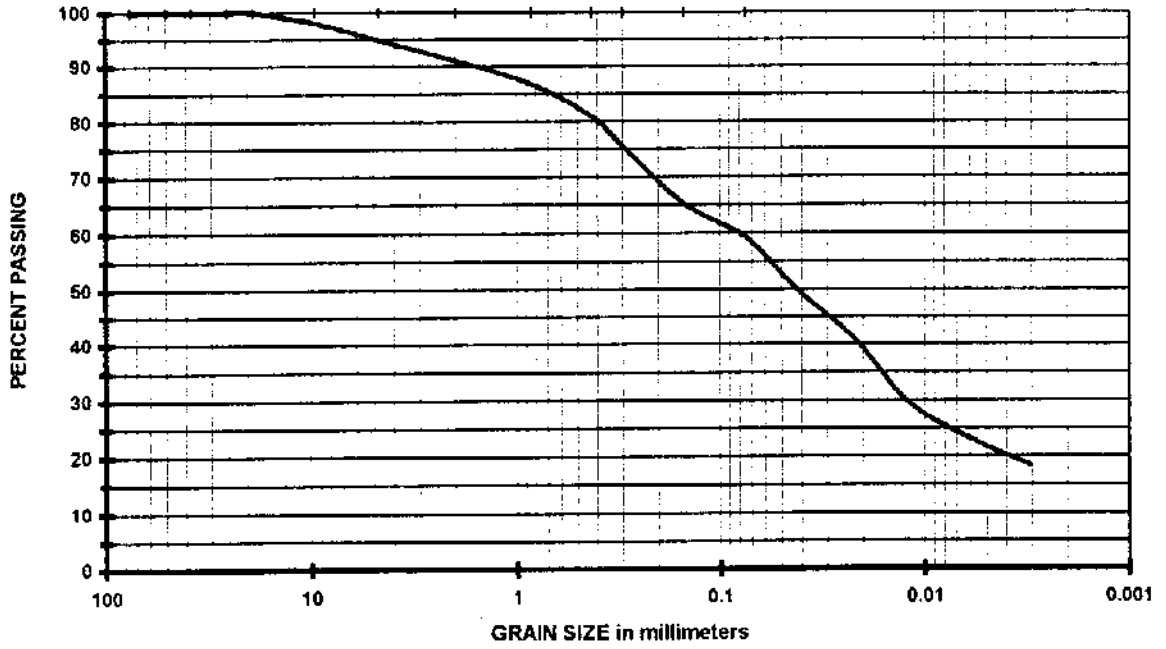
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/18/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0701 Depth (in): _____

Log No.: _____ Soil Classification: Sandy Lean Clay (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	32
PLASTIC LIMIT	20
PLASTICITY INDEX	12

GRAIN SIZE DATA

% GRAVEL	5
% SAND	36
% SILT	37
% CLAY	22

S&ME, Inc . 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 422
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0723 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 352.76 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 91.00 Dry Wt.+Tare(gm)= 89.70
Tare Wt(gm) = 38.40 Moisture(%) = 2.53
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 352.76

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	6.7	98.1	19.0500
3/8 in.	9.8	97.2	9.5300
NO.4	16.0	95.5	4.7500
NO.10	24.5	93.0	2.0000
NO.20	1.4	90.4	0.8500
NO.40	3.5	86.4	0.4250
NO.50	5.6	82.3	0.3000
NO.100	9.5	74.9	0.1500
NO.200	11.5	71.1	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.76

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	39.0	5.0	64.9	0.0406
4 min.	24.0	34.0	5.0	55.3	0.0211
15 min.	24.0	30.0	5.0	47.7	0.0112
1 hour	23.0	24.0	5.0	36.3	0.0059
4 hours	23.0	21.0	5.0	30.5	0.0030

Gravel(%)= 5 Sand(%)=24 Silt(%)= 36 Clay(%)= 35

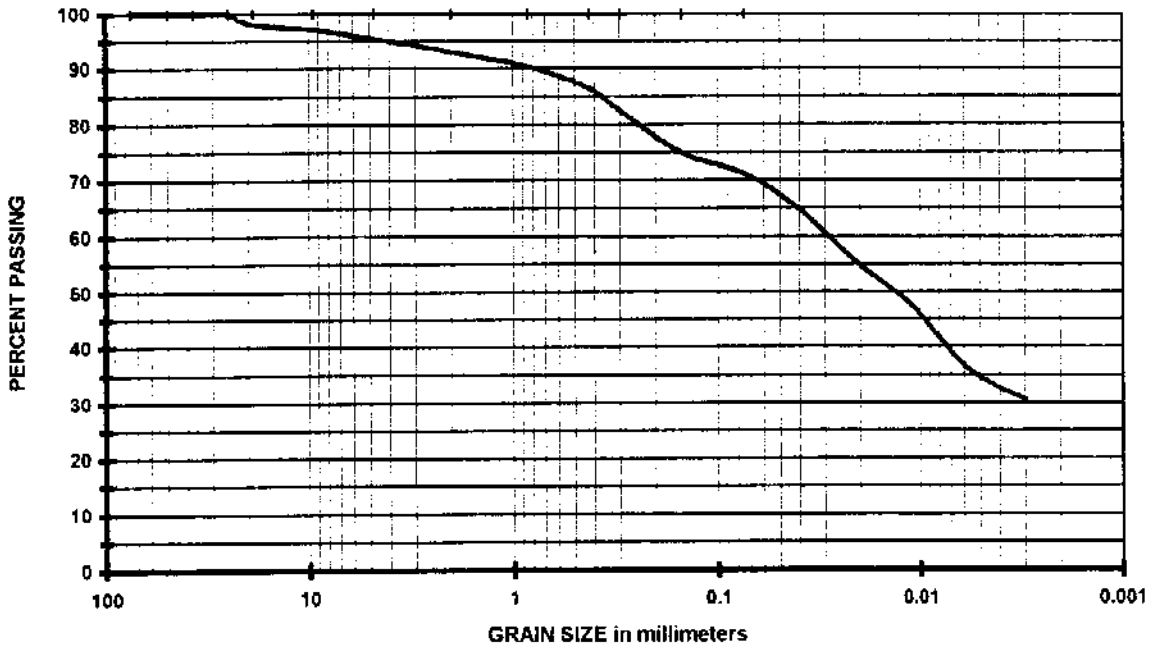
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0723 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	38
PLASTIC LIMIT	19
PLASTICITY INDEX	19

GRAIN SIZE DATA

% GRAVEL	5
% SAND	24
% SILT	36
% CLAY	35

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 426
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0730 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 546.20 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 95.90 Dry Wt.+Tare(gm)= 94.70
Tare Wt(gm) = 37.10 Moisture(%) = 2.08
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 546.2

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	41.7	92.4	9.5300
NO.4	87.0	84.1	4.7500
NO.10	124.2	77.3	2.0000
NO.20	3.4	72.0	0.8500
NO.40	9.8	61.7	0.4250
NO.50	16.9	50.6	0.3000
NO.100	28.0	33.2	0.1500
NO.200	30.1	29.8	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.98

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	22.0	5.0	26.8	0.0460
4 min.	23.0	18.0	5.0	20.5	0.0239
15 min.	23.0	16.0	5.0	17.3	0.0125
1 hour	23.0	14.0	5.0	14.2	0.0063
4 hours	22.5	11.0	5.0	9.5	0.0032

D10(mm) =0.0035 D30(mm)= 0.0783 D60(mm)= 0.4023
Gravel(%)=16 Sand(%)=54 Silt(%)= 17 Clay(%)= 13

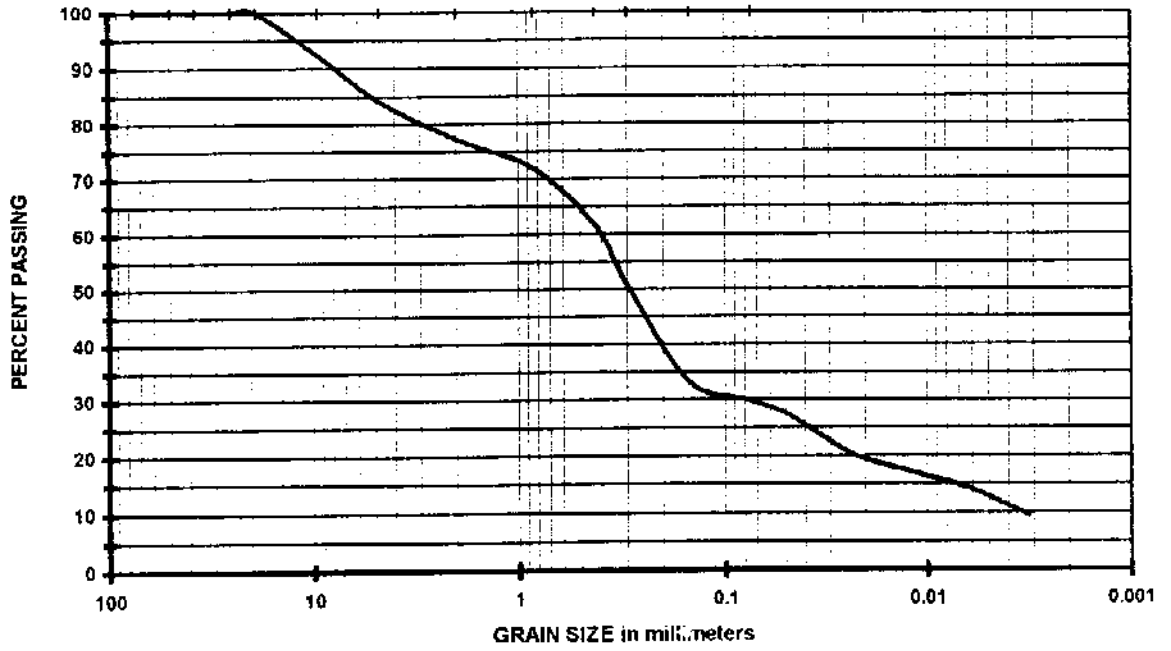
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0730 Depth (in).: _____

Log No.: _____ Soil Classification: Clayey Sand with Gravel (SC)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	31
PLASTIC LIMIT	23
PLASTICITY INDEX	8

GRAIN SIZE DATA

% GRAVEL	16
% SAND	64
% SILT	17
% CLAY	13

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 421
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0735 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 528.29 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 96.40 Dry Wt.+Tare(gm)= 95.20
Tare Wt(gm) = 39.00 Moisture(%) = 2.14
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 528.29

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	86.3	83.7	9.5300
NO.4	146.3	72.3	4.7500
NO.10	189.0	64.2	2.0000
NO.20	5.8	56.6	0.8500
NO.40	10.7	50.2	0.4250
NO.50	14.6	45.1	0.3000
NO.100	28.7	26.6	0.1500
NO.200	33.6	20.1	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.95

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	17.0	5.0	15.7	0.0475
4 min.	24.0	14.0	5.0	11.8	0.0242
15 min.	23.0	12.0	5.0	9.2	0.0128
1 hour	23.0	10.0	5.0	6.6	0.0065
4 hours	22.5	9.0	5.0	5.2	0.0033

D10(mm) =0.0156 D30(mm)= 0.1702 D60(mm)= 1.2432
Gravel(%)=28 Sand(%)=52 Silt(%)= 14 Clay(%)= 6

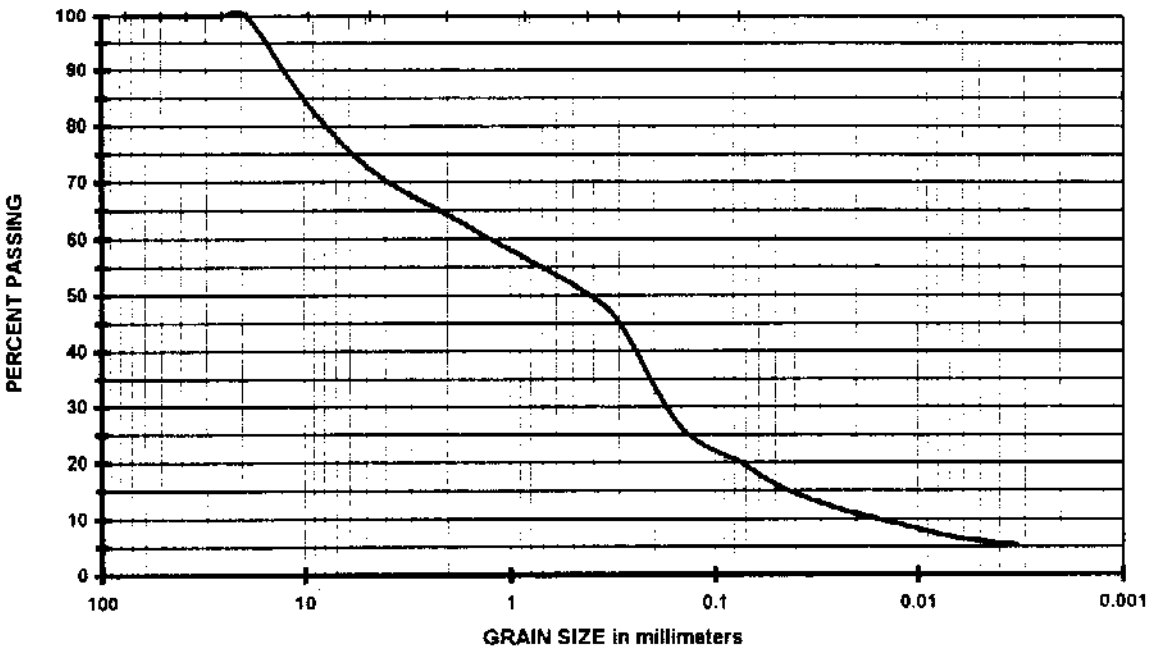
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0735 Depth (in): _____

Log No.: _____ Soil Classification: Silty Sand with Gravel (SM)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	22
PLASTIC LIMIT	21
PLASTICITY INDEX	1

GRAIN SIZE DATA

% GRAVEL	28
% SAND	52
% SILT	14
% CLAY	6

S&ME, Inc , 1413 Topside Road. Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :
El. :
Sample: WB 0742
Part :
FILE : 388
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-16-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 559.00 Tare Wt(gm) = 0.00

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 559

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	95.6	82.9	25.4000
3/4 in.	208.0	62.8	19.0500
3/8 in.	539.5	3.5	9.5300
NO.4	556.4	0.5	4.7500
NO.10	556.4	0.5	2.0000
NO.20	556.4	0.5	0.8500
NO.40	556.4	0.5	0.4250
NO.50	556.4	0.5	0.3000
NO.100	556.4	0.5	0.1500
NO.200	556.4	0.5	0.0750

D10(mm) =%10.2824 D30(mm)=12.9881 D60(mm)=18.4383
Gravel(%)=%100 Sand(%)= 0 Silt(%)= 0 Clay(%)= 0

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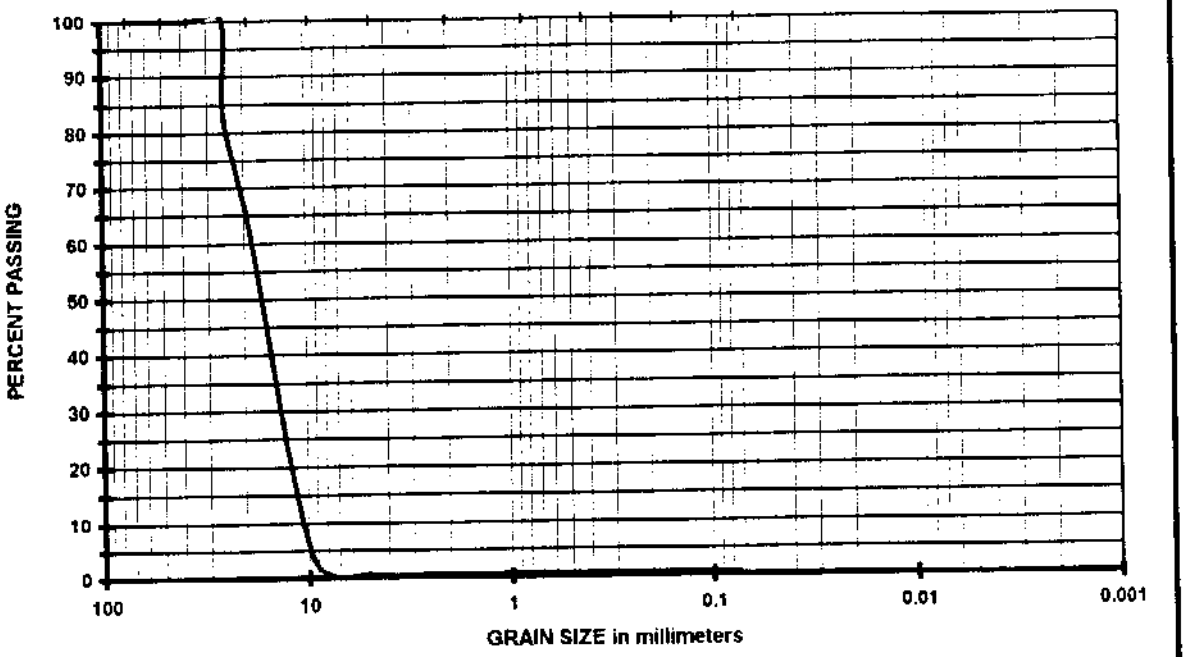
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/16/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0742 Depth (in): _____

Log No.: _____ Soil Classification: Poor Graded Gravel (GP)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	100
% SAND	0
% SILT	0
% CLAY	0

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. :
Sample: WB 0743
Part :

FILE : 389
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-16-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 616.60 Tare Wt(gm) = 0.00
Non-Plastic Soil

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 616.6

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	397.0	35.6	19.0500
3/8 in.	613.9	0.4	9.5300
NO.4	613.9	0.4	4.7500
NO.10	613.9	0.4	2.0000
NO.20	613.9	0.4	0.8500
NO.40	613.9	0.4	0.4250
NO.50	613.9	0.4	0.3000
NO.100	613.9	0.4	0.1500
NO.200	613.9	0.4	0.0750

D10(mm) =%11.5043 D30(mm)=17.0541 D60(mm)=21.2424
Gravel(%)=%100 Sand(%)= 0 Silt(%)= 0 Clay(%)= 0

