APPENDIX B1.2

GEOTECHNICAL TEST RESULTS

ADVANCED TERRA TESTING

IMPOUNDMENT GEOTECHNICAL TEST RESULTS

Moisture Content Determinations
ASTM D 2216

CLIENT:	MWH		JOB NO.	2512-77
PROJECT	Church Rock			
PROJECT NO.	--			

BORING NO.	CS-5	CS-6	CS-7	CS-8
DEPTH	9-24"	7-24"	0-20"	8-28"
SAMPLE NO.	TI-CS05-04A(9-24")	TI-CS06-04A(7-24")	TI-CS07-02A(0-20")	TI-CS08-04A(8-28")
DATE SAMPLED	11/12/13 MWH	11/13/13 MWH	11/13/13 MWH	11/13/13 MWH
DATE TESTED	11/22/13 CAL	11/22/13 CAL	11/22/13 CAL	11/22/13 CAL
LOCATION	Tailings Impoundment	Tailings Impoundment	Tailings Impoundment	Tailings Impoundment
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	414.50	391.13	532.93	528.02
Wt. of Dry Soil & Dish (gms)	378.91	352.93	494.69	489.34
Net Loss of Moisture (gms)	35.59	38.20	38.24	38.68
Wt. of Dish (gms)	6.62	6.56	6.55	9.27
Wt. of Dry Soil (gms)	372.29	346.37	488.14	480.07
Moisture Content (%)	9.6	11.0	7.8	8.1

BORING NO.	CS-9
DEPTH	9-26"
SAMPLE NO.	TI-CS09-04A(9-26")
DATE SAMPLED	11/13/13 MWH
DATE TESTED	11/22/13 CAL
LOCATION	Tailings Impoundment
MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	461.42
Wt. of Dry Soil & Dish (gms)	428.77
Net Loss of Moisture (gms)	32.65
Wt. of Dish (gms)	6.57
Wt. of Dry Soil (gms)	422.20
Moisture Content (%)	7.7

Data entry by:	CAL	Date:	12/3/2013
Checked by:	KP	Date:	12/5/13
File name:	2512-77-M&D-ASTMD-2216-2937-R0-AS3-P1.xls		

ATT
ADVANCED TERRA TESTING

Moisture Content Determinations
ASTM D 2216

CLIENT:	MWH		JOB NO.
PROJECT	Church Rock		
PROJECT NO.	--		
BORING NO.	CS-11	CS-1	CS-4
DEPTH	9-24"	11-24"	10-24"
SAMPLE NO.	TI-CS11-04A(9-24")	TI-CS01-04A(11-24")	TI-CS04-04A(10-24")
DATE SAMPLED	11/13/13 MWH	11/12/13 MWH	11/12/13 MWH
DATE TESTED	12/3/13 CAL	12/4/13 KMR	12/4/13 KMR
LOCATION	Tailings Impoundment	Tailings Impoundment	Tailings Impoundment
MOISTURE DETERMINATIONS			
Wt. of Wet Soil & Dish (gms)	241.48	312.07	402.15
Wt. of Dry Soil & Dish (gms)	222.88	286.52	350.83
Net Loss of Moisture (gms)	18.60	25.55	51.32
Wt. of Dish (gms)	6.72	9.23	9.26
Wt. of Dry Soil (gms)	216.16	277.29	341.57
Moisture Content (%)	8.6	9.2	15.0

Data entry by: CAL Date: 12/5/2013
Checked by: KR Date: 12/5/13
File name: 2512-77-M&D-ASTMD-2216-2937-R0-7.xls

Moisture Content Determinations
ASTM D 2216

CLIENT:	MWH			JOB NO.	2512-77
PROJECT	Church Rock			LOCATION	Tailings Impoundment
PROJECT NO.	--				

BORING NO.	CS-12	CS-2	CS-10
DEPTH	0-14"	10-24"	7-25"
SAMPLE NO.	TI-CS12-02A(0-14")	TI-CS2-04A(10-24")	TI-CS10-04A(7-25")
DATE SAMPLED	11/13/2013	11/12/2013	11/13/2013
DATE TESTED	12/6/2013 KMR	12/10/2013 DPM	12/10/2013 DPM
SOIL DESCRIPTION	--	--	--
MOISTURE DETERMINATIONS			
Wt. of Wet Soil & Dish (gms)	244.75	495.60	597.59
Wt. of Dry Soil & Dish (gms)	225.12	445.63	555.15
Net Loss of Moisture (gms)	19.63	49.97	42.44
Wt. of Dish (gms)	9.24	6.58	6.66
Wt. of Dry Soil (gms)	215.88	439.05	548.49
Moisture Content (%)	9.1	11.4	7.7

Data entry by: KMR Date: 12/11/2013
Checked by: DPM Date: 12/12/13
File name: 2512-77-M&D-ASTMD-2216-2937-R0-8.xls

ATT
ADVANCED TERRA TESTING

Moisture Content Determinations
ASTM D 2216

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	Tailings Impoundment
PROJECT NO.	-		

BORING NO.	CS-3
DEPTH	6-24"
SAMPLE NO.	TI-CS03-04A(6-24")
DATE SAMPLED	11/12/13 MWH
DATE TESTED	12/19/13 DPM
SOIL DESCRIPTION	-

MOISTURE DETERMINATIONS

Wt. of Wet Soil & Dish (gms)	1331.96
Wt. of Dry Soil & Dish (gms)	1257.37
Net Loss of Moisture (gms)	74.59
Wt. of Dish (gms)	15.79
Wt. of Dry Soil (gms)	1241.58
Moisture Content (%)	6.0

Data entry by: DPM Date: 12/20/2013
Checked by: DPM Date: 12/20/13
File name: 2512-77- M&D-ASTMD-2216-2937-R0-10.xls

ATT ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-1
Depth: 11-24"
Sample Number: TI-CS01-04A(11-24")
Test Date: 12/20/2013
Technician: MLM
Sampled Date: 11/12/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 0860
Material Size of Fines: -#40

Plastic Limits

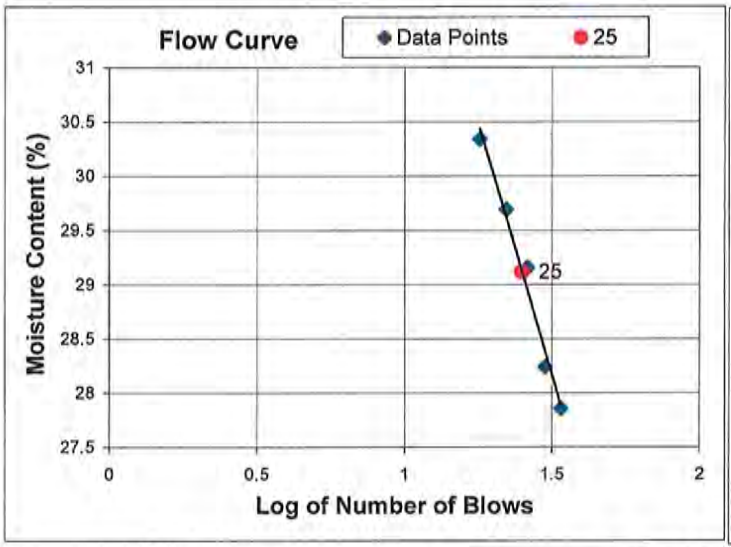
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	9.611	9.535	10.520
Weight of Dry Soil & Pan (g):	8.503	8.431	9.319
Weight of Water (g):	1.108	1.104	1.201
Weight of Pan (g):	1.135	1.117	1.133
Moisture Content (%):	15.0	15.1	14.7

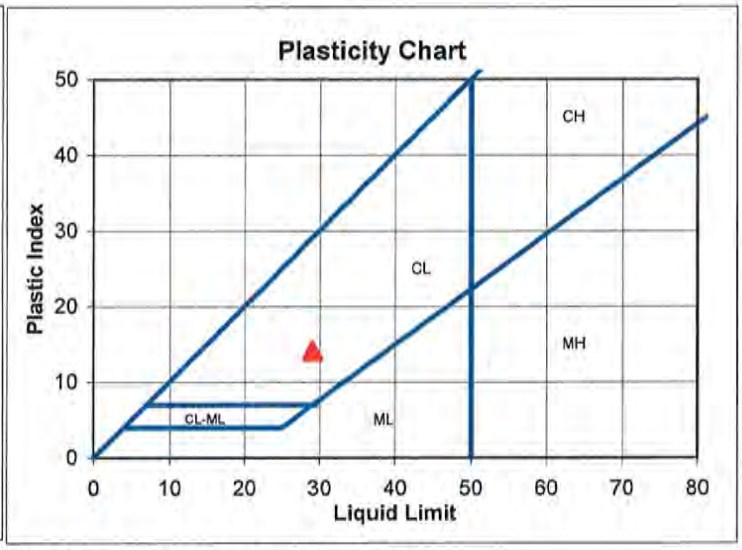
Average: 14.9%
Standard Deviation: 0.2%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	34	30	26	22	18
Weight of Wet Soil & Pan (g):	16.758	16.257	17.649	17.054	16.046
Weight of Dry Soil & Pan (g):	13.357	12.928	13.924	13.416	12.580
Weight of Water (g):	3.401	3.329	3.725	3.638	3.466
Weight of Pan (g):	1.148	1.140	1.147	1.162	1.155
Moisture Content (%):	27.9	28.2	29.2	29.7	30.3

Plastic Limit: 15
Liquid Limit: 29
Plastic Index: 14
Atterberg Classification CL





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File Name: atterberg-ASTM_4318-R6_1.xls Date: 12/30/13

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-4
Depth: 10-24"
Sample Number: TI-CS04-04A(10-24")
Test Date: 12/20/2013
Technician: MLM
Sampled Date: 11/12/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 0860
Material Size of Fines: -#40

Plastic Limits

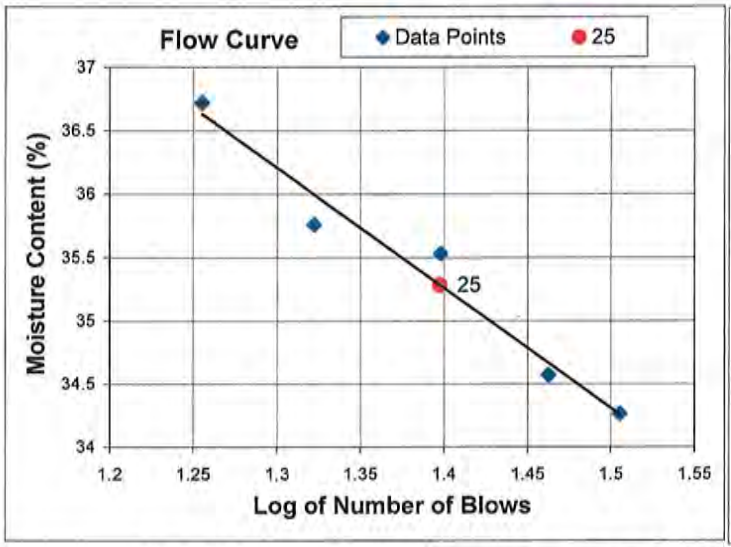
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	9.185	9.680	9.404
Weight of Dry Soil & Pan (g):	8.121	8.543	8.311
Weight of Water (g):	1.064	1.137	1.093
Weight of Pan (g):	1.108	1.136	1.133
Moisture Content (%):	15.2	15.4	15.2

