APPENDIX F.1

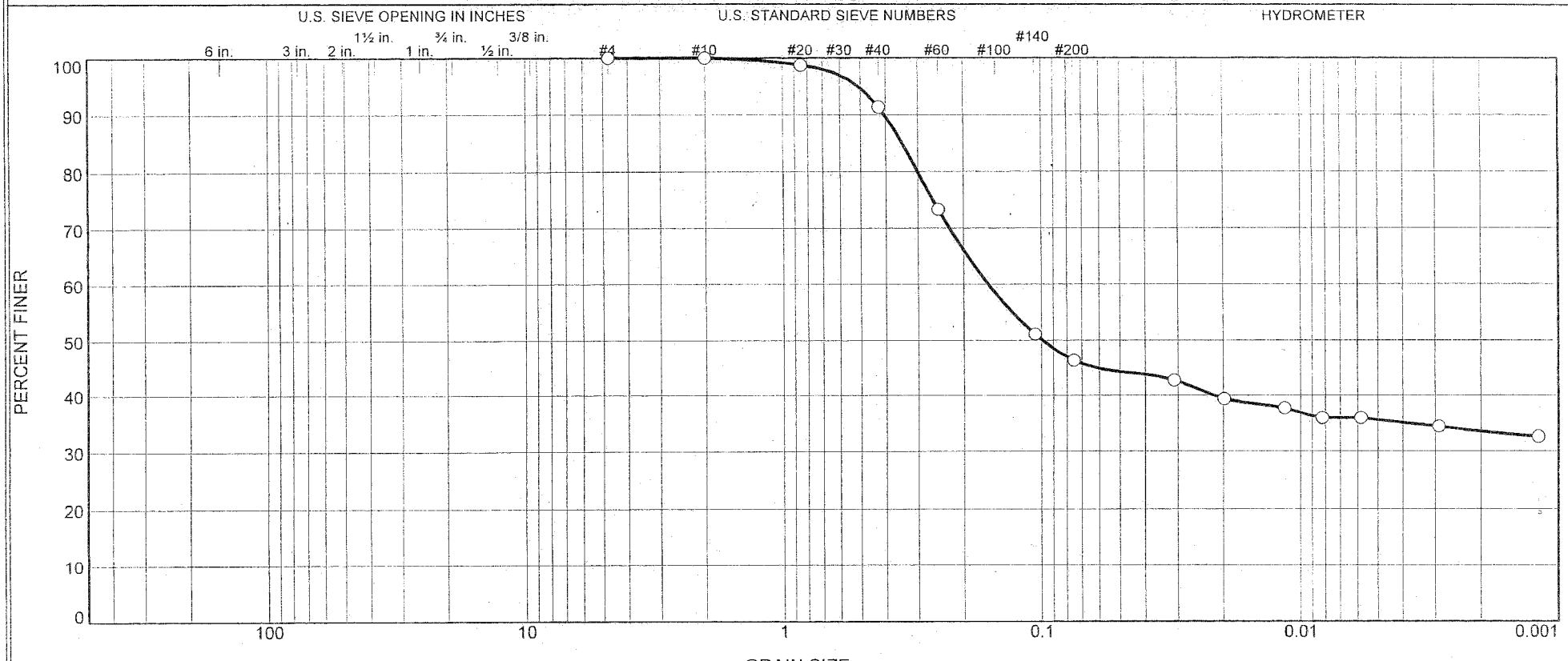
SOIL INDEX AND PARTICLE SIZE DISTRIBUTION TESTS

NORTH ANNA COL

DATA REPORT REV. 0
JANUARY 23, 2007

MACTEC PROJECT NO. 6468-06-1472

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	8.7	44.9	10.8	35.6

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-901	B-901-2	3.5-5.0'	8/10/06	ND	Yellowish red silty sand.	21.5	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ Specific gravity is assumed. ND= NOT DETERMINED

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-901
Depth: 3.5-5.0' **Sample Number:** B-901-2
Material Description: Yellowish red silty sand.
Date: 8/10/06 **Natural Moisture:** 21.5
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: Specific gravity is assumed. ND= NOT DETERMINED
Tested by: JPD **Checked by:** ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
142.66	0.00	0.00	#4	0.00	100.0
			#10	0.05	100.0
59.91	0.00	0.00	#20	0.73	98.7
			#40	5.18	91.3
			#60	15.99	73.3
			#140	29.26	51.1
			#200	32.13	46.4

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =59.91
Hygroscopic moisture correction:
Moist weight and tare = 27.27
Dry weight and tare = 26.98
Tare weight = 15.58
Hygroscopic moisture =2.5%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.9	29.0	25.3	0.0130	30.0	11.4	0.0309	42.7
5.00	22.9	27.0	23.3	0.0130	28.0	11.7	0.0198	39.4
15.00	22.9	26.0	22.3	0.0130	27.0	11.9	0.0115	37.7
30.00	22.8	25.0	21.2	0.0130	26.0	12.0	0.0082	35.9
60.00	22.8	25.0	21.2	0.0130	26.0	12.0	0.0058	35.9
243.00	23.0	24.0	20.3	0.0130	25.0	12.2	0.0029	34.3
1465.00	22.7	23.0	19.2	0.0130	24.0	12.4	0.0012	32.5

MACTEC, Inc.

Fractional Components

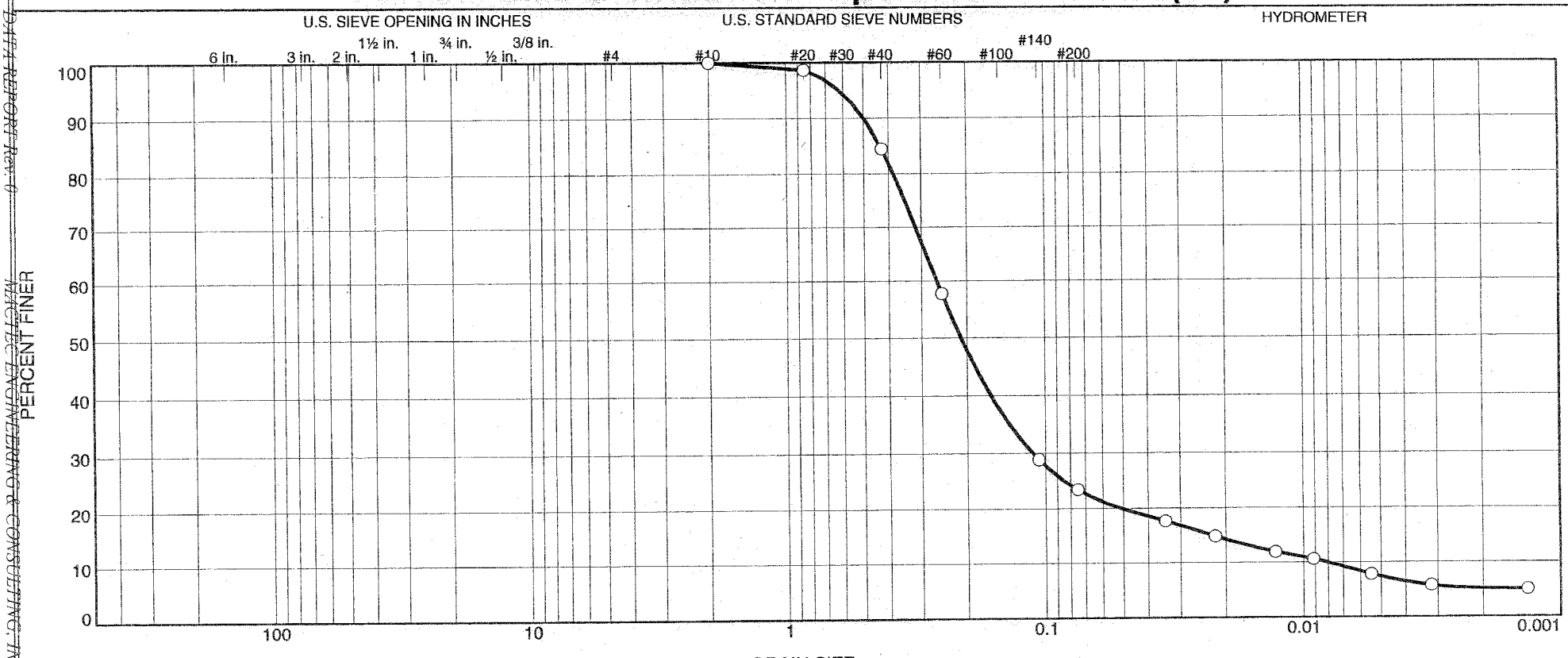
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	8.7	44.9	53.6	10.8	35.6	46.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0991	0.1607	0.3006	0.3454	0.4045	0.5100

Fineness Modulus
0.65

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	15.5	61.1	16.0	7.4

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-901	B-901-4	11.5-13'	8/10/06	ND	Pale yellow silty sand	10.2	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/2011

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-901
Depth: 11.5-13'
Sample Number: B-901-4
Material Description: Pale yellow silty sand
Date: 8/10/06
Natural Moisture: 10.2
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined
Specific gravity is assumed.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
156.50	0.00	0.00	#10	0.00	100.0
70.06	0.00	0.00	#20	0.95	98.6
			#40	10.88	84.5
			#60	29.59	57.8
			#140	49.80	28.9
			#200	53.64	23.4

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =70.06
Hygroscopic moisture correction:
Moist weight and tare = 26.07
Dry weight and tare = 26.01
Tare weight = 15.58
Hygroscopic moisture = 0.6%
Table of composite correction values:

Temp., deg. C:	12.8	28.0
Comp. corr.:	-7.0	-2.5

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.0	17.0	12.4	0.0133	18.0	13.3	0.0343	17.6
5.00	21.0	15.0	10.4	0.0133	16.0	13.7	0.0220	14.8
15.00	21.0	13.0	8.4	0.0133	14.0	14.0	0.0128	12.0
30.00	21.1	12.0	7.5	0.0133	13.0	14.2	0.0091	10.6
86.00	21.2	10.0	5.5	0.0132	11.0	14.5	0.0054	7.8
255.00	21.4	8.5	4.0	0.0132	9.5	14.7	0.0032	5.7
1440.00	21.3	8.0	3.5	0.0132	9.0	14.8	0.0013	5.0

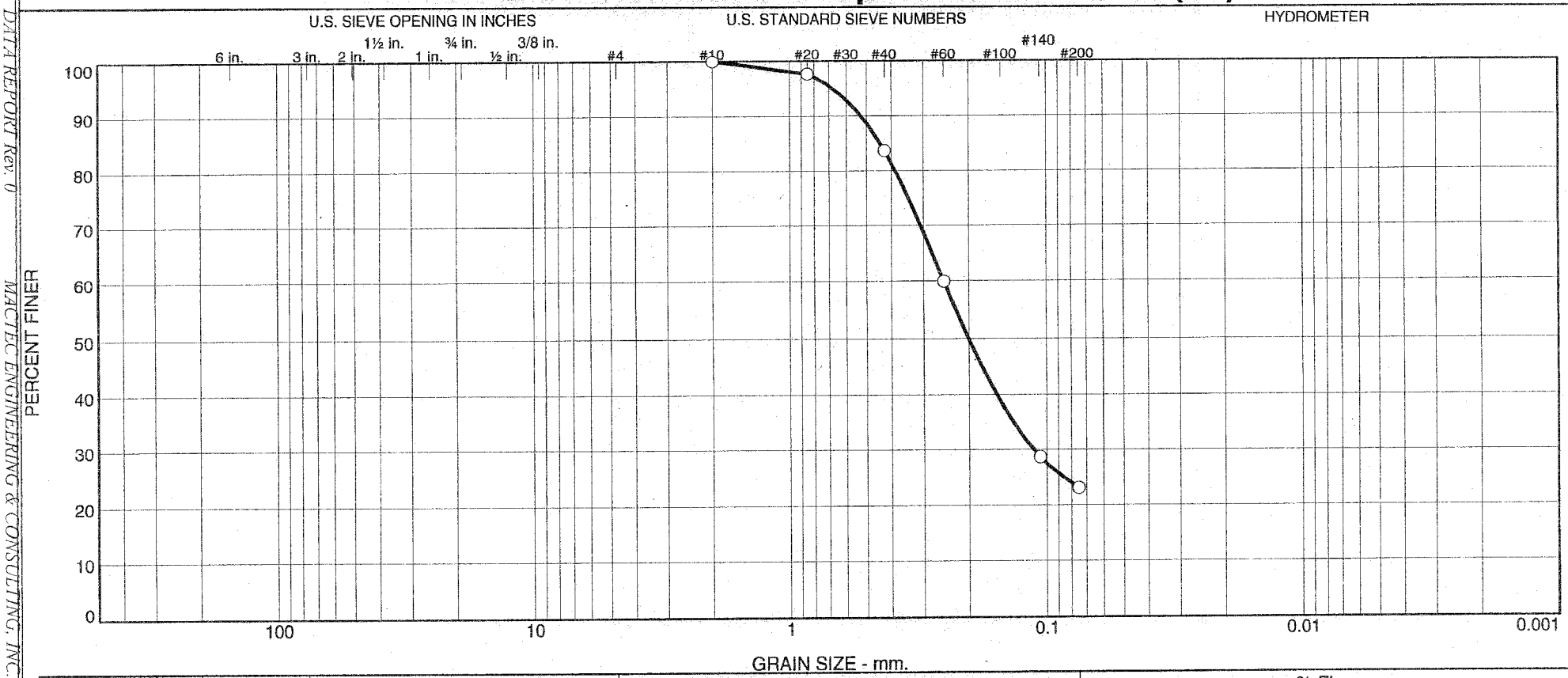
MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	15.5	61.1	76.6	16.0	7.4	23.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0081	0.0227	0.0511	0.1117	0.2112	0.2613	0.3839	0.4307	0.4984	0.6196

Fineness Modulus	C_u	C_c
1.02	32.27	5.90

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○					16.3	60.5	23.2	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-901	B-901-6	22.2-23.7'	8/10/06	ND	Pale yellow fine silty sand	16.4	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-901
Depth: 22.2-23.7'
Sample Number: B-901-6
Material Description: Pale yellow fine silty sand
Date: 8/10/06
Natural Moisture: 16.4
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
246.15	0.00	0.00	#10	0.01	100.0
103.66	0.00	0.00	#20	2.40	97.7
			#40	16.91	83.7
			#60	41.49	60.0
			#140	73.90	28.7
			#200	79.66	23.2

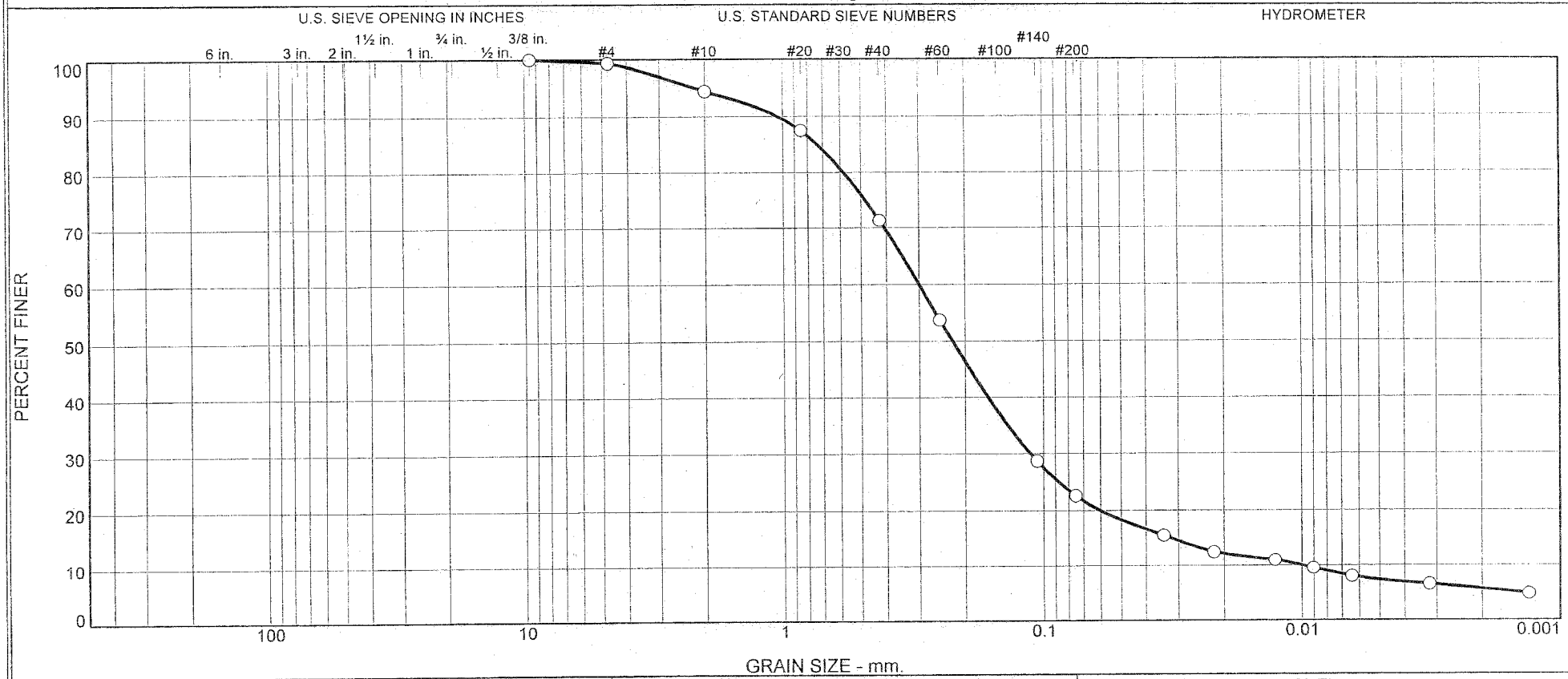
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
					16.3	60.5				23.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1122	0.2005	0.2501	0.3861	0.4414	0.5237	0.6747

Fineness Modulus
1.01

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.7	4.9	23.0	48.9	15.2	7.3

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-901	B-901-9	37.2-38.7'	8/10/06	ND	Light gray to orange brown silty sand.	16.4	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not Determined
NP= Non Plastic
Specific gravity is assumed

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-901
Depth: 37.2-38.7'
Sample Number: B-901-9
Material Description: Light gray to orange brown silty sand.
Date: 8/10/06
Natural Moisture: 16.4
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not Determined
NP= Non Plastic
Specific gravity is assumed
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
291.00	0.00	0.00	.375	0.00	100.0
			#4	1.91	99.3
			#10	16.33	94.4
62.37	0.00	0.00	#20	4.63	87.4
			#40	15.20	71.4
			#60	26.81	53.8
			#140	43.43	28.7
			#200	47.48	22.5

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =94.4
Weight of hydrometer sample =62.37
Hygroscopic moisture correction:
Moist weight and tare = 26.45
Dry weight and tare = 26.32
Tare weight = 15.51
Hygroscopic moisture =1.2%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.9	14.0	10.3	0.0130	15.0	13.8	0.0341	15.5
5.00	22.9	12.0	8.3	0.0130	13.0	14.2	0.0218	12.5
15.00	22.9	11.0	7.3	0.0130	12.0	14.3	0.0127	11.0
30.00	22.9	10.0	6.3	0.0130	11.0	14.5	0.0090	9.5
60.00	22.9	9.0	5.3	0.0130	10.0	14.7	0.0064	8.0
243.00	23.0	8.0	4.3	0.0130	9.0	14.8	0.0032	6.5
1459.00	22.6	7.0	3.2	0.0130	8.0	15.0	0.0013	4.8

MACTEC, Inc.

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.7	0.7	4.9	23.0	48.9	76.8	15.2	7.3	22.5

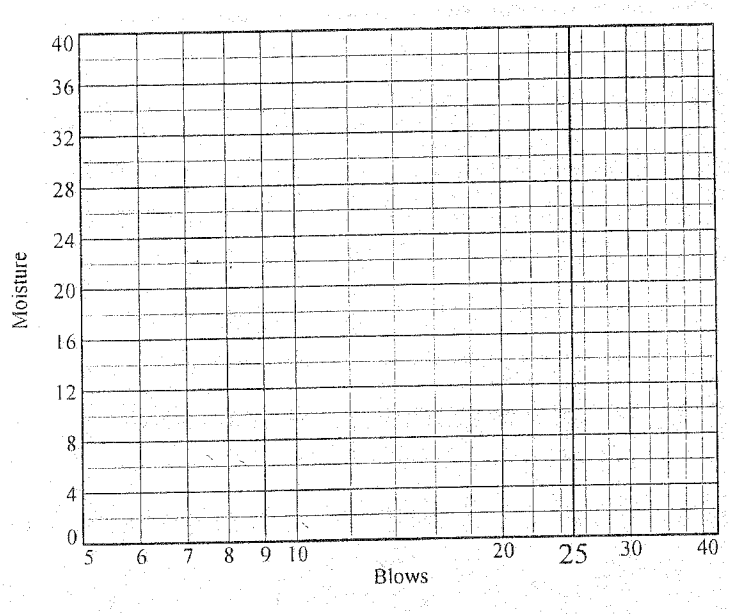
D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0100	0.0317	0.0605	0.1125	0.2232	0.2997	0.5832	0.7375	1.0486	2.2123

Fineness Modulus	C_u	C_c
1.36	29.94	4.22

LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-901
Depth: 37.2-38.7'
Sample Number: B-901-9
Material Description: Light gray to orange brown silty sand.
%<#40: 71.4 **%<#200:** 22.5
USCS: ND **AASHTO:** ND
Tested by: JPD
Checked by: ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
SLIDING IN CUP, NON PLASTIC, LIQUID LIMIT NOT DETERMINED.



Liquid Limit= _____
Plastic Limit= NP
Plasticity Index= _____
Natural Moisture= 16.4

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare					
Dry+Tare					
Tare					
Moisture					

MACTEC, Inc.

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Dominion Nuclear North Anna
Project: North Anna COL
Project Number: 6468-06-1472

Sample Data

Source: B-901
Sample No.: UD-2
Elev. or Depth: 9.5 Ft.
Sample Length(in./cm.): 6765
Location: B-901
Description: Tan Brown Silty sand
Date: 12/8/06
Natural Moisture: 15.0
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: Tested by: JM 12/08/06 Reviewed by: HJ 1/2/07
ND= NOT DETERMINED

Mechanical Analysis Data

	Initial
Dry sample and tare=	77.35
Tare =	0.00
Dry sample weight =	77.35

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	0.22	99.7
# 20	4.37	94.4
# 40	18.78	75.7
# 60	38.65	50.0
# 100	51.78	33.1
# 140	57.04	26.3
# 200	60.34	22.0

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 22.0
Weight of hydrometer sample: 17.01
Calculated biased weight= 77.32
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.7
Specific gravity correction factor= 0.989
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	23.2	20.5	15.8	0.0129	20.5	12.9	0.0329	20.2
5.00	23.2	18.0	13.3	0.0129	18.0	13.3	0.0211	17.0
15.00	23.2	16.0	11.3	0.0129	16.0	13.7	0.0123	14.5
30.00	23.2	15.0	10.3	0.0129	15.0	13.8	0.0088	13.2
60.00	23.2	13.0	8.3	0.0129	13.0	14.2	0.0063	10.6

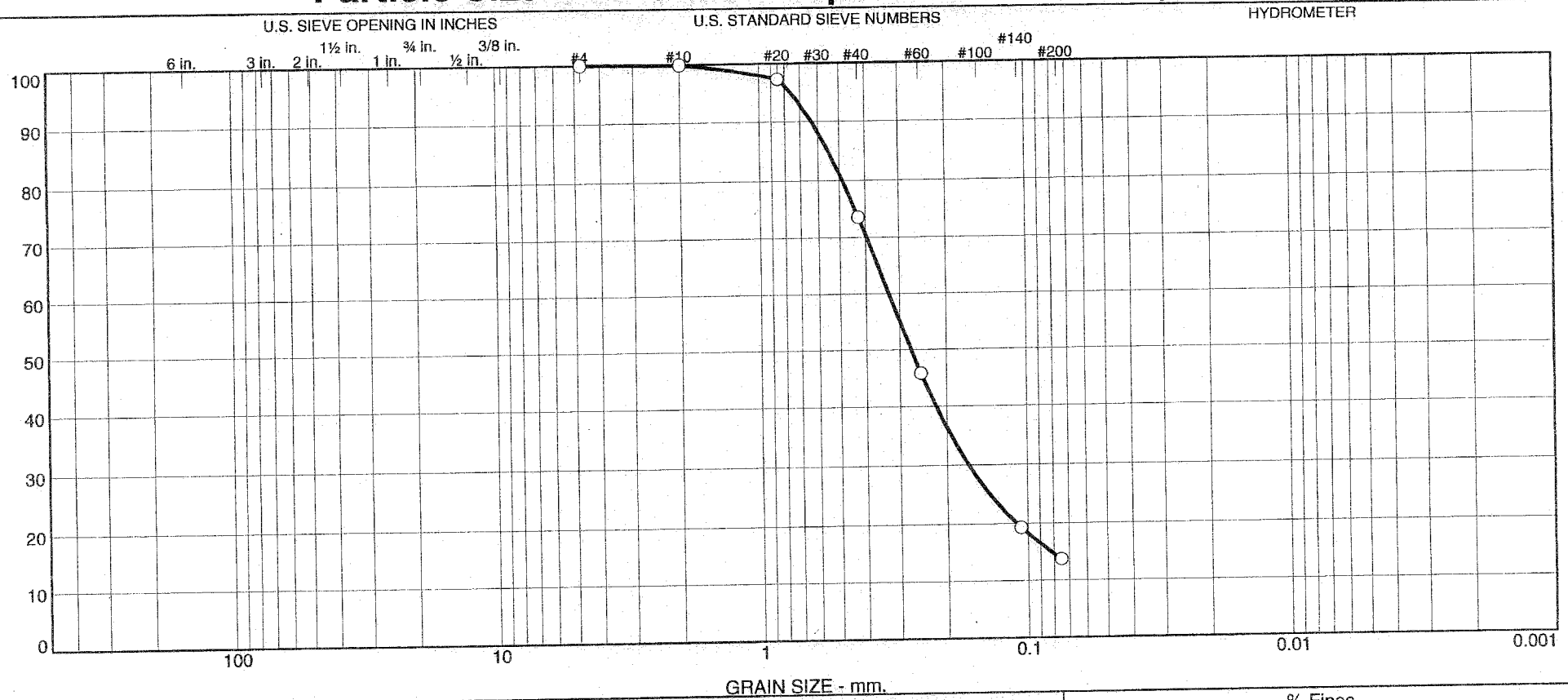
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
250.00	22.8	11.5	6.7	0.0130	11.5	14.4	0.0031	8.6
1440.00	23.1	10.5	5.8	0.0129	10.5	14.6	0.0013	7.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL =
% SAND = 78.0 (% coarse = 0.3 % medium = 24.0 % fine = 53.7)
% SILT = 12.6 % CLAY = 9.4

D_{85}= 0.55 D_{60}= 0.31 D_{50}= 0.25
D_{30}= 0.13 D_{15}= 0.01 D_{10}= 0.01
C_c= 9.6729 C_u= 54.0122

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	26.3	59.7	13.9	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-902	B-902-2	3.5-5.0	8/28/06	ND	Light gray fine to medium sand with silt.	5.6	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-902
Depth: 3.5-5.0 **Sample Number:** B-902-2
Material Description: Light gray fine to medium sand with silt.
Date: 8/28/06 **Natural Moisture:** 5.6
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= Not determined
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
167.43	0.00	0.00	#4	0.00	100.0
			#10	0.19	99.9
106.66	0.00	0.00	#20	2.78	97.3
			#40	28.02	73.6
			#60	57.79	45.8
			#140	86.07	19.3
			#200	91.86	13.9

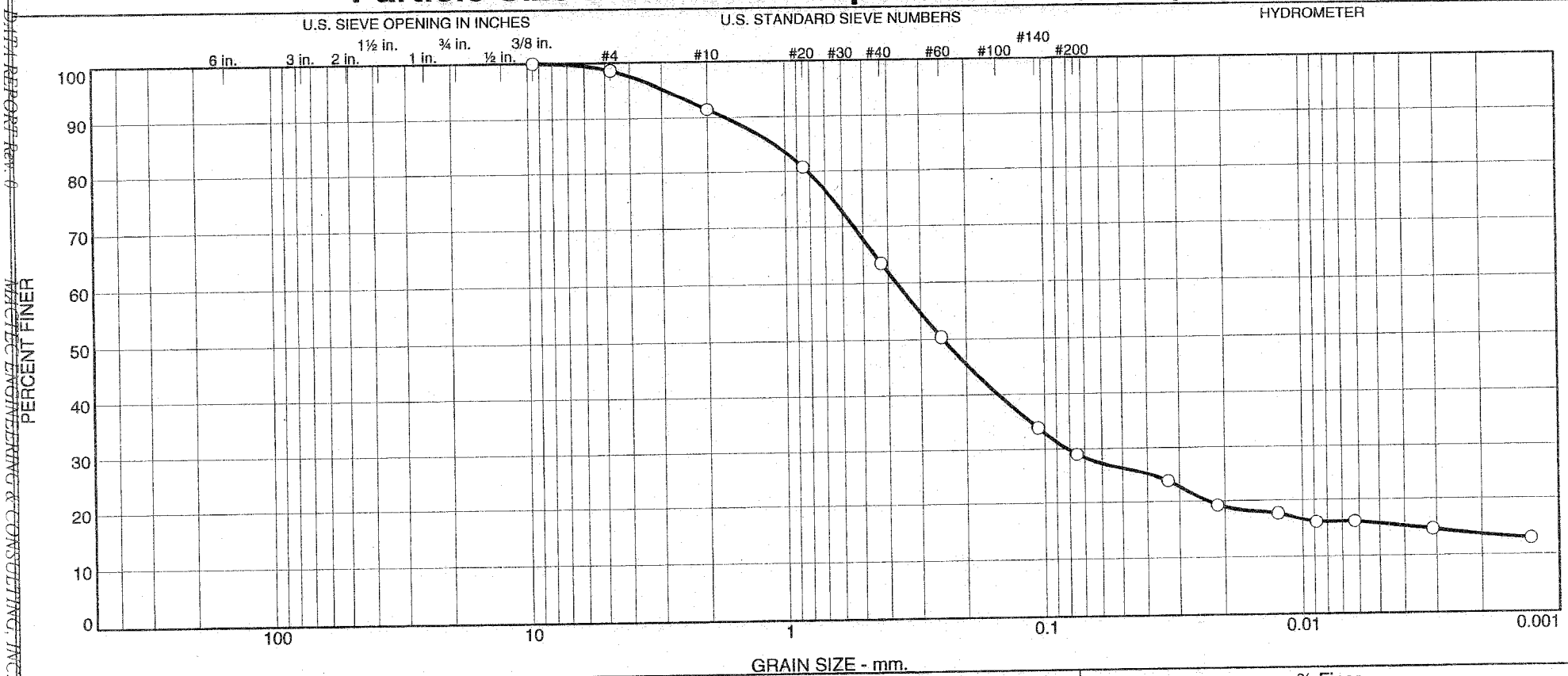
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	26.3	59.7	86.1			13.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0811	0.1102	0.1663	0.2723	0.3285	0.4868	0.5494	0.6329	0.7587

Fineness Modulus
1.31

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.3	7.2	28.0	34.5	13.4	15.6

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-902	B-902-4	8.5-10.0'	8/28/06	SM	Brown fine to medium silty sand.	23.9	33	26

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ Specific gravity is assumed.

Tested By: LBJ **Checked By:** ABS

BH1 REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 7/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-902
Depth: 8.5-10.0' **Sample Number:** B-902-4
Material Description: Brown fine to medium silty sand.
Date: 8/28/06 **Natural Moisture:** 23.9
Liquid Limit: 33 **Plastic Limit:** 26 **USCS Class.:** SM
Testing Remarks: Specific gravity is assumed.
Tested by: LBJ **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
237.25	0.00	0.00	.375	0.00	100.0
			#4	3.14	98.7
			#10	20.14	91.5
58.77	0.00	0.00	#20	6.93	80.7
			#40	17.98	63.5
			#60	26.44	50.3
			#140	37.02	33.9
			#200	40.14	29.0

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 91.5
Weight of hydrometer sample =58.77
Hygroscopic moisture correction:
Moist weight and tare = 26.72
Dry weight and tare = 26.48
Tare weight = 15.51
Hygroscopic moisture = 2.2%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.7	19.0	15.2	0.0130	20.0	13.0	0.0332	23.9
5.00	22.7	16.0	12.2	0.0130	17.0	13.5	0.0214	19.2
15.00	22.7	15.0	11.2	0.0130	16.0	13.7	0.0124	17.6
30.00	22.7	14.0	10.2	0.0130	15.0	13.8	0.0088	16.1
60.00	22.8	14.0	10.2	0.0130	15.0	13.8	0.0062	16.1
245.00	23.0	13.0	9.3	0.0130	14.0	14.0	0.0031	14.6
1451.00	22.6	12.0	8.2	0.0130	13.0	14.2	0.0013	12.9

MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.3	1.3	7.2	28.0	34.5	69.7	13.4	15.6	29.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0037	0.0234	0.0817	0.2463	0.3717	0.8199	1.0991	1.7070	2.8829

Fineness Modulus
1.55

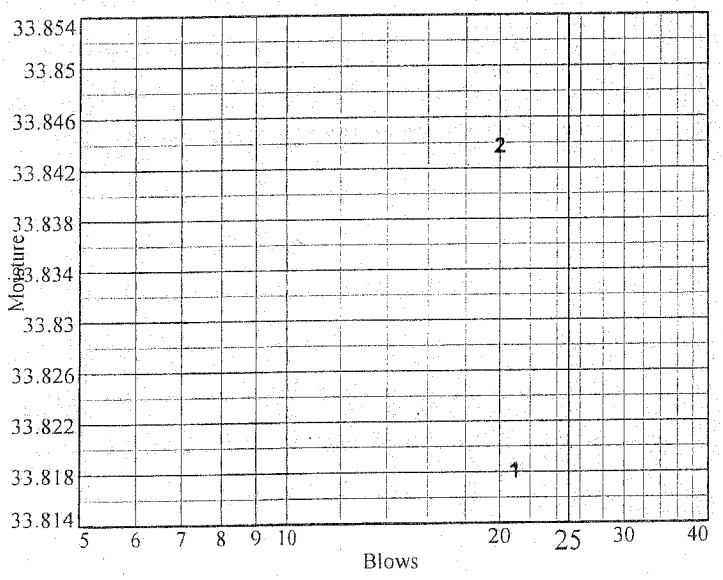
LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-902
Depth: 8.5-10.0'
Sample Number: B-902-4
Material Description: Brown fine to medium silty sand.
%<#40: 63.5 **%<#200:** 29.0 **USCS:** SM **AASHTO:** A-2-4(0)
Tested by: JPD **Checked by:** ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.9	24.15				
Dry+Tare	21.04	21.94				
Tare	15.54	15.41				
# Blows	21	20				
Moisture	33.8	33.8				



Liquid Limit= 33
Plastic Limit= 26
Plasticity Index= 7
Natural Moisture= 23.9
Liquidity Index= -0.3

Plastic Limit Data

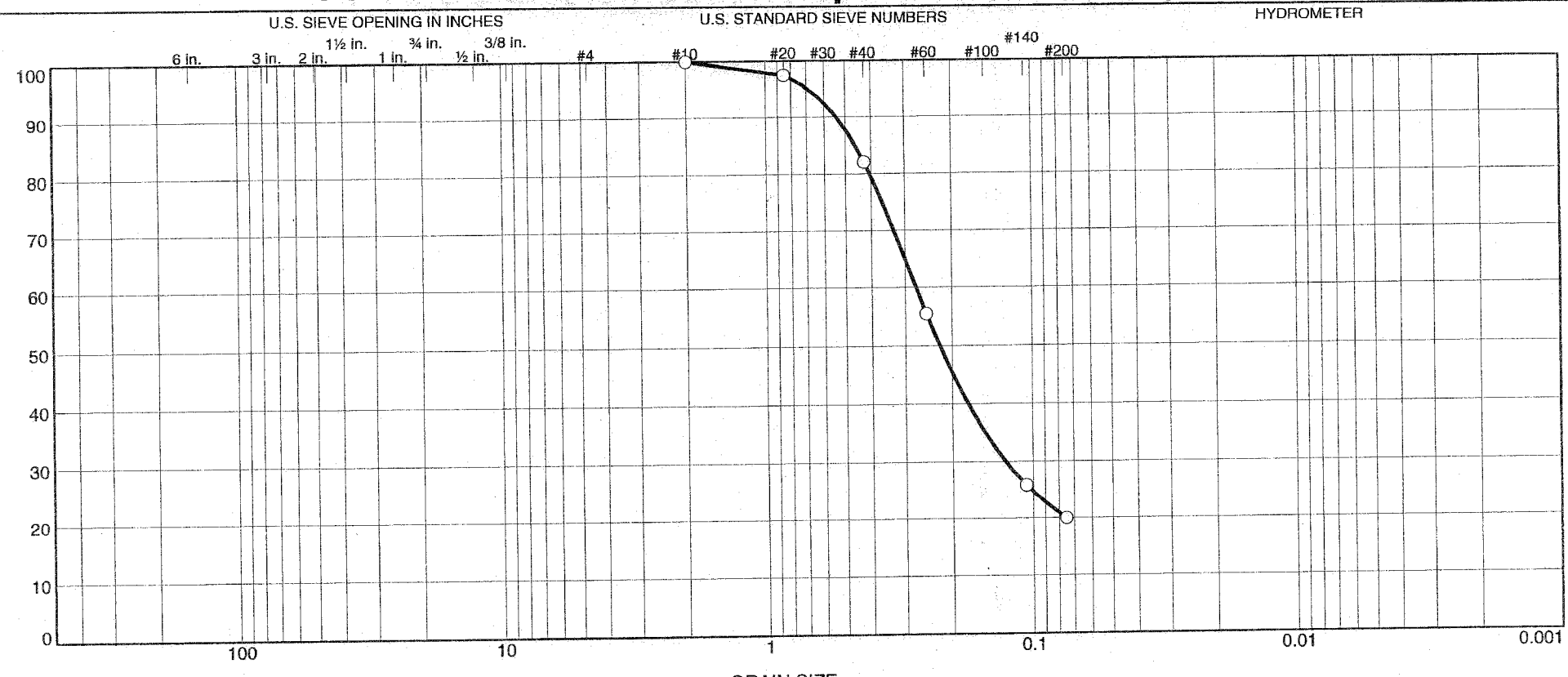
Run No.	1	2	3	4	
Wet+Tare	23.7	21.48			
Dry+Tare	22.07	20.25			
Tare	15.72	15.49			
Moisture	25.7	25.8			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
36.33	32.31	15.48	23.9

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	17.9	62.1	20.0	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-902	B-902-6	13.5-15.0'	8/28/06	ND	Pale yellow silty sand.	14.0	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-902
Depth: 13.5-15.0'
Sample Number: B-902-6
Material Description: Pale yellow silty sand.
Date: 8/28/06
Natural Moisture: 14.0
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

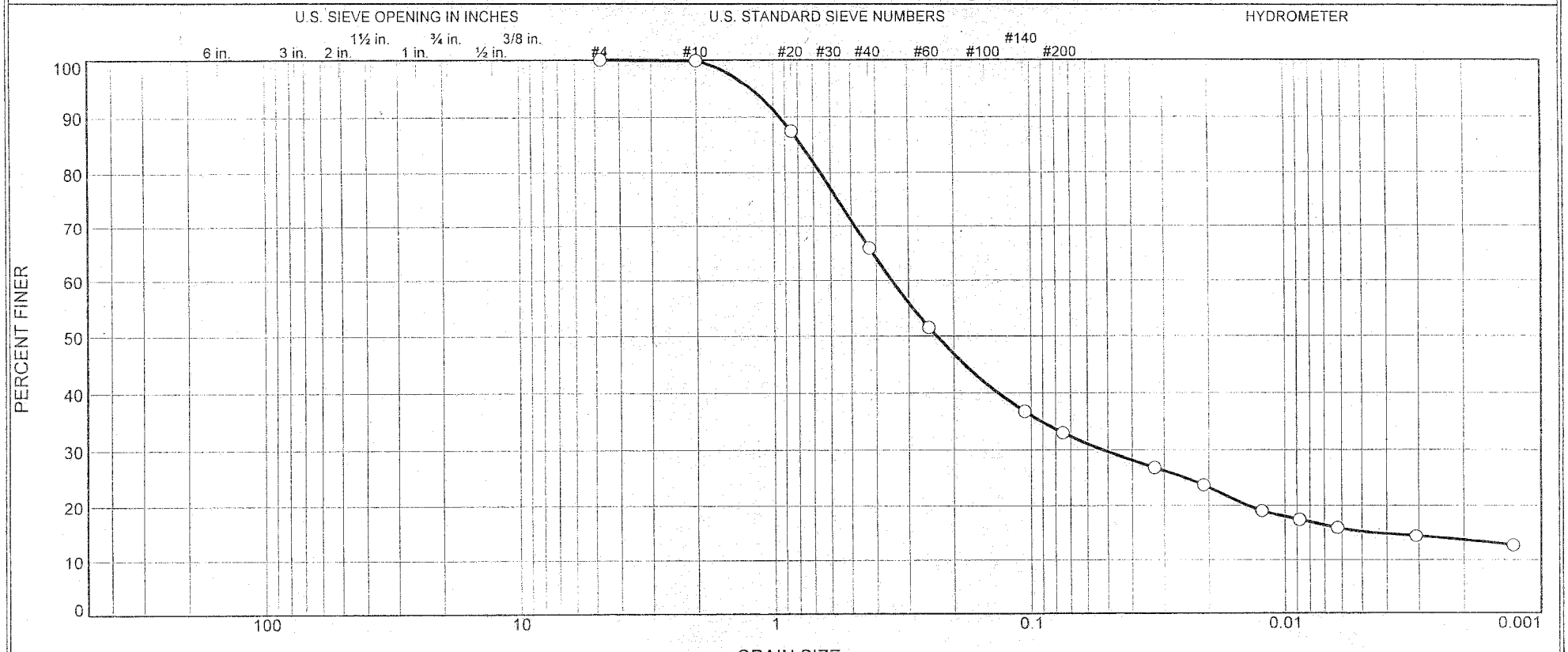
Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
197.61	0.00	0.00	#10	0.00	100.0
104.75	0.00	0.00	#20	2.63	97.5
			#40	18.78	82.1
			#60	46.63	55.5
			#140	77.66	25.9
			#200	83.84	20.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	17.9	62.1	80.0			20.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0752	0.1267	0.2227	0.2731	0.4048	0.4587	0.5393	0.6894

Fineness Modulus
1.09

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	34.1	32.8	17.7	15.3

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-907	B-907-2	3.5-5.0'	8/1/06	SM	Brown silty sand.	14.0	33	25

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-907
Depth: 3.5-5.0'
Sample Number: B-907-2
Material Description: Brown silty sand.
Date: 8/1/06
Natural Moisture: 14.0
Liquid Limit: 33
Plastic Limit: 25
USCS Class.: SM
Testing Remarks: Specific gravity is assumed.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
169.80	0.00	0.00	#4	0.00	100.0
			#10	0.25	99.9
64.46	0.00	0.00	#20	7.98	87.5
			#40	21.96	65.8
			#60	31.18	51.6
			#140	40.69	36.8
			#200	43.14	33.0

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.9
Weight of hydrometer sample =64.46
Hygroscopic moisture correction:
Moist weight and tare = 27.74
Dry weight and tare = 27.56
Tare weight = 15.55
Hygroscopic moisture =1.5%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.8	21.0	17.2	0.0130	22.0	12.7	0.0327	26.8
5.00	22.8	19.0	15.2	0.0130	20.0	13.0	0.0210	23.7
15.00	22.8	16.0	12.2	0.0130	17.0	13.5	0.0123	19.0
30.00	22.8	15.0	11.2	0.0130	16.0	13.7	0.0088	17.5
60.00	22.9	14.0	10.3	0.0130	15.0	13.8	0.0062	16.0
250.00	22.9	13.0	9.3	0.0130	14.0	14.0	0.0031	14.4
1454.00	22.6	12.0	8.2	0.0130	13.0	14.2	0.0013	12.7

MACTEC, Inc.

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	34.1	32.8	67.0	17.7	15.3	33.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0044	0.0141	0.0525	0.2332	0.3488	0.6573	0.7756	0.9426	1.2270

Fineness Modulus
1.31

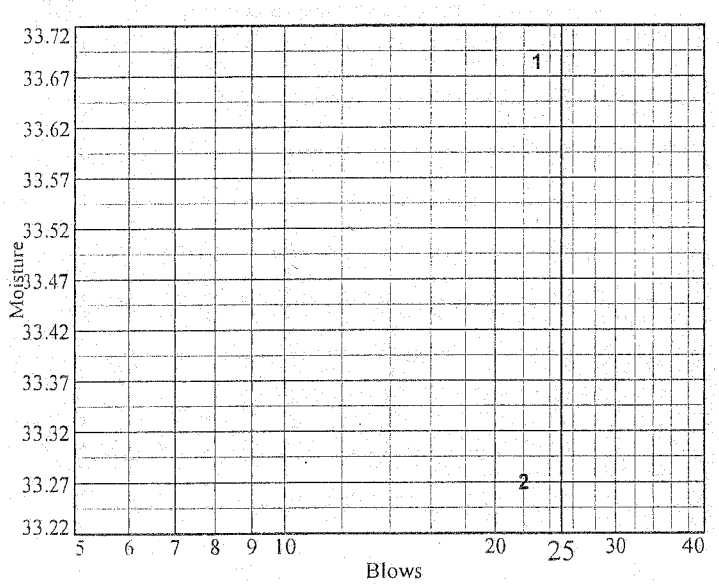
LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-907
Depth: 3.5-5.0'
Sample Number: B-907-2
Material Description: Brown silty sand.
%<#40: 65.8
%<#200: 33.0
USCS: SM
AASHTO: A-2-4(0)
Tested by: JPD
Checked by: ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.69	22.57				
Dry+Tare	23.13	20.80				
Tare	15.53	15.48				
# Blows	23	22				
Moisture	33.7	33.3				



Liquid Limit= 33
Plastic Limit= 25
Plasticity Index= 8
Natural Moisture= 14.0
Liquidity Index= -1.4

Plastic Limit Data

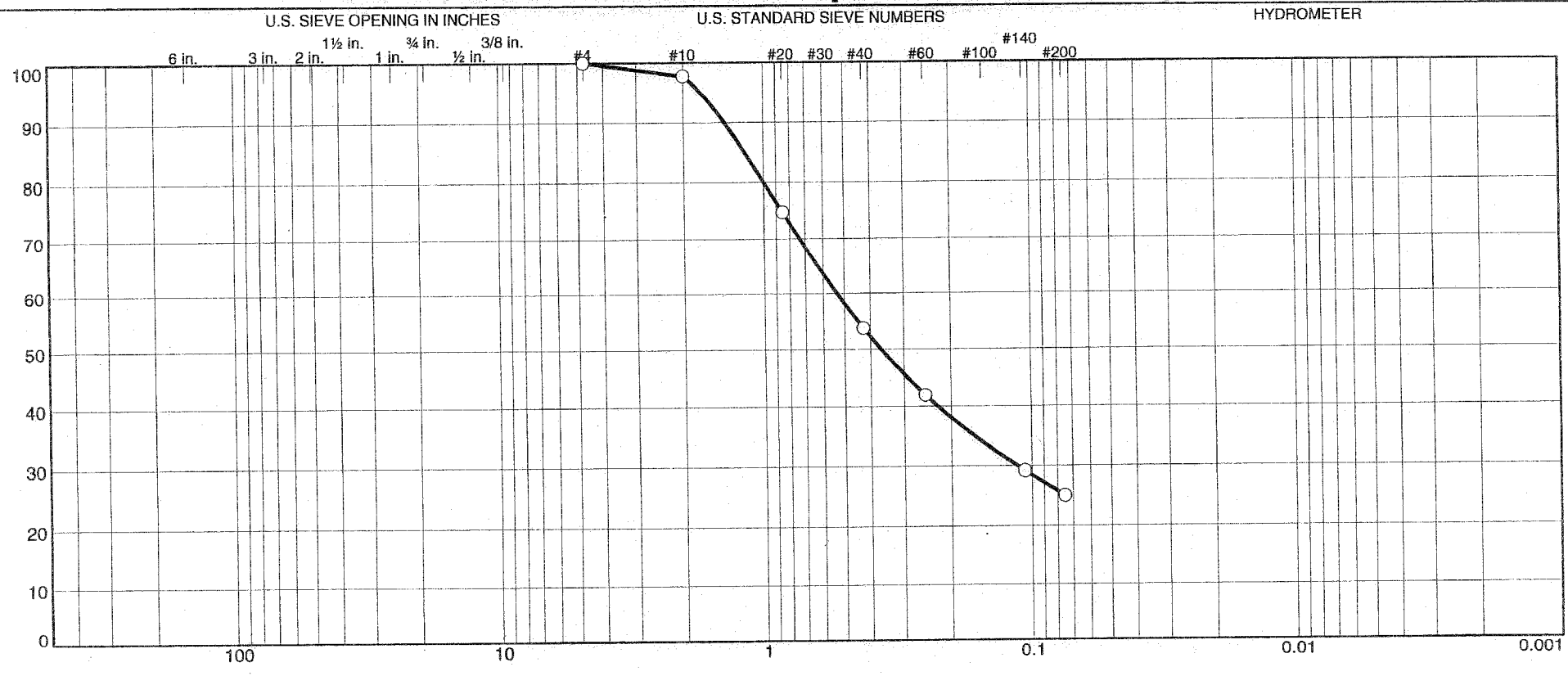
Run No.	1	2	3	4	
Wet+Tare	21.43	23.15			
Dry+Tare	20.23	21.6			
Tare	15.42	15.45			
Moisture	24.9	25.2			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
33.03	30.90	15.71	14.0

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	2.3	44.0	28.6	25.1	

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
BORING B-907	B-907-3	6.5-7.0'	8/1/06	ND	Brown fine to medium silty sand.	16.4	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not Determined.