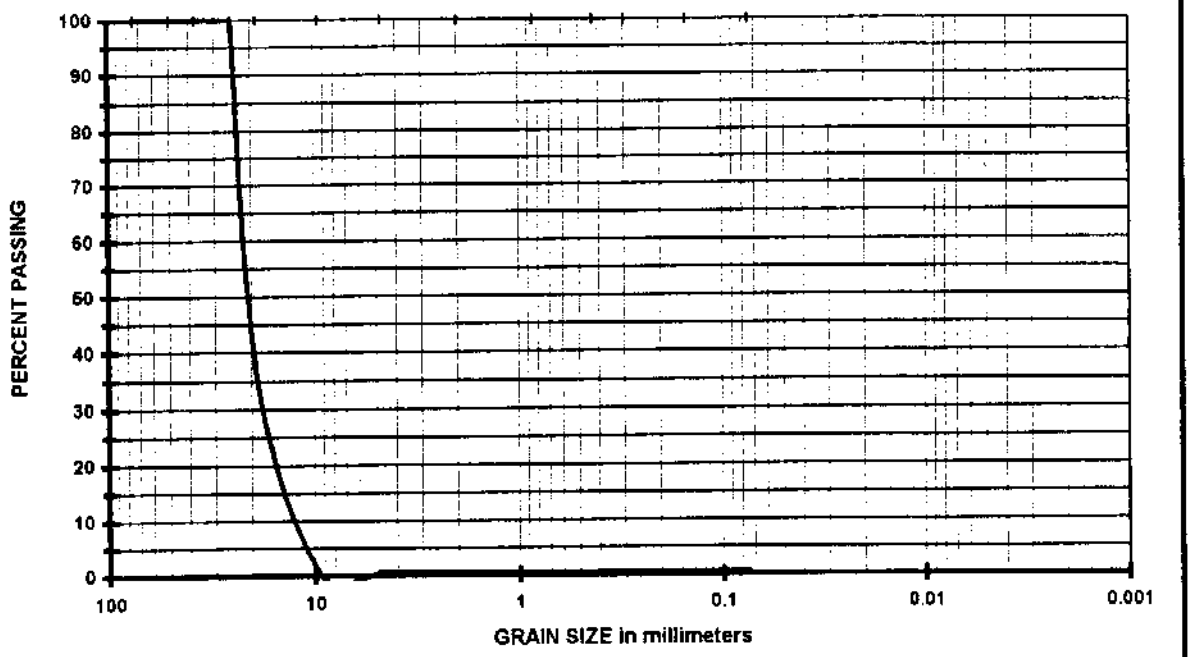
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/16/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0743 Depth (in): _____

Log No.: _____ Soil Classification: Poor Graded Gravel (GP)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	100
% SAND	0
% SILT	0
% CLAY	0

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :
El. :
Sample: WB 0749
Part :

FILE : 430
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 595.96 Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 113.80 Dry Wt.+Tare(gm)= 112.00
Tare Wt(gm) = 38.50 Moisture(%) = 2.45

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 595.96

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	4.7	99.2	9.5300
NO.4	17.8	97.0	4.7500
NO.10	28.7	95.2	2.0000
NO.20	0.9	93.4	0.8500
NO.40	2.2	91.0	0.4250
NO.50	3.2	88.9	0.3000
NO.100	5.8	83.8	0.1500
NO.200	7.6	80.3	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.80

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	42.0	5.0	72.2	0.0395
4 min.	24.0	39.0	5.0	66.3	0.0203
15 min.	23.0	35.0	5.0	58.5	0.0109
1 hour	23.0	30.0	5.0	48.8	0.0057
4 hours	22.5	25.0	5.0	39.0	0.0030

Gravel(%)= 3 Sand(%)=17 Silt(%)= 33 Clay(%)= 47

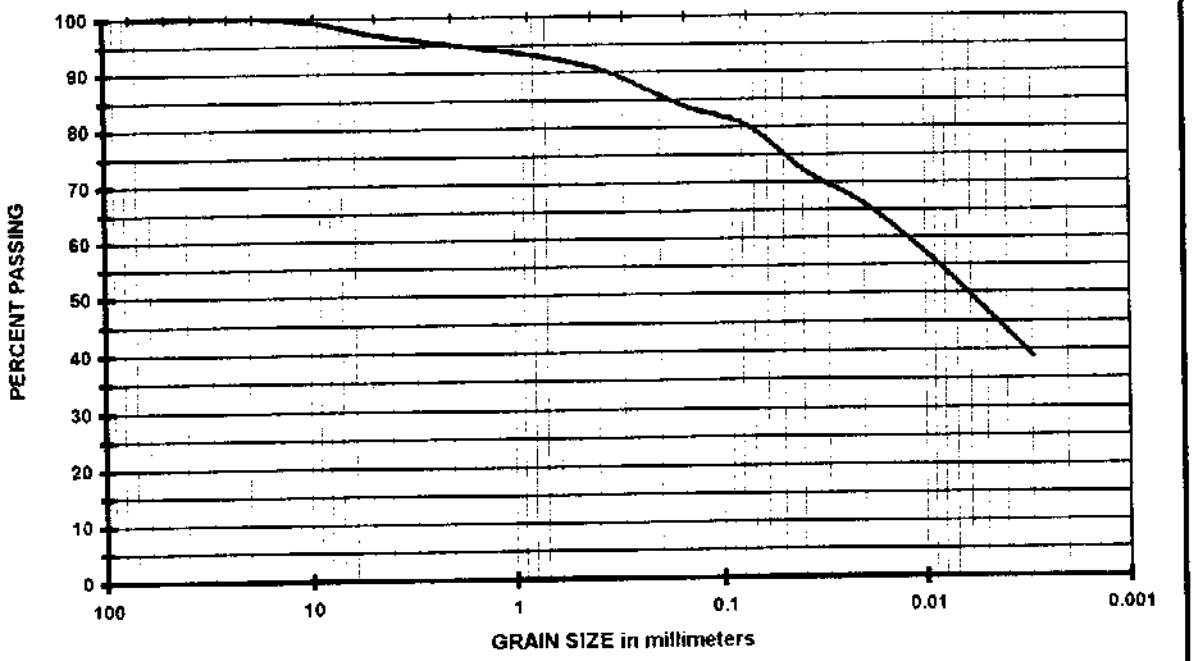
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0749 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	34
PLASTIC LIMIT	18
PLASTICITY INDEX	16

GRAIN SIZE DATA

% GRAVEL	3
% SAND	17
% SILT	33
% CLAY	47

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777. (423) 970-0003. Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 429
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0752 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 623.62 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 110.50 Dry Wt.+Tare(gm)= 109.10
Tare Wt(gm) = 36.80 Moisture(%) = 1.94
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 623.62

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	2.0	99.7	4.7500
NO.10	14.0	97.8	2.0000
NO.20	1.6	94.5	0.8500
NO.40	9.5	78.9	0.4250
NO.50	17.6	62.7	0.3000
NO.100	25.8	46.4	0.1500
NO.200	27.5	42.9	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.05

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	24.0	5.0	37.9	0.0454
4 min.	24.0	21.0	5.0	31.9	0.0232
15 min.	23.0	19.0	5.0	27.9	0.0123
1 hour	23.0	15.0	5.0	19.9	0.0063
4 hours	22.5	12.5	5.0	14.9	0.0032

D10(mm) =0.0016 D30(mm)= 0.0171 D60(mm)= 0.2675
Gravel(%)= 0 Sand(%)=57 Silt(%)= 25 Clay(%)= 18

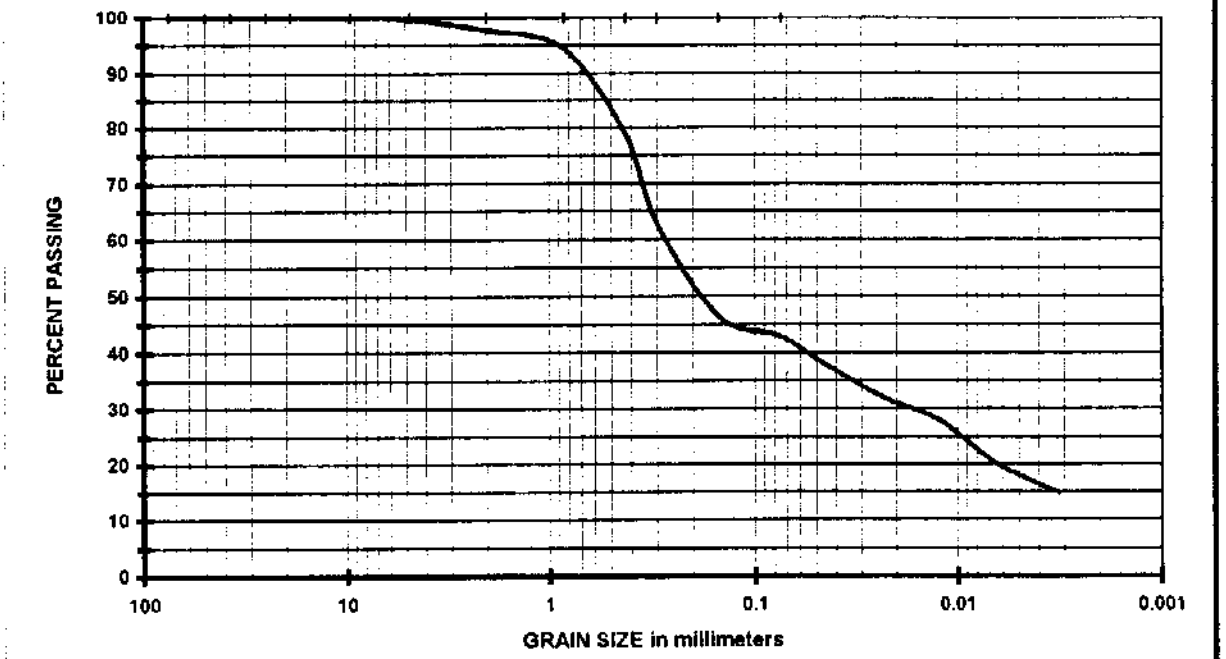
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0752 Depth (in): _____

Log No.: _____ Soil Classification: Clayey Sand (SC)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	24
PLASTIC LIMIT	13
PLASTICITY INDEX	11

GRAIN SIZE DATA

% GRAVEL	0
% SAND	57
% SILT	25
% CLAY	18

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 423
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0754 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 565.22 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 108.70 Dry Wt.+Tare(gm)= 106.90
Tare Wt(gm) = 38.20 Moisture(%) = 2.62
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 565.22

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	13.3	97.7	19.0500
3/8 in.	23.2	95.9	9.5300
NO.4	30.1	94.7	4.7500
NO.10	40.0	92.9	2.0000
NO.20	1.0	91.0	0.8500
NO.40	2.6	88.0	0.4250
NO.50	4.1	85.1	0.3000
NO.100	7.7	78.2	0.1500
NO.200	10.3	73.3	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.72

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	40.5	5.0	67.7	0.0401
4 min.	24.0	35.5	5.0	58.2	0.0209
15 min.	23.5	32.0	5.0	51.5	0.0111
1 hour	23.0	27.0	5.0	42.0	0.0058
4 hours	23.0	24.0	5.0	36.2	0.0030

Gravel(%)= 5 Sand(%)=21 Silt(%)= 33 Clay(%)= 41

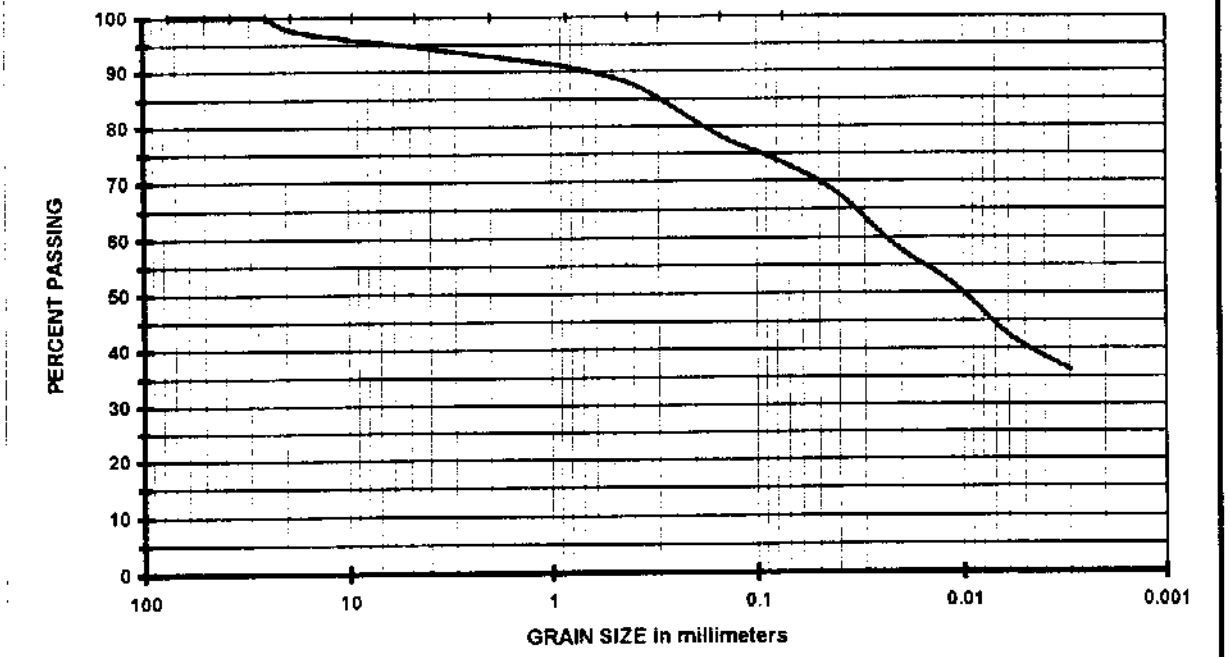
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0754 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	34
PLASTIC LIMIT	16
PLASTICITY INDEX	18

GRAIN SIZE DATA

% GRAVEL	5
% SAND	21
% SILT	33
% CLAY	41

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 427
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0758 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 415.89 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 112.40 Dry Wt.+Tare(gm)= 110.80
Tare Wt(gm) = 38.90 Moisture(%) = 2.23
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 415.89

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	2.6	99.4	9.5300
NO.4	4.7	98.9	4.7500
NO.10	11.0	97.4	2.0000
NO.20	1.5	94.4	0.8500
NO.40	3.9	89.6	0.4250
NO.50	6.7	84.0	0.3000
NO.100	12.6	72.4	0.1500
NO.200	14.8	67.8	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.91

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	34.5	5.0	58.7	0.0421
4 min.	24.0	30.0	5.0	49.8	0.0218
15 min.	23.0	24.0	5.0	37.8	0.0119
1 hour	23.0	20.5	5.0	30.9	0.0061
4 hours	22.5	16.0	5.0	21.9	0.0031

Gravel(%)= 1 Sand(%)=31 Silt(%)= 40 Clay(%)= 28

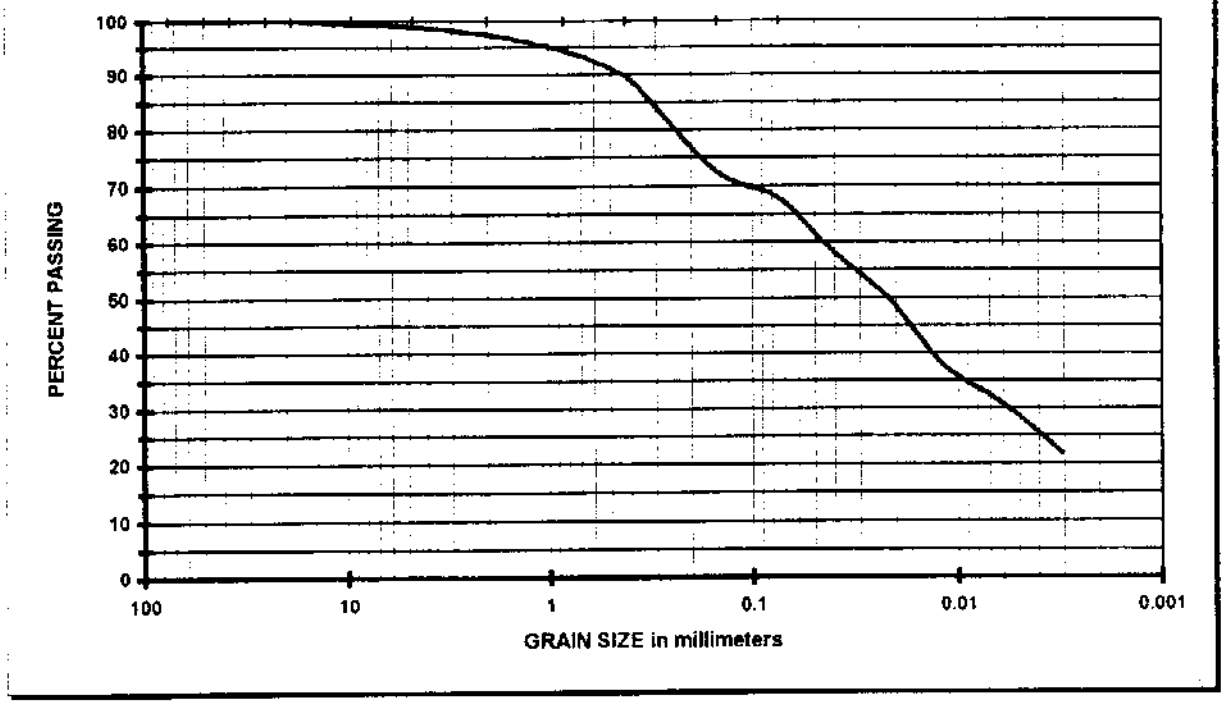
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0768 Depth (in): _____

Log No.: _____ Soil Classification: Sandy Lean Clay (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	30
PLASTIC LIMIT	18
PLASTICITY INDEX	12

GRAIN SIZE DATA

% GRAVEL	1
% SAND	31
% SILT	40
% CLAY	28

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 428
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0759 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 597.21 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 93.20 Dry Wt.+Tare(gm)= 92.40
Tare Wt(gm) = 36.30 Moisture(%) = 1.43
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 597.21