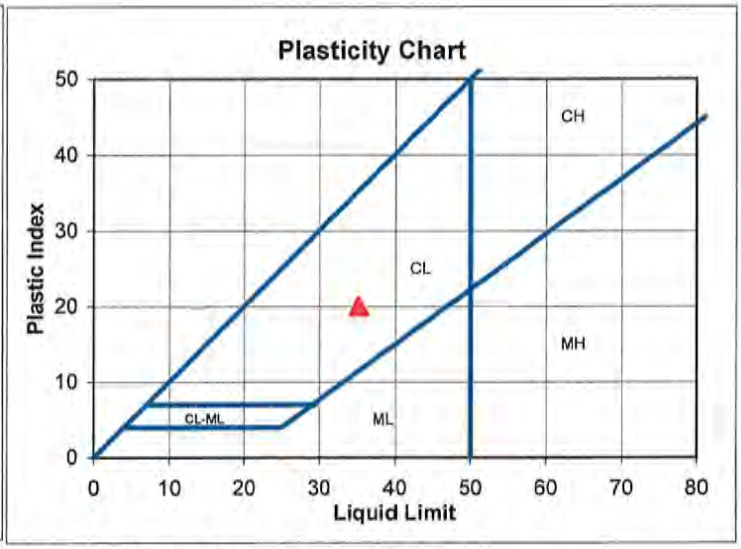
Average: 15.2%
Standard Deviation: 0.1%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	32	29	25	21	18
Weight of Wet Soil & Pan (g):	15.825	16.545	14.944	16.252	14.906
Weight of Dry Soil & Pan (g):	12.081	12.589	11.303	12.263	11.201
Weight of Water (g):	3.744	3.956	3.641	3.989	3.705
Weight of Pan (g):	1.153	1.145	1.054	1.107	1.111
Moisture Content (%):	34.3	34.6	35.5	35.8	36.7

Plastic Limit: 15
Liquid Limit: 35
Plastic Index: 20
Atterberg Classification CL





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File Name: atterberg-ASTM_4318-R6_0.xls Date: 12/30/13

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-5
Depth: 9-24"
Sample Number: TI-CS05-04A(9-24")
Test Date: 12/3/2013
Technician: CAL
Sampled Date: 11/12/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

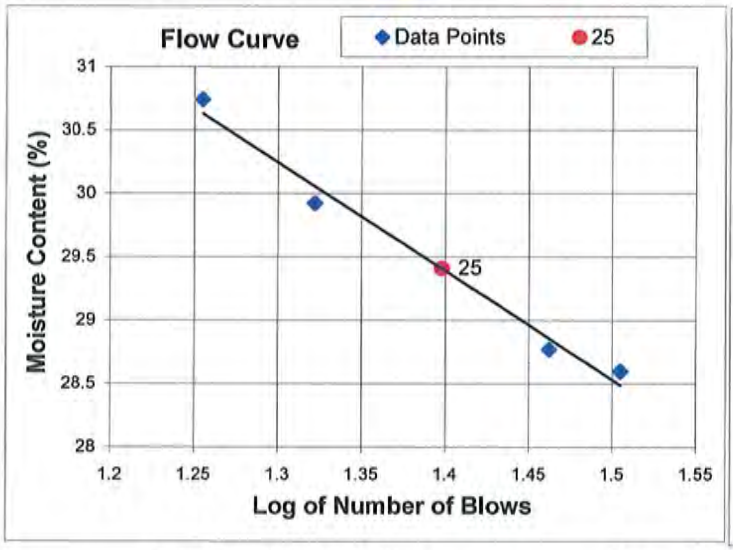
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	8.110	8.158	7.578
Weight of Dry Soil & Pan (g):	7.299	7.357	6.825
Weight of Water (g):	0.811	0.801	0.753
Weight of Pan (g):	0.738	0.763	0.743
Moisture Content (%):	12.4	12.1	12.4

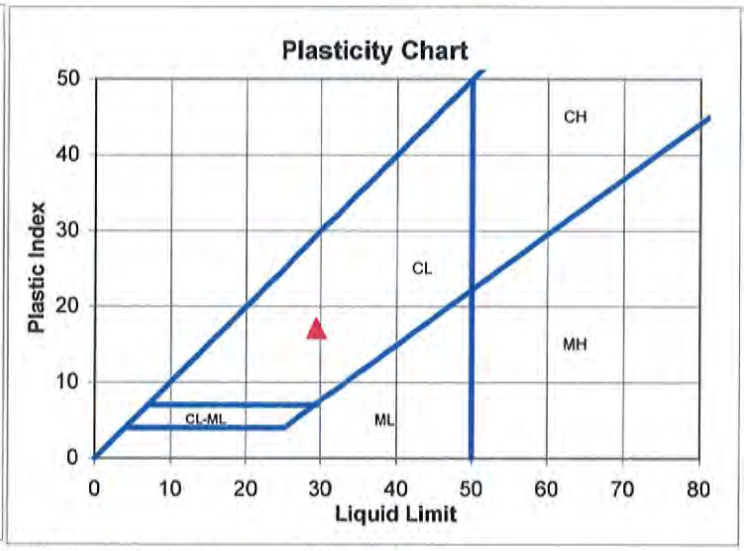
Average: 12.3%
Standard Deviation: 0.1%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	32	29	21	18
Weight of Wet Soil & Pan (g):	11.769	11.305	11.298	9.415
Weight of Dry Soil & Pan (g):	9.315	8.948	8.871	7.382
Weight of Water (g):	2.454	2.357	2.427	2.033
Weight of Pan (g):	0.733	0.755	0.760	0.769
Moisture Content (%):	28.6	28.8	29.9	30.7

Plastic Limit: 12
Liquid Limit: 29
Plastic Index: 17
Atterberg Classification CL





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File Name: atterberg-ASTM_4318-R6_4.xls Date: 12/5/13

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-6
Depth: 7-24"
Sample Number: TI-CS06-04A(7-24")
Test Date: 12/3/2013
Technician: CAL
Sampled Date: 11/13/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

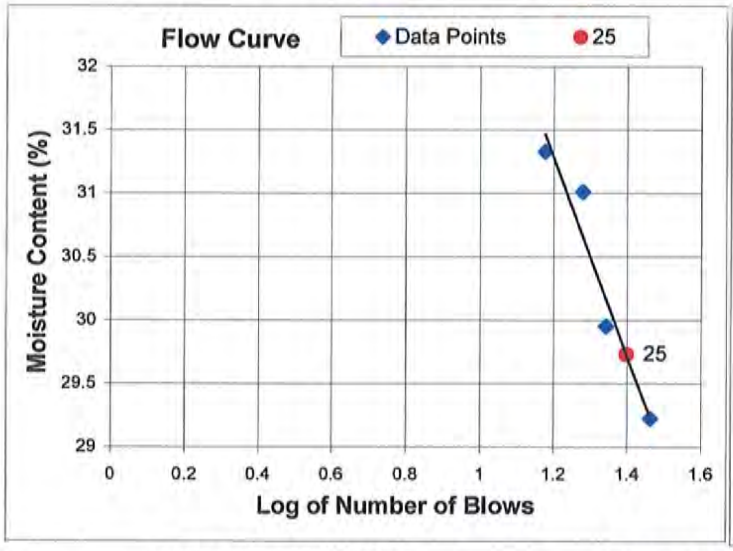
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	8.088	7.135	7.931
Weight of Dry Soil & Pan (g):	7.293	6.417	7.099
Weight of Water (g):	0.795	0.718	0.832
Weight of Pan (g):	0.766	0.746	0.734
Moisture Content (%):	12.2	12.7	13.1

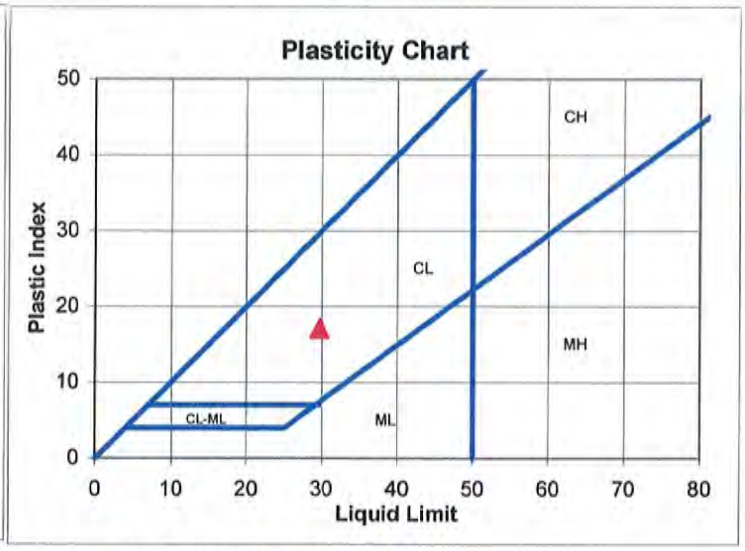
Average: 12.6%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	29	22	19	15
Weight of Wet Soil & Pan (g):	11.472	12.036	11.694	10.611
Weight of Dry Soil & Pan (g):	9.043	9.438	9.108	8.261
Weight of Water (g):	2.429	2.598	2.586	2.350
Weight of Pan (g):	0.731	0.764	0.769	0.760
Moisture Content (%):	29.2	30.0	31.0	31.3

Plastic Limit: 13
Liquid Limit: 30
Plastic Index: 17
Atterberg Classification CL





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File Name: atterberg-ASTM_4318-R6_5.xls Date: 12/5/13

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-7
Depth: 0-20"
Sample Number: TI-CS07-02A(0-20")
Test Date: 12/2/2013
Technician: CAL
Sampled Date: 11/13/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

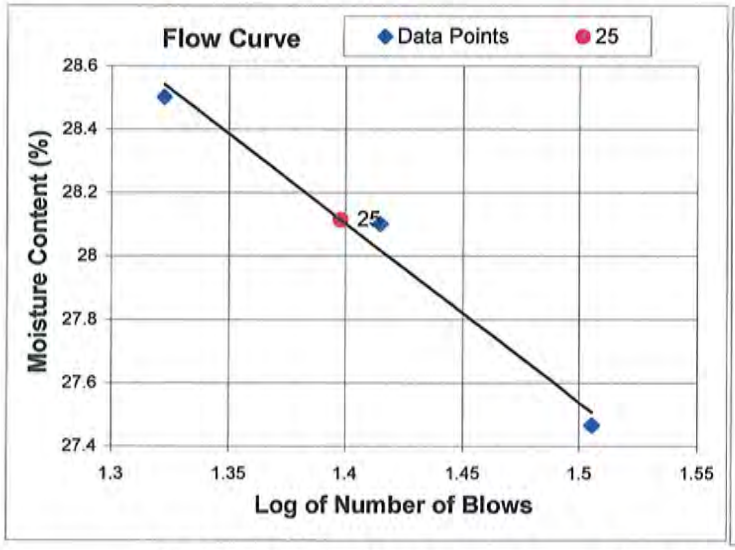
	Sample 1	Sample 2
Weight of Wet Soil & Pan (g):	6.558	7.430
Weight of Dry Soil & Pan (g):	5.888	6.648
Weight of Water (g):	0.670	0.782
Weight of Pan (g):	0.747	0.738
Moisture Content (%):	13.0	13.2