Tested By: JPD **Checked By:** LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-907
Depth: 6.5-7.0'
Sample Number: B-907-3
Material Description: Brown fine to medium silty sand.
Date: 8/1/06
Natural Moisture: 16.4
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not Determined.
Tested by: JPD
Checked by: LBJ

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
89.11	0.00	0.00	#4	0.00	100.0
			#10	2.03	97.7
73.50	0.00	0.00	#20	17.31	74.7
			#40	33.10	53.7
			#60	41.95	41.9
			#140	51.51	29.2
			#200	54.64	25.1

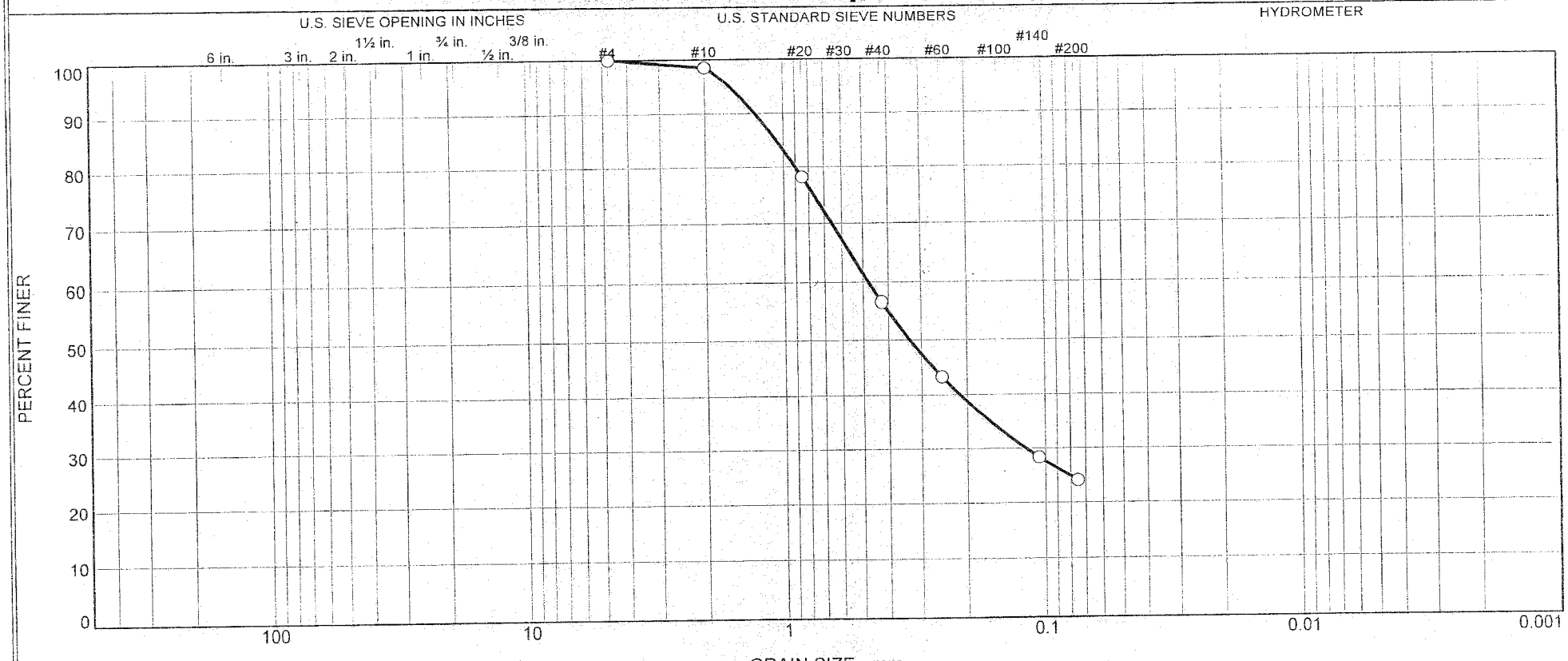
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	2.3	44.0	28.6	74.9			25.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1127	0.3663	0.5323	1.0005	1.1736	1.3963	1.7189

Fineness Modulus
1.74

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.5	41.9	32.6	24.0	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-907	B-907-5	11.0-12.5'	8/1/06	ND	Light yellow brown silty sand.	20.2	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-907
Depth: 11.0-12.5'
Sample Number: B-907-5
Material Description: Light yellow brown silty sand.
Date: 8/1/06
Natural Moisture: 20.2
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
147.16	0.00	0.00	#4	0.00	100.0
			#10	2.19	98.5
89.95	0.00	0.00	#20	18.53	78.2
			#40	38.24	56.6
			#60	50.43	43.3
			#140	64.04	28.4
			#200	68.03	24.0

Fractional Components

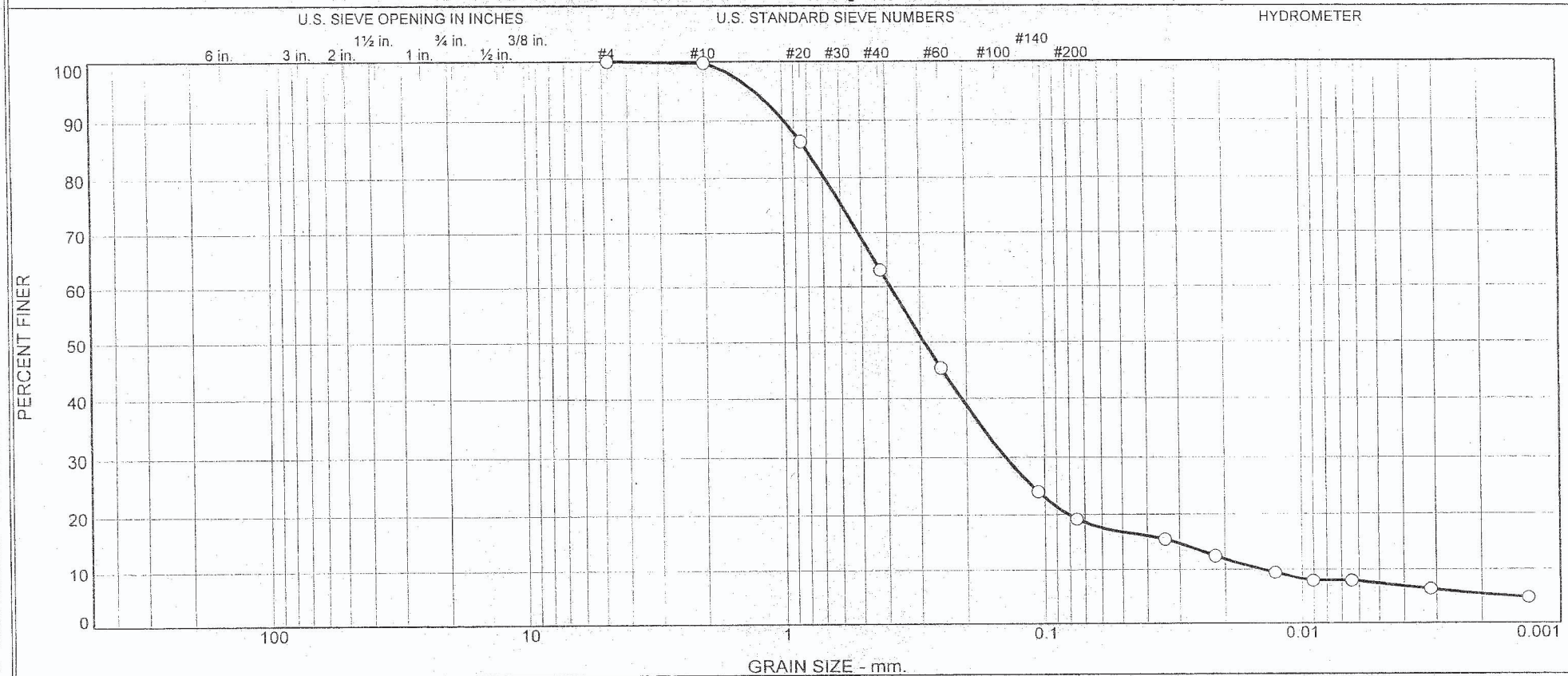
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.5	41.9	32.6	76.0			24.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1191	0.3325	0.4765	0.9006	1.0663	1.2842	1.6054

Fineness Modulus
1.65

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.3	36.6	44.0	11.7	7.4

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-907	B-907-7	17.5-19.0'	8/1/06	ND	Light yellow brown silty sand.	12.3	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-907
Depth: 17.5-19.0'
Sample Number: B-907-7
Material Description: Light yellow brown silty sand.
Date: 8/1/06
Natural Moisture: 12.3
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Specific gravity is assumed.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
172.08	0.00	0.00	#4	0.00	100.0
			#10	0.46	99.7
66.40	0.00	0.00	#20	8.91	86.3
			#40	24.40	63.1
			#60	36.20	45.4
			#140	50.37	24.1
			#200	53.67	19.1

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.7
Weight of hydrometer sample =66.4
Hygroscopic moisture correction:
Moist weight and tare = 29.36
Dry weight and tare = 29.26
Tare weight = 15.44
Hygroscopic moisture =0.7%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	23.0	14.0	10.3	0.0130	15.0	13.8	0.0341	15.4
5.00	23.0	12.0	8.3	0.0130	13.0	14.2	0.0218	12.4
15.00	23.0	10.0	6.3	0.0130	11.0	14.5	0.0127	9.4
30.00	23.0	9.0	5.3	0.0130	10.0	14.7	0.0091	7.9
60.00	23.0	9.0	5.3	0.0130	10.0	14.7	0.0064	7.9
249.00	22.9	8.0	4.3	0.0130	9.0	14.8	0.0032	6.4
1447.00	22.6	7.0	3.2	0.0130	8.0	15.0	0.0013	4.7

MACTEC, Inc.

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.3	36.6	44.0	80.9	11.7	7.4	19.1

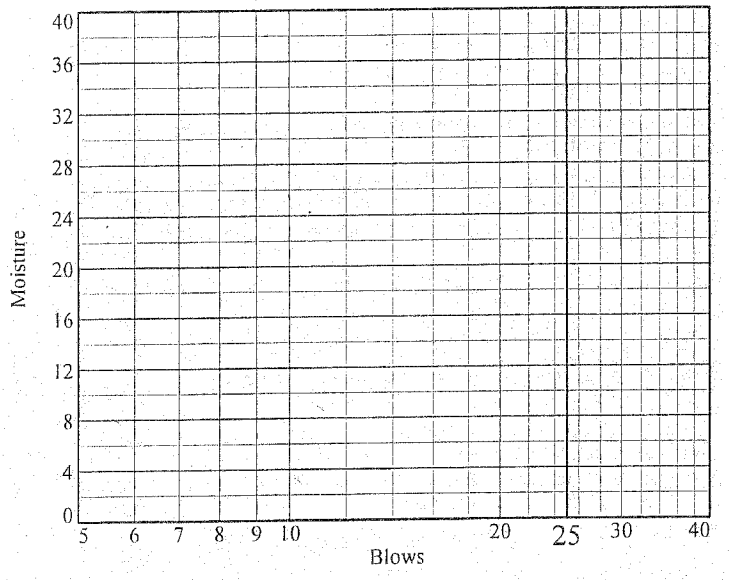
D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0142	0.0317	0.0812	0.1415	0.2896	0.3895	0.6881	0.8099	0.9838	1.2765

Fineness Modulus	C_u	C_c
1.49	27.35	3.61

LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-907
Depth: 17.5-19.0'
Sample Number: B-907-7
Material Description: Light yellow brown silty sand.
%<#40: 63.1 **%<#200:** 19.1 **USCS:** ND **AASHTO:** ND
Tested by: JPD **Checked by:** ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
SLIDING IN CUP NON-PLASTIC.
LIQUID LIMIT NOT DETERMINED.



Liquid Limit= _____
Plastic Limit= NP
Plasticity Index= _____
Natural Moisture= 12.3

Plastic Limit Data

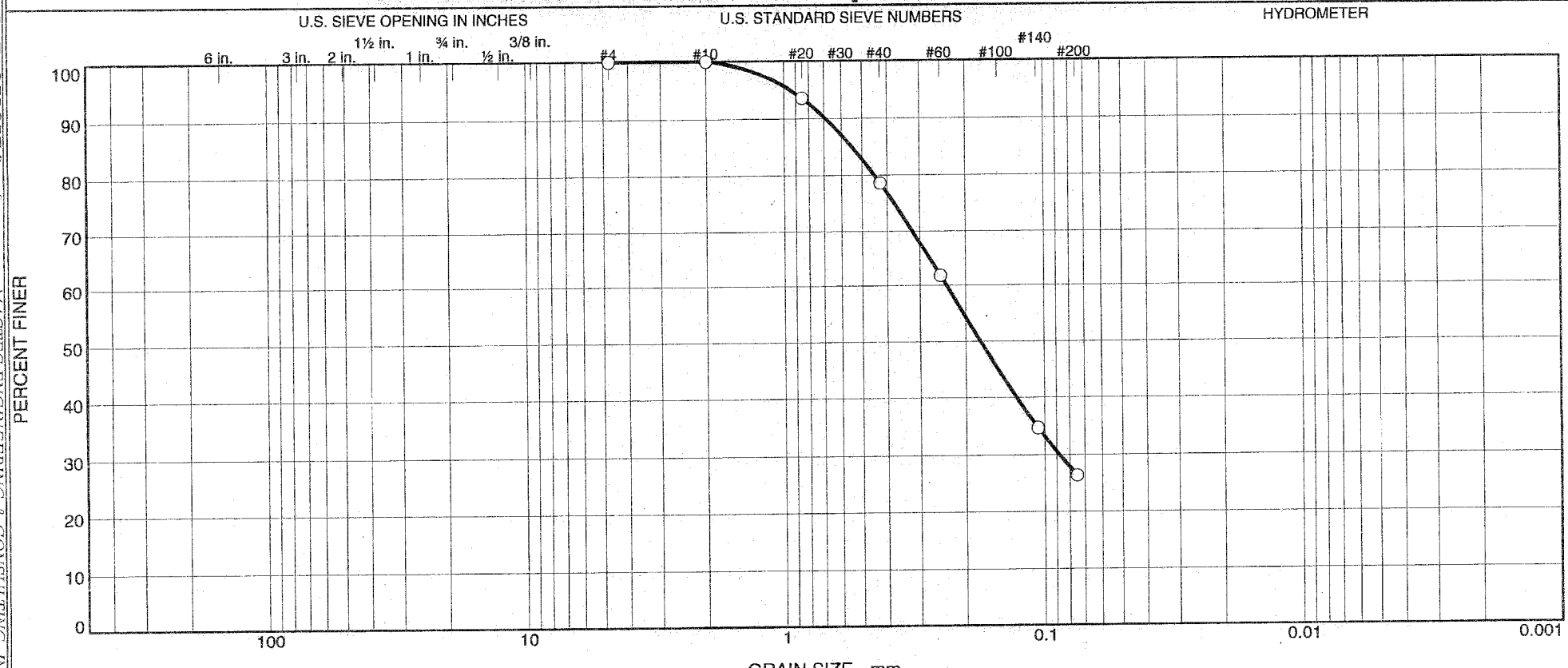
Run No.	1	2	3	4	
Wet+Tare					
Dry+Tare					
Tare					
Moisture					

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
23.37	22.5	15.41	12.3

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	21.5	52.1	26.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-907	B-907-9	27.5-29'	8/1/06	ND	Yellowish brown silty sand.	ND	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-907
Depth: 27.5-29'
Sample Number: B-907-9
Material Description: Yellowish brown silty sand.
Date: 8/1/06
Natural Moisture: ND
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: LBJ

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
192.09	0.00	0.00	#4	0.00	100.0
			#10	0.01	100.0
87.00	0.00	0.00	#20	5.54	93.6
			#40	18.67	78.5
			#60	33.21	61.8
			#140	56.83	34.7
			#200	64.07	26.4

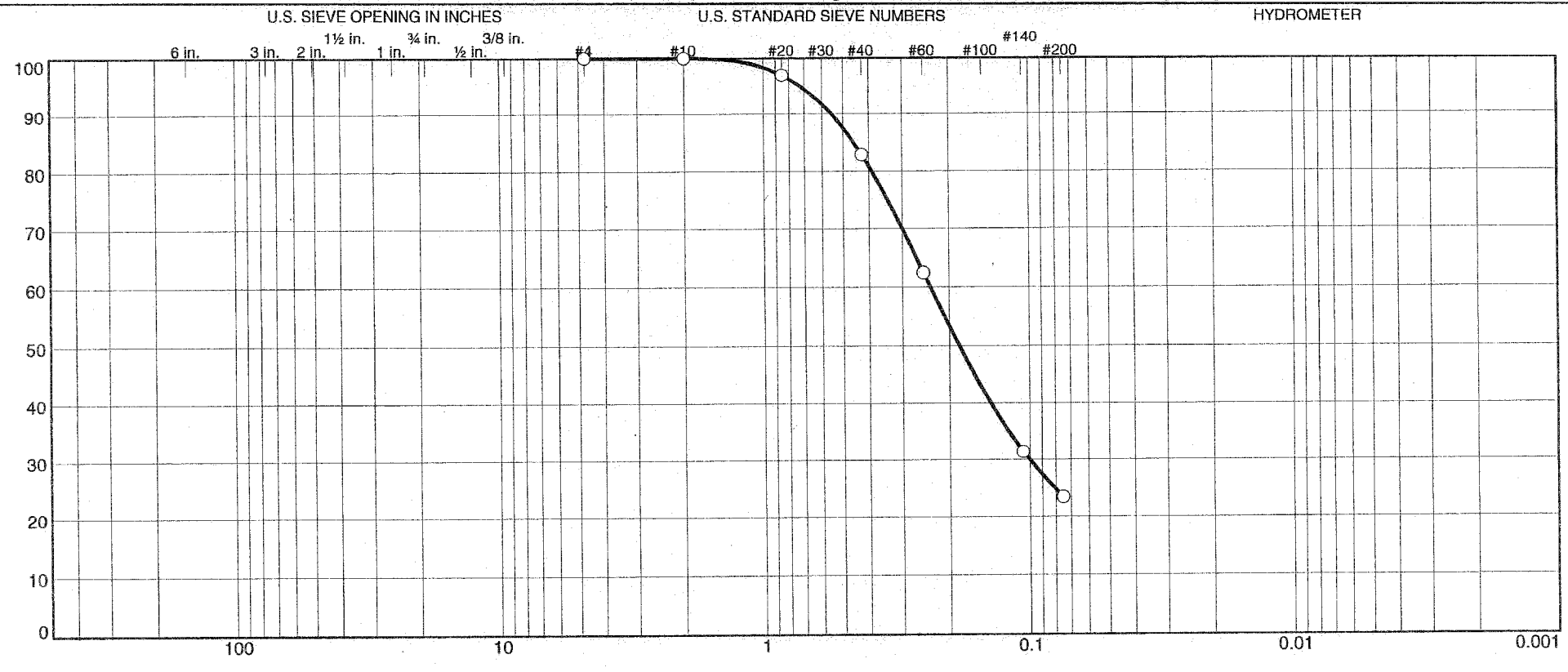
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	21.5	52.1	73.6			26.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0878	0.1758	0.2368	0.4480	0.5448	0.6870	0.9397

Fineness Modulus
1.03

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	17.1	59.5	23.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-907	B-907-10	32.5-34'	8/1/06	ND	Yellow brown silty sand.	ND	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-907
Depth: 32.5-34'
Sample Number: B-907-10
Material Description: Yellow brown silty sand.
Date: 8/1/06
Natural Moisture: ND
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
185.44	0.00	0.00	#4	0.00	100.0
			#10	0.02	100.0
68.56	0.00	0.00	#20	2.03	97.0
			#40	11.72	82.9
			#60	25.72	62.5
			#140	47.00	31.4
			#200	52.49	23.4

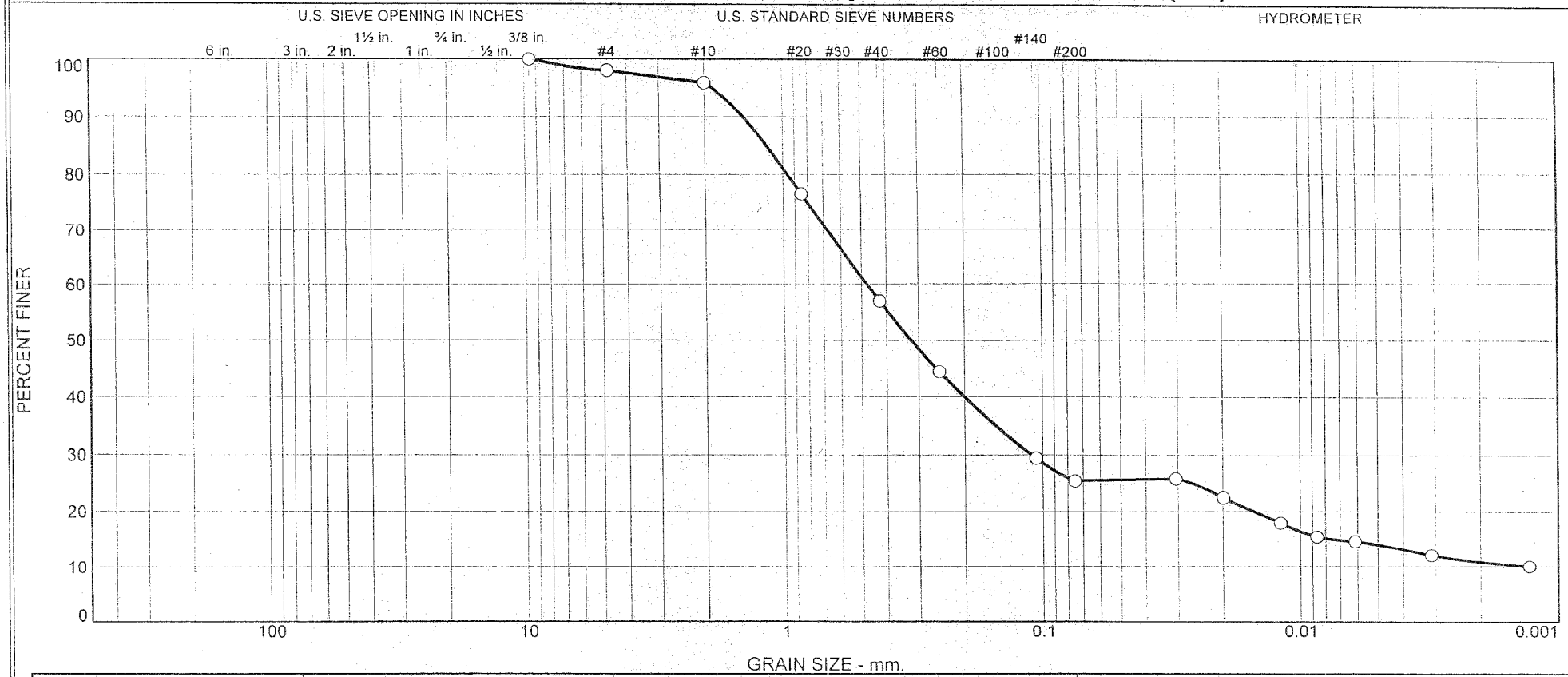
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	17.1	59.5	76.6			23.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1003	0.1837	0.2354	0.3898	0.4552	0.5516	0.7222

Fineness Modulus
0.97

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.0	2.0	39.1	31.5	11.4	14.0

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-908	B-908-3	6'-7.5'	9-13-06	ND	Strong brown to light yellowish brown silty sand.	12.3	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-908
Depth: 6'-7.5' **Sample Number:** B-908-3
Material Description: Strong brown to light yellowish brown silty sand.
Date: 9-13-06 **Natural Moisture:** 12.3
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND=NOT DETERMINED.
Tested by: LBJ **Checked by:** ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
200.30	0.00	0.00	.375	0.00	100.0
			#4	3.91	98.0
			#10	8.07	96.0
117.02	0.00	0.00	#20	23.78	76.5
			#40	47.60	56.9
			#60	62.83	44.4
			#140	81.09	29.5
			#200	86.00	25.4

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =96.0
Weight of hydrometer sample =117.02
Hygroscopic moisture correction:
Moist weight and tare = 25.95
Dry weight and tare = 25.85
Tare weight = 15.49
Hygroscopic moisture =1.0%
Table of composite correction values:

Temp., deg. C:	22.5	29.5
Comp. corr.:	-5.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.62
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.6	36.0	31.0	0.0135	37.0	10.2	0.0305	25.8
5.00	21.7	32.0	27.0	0.0135	33.0	10.9	0.0199	22.5
15.00	21.8	26.5	21.5	0.0135	27.5	11.8	0.0119	17.9
30.00	21.8	23.5	18.5	0.0135	24.5	12.3	0.0086	15.4
60.00	21.8	22.5	17.5	0.0135	23.5	12.4	0.0061	14.6
240.00	22.3	19.5	14.5	0.0134	20.5	12.9	0.0031	12.1
1443.00	22.0	17.0	12.0	0.0134	18.0	13.3	0.0013	10.0

MACTEC, Inc.

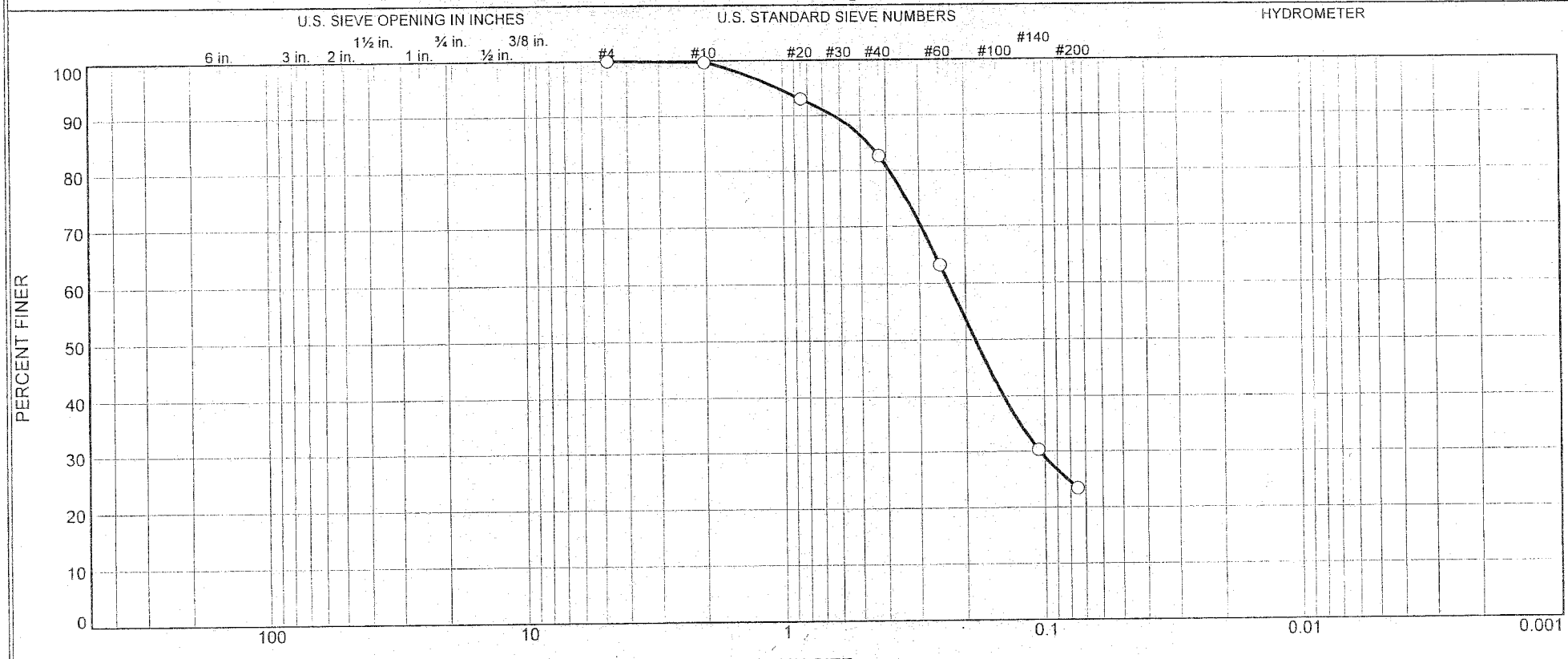
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.0	2.0	2.0	39.1	31.5	72.6	11.4	14.0	25.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0077	0.0151	0.1099	0.3212	0.4768	0.9618	1.1550	1.4182	1.8566

Fineness Modulus
1.70

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.3	17.1	59.2	23.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-908	B-908-6	13.5-15'	9-13-06	ND	Yellowish brown silty sand.	ND	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-908
Depth: 13.5-15'
Sample Number: B-908-6
Material Description: Yellowish brown silty sand.
Date: 9-13-06
Natural Moisture: ND
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
160.50	0.00	0.00	#4	0.00	100.0
			#10	0.45	99.7
79.90	0.00	0.00	#20	5.41	93.0
			#40	13.73	82.6
			#60	29.21	63.3
			#140	55.64	30.3
			#200	61.18	23.4

Fractional Components

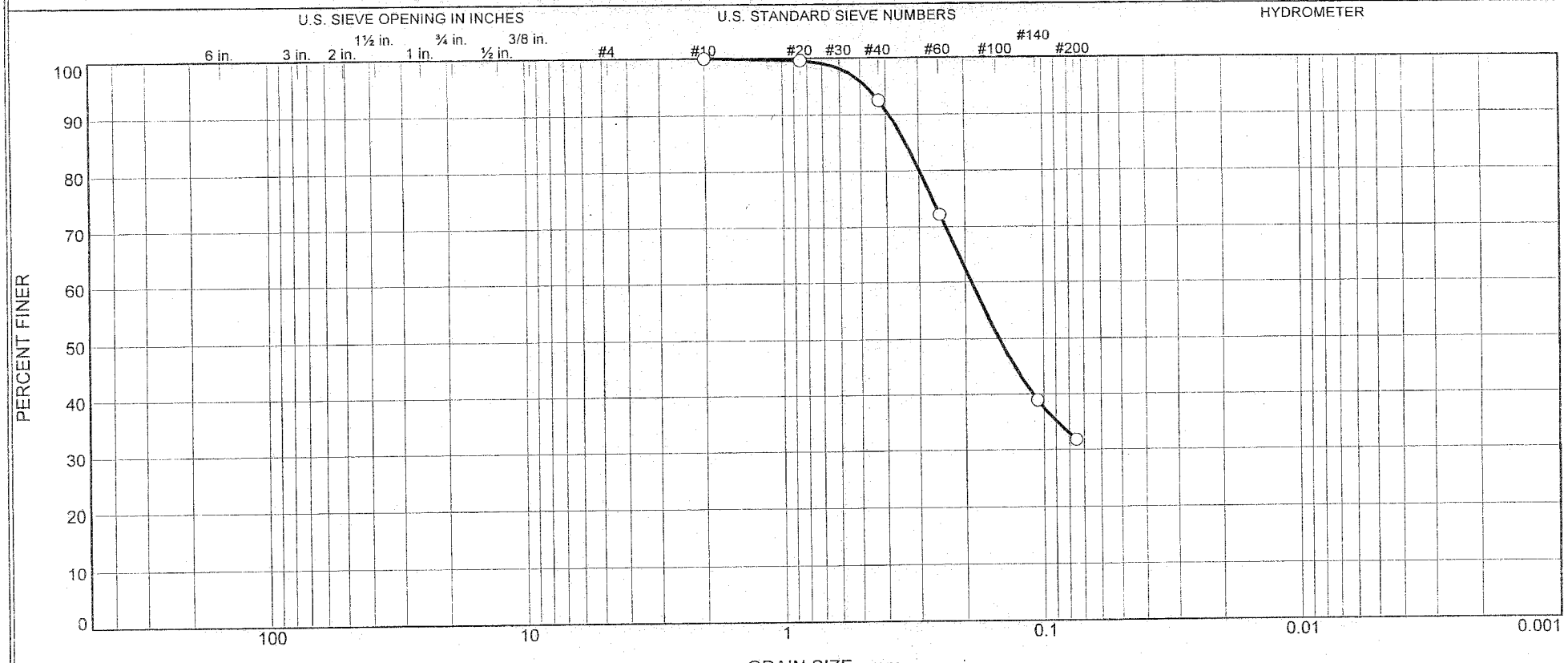
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.3	17.1	59.2	76.6			23.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1048	0.1838	0.2317	0.3884	0.4698	0.6369	1.0541

Fineness Modulus
1.02

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	7.5	60.6	31.9	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-908	B-908-8	23.7-25.2	9-13-06	ND	Dark yellowish brown silty sand.	ND	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-908
Depth: 23.7-25.2 **Sample Number:** B-908-8
Material Description: Dark yellowish brown silty sand.
Date: 9-13-06 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= Not determined.
Tested by: LBJ **Checked by:** ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
197.20	0.00	0.00	#10	0.00	100.0
97.16	0.00	0.00	#20	0.44	99.5
			#40	7.27	92.5
			#60	26.87	72.3
			#140	59.34	38.9
			#200	66.19	31.9

Fractional Components

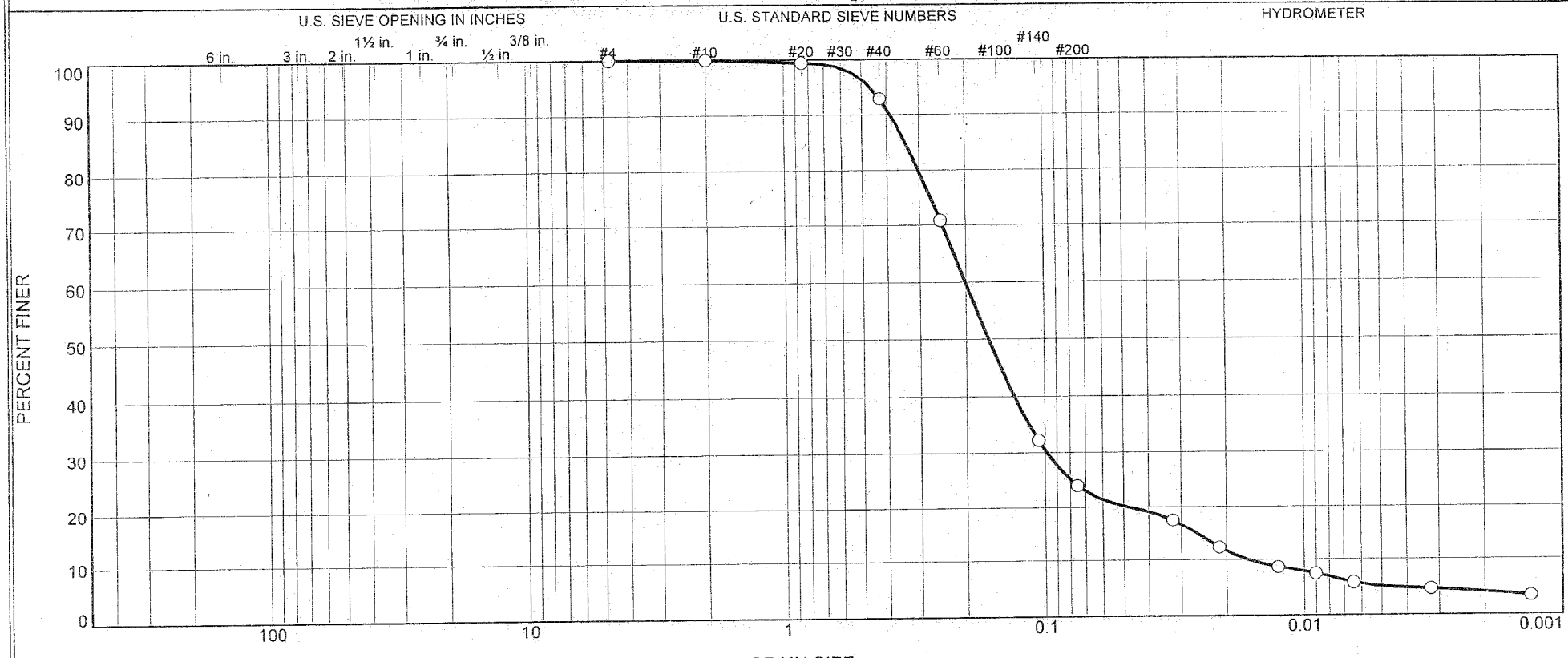
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	7.5	60.6	68.1			31.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1486	0.1893	0.2979	0.3373	0.3893	0.4748

Fineness Modulus
0.71

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	7.1	68.9	18.9	5.1

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-908	B-908-13	47.1-48.6'	9-13-06	ND	Olive brown fine silty sand.	14.5	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ SPECIFIC GRAVITY IS ASSUMED.
ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-908
Depth: 47.1-48.6'
Sample Number: B-908-13
Material Description: Olive brown fine silty sand.
Date: 9-13-06
Natural Moisture: 14.5
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: SPECIFIC GRAVITY IS ASSUMED.
ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
228.50	0.00	0.00	#4	0.00	100.0
			#10	0.01	100.0
122.80	0.00	0.00	#20	0.78	99.4
			#40	8.71	92.9
			#60	35.84	70.8
			#140	83.22	32.2
			#200	93.37	24.0

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =122.80
Hygroscopic moisture correction:
Moist weight and tare = 26.05
Dry weight and tare = 25.96
Tare weight = 15.46
Hygroscopic moisture =0.9%
Table of composite correction values:

Temp., deg. C:	12.8	29.5
Comp. corr.:	-5.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.7	25.0	21.6	0.0132	26.0	12.0	0.0323	17.5
5.00	21.7	18.5	15.1	0.0132	19.5	13.1	0.0213	12.3
15.00	21.8	14.0	10.6	0.0131	15.0	13.8	0.0126	8.6
30.00	21.8	12.5	9.1	0.0131	13.5	14.1	0.0090	7.4
60.00	21.9	10.5	7.1	0.0131	11.5	14.4	0.0064	5.8
240.00	22.3	9.0	5.7	0.0131	10.0	14.7	0.0032	4.6
1452.00	22.0	7.5	4.2	0.0131	8.5	14.9	0.0013	3.4

MACTEC, Inc.

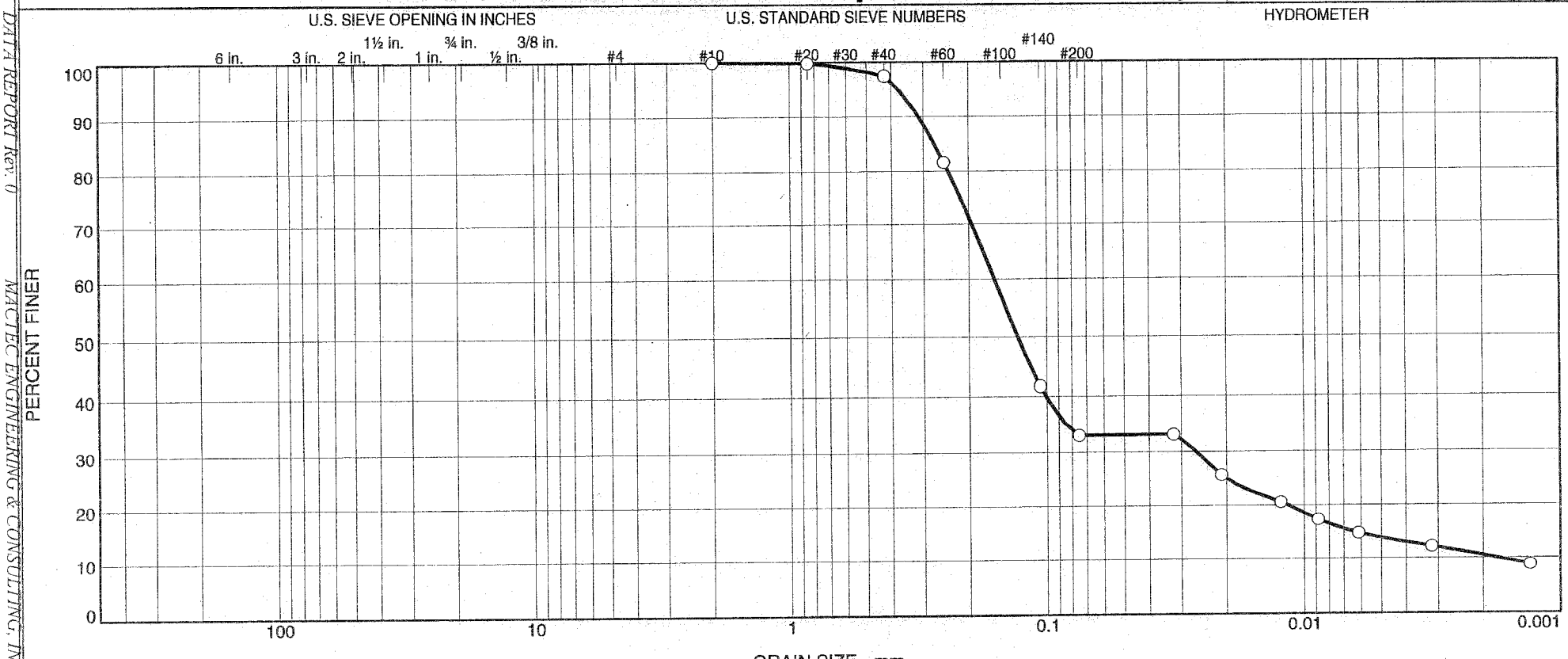
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	7.1	68.9	76.0	18.9	5.1	24.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0166	0.0263	0.0479	0.0985	0.1641	0.2015	0.3024	0.3388	0.3866	0.4639

Fineness Modulus	C_u	C_c
0.76	12.16	2.90

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	2.5	64.4	19.3	13.8

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-909	B-909-3	6.0-7.5'	8/17/06	SM	Greenish gray yellow brown fine silty sand.	25.9	57	45

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ Specific gravitry is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-909
Depth: 6.0-7.5' **Sample Number:** B-909-3
Material Description: Greenish gray yellow brown fine silty sand.
Date: 8/17/06 **Natural Moisture:** 25.9
Liquid Limit: 57 **Plastic Limit:** 45 **USCS Class.:** SM
Testing Remarks: Specific gravitry is assumed.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
161.14	0.00	0.00	#10	0.00	100.0
60.77	0.00	0.00	#20	0.12	99.8
			#40	1.49	97.5
			#60	11.17	81.6
			#140	35.41	41.7
			#200	40.67	33.1

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =60.77
Hygroscopic moisture correction:
Moist weight and tare = 25.21
Dry weight and tare = 24.93
Tare weight = 15.54
Hygroscopic moisture = 3.0%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	23.0	23.5	19.8	0.0130	24.5	12.3	0.0321	33.2
5.00	23.0	19.0	15.3	0.0130	20.0	13.0	0.0209	25.6
15.00	23.0	16.0	12.3	0.0130	17.0	13.5	0.0123	20.6
30.00	23.0	14.0	10.3	0.0130	15.0	13.8	0.0088	17.2
63.00	23.0	12.5	8.8	0.0130	13.5	14.1	0.0061	14.7
240.00	22.9	11.0	7.3	0.0130	12.0	14.3	0.0032	12.2
1440.00	22.8	9.0	5.2	0.0130	10.0	14.7	0.0013	8.8

MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	2.5	64.4	66.9	19.3	13.8	33.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0018	0.0064	0.0115	0.0263	0.1296	0.1596	0.2408	0.2716	0.3123	0.3733

Fineness Modulus	C_u	C_c
0.56	89.62	2.43

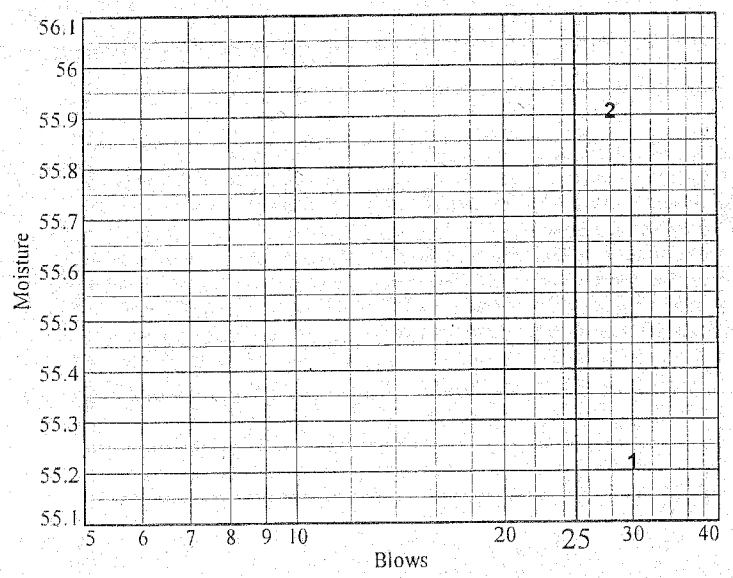
LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-909
Depth: 6.0-7.5' **Sample Number:** B-909-3
Material Description: Greenish gray yellow brown fine silty sand.
%<#40: 97.5 **%<#200:** 33.1 **USCS:** SM **AASHTO:** A-2-7(0)
Tested by: JPD **Checked by:** ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
VERY MICACEOUS, COULD NOT ROLL DOWN TO 1/8" OF AN INCH. THESE RESULTS ARE FROM THREADS ROLLED DOWN TO APPROXIMATELY 3/16".