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	1.2	99.8	9.5300
NO.4	1.4	99.8	4.7500
NO.10	2.3	99.6	2.0000
NO.20	0.2	99.2	0.8500
NO.40	4.2	91.1	0.4250
NO.50	18.5	62.2	0.3000
NO.100	34.5	30.0	0.1500
NO.200	36.3	26.2	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.30

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	17.0	5.0	24.3	0.0475
4 min.	23.5	16.0	5.0	22.2	0.0240
15 min.	23.5	15.0	5.0	20.2	0.0125
1 hour	23.0	13.0	5.0	16.2	0.0064
4 hours	22.5	12.0	5.0	14.1	0.0032

D10(mm) =0.0008 D30(mm)= 0.1499 D60(mm)= 0.2861
Gravel(%)= 0 Sand(%)=74 Silt(%)= 11 Clay(%)= 15

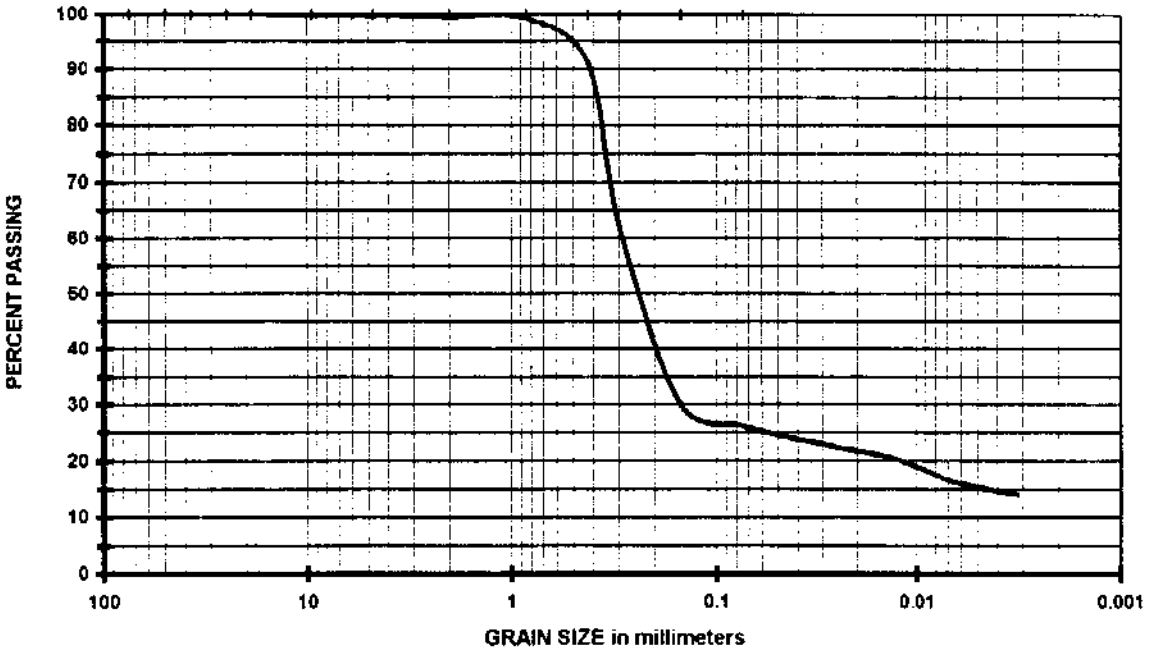
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **WB 0759** Depth (in): _____

Log No.: _____ Soil Classification: **Silty Clayey Sand (SC-SM)**

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	**20**
PLASTIC LIMIT	**13**
PLASTICITY INDEX	**7**

GRAIN SIZE DATA

% GRAVEL	**0**
% SAND	**74**
% SILT	**11**
% CLAY	**15**

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Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 425
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0764 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 664.45 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 117.30 Dry Wt.+Tare(gm)= 116.40
Tare Wt(gm) = 38.60 Moisture(%) = 1.16
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 664.45

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	2.1	99.7	9.5300
NO.4	9.8	98.5	4.7500
NO.10	27.1	95.9	2.0000
NO.20	3.0	90.2	0.8500
NO.40	19.6	57.9	0.4250
NO.50	27.8	42.0	0.3000
NO.100	35.0	28.0	0.1500
NO.200	38.1	21.9	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.43

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	14.5	5.0	18.4	0.0482
4 min.	23.5	13.0	5.0	15.5	0.0245
15 min.	23.5	12.0	5.0	13.6	0.0127
1 hour	23.0	11.0	5.0	11.6	0.0064
4 hours	22.5	10.0	5.0	9.7	0.0033

D10(mm) =0.0036 D30(mm)= 0.1659 D60(mm)= 0.4442
Gravel(%)= 1 Sand(%)=77 Silt(%)= 11 Clay(%)= 11

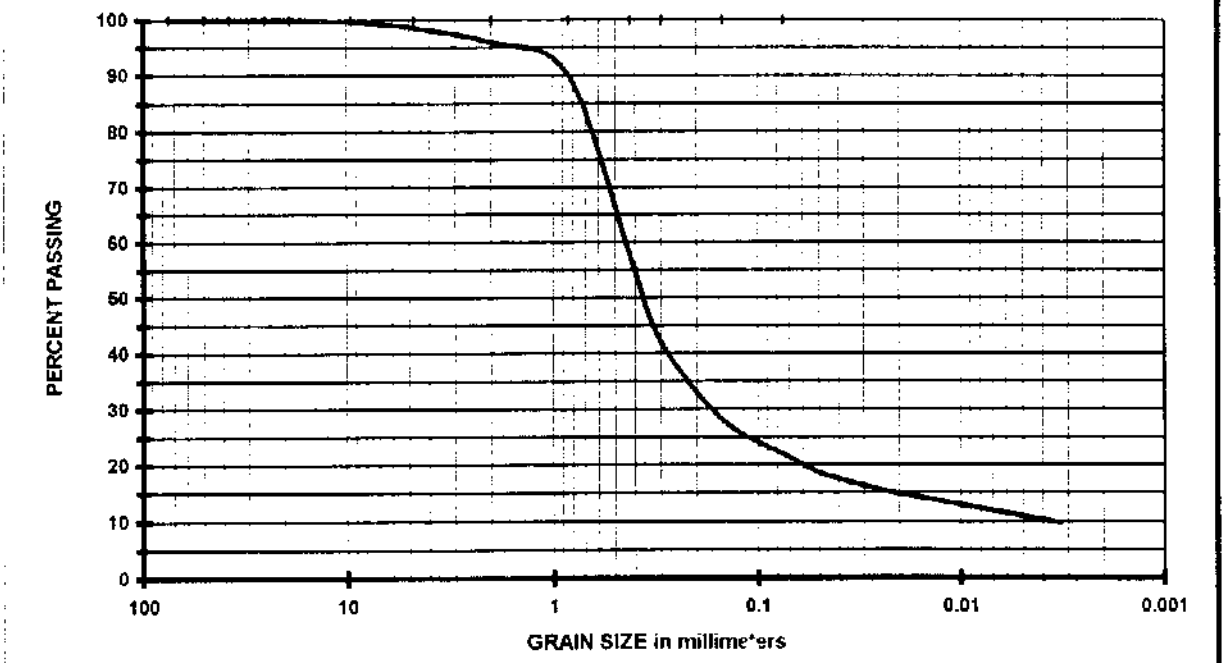
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: **WB 0764** Depth (in): _____

Log No.: _____ Soil Classification: **Silty Clayey Sand (SC-SM)**

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	**19**
PLASTIC LIMIT	**13**
PLASTICITY INDEX	**6**

GRAIN SIZE DATA

% GRAVEL	**1**
% SAND	**77**
% SILT	**11**
% CLAY	**11**

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 424
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0927 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 493.94 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 99.10 Dry Wt.+Tare(gm)= 97.60
Tare Wt(gm) = 37.60 Moisture(%) = 2.50
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 493.94

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	1.5	99.7	9.5300
NO.4	10.6	97.8	4.7500
NO.10	18.7	96.2	2.0000
NO.20	0.9	94.5	0.8500
NO.40	2.1	92.0	0.4250
NO.50	3.2	89.8	0.3000
NO.100	6.3	83.9	0.1500
NO.200	8.0	80.5	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 48.78

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	42.0	5.0	73.0	0.0395
4 min.	23.5	37.0	5.0	63.1	0.0207
15 min.	23.0	34.0	5.0	57.2	0.0110
1 hour	23.0	28.0	5.0	45.4	0.0058
4 hours	22.5	24.0	5.0	37.5	0.0030

Gravel(%)= 2 Sand(%)=17 Silt(%)= 37 Clay(%)= 44

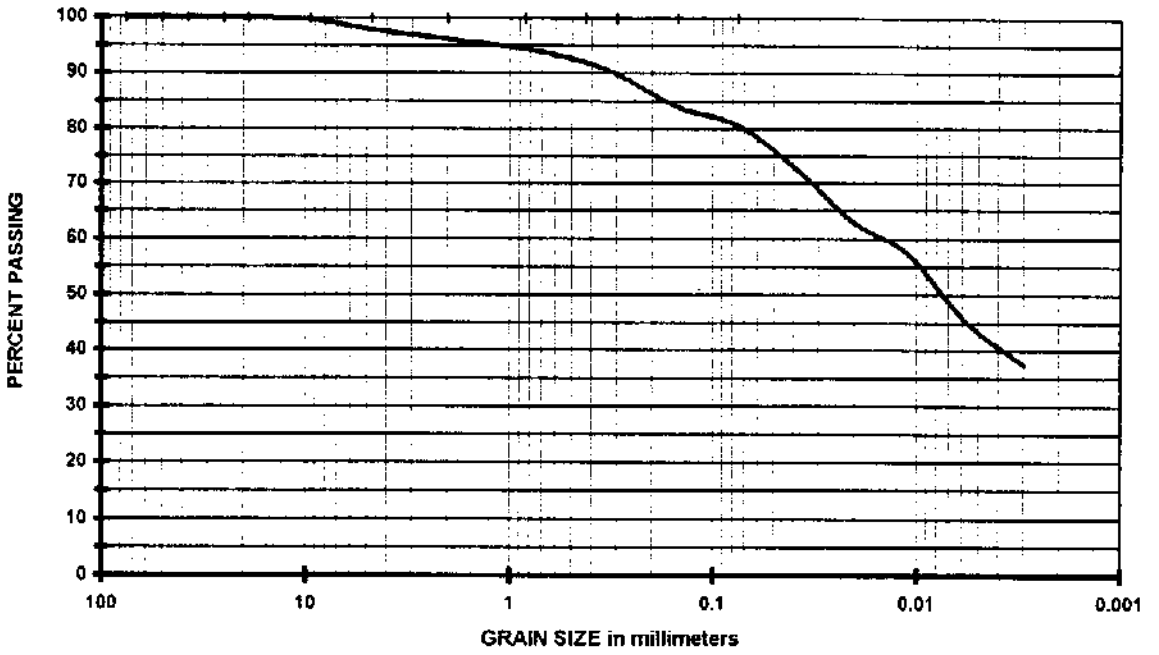
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0927 Depth (in).: _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	36
PLASTIC LIMIT	18
PLASTICITY INDEX	18

GRAIN SIZE DATA

% GRAVEL	2
% SAND	17
% SILT	37
% CLAY	44

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307 FILE : 431
Feature: SAIC, Ravenna Army Ammo Plant TESTED BY : bd
Station: El. : Computed By:bd
Range : Sample: WB 0928 Checked By :
Boring : Part : Report Date:06-20-98

Specific Gravity =2.650(Assumed)

Moisture Determination
Dry Wt.+Tare(gm)= 557.44 Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 103.70 Dry Wt.+Tare(gm)= 102.70
Tare Wt(gm) = 39.00 Moisture(%) = 1.57
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 557.44

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	22.2	96.0	9.5300
NO.4	40.5	92.7	4.7500
NO.10	71.9	87.1	2.0000
NO.20	2.6	82.5	0.8500
NO.40	5.9	76.7	0.4250
NO.50	8.3	72.5	0.3000
NO.100	13.8	62.7	0.1500
NO.200	18.7	54.0	0.0750

Air Dry Weight(gm)= 50.00 Corrected Weight(gm)= 49.23

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	30.0	5.0	44.2	0.0435
4 min.	24.0	25.0	5.0	35.4	0.0225
15 min.	23.5	20.0	5.0	26.5	0.0121
1 hour	23.0	16.0	5.0	19.5	0.0062
4 hours	23.0	15.0	5.0	17.7	0.0031

Gravel(%)= 7 Sand(%)=39 Silt(%)= 35 Clay(%)= 19

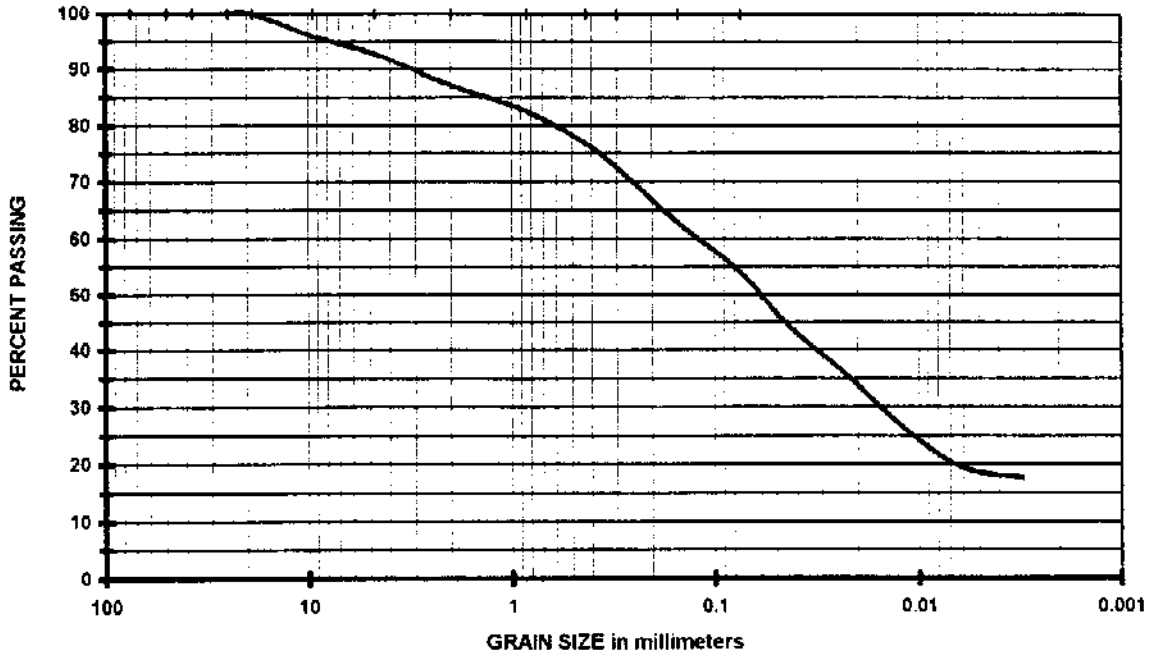
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0928 Depth (in): _____

Log No.: _____ Soil Classification: Sandy Lean Clay (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	26
PLASTIC LIMIT	15
PLASTICITY INDEX	10

GRAIN SIZE DATA

% GRAVEL	7
% SAND	39
% SILT	35
% CLAY	19

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :
El. : 12-12.5 ft
Sample: BK 0904
Part :
FILE : 350
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-04-98

Specific Gravity = 2.596
Flask No. = 17.00
Soil Wt.(gm) = 92.01
Temp.(deg.c.) = 24.00
Total Wt.(gm) =730.65
Moisture Determination
Dry Wt.+Tare(gm)= 356.93
Tare Wt(gm) = 0.00
Hygroscopic Moisture
Wet Wt.+Tare(gm)= 55.16
Tare Wt(gm) = 38.66
Dry Wt.+Tare(gm)= 55.04
Moisture(%) = 0.73
Non-Plastic Soil
Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 356.93

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	66.4	81.4	19.0500
3/8 in.	111.2	68.8	9.5300
NO.4	168.6	52.8	4.7500
NO.10	212.1	40.6	2.0000
NO.20	11.0	31.6	0.8500
NO.40	20.4	23.9	0.4250
NO.50	24.4	20.6	0.3000
NO.100	32.3	14.2	0.1500
NO.200	33.8	12.9	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.64

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	23.0	20.5	5.0	12.8	0.0478
4 min.	23.0	18.5	5.0	11.2	0.0242
15 min.	23.0	17.5	5.0	10.3	0.0126
1 hour	23.0	16.0	5.0	9.1	0.0063
4 hours	22.5	15.0	5.0	8.3	0.0032

D10(mm) =0.0104 D30(mm)= 0.7383 D60(mm)= 6.4998
Gravel(%)=47 Sand(%)=40 Silt(%)= 4 Clay(%)= 9

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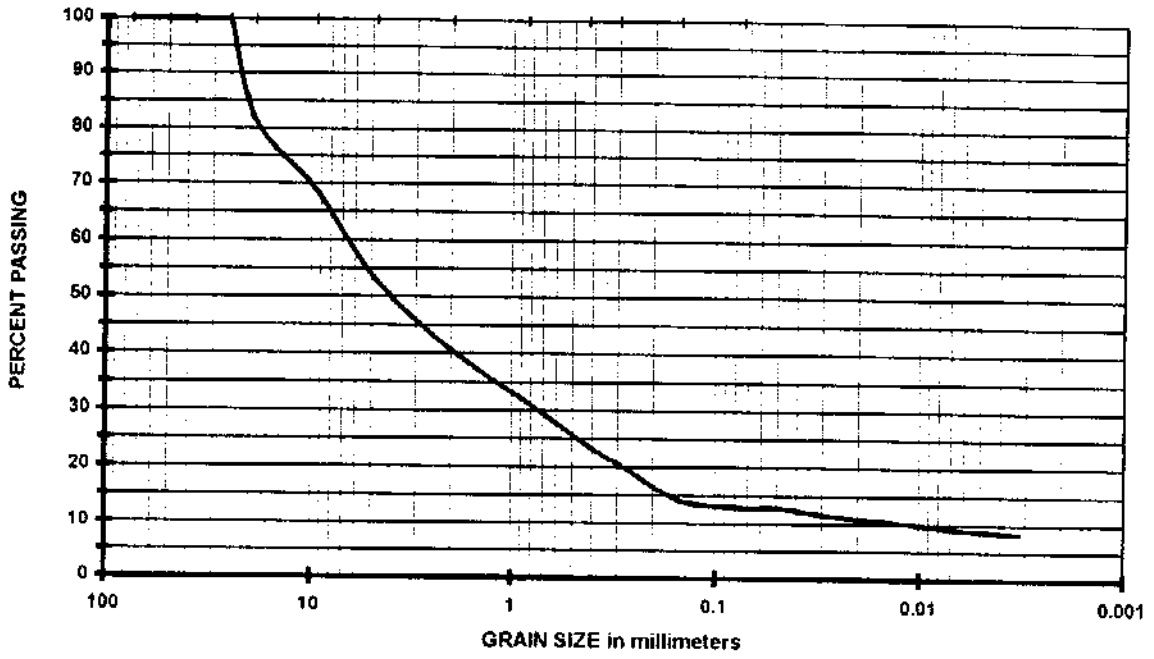
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/9/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0904 Depth (ft): 12-12.5