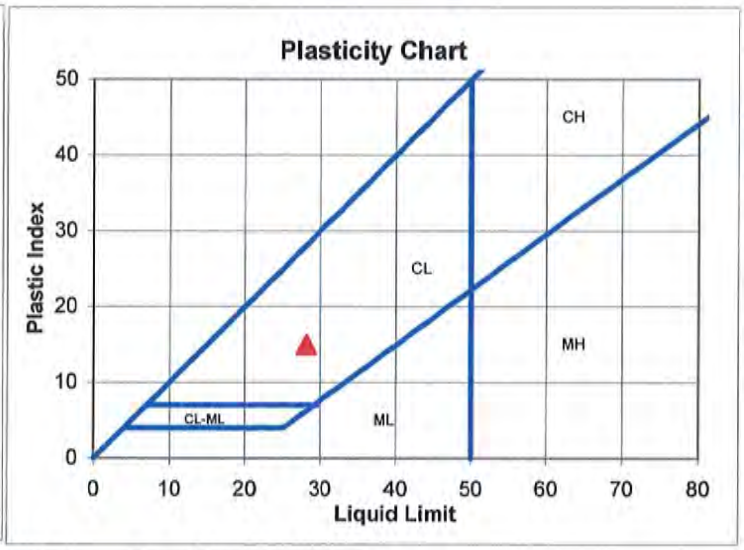
Average: 13.1%
Standard Deviation: 0.1%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	32	21	26
Weight of Wet Soil & Pan (g):	11.095	10.501	13.216
Weight of Dry Soil & Pan (g):	8.870	8.342	10.484
Weight of Water (g):	2.225	2.159	2.732
Weight of Pan (g):	0.769	0.767	0.762
Moisture Content (%):	27.5	28.5	28.1

Plastic Limit: 13
Liquid Limit: 28
Plastic Index: 15
Atterberg Classification CL





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File Name: atterberg-ASTM_4318-R6_0.xls Date: 12/3/13

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-8
Depth: 8-28"
Sample Number: TI-CS08-04A(8-28")
Test Date: 12/2/2013
Technician: CAL
Sampled Date: 11/13/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

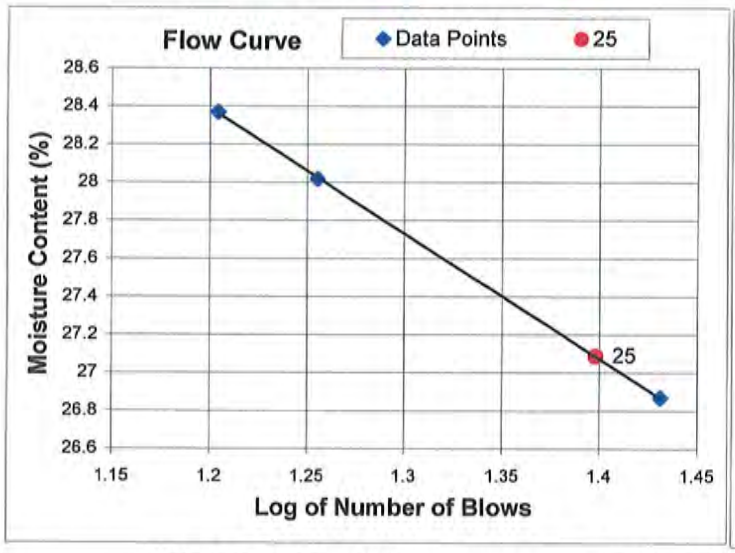
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	7.783	6.527	5.558
Weight of Dry Soil & Pan (g):	7.010	5.904	5.035
Weight of Water (g):	0.773	0.623	0.523
Weight of Pan (g):	0.770	0.763	0.732
Moisture Content (%):	12.4	12.1	12.2

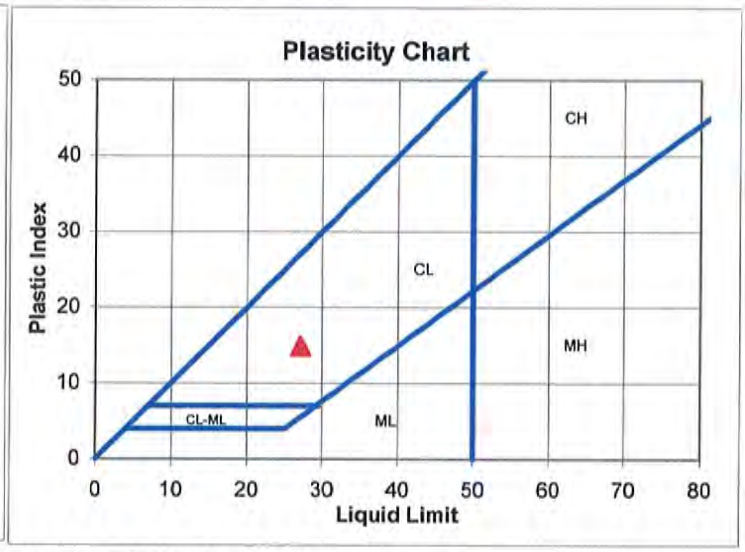
Average: 12.2%
Standard Deviation: 0.1%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	16	18	27
Weight of Wet Soil & Pan (g):	11.528	9.880	9.560
Weight of Dry Soil & Pan (g):	9.147	7.883	7.691
Weight of Water (g):	2.381	1.997	1.869
Weight of Pan (g):	0.754	0.755	0.735
Moisture Content (%):	28.4	28.0	26.9

Plastic Limit: 12
Liquid Limit: 27
Plastic Index: 15
Atterberg Classification CL





Data Entered By: KR Date: 12/3/2013 Data Checked By: CAL
File Name: atterberg-ASTM_4318-R6_1.xls Date: 12/4/13

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-9
Depth: 9-26"
Sample Number: TI-CS09-04A(9-26")
Test Date: 12/3/2013
Technician: CAL
Sampled Date: 11/13/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

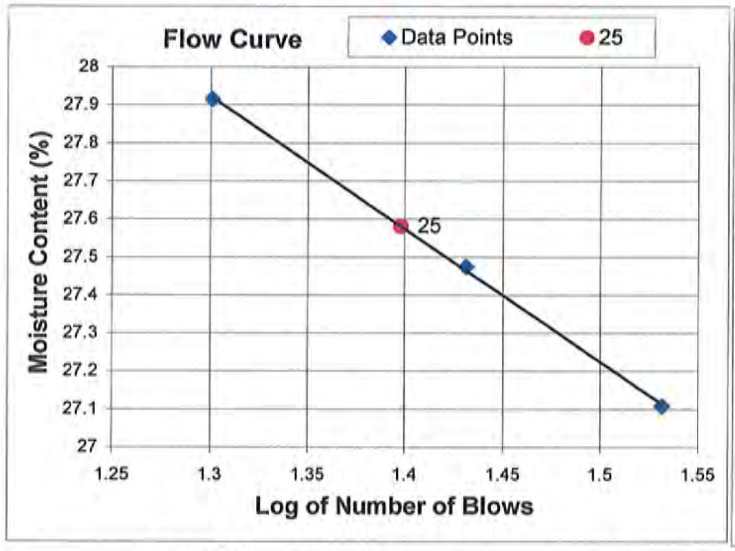
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.448	6.674	6.508
Weight of Dry Soil & Pan (g):	5.800	5.999	5.866
Weight of Water (g):	0.648	0.675	0.642
Weight of Pan (g):	0.744	0.732	0.755
Moisture Content (%):	12.8	12.8	12.6

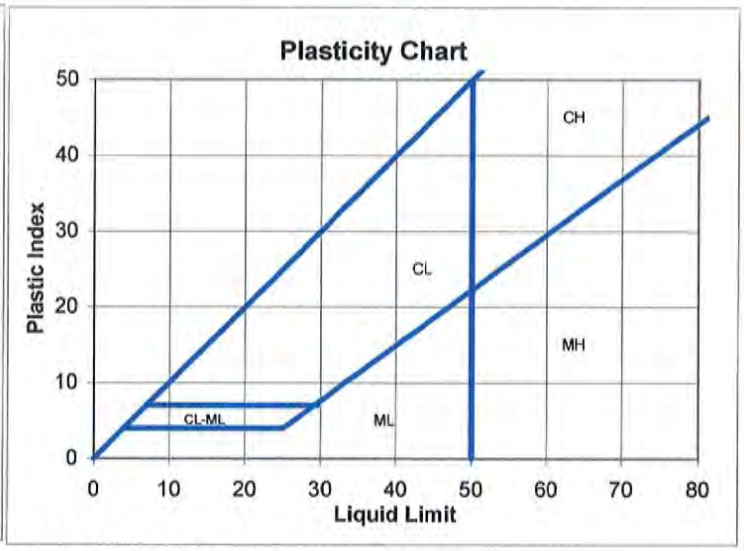
Average: -880.1%
Standard Deviation: 27.5%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	20	27	34
Weight of Wet Soil & Pan (g):	9.990	9.271	11.723
Weight of Dry Soil & Pan (g):	7.974	7.436	9.386
Weight of Water (g):	2.016	1.835	2.337
Weight of Pan (g):	0.752	0.757	0.765
Moisture Content (%):	27.9	27.5	27.1

Plastic Limit: -880
Liquid Limit: 28
Plastic Index: 908
Atterberg Classification CL





Data Entered By: KR Date: 12/4/2013 Data Checked By: CAL
File Name: atterberg-ASTM_4318-R6_3.xls Date: 12/4/13

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-3
Depth: 6-24"
Sample Number: TI-CS03-04A(6-24")
Test Date: 12/11/2013
Technician: KMR
Sampled Date: 11/12/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

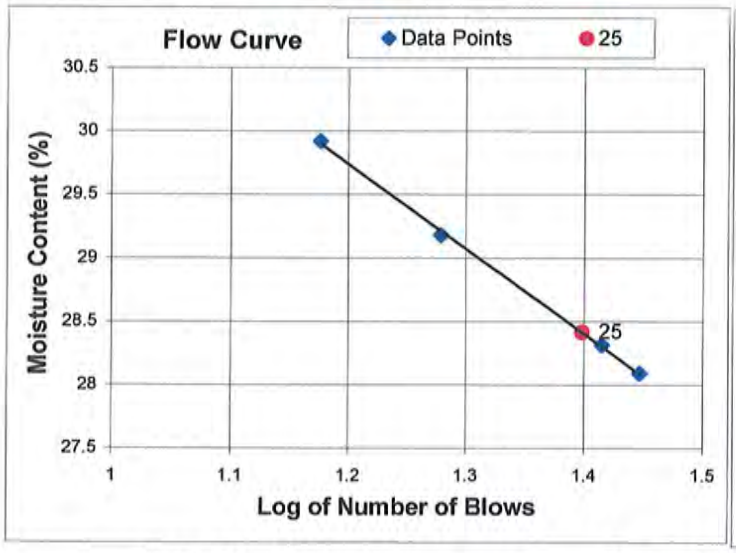
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.623	6.911	6.271
Weight of Dry Soil & Pan (g):	5.911	6.168	5.617
Weight of Water (g):	0.712	0.743	0.654
Weight of Pan (g):	0.735	0.736	0.759
Moisture Content (%):	13.8	13.7	13.5