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.62	22.36				
Dry+Tare	20.08	19.90				
Tare	15.48	15.5				
# Blows	30	28				
Moisture	55.2	55.9				



Liquid Limit= 57
Plastic Limit= 45
Plasticity Index= 12
Natural Moisture= 25.9
Liquidity Index= -1.6

Plastic Limit Data

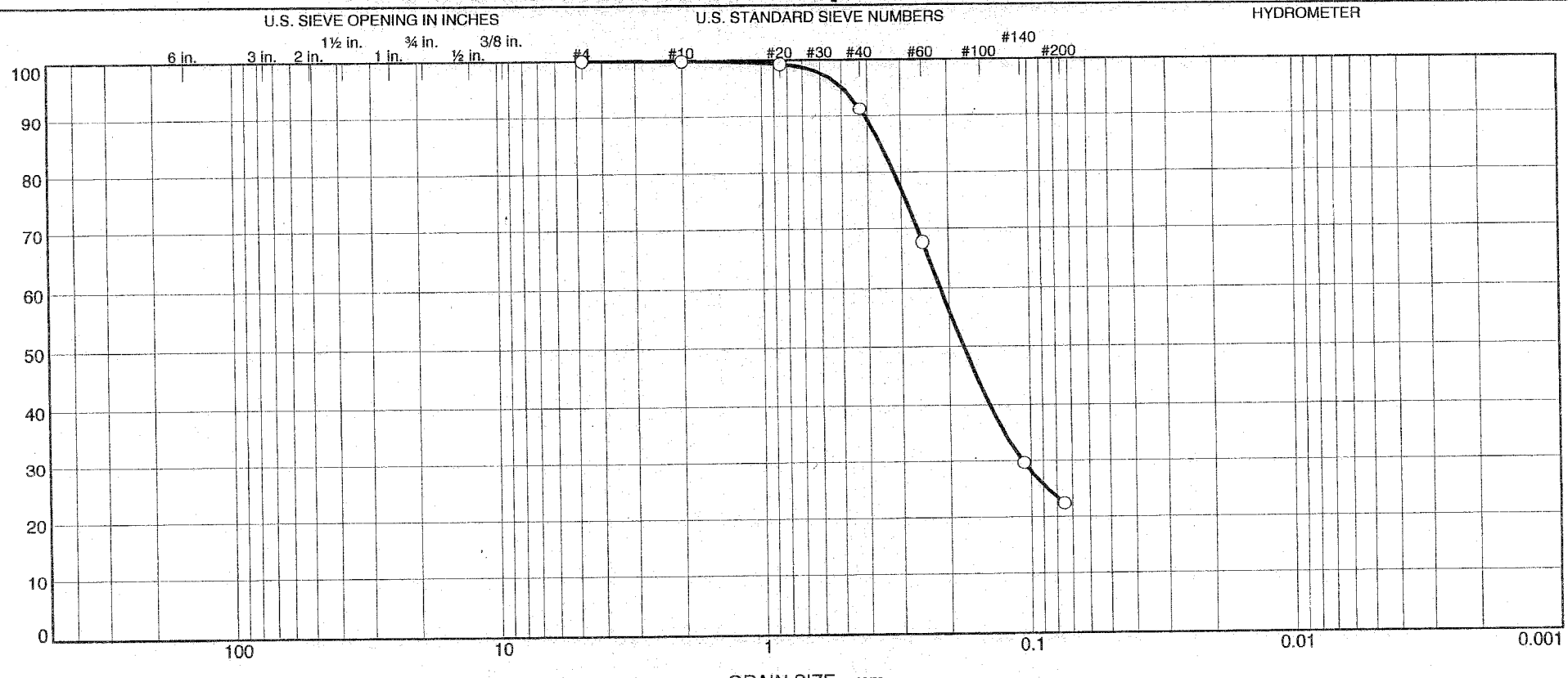
Run No.	1	2	3	4	
Wet+Tare	21.72	22.27			
Dry+Tare	19.84	20.17			
Tare	15.63	15.46			
Moisture	44.7	44.6			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
30.26	27.22	15.48	25.9

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	8.5	69.0	22.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-909	B-909-5	11.0-12.5'	8/17/06	ND	Dark grayish brown fine silty sand.	31.4	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= NOT DETERMINED.

Tested By: JPD **Checked By:** ABS

PATH: REPORT REV. 0 MACTEC ENGINEERING & CONSULTING, INC. 11/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-909
Depth: 11.0-12.5' **Sample Number:** B-909-5
Material Description: Dark grayish brown fine silty sand.
Date: 8/17/06 **Natural Moisture:** 31.4
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= NOT DETERMINED.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
140.48	0.00	0.00	#4	0.00	100.0
			#10	0.12	99.9
70.70	0.00	0.00	#20	0.45	99.3
			#40	6.06	91.4
			#60	22.77	67.7
			#140	49.69	29.7
			#200	54.87	22.4

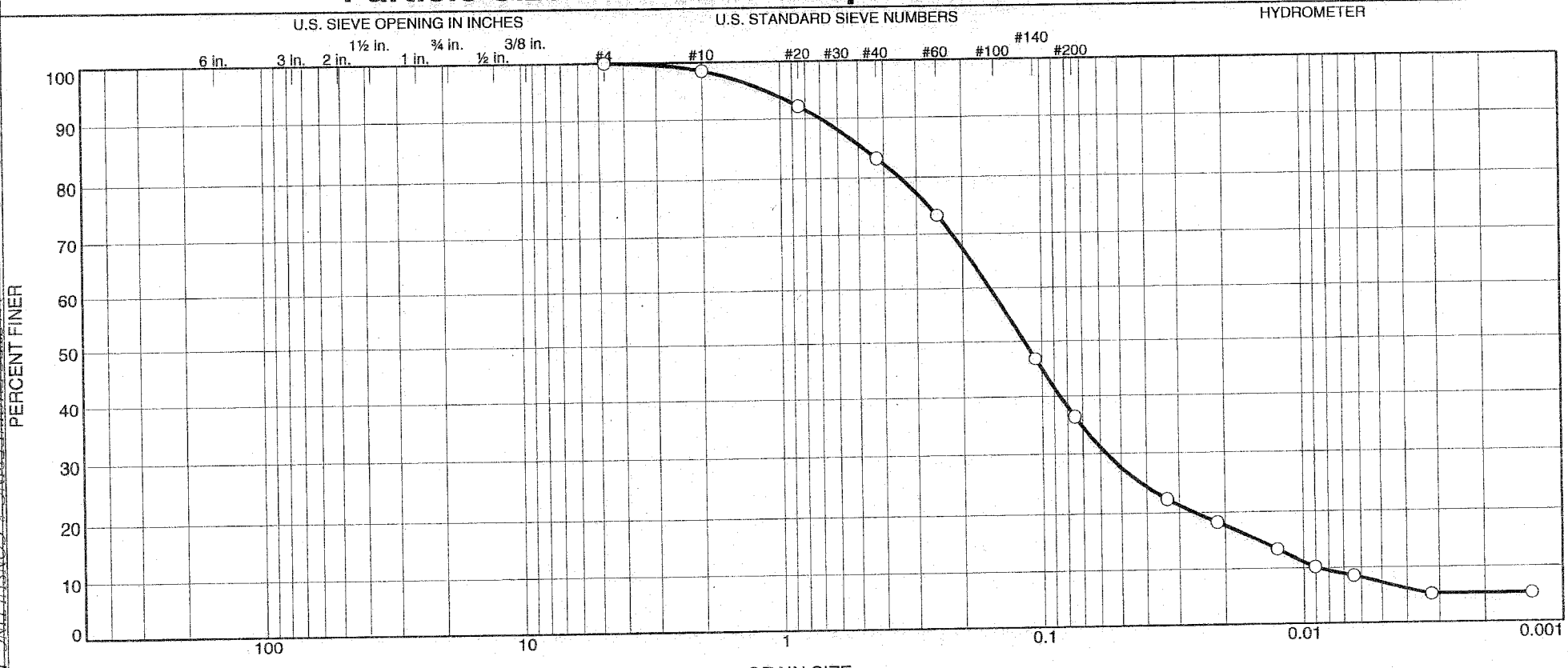
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	8.5	69.0	77.6			22.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1072	0.1766	0.2154	0.3191	0.3570	0.4073	0.4927

Fineness Modulus
0.83

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.5	15.2	47.0	29.0	7.3

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-909	B-909-7	18.5-20.0'	8/17/06	SM	Yellowish brown fine silty sand.	25.1	30	26

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-909
Depth: 18.5-20.0' **Sample Number:** B-909-7
Material Description: Yellowish brown fine silty sand.
Date: 8/17/06 **Natural Moisture:** 25.1
Liquid Limit: 30 **Plastic Limit:** 26 **USCS Class.:** SM
Testing Remarks: Specific gravity is assumed.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
169.24	0.00	0.00	#4	0.00	100.0
			#10	2.51	98.5
62.47	0.00	0.00	#20	3.98	92.2
			#40	9.68	83.3
			#60	15.96	73.3
			#140	32.79	46.8
			#200	39.46	36.3

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 98.5
Weight of hydrometer sample =62.47
Hygroscopic moisture correction:
Moist weight and tare = 28.95
Dry weight and tare = 28.47
Tare weight = 15.47
Hygroscopic moisture = 3.7%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	23.0	17.5	13.8	0.0130	18.5	13.3	0.0334	22.3
5.00	23.0	15.0	11.3	0.0130	16.0	13.7	0.0214	18.3
15.00	23.0	12.0	8.3	0.0130	13.0	14.2	0.0126	13.4
30.00	23.0	10.0	6.3	0.0130	11.0	14.5	0.0090	10.2
60.00	23.0	9.0	5.3	0.0130	10.0	14.7	0.0064	8.6
245.00	22.7	7.0	3.2	0.0130	8.0	15.0	0.0032	5.2
1450.00	22.8	7.0	3.2	0.0130	8.0	15.0	0.0013	5.2

MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.5	15.2	47.0	63.7	29.0	7.3	36.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0088	0.0148	0.0262	0.0569	0.1167	0.1577	0.3471	0.4782	0.6971	1.1367

Fineness Modulus	C_u	C_c
0.82	17.97	2.34

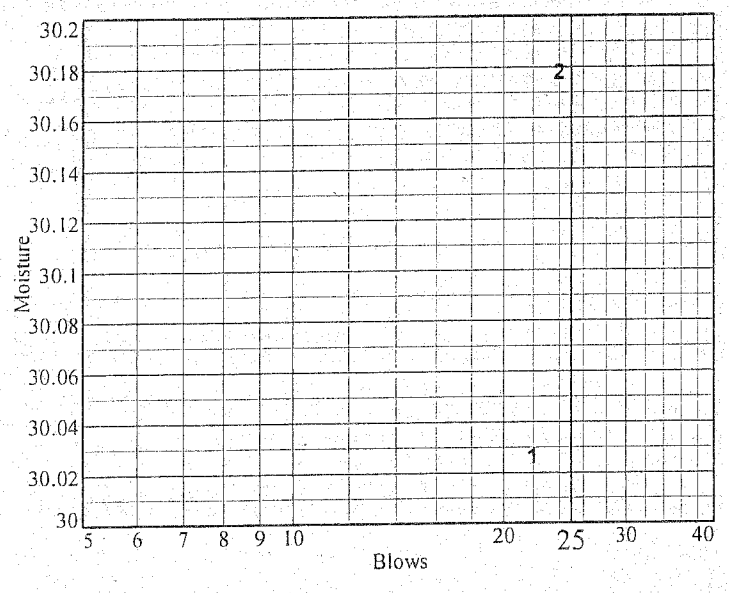
LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-909
Depth: 18.5-20.0'
Sample Number: B-909-7
Material Description: Yellowish brown fine silty sand.
%<#40: 83.3 **%<#200:** 36.3 **USCS:** SM **AASHTO:** A-4(0)
Tested by: JPD **Checked by:** ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.17	24.94				
Dry+Tare	22.93	22.74				
Tare	15.47	15.45				
# Blows	22	24				
Moisture	30.0	30.2				



Liquid Limit= 30
Plastic Limit= 26
Plasticity Index= 4
Natural Moisture= 25.1
Liquidity Index= -0.2

Plastic Limit Data

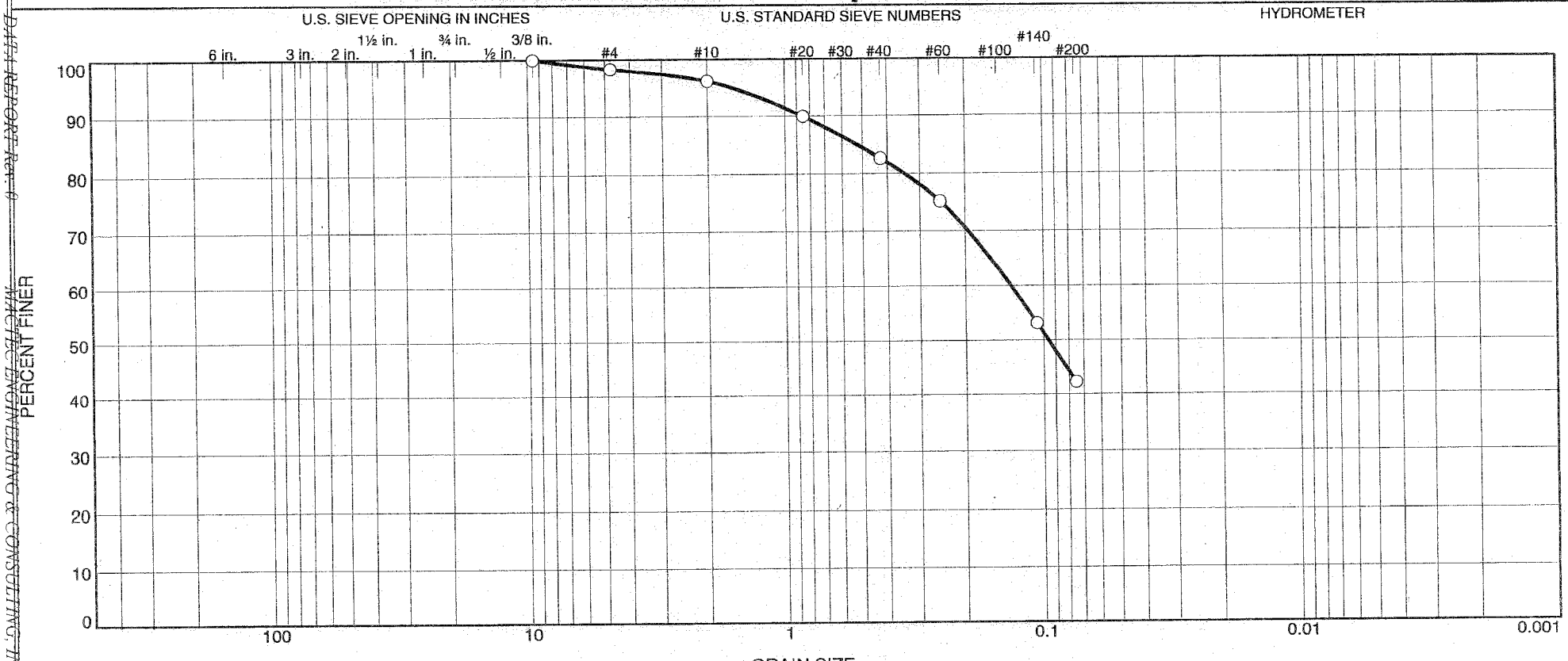
Run No.	1	2	3	4	
Wet+Tare	23.39	21.48			
Dry+Tare	21.76	20.25			
Tare	15.5	15.45			
Moisture	26.0	25.6			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
26.95	24.65	15.48	25.1

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.7	2.2	13.5	40.4	42.2	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-909	B-909-8	23.5-25'	8/17/06	ND	Yellowish brown silty sand.	35.4	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0
MACTEC ENGINEERING & CONSULTING, INC.
7/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-909
Depth: 23.5-25'
Sample Number: B-909-8
Material Description: Yellowish brown silty sand.
Date: 8/17/06
Natural Moisture: 35.4
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
186.40	0.00	0.00	.375	0.00	100.0
			#4	3.23	98.3
			#10	7.24	96.1
67.40	0.00	0.00	#20	4.35	89.9
			#40	9.49	82.6
			#60	14.69	75.2
			#140	30.15	53.1
			#200	37.80	42.2

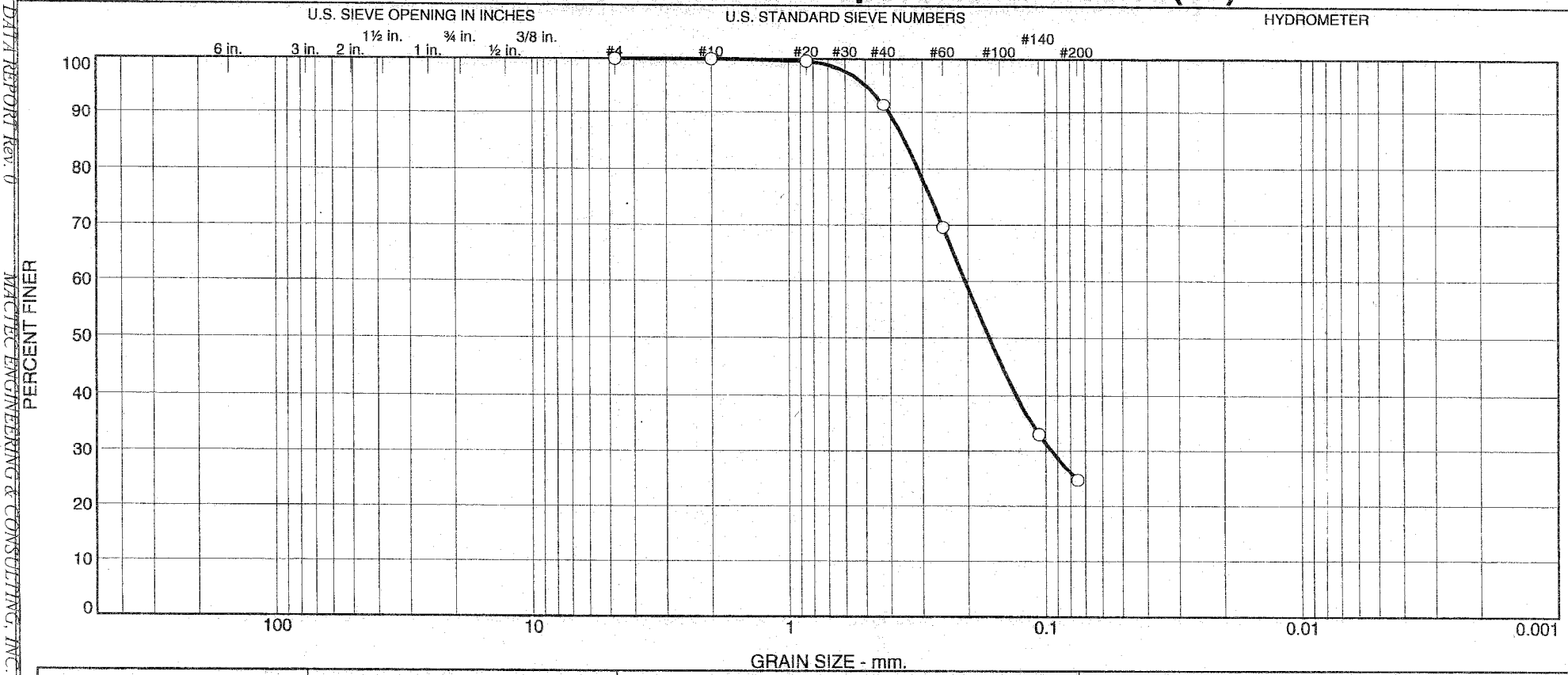
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.7	1.7	2.2	13.5	40.4	56.1			42.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0959	0.1334	0.3432	0.5266	0.8579	1.6177

Fineness Modulus
0.84

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	8.5	66.8	24.7	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-909	B-909-12	41.9-43.4'	8/17/06	ND	Olive silty sand with mica clast.	17.6	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-909
Depth: 41.9-43.4'
Sample Number: B-909-12
Material Description: Olive silty sand with mica clast.
Date: 8/17/06
Natural Moisture: 17.6
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
178.44	0.00	0.00	#4	0.00	100.0
			#10	0.01	100.0
101.07	0.00	0.00	#20	0.39	99.6
			#40	8.58	91.5
			#60	30.76	69.6
			#140	67.65	33.1
			#200	76.12	24.7

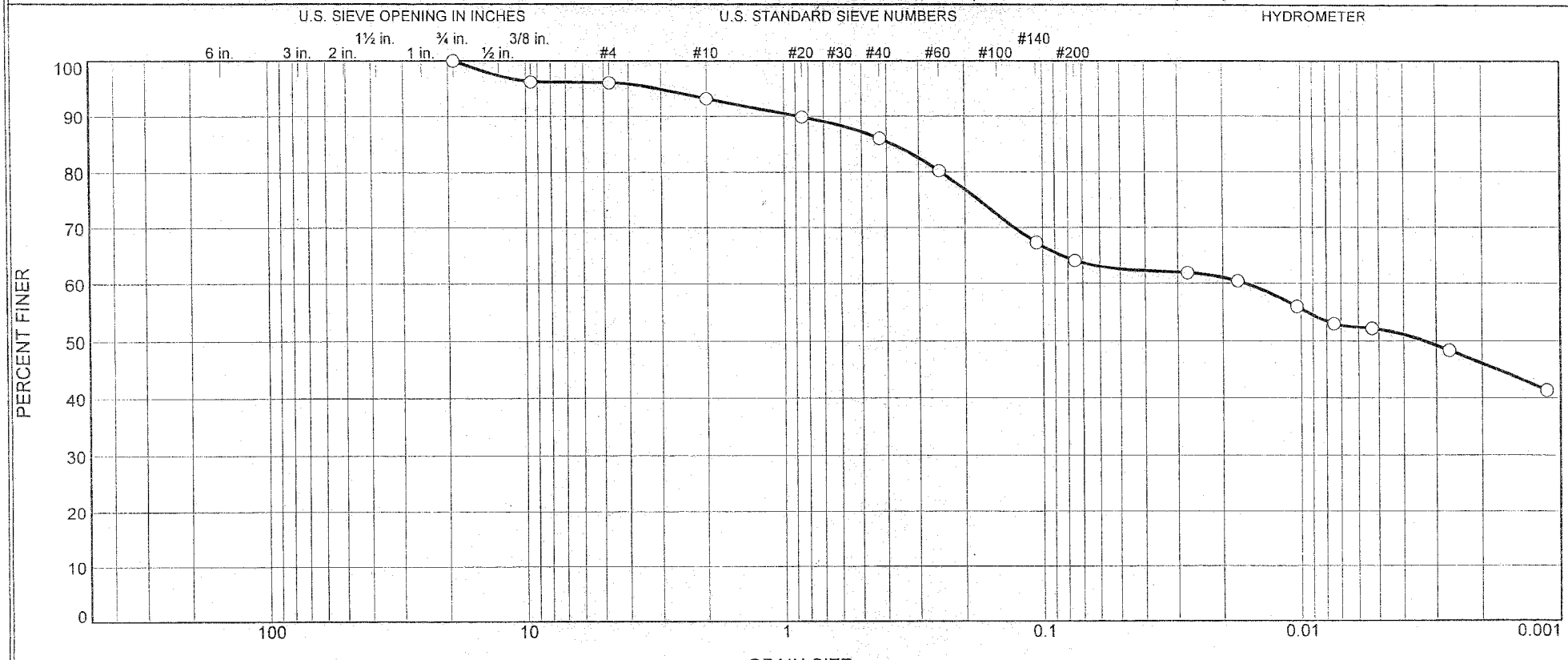
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	8.5	66.8	75.3			24.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0947	0.1653	0.2050	0.3125	0.3520	0.4044	0.4922

Fineness Modulus
0.78

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	4.0	2.8	7.2	21.9	12.1	52.0

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-910	B-910-2	3.5-5.0'	8/31/06	ND	Light yellowish brown sandy clay.	27.7	ND	ND

Client Dominion Nuclear North Anna
Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-910
Depth: 3.5-5.0'
Sample Number: B-910-2
Material Description: Light yellowish brown sandy clay.
Date: 8/31/06
Natural Moisture: 27.7
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Specific gravity is assumed.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
248.48	0.00	0.00	.75	0.00	100.0
			.375	9.46	96.2
			#4	9.90	96.0
			#10	16.97	93.2
64.37	0.00	0.00	#20	2.29	89.9
			#40	4.97	86.0
			#60	8.97	80.2
			#140	17.86	67.3
			#200	20.05	64.1

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =93.2
Weight of hydrometer sample =64.37
Hygroscopic moisture correction:
Moist weight and tare = 28.35
Dry weight and tare = 27.93
Tare weight = 15.72
Hygroscopic moisture =3.4%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.4	46.0	41.8	0.0132	47.0	8.6	0.0274	61.9
5.00	21.4	45.0	40.8	0.0132	46.0	8.8	0.0175	60.4
15.00	21.4	42.0	37.8	0.0132	43.0	9.2	0.0104	56.0
30.00	21.3	40.0	35.8	0.0132	41.0	9.6	0.0075	53.0
60.00	21.2	39.5	35.2	0.0132	40.5	9.7	0.0053	52.2
249.00	21.0	37.0	32.7	0.0133	38.0	10.1	0.0027	48.4
1478.00	21.7	32.0	27.9	0.0132	33.0	10.9	0.0011	41.3

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Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.0	4.0	2.8	7.2	21.9	31.9	12.1	52.0	64.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0033	0.0163	0.2467	0.3796	0.8808	3.1247

Fineness Modulus
0.80

MACTEC, Inc.

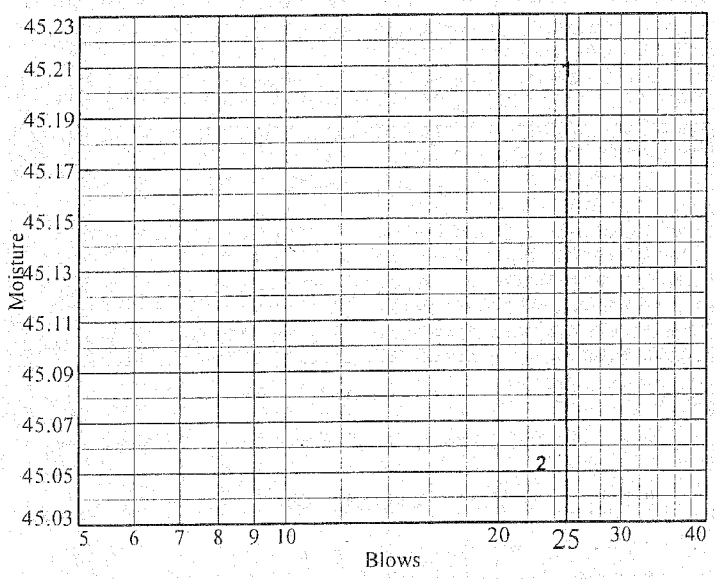
LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-910
Depth: 11-12.5'
Sample Number: B-910-5
Material Description: Yellowish brown sandy silt.
%<#40: ND
%<#200: ND
USCS: ND
AASHTO: ND
Tested by: JPD
Checked by: ABS
Testing Remarks: ND=NOT DETERMINED.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.85	23.79				
Dry+Tare	20.68	21.24				
Tare	15.88	15.58				
# Blows	25	23				
Moisture	45.2	45.1				



Liquid Limit= 45
Plastic Limit= 32
Plasticity Index= 13
Natural Moisture= 30.5
Liquidity Index= -0.1

Plastic Limit Data

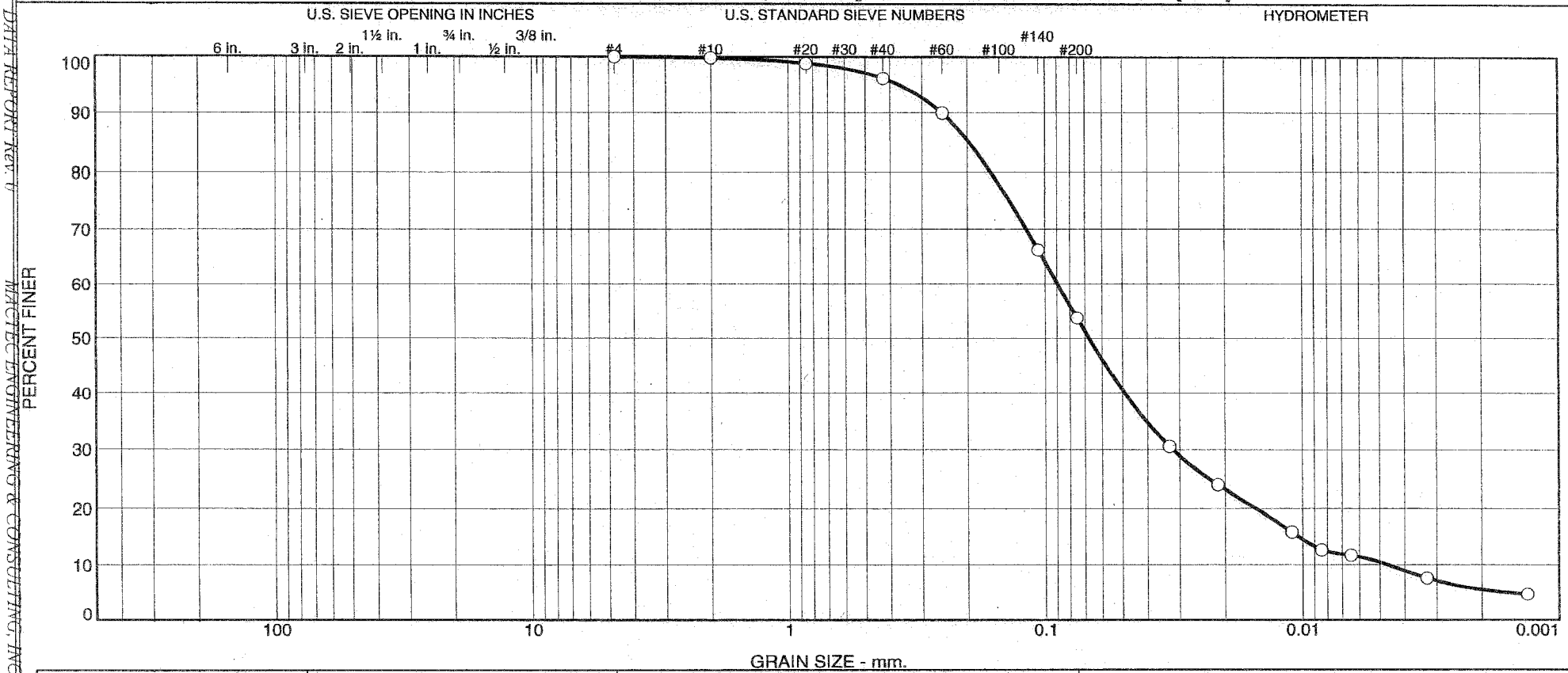
Run No.	1	2	3	4	
Wet+Tare	23.22	24.09			
Dry+Tare	21.35	21.98			
Tare	15.45	15.42			
Moisture	31.7	32.2			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
53.3	44.49	15.63	30.5

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	3.6	42.6	43.1	10.5

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-910	B-910-7	18.5-20.0'	8/31/06	ND	Yellowish brown and black sandy silt.	33.1	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 11/2/04

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-910
Depth: 18.5-20.0'
Sample Number: B-910-7
Material Description: Yellowish brown and black sandy silt.
Date: 8/31/06
Natural Moisture: 33.1
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Specific gravity is assumed.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
299.14	0.00	0.00	#4	0.00	100.0
			#10	0.58	99.8
63.17	0.00	0.00	#20	0.60	98.9
			#40	2.30	96.2
			#60	6.20	90.0
			#140	21.22	66.3
			#200	29.23	53.6

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.8
Weight of hydrometer sample =63.17
Hygroscopic moisture correction:
Moist weight and tare = 27.42
Dry weight and tare = 26.96
Tare weight = 15.49
Hygroscopic moisture = 4.0%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.4	23.0	18.8	0.0132	24.0	12.4	0.0328	30.6
5.00	21.4	19.0	14.8	0.0132	20.0	13.0	0.0213	24.1
20.00	21.3	14.0	9.8	0.0132	15.0	13.8	0.0110	15.9
35.00	21.3	12.0	7.8	0.0132	13.0	14.2	0.0084	12.6
60.00	21.1	11.5	7.2	0.0133	12.5	14.2	0.0065	11.7
241.00	21.0	9.0	4.7	0.0133	10.0	14.7	0.0033	7.6
1470.00	21.7	7.0	2.9	0.0132	8.0	15.0	0.0013	4.7

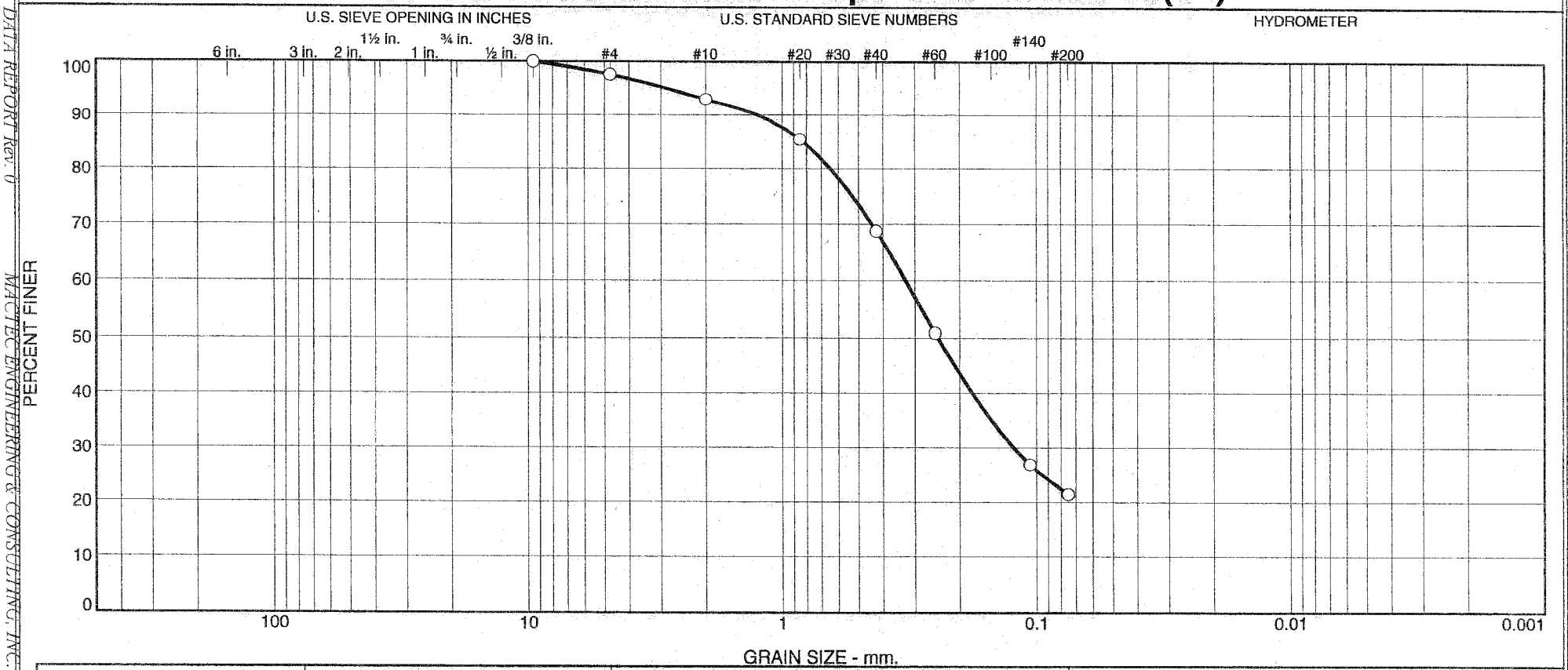
MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.2	3.6	42.6	46.4	43.1	10.5	53.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0046	0.0103	0.0152	0.0319	0.0676	0.0893	0.1622	0.1965	0.2499	0.3670

Fineness Modulus	C_u	C_c
0.32	19.29	2.46

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.3	4.5	24.5	47.3	21.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-910	B-910-9	25.9-27.4'	8/31/06	ND	Yellowish brown weathered rock.	14.6	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/25/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-910
Depth: 25.9-27.4'
Sample Number: B-910-9
Material Description: Yellowish brown weathered rock.
Date: 8/31/06
Natural Moisture: 14.6
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
284.77	0.00	0.00	.375	0.00	100.0
			#4	6.51	97.7
			#10	19.49	93.2
99.24	0.00	0.00	#20	8.31	85.4
			#40	26.02	68.7
			#60	45.07	50.8
			#140	70.54	26.9
			#200	76.43	21.4

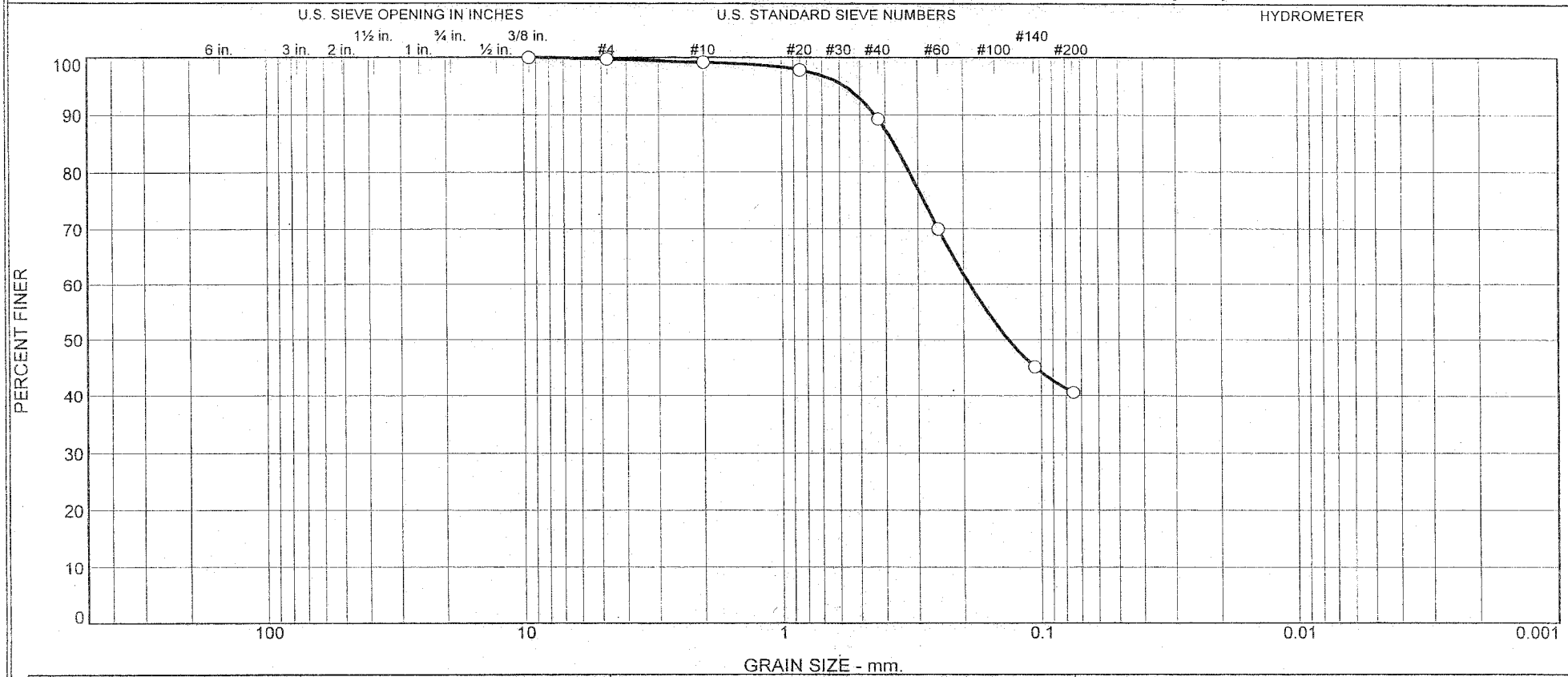
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.3	2.3	4.5	24.5	47.3	76.3			21.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1227	0.2438	0.3262	0.6452	0.8318	1.2484	2.7652

Fineness Modulus
1.48

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.6	9.9	48.6	40.6	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-911	B-911-2	3.5-5.0'	8/08/06	ND	Brown silty sand.	12.8	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-911
Depth: 3.5-5.0'
Sample Number: B-911-2
Material Description: Brown silty sand.
Date: 8/08/06
Natural Moisture: 12.8
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
290.01	0.00	0.00	.375	0.00	100.0
			#4	0.81	99.7
			#10	2.53	99.1
101.50	0.00	0.00	#20	1.37	97.8
			#40	10.12	89.2
			#60	29.87	70.0
			#140	55.23	45.2
			#200	59.91	40.6

Fractional Components

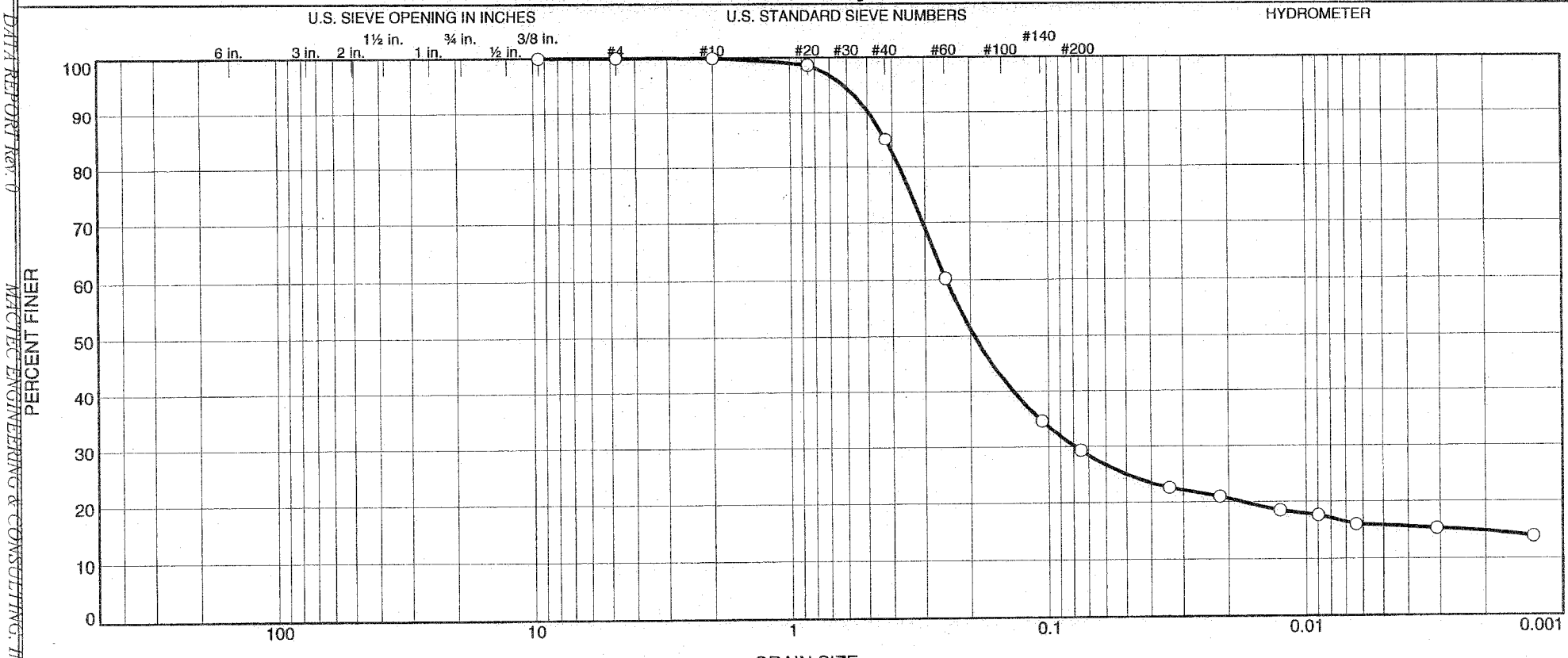
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	0.6	9.9	48.6	59.1			40.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1338	0.1895	0.3229	0.3704	0.4374	0.5728

Fineness Modulus
0.77

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	14.8	55.7	13.6	15.8

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-911	B-911-4	8.0-9.5'	8/08/06	ND	Brown silty sand.	19.6	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT REV. 0
MACTEC ENGINEERING & CONSULTING, INC.
1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-911
Depth: 8.0-9.5'
Sample Number: B-911-4
Material Description: Brown silty sand.
Date: 8/08/06
Natural Moisture: 19.6
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Specific gravity is assumed.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
263.56	0.00	0.00	0.375	0.00	100.0
			#4	0.00	100.0
			#10	0.17	99.9
61.39	0.00	0.00	#20	0.77	98.7
			#40	9.12	85.1
			#60	24.35	60.3
			#140	40.09	34.7
			#200	43.36	29.4

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.9
Weight of hydrometer sample =61.39
Hygroscopic moisture correction:
Moist weight and tare = 27.98
Dry weight and tare = 27.71
Tare weight = 15.58
Hygroscopic moisture = 2.2%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.2	18.0	13.7	0.0132	19.0	13.2	0.0340	22.6
5.00	21.2	17.0	12.7	0.0132	18.0	13.3	0.0216	21.0
15.00	21.2	15.5	11.2	0.0132	16.5	13.6	0.0126	18.5
30.00	21.1	15.0	10.7	0.0133	16.0	13.7	0.0090	17.6
60.00	21.1	14.0	9.7	0.0133	15.0	13.8	0.0064	16.0
255.00	21.2	13.5	9.2	0.0132	14.5	13.9	0.0031	15.2
1444.00	21.7	12.5	8.4	0.0132	13.5	14.1	0.0013	13.8

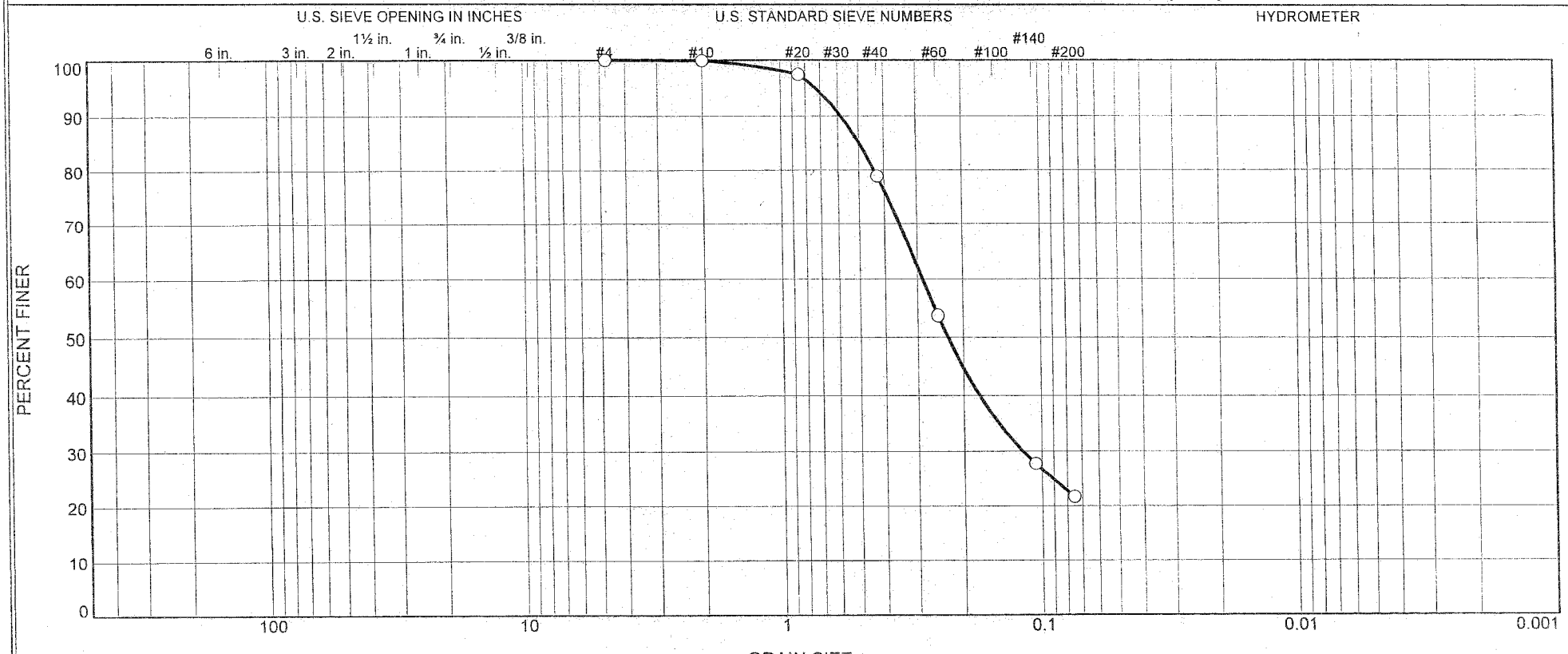
MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	14.8	55.7	70.6	13.6	15.8	29.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0024	0.0177	0.0788	0.1930	0.2484	0.3764	0.4240	0.4926	0.6147

Fineness Modulus
0.95

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	21.0	57.2	21.7	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-911	B-911-5	11-12.5'	8/08/06	ND	Brown silty sand.	17.3	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-911
Depth: 11-12.5'
Sample Number: B-911-5
Material Description: Brown silty sand.
Date: 8/08/06
Natural Moisture: 17.3
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
230.11	0.00	0.00	#4	0.00	100.0
			#10	0.17	99.9
106.36	0.00	0.00	#20	2.60	97.5
			#40	22.38	78.9
			#60	49.20	53.7
			#140	76.86	27.7
			#200	83.24	21.7