Log No.: _____ Soil Classification: Silty Gravel with Sand (GM)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	47
% SAND	40
% SILT	4
% CLAY	9

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :
El. : 14-15.5 ft
Sample: BK 0905
Part :

FILE : 444
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-29-98

Specific Gravity = 2.655
Flask No. = 27.00
Soil Wt.(gm) =142.66
Temp.(deg.c.) = 24.00
Total Wt.(gm) =768.60

Moisture Determination
Dry Wt.+Tare(gm)= 209.69
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 82.20
Tare Wt(gm) = 38.75
Dry Wt.+Tare(gm)= 82.05
Moisture(%) = 0.35

Non-Plastic Soil

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 209.69

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	2.1	99.0	9.5300
NO.4	8.4	96.0	4.7500
NO.10	43.5	79.3	2.0000
NO.20	10.5	62.6	0.8500
NO.40	19.7	48.0	0.4250
NO.50	28.4	34.1	0.3000
NO.100	44.8	8.0	0.1500
NO.200	47.7	3.4	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.83

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	7.0	5.0	3.2	0.0503
4 min.	24.0	6.0	5.0	1.6	0.0253
15 min.	24.0	6.0	5.0	1.6	0.0130
1 hour	23.0	6.0	5.0	1.6	0.0066
4 hours	23.0	5.0	5.0	0.0	0.0033

D10(mm) =0.1581 D30(mm)= 0.2692 D60(mm)= 0.7525
Gravel(%)= 4 Sand(%)=93 Silt(%)= 2 Clay(%)= 1

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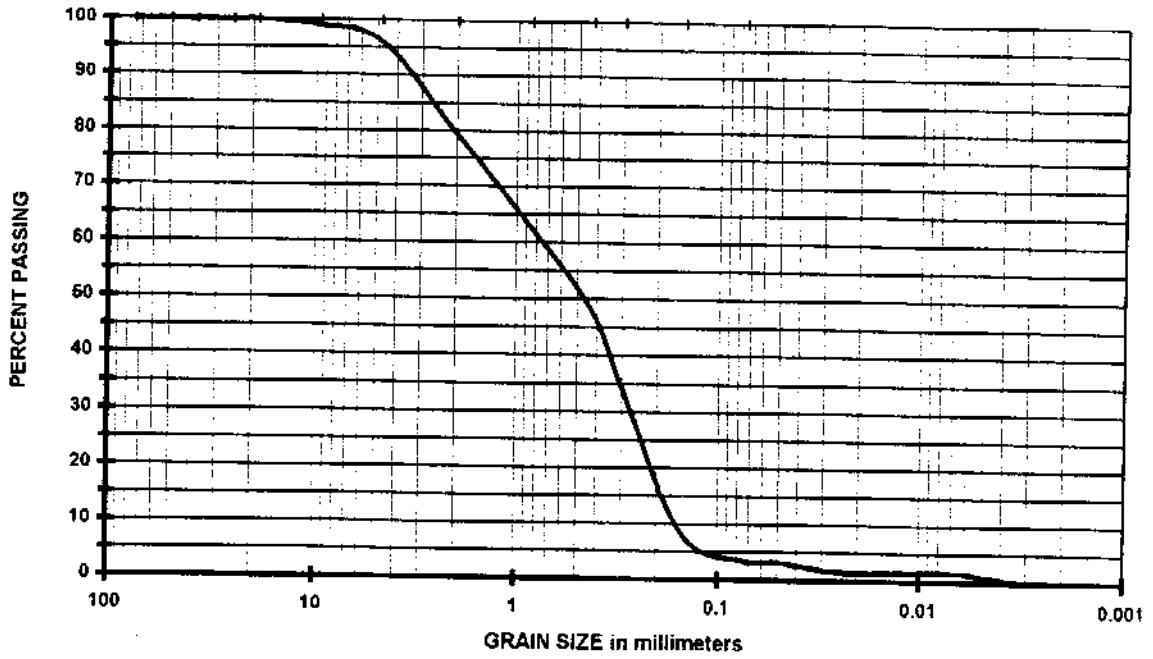
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/9/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0905 Depth (ft): 14-15.5

Log No.: _____ Soil Classification: Poor Graded Sand (SP)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	4
% SAND	93
% SILT	2
% CLAY	1

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. : 12-12.9
Sample: BK 0906
Part :

FILE : 352
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-04-98

Specific Gravity = 2.700
Flask No. = 35.00
Soil Wt.(gm) =102.51

Temp.(deg.c.) = 24.00
Total Wt.(gm) =743.50

Moisture Determination
Dry Wt.+Tare(gm)= 205.85

Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 52.84
Tare Wt(gm) = 38.41

Dry Wt.+Tare(gm)= 52.59
Moisture(%) = 1.76

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 205.85

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	3.7	98.2	9.5300
NO.4	5.3	97.4	4.7500
NO.10	10.8	94.7	2.0000
NO.20	1.1	92.6	0.8500
NO.40	2.4	90.1	0.4250
NO.50	3.4	88.2	0.3000
NO.100	5.6	83.9	0.1500
NO.200	7.2	80.9	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.13

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	23.0	47.0	5.0	80.1	0.0376
4 min.	23.0	44.0	5.0	74.4	0.0193
15 min.	23.0	40.0	5.0	66.7	0.0104
1 hour	22.5	35.0	5.0	57.2	0.0054
4 hours	22.5	30.5	5.0	48.6	0.0028

Gravel(%)= 3 Sand(%)=17 Silt(%)= 25 Clay(%)= 55

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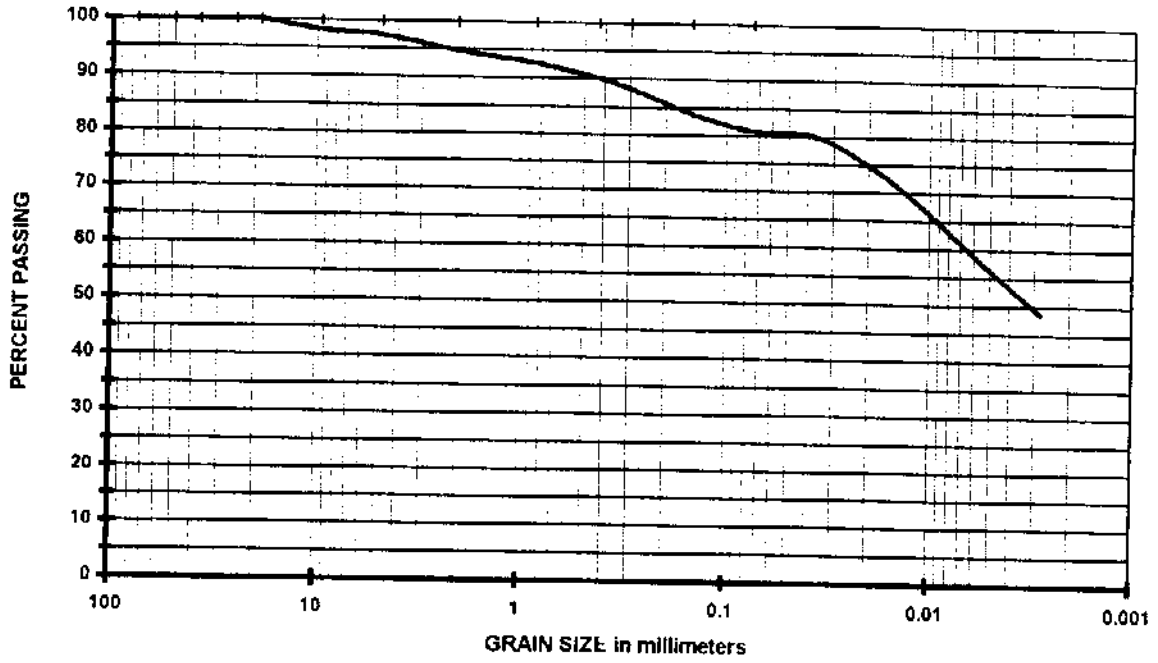
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/9/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0906 Depth (ft): 12-12.9

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	33
PLASTIC LIMIT	17
PLASTICITY INDEX	16

GRAIN SIZE DATA

% GRAVEL	3
% SAND	17
% SILT	25
% CLAY	55

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. : 12-12.5 ft
Sample: BK 0907
Part :

FILE : 445
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-29-98

Specific Gravity = 2.653
Flask No. = 15.00
Soil Wt.(gm) = 91.89
Temp.(deg.c.) = 24.00
Total Wt.(gm) =734.99

Moisture Determination
Dry Wt.+Tare(gm)= 96.72
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 74.21
Tare Wt(gm) = 39.17
Dry Wt.+Tare(gm)= 73.86
Moisture(%) = 1.01

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 96.72

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	2.4	97.5	9.5300
NO.4	6.9	92.9	4.7500
NO.10	11.2	88.4	2.0000
NO.20	2.0	84.8	0.8500
NO.40	4.6	80.2	0.4250
NO.50	7.6	74.9	0.3000
NO.100	15.3	61.1	0.1500
NO.200	19.6	53.4	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.50

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	32.0	5.0	48.2	0.0429
4 min.	24.0	25.5	5.0	36.6	0.0225
15 min.	24.0	20.0	5.0	26.8	0.0120
1 hour	23.0	15.0	5.0	17.9	0.0063
4 hours	23.0	12.0	5.0	12.5	0.0032

Gravel(%)= 7 Sand(%)=39 Silt(%)= 37 Clay(%)= 17

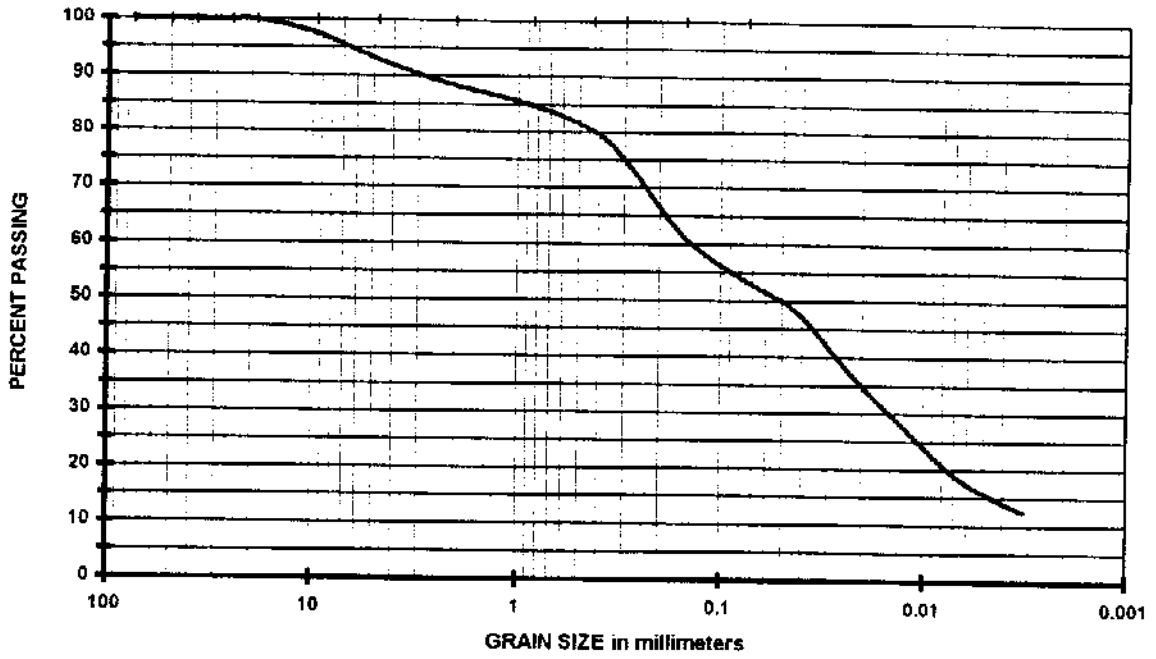
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/9/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0907 Depth (ft): 12-12.5

Log No.: _____ Soil Classification: Sandy Silty Clay (CL-ML)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	22
PLASTIC LIMIT	15
PLASTICITY INDEX	7

GRAIN SIZE DATA

% GRAVEL	7
% SAND	39
% SILT	37
% CLAY	17

S&ME, Inc . 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :
El. : 12-14 ft
Sample: BK 0909
Part :

FILE : 446
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-29-98

Specific Gravity = 2.650
Flask No. = 24.00
Soil Wt.(gm) =141.79
Temp.(deg.c.) = 24.00
Total Wt.(gm) =763.93

Moisture Determination
Dry Wt.+Tare(gm)= 123.93
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 65.00
Tare Wt(gm) = 27.87
Dry Wt.+Tare(gm)= 64.76
Moisture(%) = 0.65

Non-Plastic Soil

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 123.93

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	0.0	100.0	4.7500
NO.10	0.7	99.4	2.0000
NO.20	0.2	98.9	0.8500
NO.40	4.8	89.9	0.4250
NO.50	18.5	62.4	0.3000
NO.100	42.0	15.4	0.1500
NO.200	43.8	11.8	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.68

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	10.0	5.0	10.0	0.0495
4 min.	24.0	9.0	5.0	8.0	0.0249
15 min.	24.0	9.0	5.0	8.0	0.0129
1 hour	23.0	7.0	5.0	4.0	0.0066
4 hours	23.0	7.0	5.0	4.0	0.0033

D10(mm) =0.0494 D30(mm)= 0.1861 D60(mm)= 0.2897
Gravel(%)= 0 Sand(%)=88 Silt(%)= 8 Clay(%)= 4

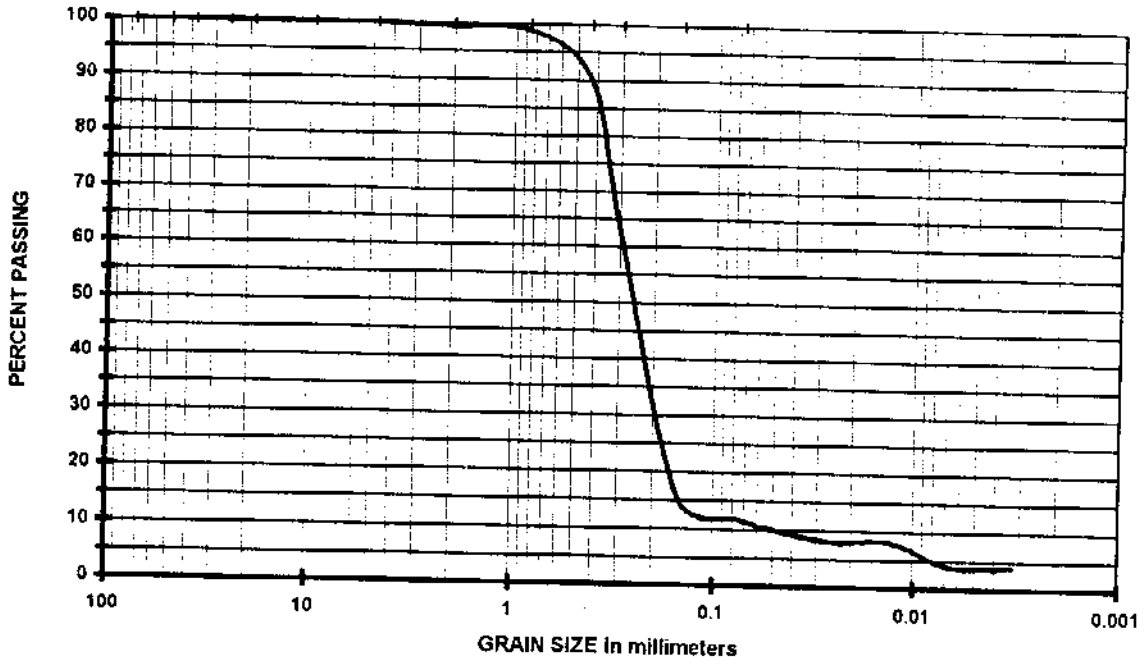
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/9/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: BK 0909 Depth (ft): 12-14

Log No.: _____ Soil Classification: Well Graded Sand with Silt (SW-SM)

ATTERBERG LIMIT (#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	0
% SAND	88
% SILT	8
% CLAY	4

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :
El. : 14-15.5 ft
Sample: WB 0858
Part :

FILE : 440
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-29-98

Specific Gravity = 2.673
Flask No. = 34.00
Soil Wt.(gm) =112.75
Temp.(deg.c.) = 24.00
Total Wt.(gm) =748.99

Moisture Determination
Dry Wt.+Tare(gm)= 180.74
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 86.20
Tare Wt(gm) = 27.51
Dry Wt.+Tare(gm)= 85.88
Moisture(%) = 0.55

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 180.74

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	1.2	99.3	9.5300
NO.4	4.4	97.6	4.7500
NO.10	8.5	95.3	2.0000
NO.20	1.2	93.1	0.8500
NO.40	3.2	89.2	0.4250
NO.50	6.2	83.5	0.3000
NO.100	13.3	69.8	0.1500
NO.200	16.3	64.1	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.73