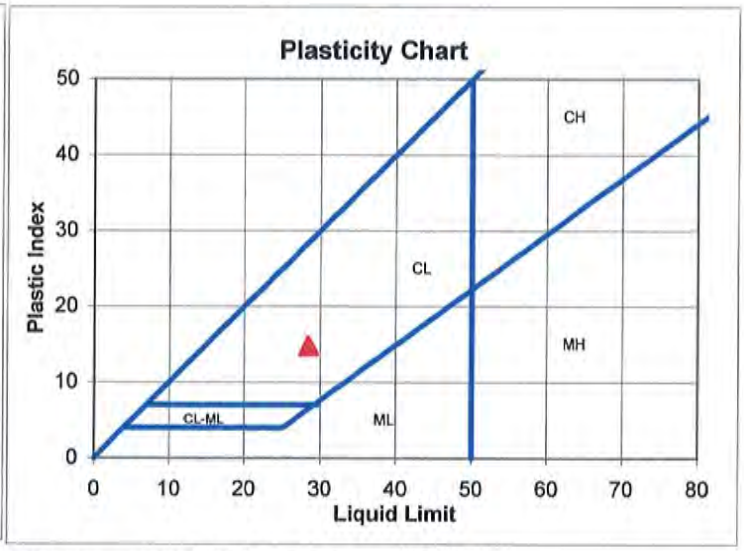
Average: 13.6%
Standard Deviation: 0.2%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	28	26	19	15
Weight of Wet Soil & Pan (g):	11.741	12.307	14.543	12.590
Weight of Dry Soil & Pan (g):	9.334	9.756	11.432	9.870
Weight of Water (g):	2.407	2.551	3.111	2.720
Weight of Pan (g):	0.765	0.746	0.770	0.779
Moisture Content (%):	28.1	28.3	29.2	29.9

Plastic Limit: 14
Liquid Limit: 28
Plastic Index: 15
Atterberg Classification CL





Data Entered By: KMR Date: 12/12/2013 Data Checked By: DPW
File Name: atterberg-ASTM_4318-R6_7.xls Date: 12/13/13

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-10
Depth: 7-25"
Sample Number: TI-CS10-04A(7-25")
Test Date: 12/12/2013
Technician: KMR
Sampled Date: 11/13/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

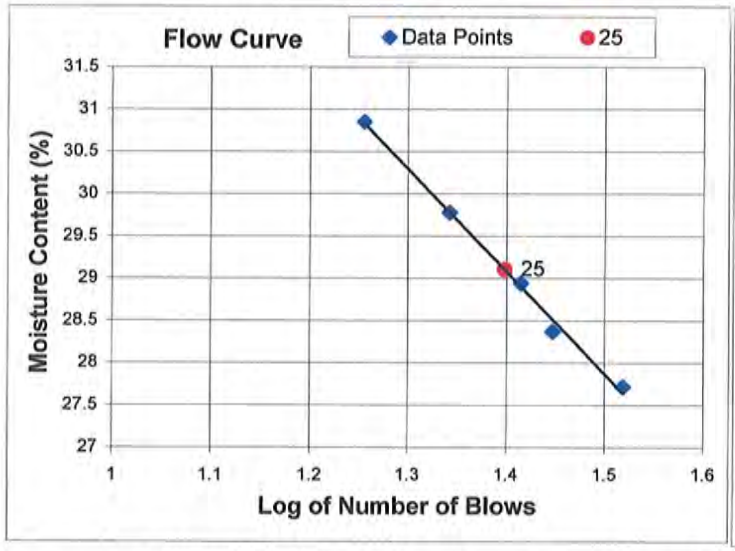
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	5.870	6.032	6.324
Weight of Dry Soil & Pan (g):	5.244	5.397	5.652
Weight of Water (g):	0.626	0.635	0.672
Weight of Pan (g):	0.759	0.771	0.731
Moisture Content (%):	14.0	13.7	13.7

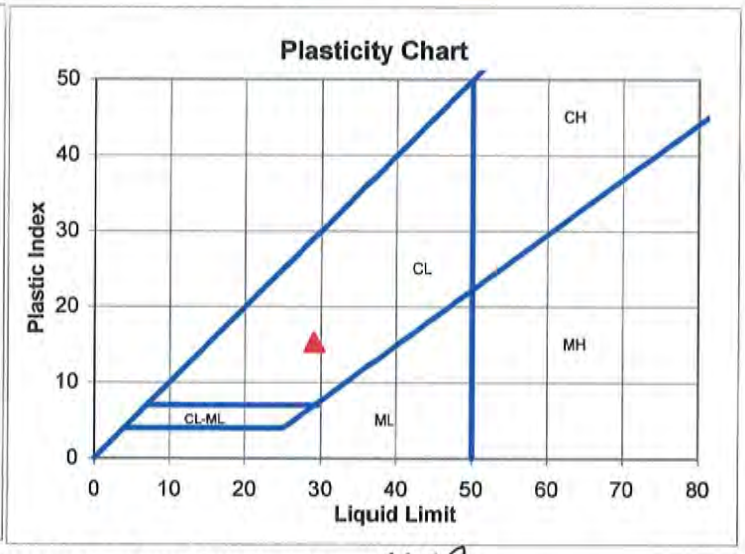
Average: 13.8%
Standard Deviation: 0.2%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	33	28	26	22	18
Weight of Wet Soil & Pan (g):	14.400	15.122	13.908	18.819	15.267
Weight of Dry Soil & Pan (g):	11.441	11.951	10.958	14.677	11.845
Weight of Water (g):	2.959	3.171	2.950	4.142	3.422
Weight of Pan (g):	0.765	0.773	0.764	0.766	0.752
Moisture Content (%):	27.7	28.4	28.9	29.8	30.8

Plastic Limit: 14
Liquid Limit: 29
Plastic Index: 15
Atterberg Classification CL





Data Entered By: KMR Date: 12/13/2013 Data Checked By: DPMS
File Name: atterberg-ASTM_4318-R6_9.xls Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-11
Depth: 9-24"
Sample Number: TI-CS11-04A(9-24")
Test Date: 12/5/2013
Technician: CAL
Sampled Date: 11/13/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

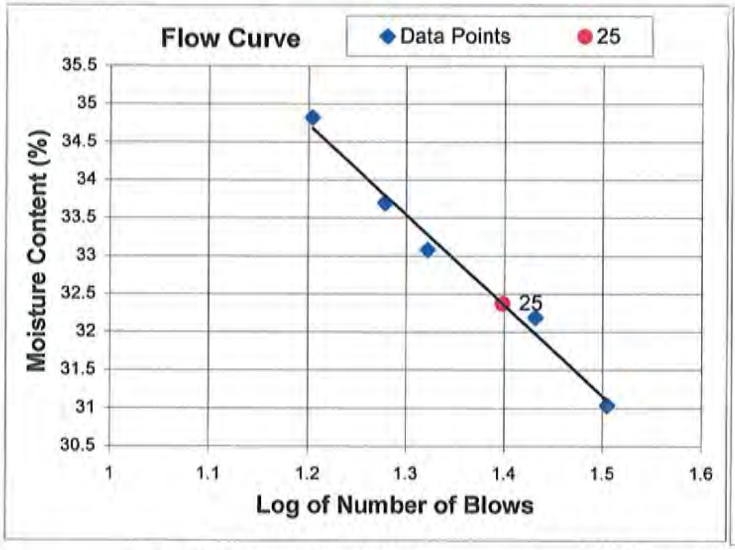
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.818	7.132	7.445
Weight of Dry Soil & Pan (g):	6.139	6.413	6.699
Weight of Water (g):	0.679	0.719	0.746
Weight of Pan (g):	0.735	0.746	0.768
Moisture Content (%):	12.6	12.7	12.6

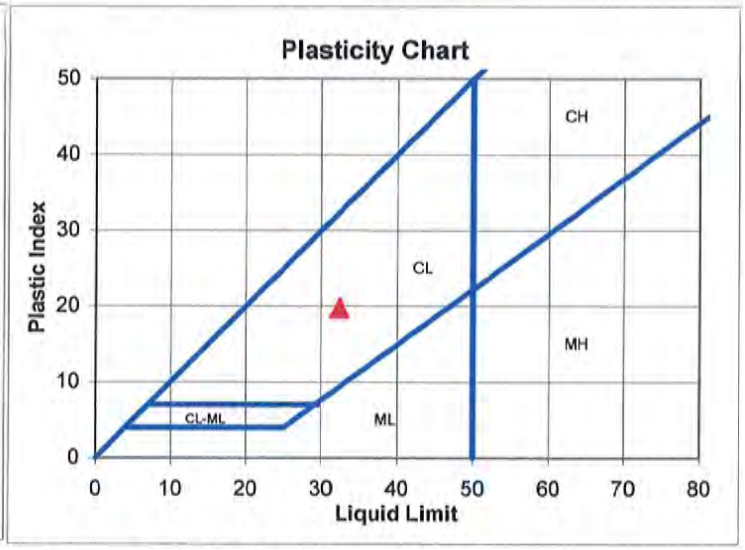
Average: 12.6%
Standard Deviation: 0.1%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	32	27	21	19	16
Weight of Wet Soil & Pan (g):	10.899	10.245	9.851	10.238	8.958
Weight of Dry Soil & Pan (g):	8.501	7.936	7.590	7.843	6.844
Weight of Water (g):	2.398	2.309	2.261	2.395	2.114
Weight of Pan (g):	0.775	0.763	0.755	0.735	0.773
Moisture Content (%):	31.0	32.2	33.1	33.7	34.8

Plastic Limit: 13
Liquid Limit: 32
Plastic Index: 20
Atterberg Classification CL





Data Entered By: KMR Date: 12/9/2013 Data Checked By: DPM
File Name: atterberg-ASTM_4318-R6_6.xls Date: 12/09/13

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-12
Depth: 0-14"
Sample Number: TI-CS12-02A(0-14")
Test Date: 12/11/2013
Technician: KMR
Sampled Date: 11/13/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

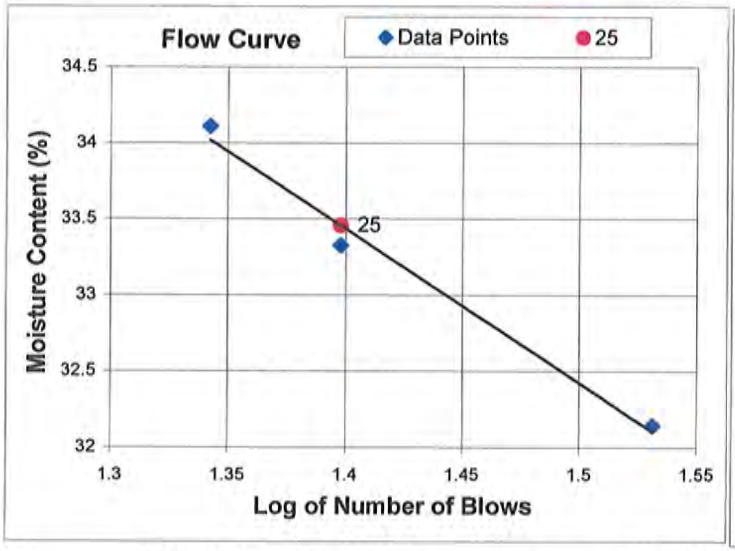
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	5.056	5.335	5.968
Weight of Dry Soil & Pan (g):	4.558	4.790	5.354
Weight of Water (g):	0.498	0.545	0.614
Weight of Pan (g):	0.744	0.724	0.733
Moisture Content (%):	13.1	13.4	13.3