Fractional Components

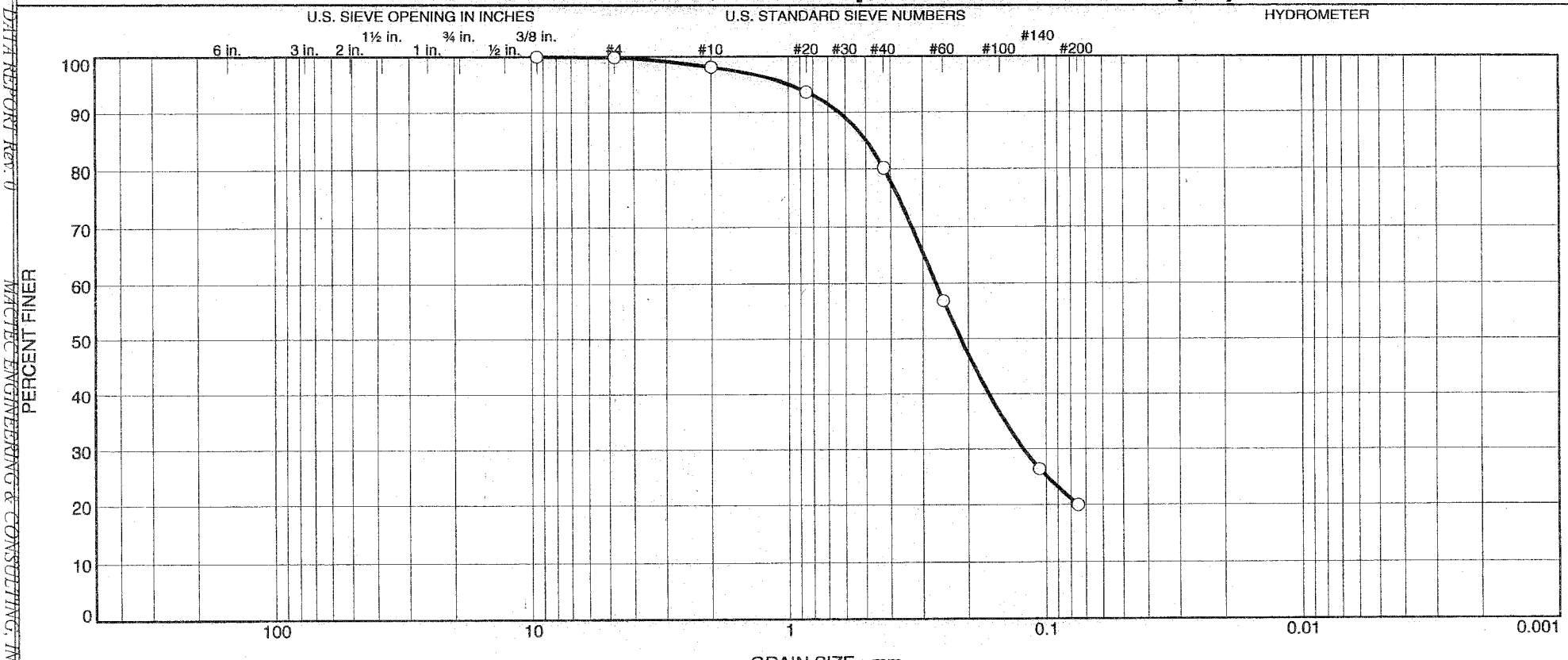
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	21.0	57.2	78.3			21.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1186	0.2293	0.2860	0.4363	0.4978	0.5842	0.7253

Fineness Modulus
1.13

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	1.8	18.0	60.2	19.9	

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
BORING B-911	B-911-7	18.5-20.0'	8/08/06	ND	Brown silty sand contains weathered quartz fragments.	11.1	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/12/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-911
Depth: 18.5-20.0' **Sample Number:** B-911-7
Material Description: Brown silty sand contains weathered quartz fragments.
Date: 8/08/06 **Natural Moisture:** 11.1
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= Not determined.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
328.77	0.00	0.00	.375	0.00	100.0
			#4	0.45	99.9
			#10	6.23	98.1
95.75	0.00	0.00	#20	4.37	93.6
			#40	17.53	80.1
			#60	40.23	56.9
			#140	69.96	26.4
			#200	76.31	19.9

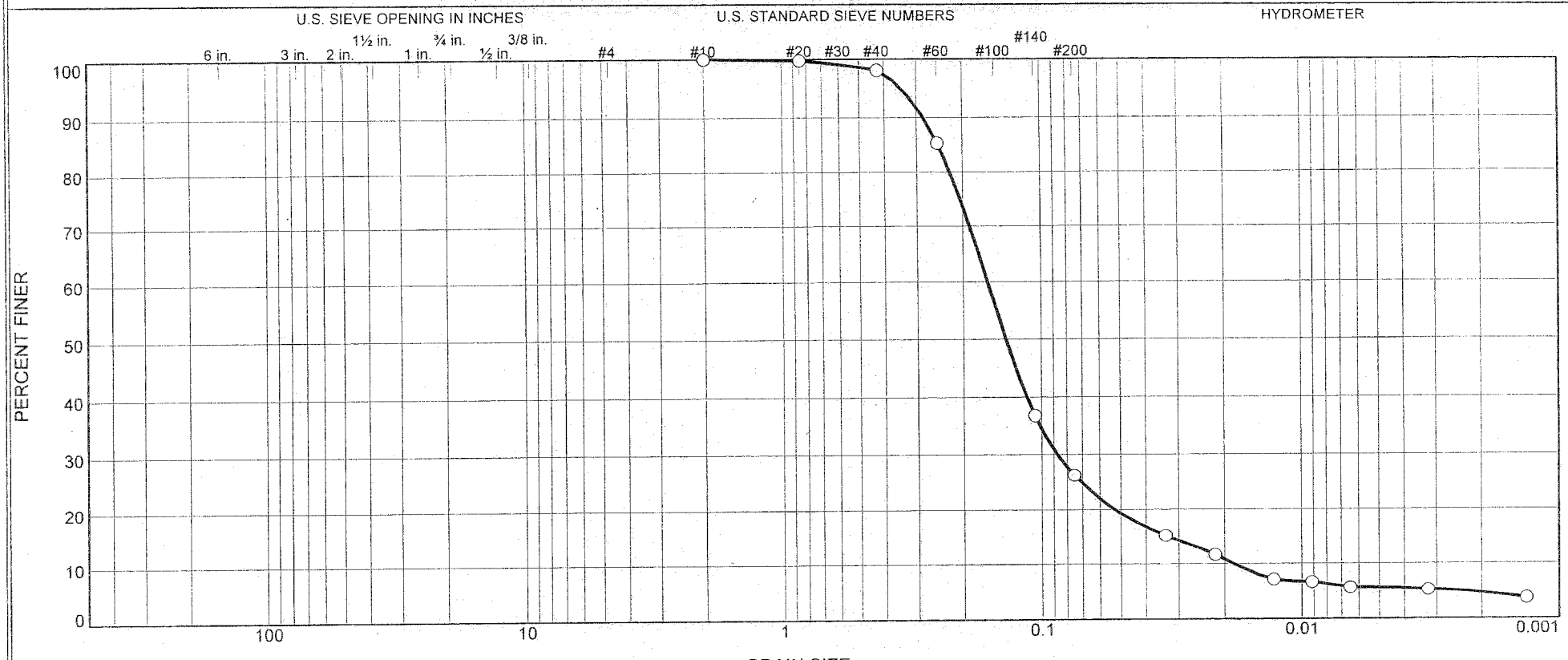
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	1.8	18.0	60.2	80.0			19.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0754	0.1221	0.2140	0.2674	0.4233	0.4987	0.6334	1.0033

Fineness Modulus
1.15

MACTEC, inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	2.0	71.7	20.8	5.5

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-912	B-912-1	9.6-9.1'	10-23-06	ND	Light yellowish brown silty sand.	24.0	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ SPECIFIC GRAVITY WAS ASSUMED.
ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-912
Depth: 9.6-9.1'
Sample Number: B-912-1
Material Description: Light yellowish brown silty sand.
Date: 10-23-06
Natural Moisture: 24.0
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: SPECIFIC GRAVITY WAS ASSUMED.
ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
266.30	0.00	0.00	#10	0.00	100.0
99.74	0.00	0.00	#20	0.27	99.7
			#40	1.97	98.0
			#60	14.70	85.3
			#140	63.08	36.8
			#200	73.53	26.3

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =99.74
Hygroscopic moisture correction:
Moist weight and tare = 42.23
Dry weight and tare = 42.08
Tare weight = 15.23
Hygroscopic moisture =0.6%
Table of composite correction values:

Temp., deg. C:	12.8	29.5
Comp. corr.:	-5.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.8	18.5	15.1	0.0131	19.5	13.1	0.0336	15.1
5.00	21.9	15.0	11.6	0.0131	16.0	13.7	0.0217	11.6
15.00	21.9	10.5	7.1	0.0131	11.5	14.4	0.0129	7.1
30.00	21.9	10.0	6.6	0.0131	11.0	14.5	0.0091	6.6
60.00	21.9	9.0	5.6	0.0131	10.0	14.7	0.0065	5.6
240.00	22.3	8.5	5.2	0.0131	9.5	14.7	0.0032	5.2
1440.00	22.0	7.0	3.7	0.0131	8.0	15.0	0.0013	3.6

MACTEC, Inc.

Fractional Components

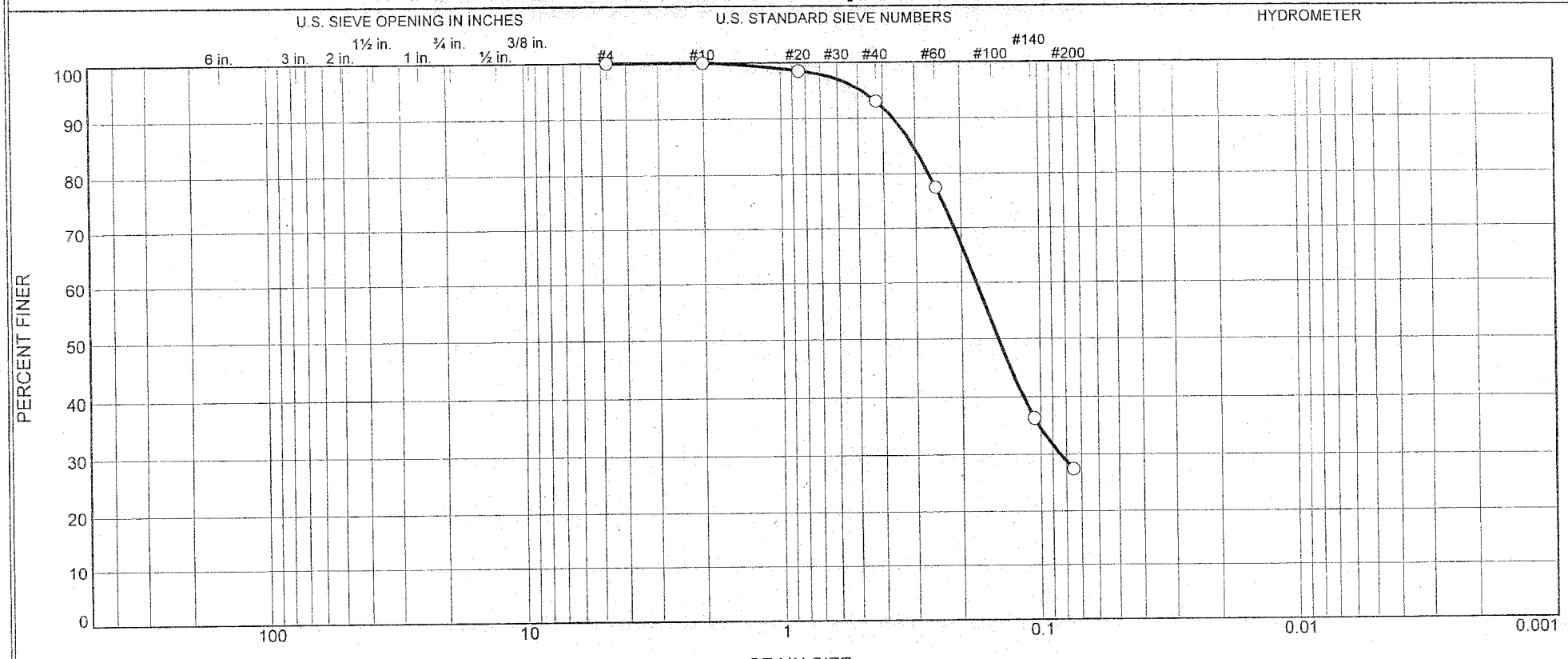
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	2.0	71.7	73.7	20.8	5.5	26.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0184	0.0334	0.0528	0.0873	0.1365	0.1604	0.2241	0.2485	0.2832	0.3438

Fineness Modulus	C_u	C_c
0.54	8.70	2.57

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	6.9	65.7	27.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-912	B-912-3	14.1-15.6	10-23-06	ND	Light yellowish brown silty sand.	15.2	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-912
Depth: 14.1-15.6 **Sample Number:** B-912-3
Material Description: Light yellowish brown silty sand.
Date: 10-23-06 **Natural Moisture:** 15.2
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ **Checked by:** ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
190.52	0.00	0.00	#4	0.00	100.0
			#10	0.05	100.0
94.91	0.00	0.00	#20	1.39	98.5
			#40	6.54	93.1
			#60	21.30	77.5
			#140	60.31	36.4
			#200	68.90	27.4

Fractional Components

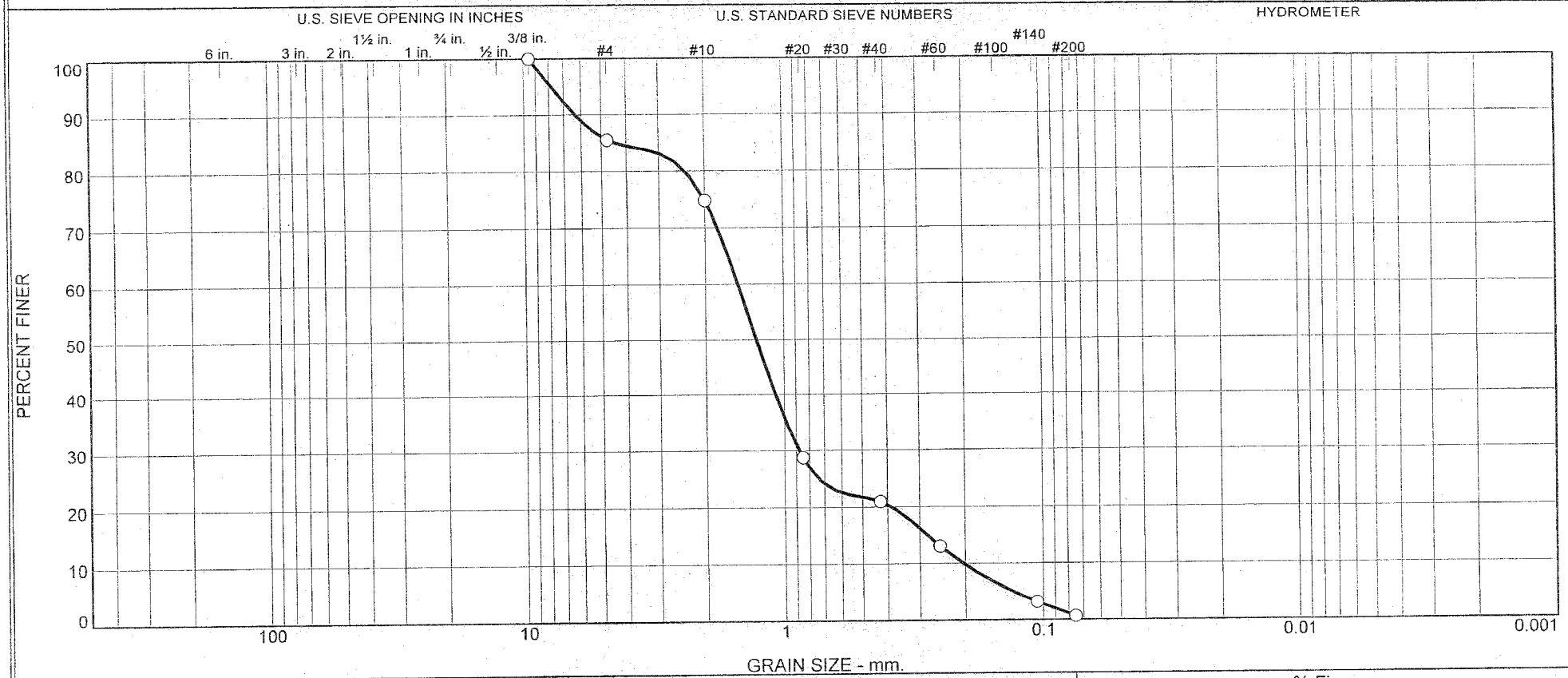
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	6.9	65.7	72.6			27.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0842	0.1445	0.1752	0.2655	0.3054	0.3655	0.4833

Fineness Modulus
0.67

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	14.5	10.7	53.8	20.4	0.6	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-912	B-912-4	19.1-19.9'	10-23-06	SW	Olive brown weathered soft rock.	15.7	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-912
Depth: 19.1-19.9'
Sample Number: B-912-4
Material Description: Olive brown weathered soft rock.
Date: 10-23-06
Natural Moisture: 15.7
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: SW
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
215.75	0.00	0.00	.375	0.00	100.0
			#4	31.30	85.5
			#10	54.27	74.8
119.27	0.00	0.00	#20	73.49	28.7
			#40	85.86	21.0
			#60	98.51	13.0
			#140	114.11	3.2
			#200	118.27	0.6

Fractional Components

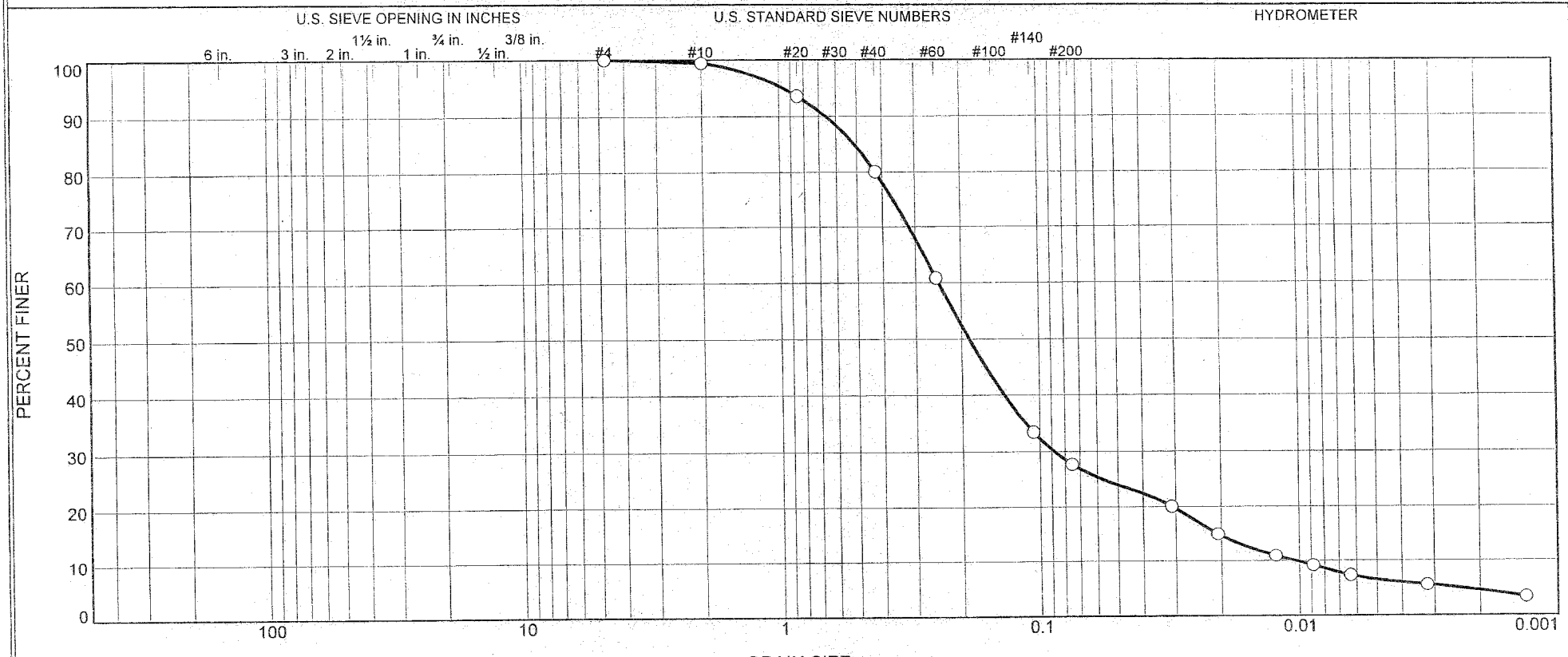
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	14.5	14.5	10.7	53.8	20.4	84.9			0.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2042	0.2806	0.3858	0.8799	1.2760	1.4993	2.3804	4.4750	6.3382	7.8616

Fineness Modulus	C_u	C_c
3.44	7.34	2.53

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.6	19.3	52.4	21.2	6.5

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-913	B-913-8	42.0-43.5	10-30-06	ND	Brownish to yellow silty sand.	ND	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
SPECIFIC GRAVITY IS ASSUMED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-913
Depth: 42.0-43.5 **Sample Number:** B-913-8
Material Description: Brownish to yellow silty sand.
Date: 10-30-06 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
SPECIFIC GRAVITY IS ASSUMED.
ND=NOT DETERMINED.
Tested by: LBJ **Checked by:** ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
302.30	0.00	0.00	#4	0.00	100.0
			#10	1.70	99.4
135.53	0.00	0.00	#20	8.00	93.6
			#40	26.40	80.1
			#60	52.60	60.8
			#140	89.90	33.5
			#200	97.80	27.7

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.4
Weight of hydrometer sample =135.53
Hygroscopic moisture correction:
Moist weight and tare = 28.43
Dry weight and tare = 28.38
Tare weight = 15.57
Hygroscopic moisture =0.4%
Table of composite correction values:

Temp., deg. C:	12.8	29.5
Comp. corr.:	-5.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.4	31.0	27.5	0.0132	32.0	11.0	0.0311	20.1
5.00	21.5	24.0	20.6	0.0132	25.0	12.2	0.0206	15.0
15.00	21.5	18.5	15.1	0.0132	19.5	13.1	0.0123	11.0
30.00	21.5	16.0	12.6	0.0132	17.0	13.5	0.0089	9.2
60.00	21.7	13.5	10.1	0.0132	14.5	13.9	0.0063	7.4
240.00	22.1	11.0	7.7	0.0131	12.0	14.3	0.0032	5.6
1453.00	22.0	8.0	4.7	0.0131	9.0	14.8	0.0013	3.4

MACTEC, Inc.

Fractional Components

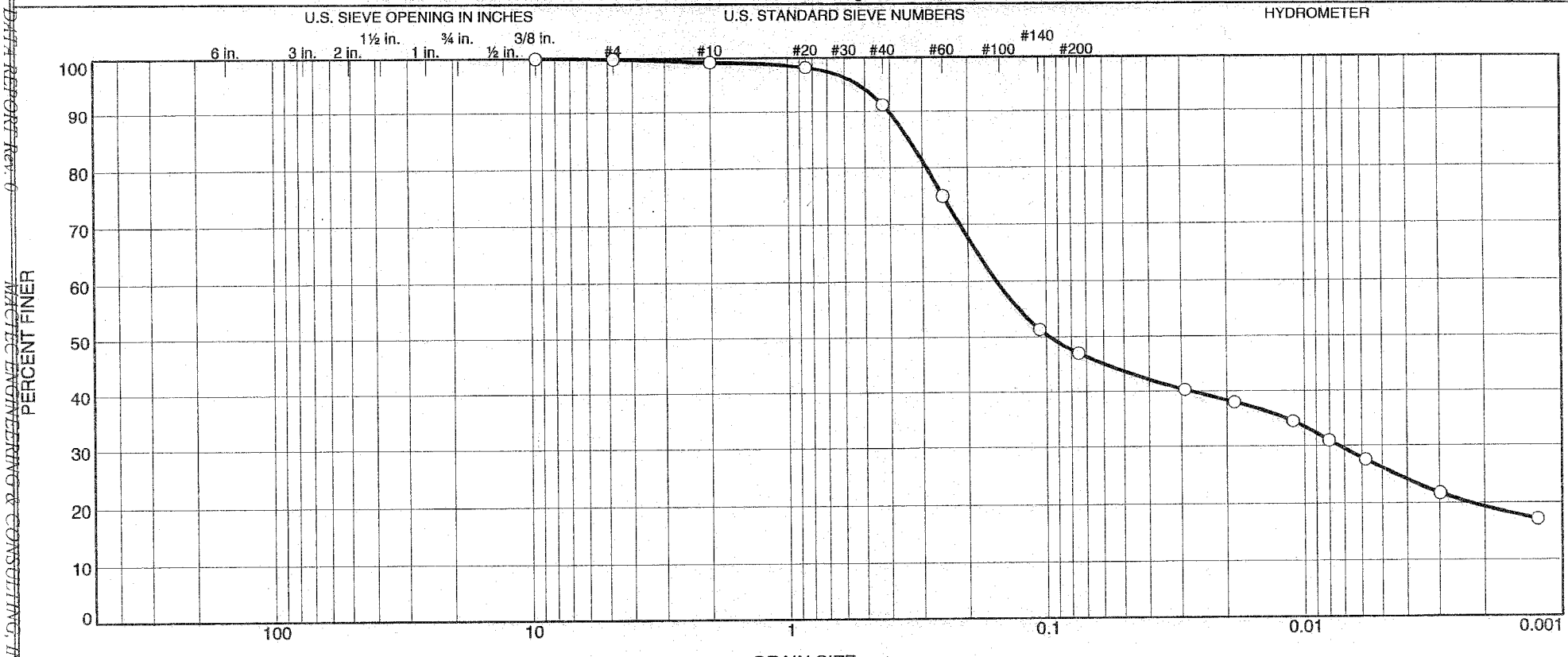
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.6	19.3	52.4	72.3	21.2	6.5	27.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0103	0.0207	0.0309	0.0882	0.1865	0.2446	0.4240	0.5115	0.6585	0.9686

Fineness Modulus	C_u	C_c
1.05	23.65	3.08

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.7	8.0	44.2	21.0	26.0

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
BORING B-914	B-914-2	3.5-5.0'	8/22/06	SC	Reddish brown clayey sand.	16.6	27	17

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-914
Depth: 3.5-5.0'
Sample Number: B-914-2
Material Description: Reddish brown clayey sand.
Date: 8/22/06
Natural Moisture: 16.6
Liquid Limit: 27
Plastic Limit: 17
USCS Class.: SC
Testing Remarks: Specific gravity is assumed.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
227.99	0.00	0.00	.375	0.00	100.0
			#4	0.32	99.9
			#10	1.73	99.2
86.22	0.00	0.00	#20	0.86	98.3
			#40	6.97	91.2
			#60	21.02	75.0
			#140	41.68	51.3
			#200	45.35	47.0

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.2
Weight of hydrometer sample =86.22
Hygroscopic moisture correction:
Moist weight and tare = 29.74
Dry weight and tare = 29.53
Tare weight = 15.47
Hygroscopic moisture = 1.5%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.6	39.0	34.9	0.0132	40.0	9.7	0.0291	40.3
5.00	21.6	37.0	32.9	0.0132	38.0	10.1	0.0187	38.0
15.00	21.5	34.0	29.8	0.0132	35.0	10.6	0.0111	34.5
30.00	21.4	31.0	26.8	0.0132	32.0	11.0	0.0080	31.0
60.00	21.4	28.0	23.8	0.0132	29.0	11.5	0.0058	27.5
245.00	21.2	23.0	18.7	0.0132	24.0	12.4	0.0030	21.7
1457.00	21.7	19.0	14.9	0.0132	20.0	13.0	0.0012	17.2

MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.7	8.0	44.2	52.9	21.0	26.0	47.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0023	0.0073	0.0976	0.1555	0.2892	0.3374	0.4035	0.5283

Fineness Modulus
0.65

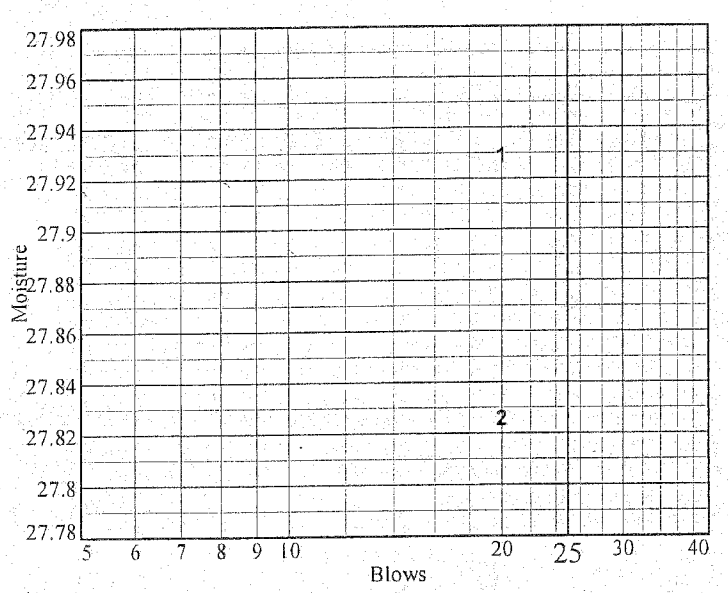
LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-914
Depth: 3.5-5.0'
Sample Number: B-914-2
Material Description: Reddish brown clayey sand.
%<#40: 91.2
%<#200: 47.0
USCS: SC
AASHTO: A-4(2)
Tested by: JPD
Checked by: ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	23.68	24.26				
Dry+Tare	21.94	22.34				
Tare	15.71	15.44				
# Blows	20	20				
Moisture	27.9	27.8				



Liquid Limit= 27
Plastic Limit= 17
Plasticity Index= 10
Natural Moisture= 16.6
Liquidity Index= 0.0

Plastic Limit Data

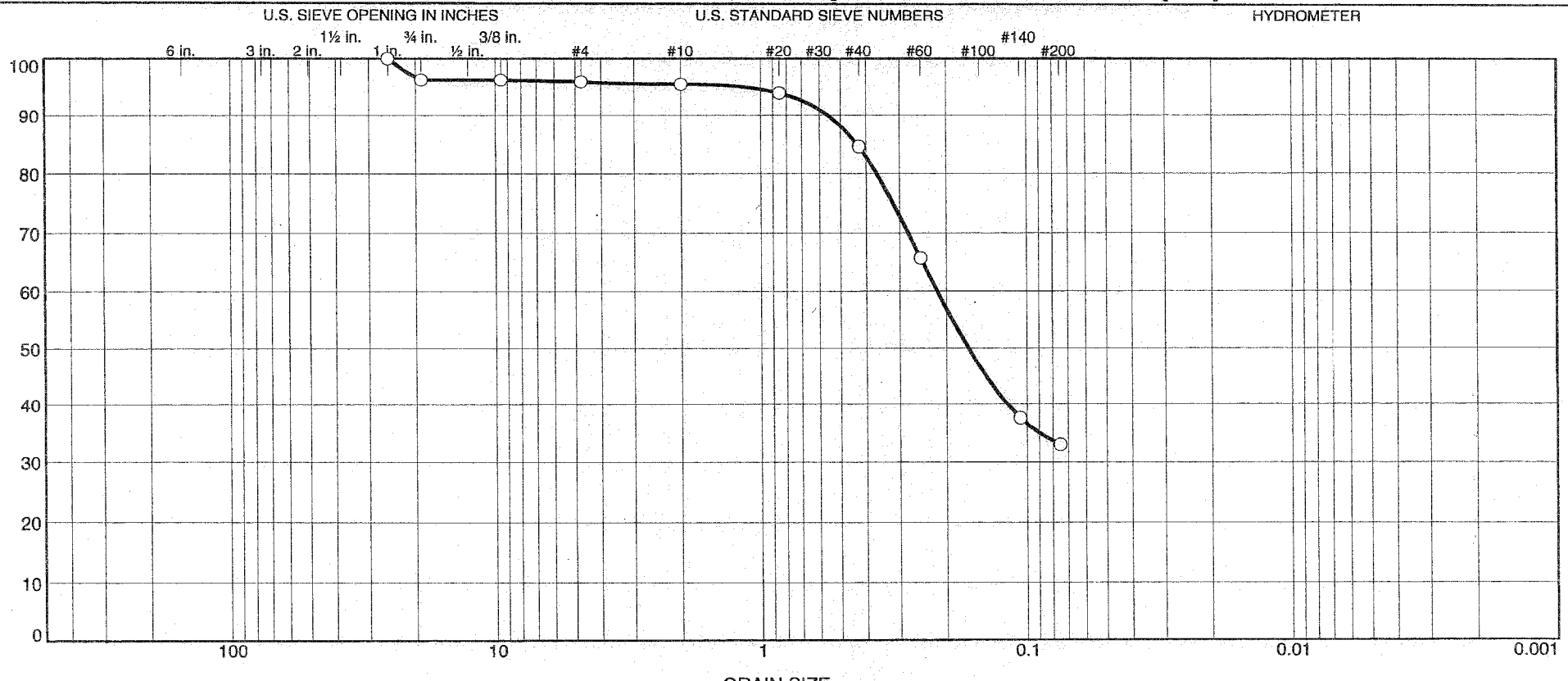
Run No.	1	2	3	4	
Wet+Tare	22.94	24.32			
Dry+Tare	21.85	23.03			
Tare	15.47	15.53			
Moisture	17.1	17.2			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
32.01	29.65	15.4	16.6

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	3.7	0.3	0.5	11.0	51.5	33.0	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-914	B-914-3	6.0-7.5'	8/22/06	ND	Yellowish brown silty sand.	ND	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-914
Depth: 6.0-7.5'
Sample Number: B-914-3
Material Description: Yellowish brown silty sand.
Date: 8/22/06
Natural Moisture: ND
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
364.95	0.00	0.00	1.0	0.00	100.0
			.75	13.55	96.3
			.375	13.55	96.3
			#4	14.78	96.0
			#10	16.35	95.5
105.68	0.00	0.00	#20	1.76	93.9
			#40	12.18	84.5
			#60	32.97	65.7
			#140	64.10	37.6
			#200	69.20	33.0

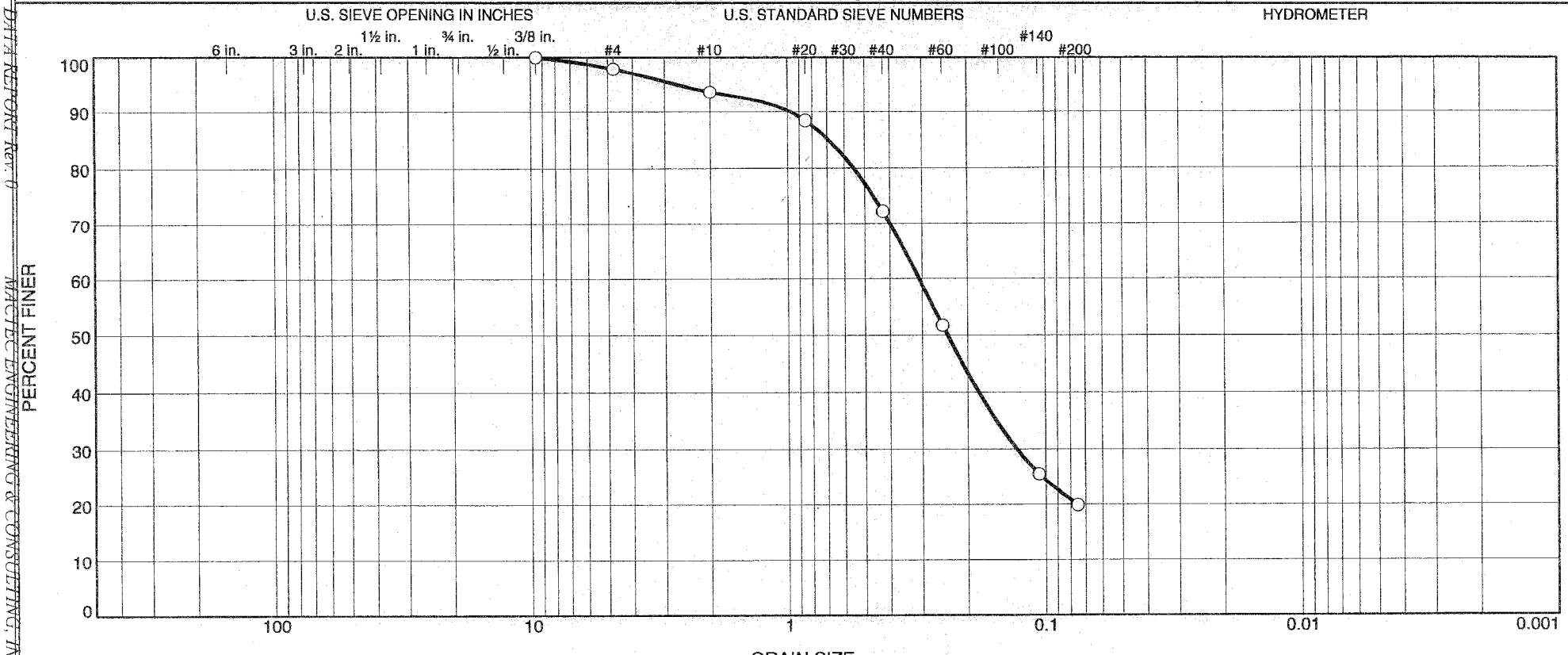
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	3.7	0.3	4.0	0.5	11.0	51.5	63.0			33.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1656	0.2164	0.3656	0.4330	0.5558	1.1384

Fineness Modulus
1.10

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.1	4.1	21.6	52.3	19.9	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-914	B-914-5	11.0-13.5'	8/22/06	ND	Yellowish brown silty sand.	ND	ND	ND

Client Dominion Nuclear North Anna
Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-914
Depth: 11.0-13.5' **Sample Number:** B-914-5
Material Description: Yellowish brown silty sand.
Date: 8/22/06 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= Not determined.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
349.07	0.00	0.00	.375	0.00	100.0
			#4	7.23	97.9
			#10	21.64	93.8
110.06	0.00	0.00	#20	6.27	88.5
			#40	25.35	72.2
			#60	49.35	51.7
			#140	80.10	25.5
			#200	86.69	19.9

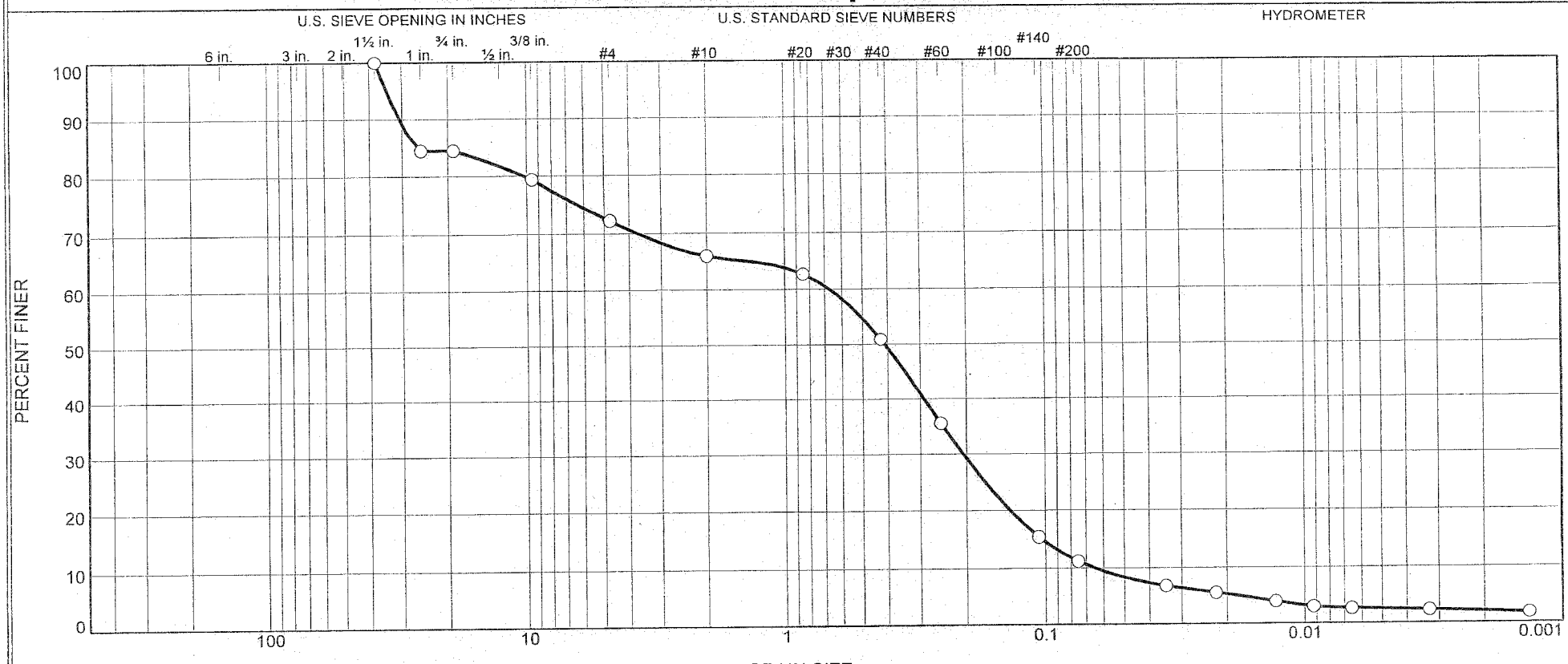
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.1	2.1	4.1	21.6	52.3	78.0			19.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0754	0.1291	0.2390	0.3077	0.5514	0.6878	0.9707	2.6131

Fineness Modulus
1.41

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	15.6	12.2	6.2	15.1	39.7	8.6	2.6

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-914	B-914-7	19.0-20.5'	8/22/06	ND	Yellowish brown poorly graded sand with silt and gravel.	20.8	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-914
Depth: 19.0-20.5' **Sample Number:** B-914-7
Material Description: Yellowish brown poorly graded sand with silt and gravel.
Date: 8/22/06 **Natural Moisture:** 20.8
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= Not determined.
Specific gravity is assumed.
Tested by: JPD **Checked by:** ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
346.00	0.00	0.00	1.5	0.00	100.0
			1.0	53.86	84.4
			.75	53.86	84.4
			.375	71.32	79.4
			#4	96.09	72.2
			#10	117.59	66.0
104.17	0.00	0.00	#20	5.15	62.8
			#40	23.79	50.9
			#60	48.14	35.5
			#140	79.85	15.4
			#200	86.48	11.2

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =66.0
Weight of hydrometer sample =104.17
Hygroscopic moisture correction:
Moist weight and tare = 31.69
Dry weight and tare = 31.62
Tare weight = 15.57
Hygroscopic moisture =0.4%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.5	15.0	10.8	0.0132	16.0	13.7	0.0345	6.8
5.00	21.5	13.0	8.8	0.0132	14.0	14.0	0.0221	5.6
15.00	21.4	10.5	6.3	0.0132	11.5	14.4	0.0129	4.0
30.00	21.4	9.0	4.8	0.0132	10.0	14.7	0.0092	3.0
60.00	21.3	8.5	4.3	0.0132	9.5	14.7	0.0066	2.7
242.00	21.2	8.0	3.7	0.0132	9.0	14.8	0.0033	2.4
1446.00	21.7	7.0	2.9	0.0132	8.0	15.0	0.0013	1.8

MACTEC, Inc.