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	33.0	5.0	53.4	0.0423
4 min.	24.0	27.0	5.0	41.9	0.0221
15 min.	24.0	20.0	5.0	28.6	0.0120
1 hour	23.0	16.0	5.0	21.0	0.0062
4 hours	23.0	12.0	5.0	13.3	0.0032

Gravel(%)= 2 Sand(%)=34 Silt(%)= 46 Clay(%)= 18

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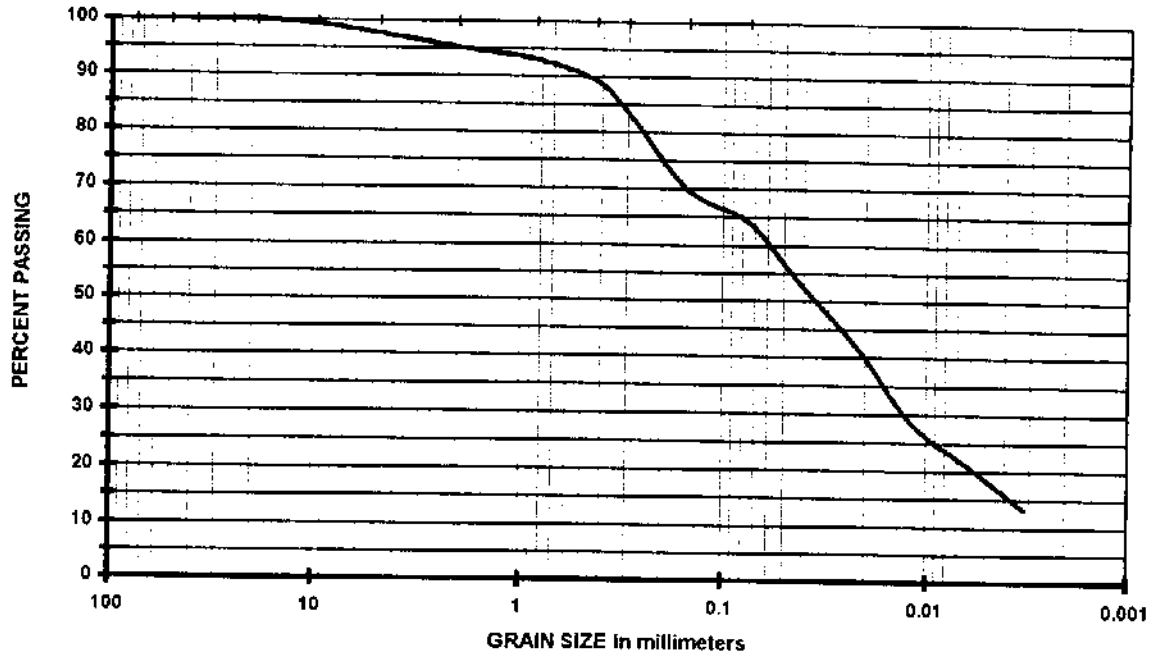
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/29/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0858 Depth (ft): 14-15.5

Log No.: _____ Soil Classification: Sandy Silty Clay (CL-ML)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	22
PLASTIC LIMIT	18
PLASTICITY INDEX	4

GRAIN SIZE DATA

% GRAVEL	2
% SAND	34
% SILT	46
% CLAY	18

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. : 9-10.8 ft
Sample: WB 0859
Part :

FILE : 441
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-29-98

Specific Gravity = 2.720
Flask No. = 11.00
Soil Wt.(gm) =114.62
Temp.(deg.c.) = 24.00
Total Wt.(gm) =745.47

Moisture Determination
Dry Wt.+Tare(gm)= 275.79
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 69.23
Tare Wt(gm) = 26.81
Dry Wt.+Tare(gm)= 68.62
Moisture(%) = 1.46

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 275.79

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	4.4	98.4	4.7500
NO.10	9.6	96.5	2.0000
NO.20	0.9	94.8	0.8500
NO.40	2.1	92.4	0.4250
NO.50	3.1	90.4	0.3000
NO.100	5.9	85.0	0.1500
NO.200	8.4	80.1	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.28

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	41.5	5.0	70.4	0.0389
4 min.	24.0	35.0	5.0	57.8	0.0205
15 min.	24.0	30.0	5.0	48.2	0.0110
1 hour	23.0	24.0	5.0	36.6	0.0058
4 hours	23.0	20.0	5.0	28.9	0.0030

Gravel(%)= 2 Sand(%)=18 Silt(%)= 45 Clay(%)= 35

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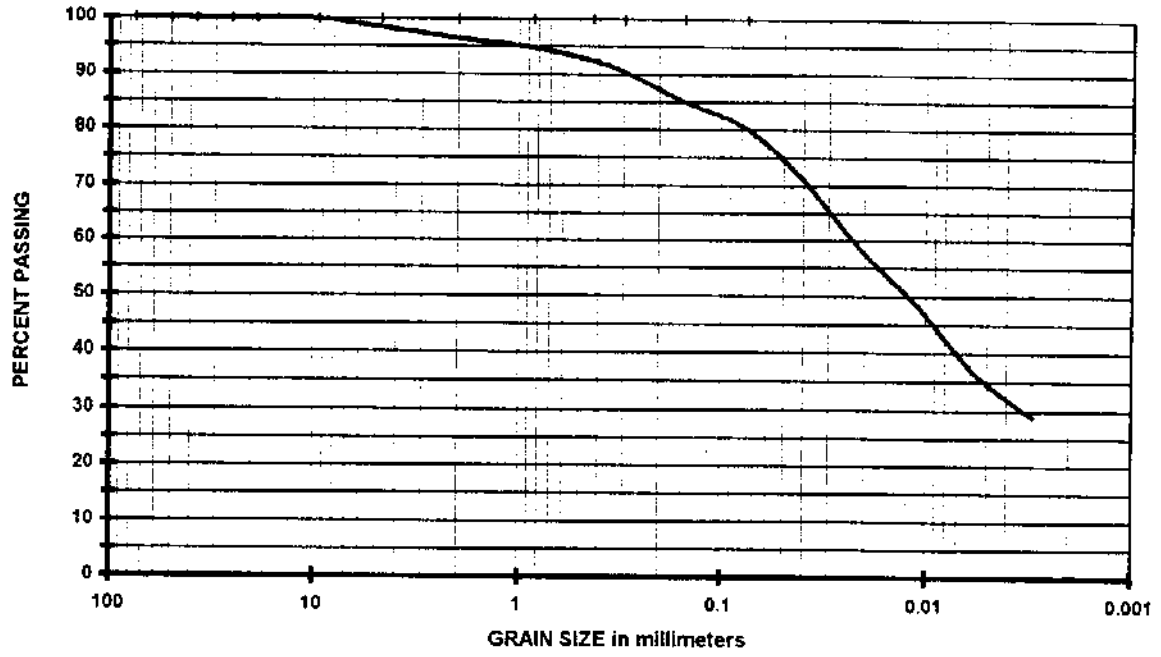
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/9/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0859 Depth (ft): 9-10.8

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	28
PLASTIC LIMIT	17
PLASTICITY INDEX	11

GRAIN SIZE DATA

% GRAVEL	2
% SAND	18
% SILT	46
% CLAY	35

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Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. : 9-10.5 ft
Sample: WB 0860
Part :

FILE : 442
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-29-98

Specific Gravity = 2.699
Flask No. = 23.00
Soil Wt.(gm) = 98.51
Temp.(deg.c.) = 24.00
Total Wt.(gm) =737.36

Moisture Determination
Dry Wt.+Tare(gm)= 189.45
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 91.73
Tare Wt(gm) = 37.54
Dry Wt.+Tare(gm)= 90.85
Moisture(%) = 1.65

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 189.45

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	0.0	100.0	9.5300
NO.4	1.3	99.3	4.7500
NO.10	3.4	98.2	2.0000
NO.20	1.0	96.3	0.8500
NO.40	2.4	93.4	0.4250
NO.50	3.8	90.7	0.3000
NO.100	6.7	84.9	0.1500
NO.200	8.7	80.9	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.19

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	41.0	5.0	71.1	0.0393
4 min.	24.0	39.0	5.0	67.2	0.0200
15 min.	24.0	33.0	5.0	55.3	0.0108
1 hour	23.0	27.0	5.0	43.5	0.0057
4 hours	23.0	22.5	5.0	34.6	0.0030

Gravel(%)= 1 Sand(%)=18 Silt(%)= 39 Clay(%)= 42

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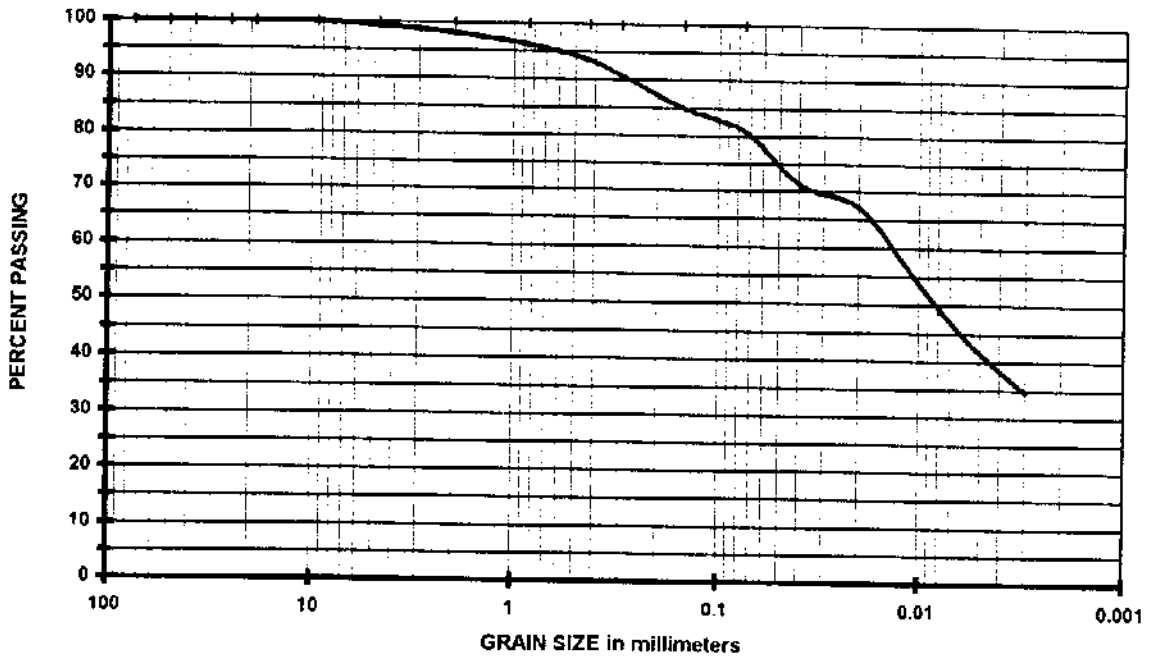
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/9/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0860 Depth (ft): 9-10.5

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	33
PLASTIC LIMIT	18
PLASTICITY INDEX	15

GRAIN SIZE DATA

% GRAVEL	1
% SAND	18
% SILT	39
% CLAY	42

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. : 5-6.5 ft
Sample: WB 0861
Part :

FILE : 443
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-29-98

Specific Gravity = 2.670
Flask No. = 31.00
Soil Wt.(gm) =137.73
Temp.(deg.c.) = 24.00
Total Wt.(gm) =764.63

Moisture Determination
Dry Wt.+Tare(gm)= 139.16
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 58.00
Tare Wt(gm) = 37.87
Dry Wt.+Tare(gm)= 57.84
Moisture(%) = 0.80

Non-Plastic Soil

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 139.16

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	4.9	96.5	9.5300
NO.4	7.0	95.0	4.7500
NO.10	14.2	89.8	2.0000
NO.20	3.4	83.7	0.8500
NO.40	11.8	68.4	0.4250
NO.50	20.2	53.3	0.3000
NO.100	30.0	35.5	0.1500
NO.200	33.3	29.5	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.60

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	17.0	5.0	21.6	0.0472
4 min.	24.0	14.0	5.0	16.2	0.0240
15 min.	24.0	11.0	5.0	10.8	0.0126
1 hour	23.0	9.0	5.0	7.2	0.0065
4 hours	23.0	8.0	5.0	5.4	0.0032

D10(mm) =0.0109 D30(mm)= 0.0794 D60(mm)= 0.3502
Gravel(%)= 5 Sand(%)=66 Silt(%)= 23 Clay(%)= 6

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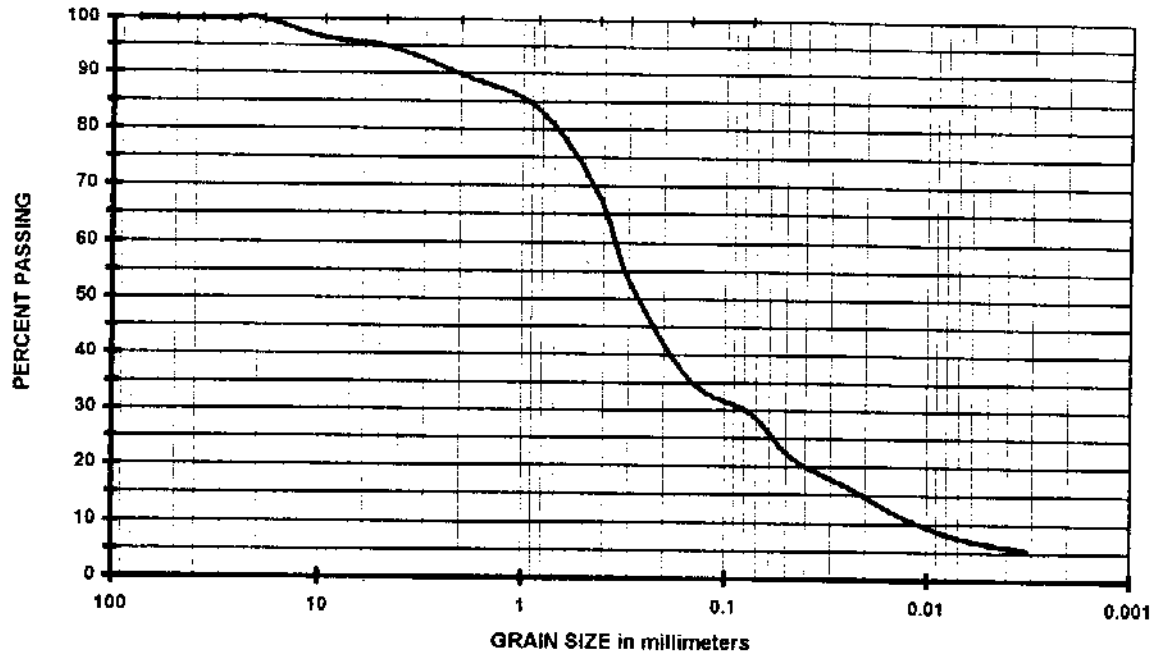
GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/10/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0861 Depth (ft): 5-6.5

Log No.: _____ Soil Classification: Silty Sand (SM)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

GRAIN SIZE DATA

% GRAVEL	5
% SAND	66
% SILT	23
% CLAY	6

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. : 9-11 ft
Sample: WB 0862
Part :

FILE : 432
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-20-98

Specific Gravity = 2.683
Flask No. = 13.00
Soil Wt.(gm) =127.60
Temp.(deg.c.) = 24.00
Total Wt.(gm) =753.34

Moisture Determination
Dry Wt.+Tare(gm)= 593.53
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 53.55
Tare Wt(gm) = 37.34
Dry Wt.+Tare(gm)= 53.31
Moisture(%) = 1.50

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 593.53

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	2.1	99.6	9.5300
NO.4	9.3	98.4	4.7500
NO.10	20.1	96.6	2.0000
NO.20	0.9	94.8	0.8500
NO.40	2.3	92.2	0.4250
NO.50	3.3	90.2	0.3000
NO.100	6.5	83.8	0.1500
NO.200	9.3	78.4	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.26

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	39.0	5.0	66.2	0.0402
4 min.	23.5	32.0	5.0	52.6	0.0214
15 min.	23.0	26.0	5.0	40.9	0.0116
1 hour	23.0	19.5	5.0	28.2	0.0060
4 hours	23.0	16.0	5.0	21.4	0.0031

Gravel(%)= 2 Sand(%)=20 Silt(%)= 52 Clay(%)= 26

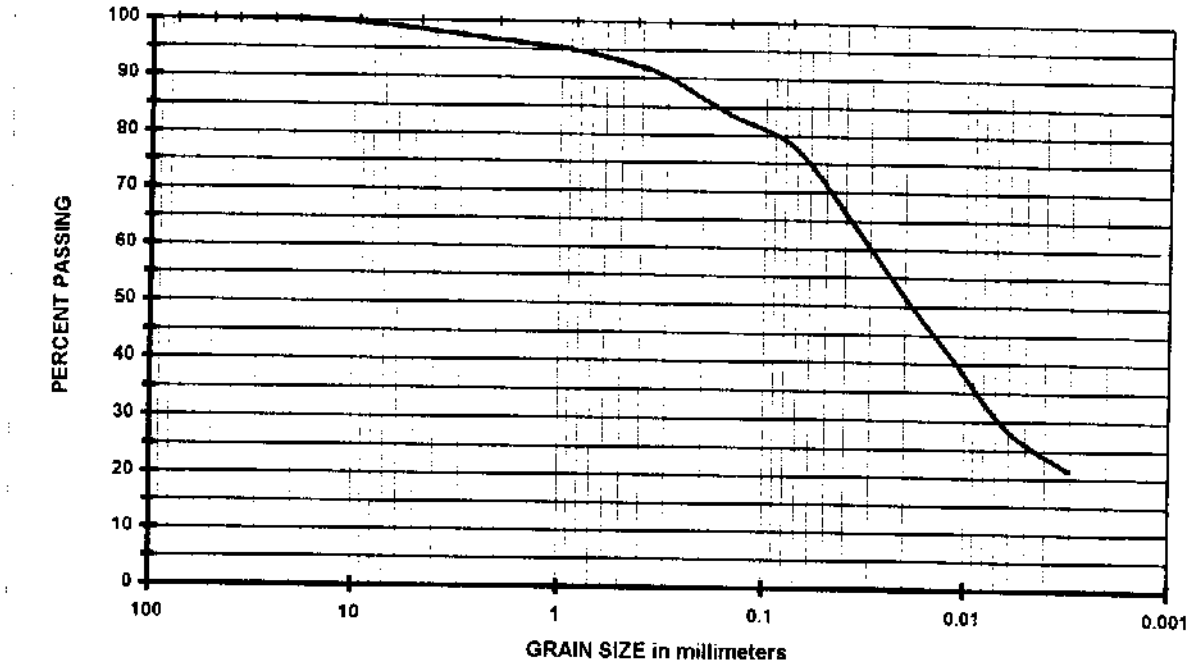
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/20/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0862 Depth (in): _____