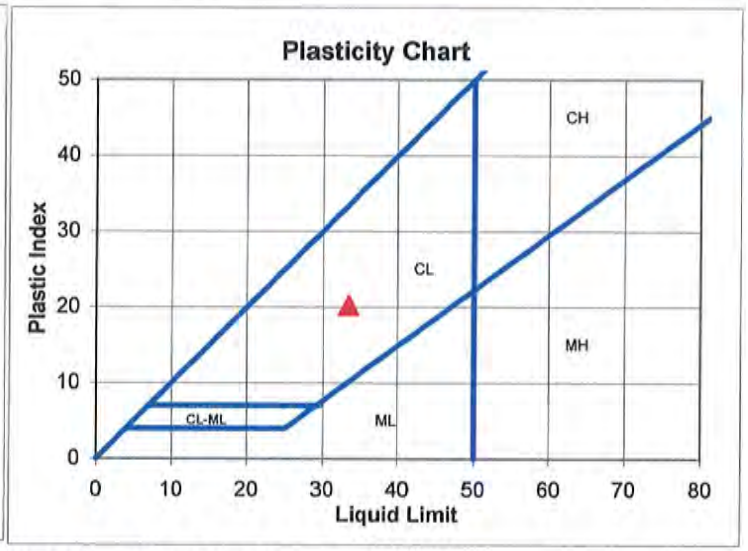
Average: 13.2%
Standard Deviation: 0.2%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	34	25	22
Weight of Wet Soil & Pan (g):	14.697	12.843	15.671
Weight of Dry Soil & Pan (g):	11.301	9.819	11.877
Weight of Water (g):	3.396	3.024	3.794
Weight of Pan (g):	0.736	0.745	0.754
Moisture Content (%):	32.1	33.3	34.1

Plastic Limit: 13
Liquid Limit: 33
Plastic Index: 20
Atterberg Classification CL





Data Entered By: KMR Date: 12/12/2013 Data Checked By: DPM
File Name: atterberg-ASTM_4318-R6_8.xls Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-2
Depth: 10-24"
Sample Number: TI-CS02-04A(10-24")
Test Date: 12/16/2013
Technician: DPM
Sampled Date: 11/12/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

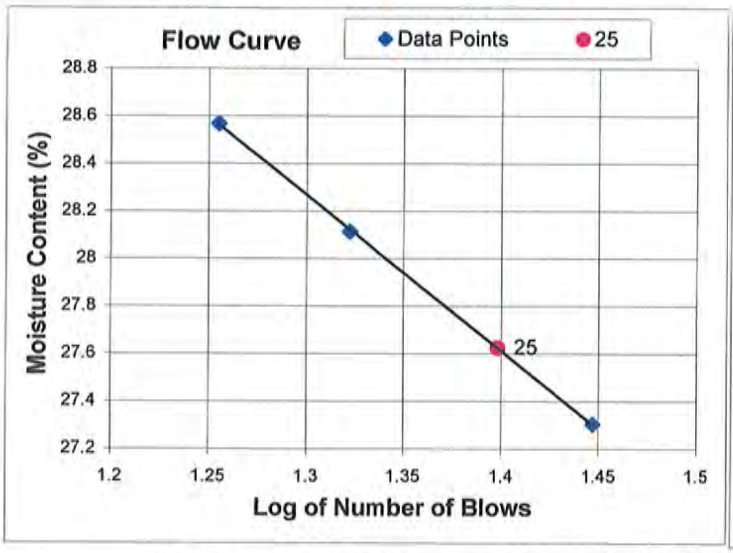
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.531	6.973	6.868
Weight of Dry Soil & Pan (g):	5.892	6.284	6.220
Weight of Water (g):	0.639	0.689	0.648
Weight of Pan (g):	0.766	0.768	0.774
Moisture Content (%):	12.5	12.5	11.9

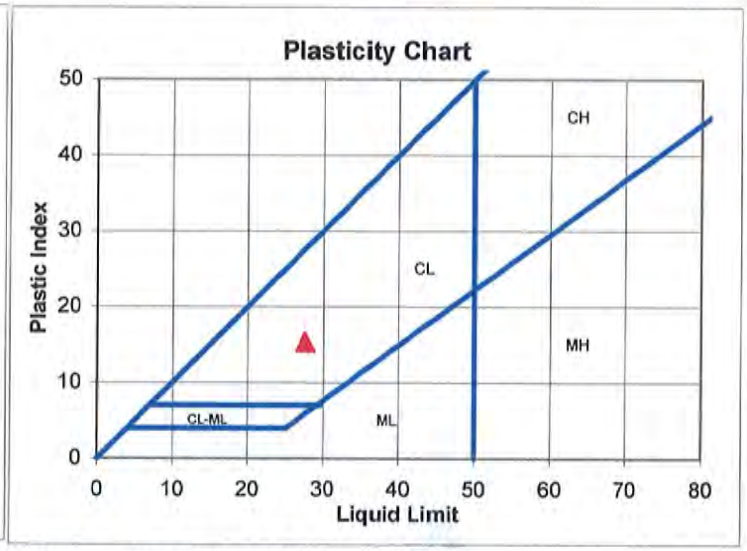
Average: 12.3%
Standard Deviation: 0.3%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	28	18	21
Weight of Wet Soil & Pan (g):	14.596	14.925	14.115
Weight of Dry Soil & Pan (g):	11.625	11.772	11.180
Weight of Water (g):	2.971	3.153	2.935
Weight of Pan (g):	0.744	0.735	0.740
Moisture Content (%):	27.3	28.6	28.1

Plastic Limit: 12
Liquid Limit: 28
Plastic Index: 15
Atterberg Classification CL





Data Entered By: DPM Date: 12/17/2013 Data Checked By: CJ
File Name: atterberg-ASTM_4318-R6_10.xls Date: 12/17/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-1
Depth: 11-24"
Sample Number: TI-CS01-04A(11-24")
Sampled Date: 11/12/2013
Test Date: 12/20/2013

Sampled By: MWH
Technician: DAW

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 75.37
Weight of Dry Soil & Pan (g): 73.80
Weight of Water (g): 1.57
Weight of Pan (g): 3.20
Weight of Dry Soil (g): 70.60
Moisture (%): 2.2

General Sample Data

Total Wet Weight of Sample (g): 2,163.10
Total Dry Weight of Sample (g): 2,117.52
Calculated Weight Plus #200 (g): 884.35
Moisture of Total Sample (%): 2.2
Percent Retained #200 Sieve (%): 41.8

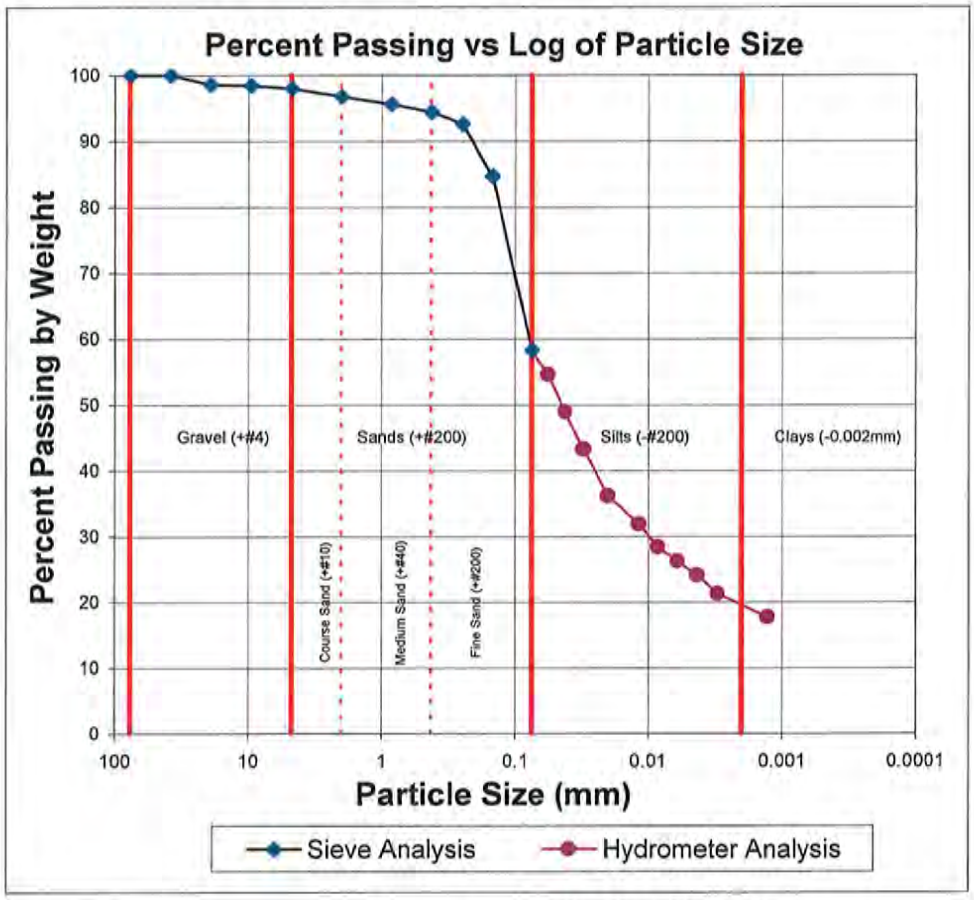
Plus Split Data

Original Weight of +#10 (g): 83.30
Calculated Weight of +#10 (g): 68.05

Minus Split Data

Original Weight of -#10 (g): 2,079.80
Calculated Dry Weight of -#10 (g): 2,049.47

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	30.00	0.00	30.00	30.00	98.6
3/8"	**9.525**	3.47	0.00	3.47	3.47	98.4
#4	**4.750**	8.44	0.00	8.44	8.44	98.0
#10	**2.000**	26.14	0.00	26.14	26.14	96.8
69.406g split out of -#10 material.						
#20	**0.850**	4.01	3.19	0.82	24.84	95.6
#40	**0.425**	3.87	3.03	0.84	25.30	94.4
#60	**0.250**	4.38	3.09	1.29	38.88	92.6
#100	**0.150**	8.64	3.09	5.55	167.47	84.7
#200	**0.075**	21.52	2.97	18.55	559.82	58.2



Data Entered By: SKL
Date: 12/27/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0_0.xls

Checked By: MLM
Date: 12/30/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-1
Depth: 11-24"
Sample Number: TI-CS01-04A(11-24")
Sampled Date: 11/12/2013 Sampled By: MWH
Test Date: 12/19/2013 Technician: MLM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.68
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 2,163.10
Total Dry Weight of Sample (g): 2,117.52
Wet Weight of Sub-Sample (g): 69.406
Dry Weight of Sub-Sample (g): 67.896
Corrected Dry Weight of Sub-Sample - W(g): 70.141

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	44.0	38.5	22.1	0.0133	9.08	0.0568	54.6	1156.60	54.6
1	40.0	34.5	22.1	0.0133	9.73	0.0416	48.9	1036.43	48.9
2	36.0	30.5	22.1	0.0133	10.39	0.0304	43.3	916.27	43.3
5	31.0	25.5	22.1	0.0133	11.21	0.0199	36.2	766.06	36.2
15	28.0	22.5	22.2	0.0133	11.70	0.0118	31.9	675.93	31.9
30	25.5	20.0	22.2	0.0133	12.11	0.0085	28.4	600.83	28.4
60	24.0	18.5	22.3	0.0133	12.36	0.0060	26.2	555.77	26.2
120	22.5	17.0	22.4	0.0133	12.60	0.0043	24.1	510.71	24.1
250	20.5	15.0	22.7	0.0133	12.93	0.0030	21.3	450.62	21.3
1440	18.0	12.5	22.6	0.0133	13.34	0.0013	17.7	375.52	17.7

Data Entered By: SKL
Date: 12/27/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0_0.xls

Checked By: MLM
Date: 12/30/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-4
Depth: 10-24"
Sample Number: TI-CS04-04A(10-24")
Sampled Date: 11/12/2013 Sampled By: MWH
Test Date: 12/20/2013 Technician: DAW

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 55.14
Weight of Dry Soil & Pan (g): 54.07
Weight of Water (g): 1.07
Weight of Pan (g): 3.13
Weight of Dry Soil (g): 50.94
Moisture (%): 2.1