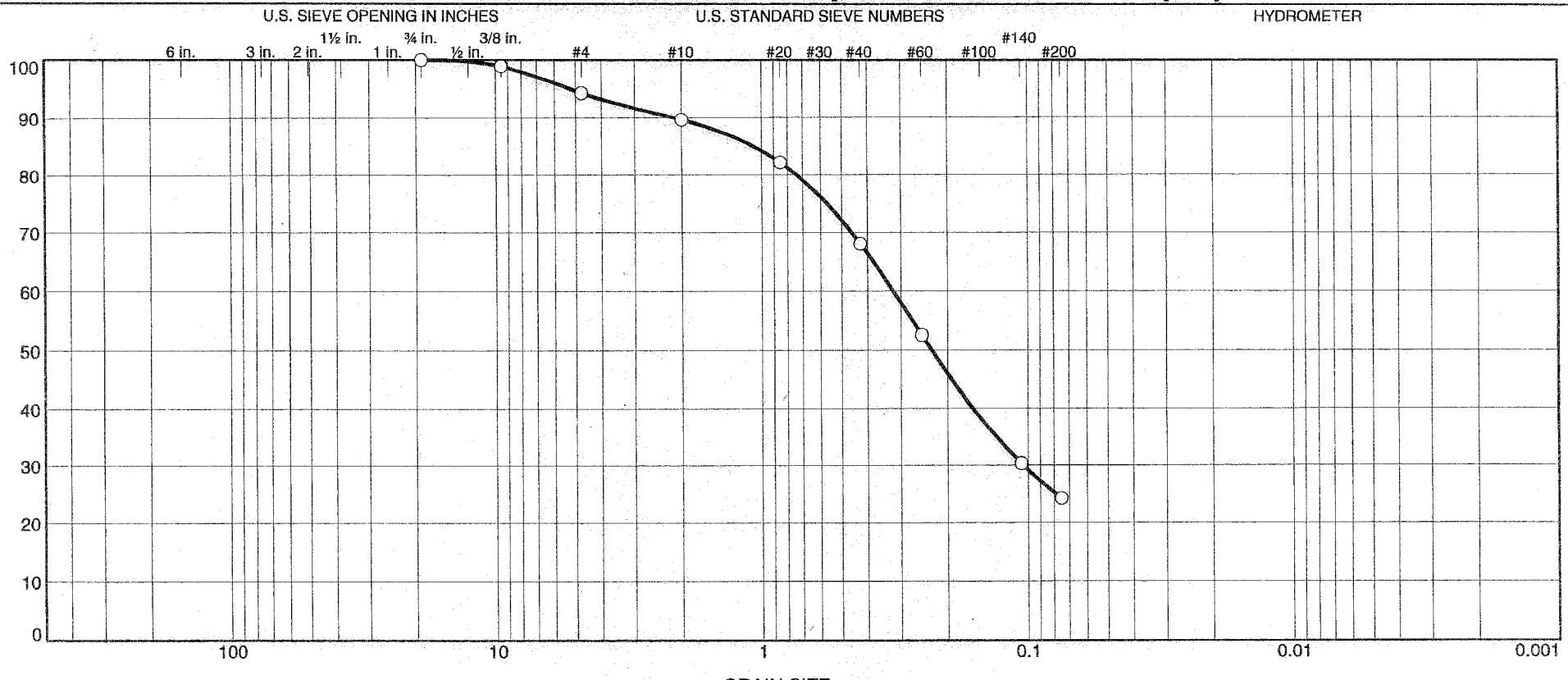
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	15.6	12.2	27.8	6.2	15.1	39.7	61.0	8.6	2.6	11.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0650	0.1032	0.1364	0.2060	0.4099	0.6702	10.2260	26.2437	30.8041	34.4455

Fineness Modulus	C_u	C_c
3.11	10.30	0.97

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	5.7	4.7	21.6	43.8	24.2	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-914	B-914-9	35.6-37.1'	8/22/06	ND	Yellowish brown silty sand.	ND	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

DRAFT REPORT Rev. 0
MACTEC ENGINEERING & CONSULTING, INC.
1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-914
Depth: 35.6-37.1'
Sample Number: B-914-9
Material Description: Yellowish brown silty sand.
Date: 8/22/06
Natural Moisture: ND
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
266.62	0.00	0.00	.75	0.00	100.0
			.375	2.89	98.9
			#4	15.24	94.3
			#10	27.62	89.6
101.00	0.00	0.00	#20	8.45	82.1
			#40	24.33	68.0
			#60	41.83	52.5
			#140	66.89	30.3
			#200	73.72	24.2

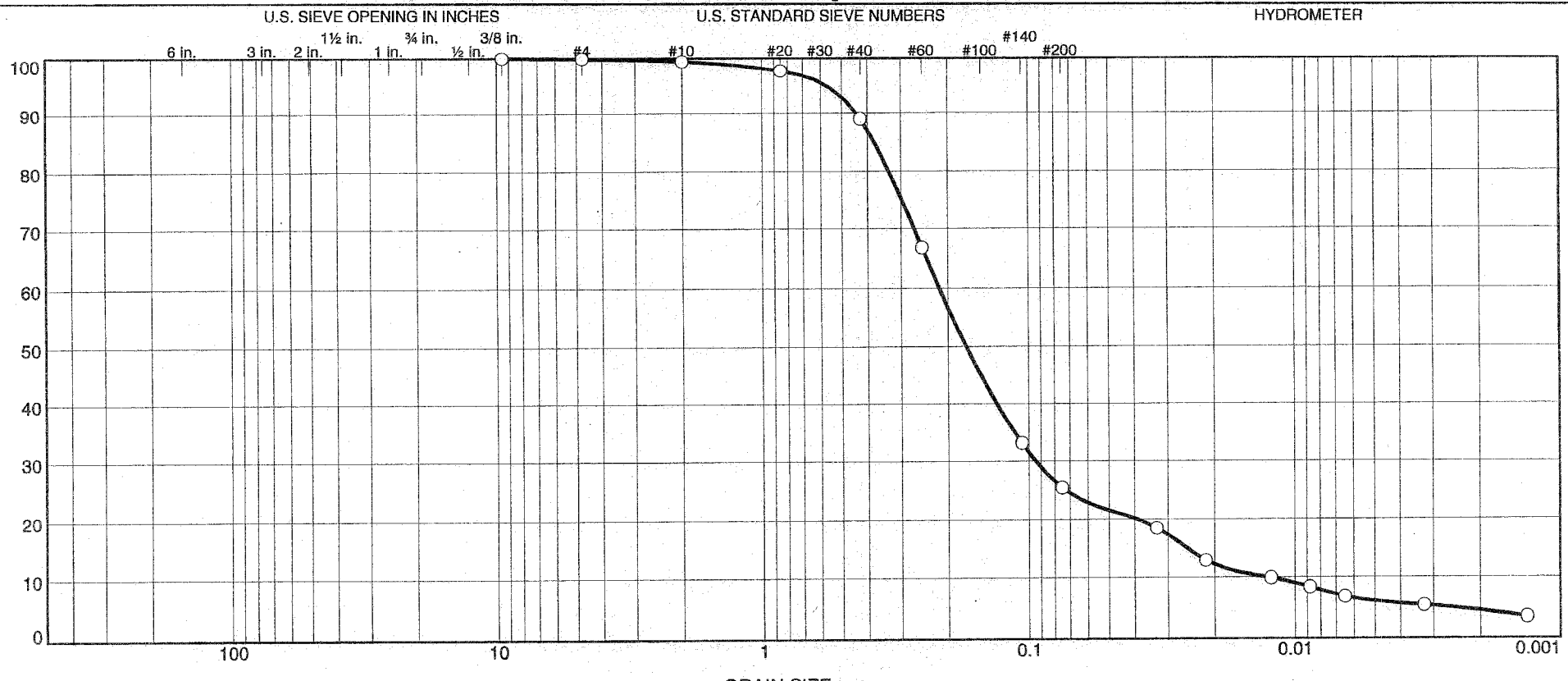
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	5.7	5.7	4.7	21.6	43.8	70.1			24.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1045	0.2298	0.3204	0.7398	1.0719	2.1408	5.2649

Fineness Modulus
1.58

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	0.5	10.3	63.6	19.5	6.0

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-914	B-914-10	40.6-42.1'	8/22/06	ND	Yellowish brown silty sand.	20.5	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-914
Depth: 40.6-42.1'
Sample Number: B-914-10
Material Description: Yellowish brown silty sand.
Date: 8/22/06
Natural Moisture: 20.5
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Specific gravity is assumed.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
348.80	0.00	0.00	.375	0.00	100.0
			#4	0.39	99.9
			#10	2.05	99.4
98.63	0.00	0.00	#20	1.69	97.7
			#40	10.28	89.1
			#60	32.34	66.8
			#140	65.79	33.1
			#200	73.33	25.5

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.4
Weight of hydrometer sample =98.63
Hygroscopic moisture correction:
Moist weight and tare = 25.41
Dry weight and tare = 25.29
Tare weight = 15.55
Hygroscopic moisture = 1.2%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.3	22.5	18.3	0.0132	23.5	12.4	0.0330	18.4
5.00	21.3	17.0	12.8	0.0132	18.0	13.3	0.0216	12.9
16.00	21.4	14.0	9.8	0.0132	15.0	13.8	0.0123	9.9
32.00	21.4	12.5	8.3	0.0132	13.5	14.1	0.0088	8.4
60.00	21.3	11.0	6.8	0.0132	12.0	14.3	0.0065	6.8
240.00	21.4	9.5	5.3	0.0132	10.5	14.6	0.0033	5.4
1454.00	21.8	7.5	3.4	0.0131	8.5	14.9	0.0013	3.5

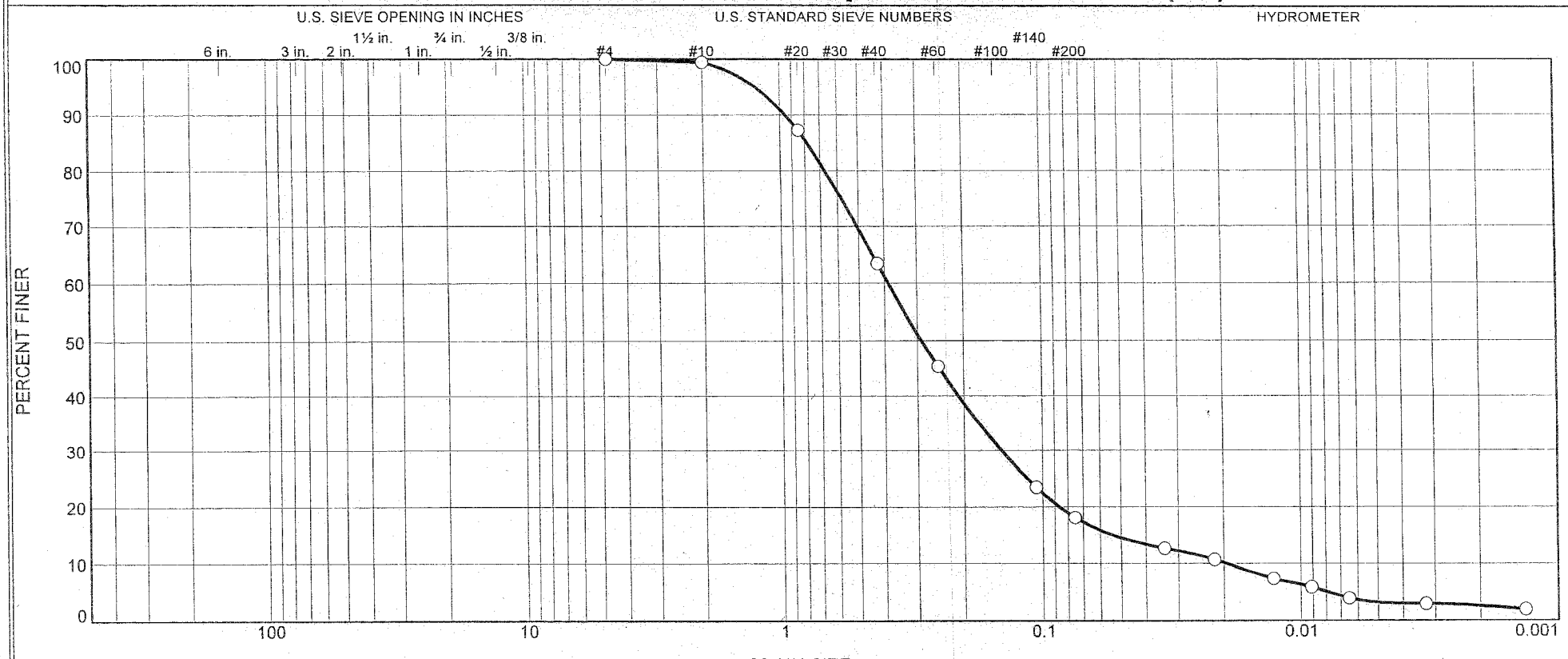
MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.5	10.3	63.6	74.4	19.5	6.0	25.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0127	0.0255	0.0392	0.0941	0.1711	0.2156	0.3331	0.3770	0.4394	0.5670

Fineness Modulus	C_u	C_c
0.86	17.01	3.24

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.6	36.0	45.3	15.0	3.1

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-917	B-917-13	48.5-53.5'	9-25-06	ND	Brownish to yellow silty sand.	ND	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
SPECIFIC GRAVITY IS ASSUMED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-917
Depth: 48.5-53.5'
Sample Number: B-917-13
Material Description: Brownish to yellow silty sand.
Date: 9-25-06
Natural Moisture: ND
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
SPECIFIC GRAVITY IS ASSUMED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
317.76	0.00	0.00	#4	0.00	100.0
			#10	1.80	99.4
101.33	0.00	0.00	#20	12.50	87.2
			#40	36.70	63.4
			#60	55.20	45.3
			#140	77.40	23.5
			#200	82.90	18.1

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.4
Weight of hydrometer sample =101.33
Hygroscopic moisture correction:
Moist weight and tare = 26.94
Dry weight and tare = 26.92
Tare weight = 15.40
Hygroscopic moisture =0.2%
Table of composite correction values:

Temp., deg. C:	12.8	29.5
Comp. corr.:	-5.0	-5.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.5	18.0	13.0	0.0132	19.0	13.2	0.0339	12.6
5.00	21.5	16.0	11.0	0.0132	17.0	13.5	0.0217	10.7
15.00	21.5	12.5	7.5	0.0132	13.5	14.1	0.0128	7.3
30.00	21.6	11.0	6.0	0.0132	12.0	14.3	0.0091	5.8
60.00	21.7	9.0	4.0	0.0132	10.0	14.7	0.0065	3.9
240.00	22.0	8.0	3.0	0.0131	9.0	14.8	0.0033	2.9
1440.00	22.0	7.0	2.0	0.0131	8.0	15.0	0.0013	1.9

MACTEC, Inc.

Fractional Components

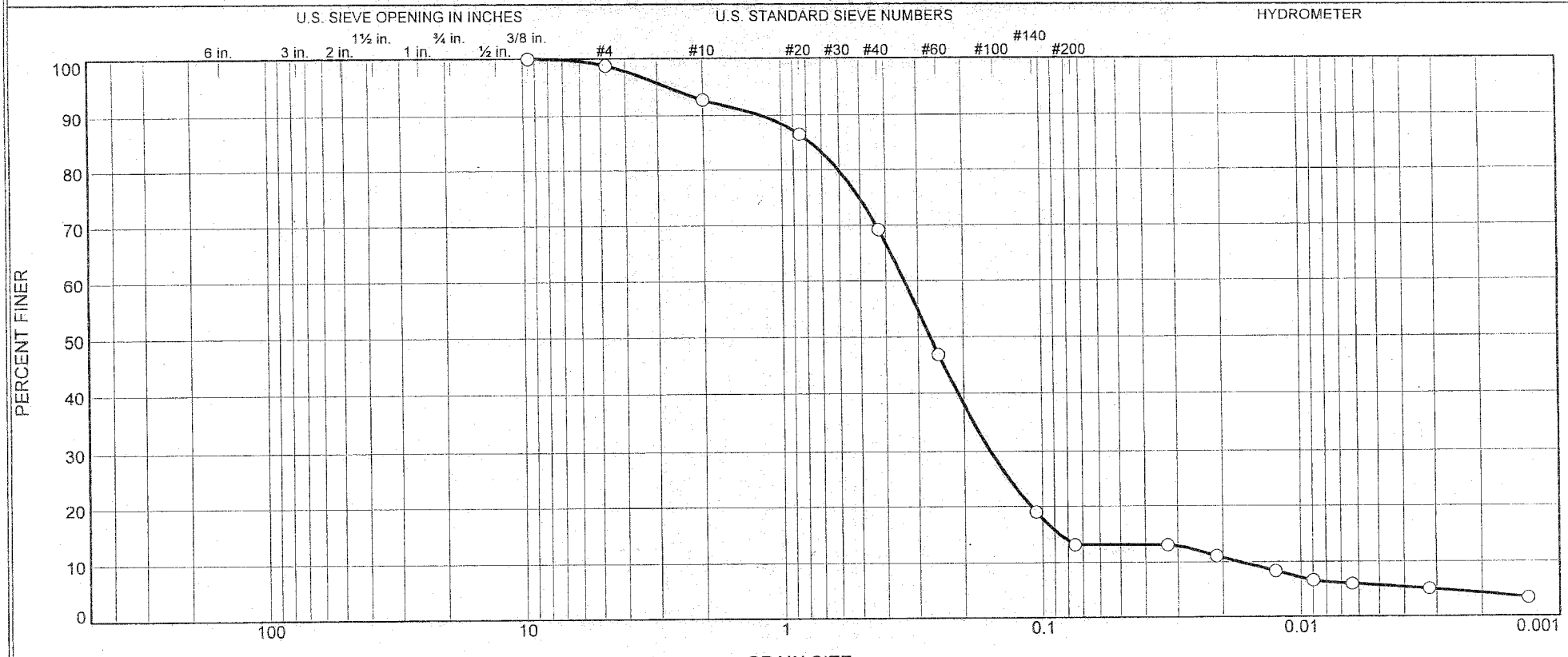
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.6	36.0	45.3	81.9	15.0	3.1	18.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0194	0.0542	0.0863	0.1440	0.2896	0.3868	0.6718	0.7869	0.9530	1.2465

Fineness Modulus	C_u	C_c
1.48	19.92	2.76

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.2	6.0	23.6	56.1	7.3	5.8

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-918	B-918-2	1.8-3.2'	9-20-06	ND	Brownish yellow silty sand.	15.8	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-918
Depth: 1.8-3.2'
Sample Number: B-918-2
Material Description: Brownish yellow silty sand.
Date: 9-20-06
Natural Moisture: 15.8
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
305.52	0.00	0.00	.375	0.00	100.0
			#4	3.70	98.8
138.61	0.00	0.00	#10	8.40	92.8
			#20	17.30	86.5
			#40	41.50	69.2
			#60	72.80	46.9
			#140	112.00	19.0
			#200	120.20	13.1

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =92.8
Weight of hydrometer sample =138.61
Hygroscopic moisture correction:
Moist weight and tare = 29.70
Dry weight and tare = 29.62
Tare weight = 15.46
Hygroscopic moisture =0.6%
Table of composite correction values:

Temp., deg. C:	12.8	29.5
Comp. corr.:	-5.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.6	23.0	19.6	0.0132	24.0	12.4	0.0328	13.0
5.00	21.6	20.0	16.6	0.0132	21.0	12.9	0.0211	11.0
15.00	21.6	16.0	12.6	0.0132	17.0	13.5	0.0125	8.4
30.00	21.7	13.5	10.1	0.0132	14.5	13.9	0.0090	6.7
60.00	21.8	12.5	9.1	0.0131	13.5	14.1	0.0064	6.1
240.00	22.2	11.0	7.7	0.0131	12.0	14.3	0.0032	5.1
1450.00	22.0	8.5	5.2	0.0131	9.5	14.7	0.0013	3.4

MACTEC, Inc.

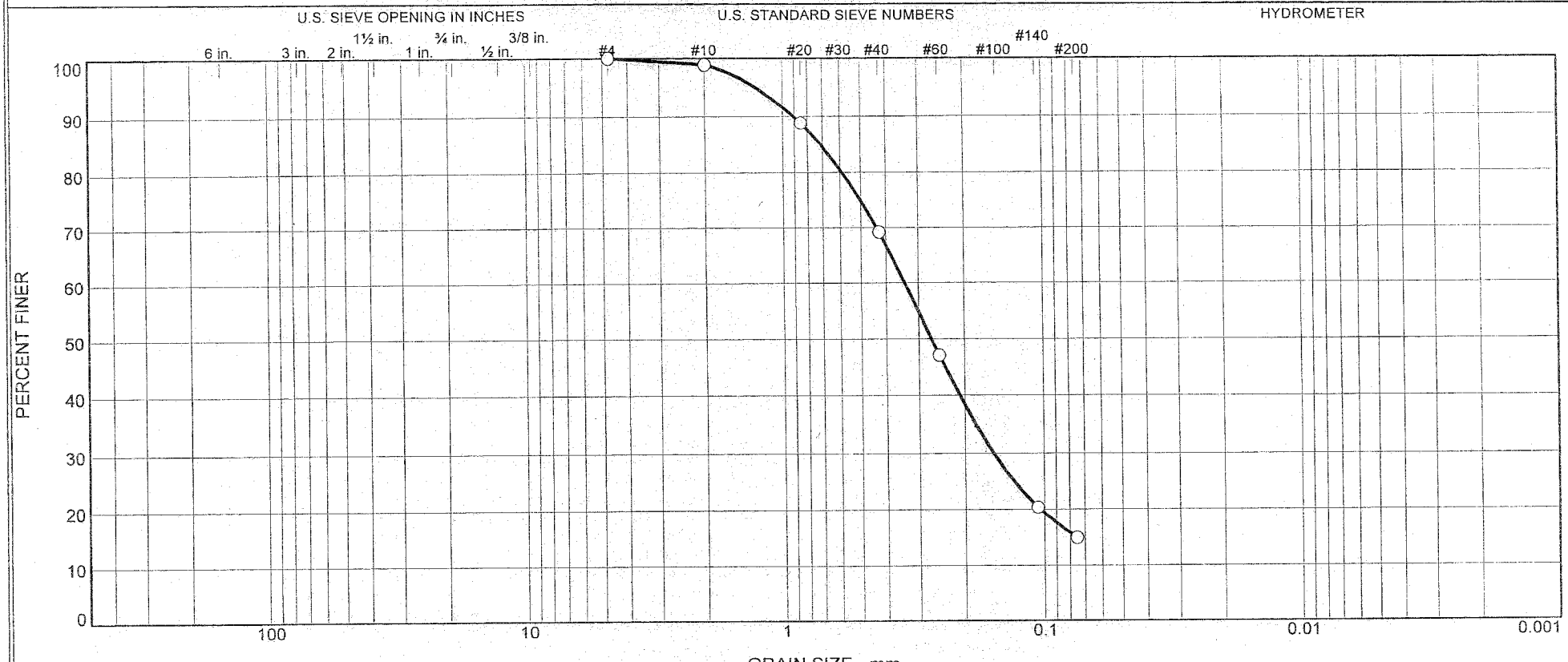
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.2	1.2	6.0	23.6	56.1	85.7	7.3	5.8	13.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0173	0.0866	0.1108	0.1585	0.2689	0.3384	0.6053	0.7730	1.2108	2.7260

Fineness Modulus	C_u	C_c
1.55	19.51	4.28

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.1	29.7	54.3	14.9	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-918	B-918-3	5-6.6'	9/20/06	ND	Brownish yellow silty sand.	13.3	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-918
Depth: 5-6.6'
Sample Number: B-918-3
Material Description: Brownish yellow silty sand.
Date: 9/20/06
Natural Moisture: 13.3
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
171.77	0.00	0.00	#4	0.00	100.0
			#10	1.91	98.9
85.02	0.00	0.00	#20	8.71	88.8
			#40	25.51	69.2
			#60	44.56	47.1
			#140	67.50	20.4
			#200	72.19	14.9

Fractional Components

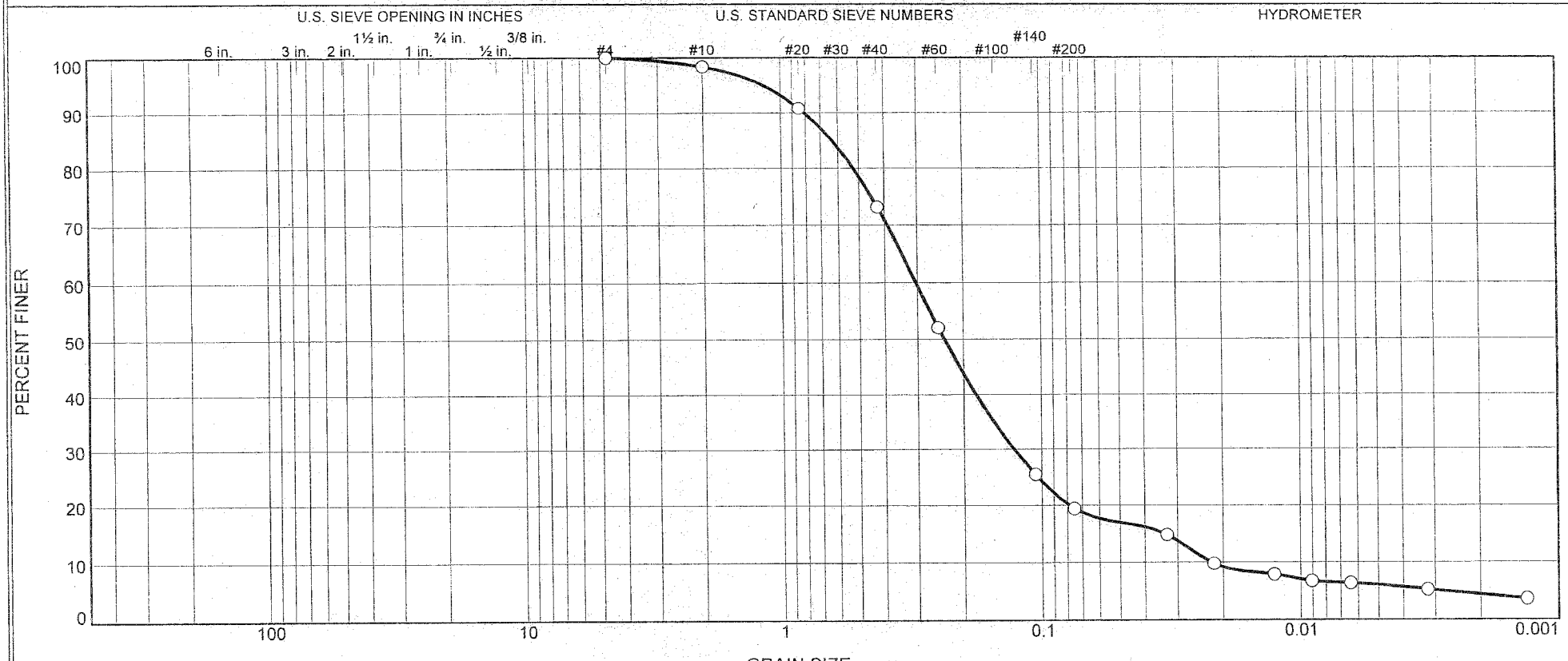
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.1	29.7	54.3	85.1			14.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0754	0.1039	0.1557	0.2683	0.3388	0.5891	0.7143	0.9074	1.2620

Fineness Modulus
1.43

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.7	25.1	53.8	13.4	6.0

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-918	B-918-4	9.-10.8	9-20-06	ND	Brownish yellow silty sand.	13.7	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-918
Depth: 9.-10.8 **Sample Number:** B-918-4
Material Description: Brownish yellow silty sand.
Date: 9-20-06 **Natural Moisture:** 13.7
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ **Checked by:** ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
355.30	0.00	0.00	#4	0.00	100.0
			#10	5.90	98.3
125.72	0.00	0.00	#20	9.60	90.8
			#40	32.10	73.2
			#60	59.10	52.1
			#140	93.20	25.4
			#200	100.90	19.4

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =98.3
Weight of hydrometer sample =125.72
Hygroscopic moisture correction:
Moist weight and tare = 28.22
Dry weight and tare = 28.17
Tare weight = 15.50
Hygroscopic moisture =0.4%
Table of composite correction values:

Temp., deg. C:	12.8	29.5
Comp. corr.:	-5.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.7	22.5	19.1	0.0132	23.5	12.4	0.0328	14.8
5.00	21.5	16.0	12.6	0.0132	17.0	13.5	0.0217	9.8
15.00	21.6	13.5	10.1	0.0132	14.5	13.9	0.0127	7.8
30.00	21.6	12.0	8.6	0.0132	13.0	14.2	0.0091	6.7
60.00	21.7	11.5	8.1	0.0132	12.5	14.2	0.0064	6.3
240.00	22.2	10.0	6.7	0.0131	11.0	14.5	0.0032	5.2
1455.00	22.0	8.0	4.7	0.0131	9.0	14.8	0.0013	3.6

MACTEC, Inc.

Fractional Components

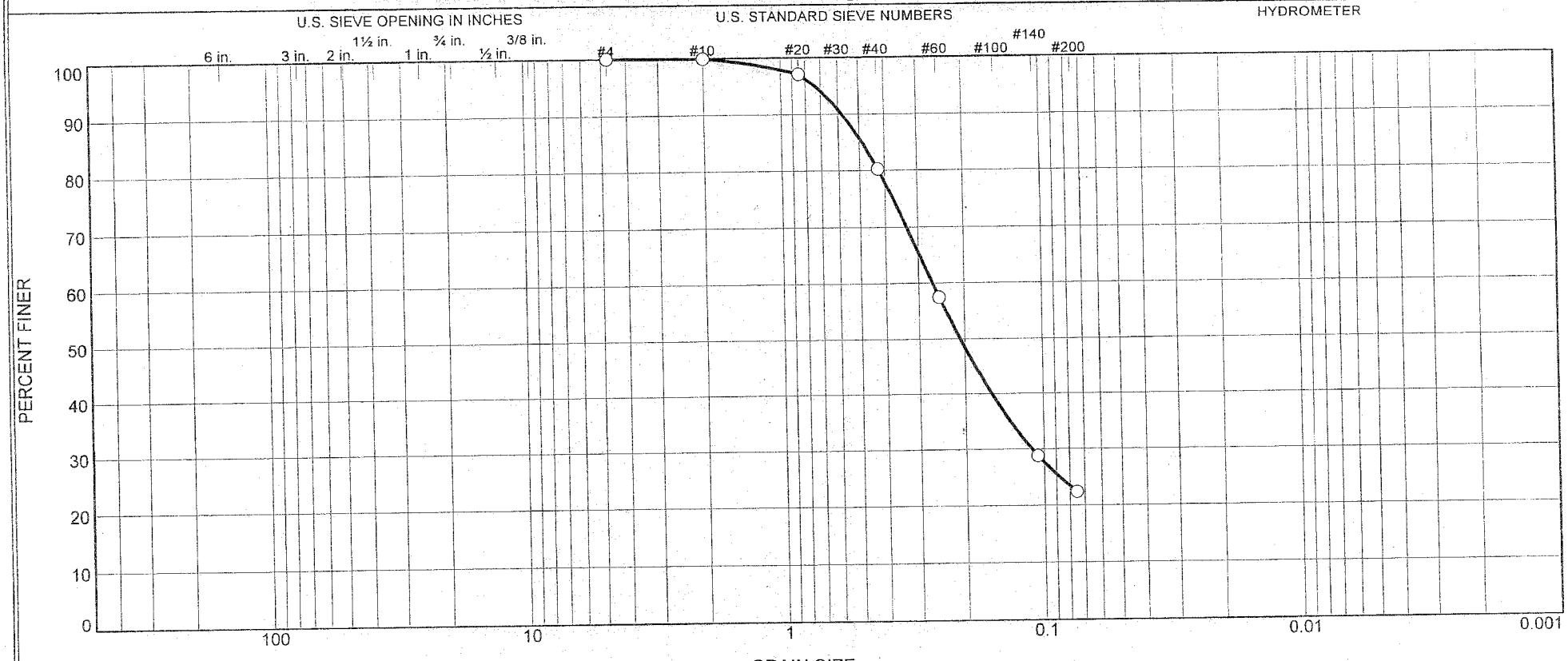
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.7	25.1	53.8	80.6	13.4	6.0	19.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0222	0.0334	0.0786	0.1279	0.2368	0.3036	0.5241	0.6337	0.8091	1.1757

Fineness Modulus	C_u	C_c
1.28	13.65	2.42

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	19.7	57.9	22.3	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-918	B-918-6	13.2-14.7	9-20-06	ND	Brownish yellow silty sand.	13.9	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-918
Depth: 13.2-14.7
Sample Number: B-918-6
Material Description: Brownish yellow silty sand.
Date: 9-20-06
Natural Moisture: 13.9
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
256.88	0.00	0.00	#4	0.00	100.0
			#10	0.30	99.9
130.00	0.00	0.00	#20	3.65	97.1
			#40	25.56	80.2
			#60	55.12	57.5
			#140	92.50	28.8
			#200	100.96	22.3

Fractional Components

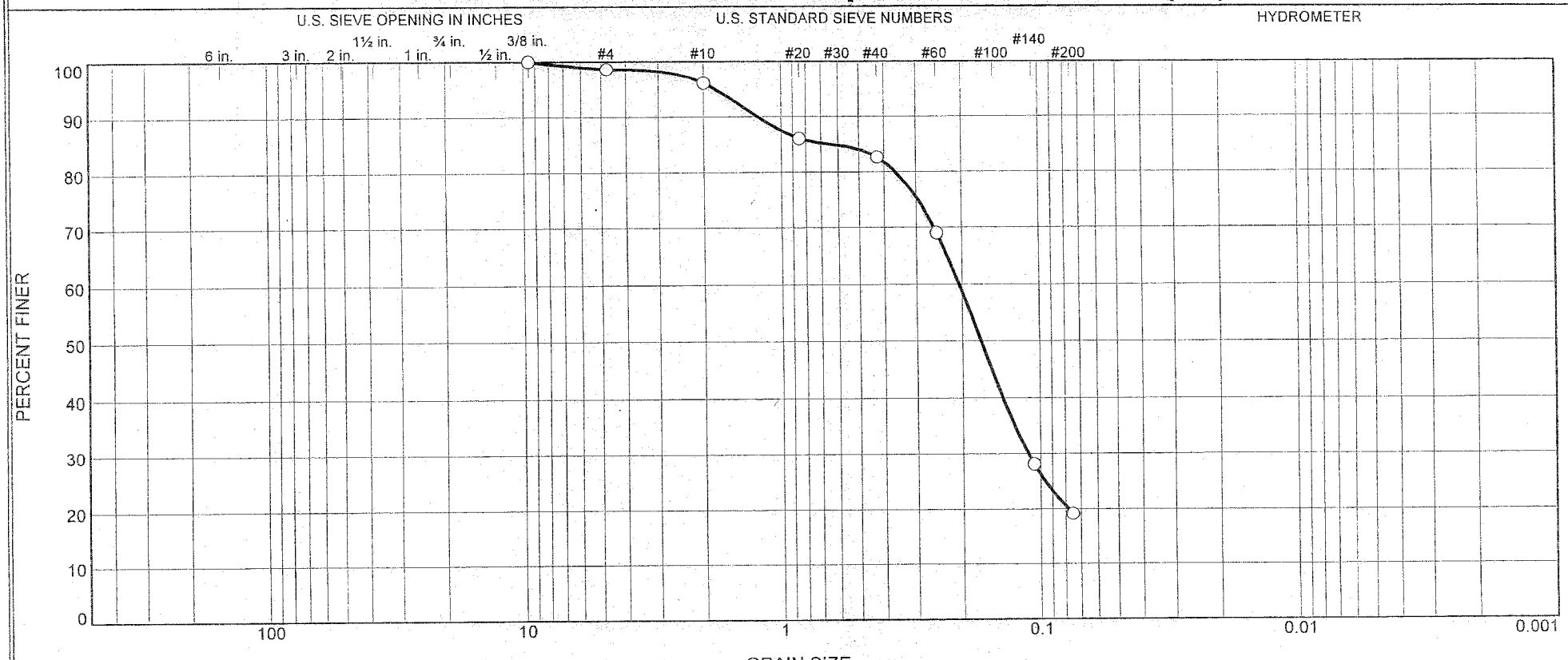
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	19.7	57.9	77.7			22.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1116	0.2083	0.2646	0.4222	0.4876	0.5809	0.7366

Fineness Modulus
1.07

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.4	2.6	13.4	63.4	19.2	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-918	B-918-8	22.4-23.9	9-20-06	ND	Brownish yellow silty sand.	17.8	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-918
Depth: 22.4-23.9
Sample Number: B-918-8
Material Description: Brownish yellow silty sand.
Date: 9-20-06
Natural Moisture: 17.8
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
249.31	0.00	0.00	.375	0.00	100.0
			#4	3.45	98.6
			#10	9.88	96.0
120.79	0.00	0.00	#20	12.64	86.0
			#40	16.89	82.6
			#60	33.94	69.1
			#140	85.46	28.1
			#200	96.66	19.2

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.4	1.4	2.6	13.4	63.4	79.4			19.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0779	0.1117	0.1693	0.2053	0.3604	0.6618	1.2354	1.8085

Fineness Modulus
1.11

MACTEC, Inc.

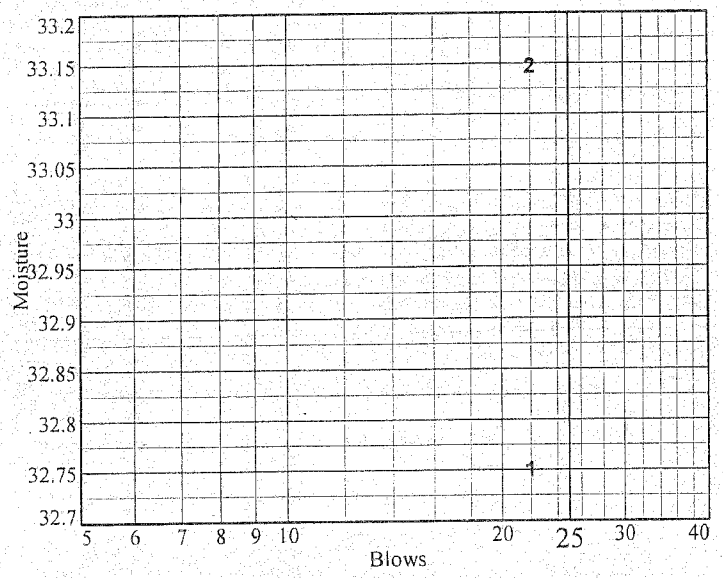
LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-919
Depth: 1.5-3.0'
Sample Number: B-919-1
Material Description: Brown sandy clay with silt.
%<#40: ND
%<#200: ND
USCS: ND
AASHTO: ND
Tested by: JPD
Checked by: ABS
Testing Remarks: ND= Not determined.
Natural moisture = 18.6%

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.84	25.07				
Dry+Tare	22.59	22.69				
Tare	15.72	15.51				
# Blows	22	22				
Moisture	32.8	33.1				



Liquid Limit= 32
Plastic Limit= 21
Plasticity Index= 11
Natural Moisture= 18.6
Liquidity Index= -0.2

Plastic Limit Data

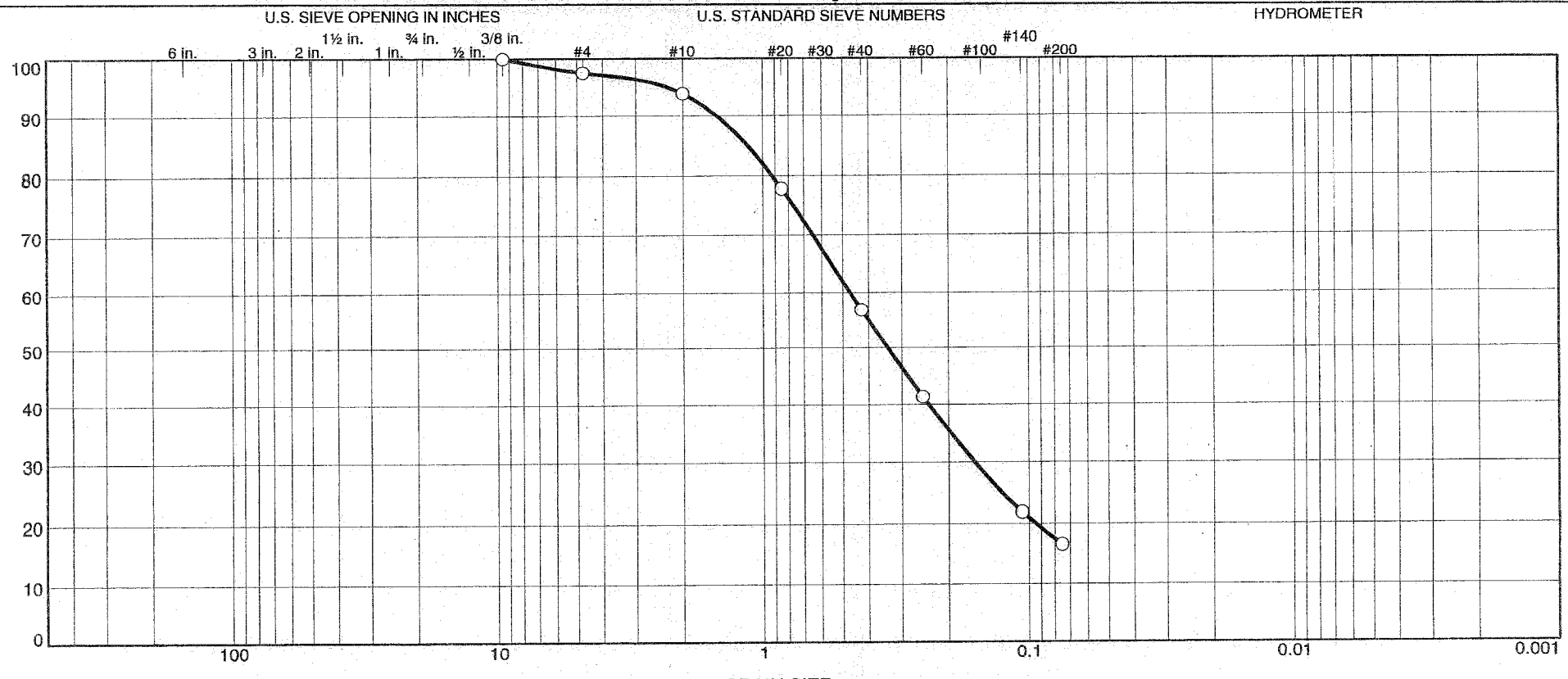
Run No.	1	2	3	4	
Wet+Tare	26.06	24.58			
Dry+Tare	24.23	22.99			
Tare	15.71	15.53			
Moisture	21.5	21.3			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
36.97	33.63	15.71	18.6

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.5	3.6	37.0	40.3	16.6	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-919	B-919-3	5.9-7.4'	9/13/06	ND	Brownish yellow silty sand.	11.1	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-919
Depth: 5.9-7.4' **Sample Number:** B-919
Material Description: Brownish yellow silty sand.
Date: 9/13/06 **Natural Moisture:** 11.1
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= Not determined.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
310.65	0.00	0.00	.375	0.00	100.0
			#4	7.83	97.5
			#10	19.00	93.9
110.83	0.00	0.00	#20	18.87	77.9
			#40	43.64	56.9
			#60	62.04	41.3
			#140	85.01	21.9
			#200	91.20	16.6

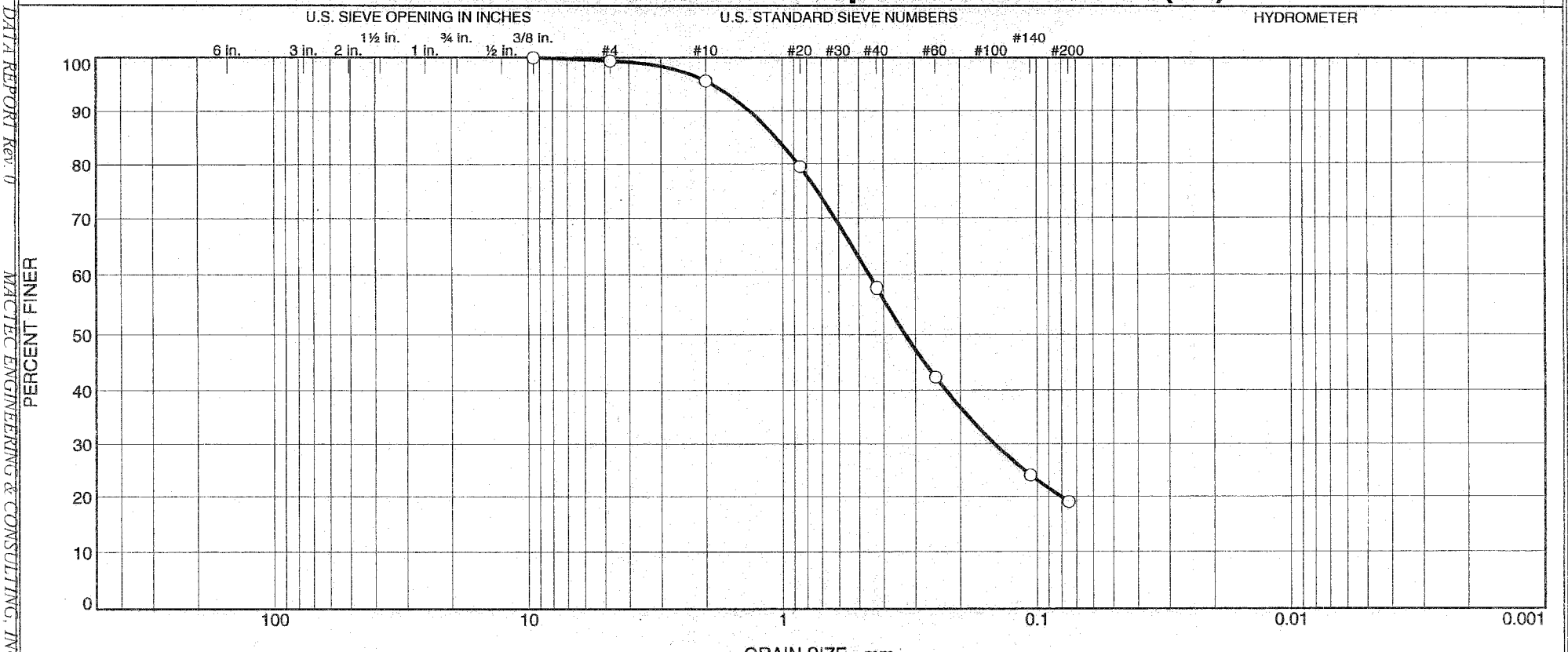
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.5	2.5	3.6	37.0	40.3	80.9			16.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0944	0.1594	0.3386	0.4690	0.9212	1.1399	1.4857	2.2821

Fineness Modulus
1.79

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.6	3.7	37.9	38.8	19.0	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-919	B-919-5	11.0-12.5'	9/13/06	ND	Brownish yellow silty sand.	11.2	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-919
Depth: 11.0-12.5' **Sample Number:** B-919-5
Material Description: Brownish yellow silty sand.
Date: 9/13/06 **Natural Moisture:** 11.2
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= Not determined.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
233.38	0.00	0.00	.375	0.00	100.0
			#4	1.40	99.4
			#10	10.00	95.7
96.22	0.00	0.00	#20	16.33	79.5
			#40	38.12	57.8
			#60	53.60	42.4
			#140	72.06	24.0
			#200	77.17	19.0

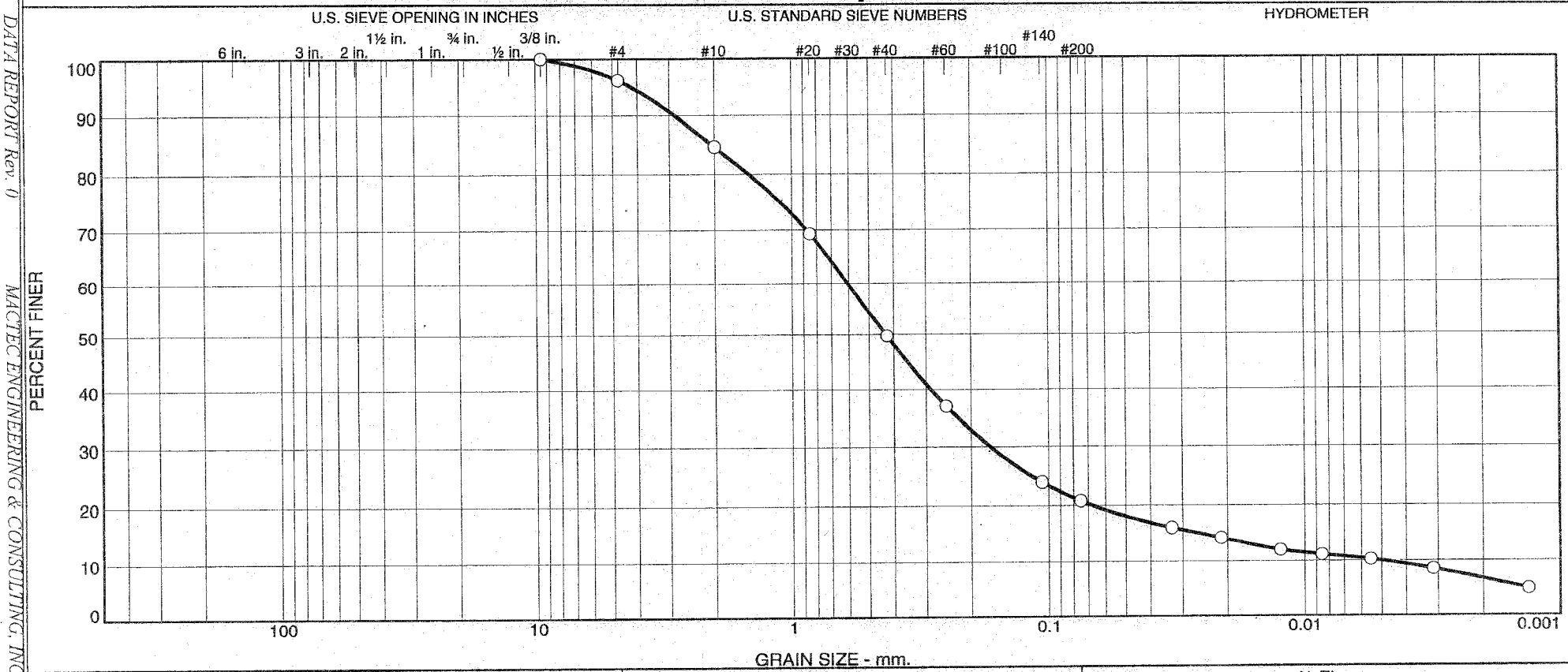
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.6	0.6	3.7	37.9	38.8	80.4			19.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0808	0.1470	0.3288	0.4555	0.8665	1.0562	1.3427	1.8735

Fineness Modulus
1.69

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	3.7	11.6	35.0	28.9	10.8	10.0

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-919	B-919-7	18.9-19.4'	9/13/06	ND	Brownish yellow silty sand contains gravel.	13.8	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-919
Depth: 18.9-19.4' **Sample Number:** B-919-7
Material Description: Brownish yellow silty sand contains gravel.
Date: 9/13/06 **Natural Moisture:** 13.8
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= Not determined.
Specific gravity is assumed.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
294.58	0.00	0.00	.375	0.00	100.0
			#4	11.02	96.3
			#10	45.11	84.7
95.66	0.00	0.00	#20	17.36	69.3
			#40	39.48	49.7
			#60	53.85	37.0
			#140	68.54	24.0
			#200	72.14	20.8

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 84.7
Weight of hydrometer sample =95.66
Hygroscopic moisture correction:
Moist weight and tare = 25.84
Dry weight and tare = 25.65
Tare weight = 15.54
Hygroscopic moisture = 1.9%
Table of composite correction values:

Temp., deg. C:	12.8	28.0
Comp. corr.:	-7.0	-2.5

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.2	22.5	18.0	0.0132	23.5	12.4	0.0330	16.0
5.00	21.2	20.5	16.0	0.0132	21.5	12.8	0.0212	14.3
15.00	21.2	18.0	13.5	0.0132	19.0	13.2	0.0124	12.0
32.00	21.3	17.0	12.5	0.0132	18.0	13.3	0.0085	11.2
78.00	21.3	16.0	11.5	0.0132	17.0	13.5	0.0055	10.3
247.00	21.4	14.0	9.5	0.0132	15.0	13.8	0.0031	8.5
1440.00	21.3	10.0	5.5	0.0132	11.0	14.5	0.0013	4.9

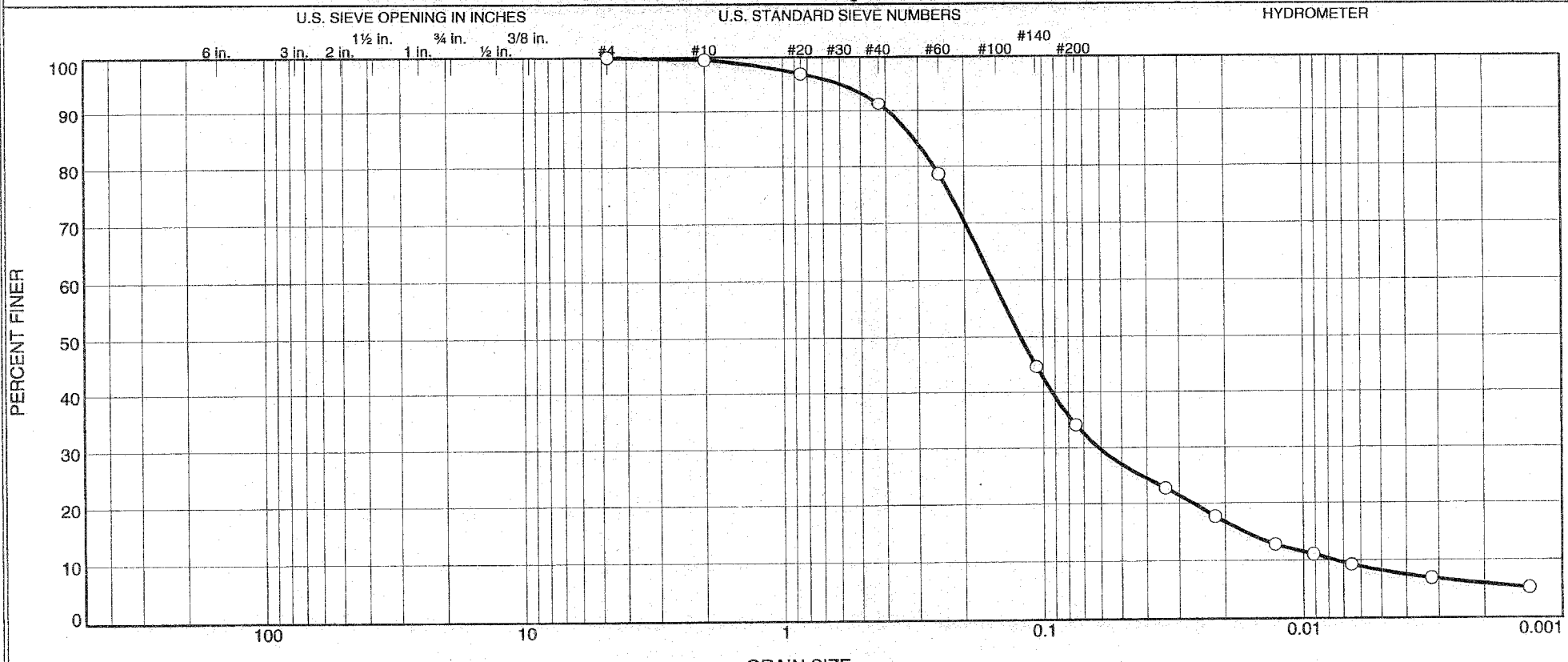
MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.7	3.7	11.6	35.0	28.9	75.5	10.8	10.0	20.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0050	0.0254	0.0673	0.1685	0.4291	0.6050	1.4724	2.0418	2.8480	4.1886