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMITS (-#40 MATERIAL)

LIQUID LIMIT	25
PLASTIC LIMIT	16
PLASTICITY INDEX	9

GRAIN SIZE DATA

% GRAVEL	2
% SAND	20
% SILT	52
% CLAY	26

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. : 17-18.5 ft
Sample: WB 0910
Part :

FILE : 449
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-04-98

Specific Gravity = 2.632
Flask No. = 16.00
Soil Wt.(gm) = 88.97
Temp.(deg.c.) = 24.00
Total Wt.(gm) =731.06

Moisture Determination
Dry Wt.+Tare(gm)= 188.22
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 96.14
Tare Wt(gm) = 38.24
Dry Wt.+Tare(gm)= 95.80
Moisture(%) = 0.59

Non-Plastic Soil

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 188.22

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	8.8	95.3	9.5300
NO.4	15.1	92.0	4.7500
NO.10	23.3	87.6	2.0000
NO.20	8.3	73.1	0.8500
NO.40	23.4	46.3	0.4250
NO.50	31.5	32.1	0.3000
NO.100	40.1	17.0	0.1500
NO.200	42.2	13.3	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.71

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	11.5	5.5	10.6	0.0493
4 min.	24.0	11.0	5.5	9.7	0.0247
15 min.	24.0	10.0	5.5	8.0	0.0128
1 hour	23.0	9.0	5.5	6.2	0.0065
4 hours	23.0	8.0	5.5	4.4	0.0033

D10(mm) =0.0304 D30(mm)= 0.2724 D60(mm)= 0.6058
Gravel(%)= 8 Sand(%)=79 Silt(%)= 8 Clay(%)= 5

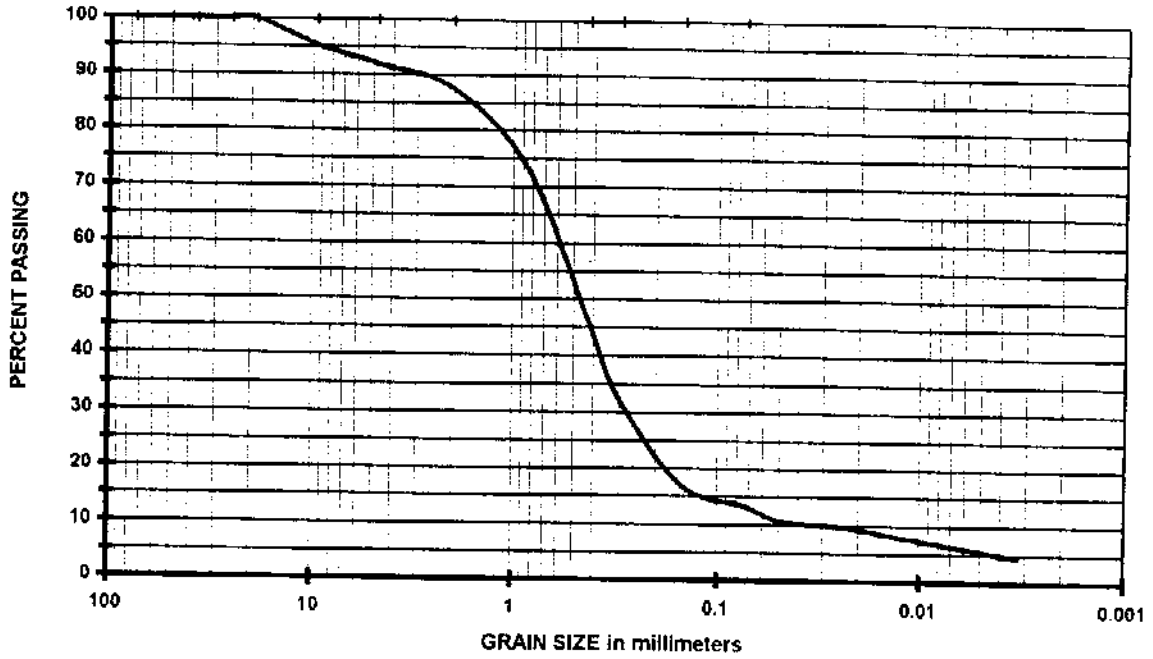
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/10/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0910 Depth (ft): 17-18.5

Log No.: _____ Soil Classification: Silty Sand (SM)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	16
PLASTIC LIMIT	13
PLASTICITY INDEX	3

GRAIN SIZE DATA

% GRAVEL	8
% SAND	79
% SILT	8
% CLAY	5

S&ME, Inc . 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

Singleton Laboratories
General Classification Tests

Project: 1439-98-307
Feature: SAIC, Ravenna Army Ammo Plant
Station:
Range :
Boring :

El. : 12-13.5 ft
Sample: WB 0911
Part :

FILE : 447
TESTED BY : bd
Computed By:bd
Checked By :
Report Date:06-29-98

Specific Gravity = 2.673
Flask No. = 28.00
Soil Wt.(gm) =102.72
Temp.(deg.c.) = 24.00
Total Wt.(gm) =733.97

Moisture Determination
Dry Wt.+Tare(gm)= 224.22
Tare Wt(gm) = 0.00

Hygroscopic Moisture
Wet Wt.+Tare(gm)= 79.49
Tare Wt(gm) = 38.11
Dry Wt.+Tare(gm)= 78.87
Moisture(%) = 1.52

Sieve and Hydrometer Analysis
Total Dry Weight(gm) = 224.22

Sieve	Wt.Ret.	% Pass.	Size(mm)
3 in.	0.0	100.0	76.2000
2 in.	0.0	100.0	50.8000
1.5 in.	0.0	100.0	38.1000
1 in.	0.0	100.0	25.4000
3/4 in.	0.0	100.0	19.0500
3/8 in.	9.5	95.8	9.5300
NO.4	12.0	94.6	4.7500
NO.10	16.7	92.5	2.0000
NO.20	1.5	89.7	0.8500
NO.40	3.1	86.8	0.4250
NO.50	4.4	84.3	0.3000
NO.100	7.8	77.9	0.1500
NO.200	10.5	72.9	0.0750

Air Dry Weight(gm)= 50.00
Corrected Weight(gm)= 49.25

Time	Temp.	Hyd.Rdg	Corr	% Pass	Size(mm)
1 min.	24.0	39.0	5.0	63.5	0.0403
4 min.	24.0	34.0	5.0	54.2	0.0210
15 min.	24.0	28.0	5.0	43.0	0.0113
1 hour	23.0	22.0	5.0	31.8	0.0060
4 hours	23.0	18.0	5.0	24.3	0.0031

Gravel(%)= 5 Sand(%)=22 Silt(%)= 43 Clay(%)= 30

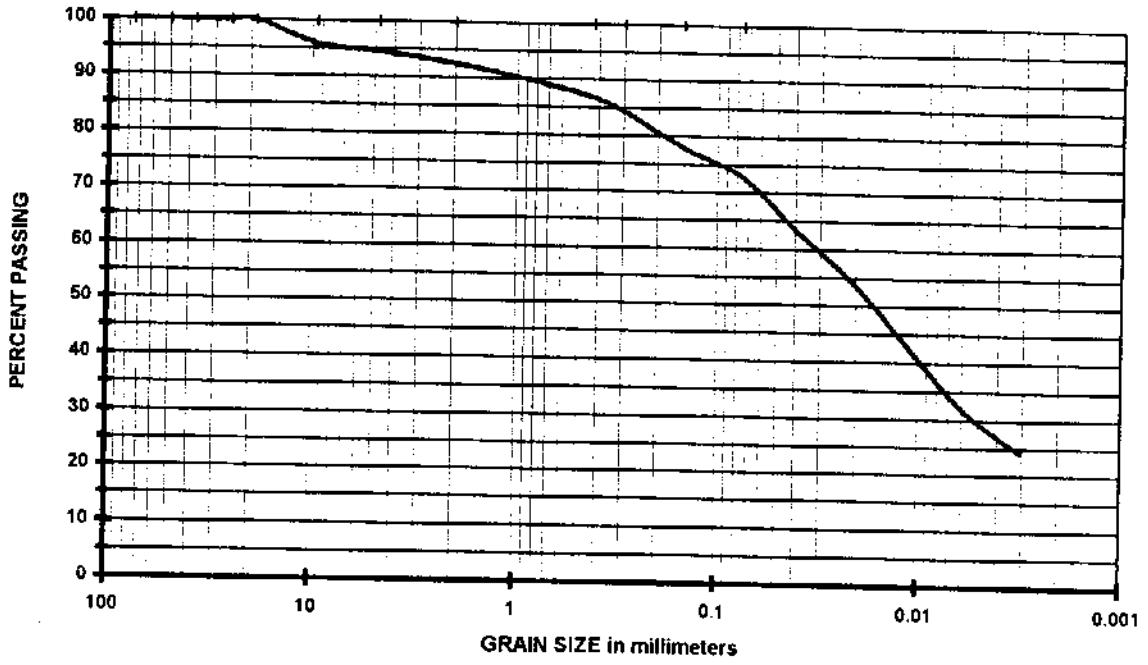
S&ME

GRAIN SIZE DATA SHEET

Job Name: SAIC, Ravenna Army Ammo Plant
Job Number: 1439-98-307

ASTM: D422
Date: 6/10/98

GRAIN SIZE DISTRIBUTION CURVE



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

Boring No.: _____ Sample No.: WB 0911 Depth (ft): 12-13.5

Log No.: _____ Soil Classification: Lean Clay with Sand (CL)

ATTERBERG LIMIT (-#40 MATERIAL)

LIQUID LIMIT	36
PLASTIC LIMIT	19
PLASTICITY INDEX	18

GRAIN SIZE DATA

% GRAVEL	5
% SAND	22
% SILT	43
% CLAY	30

S&ME, Inc., 1413 Topside Road, Louisville, Tennessee 37777, (423) 970-0003, Fax (423) 970-0004

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MOISTURE CONTENT

Job No: 1439-98-307

Job Name: SAIC, RVAAP Phase II

ASTM D: 2216

Operator: bd

Date: 6/4/98

I.D.'s		Weights (g)					Percent	
Log	Spec.	Wet	Dry	Tare	Water	Solids	M.C.	Spec.
	BK 0789	82.21	72.71	37.77	9.50	34.94	27.2	BK 0789
	BK 0790	61.44	55.56	38.69	5.88	16.87	34.9	BK 0790
	BK 0793	76.59	67.78	38.08	8.81	29.70	29.7	BK 0793
	BK 0795	71.33	65.76	37.71	5.57	28.05	19.9	BK 0795
	BK 0797	66.22	58.08	35.83	8.14	22.25	36.6	BK 0797
	BK 0800	66.59	49.94	39.92	16.65	10.02	166.2	BK 0800
	BK 0802	53.65	49.90	37.26	3.75	12.64	29.7	BK 0802
	BK 0803	53.93	51.52	39.13	2.41	12.39	19.5	BK 0803
	BK 0810	59.90	56.52	38.03	3.38	18.49	18.3	BK 0810
	BK 0811	75.66	70.55	38.87	5.11	31.68	16.1	BK 0811
	BK 0812	61.60	57.56	38.27	4.04	19.29	20.9	BK 0812
	BK 0813	58.37	54.83	38.09	3.54	16.74	21.1	BK 0813
	BK 0816	59.57	56.03	37.09	3.54	18.94	18.7	BK 0816
	BK 0817	52.50	51.82	38.45	0.68	13.37	5.1	BK 0817
	BK 0828	53.30	50.27	37.35	3.03	12.92	23.5	BK 0828
	BK 0829	63.63	61.70	37.52	1.93	24.18	8.0	BK 0829
	BK 0833	63.08	59.37	37.74	3.71	21.63	17.2	BK 0833
	BK 0834	59.70	56.94	39.00	2.76	17.94	15.4	BK 0834
	BK 0835	66.68	62.82	37.57	3.86	25.25	15.3	BK 0835
	BK 0879	64.26	58.43	37.68	5.83	20.75	28.1	BK 0879
	BK 0953	52.29	51.08	39.43	1.21	11.65	10.4	BK 0953
	BK 0954	80.97	74.21	38.57	6.76	35.64	19.0	BK 0954
	BK 0955	60.66	55.64	37.11	5.02	18.53	27.1	BK 0955

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MOISTURE CONTENT

Job No: 1439-98-307

Job Name: SAIC, RVAAP Phase II

ASTM D: 2216

Operator: bd

Date: 6/4/98

I.D.'s		Weights (g)					Percent	
Log	Spec.	Wet	Dry	Tare	Water	Solids	M.C.	Spec.
	WB 0694	57.39	53.16	37.85	4.23	15.31	27.6	WB 0694
	WB 0696	63.89	61.46	39.30	2.43	22.16	11.0	WB 0696
	WB 0701	49.74	47.46	37.75	2.28	9.71	23.5	WB 0701
	WB 0723	54.75	51.48	36.71	3.27	14.77	22.1	WB 0723
	WB 0730	67.36	61.36	37.00	6.00	24.36	24.6	WB 0730
	WB 0735	63.99	60.84	38.12	3.15	22.72	13.9	WB 0735
	WB 0742	47.64	47.59	38.39	0.05	9.20	0.5	WB 0742
	WB 0743	60.27	60.16	38.18	0.11	21.98	0.5	WB 0743
	WB 0749	60.41	57.49	39.34	2.92	18.15	16.1	WB 0749
	WB 0752	53.16	51.08	36.91	2.08	14.17	14.7	WB 0752
	WB 0754	65.81	61.59	38.10	4.22	23.49	18.0	WB 0754
	WB 0758	56.92	53.07	39.32	3.85	13.75	28.0	WB 0758
	WB 0759	59.78	55.47	37.14	4.31	18.33	23.5	WB 0759
	WB 0764	59.04	55.05	35.76	3.99	19.29	20.7	WB 0764
	WB 0927	58.76	55.89	39.24	2.87	16.65	17.2	WB 0927
	WB 0928	54.80	52.23	37.90	2.57	14.33	17.9	WB 0928

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MOISTURE CONTENT

Job No: 1439-98-307

Job Name SAIC, RVAAP Phase II

ASTM D: 2216

Operator: bd

Date: 6/9/98

I.D.'s		Weights (g)					Percent	
Log	Spec.	Wet	Dry	Tare	Water	Solids	M.C.	Spec.
	BK 0904	218.25	202.27	27.98	15.98	174.29	9.2	BK 0904
	BK 0905	224.71	207.71	29.51	17.00	178.20	9.5	BK 0905
	BK 0906	153.80	135.77	29.43	18.03	106.34	17.0	BK 0906
	BK 0907	146.21	136.53	37.95	9.68	98.58	9.8	BK 0907
	BK 0909	128.49	113.00	38.10	15.49	74.90	20.7	BK 0909
	WB 0858	212.99	193.89	38.60	19.10	155.29	12.3	WB 0858
	WB 0859	173.77	158.70	38.86	15.07	119.84	12.6	WB 0859
	WB 0860	147.10	133.80	38.45	13.30	95.35	13.9	WB 0860
	WB 0861	182.80	165.91	38.30	16.89	127.61	13.2	WB 0861
	WB 0862	227.20	201.01	37.91	26.19	163.10	16.1	WB 0862
	WB 0910	141.00	129.93	27.48	11.07	102.45	10.8	WB 0910
	WB 0911	150.71	136.92	28.31	13.79	108.61	12.7	WB 0911

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INSITU SOIL DENSITY

Job No: 1439-98-307

Job Name: SAIC, RVAAP

Dens. ASTM

Moist. ASTM D2216

Operator: bd

Date: 6/29/98

Log No:					
Sample I.D.:	BK 0905	BK 0909	WB 0858	WB 0859	WB 0860
Depth/Elevation (ft):	14 to 15.5	12 to 14	14 to 15.5	9 to 10.8	9 to 10.5
Description:	Gray-White	Brown	Gray	Tan-Br	Brown
Spec. Weight:					
Wet weight (g):	728.20	590.10	690.70	708.30	622.400
Spec. Volume:					
Dia. (in):	2.844	2.790	2.837	2.832	2.779
Length (in):	3.045	3.020	2.964	3.040	2.900
Area (in^2):	**6.353**	**6.114**	**6.321**	**6.299**	**6.066**
Volume (cm^3):	**316.98**	**302.56**	**307.04**	**313.80**	**288.25**
Moisture Cont.:					
Wt. of wet spec. + tin:	224.71	128.49	212.99	173.77	147.10
Wt. of dry spec. + tin:	207.71	113.00	193.89	158.70	133.80
Wt. of tin:	29.51	38.10	38.60	38.86	38.45
Wt. of solids:	**178.20**	**74.90**	**155.29**	**119.84**	**95.35**
Wt. of moist.:	**17.00**	**15.49**	**19.10**	**15.07**	**13.30**
Moisture Cont. (%):	**9.54**	**20.68**	**12.30**	**12.58**	**13.95**
Density:					
Wet Density (pcf):	**143.4**	**121.8**	**140.4**	**140.9**	**134.8**
Dry Density (pcf):	**130.9**	**100.9**	**125.0**	**125.2**	**118.3**