General Sample Data

Total Wet Weight of Sample (g): 1,557.65
Total Dry Weight of Sample (g): 1,526.04
Calculated Weight Plus #200 (g): 485.81
Moisture of Total Sample (%): 2.1
Percent Retained #200 Sieve (%): 31.8

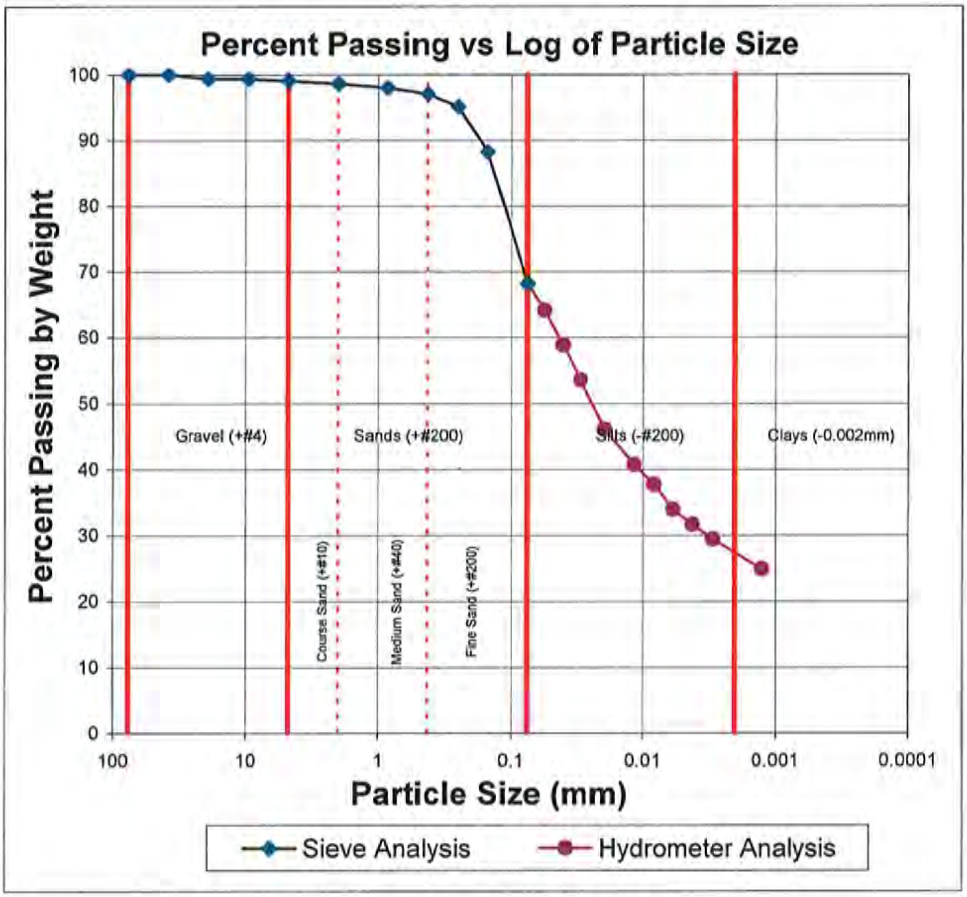
Plus Split Data

Original Weight of +#10 (g): 38.49
Calculated Weight of +#10 (g): 21.12

Minus Split Data

Original Weight of -#10 (g): 1,519.16
Calculated Dry Weight of -#10 (g): 1,504.92

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	9.95	0.00	9.95	9.95	99.3
3/8"	9.525	0.00	0.00	0.00	0.00	99.3
#4	4.750	3.94	0.00	3.94	3.94	99.1
#10	2.000	7.23	0.00	7.23	7.23	98.6
66.413g split out of -#10 material.						
#20	0.850	3.42	3.03	0.40	9.16	98.0
#40	0.425	3.64	3.03	0.60	13.97	97.1
#60	0.250	4.28	2.99	1.29	29.89	95.1
#100	0.150	7.58	3.03	4.56	105.41	88.2
#200	0.075	16.48	3.24	13.24	306.25	68.2



Data Entered By: SKL
Date: 12/27/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0_1.xls

Checked By: CHL
Date: 12/27/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-4
Depth: 10-24"
Sample Number: TI-CS04-04A(10-24")
Sampled Date: 11/12/2013 Sampled By: MWH
Test Date: 12/19/2013 Technician: MLM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.68
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 1,557.65
Total Dry Weight of Sample (g): 1,526.04
Wet Weight of Sub-Sample (g): 66.413
Dry Weight of Sub-Sample (g): 65.047
Corrected Dry Weight of Sub-Sample - W(g): 65.970

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	48.0	42.5	21.9	0.0135	8.42	0.0553	64.1	978.29	64.1
1	44.5	39.0	21.9	0.0135	9.00	0.0404	58.8	897.73	58.8
2	41.0	35.5	21.9	0.0135	9.57	0.0295	53.5	817.16	53.5
5	36.0	30.5	21.9	0.0135	10.39	0.0194	46.0	702.07	46.0
15	32.5	27.0	21.9	0.0135	10.96	0.0115	40.7	621.50	40.7
30	30.5	25.0	22.0	0.0133	11.29	0.0082	37.7	575.47	37.7
60	28.0	22.5	22.1	0.0133	11.70	0.0059	33.9	517.92	33.9
120	26.5	21.0	22.2	0.0133	11.95	0.0042	31.7	483.39	31.7
250	25.0	19.5	22.4	0.0133	12.19	0.0029	29.4	448.86	29.4
1440	22.0	16.5	22.3	0.0133	12.69	0.0013	24.9	379.81	24.9

Data Entered By: SKL
Date: 12/27/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0_1.xls

Checked By: _____
Date: _____

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-5
Depth: 9-24"
Sample Number: TI-CS05-04A(9-24")
Sampled Date: 11/12/2013
Test Date: 12/3/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 108.63
Weight of Dry Soil & Pan (g): 105.86
Weight of Water (g): 2.77
Weight of Pan (g): 3.60
Weight of Dry Soil (g): 102.26
Moisture (%): 2.7

General Sample Data

Total Wet Weight of Sample (g): 1,644.61
Total Dry Weight of Sample (g): 1,601.96
Calculated Weight Plus #200 (g): 617.80
Moisture of Total Sample (%): 2.7
Percent Retained #200 Sieve (%): 38.6

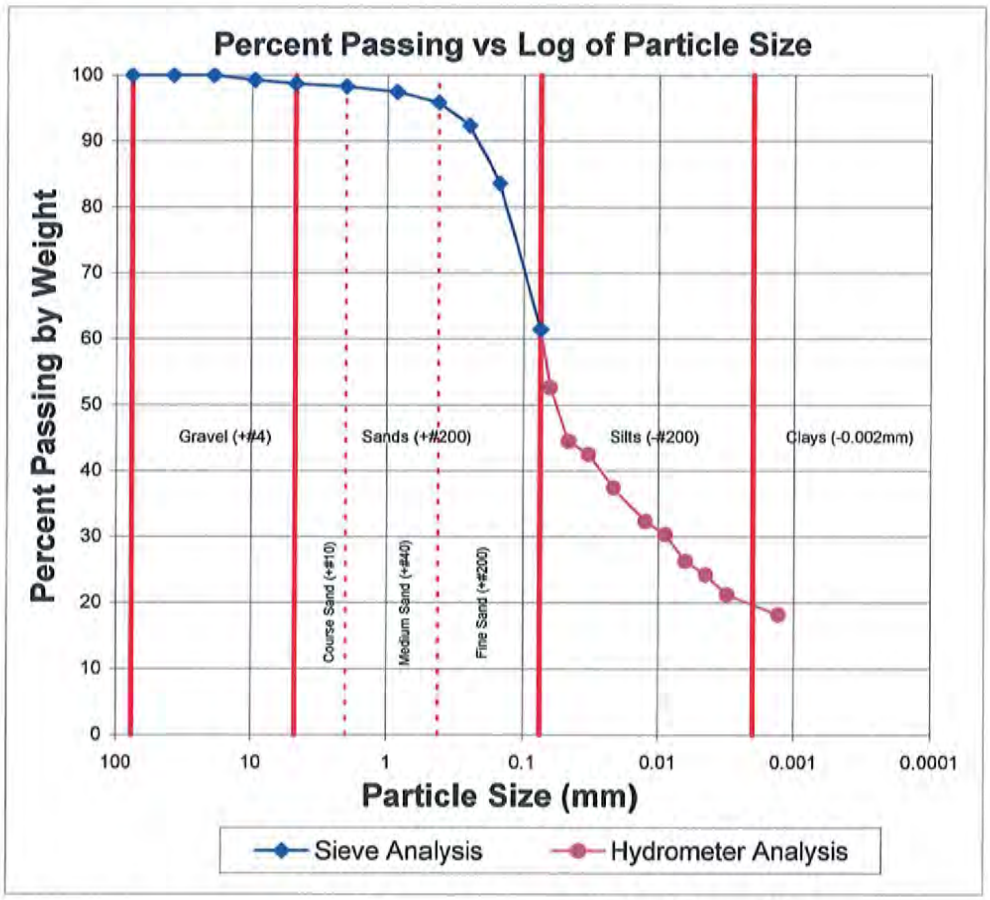
Plus Split Data

Original Weight of +#10 (g): 32.87
Calculated Weight of +#10 (g): 27.24

Minus Split Data

Original Weight of -#10 (g): 1,611.74
Calculated Dry Weight of -#10 (g): 1,574.72

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	11.73	0.00	11.73	11.73	99.3
#4	**4.750**	8.37	0.00	8.37	8.37	98.7
#10	**2.000**	7.14	0.00	7.14	7.14	98.3
49.99g split out of -#10 material.						
#20	**0.850**	4.27	3.84	0.42	13.69	97.4
#40	**0.425**	4.55	3.76	0.79	25.62	95.8
#60	**0.250**	5.41	3.69	1.72	55.58	92.4
#100	**0.150**	8.01	3.66	4.35	140.67	83.6
#200	**0.075**	14.51	3.53	10.97	354.99	61.4



Data Entered By: CAL
Date: 12/5/2013
File Name: 2512_77_hydrometer-ASTM-D422-R1_2.xls

Checked By: KR
Date: 12/5/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-5
Depth: 9-24"
Sample Number: TI-CS05-04A(9-24")
Sampled Date: 11/12/2013
Test Date: 12/3/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 8.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 1,644.61
Total Dry Weight of Sample (g): 1,601.96
Wet Weight of Sub-Sample (g): 49.990
Dry Weight of Sub-Sample (g): 48.672
Corrected Dry Weight of Sub-Sample - W(g): 49.513

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	34.0	26.0	19.8	0.0138	10.72	0.0640	52.6	842.35	52.6
1	30.0	22.0	19.8	0.0138	11.37	0.0466	44.5	712.76	44.5
2	29.0	21.0	19.8	0.0138	11.54	0.0332	42.5	680.36	42.5
5	26.5	18.5	19.8	0.0138	11.95	0.0214	37.4	599.37	37.4
15	24.0	16.0	19.8	0.0138	12.36	0.0125	32.4	518.37	32.4
30	23.0	15.0	19.9	0.0138	12.52	0.0089	30.3	485.97	30.3
60	21.0	13.0	20.1	0.0137	12.85	0.0063	26.3	421.18	26.3
120	20.0	12.0	20.5	0.0137	13.01	0.0045	24.3	388.78	24.3
250	18.5	10.5	21.4	0.0135	13.26	0.0031	21.2	340.18	21.2
1440	17.0	9.0	21.2	0.0135	13.51	0.0013	18.2	291.58	18.2