Fineness Modulus	C_u	C_c
2.11	122.17	9.48

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.4	8.2	57.3	26.0	8.1

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-919	B-919-13	51.3-52.8'	9/13/06	ND	Yellowish brown silty sand.	17.9	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-919
Depth: 51.3-52.8'
Sample Number: B-919-13
Material Description: Yellowish brown silty sand.
Date: 9/13/06
Natural Moisture: 17.9
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Specific gravity is assumed.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
338.90	0.00	0.00	#4	0.00	100.0
			#10	1.40	99.6
60.82	0.00	0.00	#20	1.55	97.0
			#40	5.01	91.4
			#60	12.83	78.6
			#140	33.54	44.7
			#200	39.99	34.1

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.6
Weight of hydrometer sample =60.82
Hygroscopic moisture correction:
Moist weight and tare = 26.03
Dry weight and tare = 25.64
Tare weight = 15.39
Hygroscopic moisture = 3.8%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.5

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.5	18.0	13.6	0.0132	19.0	13.2	0.0339	22.8
5.00	21.5	15.0	10.6	0.0132	16.0	13.7	0.0218	17.7
15.00	21.6	12.0	7.6	0.0132	13.0	14.2	0.0128	12.7
30.00	21.5	11.0	6.6	0.0132	12.0	14.3	0.0091	11.0
60.00	21.3	10.0	5.5	0.0132	11.0	14.5	0.0065	9.2
251.00	21.6	8.5	4.1	0.0132	9.5	14.7	0.0032	6.9
1445.00	21.7	7.5	3.1	0.0132	8.5	14.9	0.0013	5.2

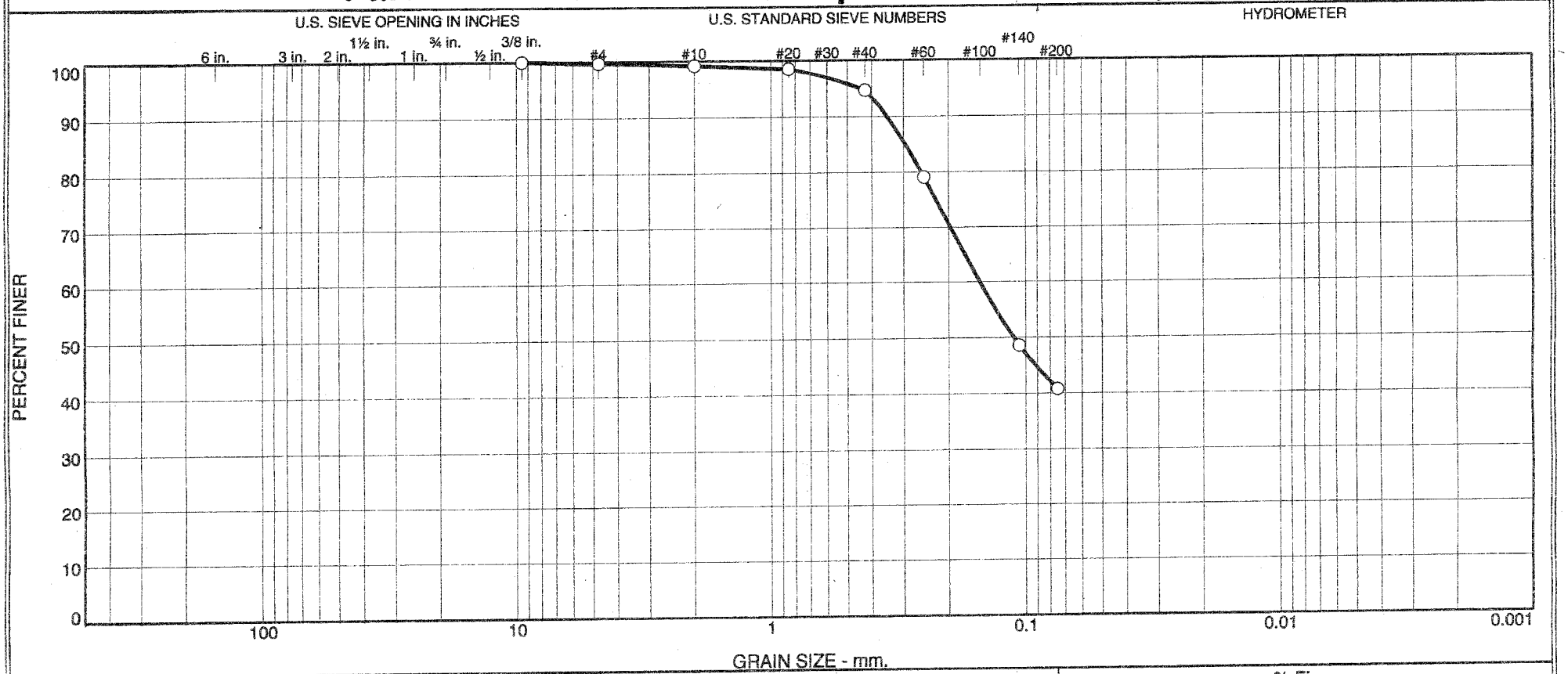
MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.4	8.2	57.3	65.9	26.0	8.1	34.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0075	0.0169	0.0265	0.0613	0.1219	0.1554	0.2612	0.3110	0.3913	0.5854

Fineness Modulus	C_u	C_c
0.64	20.66	3.22

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.5	4.5	53.9	40.8	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-920	B-920-3	6-7.5'	9/6/06	ND	Dark yellowish brown silty sand.	24.1	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/22/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-920
Depth: 6-7.5'
Sample Number: B-920-3
Material Description: Dark yellowish brown silty sand.
Date: 9/6/06
Natural Moisture: 24.1
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
198.68	0.00	0.00	.375	0.00	100.0
			#4	0.56	99.7
			#10	1.60	99.2
60.85	0.00	0.00	#20	0.39	98.6
			#40	2.78	94.7
			#60	12.33	79.1
			#140	31.02	48.6
			#200	35.82	40.8

Fractional Components

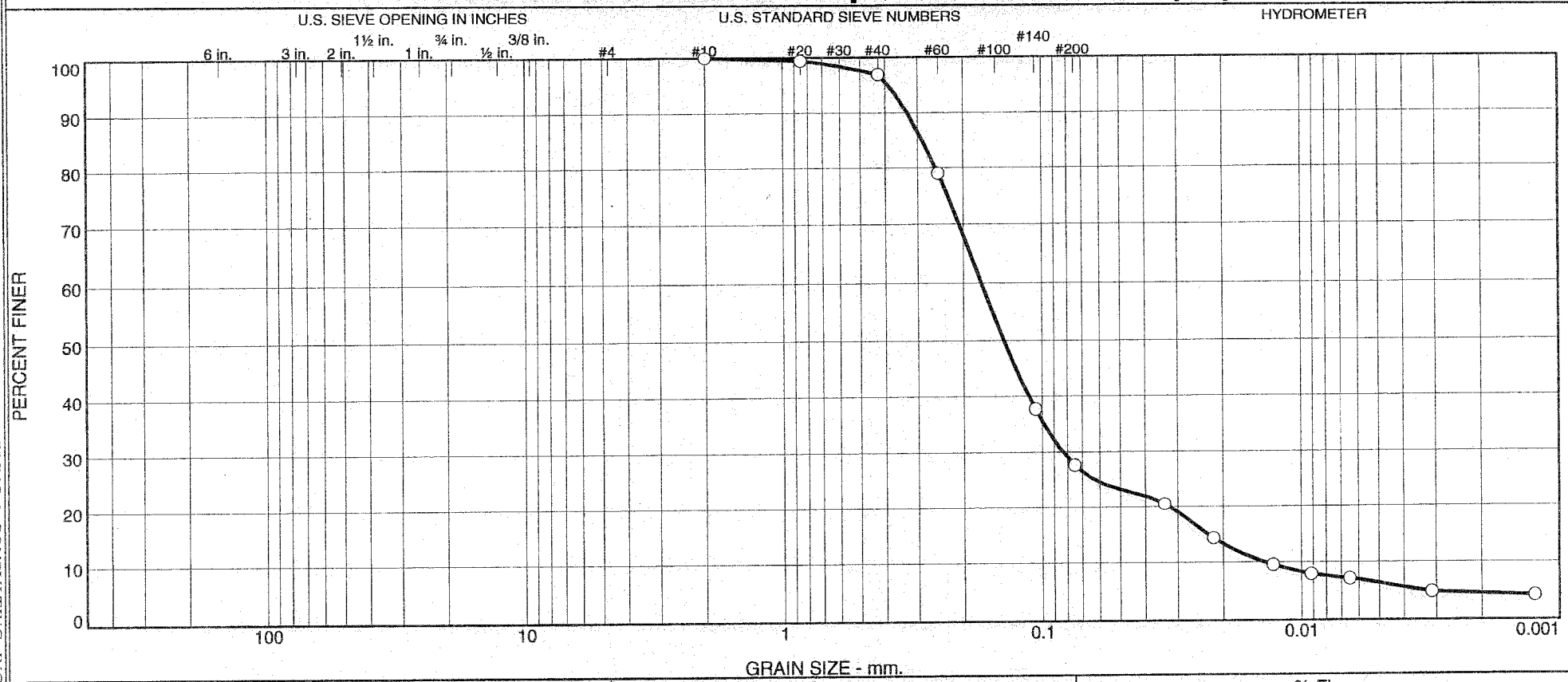
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	0.5	4.5	53.9	58.9			40.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1114	0.1509	0.2563	0.2956	0.3478	0.4441

Fineness Modulus
0.60

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	3.1	69.2	21.3	6.4

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-920	B-920-7	18.8-20.3'	9/6/06	ND	Olive silty sand.	15.4	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-920
Depth: 18.8-20.3' **Sample Number:** B-920-7
Material Description: Olive silty sand.
Date: 9/6/06 **Natural Moisture:** 15.4
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND= Not determined.
Specific gravity is assumed.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
273.72	0.00	0.00	#10	0.00	100.0
65.16	0.00	0.00	#20	0.40	99.4
			#40	2.00	96.9
			#60	13.71	79.0
			#140	40.56	37.8
			#200	47.12	27.7

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =65.16
Hygroscopic moisture correction:
Moist weight and tare = 26.84
Dry weight and tare = 26.50
Tare weight = 15.46
Hygroscopic moisture = 3.1%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.4	17.0	13.1	0.0131	18.0	13.3	0.0337	20.5
5.00	22.4	13.0	9.1	0.0131	14.0	14.0	0.0218	14.3
15.00	22.4	10.0	6.1	0.0131	11.0	14.5	0.0128	9.6
30.00	22.3	9.0	5.1	0.0131	10.0	14.7	0.0091	7.9
60.00	22.3	8.5	4.6	0.0131	9.5	14.7	0.0065	7.2
262.00	22.4	7.0	3.1	0.0131	8.0	15.0	0.0031	4.9
1642.00	22.7	6.5	2.7	0.0130	7.5	15.1	0.0012	4.2

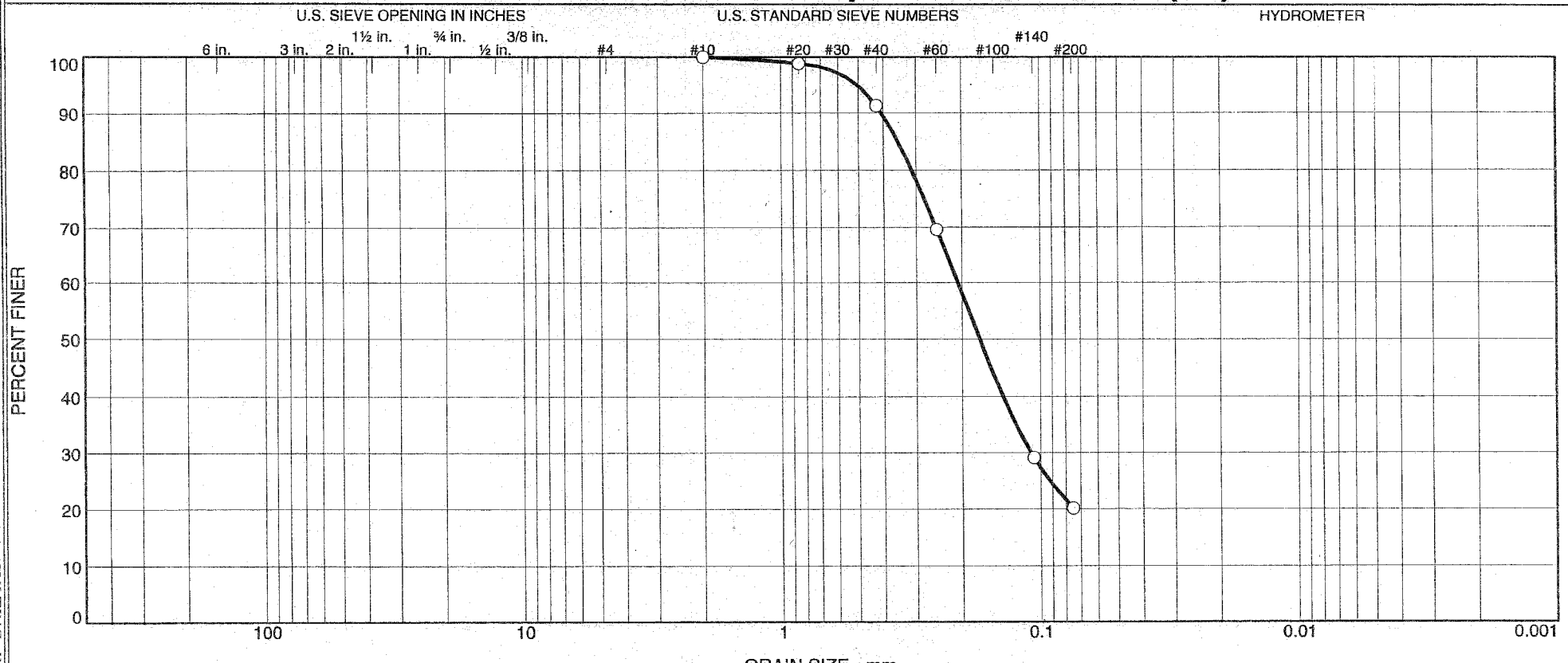
MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	3.1	69.2	72.3	21.3	6.4	27.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0138	0.0230	0.0323	0.0831	0.1400	0.1708	0.2558	0.2874	0.3283	0.3887

Fineness Modulus	C_u	C_c
0.62	12.38	2.93

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	8.7	71.2	20.1	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-920	B-920-9	27.3-28.8'	9/6/06	ND	Dark yellowish brown fine silty sand.	19.5	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=Not determined.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-920
Depth: 27.3-28.8'
Sample Number: B-920-9
Material Description: Dark yellowish brown fine silty sand.
Date: 9/6/06
Natural Moisture: 19.5
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=Not determined.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
265.34	0.00	0.00	#10	0.00	100.0
64.82	0.00	0.00	#20	0.75	98.8
			#40	5.65	91.3
			#60	19.71	69.6
			#140	45.94	29.1
			#200	51.79	20.1

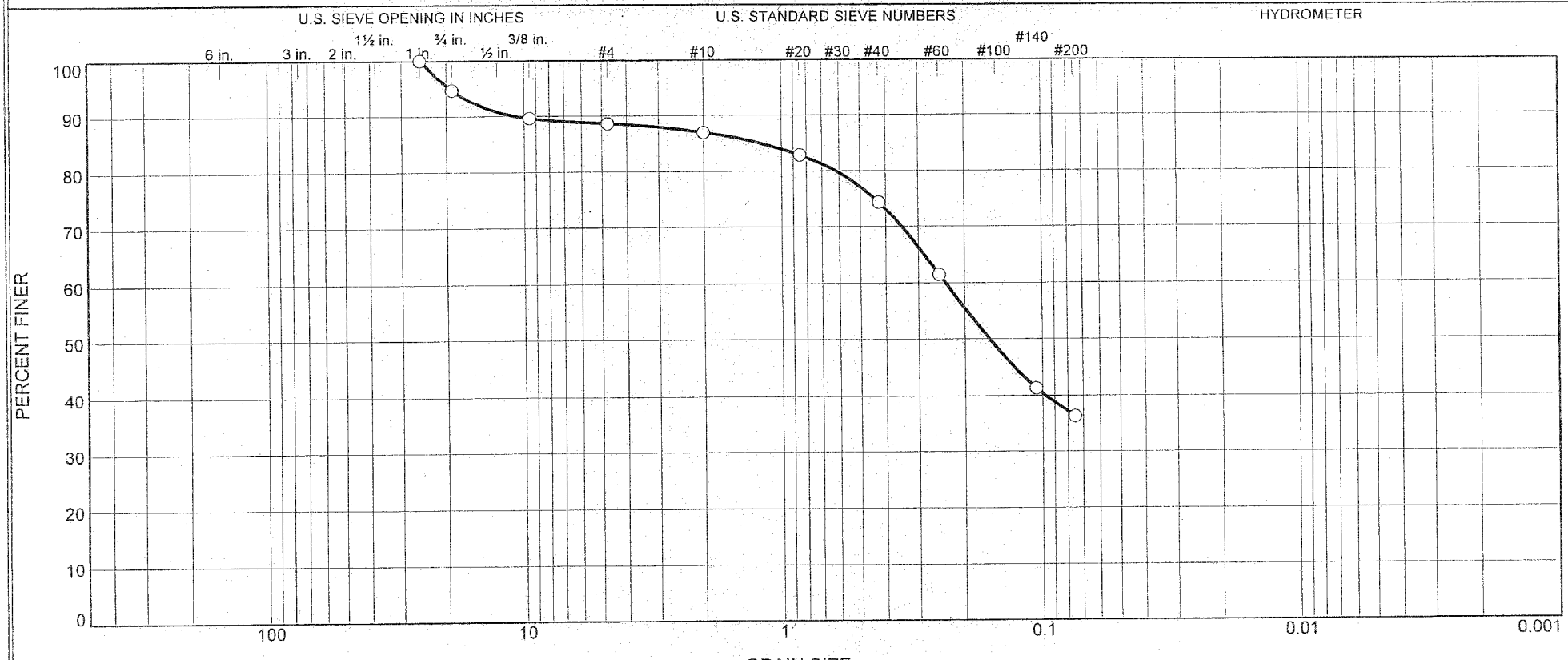
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	8.7	71.2	79.9			20.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1088	0.1711	0.2075	0.3113	0.3514	0.4064	0.5044

Fineness Modulus
0.82

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	5.2	6.3	1.6	12.4	38.1	36.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-921	B-921-1	1.5-3.0'	9/8/06	ND	Olive brown silty sand.	12.0	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= Not determined.
Entire sample was tested.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-921
Depth: 1.5-3.0'
Sample Number: B-921-1
Material Description: Olive brown silty sand.
Date: 9/8/06
Natural Moisture: 12.0
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= Not determined.
Entire sample was tested.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
225.54	0.00	0.00	1.0	0.00	100.0
			.75	11.75	94.8
			.375	23.55	89.6
			#4	25.83	88.5
			#10	29.58	86.9
101.63	0.00	0.00	#20	4.75	82.8
			#40	14.54	74.5
			#60	29.71	61.5
			#140	53.28	41.3
			#200	59.06	36.4

Fractional Components

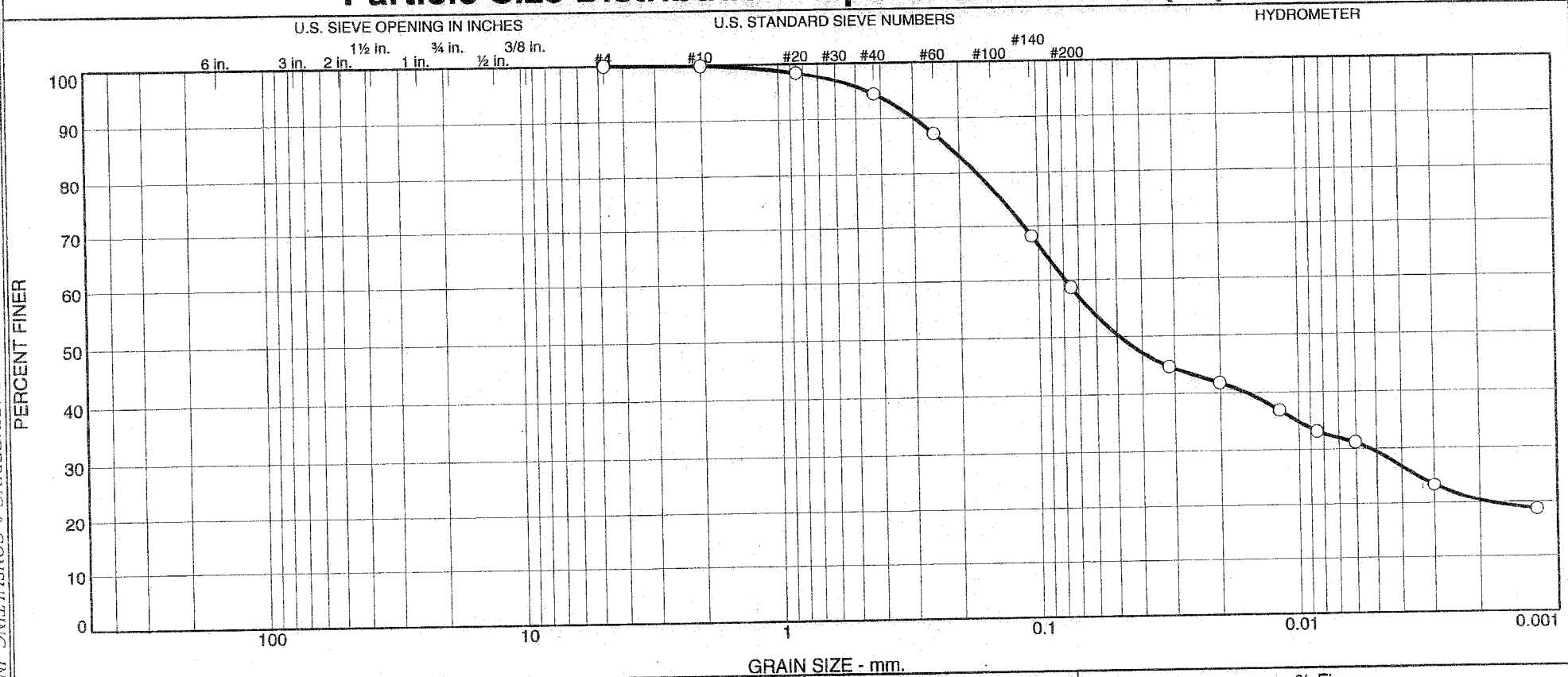
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	5.2	6.3	11.5	1.6	12.4	38.1	52.1			36.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1605	0.2365	0.6171	1.2227	10.9347	19.3109

Fineness Modulus
1.61

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	5.4	35.7	29.2	29.5

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-921	B-921-3	6.0-7.5'	9/8/06	CL	Olive sandy lean clay.	24.8	34	20

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ SPECIFIC GRAVITY IS ASSUMED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-921
Depth: 6.0-7.5'
Sample Number: B-921-3
Material Description: Olive sandy lean clay.
Date: 9/8/06
Natural Moisture: 24.8
Liquid Limit: 34
Plastic Limit: 20
USCS Class.: CL
Testing Remarks: SPECIFIC GRAVITY IS ASSUMED.
Tested by: JPD
Checked by: ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
190.60	0.00	0.00	#4	0.00	100.0
			#10	0.30	99.8
52.75	0.00	0.00	#20	0.75	98.4
			#40	2.88	94.4
			#60	6.64	87.3
			#140	16.71	68.2
			#200	21.73	58.7

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.8
Weight of hydrometer sample =52.75
Hygroscopic moisture correction:
Moist weight and tare = 30.16
Dry weight and tare = 29.71
Tare weight = 15.47
Hygroscopic moisture = 3.2%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.6	27.0	23.2	0.0130	28.0	11.7	0.0315	44.7
5.00	22.6	25.5	21.7	0.0130	26.5	11.9	0.0201	41.8
15.00	22.5	23.0	19.1	0.0130	24.0	12.4	0.0118	37.0
30.00	22.5	21.0	17.1	0.0130	22.0	12.7	0.0085	33.1
60.00	22.5	20.0	16.1	0.0130	21.0	12.9	0.0060	31.2
256.00	22.4	16.0	12.1	0.0131	17.0	13.5	0.0030	23.4
1635.00	22.7	13.5	9.7	0.0130	14.5	13.9	0.0012	18.7

MACTEC, Inc.

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.2	5.4	35.7	41.3	29.2	29.5	58.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0018	0.0053	0.0490	0.0788	0.1714	0.2199	0.2970	0.4539

Fineness Modulus
0.37

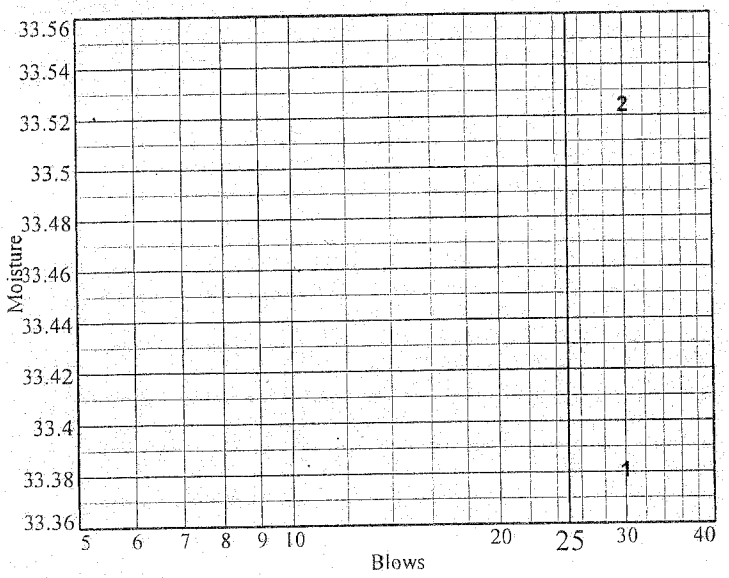
LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-921
Depth: 6.0-7.5'
Sample Number: B-921-3
Material Description: Olive sandy lean clay.
%<#40: 94.4
%<#200: 58.7
USCS: CL
AASHTO: A-6(6)
Tested by: JPD
Checked by: ABS

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.85	24.81				
Dry+Tare	22.51	22.47				
Tare	15.50	15.49				
# Blows	30	30				
Moisture	33.4	33.5				



Liquid Limit= 34
Plastic Limit= 20
Plasticity Index= 14
Natural Moisture= 24.8
Liquidity Index= 0.3

Plastic Limit Data

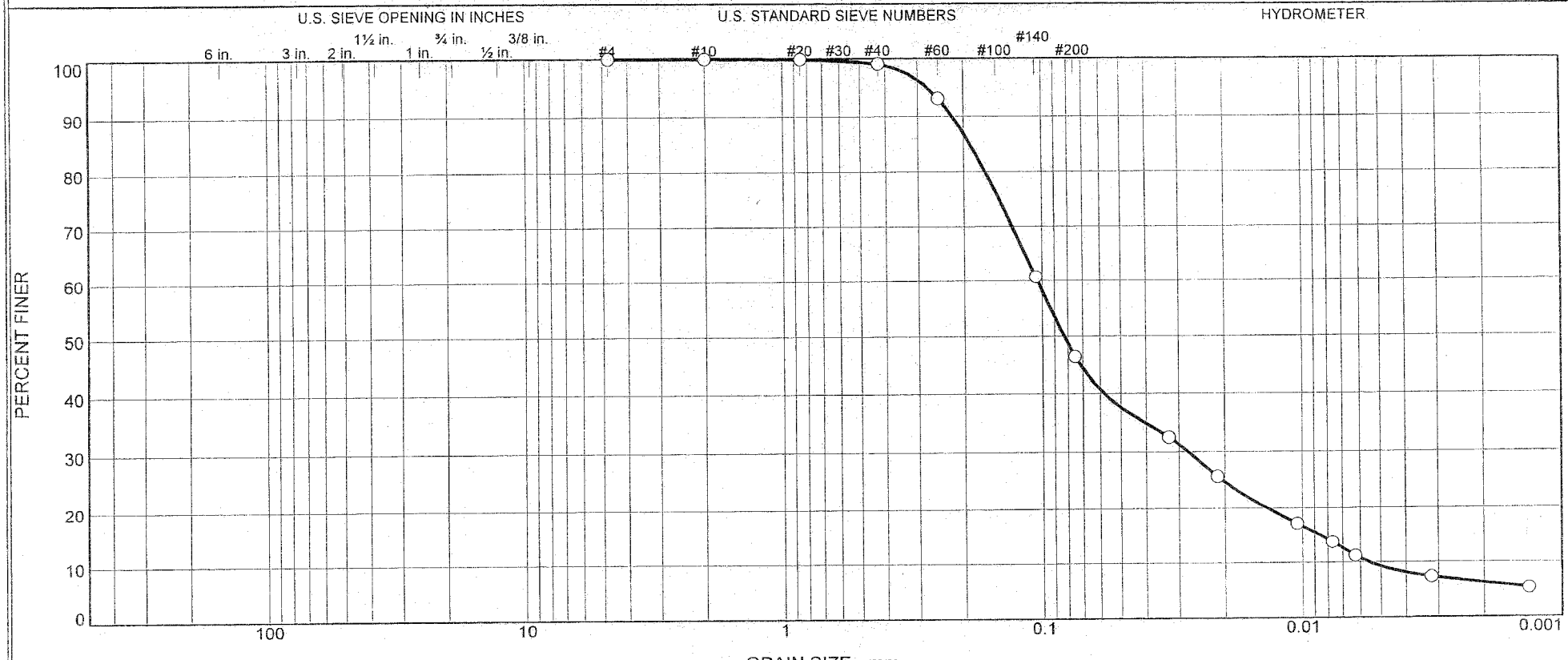
Run No.	1	2	3	4	
Wet+Tare	22.44	25.32			
Dry+Tare	21.28	23.68			
Tare	15.45	15.46			
Moisture	19.9	20.0			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
25.67	23.64	15.45	24.8

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.9	52.6	37.3	9.2

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-921	B-921-4	8.5-10'	9/08/06	ND	Olive yellow fine silty sand.	28.0	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-921
Depth: 8.5-10'
Sample Number: B-921-4
Material Description: Olive yellow fine silty sand.
Date: 9/08/06
Natural Moisture: 28.0
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
149.64	0.00	0.00	#4	0.00	100.0
			#10	0.04	100.0
60.52	0.00	0.00	#20	0.06	99.9
			#40	0.55	99.1
			#60	4.14	93.1
			#140	23.73	60.8
			#200	32.38	46.5

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =60.52
Hygroscopic moisture correction:
Moist weight and tare = 29.97
Dry weight and tare = 29.37
Tare weight = 15.48
Hygroscopic moisture =4.3%
Table of composite correction values:

Temp., deg. C:	12.6	27.1
Comp. corr.:	-7.5	-3.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.0	24.0	19.1	0.0133	25.0	12.2	0.0328	32.6
5.00	21.0	20.0	15.1	0.0133	21.0	12.9	0.0213	25.7
22.00	20.9	15.0	10.1	0.0133	16.0	13.7	0.0105	17.2
42.00	20.9	13.0	8.1	0.0133	14.0	14.0	0.0077	13.8
64.00	20.9	11.5	6.6	0.0133	12.5	14.2	0.0063	11.2
250.00	21.6	9.0	4.3	0.0132	10.0	14.7	0.0032	7.3
1447.00	21.0	8.0	3.1	0.0133	9.0	14.8	0.0013	5.3

MACTEC, Inc.

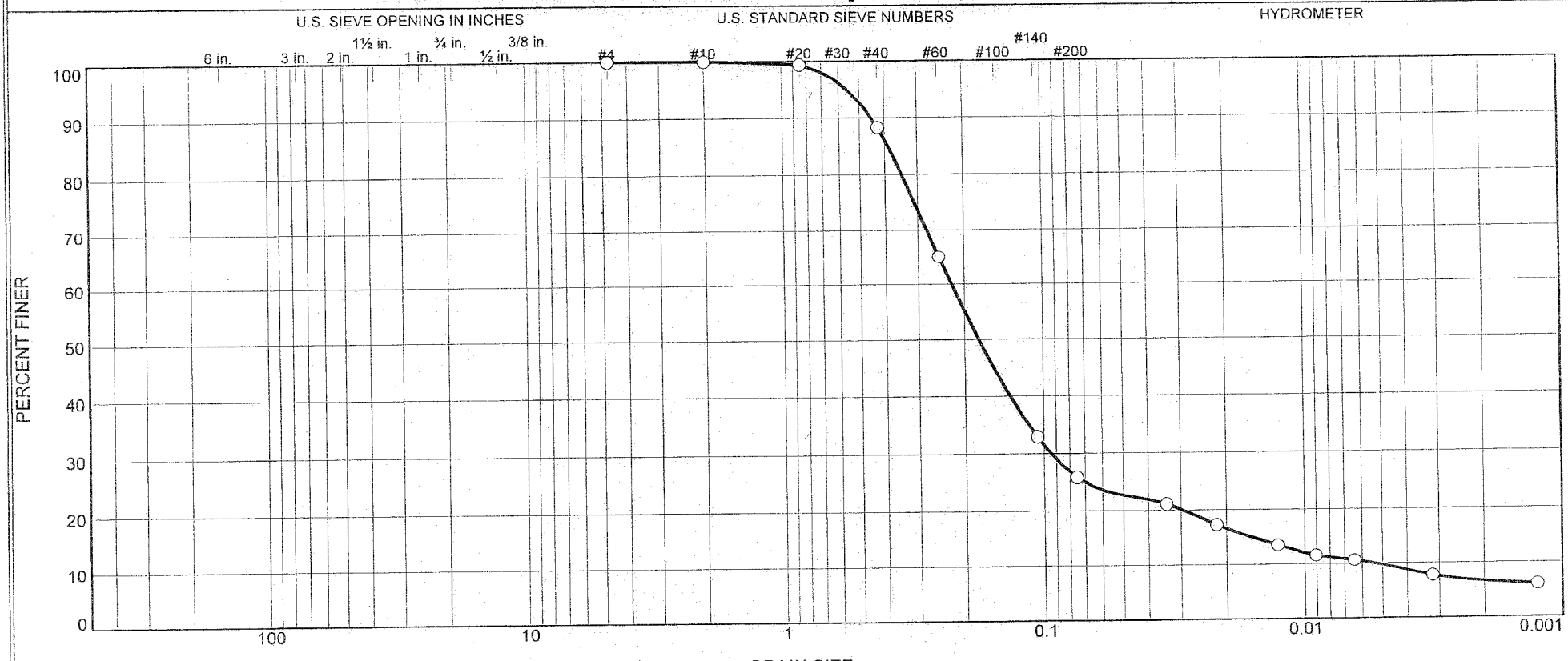
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.9	52.6	53.5	37.3	9.2	46.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0056	0.0085	0.0137	0.0276	0.0826	0.1042	0.1650	0.1887	0.2209	0.2750

Fineness Modulus	C_u	C_c
0.28	18.72	1.32

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	11.7	62.5	16.1	9.7

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-921	B-921-6	13.5-15'	9/08/06	ND	Olive yellow silty sand.	26.0	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED.
SPECIFIC GRAVITY IS ASSUMED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-921
Depth: 13.5-15'
Sample Number: B-921-6
Material Description: Olive yellow silty sand.
Date: 9/08/06
Natural Moisture: 26.0
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED.
SPECIFIC GRAVITY IS ASSUMED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
181.73	0.00	0.00	#4	0.00	100.0
			#10	0.07	100.0
55.54	0.00	0.00	#20	0.33	99.4
			#40	6.50	88.3
			#60	19.37	65.1
			#140	37.26	32.9
			#200	41.18	25.8

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =55.54
Hygroscopic moisture correction:
Moist weight and tare = 25.53
Dry weight and tare = 24.96
Tare weight = 15.50
Hygroscopic moisture =6.0%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.6	15.0	11.2	0.0130	16.0	13.7	0.0340	21.1
5.00	22.6	13.0	9.2	0.0130	14.0	14.0	0.0218	17.3
15.00	22.6	11.0	7.2	0.0130	12.0	14.3	0.0127	13.5
30.00	22.5	10.0	6.1	0.0130	11.0	14.5	0.0091	11.6
60.00	22.5	9.5	5.6	0.0130	10.5	14.6	0.0064	10.6
249.00	22.4	8.0	4.1	0.0131	9.0	14.8	0.0032	7.8
1630.00	22.7	7.0	3.2	0.0130	8.0	15.0	0.0012	6.0

MACTEC, Inc.

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	11.7	62.5	74.2	16.1	9.7	25.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0053	0.0160	0.0294	0.0941	0.1766	0.2236	0.3442	0.3883	0.4491	0.5552

Fineness Modulus	C_u	C_c
0.87	41.84	7.41

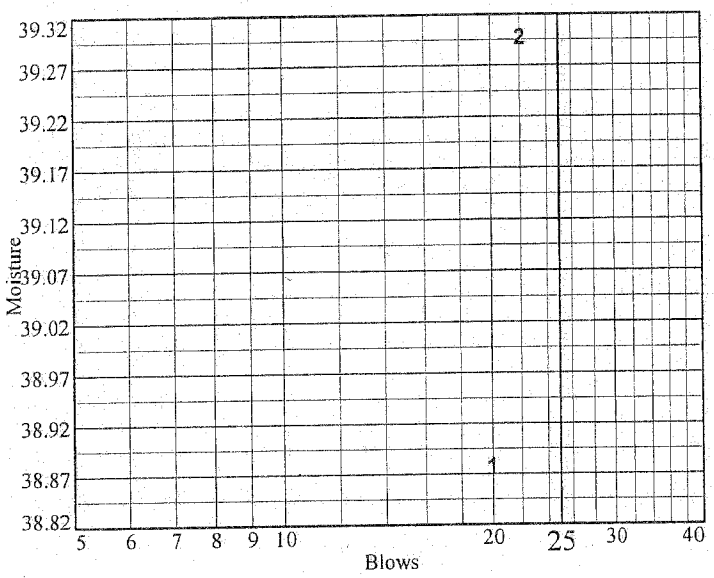
LIQUID AND PLASTIC LIMIT TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-921
Depth: 23.8-25.3'
Sample Number: B-921-8
Material Description: Olive yellow sandy silt.
Tested by: JPD
Checked by: ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.84	23.41				
Dry+Tare	20.76	21.17				
Tare	15.41	15.47				
# Blows	20	22				
Moisture	38.9	39.3				



Liquid Limit= 38
Plastic Limit= 39
Plasticity Index= NP
Natural Moisture= 32.1

Plastic Limit Data

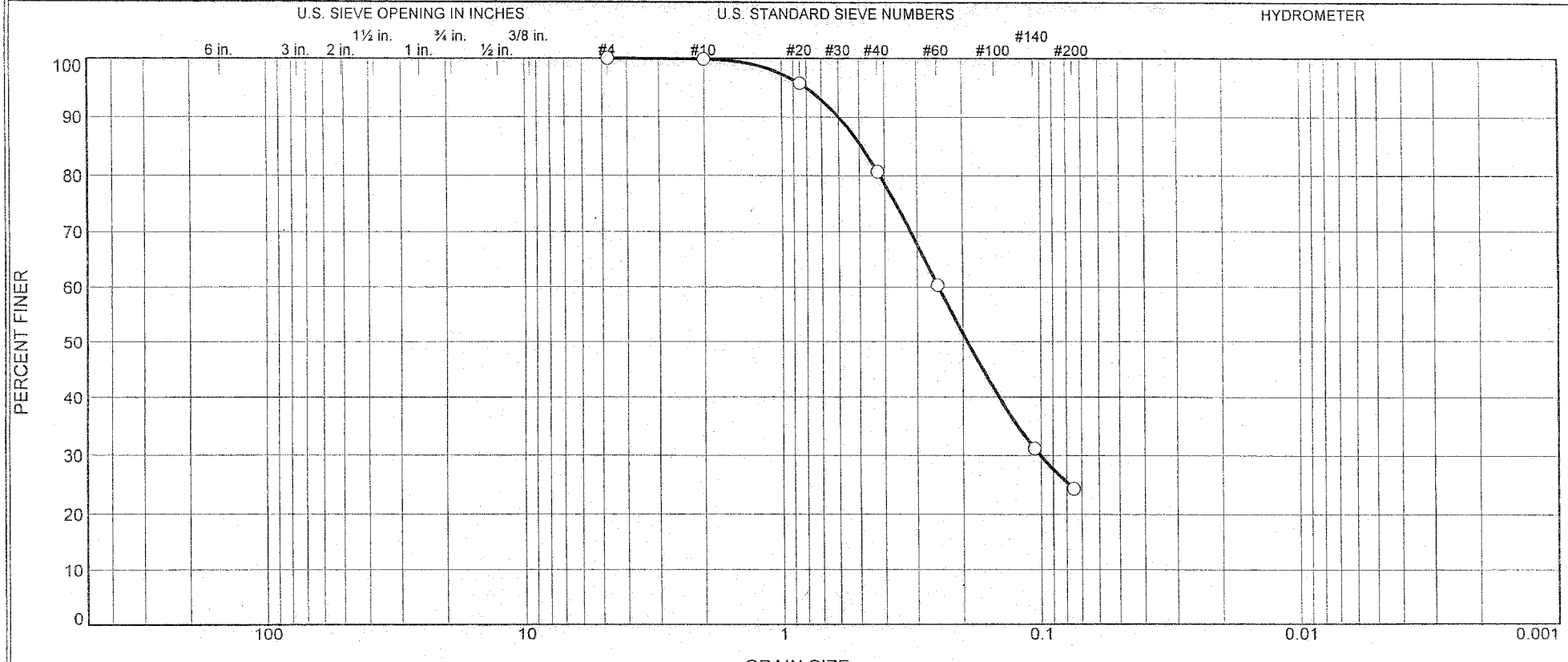
Run No.	1	2	3	4	
Wet+Tare	22.36	22.98			
Dry+Tare	20.43	20.93			
Tare	15.47	15.71			
Moisture	38.9	39.3			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
31.25	27.42	15.47	32.1

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	19.1	56.2	24.5	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-921	B-921-10	33.8-35.3'	9/08/06	ND	Olive yellow silty sand.	20.4	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND= NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.