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SOIL POROSITY

Job No: 1439-98-307 **Operator:** bd

Job Name: SAIC, RVAAP **Date:** 06/29/98

Sampl. Descript.: Undist. Shelby Tubes

Log No:					
Sample I.D.:	**BK 0905**	**BK 0909**	**WB 0858**	**WB 0859**	**WB 0860**
Depth/Elevation (ft):	14 to 15.5	12 to14	14 to 15.5	9 to 10.8	9 to 10.5
Description:	Gray-White	Brown	Gray	Tan-Br	Brown
Wt. of Solids (g):	664.78	488.98	615.05	623.01	546.20
Sp. Gr. Of Solids:	2.655	2.650	2.673	2.720	2.699
Total Volume (cm^3):	316.98	302.56	307.04	313.80	288.25
Vol. Of Solids (cm^3):	**250.39**	**184.52**	**230.10**	**229.05**	**202.37**
Vol. Of Voids (cm^3):	**66.60**	**118.04**	**76.94**	**84.75**	**85.88**
Volumetric Air	**0.0100**	**0.0559**	**0.0042**	**0.0179**	**0.0336**
Volumetric Water	**0.2001**	**0.3342**	**0.2464**	**0.2522**	**0.2643**
Volumetric Solids	**0.7899**	**0.6099**	**0.7494**	**0.7299**	**0.7021**
Volume Water (cm^3):	**63.42**	**101.12**	**75.65**	**79.15**	**76.20**
Porosity:	**0.210**	**0.390**	**0.251**	**0.270**	**0.298**

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INSITU SOIL DENSITY

Job No: 1439-98-307

Job Name: SAIC, RVAAP

Dens. ASTM

Moist. ASTM D2216

Operator: bd

Date: 6/29/98

Log No:					
Sample I.D.:	WB 0861	WB 0862	WB 0911		
Depth/Elevation (ft):	5 to 6.5	9 to 11	12 to 13.5		
Description:	Brown	Tan	Tan-Br		
Spec. Weight:					
Wet weight (g):	530.90	602.80	728.00		
Spec. Volume:					
Dia. (in):	2.807	2.770	2.854		
Length (in):	2.770	2.847	3.050		
Area (in^2):	**6.188**	**6.026**	**6.397**		
Volume (cm^3):	**280.90**	**281.15**	**319.74**		
Moisture Cont.:					
Wt. of wet spec. + tin:	182.80	227.20	150.71		
Wt. of dry spec. + tin:	165.91	201.01	136.92		
Wt. of tin:	38.30	37.91	28.31		
Wt. of solids:	**127.61**	**163.10**	**108.61**		
Wt. of moist.:	**16.89**	**26.19**	**13.79**		
Moisture Cont. (%):	**13.24**	**16.06**	**12.70**		
Density:					
Wet Density (pcf):	**118.0**	**133.8**	**142.1**		
Dry Density (pcf):	**104.2**	**115.3**	**126.1**		

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SOIL POROSITY

Job No: 1439-98-307 **Operator:** bd

Job Name: SAIC, RVAAP **Date:** 06/29/98

Sampl. Descript.: Undist. Shelby Tubes

Log No:					
Sample I.D.:	**WB 0861**	**WB 0862**	**WB 0911**		
Depth/Elevation (ft):	5 to 6.5	9 to 11	12 to 13.5		
Description:	Brown	Tan	Tan-Br		
Wt. of Solids (g):	468.83	519.39	627.48		
Sp. Gr. Of Solids:	2.670	2.662	2.673		
Total Volume (cm^3):	280.90	281.15	319.74		
Vol. Of Solids (cm^3):	**175.59**	**195.11**	**234.75**		
Vol. Of Voids (cm^3):	**105.31**	**86.04**	**84.99**		
Volumetric Air	**0.0718**	**0.0156**	**0.0224**		
Volumetric Water	**0.3031**	**0.2904**	**0.2434**		
Volumetric Solids	**0.6251**	**0.6940**	**0.7342**		
Volume Water (cm^3):	**85.14**	**81.66**	**77.83**		
Porosity:	**0.375**	**0.306**	**0.266**		

*** PERMEABILITY ANALYSIS ***

PROJECT: 1439-98-307
FEATURE: SAIC - Ravenna Army Ammo Plant
TEST NO: BK0905 @ 14.0'-15.5'

RUN NO.	CONF. PRESS PSI	AREA PIPETTE IN CM2	AREA PIPETTE OUT CM2	AREA SPEC CM2	HT SPEC CM	TIME INTERVAL SEC	HEAD DIFF INITIAL CM	HEAD DIFF FINAL CM	PERMEABILITY K CM/SEC
1	4.0	0.3091	0.3091	40.99	7.73	6300.0	210.45	175.04	0.000000852
2	4.0	0.3091	0.3091	40.99	7.73	7680.0	175.04	144.41	0.000000730
3	4.0	0.3091	0.3091	40.99	7.73	5520.0	144.41	126.32	0.000000707
4	4.0	0.3091	0.3091	40.99	7.73	5100.0	126.32	112.26	0.000000674
								Avg=	7.41267E-07

*** PERMEABILITY ANALYSIS ***

PROJECT: 1439-98-307
FEATURE: SAIC - Ravenna Army Ammo Plant
TEST NO: BK0909 @ 12.0'-14.0'

RUN NO.	CONF. PRESS PSI	AREA PIPETTE IN CM2	AREA PIPETTE OUT CM2	AREA SPEC CM2	HT SPEC CM	TIME INTERVAL SEC	HEAD DIFF INITIAL CM	HEAD DIFF FINAL CM	PERMEABILITY K CM/SEC
1	3.0	0.3091	0.3091	39.45	7.67	180.0	139.99	32.04	0.000246221
2	3.0	0.3091	0.3091	39.45	7.67	177.0	139.99	32.04	0.000250395
3	3.0	0.3091	0.3091	39.45	7.67	179.0	139.99	32.04	0.000247597
4	3.0	0.3091	0.3091	39.45	7.67	178.0	139.99	32.04	0.000248988
								Avg=	2.48301E-04

*** PERMEABILITY ANALYSIS ***

PROJECT: 1439-98-307
FEATURE: SAIC - Ravenna Army Ammo Plant
TEST NO: WB0858 @ 14.0'-15.5'

RUN NO.	CONF. PRESS PSI	AREA PIPETTE IN CM2	AREA PIPETTE OUT CM2	AREA SPEC CM2	HT SPEC CM	TIME INTERVAL SEC	HEAD DIFF INITIAL CM	HEAD DIFF FINAL CM	PERMEABILITY K CM/SEC
1	4.0	0.3091	0.3091	40.78	7.53	7200.0	210.45	203.23	0.000000138
2	4.0	0.3091	0.3091	40.78	7.53	7200.0	203.23	197.44	0.000000114
3	4.0	0.3091	0.3091	40.78	7.53	10800.0	197.44	188.86	0.000000117
4	4.0	0.3091	0.3091	40.78	7.53	52200.0	188.86	155.84	0.000000105
								Avg=	1.18828E-07

*** PERMEABILITY ANALYSIS ***

PROJECT: 1439-98-307
FEATURE: SAIC - Ravenna Army Ammo Plant
TEST NO: WB0859 @ 9.0'-10.8'

RUN NO.	CONF. PRESS PSI	AREA PIPETTE IN CM2	AREA PIPETTE OUT CM2	AREA SPEC CM2	HT SPEC CM	TIME INTERVAL SEC	HEAD DIFF INITIAL CM	HEAD DIFF FINAL CM	PERMEABILITY K CM/SEC
1	5.0	0.7158	0.3777	40.64	7.72	36420.0	235.11	219.00	0.000000091
2	5.0	0.7158	0.3777	40.64	7.72	49800.0	219.00	196.47	0.000000102
3	5.0	0.7158	0.3777	40.64	7.72	37020.0	235.11	220.15	0.000000083
4	5.0	0.7158	0.3777	40.64	7.72	38760.0	225.27	209.31	0.000000089
								Avg=	9.16179E-08

*** PERMEABILITY ANALYSIS ***

PROJECT: 1439-98-307
FEATURE: SAIC - Ravenna Army Ammo Plant
TEST NO: WB0860 @ 9.0'-10.5'

RUN NO.	CONF. PRESS PSI	AREA PIPETTE IN CM2	AREA PIPETTE OUT CM2	AREA SPEC CM2	HT SPEC CM	TIME INTERVAL SEC	HEAD DIFF INITIAL CM	HEAD DIFF FINAL CM	PERMEABILITY K CM/SEC
1	5.0	0.3091	0.3091	39.13	7.37	9000.0	272.50	269.16	0.000000039
2	5.0	0.3091	0.3091	39.13	7.37	47400.0	269.16	254.79	0.000000033
3	5.0	0.3091	0.3091	39.13	7.37	7200.0	254.79	252.79	0.000000031
4	5.0	0.3091	0.3091	39.13	7.37	9000.0	252.79	250.44	0.000000030
								Avg=	3.38895E-08

*** PERMEABILITY ANALYSIS ***

PROJECT: 1439-98-307
FEATURE: SAIC - Ravenna Army Ammo Plant
TEST NO: WB0861 @ 5.0'-6.5'

RUN NO.	CONF. PRESS PSI	AREA PIPETTE IN CM2	AREA PIPETTE OUT CM2	AREA SPEC CM2	HT SPEC CM	TIME INTERVAL SEC	HEAD DIFF INITIAL CM	HEAD DIFF FINAL CM	PERMEABILITY K CM/SEC
1	3.0	0.3091	0.3091	39.92	7.04	174.0	139.99	17.19	0.000328300
2	3.0	0.3091	0.3091	39.92	7.04	204.0	139.99	17.19	0.000280020
3	3.0	0.3091	0.3091	39.92	7.04	212.0	139.99	17.19	0.000269454
4	3.0	0.3091	0.3091	39.92	7.04	226.0	139.99	17.19	0.000252762
								Avg=	2.82634E-04

*** PERMEABILITY ANALYSIS ***

PROJECT: 1439-98-307
FEATURE: SAIC - Ravenna Army Ammo Plant
TEST NO: WB0862 @ 9.0'-11.0'

RUN NO.	CONF. PRESS PSI	AREA PIPETTE IN CM2	AREA PIPETTE OUT CM2	AREA SPEC CM2	HT SPEC CM	TIME INTERVAL SEC	HEAD DIFF INITIAL CM	HEAD DIFF FINAL CM	PERMEABILITY K CM/SEC
1	5.0	0.7184	0.3656	38.88	7.23	49860.0	236.80	224.87	0.000000046
2	5.0	0.7184	0.3656	38.88	7.23	36360.0	224.87	218.50	0.000000035
3	5.0	0.7184	0.3656	38.88	7.23	48300.0	218.50	208.18	0.000000045
4	5.0	0.7184	0.3656	38.88	7.23	38760.0	208.18	199.35	0.000000050
								Avg=	4.44689E-08

*** PERMEABILITY ANALYSIS ***

PROJECT: 1439-98-307
FEATURE: SAIC - Ravenna Army Ammo Plant
TEST NO: WB0911 @ 12.0'-13.5'

RUN NO.	CONF. PRESS PSI	AREA PIPETTE IN CM2	AREA PIPETTE OUT CM2	AREA SPEC CM2	HT SPEC CM	TIME INTERVAL SEC	HEAD DIFF INITIAL CM	HEAD DIFF FINAL CM	PERMEABILITY K CM/SEC
1	5.0	0.3091	0.3091	41.27	7.75	65460.0	236.93	213.75	0.000000045
2	5.0	0.3091	0.3091	41.27	7.75	21600.0	281.70	271.71	0.000000048
3	5.0	0.3091	0.3091	41.27	7.75	14940.0	271.71	265.83	0.000000042
4	5.0	0.3091	0.3091	41.27	7.75	53700.0	265.83	245.35	0.000000043
								Avg=	4.49797E-08

Appendix A

Chain-Of-Custody Records
and
Receipt Inspection Reports

Inspection Report

☑ RECEIVING ☐ SHIPPING

RECEIVED FROM/SHIPPED TO: SAIC

DATE: 5/15/98

REPORT No.: QA-INSP-98-163

SL JOB No.: 1439-98-307

INSPECTOR: TR BEST

SL P.O. No.: N/A

CLIENT ~~P.O.~~ SUBCONTRACT No.: 4400001842

PROJECT MANAGER/ENGINEER: JB PEARSON

RELEASE/CO/REV No.: N/A

ITEM No.	QTY	~~PART~~ DEPTH ~~No.~~ (FT)	IDENTIFICATION No.	DESCRIPTION	ACCEPTABLE YES	ACCEPTABLE NO*
1	1	2-4	WB0928	SOIL (BORE)	✓	
2	1	N/A	WB0743	SURFACE SLAG	✓	
3	1	N/A	WB0742	SURFACE SLAG	✓	
4	1	0-6	BK0863	SEDIMENT	✓	
5	1	0-1	WB0701	SURFACE SOIL	✓	
6	1	0-6"	BK0802	SEDIMENT	✓	
7	1	1-2	BK0810	SOIL (BORE)	✓	
8	1	27-28	BK0953	SOIL (BORE)	✓	
9	1	4-6	WB0927	SUB-SOIL (BORE)	✓	

H-271

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

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

*1. NOTICE OF ANOMALY IS REQUIRED PER QAP 15.1
☐ YES ☑ NO

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

COMMENTS/DESCRIPTION OF DESCREPANCIES (continue on reverse):

Inspector Signature

5/15/98
Date

Inspection Report

DATE: 5/15/98

REPORT No.: QA-INSP-98- 163

☑ RECEIVING ☐ SHIPPING

SL JOB No.: 1439-98-307

INSPECTOR: TR BEST

RECEIVED FROM/SHIPPED TO: SAIC

SL P.O. No.: N/A

CLIENT ~~P.O.~~ SUBCONTRACT No.: 4400001842

PROJECT MANAGER/ENGINEER: JB PEARSON

RELEASE/CO/REV No.: N/A

ITEM No.	QTY	~~PART DEPTH~~ No. (FT)	IDENTIFICATION No.	DESCRIPTION	ACCEPTABLE YES	ACCEPTABLE NO*
10	1	2-3	BK0828	SUBSURFACE SOIL (BORE)	✓	
11	1	14-15	BK0955	SOIL (BORE)	✓	
12	1	9-10	BK0835	SUB-SOIL (BORE)	✓	
13	1	0-1	WB0735	SURFACE SOIL	✓	
14	1	2-4	WB0764	SUBSURFACE SOIL (BORE)	✓	
15	1	4-6	WB0749	SUBSURFACE SOIL (BORE)	✓	
16	1	4-6	WB0759	SUBSURFACE SOIL (BORE)	✓	
17	1	0-1	WB0730	SURFACE SOIL	✓	
18	1	0-1	WB0696	SURFACE SOIL	✓	

H-272

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

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

*1. NOTICE OF ANOMALY IS REQUIRED PER QAP 15.1
☐ YES ☑ NO

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

COMMENTS/DESCRIPTION OF DESCREPANCIES (continue on reverse):

Inspector Signature

5/15/98
Date

FORM 10.1-1 REVISION 2

Inspection Report

DATE: 5/15/98

REPORT No.: QA-INSP-98- 163

☑ RECEIVING ☐ SHIPPING

SL JOB No.: 1439-98-307

INSPECTOR: TR BEST

RECEIVED FROM/SHIPPED TO: SAIC

SL P.O. No.: N/A

SUBCONTRACT CLIENT ~~P.O.~~ No.: 4600001842

PROJECT MANAGER/ENGINEER: JB PEARSON

RELEASE/CO/REV No.: N/A

ITEM No.	QTY	~~PART~~ ~~DEPTH~~ ~~No.~~ (FT)	IDENTIFICATION No.	DESCRIPTION	ACCEPTABLE YES	ACCEPTABLE NO*
19	1	0-1	WB0723	SURFACE SOIL	✓	
20	1	0-1	WB0694	SURFACE SOIL	✓	
21	1	2-4	WB0754	SUBSURFACE SOIL (BORE)	✓	
22	1	2-4	WB0752	SUBSURFACE SOIL (BORE)	✓	
23	1	0-6"	BK0800	SEDIMENT	✓	
24	1	0-1	BK0790	SURFACE SOIL	✓	
25	1	7-8	BK0833	SUBSURFACE SOIL (BORE)	✓	
26	1	0-1	BK0795	SURFACE SOIL	✓	
27	1	2-4	WB0758	SUBSURFACE SOIL (BORE)	✓	

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

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

*1. NOTICE OF ANOMALY IS REQUIRED PER QAP 15.1
☐ YES ☑ NO

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

COMMENTS/DESCRIPTION OF DESCREPANCIES (continue on reverse):

Inspector Signature — Date: 5/15/98

FORM 10.1-1 REVISION 2

Inspection Report

DATE: 5/15/98

REPORT No.: QA-INSP-98-163

☑ RECEIVING ☐ SHIPPING

SL JOB No.: 1439-98-307

INSPECTOR: TR Best

RECEIVED FROM/SHIPPED TO: SAIC

SL P.O. No.: N/A

~~SUBCONTRACT~~ CLIENT ~~P.O.~~ No.: 4600001842

PROJECT MANAGER/ENGINEER: JB Pearson

RELEASE/CO/REV No.: N/A

ITEM No.	QTY	~~PART~~ DEPTH ~~No.~~ (FT)	IDENTIFICATION No.	DESCRIPTION	ACCEPTABLE YES	ACCEPTABLE NO*
28	1	25-30	BK0879	SUBSURFACE SOIL (BORE)	✓	
29	1	0-1	BK0793	SURFACE SOIL	✓	
30	1	11-12	BK0829	SUBSURFACE SOIL (BORE)	✓	
31	1	0-1	BK0797	SURFACE SOIL	✓	
32	1	0-1	BK0789	SURFACE SOIL	✓	
33	1	1-2	BK0816	SUBSURFACE SOIL (BORE)	✓	
34	1	11-12	BK0813	SUBSURFACE SOIL (BORE)	✓	
35	1	1-3	BK0834	SUBSURFACE SOIL (BORE)	✓	
36	1	4-5	BK0817	SUBSURFACE SOIL (BORE)	✓	

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

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

*1. NOTICE OF ANOMALY IS REQUIRED PER QAP 15.1
☐ YES ☑ NO

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

COMMENTS/DESCRIPTION OF DESCREPANCIES (continue on reverse):