Data Entered By: CAL
Date: 12/5/2013
File Name: 2512_77_hydrometer-ASTM-D422-R1_2.xls

Checked By: KP
Date: 12/5/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-7
Depth: 0-20"
Sample Number: TI-CS07-02A(0-20")
Sampled Date: 11/13/2013
Test Date: 12/2/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 109.74
Weight of Dry Soil & Pan (g): 107.07
Weight of Water (g): 2.66
Weight of Pan (g): 3.56
Weight of Dry Soil (g): 103.52
Moisture (%): 2.6

General Sample Data

Total Wet Weight of Sample (g): 1,976.72
Total Dry Weight of Sample (g): 1,927.70
Calculated Weight Plus #200 (g): 754.57
Moisture of Total Sample (%): 2.5
Percent Retained #200 Sieve (%): 39.1

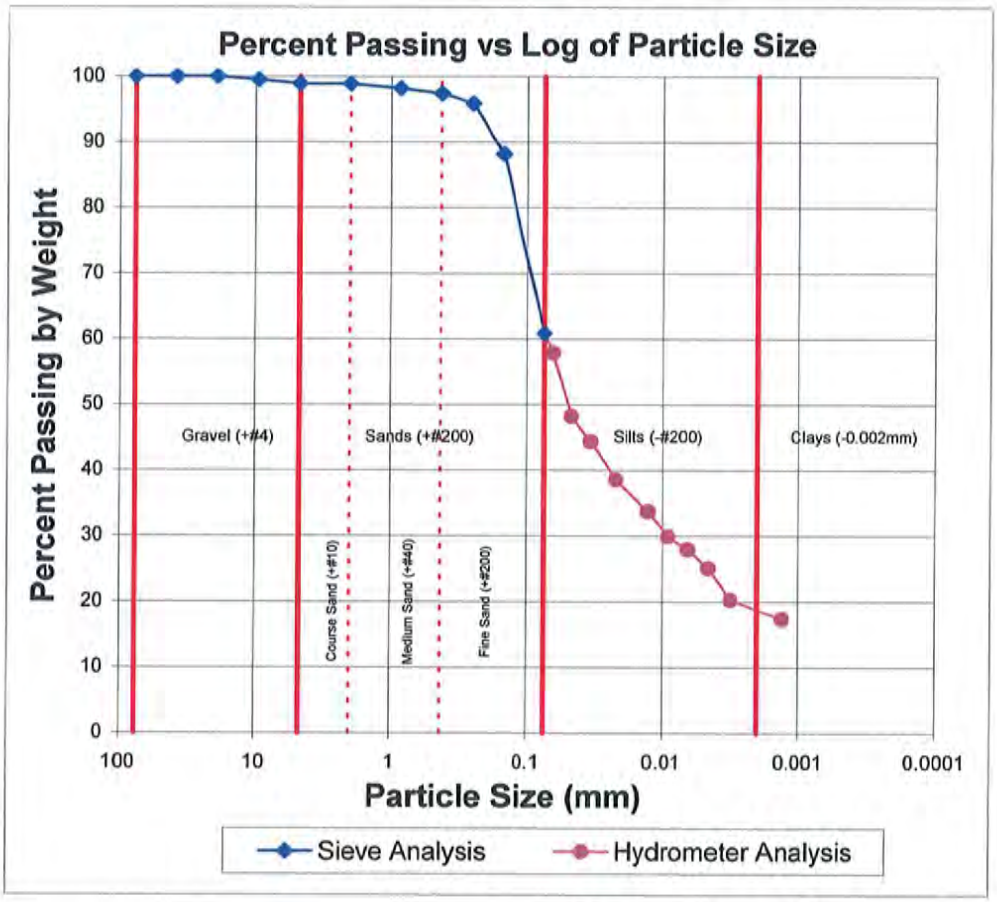
Plus Split Data

Original Weight of +#10 (g): 25.71
Calculated Weight of +#10 (g): 22.06

Minus Split Data

Original Weight of -#10 (g): 1,951.01
Calculated Dry Weight of -#10 (g): 1,905.64

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	9.33	0.00	9.33	9.33	99.5
#4	**4.750**	11.27	0.00	11.27	11.27	98.9
#10	**2.000**	1.46	0.00	1.46	1.46	98.9
52.654g split out of -#10 material.						
#20	**0.850**	4.05	3.71	0.34	12.58	98.2
#40	**0.425**	4.11	3.70	0.42	15.55	97.4
#60	**0.250**	4.63	3.84	0.79	29.29	95.9
#100	**0.150**	7.83	3.84	3.99	147.97	88.2
#200	**0.075**	17.98	3.78	14.20	527.11	60.9



Data Entered By: CAL
Date: 12/5/2013
File Name: 2512_77_hydrometer-ASTM-D422-R1_1.xls

Checked By: KR
Date: 12/6/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-7
Depth: 0-20"
Sample Number: TI-CS07-02A(0-20")
Sampled Date: 11/13/2013
Test Date: 12/2/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 8.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 1,976.72
Total Dry Weight of Sample (g): 1,927.70
Wet Weight of Sub-Sample (g): 52.654
Dry Weight of Sub-Sample (g): 51.333
Corrected Dry Weight of Sub-Sample - W(g): 51.904

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	38.0	30.0	16.9	0.0144	10.06	0.0644	57.9	1115.70	57.9
1	33.0	25.0	16.9	0.0144	10.88	0.0473	48.2	929.75	48.2
2	31.0	23.0	16.9	0.0144	11.21	0.0340	44.4	855.37	44.4
5	28.0	20.0	16.8	0.0144	11.70	0.0220	38.6	743.80	38.6
15	25.5	17.5	17.1	0.0142	12.11	0.0127	33.8	650.83	33.8
30	23.5	15.5	17.4	0.0142	12.44	0.0091	29.9	576.45	29.9
60	22.5	14.5	17.7	0.0142	12.60	0.0065	28.0	539.26	28.0
120	21.0	13.0	18.3	0.0140	12.85	0.0046	25.1	483.47	25.1
250	18.5	10.5	20.1	0.0137	13.26	0.0031	20.3	390.50	20.3
1440	17.0	9.0	20.2	0.0137	13.51	0.0013	17.4	334.71	17.4

Data Entered By: CAL
Date: 12/5/2013
File Name: 2512_77_hydrometer-ASTM-D422-R1_1.xls

Checked By: KR
Date: 12/5/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-9
Depth: 9-26"
Sample Number: TI-CS09-04A(9-26")
Sampled Date: 11/13/2013
Test Date: 12/2/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 101.03
Weight of Dry Soil & Pan (g): 98.89
Weight of Water (g): 2.14
Weight of Pan (g): 3.77
Weight of Dry Soil (g): 95.12
Moisture (%): 2.3

General Sample Data

Total Wet Weight of Sample (g): 1,718.28
Total Dry Weight of Sample (g): 1,681.98
Calculated Weight Plus #200 (g): 707.36
Moisture of Total Sample (%): 2.2
Percent Retained #200 Sieve (%): 42.1

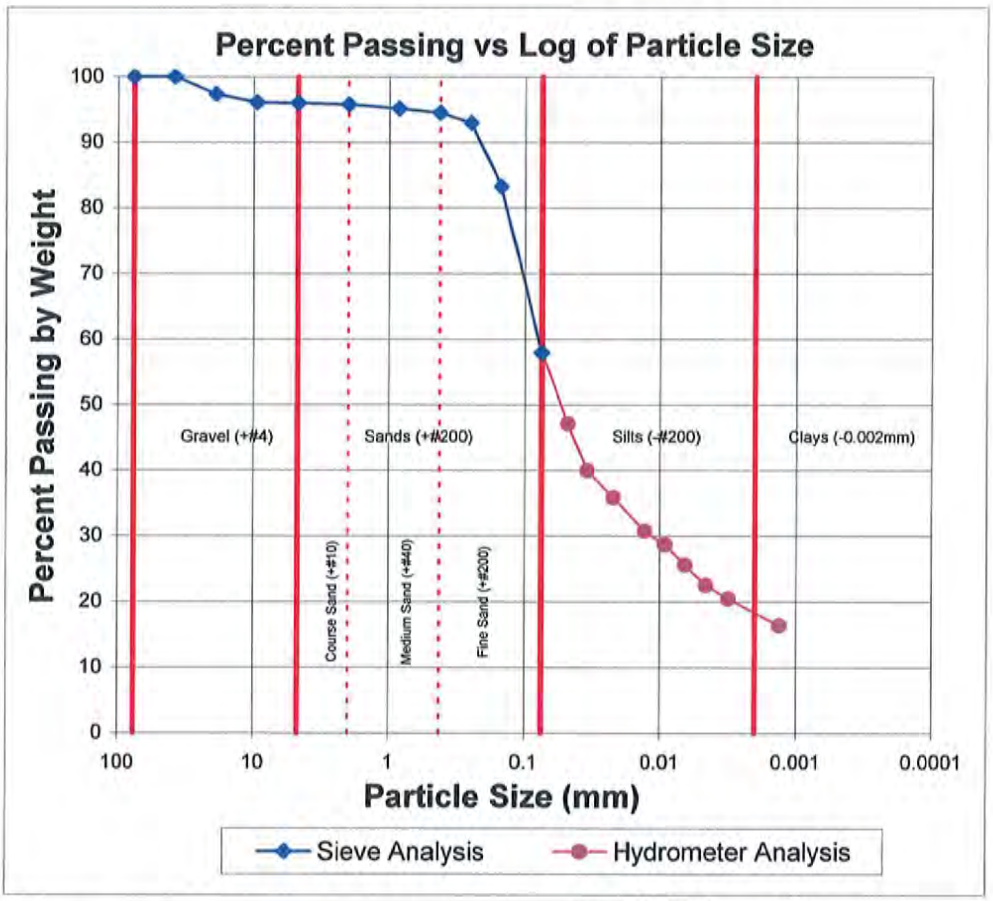
Plus Split Data

Original Weight of +#10 (g): 86.45
Calculated Weight of +#10 (g): 70.98

Minus Split Data

Original Weight of -#10 (g): 1,631.83
Calculated Dry Weight of -#10 (g): 1,611.00

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	44.53	0.00	44.53	44.53	97.4
3/8"	**9.525**	21.02	0.00	21.02	21.02	96.1
#4	**4.750**	1.85	0.00	1.85	1.85	96.0
#10	**2.000**	3.58	0.00	3.58	3.58	95.8
47.875g split out of -#10 material.						
#20	**0.850**	4.13	3.83	0.30	10.22	95.2
#40	**0.425**	4.28	3.96	0.32	10.94	94.5
#60	**0.250**	4.58	3.80	0.77	26.67	92.9
#100	**0.150**	8.56	3.82	4.74	162.92	83.3
#200	**0.075**	15.92	3.55	12.37	425.63	57.9



Data Entered By: CAL
Date: 12/5/2013
File Name: 2512_77_hydrometer-ASTM-D422-R1_0.xls

Checked By: KR
Date: 12/5/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-9
Depth: 9-26"
Sample Number: TI-CS09-04A(9-26")
Sampled Date: 11/13/2013
Test Date: 12/2/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 8.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 1,718.28
Total Dry Weight of Sample (g): 1,681.98
Wet Weight of Sub-Sample (g): 47.875
Dry Weight of Sub-Sample (g): 46.820
Corrected Dry Weight of Sub-Sample - W(g): 48.873