Tested By: JPD **Checked By:** LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-921
Depth: 33.8-35.3'
Sample Number: B-921-10
Material Description: Olive yellow silty sand.
Date: 9/08/06
Natural Moisture: 20.4
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND= NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.
Tested by: JPD
Checked by: LBJ

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
197.75	0.00	0.00	#4	0.00	100.0
			#10	0.31	99.8
61.69	0.00	0.00	#20	2.56	95.7
			#40	11.82	80.7
			#60	24.40	60.4
			#140	42.41	31.2
			#200	46.57	24.5

Fractional Components

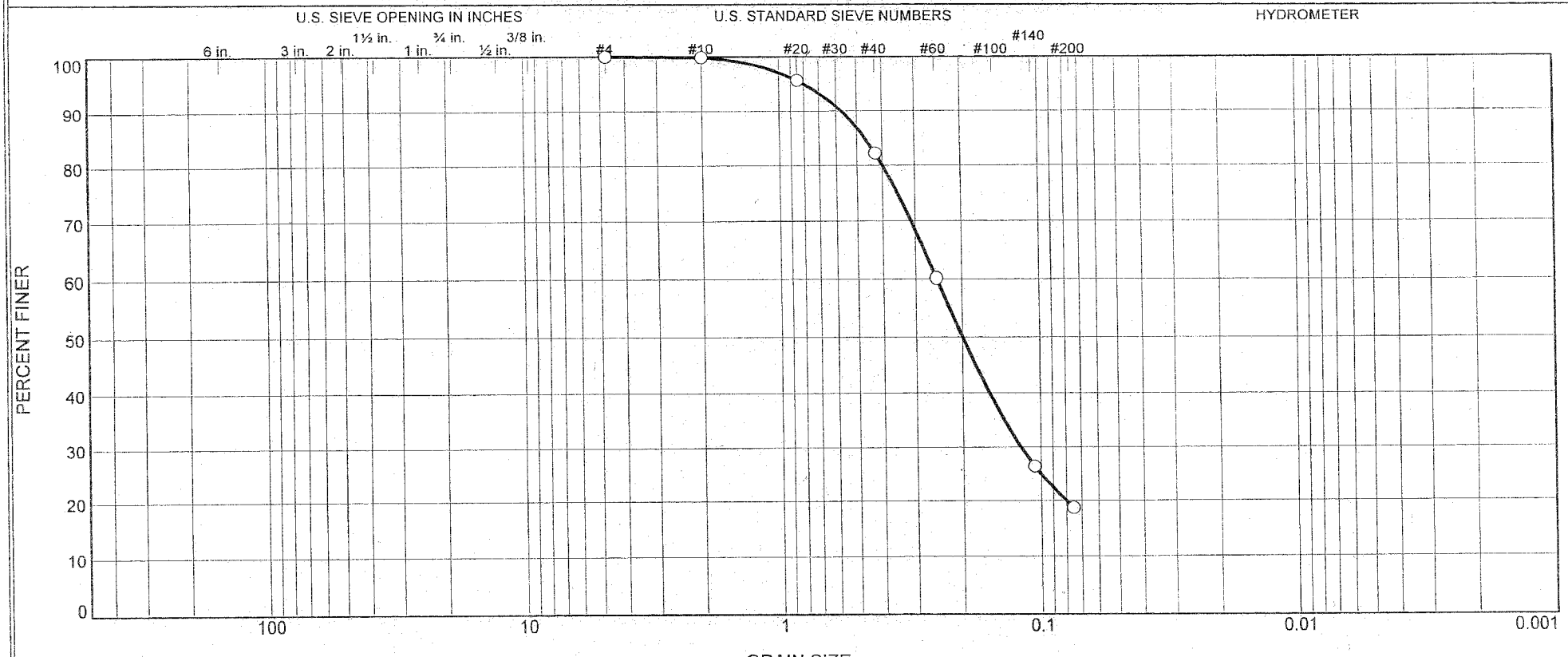
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.2	19.1	56.2	75.5			24.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1005	0.1922	0.2478	0.4159	0.4900	0.6013	0.8043

Fineness Modulus
1.03

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	17.7	63.5	18.7	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-921	B-921-11	38.8-40.3	9/08/06	ND	Very dark grayish brown fine silty sand.	15.8	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-921
Depth: 38.8-40.3
Sample Number: B-921-11
Material Description: Very dark grayish brown fine silty sand.
Date: 9/08/06
Natural Moisture: 15.8
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ENTIRE SAMPLE WAS TESTED.
ND=NOT DETERMINED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
190.67	0.00	0.00	#4	0.00	100.0
			#10	0.26	99.9
84.21	0.00	0.00	#20	3.59	95.6
			#40	14.86	82.2
			#60	33.46	60.2
			#140	61.91	26.4
			#200	68.43	18.7

Fractional Components

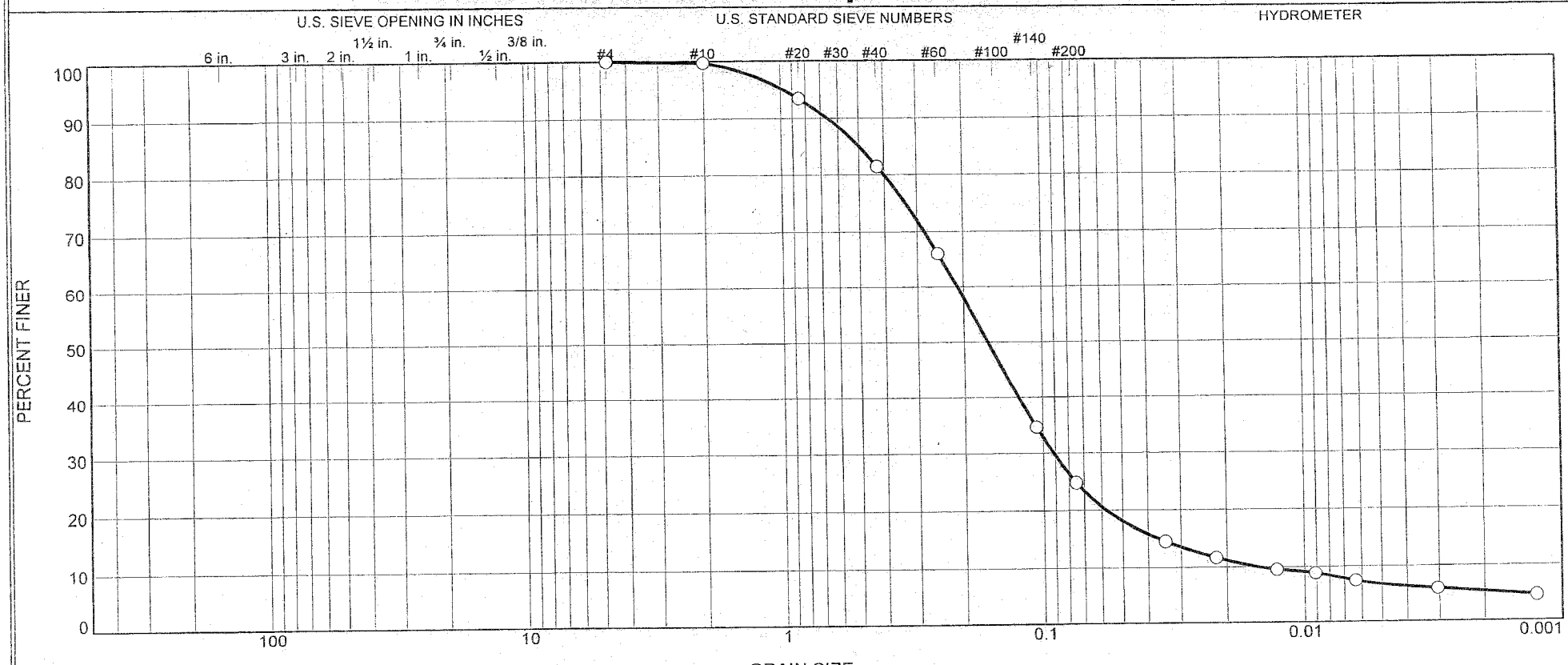
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	17.7	63.5	81.3			18.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0800	0.1195	0.1995	0.2490	0.3981	0.4652	0.5733	0.8019

Fineness Modulus
1.05

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.3	18.2	56.6	18.2	6.7

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-921	B-921-16	63.8-65.3'	9/08/06	ND	Black to brown silty sand.	8.5	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-921
Depth: 63.8-65.3'
Sample Number: B-921-16
Material Description: Black to brown silty sand.
Date: 9/08/06
Natural Moisture: 8.5
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
259.03	0.00	0.00	#4	0.00	100.0
			#10	0.79	99.7
70.31	0.00	0.00	#20	4.38	93.5
			#40	12.85	81.5
			#60	23.67	66.1
			#140	45.88	34.6
			#200	52.77	24.9

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.7
Weight of hydrometer sample =70.31
Hygroscopic moisture correction:
Moist weight and tare = 31.90
Dry weight and tare = 31.49
Tare weight = 15.50
Hygroscopic moisture =2.6%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.4	14.0	10.1	0.0131	15.0	13.8	0.0343	14.5
5.00	22.4	12.0	8.1	0.0131	13.0	14.2	0.0220	11.7
15.00	22.4	10.5	6.6	0.0131	11.5	14.4	0.0128	9.5
30.00	22.4	10.0	6.1	0.0131	11.0	14.5	0.0091	8.8
62.00	22.5	9.0	5.1	0.0130	10.0	14.7	0.0063	7.4
273.00	22.3	8.0	4.1	0.0131	9.0	14.8	0.0030	5.9
1609.00	22.7	7.0	3.2	0.0130	8.0	15.0	0.0013	4.6

MACTEC, Inc.

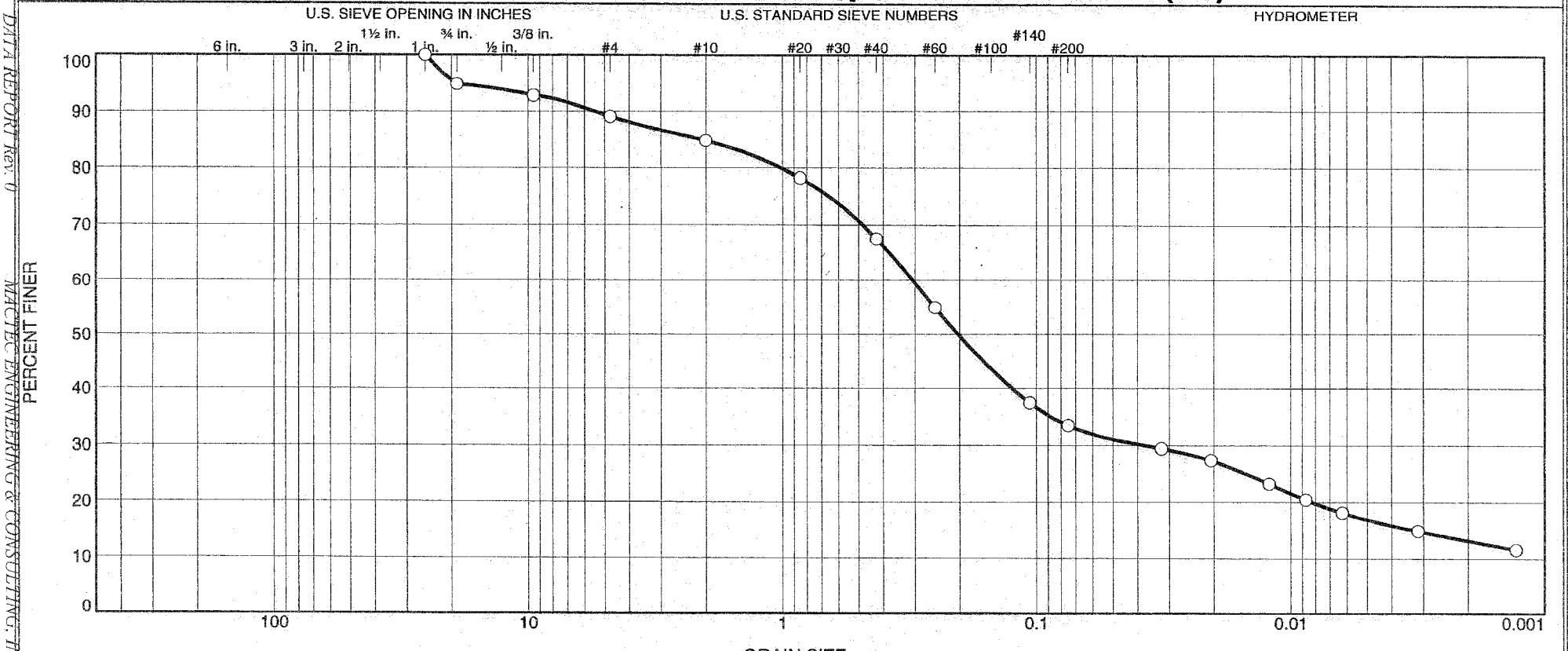
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.3	18.2	56.6	75.1	18.2	6.7	24.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0152	0.0365	0.0579	0.0913	0.1618	0.2106	0.3998	0.4992	0.6601	0.9725

Fineness Modulus	C_u	C_c
0.96	13.87	2.61

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	5.2	5.7	4.3	17.2	34.0	16.7	16.9

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-923	B-923-2	3.3-4.8'	8/29/06	SC	Reddish brown clayey sand contains gravel.	22.5	33	23

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ Specific gravity is assumed.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/23/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-923
Depth: 3.3-4.8' **Sample Number:** B-923-2
Material Description: Reddish brown clayey sand contains gravel.
Date: 8/29/06 **Natural Moisture:** 22.5
Liquid Limit: 33 **Plastic Limit:** 23 **USCS Class.:** SC
Testing Remarks: Specific gravity is assumed.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
236.71	0.00	0.00	1	0.00	100.0
			.75	12.21	94.8
			.375	16.93	92.8
			#4	25.87	89.1
			#10	36.02	84.8
61.72	0.00	0.00	#20	4.78	78.2
			#40	12.51	67.6
			#60	21.72	54.9
			#140	34.43	37.5
			#200	37.28	33.6

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 84.8
Weight of hydrometer sample =61.72
Hygroscopic moisture correction:
Moist weight and tare = 28.23
Dry weight and tare = 28.03
Tare weight = 15.41
Hygroscopic moisture = 1.6%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

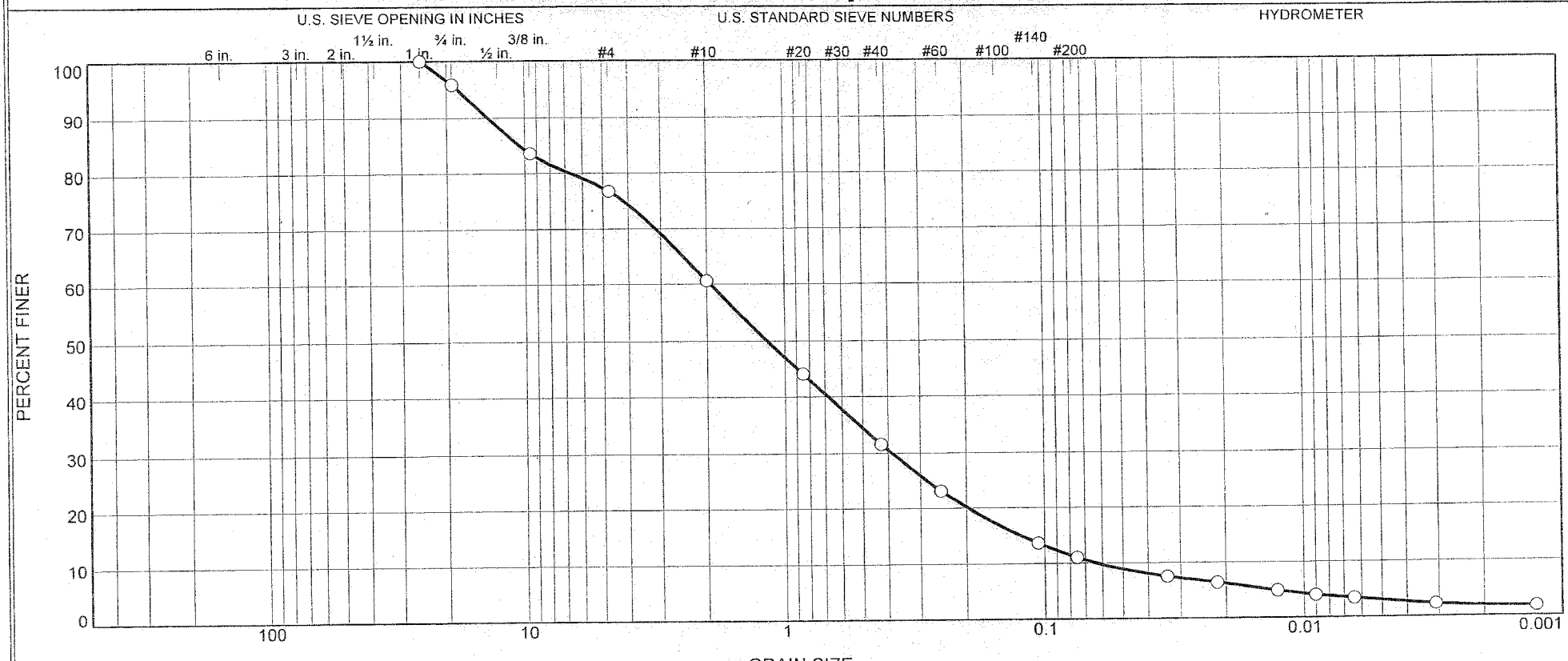
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.7	25.5	21.4	0.0132	26.5	11.9	0.0322	29.5
5.00	21.7	24.0	19.9	0.0132	25.0	12.2	0.0206	27.5
15.00	21.6	21.0	16.9	0.0132	22.0	12.7	0.0121	23.3
30.00	21.4	19.0	14.8	0.0132	20.0	13.0	0.0087	20.4
60.00	20.9	17.5	13.2	0.0133	18.5	13.3	0.0062	18.1
240.00	21.5	15.0	10.8	0.0132	16.0	13.7	0.0031	15.0
1450.00	21.8	12.5	8.4	0.0131	13.5	14.1	0.0013	11.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	5.2	5.7	10.9	4.3	17.2	34.0	55.5	16.7	16.9	33.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0032	0.0082	0.0370	0.2032	0.3065	1.0137	2.0869	5.4672	19.2808

Fineness Modulus
1.80

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	4.1	19.1	16.2	29.0	20.6	7.9	3.1

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-924	B-924-2	3.5-5'	8/01/06	ND	Gray silty sand with gravel.	2.1	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-924
Depth: 3.5-5'
Sample Number: B-924-2
Material Description: Gray silty sand with gravel.
Date: 8/01/06
Natural Moisture: 2.1
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
276.02	0.00	0.00	1.0	0.00	100.0
			.75	11.43	95.9
			.375	45.49	83.5
			#4	64.03	76.8
			#10	108.75	60.6
106.05	0.00	0.00	#20	28.90	44.1
			#40	50.71	31.6
			#60	65.50	23.2
			#140	82.17	13.6
			#200	86.77	11.0

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =60.6
Weight of hydrometer sample =106.05
Hygroscopic moisture correction:
Moist weight and tare = 25.78
Dry weight and tare = 25.57
Tare weight = 15.48
Hygroscopic moisture =2.1%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.4	17.0	13.1	0.0131	18.0	13.3	0.0337	7.6
5.00	22.4	15.0	11.1	0.0131	16.0	13.7	0.0216	6.4
15.00	22.4	12.5	8.6	0.0131	13.5	14.1	0.0126	5.0
30.00	22.4	11.0	7.1	0.0131	12.0	14.3	0.0090	4.1
60.00	22.4	10.0	6.1	0.0131	11.0	14.5	0.0064	3.5
266.00	22.3	8.0	4.1	0.0131	9.0	14.8	0.0031	2.4
1602.00	22.7	7.0	3.2	0.0130	8.0	15.0	0.0013	1.8

MACTEC, Inc.

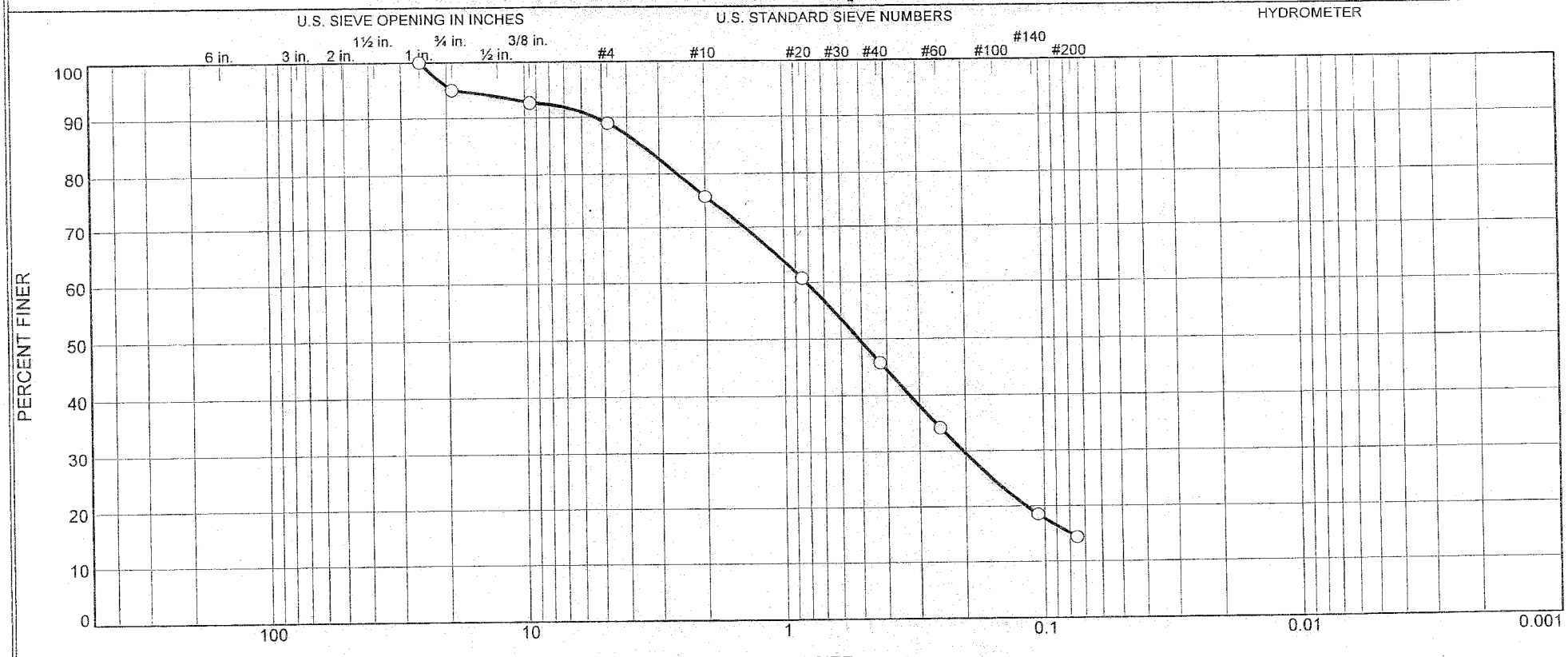
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.1	19.1	23.2	16.2	29.0	20.6	65.8	7.9	3.1	11.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0631	0.1234	0.1966	0.3864	1.1683	1.9430	6.6864	10.5271	13.8697	18.1047

Fineness Modulus	C_u	C_c
3.49	30.77	1.22

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	5.1	6.0	13.1	30.0	31.4	14.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-924	B-924-3	6.0-7.5'	8/01/06	ND	Dark light brown silty Sand.	4.8	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND-NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-924
Depth: 6.0-7.5'
Sample Number: B-924-3
Material Description: Dark light brown silty Sand.
Date: 8/01/06
Natural Moisture: 4.8
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND-NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
285.39	0.00	0.00	1	0.00	100.0
			.75	14.54	94.9
			.375	21.07	92.6
			#4	31.63	88.9
			#10	69.16	75.8
111.01	0.00	0.00	#20	21.97	60.8
			#40	43.97	45.8
			#60	60.92	34.2
			#140	83.83	18.6
			#200	89.97	14.4

Fractional Components

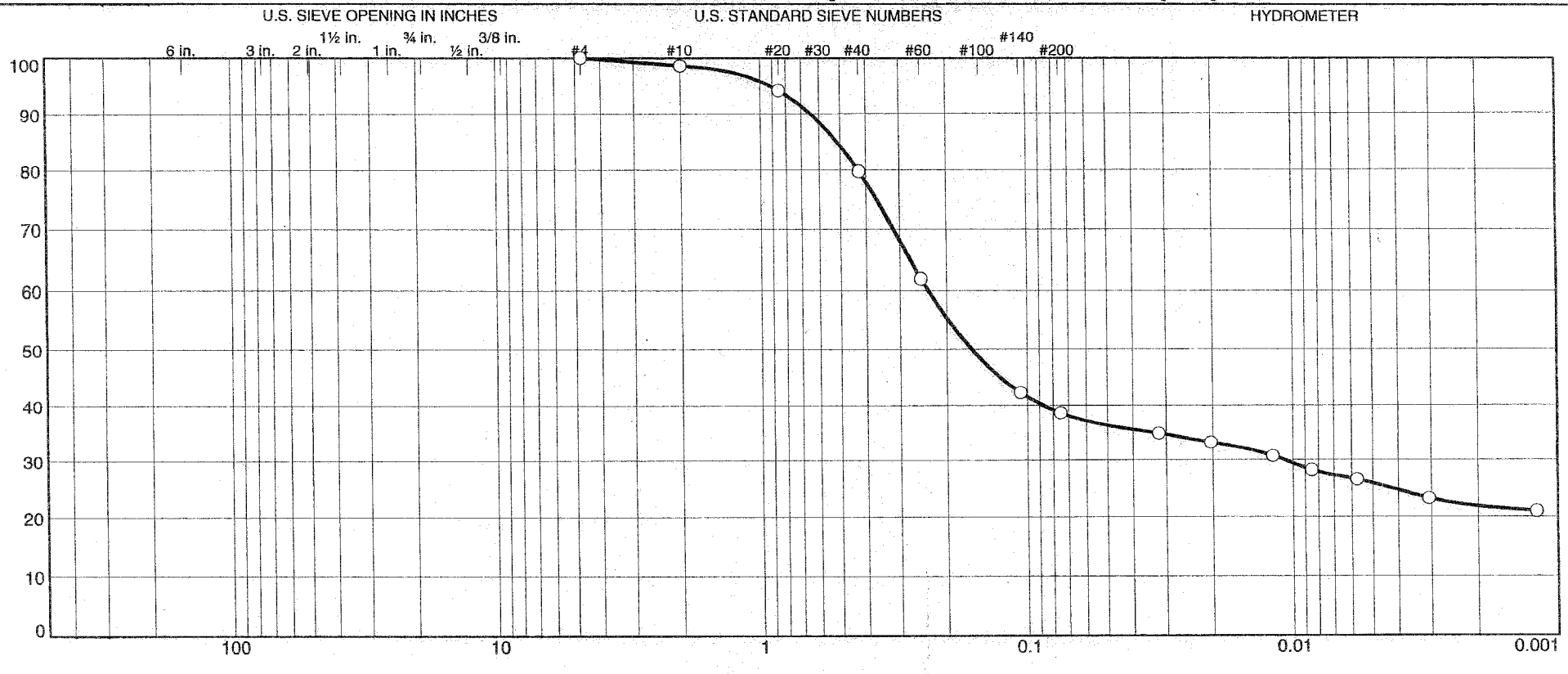
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	5.1	6.0	11.1	13.1	30.0	31.4	74.5			14.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0794	0.1172	0.2043	0.5136	0.8177	2.5651	3.5059	5.3089	19.1868

Fineness Modulus
2.63

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.4	18.8	41.2	12.6	26.0

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING-B-927	B-927-1	1.5-3'	8/01/06	SC	BROWN CLAYEY SAND.	14.1	28	18

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ SPECIFIC GRAVITY IS ASSUMED. ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0 MACTEC ENGINEERING & CONSULTING, INC. 1/18/01

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING-B-927
Depth: 1.5-3' **Sample Number:** B-927-1
Material Description: BROWN CLAYEY SAND.
Date: 8/01/06 **Natural Moisture:** 14.1
Liquid Limit: 28 **Plastic Limit:** 18 **USCS Class.:** SC
Testing Remarks: SPECIFIC GRAVITY IS ASSUMED.
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD **Checked by:** ABS

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
256.16	0.00	0.00	#4	0.00	100.0
			#10	3.52	98.6
60.16	0.00	0.00	#20	2.68	94.2
			#40	11.51	79.8
			#60	22.33	62.0
			#140	34.36	42.3
			#200	36.59	38.6

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 98.6
Weight of hydrometer sample =60.16
Hygroscopic moisture correction:
Moist weight and tare = 29.42
Dry weight and tare = 29.17
Tare weight = 15.47
Hygroscopic moisture = 1.8%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

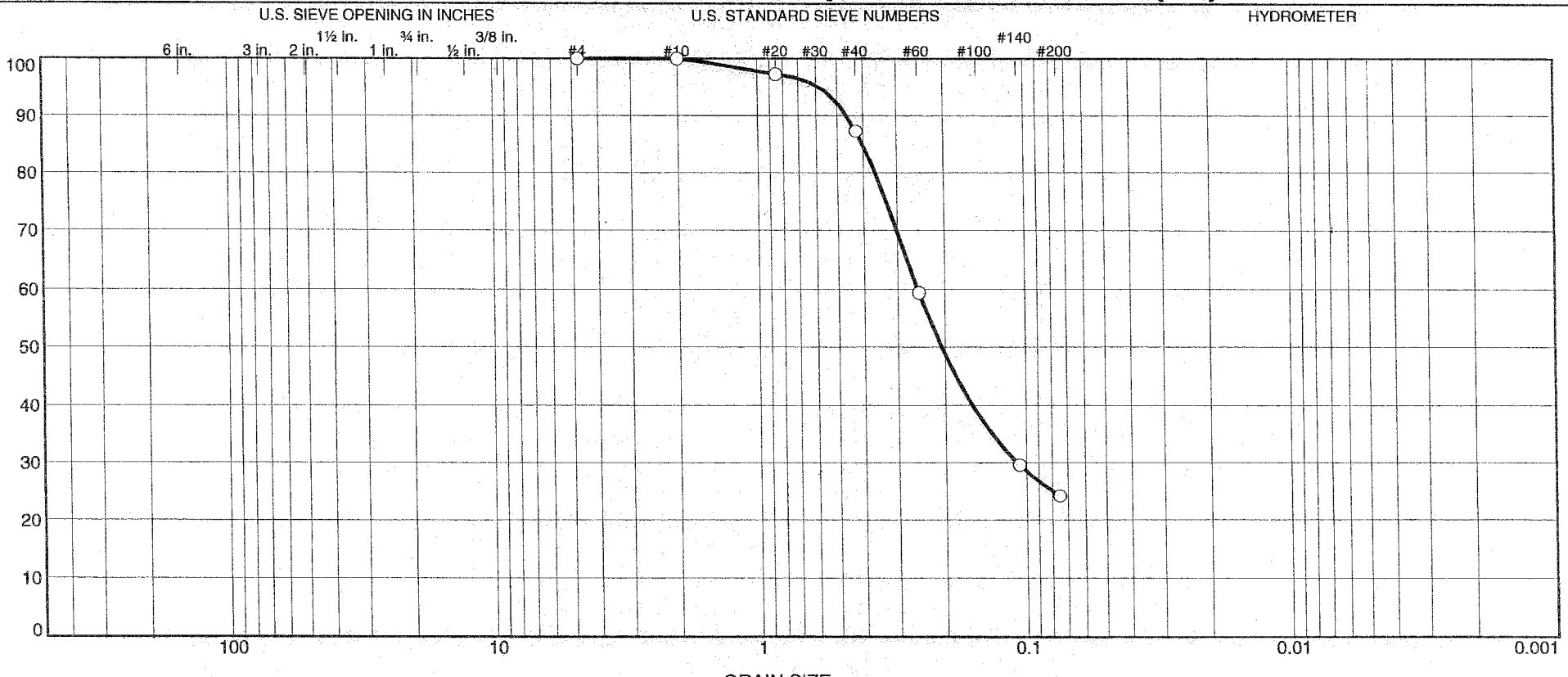
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.5	25.0	21.1	0.0130	26.0	12.0	0.0320	34.9
5.00	22.5	24.0	20.1	0.0130	25.0	12.2	0.0204	33.2
15.00	22.5	22.5	18.6	0.0130	23.5	12.4	0.0119	30.8
30.00	22.4	21.0	17.1	0.0131	22.0	12.7	0.0085	28.2
67.00	22.4	20.0	16.1	0.0131	21.0	12.9	0.0057	26.6
240.00	22.3	18.0	14.1	0.0131	19.0	13.2	0.0031	23.2
1573.00	22.7	16.5	12.7	0.0130	17.5	13.4	0.0012	21.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.4	18.8	41.2	61.4	12.6	26.0	38.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0107	0.1615	0.2345	0.4284	0.5140	0.6459	0.9102

Fineness Modulus
0.99

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	12.7	63.1	24.2	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING-B-927	B-927-2	3.5-5'	8-01-06	ND	BROWNISH YELLOW SILTY SAND.	11.7	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

DATA REPORT Rev. 0
PERCENT FINER
MACTEC ENGINEERING & CONSULTING, INC.
10/31/07

GRAIN SIZE DISTRIBUTION TEST DATA

12/18/2006

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING-B-927
Depth: 3.5-5'
Sample Number: B-927-2
Material Description: BROWNISH YELLOW SILTY SAND.
Date: 8-01-06
Natural Moisture: 11.7
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

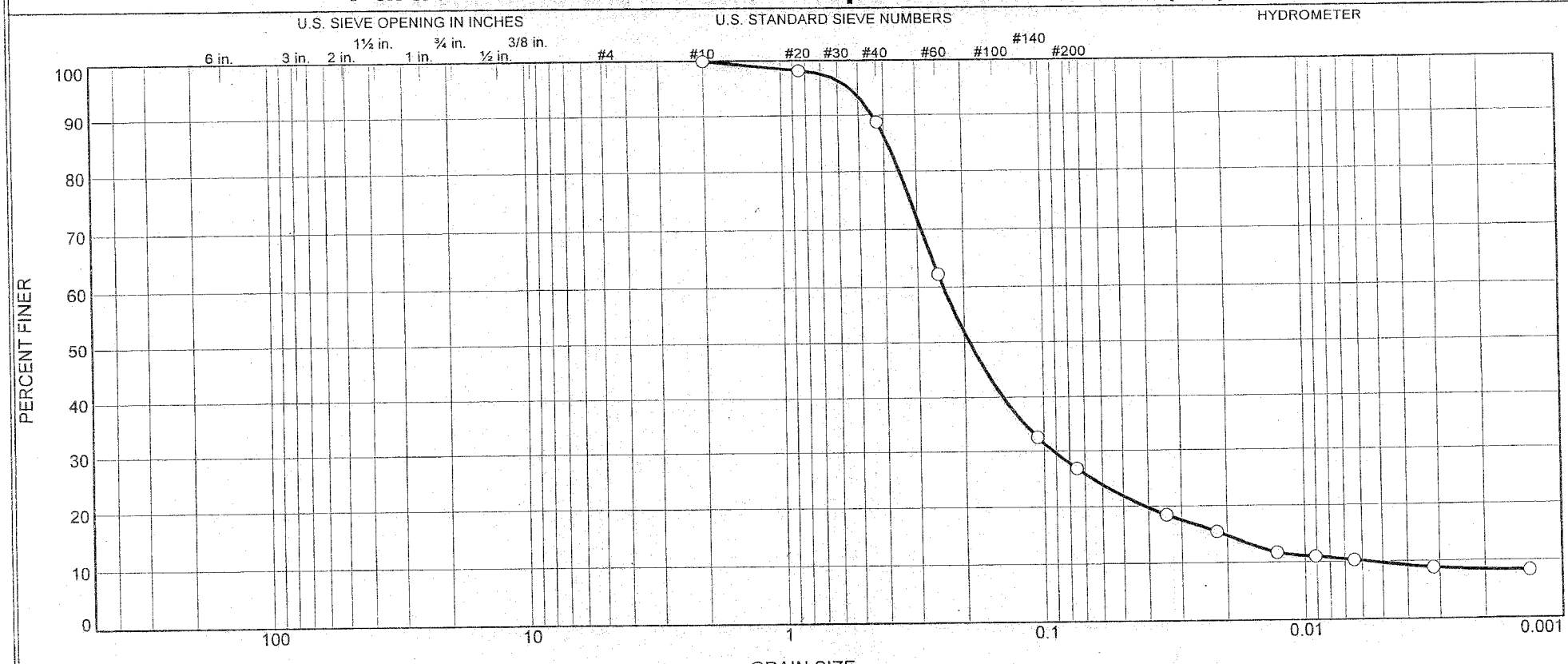
Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
264.55	0.00	0.00	#4	0.00	100.0
			#10	0.05	100.0
72.74	0.00	0.00	#20	1.95	97.3
			#40	9.20	87.3
			#60	29.52	59.4
			#140	51.19	29.6
			#200	55.16	24.2

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	12.7	63.1	75.8			24.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1081	0.2059	0.2528	0.3618	0.4016	0.4592	0.5823

Fineness Modulus
0.98

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	11.3	61.9	17.1	9.7

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING-B-927	B-927-3	6-7.5'	8/01/06	ND	Reddish yellow fine silty sand.	12.2	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING-B-927
Depth: 6-7.5'
Sample Number: B-927-3
Material Description: Reddish yellow fine silty sand.
Date: 8/01/06
Natural Moisture: 12.2
Plastic Limit: NP
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
SPECIFIC GRAVITY IS ASSUMED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
305.19	0.00	0.00	#10	0.00	100.0
67.02	0.00	0.00	#20	1.23	98.2
			#40	7.55	88.7
			#60	25.32	62.2
			#140	45.20	32.6
			#200	49.09	26.8

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =67.02
Hygroscopic moisture correction:
Moist weight and tare = 30.39
Dry weight and tare = 30.18
Tare weight = 15.47
Hygroscopic moisture =1.4%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.5	16.5	12.3	0.0132	17.5	13.4	0.0342	18.5
5.00	21.5	14.5	10.3	0.0132	15.5	13.8	0.0219	15.5
15.00	21.5	12.0	7.8	0.0132	13.0	14.2	0.0128	11.7
30.00	21.5	11.5	7.3	0.0132	12.5	14.2	0.0091	11.0
60.00	21.6	11.0	6.9	0.0132	12.0	14.3	0.0064	10.3
249.00	21.7	10.0	5.9	0.0132	11.0	14.5	0.0032	8.8
1440.00	20.5	10.0	5.5	0.0134	11.0	14.5	0.0013	8.3

MACTEC, Inc.

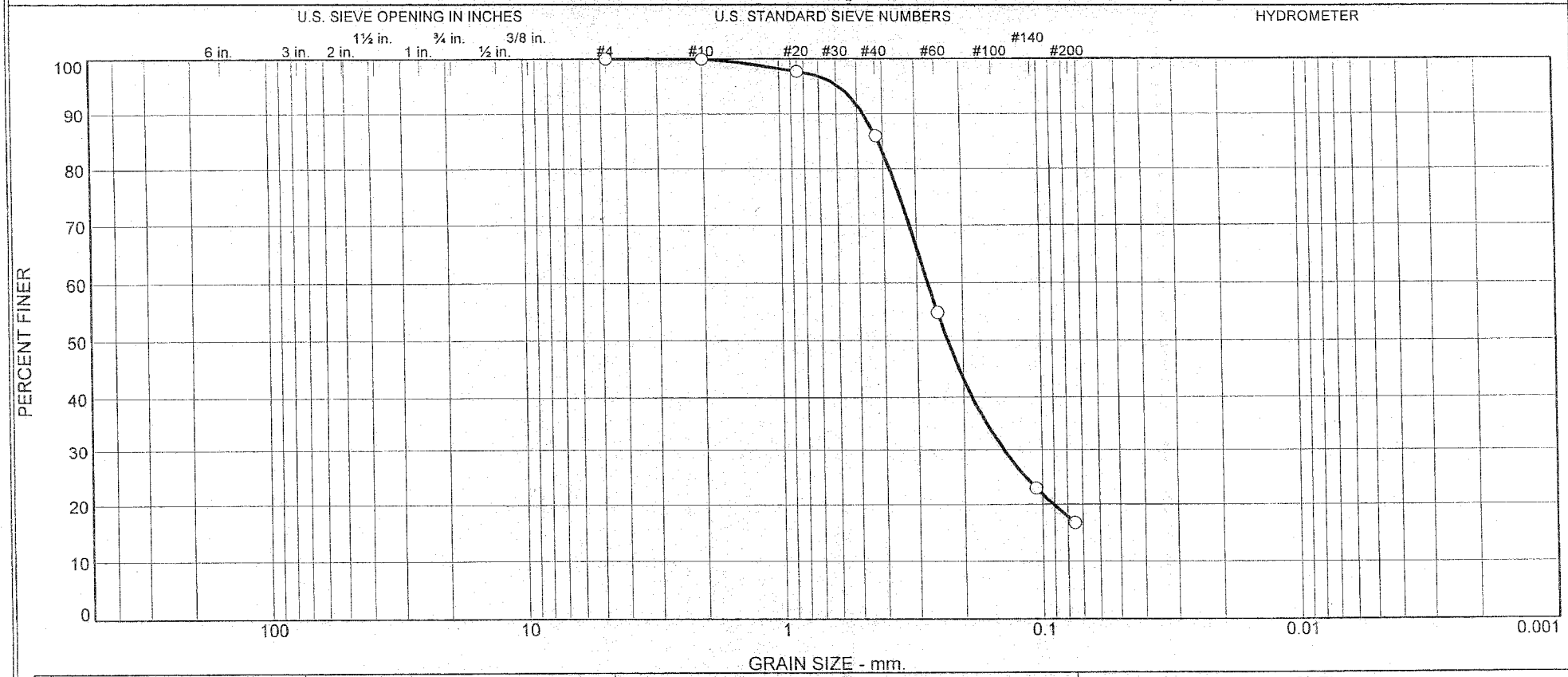
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	11.3	61.9	73.2	17.1	9.7	26.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0057	0.0206	0.0414	0.0925	0.1909	0.2391	0.3490	0.3876	0.4408	0.5416

Fineness Modulus	C_u	C_c
0.91	41.81	6.26

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	13.9	69.3	16.7	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING-B-927	B-927-4	8.5-10'	8/01/06	ND	Pale yellow silty sand.	6.8	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING-B-927
Depth: 8.5-10'
Sample Number: B-927-4
Material Description: Pale yellow silty sand.
Date: 8/01/06
Natural Moisture: 6.8
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
213.52	0.00	0.00	#4	0.00	100.0
			#10	0.16	99.9
101.24	0.00	0.00	#20	2.31	97.6
			#40	14.14	86.0
			#60	45.70	54.8
			#140	77.97	23.0
			#200	84.32	16.7

Fractional Components

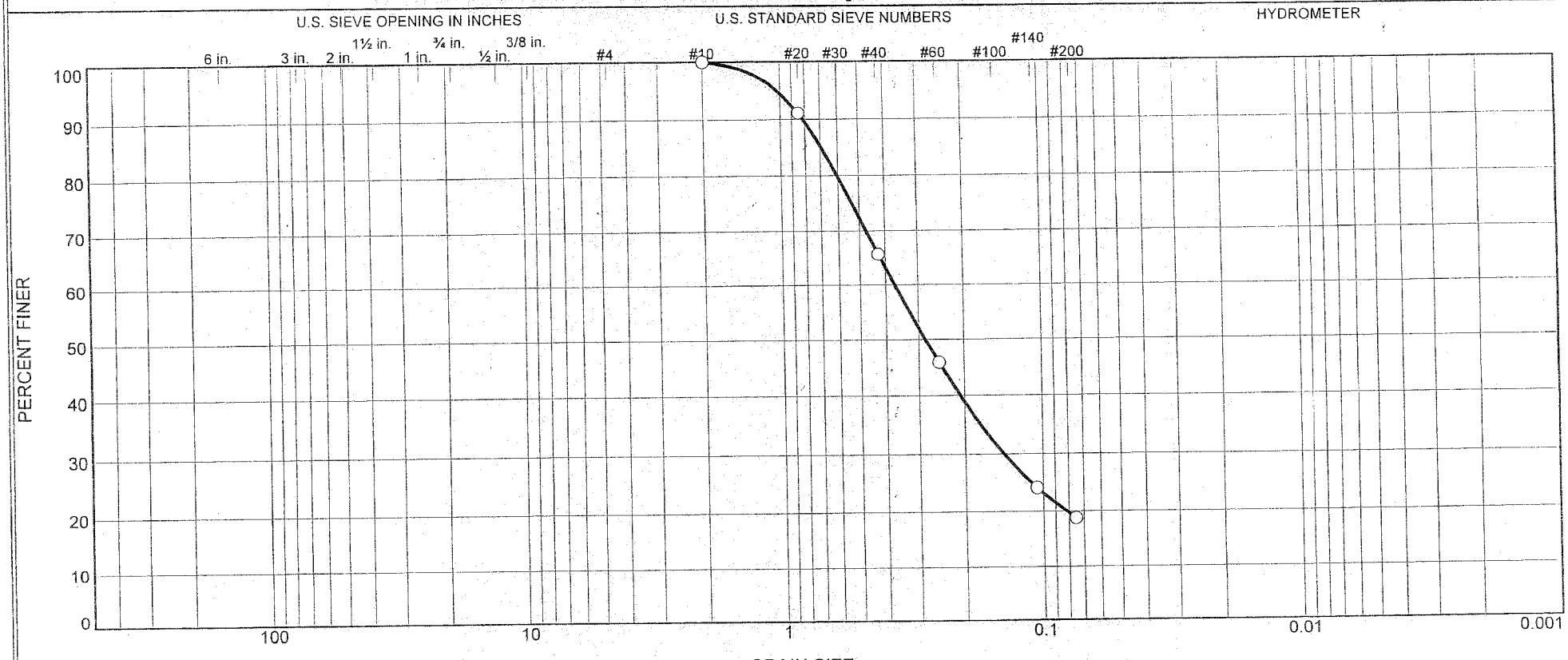
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	13.9	69.3	83.3			16.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0910	0.1401	0.2292	0.2724	0.3770	0.4159	0.4729	0.5888

Fineness Modulus
1.08

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○					34.3	46.9	18.8	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING-B-927	B-927-6	13.5-15'	8-01-06	ND	Pale yellow silty sand.	11.2	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: LBJ **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING-B-927
Depth: 13.5-15'
Sample Number: B-927-6
Material Description: Pale yellow silty sand.
Date: 8-01-06
Natural Moisture: 11.2
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: LBJ
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
304.63	0.00	0.00	#10	0.02	100.0
100.42	0.00	0.00	#20	8.89	91.1
			#40	34.45	65.7
			#60	54.46	45.8
			#140	76.14	24.2
			#200	81.54	18.8

Fractional Components

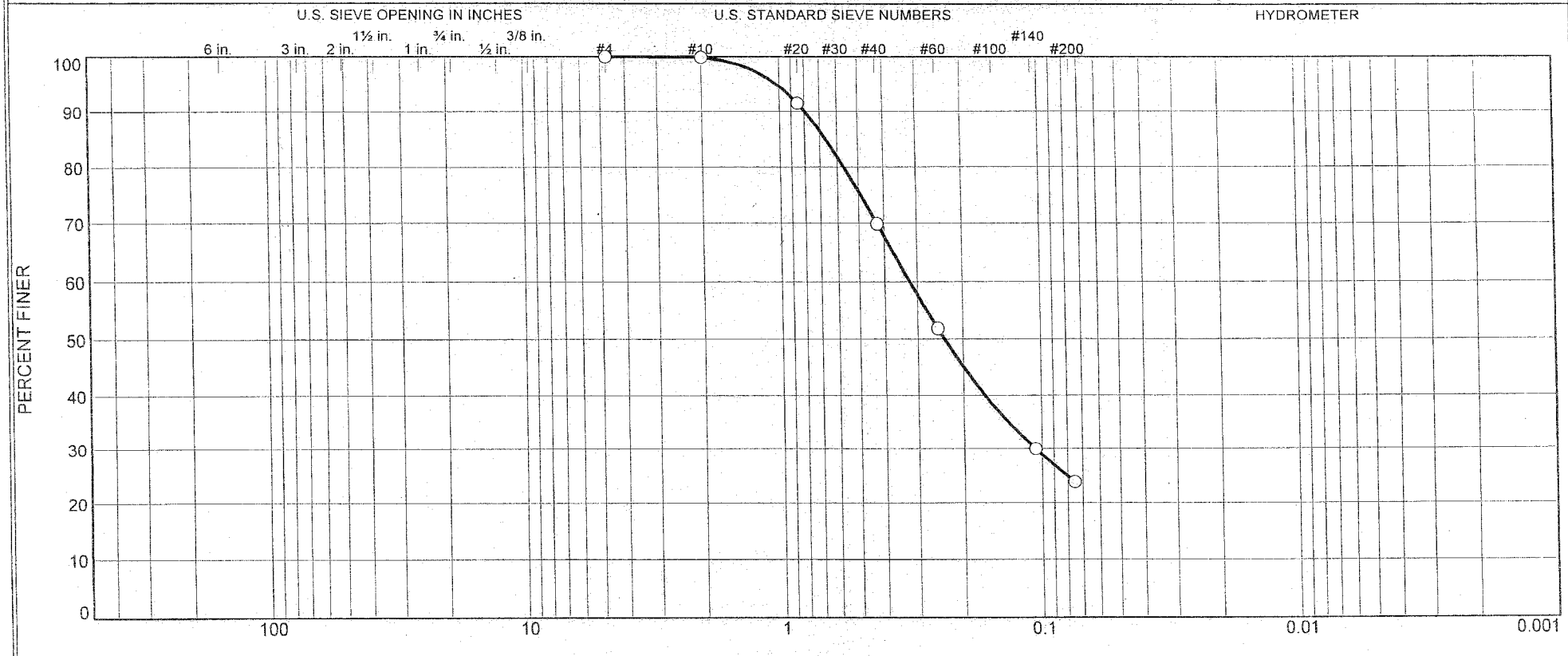
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
					34.3	46.9				18.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0814	0.1418	0.2827	0.3689	0.6050	0.6938	0.8143	1.0221

Fineness Modulus
1.40

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	30.0	46.1	23.8	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING-B-927	B-927-7	18.5-20'	8-01-06	ND	Pale yellow silty sand.	11.4	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING-B-927
Depth: 18.5-20'
Sample Number: B-927-7
Material Description: Pale yellow silty sand.
Date: 8-01-06
Natural Moisture: 11.4
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
296.73	0.00	0.00	#4	0.00	100.0
			#10	0.27	99.9
122.15	0.00	0.00	#20	10.27	91.5
			#40	36.70	69.9
			#60	58.81	51.8
			#140	85.58	29.9
			#200	93.07	23.8

Fractional Components

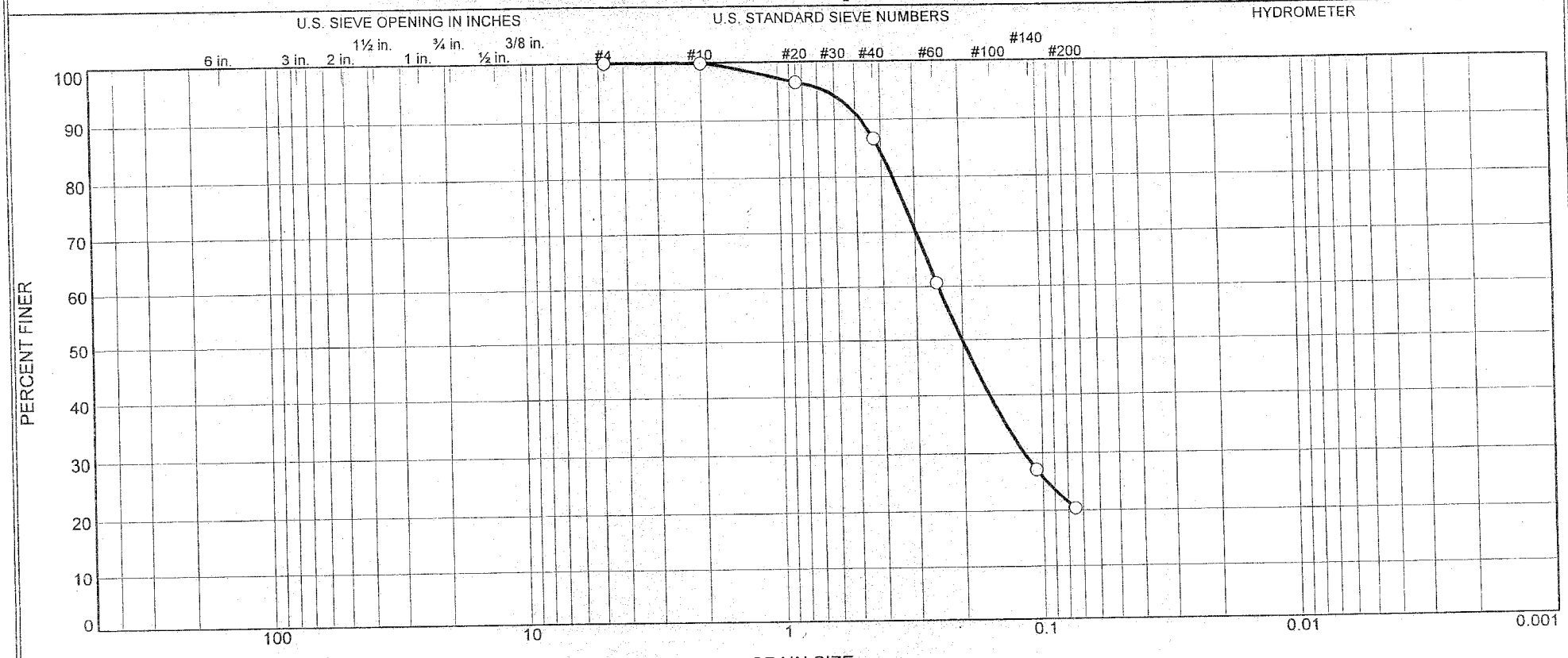
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	30.0	46.1	76.2			23.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1065	0.2359	0.3204	0.5680	0.6645	0.7969	1.0249