Inspector Signature 5/15/98 Date

H-274

FORM 10.1-1 REVISION 2

Inspection Report

☑ RECEIVING ☐ SHIPPING

RECEIVED FROM/SHIPPED TO: SAIC

DATE: 5/15/98

SL JOB No.: 1439-98-307

SL P.O. No.: N/A

SUBCONTRACT CLIENT ~~P.O.~~ No.: 4400001842

RELEASE/CO/REV No.: N/A

REPORT No.: QA-INSP-98- 163

INSPECTOR: TR BEST

PROJECT MANAGER/ENGINEER: JB PEARSON

ITEM No.	QTY	~~DEPTH~~ PART ~~No.~~ (PT)	IDENTIFICATION No.	DESCRIPTION	ACCEPTABLE YES	ACCEPTABLE NO*
37	1	2-3	BK0812	SUBSURFACE SOIL (BORE)	✓	
38	1	3-4	BK0811	SUBSURFACE SOIL (BORE)	✓	
39	1	6-7	BK0954	SOIL (BORE)	✓	

H-275

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

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

*1. NOTICE OF ANOMALY IS REQUIRED PER QAP 15.1
☐ YES ☑ NO

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

COMMENTS/DESCRIPTION OF DISCREPANCIES (continue on reverse):

Inspector Signature 5/15/98 Date

FORM 10.1-1 REVISION 2

Chain of Custody Record

SAIC *Science Applications International Corporation* *An Employee Owned Company*

COC No.: **S001**

Page 1 of 3 Date: 5/13/98

Name: Science Applications International Corporation
Address: 800 Oak Ridge Turnpike, Oak Ridge, TN 37331
Phone Number: (423) 481-4600
Project Manager: Steve Selecman
Project Name: RVAAP Phase II RI at WBG & Background Inv.
Job/P.O. #: DACA62-94-D-0029

Sampler (Signature): Laura M. Obloy (Printed Name): LAURA M. OBLOY

Laboratory Name: S&ME Laboratory
Address: 1413 Topside Road, Louisville, TN 37777
Phone: (423) 970-2299
Contact: John Pearson

Laboratory No.	Site ID	Field Sample #	Site Type	Depth	Date	Time	Matrix	Grain Size[1]	Moisture Content[2]	Atterberg Limits[3]	Unified Soil Classification[4]	Bulk Density[5]	Porosity[6]	Hydraulic Conductivity[7]	Specific Gravity - solids[8]	pH[9]	Total Organic Carbon					NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	BKG	BK0797	SURF	0-1'	4/23/98	1000	SO	X	X	X	X											1	
	WBG	WB0723	SURF	0-1'	4/21/98	1358	SO	X	X	X	X											1	
	BKG	BK0795	SURF	0-1'	4/21/98	1420	SO	X	X	X	X											1	
	WBG	WB0730	SURF	0-1'	4/22/98	1021	SO	X	X	X	X											1	
	BKG	BK0793	SURF	0-1'	4/22/98	1053	SO	X	X	X	X											1	
	BKG	BK0790	SURF	0-1'	4/22/98	1518	SO	X	X	X	X											1	
	BKG	BK0953	BORE	27-28'	5/7/98	1110	SO	X	X	X	X											1	
	BKG	BK0789	SURF	0-1'	4/22/98	1705	SO	X	X	X	X											1	
	WBG	WB0696	SURF	0-1'	4/23/98	0858	SO	X	X	X	X											1	
	WBG	WB0694	SURF	0-1'	4/23/98	1029	SO	X	X	X	X											1	
	WBG	WB0701	SURF	0-1'	4/23/98	1345	SO	X	X	X	X											1	
	WBG	WB0735	SURF	0-1'	4/23/98	1511	SO	X	X	X	X											1	
	BKG	BK0800	SEDI	0-6"	4/23/98	1540	SO	X	X	X	X											1	

Total Number of Containers:

Relinquished by: Laura M Obloy (Signature) LAURA M. OBLOY (Printed Name) SAIC (Company) — Date: 13 May 98 — Time: 1430

Received by (Signature, Printed Name, Company) — Date — Time

Relinquished by (Signature, Printed Name, Company) — Date — Time

Received by (Signature, Printed Name, Company) — Date — Time

Notes:

Methods:
1. ASTM D422
2. ASTM D2216
3. ASTM D4318
4. ASTM D2487
5. ASTM D4531
6. EM 1110-2-1906
7. ASTM D5084
8. ASTM D854
9. SW 846-9045

RECEIVED
MAY 15 1998

SAIC Location
Oak Ridge
800 Oak Ridge Turnpike
Oak Ridge, TN 37831
(423) 481-4600

H-276

Science Applications International Corporation — White: Laboratory — Pink: Project Manager — Yellow: Project QAO — Goldenrod: Field Project Manager

Chain of Custody Record

Science Applications International Corporation
An Employee Owned Company

COC No.: S001

Page 2 of 3 Date: 5/13/98

Name: Science Applications International Corporation
Address: 800 Oak Ridge Turnpike, Oak Ridge, TN 37331
Phone Number: (423) 481-4600
Project Manager: Steve Selecman
Project Name: RVAAP Phase II RI at WBG & Background Inv.
Job/P.O. #: DACA62-94-D-0029

Sampler (Signature): Laura M. Obloy (Printed Name): LAURA M. OBLOY

Laboratory Name: S&ME Laboratory
Address: 1413 Topside Road Louisville, TN 37777
Phone: (423) 970-2299
Contact: John Pearson

Laboratory No	Site ID	Field Sample #	Site Type	Depth	Date	Time	Matrix	Grain Size[1]	Moisture Content[2]	Atterberg Limits[3]	Unified Soil Classification[4]	Bulk Density[5]	Porosity[6]	Hydraulic Conductivity[7]	Specific Gravity - solids[8]	pH[9]	Total Organic Carbon					No. of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	WBG	WB0749	BORE	4-6'	4/24/98	0952	SO	X	X	X	X											1	
	WBG	WB0752	BORE	2-4'	4/24/98	1139	SO	X	X	X	X											1	
	BKG	BK0833	BORE	7-8'	4/24/98	1000	SO	X	X	X	X											1	
	BKG	BK0879	BORE	25-30'	4/24/98	1110	SO	X	X	X	X											1	
	WBG	WB0754	BORE	2-4'	4/24/98	1402	SO	X	X	X	X											1	
	WBG	WB0758	BORE	2-4'	4/25/98	0858	SO	X	X	X	X											1	
	WBG	WB0759	BORE	4-6'	4/25/98	0929	SO	X	X	X	X											1	
	WBG	WB0764	BORE	2-4'	4/25/98	1545	SO	X	X	X	X											1	
	BKG	BK0828	BORE	2-3'	4/25/98	1015	SO	X	X	X	X											1	
	BKG	BK0829	BORE	11-12'	4/25/98	1045	SO	X	X	X	X											1	
	BKG	BK0816	BORE	1-2'	4/27/98	0907	SO	X	X	X	X											1	
	BKG	BK0817	BORE	4-5'	4/27/98	0930	SO	X	X	X	X											1	
	BKG	BK0802	SEDI	0-6"	4/27/98	1127	SO	X	X	X	X											1	

Relinquished by: Laura M. Obloy
Signature: Laura M. Obloy
Printed Name: LAURA M. OBLOY
Company: SAIC
Date: 13 MAY 98
Time: 1430

Received by:
Signature:
Printed Name:
Company:
Date:
Time:

Relinquished by:
Signature:
Printed Name:
Company:
Date:
Time:

Received by:
Signature:
Printed Name:
Company:
Date:
Time:

Total Number of Containers:

Notes:

Methods:
1. ASTM D422
2. ASTM D2216
3. ASTM D4318
4. ASTM D2487
5. ASTM D4531
6. EM 1110-2-1906
7. ASTM D5084
8. ASTM D854
9. SW 846-9045

RECEIVED
MAY 15 1998

SAIC Location
Oak Ridge
800 Oak Ridge Turnpike
Oak Ridge, TN 37831
(423) 481-4600

Science Applications International Corporation — White: Laboratory — Pink: Project Manager — Yellow: Project QAO — Goldenrod: Field Project Manager

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Chain of Custody Record

Science Applications International Corporation
An Employee Owned Company

COC No.: S001
Page 3 of 3 Date: 5/13/98

Name: Science Applications International Corporation
Address: 800 Oak Ridge Turnpike, Oak Ridge, TN 37331
Phone Number: (423) 481-4600
Project Manager: Steve Selecman
Project Name: RVAAP Phase II RI at WBG & Background Inv.
Job/P.O. #: DACA62-94-D-0029

Sampler (Signature): Laura M. Obloy (Printed Name): Laura M. Obloy

Laboratory Name: S&ME Laboratory
Address: 1413 Topside Road, Louisville, TN 37777
Phone: (423) 970-2299
Contact: John Pearson

Laboratory No.	Site ID	Field Sample #	Site Type	Depth	Date	Time	Matrix	Grain Size[1]	Moisture Content[2]	Atterberg Limits[3]	Unified Soil Classification[4]	Bulk Density[5]	Porosity[6]	Hydraulic Conductivity[7]	Specific Gravity - solids[8]	pH[9]	Total Organic Carbon					No. of Containers	Observations, Comments, Special Instructions
	BKG	BK0803	SEDI	0-6"	4/27/98	1248	SO	X	X	X	X											1	
	BKG	BK0812	BORE	2-3'	4/27/98	1650	SO	X	X	X	X											1	
	BKG	BK0813	BORE	11-12'	4/27/98	1705	SO	X	X	X	X											1	
	BKG	BK0834	BORE	1-3'	5/5/98	1245	SO	X	X	X	X											1	
	BKG	BK0835	BORE	9-10'	5/5/98	1330	SO	X	X	X	X											1	
	WBG	WB0927	BORE	4-6'	5/6/98	1544	SO	X	X	X	X											1	
	WBG	WB0928	BORE	2-4'	5/6/98	1639	SO	X	X	X	X											1	
	BKG	BK0810	BORE	1-2'	5/7/98	0915	SO	X	X	X	X											1	
	BKG	BK0811	BORE	3-4'	5/7/98	0930	SO	X	X	X	X											1	
	WBG	WB0742	SLAG	NA	5/11/98	0836	SO				X											1	
	WBG	WB0743	SLAG	NA	5/11/98	0839	SO				X											1	
	BKG	BK0954	BORE	6-7'	5/8/98	1030	SO	X	X	X	X											1	
	BKG	BK0955	BORE	14-15'	5/8/98	1040	SO	X	X	X	X											1	

Total Number of Containers: 39

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Relinquished by	Date	Received by	Date
Laura M. Obloy (Signature)	13 May 98	(Signature)	
Laura M. Obloy (Printed Name)	Time 1430	(Printed Name)	Time
SAIC (Company)		(Company)	
Relinquished by	Date	Received by	Date
(Signature)		(Signature)	
(Printed Name)	Time	(Printed Name)	Time
(Company)		(Company)	

Notes:

Methods:
1. ASTM D422
2. ASTM D2216
3. ASTM D4318
4. ASTM D2487
5. ASTM D4531
6. EM 1110-2-1906
7. ASTM D5084
8. ASTM D854
9. SW 846-9045

Shipment Method: Fed-ex
Airbill No.: 804709786513
804709786498
Custody Seal 1 No.: LMO-13A
Custody Seal 2 No.: LMO-13B

RECEIVED
MAY 15 1998

SAIC Location
Oak Ridge
800 Oak Ridge Turnpike
Oak Ridge, TN 37831
(423) 481-4600

Science Applications International Corporation — White: Laboratory — Pink: Project Manager — Yellow: Project QAO — Goldenrod: Field Project Manager

Inspection Report

DATE: 5/27/98

REPORT No.: QA-INSP-98-169

☑ RECEIVING ☐ SHIPPING

SL JOB No.: 1439-98-307

INSPECTOR: TR BEST

RECEIVED FROM/SHIPPED TO: SAIC

SL P.O. No.: N/A

~~SUBCONTRACT~~ CLIENT P.O. No.: 4400001842

PROJECT MANAGER/ENGINEER: JB PEARSON

RELEASE/CO/REV No.: N/A

ITEM No.	QTY	~~PART~~ STATION No.	IDENTIFICATION No.	DESCRIPTION	ACCEPTABLE YES	ACCEPTABLE NO*
1	1	BKGMW.021	BKØ9Ø9	SUBSOIL (SHELBY TUBE)	✓	
2	1	WBGMW.009	WBØ91Ø	SUBSOIL (SHELBY TUBE)	✓	
3	1	BKGMW.019	BKØ9Ø7	SUBSOIL (SHELBY TUBE)	✓	
4	1	WBGMW.008	WBØ911	SUBSOIL (SHELBY TUBE)	✓	
5	1	WBGMW.005	WBØ858	SUBSOIL (SHELBY TUBE)	✓	
6	1	BKGMW.005	BKØ9Ø4	SUBSOIL (SHELBY TUBE)	✓	
7	1	WBGMW.007	WBØ86Ø	SUBSOIL (SHELBY TUBE)	✓	
8	1	WBGMW.008	WBØ861	SUBSOIL (SHELBY TUBE)	✓	
9	1	WBGMW.009	WBØ862	SUBSOIL (SHELBY TUBE)	✓	

H-279

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

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

*1. NOTICE OF ANOMALY IS REQUIRED PER QAP 15.1
☐ YES ☑ NO

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

COMMENTS/DESCRIPTION OF DESCREPANCIES (continue on reverse):

Inspector Signature

5/27/98
Date

FORM 10.1-1 REVISION 2

Inspection Report

☑ RECEIVING ☐ SHIPPING

RECEIVED FROM/SHIPPED TO: SAIC

DATE: 5/27/98

SL JOB No.: 1439-98-307

SL P.O. No.: N/A

~~SUBCONTRACT~~ CLIENT ~~P.O.~~ No.: 4400001842

RELEASE/CO/REV No.: N/A

REPORT No.: QA-INSP-98- 169

INSPECTOR: TR BEST

PROJECT MANAGER/ENGINEER: JB PEARSON

ITEM No.	QTY	~~PART~~ STATION No.	IDENTIFICATION No.	DESCRIPTION	ACCEPTABLE YES	ACCEPTABLE NO*
10	1	WBGMW.006	WB0859	SUBSOIL (SHELBY TUBE)	✓	
11	1	BKGMW.017	BK0906	SUBSOIL (SHELBY TUBE)	✓	
12	1	BKGMW.016	BK0905	SUBSOIL (SHELBY TUBE)	✓	

H-280

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

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

*1. NOTICE OF ANOMALY IS REQUIRED PER QAP 15.1
☐ YES ☑ NO

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

COMMENTS/DESCRIPTION OF DESCREPANCIES (continue on reverse):

Inspector Signature

5/27/98
Date

FORM 10.1-1 REVISION 2

Chain of Custody Record

Science Applications International Corporation
An Employee Owned Company

COC No.: S002
Page 1 of 1 Date: 5/22/98

Name: Science Applications International Corporation
Address: 800 Oak Ridge Turnpike, Oak Ridge, TN 37331
Phone Number: (423) 481-4600
Project Manager: Steve Selecman
Project Name: RVAAP Phase II RI at WBG & Background Inv.
Job/P.O. #: DACA62-94-D-0029
Sampler (Signature): Laura M. Obley (Printed Name): Laura M. Obley

Laboratory No	Site ID	Field Sample #	Site Type	Depth	Date	Matrix	Grain Size[1]	Moisture Content[2]	Atterberg Limits[3]	Unified Soil Classification[4]	Bulk Density[5]	Porosity[6]	Hydraulic Conductivity[7]	Specific Gravity - solids[8]	pH[9]	Total Organic Carbon					NO. OF CONTAINERS	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	BKG	BK0904	BORE	12-12.5	5/4/98	SO	X	X	X	X	X	X	X	X	X						1	shelby tube
	BKG	BK0905	BORE	14-15.5	5/5/98	SO	X	X	X	X	X	X	X	X	X						1	shelby tube
	BKG	BK0906	BORE	12-12.9	5/6/98	SO	X	X	X	X	X	X	X	X	X						1	shelby tube
	BKG	BK0907	BORE	12-12.5	5/7/98	SO	X	X	X	X	X	X	X	X	X						1	shelby tube
	BKG	BK0909	BORE	12-14	5/8/98	SO	X	X	X	X	X	X	X	X	X						1	shelby tube
	WBG	WB0858	BORE	14-15.5	4/22/98	SO	X	X	X	X	X	X	X	X	X	X					1	shelby tube
	WBG	WB0859	BORE	9-10.8	4/24/98	SO	X	X	X	X	X	X	X	X	X	X					1	shelby tube
	WBG	WB0860	BORE	9-10.5	4/24/98	SO	X	X	X	X	X	X	X	X	X	X					1	shelby tube
	WBG	WB0861	BORE	5-6.5	4/23/98	SO	X	X	X	X	X	X	X	X	X	X					1	shelby tube
	WBG	WB0862	BORE	9-11	4/25/98	SO	X	X	X	X	X	X	X	X	X	X					1	shelby tube
	WBG	WB0910	BORE	17-18.5	4/25/98	SO	X	X	X	X	X	X	X	X	X	X					1	shelby tube
	WBG	WB0911	BORE	12-13.5	4/23/98	SO	X	X	X	X	X	X	X	X	X	X					1	shelby tube

Total Number of Containers: 12

Laboratory Name: S&ME Laboratory
Address: 1413 Topside Road
Louisville, TN 37777
Phone: (423) 970-2299
Contact: John Pearson

Relinquished by: Laura M. Obley
Signature: Laura M. Obley
Printed Name: SAIC
Company:
Date: 22 May 98
Time: 930

Received by:
Signature:
Printed Name:
Company:
Date:
Time:

Relinquished by:
Signature:
Printed Name:
Company:
Date:
Time:

Received by:
Signature:
Printed Name:
Company:
Date:
Time:

Notes:

Methods:
1 ASTM D422
2 ASTM D2216
3 ASTM D4318
4 ASTM D2487
5 ASTM D4531
6 EM 1110-2-1906
7 ASTM D5084
8 ASTM D854
9 SW 846-9045

Shipment Method: Fed-ex
Airbill No.: 804709786465
804709786454
Custody Seal 1 No.:
Custody Seal 2 No.:

RECEIVED
MAY 27 1998

SAIC Location
Oak Ridge
800 Oak Ridge Turnpike
Oak Ridge, TN 37831
(423) 481-4600

H-281

Science Applications International Corporation — White: Laboratory — Pink: Project Manager — Yellow: Project QAO — Goldenrod: Field Project Manager