Fineness Modulus
1.26

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	13.2	66.4	20.3	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING-B-927	B-927-8	23.5-25'	8/01/06	ND	Pale yellow silty sand.	15.7	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 | Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING-B-927
Depth: 23.5-25'
Sample Number: B-927-8
Material Description: Pale yellow silty sand.
Natural Moisture: 15.7
Date: 8/01/06
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
203.94	0.00	0.00	#4	0.00	100.0
			#10	0.22	99.9
103.29	0.00	0.00	#20	3.54	96.5
			#40	13.69	86.7
			#60	40.50	60.7
			#140	75.21	27.2
			#200	82.25	20.3

Fractional Components

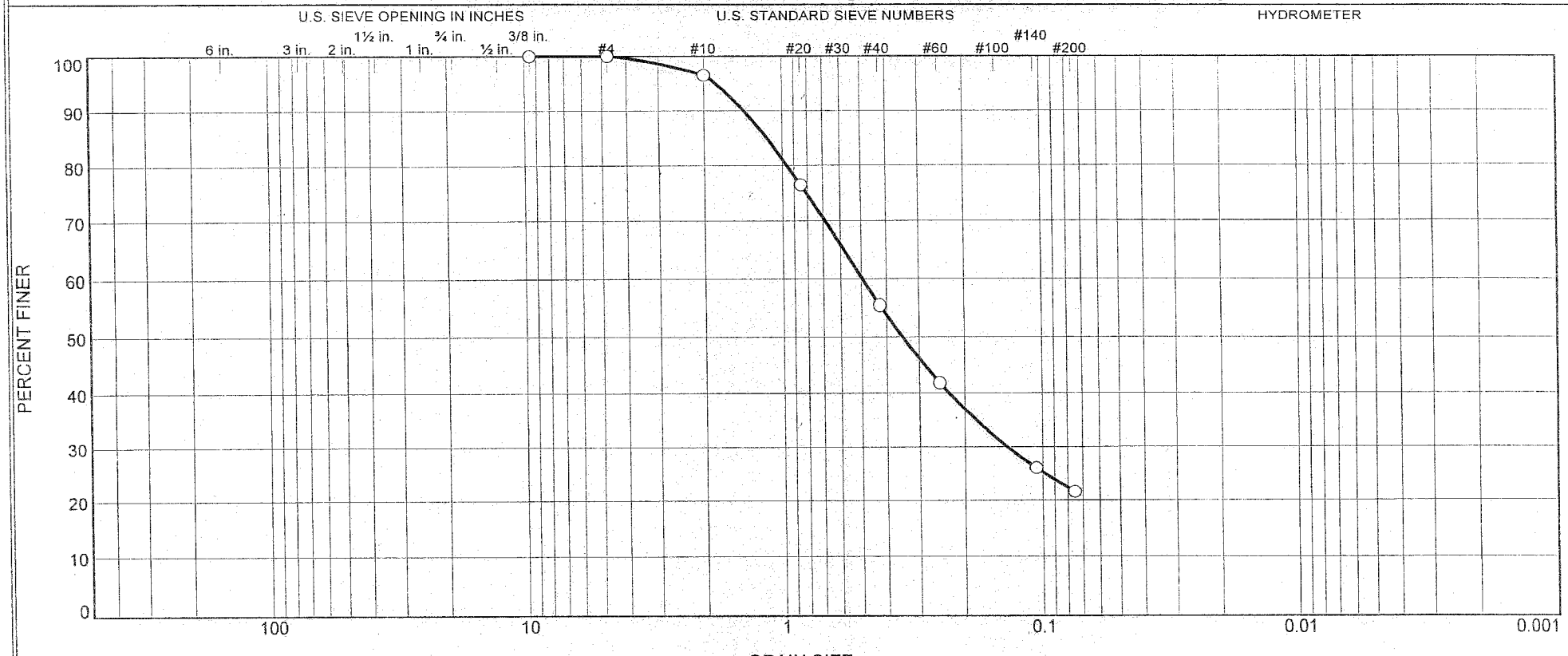
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	13.2	66.4	79.7			20.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1181	0.2011	0.2465	0.3619	0.4064	0.4748	0.6504

Fineness Modulus
1.00

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	3.5	41.0	33.9	21.6	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-928	B-928-2	3.5-5.0'	9-14-06	ND	Brownish yellow silty sand.	17.9	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-928
Depth: 3.5-5.0'
Sample Number: B-928-2
Material Description: Brownish yellow silty sand.
Date: 9-14-06
Natural Moisture: 17.9
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
322.65	0.00	0.00	.375	0.00	100.0
			#4	0.10	100.0
			#10	11.30	96.5
100.67	0.00	0.00	#20	20.89	76.5
			#40	42.73	55.5
			#60	57.04	41.8
			#140	73.50	26.0
			#200	78.18	21.6

Fractional Components

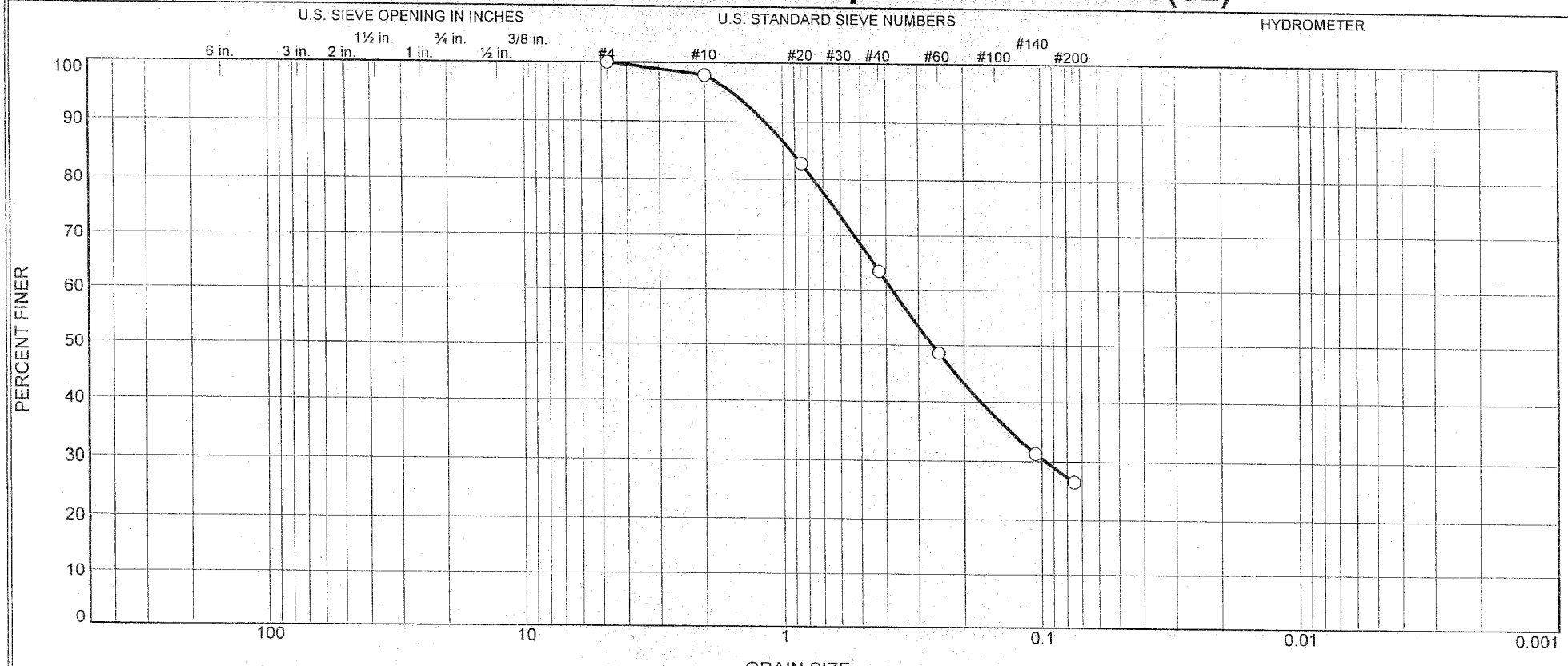
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	3.5	41.0	33.9	78.4			21.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1373	0.3477	0.4949	0.9582	1.1469	1.4031	1.8074

Fineness Modulus
1.73

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	2.2	34.4	36.8	26.6	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-928	B-928-4	8.3-9.8'	9/07/06	ND	Brownish yellow silty sand.	18.5	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: LPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-928
Depth: 8.3-9.8'
Sample Number: B-928-4
Material Description: Brownish yellow silty sand.
Date: 9/07/06
Natural Moisture: 18.5
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: LPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
219.38	0.00	0.00	#4	0.00	100.0
			#10	4.74	97.8
110.89	0.00	0.00	#20	17.00	82.8
			#40	39.02	63.4
			#60	55.90	48.5
			#140	75.41	31.3
			#200	80.75	26.6

Fractional Components

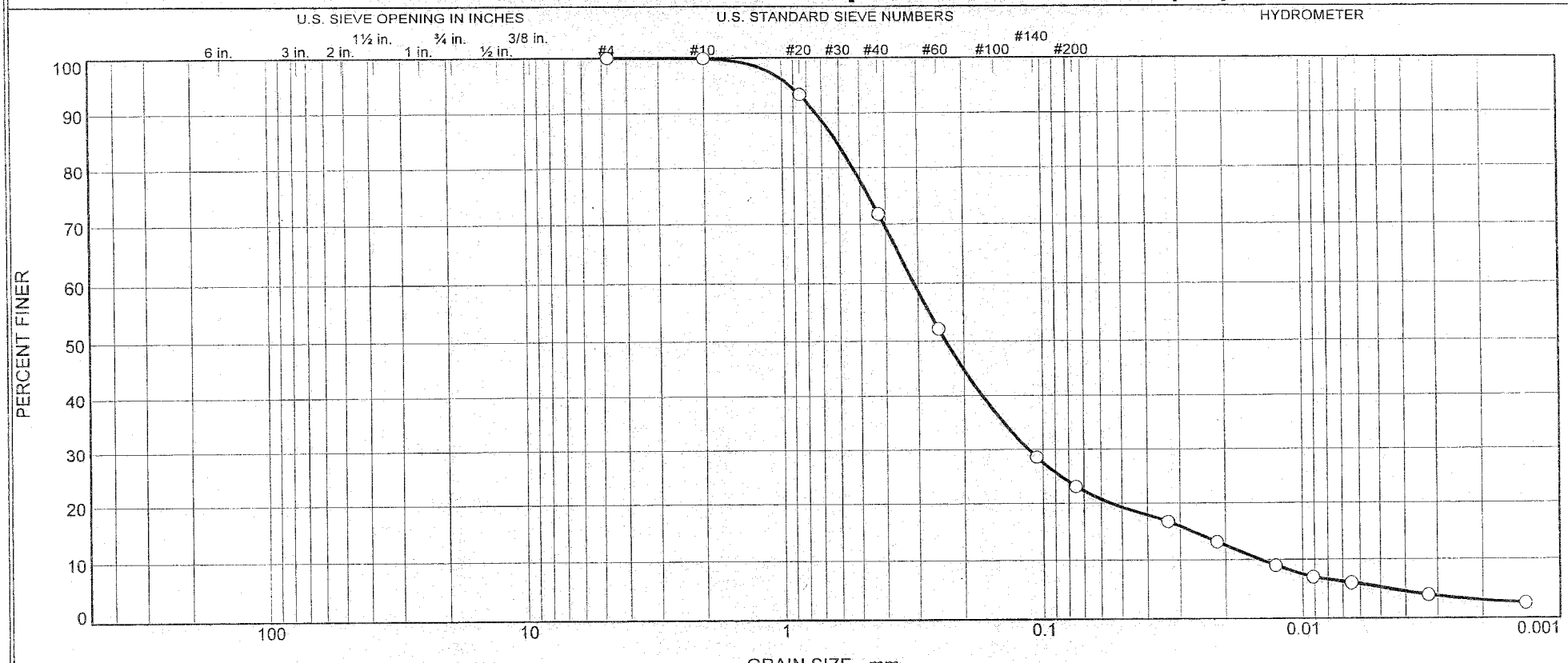
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	2.2	34.4	36.8	73.4			26.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0968	0.2647	0.3783	0.7607	0.9294	1.1704	1.5685

Fineness Modulus
1.48

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	28.1	48.8	17.8	5.2

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-928	B-928-6	14-15.5'	9/17/06	ND	Brownish yellow silty sand.	24.5	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ SPECIFIC GRAVITY IS ASSUMED ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-928
Depth: 14-15.5'
Sample Number: B-928-6
Material Description: Brownish yellow silty sand.
Date: 9/17/06
Natural Moisture: 24.5
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: SPECIFIC GRAVITY IS ASSUMED
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
310.10	0.00	0.00	#4	0.00	100.0
			#10	0.38	99.9
97.92	0.00	0.00	#20	6.44	93.3
			#40	27.56	71.8
			#60	46.83	52.1
			#140	69.89	28.6
			#200	75.35	23.0

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.9
Weight of hydrometer sample =97.92
Hygroscopic moisture correction:
Moist weight and tare = 27.56
Dry weight and tare = 27.46
Tare weight = 15.64
Hygroscopic moisture =0.8%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.5	20.5	16.3	0.0132	21.5	12.8	0.0333	16.6
5.00	21.5	17.0	12.8	0.0132	18.0	13.3	0.0216	13.1
15.00	21.5	13.0	8.8	0.0132	14.0	14.0	0.0127	9.0
30.00	21.5	11.0	6.8	0.0132	12.0	14.3	0.0091	7.0
60.00	21.6	10.0	5.9	0.0132	11.0	14.5	0.0065	6.0
243.00	21.7	8.0	3.9	0.0132	9.0	14.8	0.0033	4.0
1440.00	20.5	7.0	2.5	0.0134	8.0	15.0	0.0014	2.6

MACTEC, Inc.

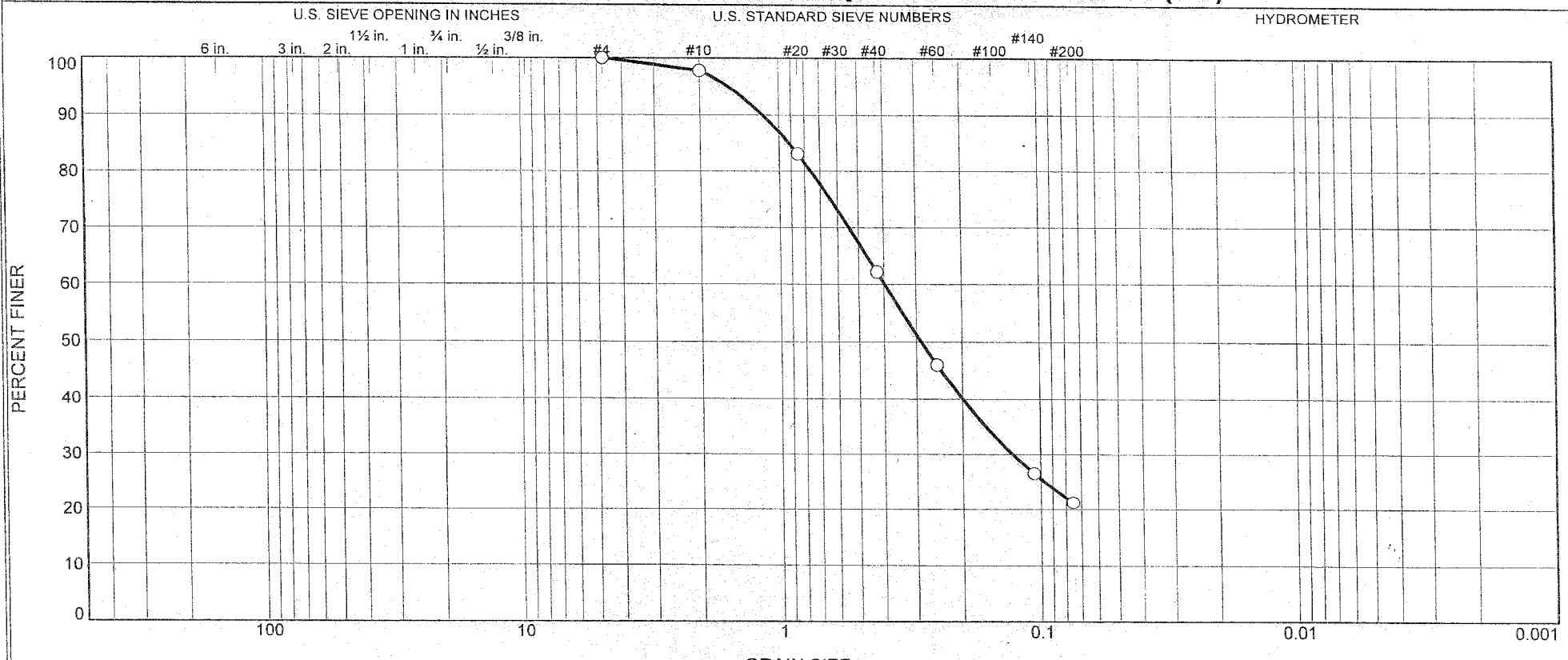
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	28.1	48.8	77.0	17.8	5.2	23.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0146	0.0271	0.0552	0.1136	0.2351	0.3110	0.5332	0.6200	0.7374	0.9315

Fineness Modulus	C_u	C_c
1.23	21.23	2.84

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	2.2	35.6	40.9	21.3	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-928	B-928-8	22.1-23.6'	9/7/06	ND	Brownish yellow silty sand.	17.0	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-928
Depth: 22.1-23.6'
Sample Number: B-928-8
Material Description: Brownish yellow silty sand.
Date: 9/7/06
Natural Moisture: 17.0
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
367.95	0.00	0.00	#4	0.00	100.0
			#10	8.07	97.8
102.07	0.00	0.00	#20	15.33	83.1
			#40	37.19	62.2
			#60	53.99	46.1
			#140	74.39	26.5
			#200	79.86	21.3

Fractional Components

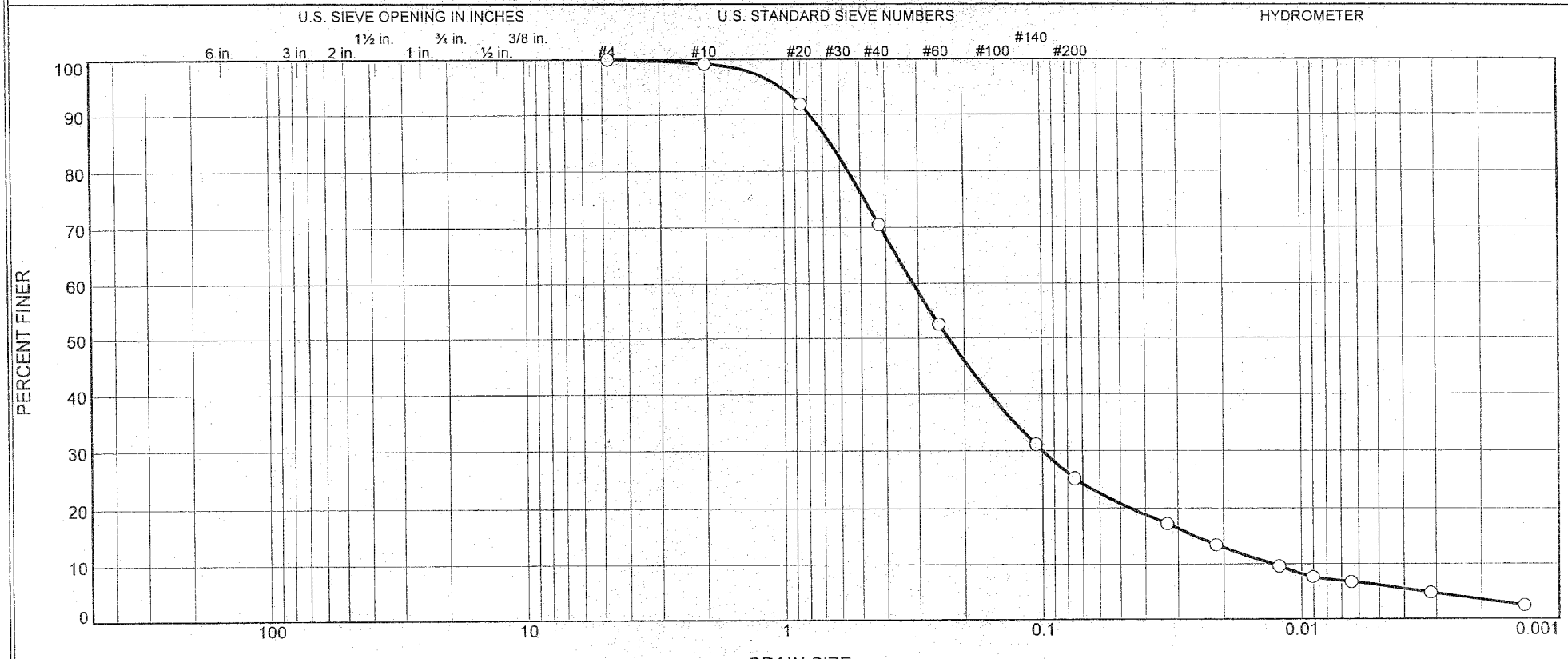
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	2.2	35.6	40.9	78.7			21.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1282	0.2865	0.3969	0.7573	0.9162	1.1494	1.5508

Fineness Modulus
1.54

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.8	28.7	45.2	19.2	6.1

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-928	B-928-9	27.1-28.6'	9/7/06	ND	Brownish yellow silty sand.	16.4	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ SPECIFIC GRAVITY IS ASSUMED. ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-928
Depth: 27.1-28.6'
Sample Number: B-928-9
Material Description: Brownish yellow silty sand.
Date: 9/7/06
Natural Moisture: 16.4
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: SPECIFIC GRAVITY IS ASSUMED.
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
340.00	0.00	0.00	#4	0.00	100.0
			#10	2.73	99.2
102.95	0.00	0.00	#20	7.61	91.9
			#40	29.75	70.5
			#60	48.41	52.6
			#140	70.73	31.0
			#200	76.74	25.3

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.2
Weight of hydrometer sample =102.95
Hygroscopic moisture correction:
Moist weight and tare = 25.71
Dry weight and tare = 25.60
Tare weight = 15.42
Hygroscopic moisture =1.1%
Table of composite correction values:

Temp., deg. C:	12.2	28.6
Comp. corr.:	-7.0	-2.0

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.8	22.0	17.9	0.0131	23.0	12.5	0.0329	17.3
5.00	21.8	18.0	13.9	0.0131	19.0	13.2	0.0213	13.4
16.00	21.8	14.0	9.9	0.0131	15.0	13.8	0.0122	9.6
30.00	21.8	12.0	7.9	0.0131	13.0	14.2	0.0090	7.6
60.00	21.9	11.0	7.0	0.0131	12.0	14.3	0.0064	6.7
254.00	21.9	9.0	5.0	0.0131	10.0	14.7	0.0032	4.8
1440.00	20.5	7.0	2.5	0.0134	8.0	15.0	0.0014	2.4

MACTEC, Inc.

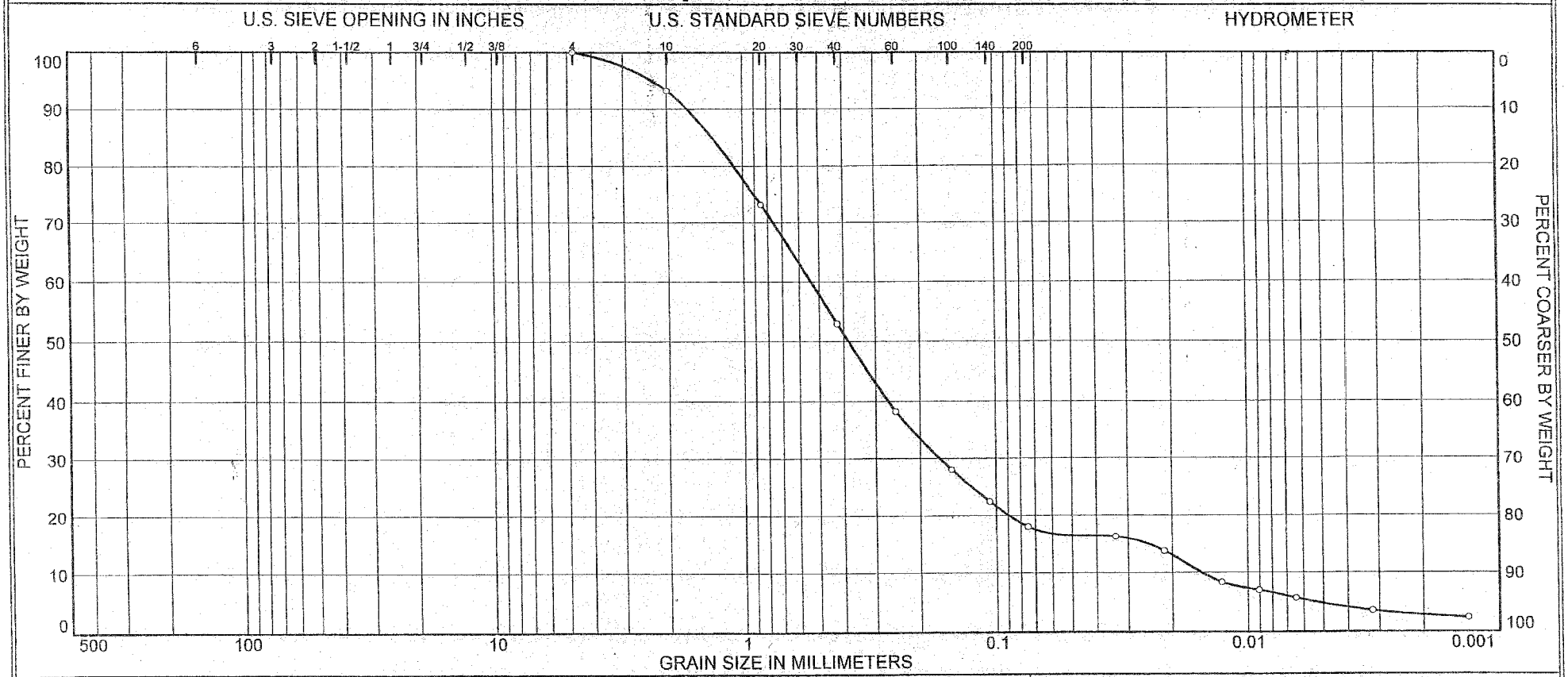
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.8	28.7	45.2	74.7	19.2	6.1	25.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0130	0.0256	0.0457	0.1003	0.2300	0.3141	0.5579	0.6526	0.7831	1.0164

Fineness Modulus	C_u	C_c
1.24	24.08	2.45

Particle Size Distribution Report ASTM D 422-63 (Reapproved 2002)



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	6.8	40.3	34.9	13.2	4.8

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	B-928A	UD-3	20 Ft.	12/8/06	ND	Tan Brown Silty sand	ND	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL

Project No. 6468-06-1472 | Lab ID # 6767

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: JM 12/8/06 Reviewed by: HJ 1/2/07

ND= NOT DETERMINED

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Dominion Nuclear North Anna
Project: North Anna COL
Project Number: 6468-06-1472

Sample Data

Source: B-928A
Sample No.: UD-3
Elev. or Depth: 20 Ft. **Sample Length(in./cm.):** 6767
Location: B-298A
Description: Tan Brown Silty sand
Date: 12/8/06 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: Tested by: JM 12/8/06 Reviewed by: HJ 1/2/07
ND= NOT DETERMINED

Mechanical Analysis Data

	Initial
Dry sample and tare=	75.10
Tare =	0.00
Dry sample weight =	75.10

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	5.12	93.2
20	20.19	73.1
# 40	35.37	52.9
# 60	46.31	38.3
# 100	54.04	28.0
# 140	58.25	22.4
# 200	61.56	18.0

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 18.0
Weight of hydrometer sample: 13.54
Calculated biased weight= 75.22
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.7
Specific gravity correction factor= 0.989
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	23.2	17.0	12.3	0.0129	17.0	13.5	0.0336	16.2
5.00	23.2	15.0	10.3	0.0129	15.0	13.8	0.0215	13.6
15.00	23.2	11.0	6.3	0.0129	11.0	14.5	0.0127	8.3
30.00	23.2	10.0	5.3	0.0129	10.0	14.7	0.0090	7.0
60.00	23.2	9.0	4.3	0.0129	9.0	14.8	0.0064	5.7

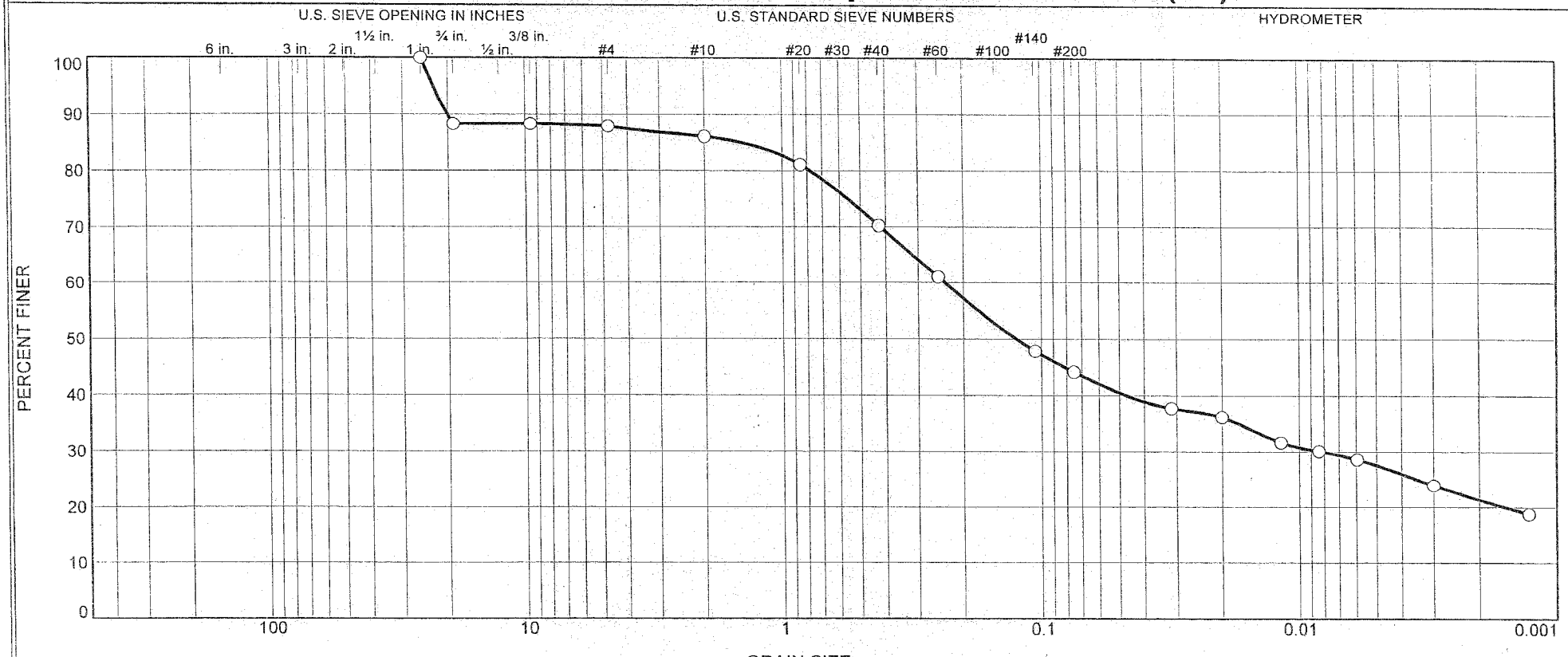
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
250.00	22.8	7.5	2.7	0.0130	7.5	15.1	0.0032	3.6
1440.00	23.1	6.5	1.8	0.0129	6.5	15.2	0.0013	2.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL =
% SAND = 82.0 (% coarse = 6.8 % medium = 40.3 % fine = 34.9)
% SILT = 13.2 % CLAY = 4.8

D_{85}= 1.33 D_{60}= 0.54 D_{50}= 0.38
D_{30}= 0.17 D_{15}= 0.03 D_{10}= 0.02
C_c= 3.3806 C_u= 35.0977

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	11.8	0.4	1.8	15.7	26.2	16.6	27.5

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-929	B-929-1	1.5-3'	8/8/06	SC	Brown clayey sand.	14.5	36	19

Client Dominion Nuclear North Anna
Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-929
Depth: 1.5-3'
Sample Number: B-929-1
Material Description: Brown clayey sand.
Date: 8/8/06
Natural Moisture: 14.5
Liquid Limit: 36
Plastic Limit: 19
USCS Class.: SC
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
207.56	0.00	0.00	1	0.00	100.0
			.75	24.46	88.2
			.375	24.46	88.2
			#4	25.31	87.8
			#10	29.04	86.0
56.55	0.00	0.00	#20	3.26	81.1
			#40	10.36	70.3
			#60	16.46	61.0
			#140	25.09	47.8
			#200	27.53	44.1

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =86.0
Weight of hydrometer sample =56.55
Hygroscopic moisture correction:
Moist weight and tare = 26.78
Dry weight and tare = 26.53
Tare weight = 15.43
Hygroscopic moisture =2.3%
Table of composite correction values:

Temp., deg. C:	12.8	28.6
Comp. corr.:	-7.0	-2.5

Meniscus correction only =1.0
Specific gravity of solids =2.7
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.7	29.0	24.5	0.0132	30.0	11.4	0.0314	37.7
5.00	21.7	28.0	23.5	0.0132	29.0	11.5	0.0200	36.2
15.00	21.8	25.0	20.6	0.0131	26.0	12.0	0.0118	31.6
30.00	21.8	24.0	19.6	0.0131	25.0	12.2	0.0084	30.1
60.00	21.9	23.0	18.6	0.0131	24.0	12.4	0.0060	28.6
246.00	21.9	20.0	15.6	0.0131	21.0	12.9	0.0030	24.0
1440.00	20.5	17.0	12.2	0.0134	18.0	13.3	0.0013	18.8

MACTEC, Inc.

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	11.8	0.4	12.2	1.8	15.7	26.2	43.7	16.6	27.5	44.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0016	0.0082	0.1252	0.2362	0.7798	1.4423	20.1654	22.8203

Fineness Modulus
1.73

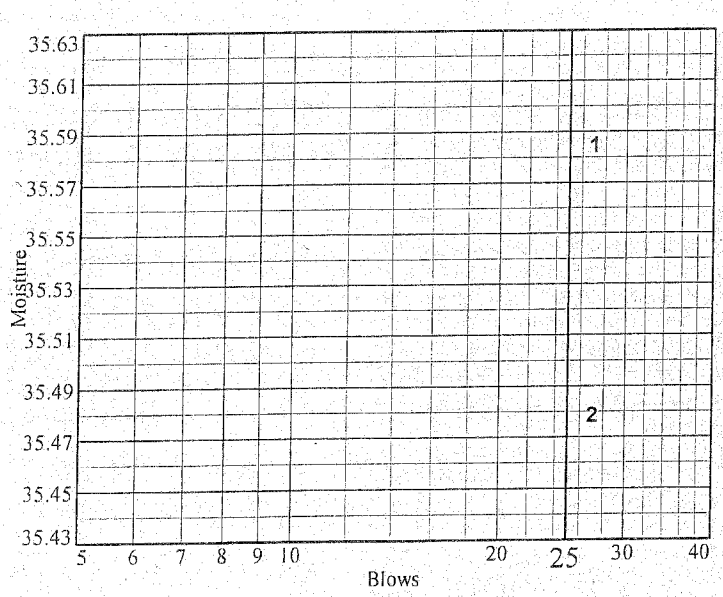
LIQUID AND PLASTIC LIMIT TEST DATA

1/17/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-929
Depth: 1.5-3'
Sample Number: B-929-1
Material Description: Brown clayey sand.
%<#40: 70.3 **%<#200:** 44.1 **USCS:** SC **AASHTO:** A-6(4)
Tested by: JPD **Checked by:** ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	23.69	24.08				
Dry+Tare	21.53	21.82				
Tare	15.46	15.45				
# Blows	27	27				
Moisture	35.6	35.5				



Liquid Limit= 36
Plastic Limit= 19
Plasticity Index= 17
Natural Moisture= 14.5
Liquidity Index= -0.3

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	22.67	22.40			
Dry+Tare	21.52	21.27			
Tare	15.57	15.48			
Moisture	19.3	19.5			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
26.98	25.54	15.63	14.5

MACTEC, Inc.

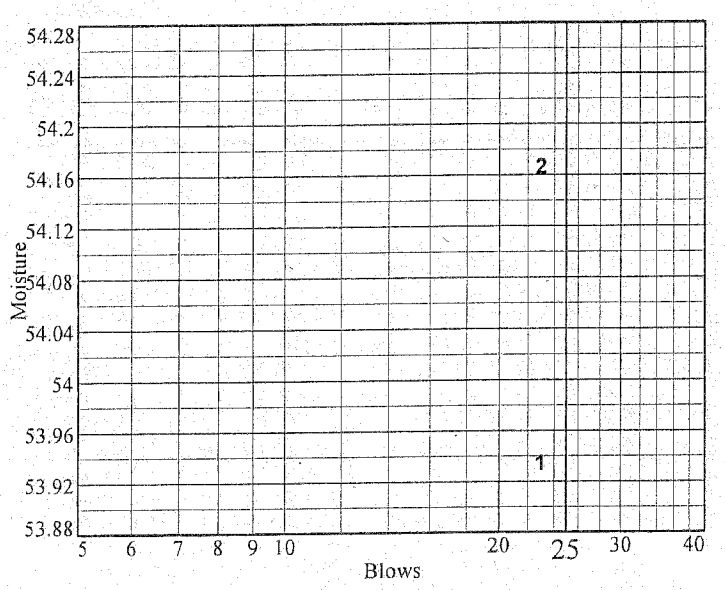
LIQUID AND PLASTIC LIMIT TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-929
Depth: 3.5-5'
Sample Number: B-929-2
Material Description: Brown sandy silty.
%<#40: ND
%<#200: ND
USCS: ND
AASHTO: ND
Tested by: JPD
Checked by: ABS
Testing Remarks: ENTIRE SAMPLE WAS TESTED.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.12	22.99				
Dry+Tare	19.79	20.39				
Tare	15.47	15.59				
# Blows	23	23				
Moisture	53.9	54.2				



Liquid Limit= 54
Plastic Limit= 38
Plasticity Index= 16
Natural Moisture= 26.1
Liquidity Index= -0.7

Plastic Limit Data

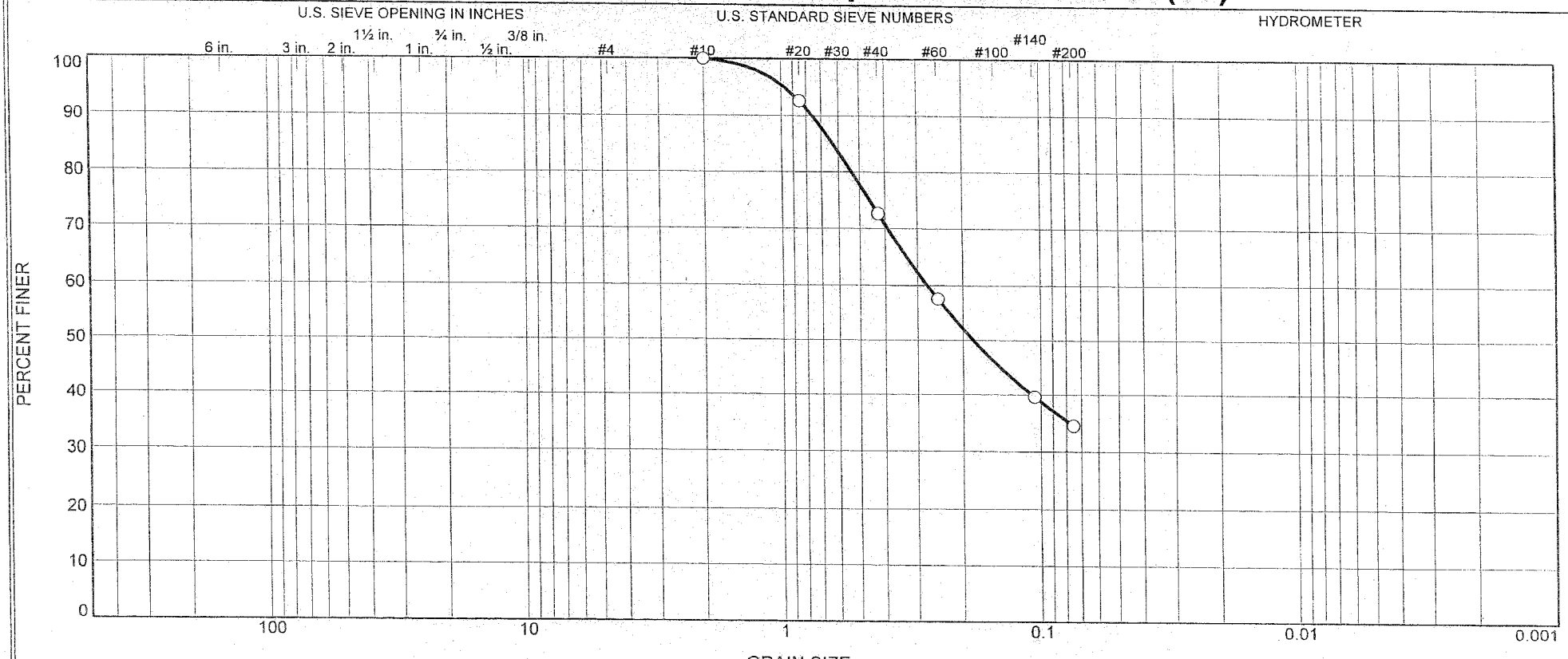
Run No.	1	2	3	4	
Wet+Tare	23.76	24.48			
Dry+Tare	21.47	21.98			
Tare	15.47	15.49			
Moisture	38.2	38.5			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
40.40	35.25	15.51	26.1

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	27.4	38.1	34.5	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-929	B-929-4	8.7-10.2'	8/8/06	ND	Reddish yellow silty sand.	18.9	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED
ENTIRE SAMPLE WAS TAKEN

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-929
Depth: 8.7-10.2'
Sample Number: B-929-4
Material Description: Reddish yellow silty sand.
Date: 8/8/06
Natural Moisture: 18.9
Liquid Limit: ND
Plastic Limit: ND
USCS Class.: ND
Testing Remarks: ND=NOT DETERMINED
ENTIRE SAMPLE WAS TAKEN
Tested by: JPD
Checked by: ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
114.14	0.00	0.00	#10	0.00	100.0
68.36	0.00	0.00	#20	5.01	92.7
			#40	18.72	72.6
			#60	29.05	57.5
			#140	41.27	39.6
			#200	44.79	34.5

Fractional Components

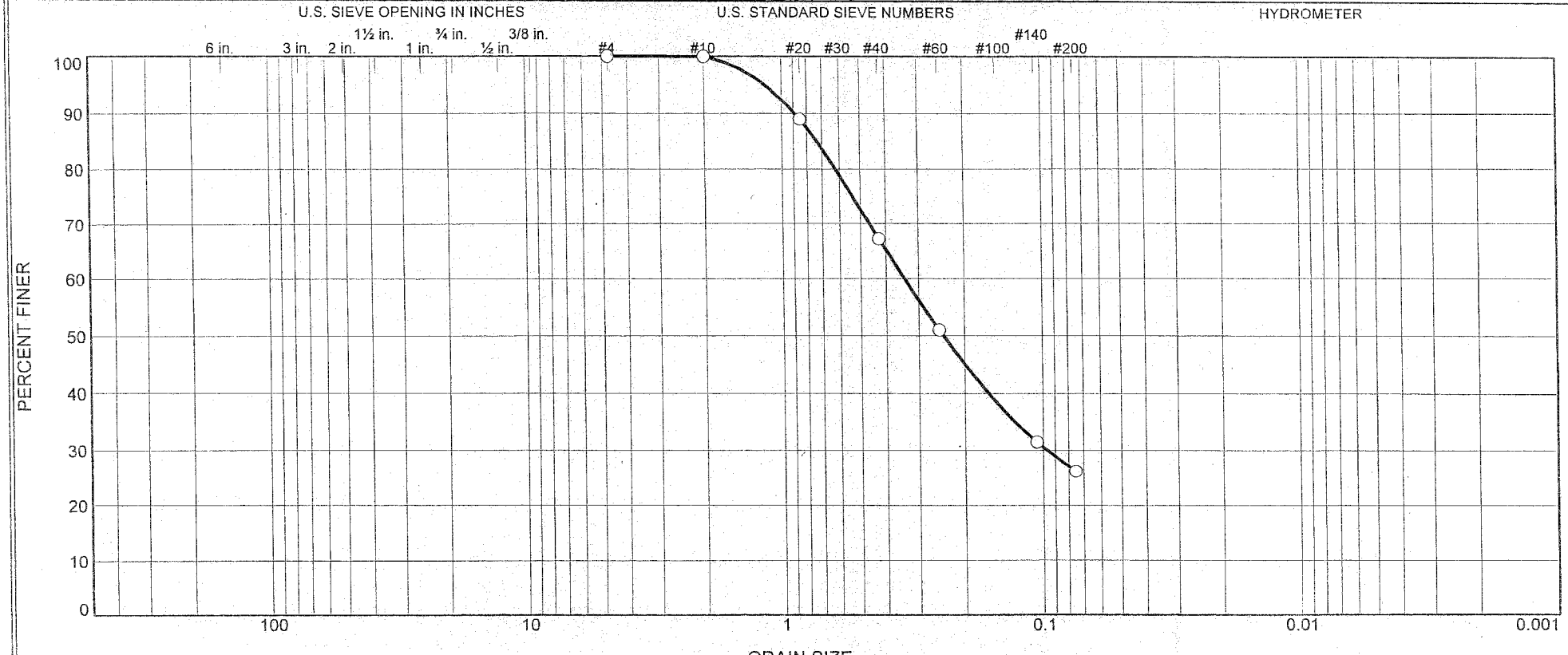
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	27.4	38.1	65.5			34.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1824	0.2751	0.5358	0.6301	0.7559	0.9680

Fineness Modulus
1.11

MACTEC, Inc.

Particle Size Distribution Report/ASTM-422-63(02)



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	32.7	41.0	26.2	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	BORING B-929	B-929-5	13.5-15.0	8/8/06	ND	Reddish yellow silty sand.	19.6	ND	ND

Client Dominion Nuclear North Anna

Project North Anna COL Project

Project No. 6468061472 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ ND=NOT DETERMINED.
ENTIRE SAMPLE WAS TESTED.

Tested By: JPD **Checked By:** ABS

GRAIN SIZE DISTRIBUTION TEST DATA

1/15/2007

Client: Dominion Nuclear North Anna
Project: North Anna COL Project
Project Number: 6468061472
Location: BORING B-929
Depth: 13.5-15.0 **Sample Number:** B-929-5
Material Description: Reddish yellow silty sand.
Date: 8/8/06 **Natural Moisture:** 19.6
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** ND
Testing Remarks: ND=NOT DETERMINED.
ENTIRE SAMPLE WAS TESTED.
Tested by: JPD **Checked by:** ABS

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
212.73	0.00	0.00	#4	0.00	100.0
			#10	0.13	99.9
82.01	0.00	0.00	#20	9.00	89.0
			#40	26.83	67.2
			#60	40.12	51.0
			#140	56.14	31.5
			#200	60.52	26.2

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	32.7	41.0	73.8			26.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0966	0.2407	0.3390	0.6227	0.7331	0.8875	1.1550

Fineness Modulus
1.31

MACTEC, Inc.