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	31.0	23.0	16.7	0.0144	11.21	0.0480	47.1	792.64	47.1
2	27.5	19.5	16.7	0.0144	11.78	0.0348	40.0	672.02	40.0
5	25.5	17.5	16.7	0.0144	12.11	0.0223	35.9	603.09	35.9
15	23.0	15.0	17.0	0.0142	12.52	0.0129	30.7	516.94	30.7
30	22.0	14.0	17.2	0.0142	12.69	0.0092	28.7	482.47	28.7
60	20.5	12.5	17.7	0.0142	12.93	0.0066	25.6	430.78	25.6
120	19.0	11.0	18.1	0.0140	13.18	0.0046	22.5	379.09	22.5
250	18.0	10.0	20.1	0.0137	13.34	0.0032	20.5	344.62	20.5
1440	16.0	8.0	20.1	0.0137	13.67	0.0013	16.4	275.70	16.4

Data Entered By: CAL
Date: 12/5/2013
File Name: 2512_77_hydrometer-ASTM-D422-R1_0.xls

Checked By: KR
Date: 12/5/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-2
Depth: 0-10"
Sample Number: TI-CS02-02A(0-10")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 117.84
Weight of Dry Soil & Pan (g): 112.26
Weight of Water (g): 5.58
Weight of Pan (g): 3.60
Weight of Dry Soil (g): 108.66
Moisture (%): 5.1

General Sample Data

Total Wet Weight of Sample (g): 10,935.00
Total Dry Weight of Sample (g): 10,592.42
Calculated Weight Plus #200 (g): 5,714.14
Moisture of Total Sample (%): 3.2
Percent Retained #200 Sieve (%): 53.9

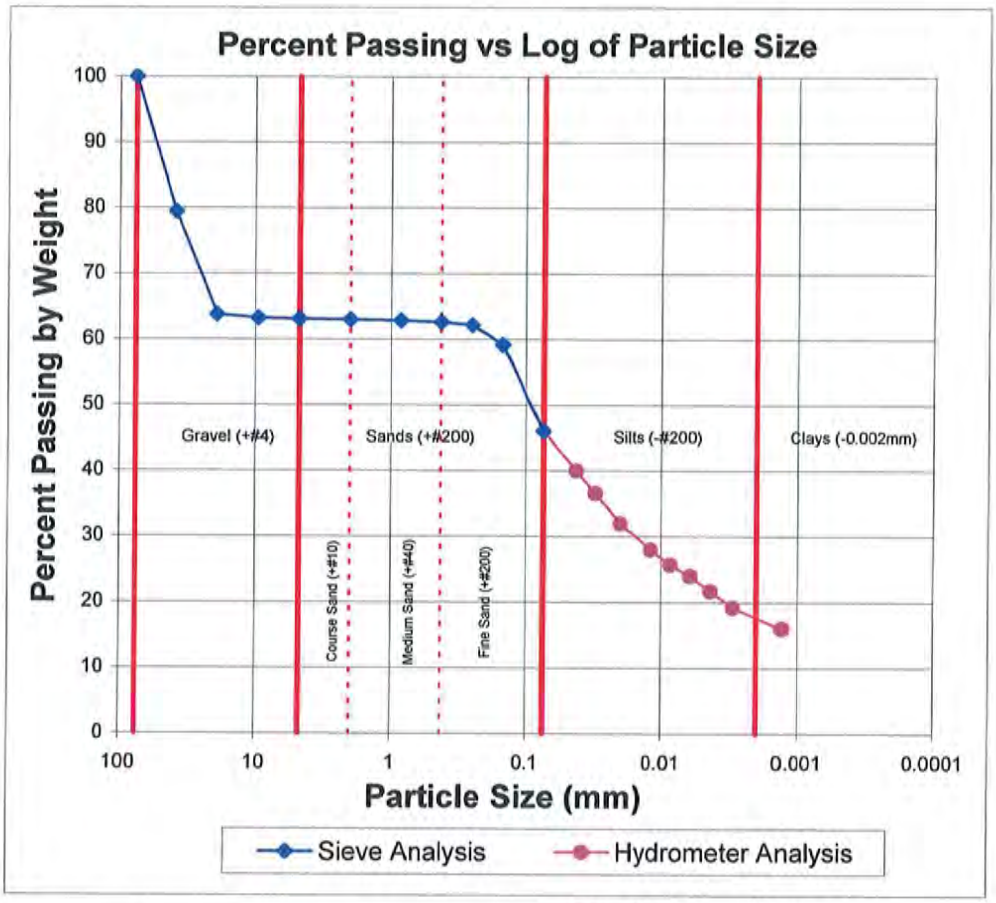
Plus Split Data

Original Weight of +#10 (g): 3,980.00
Calculated Weight of +#10 (g): 3,921.13

Minus Split Data

Original Weight of -#10 (g): 6,955.00
Calculated Dry Weight of -#10 (g): 6,671.29

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	2180.00	0.00	2180.00	2180.00	79.4
3/4"	**19.05**	1660.45	0.00	1660.45	1660.45	63.7
3/8"	**9.525**	54.02	0.00	54.02	54.02	63.2
#4	**4.750**	16.04	0.00	16.04	16.04	63.1
#10	**2.000**	10.62	0.00	10.62	10.62	63.0
58.043g split out of -#10 material.						
#20	**0.850**	3.95	3.80	0.15	18.01	62.8
#40	**0.425**	3.94	3.74	0.20	24.41	62.6
#60	**0.250**	4.15	3.77	0.38	46.16	62.1
#100	**0.150**	6.16	3.56	2.60	314.06	59.2
#200	**0.075**	14.57	3.07	11.51	1390.38	46.1



Data Entered By: KMR
Date: 12/13/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_8.xls

Checked By: DPM
Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-2
Depth: 0-10"
Sample Number: TI-CS02-02A(0-10")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 10,935.00
Total Dry Weight of Sample (g): 10,592.42
Wet Weight of Sub-Sample (g): 58.043
Dry Weight of Sub-Sample (g): 55.208
Corrected Dry Weight of Sub-Sample - W(g): 87.632

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	41.0	35.0	19.3	0.0138	9.57	0.0428	40.0	4236.37	40.0
2	38.0	32.0	19.3	0.0138	10.06	0.0310	36.6	3873.25	36.6
5	34.0	28.0	19.3	0.0138	10.72	0.0202	32.0	3389.09	32.0
15	30.5	24.5	19.4	0.0138	11.29	0.0120	28.0	2965.46	28.0
30	28.5	22.5	19.6	0.0138	11.62	0.0086	25.7	2723.38	25.7
60	27.0	21.0	19.9	0.0138	11.87	0.0061	24.0	2541.82	24.0
120	25.0	19.0	20.4	0.0137	12.19	0.0044	21.7	2299.74	21.7
250	22.8	16.8	22.0	0.0133	12.56	0.0030	19.2	2033.46	19.2
1440	20.0	14.0	20.1	0.0137	13.01	0.0013	16.0	1694.55	16.0

Data Entered By: KMR
Date: 12/13/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_8.xls

Checked By: DPas
Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-3
Depth: 0-6"
Sample Number: TI-CS03-02A(0-6")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 114.81
Weight of Dry Soil & Pan (g): 107.72
Weight of Water (g): 7.10
Weight of Pan (g): 3.67
Weight of Dry Soil (g): 104.05
Moisture (%): 6.8

General Sample Data

Total Wet Weight of Sample (g): 12,025.00
Total Dry Weight of Sample (g): 11,659.26
Calculated Weight Plus #200 (g): 8,432.80
Moisture of Total Sample (%): 3.1
Percent Retained #200 Sieve (%): 72.3

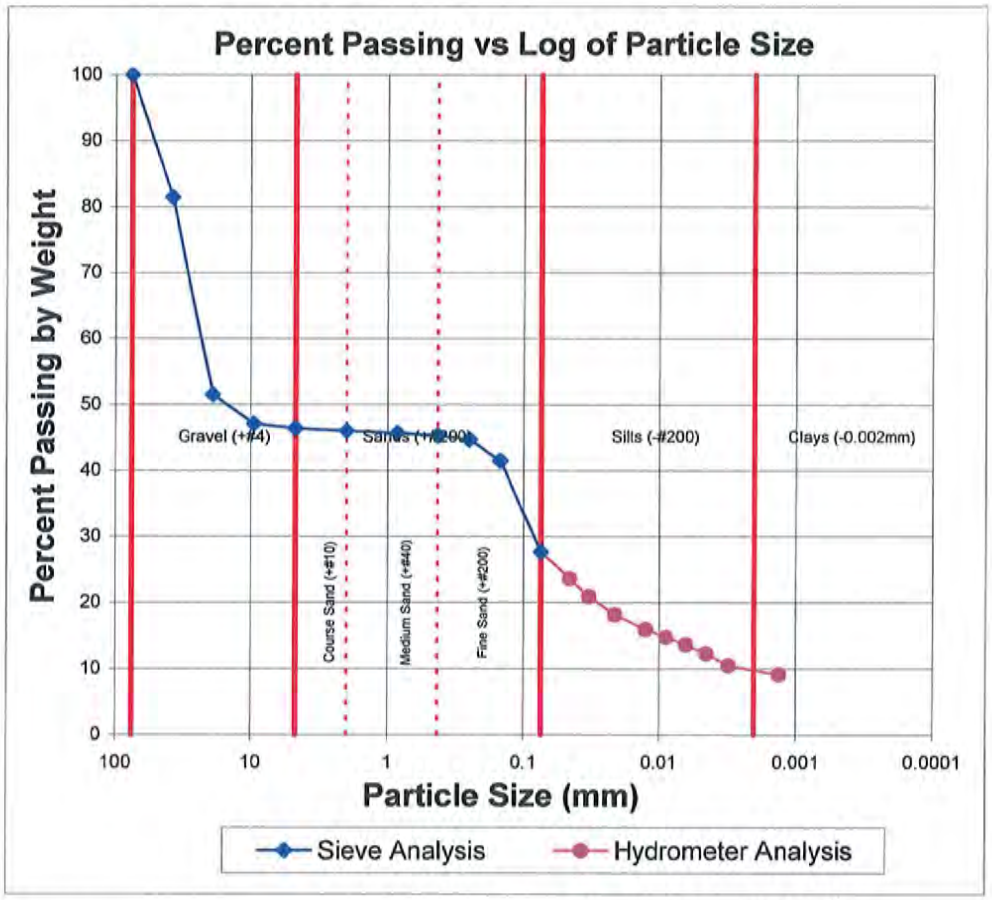
Plus Split Data

Original Weight of +#10 (g): 6,450.00
Calculated Weight of +#10 (g): 6,296.34

Minus Split Data

Original Weight of -#10 (g): 5,575.00
Calculated Dry Weight of -#10 (g): 5,362.92

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	2165.00	0.00	2165.00	2165.00	81.4
3/4"	**19.05**	3490.00	0.00	3490.00	3490.00	51.5
3/8"	**9.525**	516.72	0.00	516.72	516.72	47.1
#4	**4.750**	79.91	0.00	79.91	79.91	46.4
#10	**2.000**	44.71	0.00	44.71	44.71	46.0
54.113g split out of -#10 material.						
#20	**0.850**	4.25	3.89	0.36	38.43	45.7
#40	**0.425**	4.18	3.73	0.45	47.75	45.3
#60	**0.250**	4.22	3.55	0.67	71.25	44.6
#100	**0.150**	7.24	3.72	3.52	372.43	41.5
#200	**0.075**	18.73	3.56	15.18	1606.60	27.7



Data Entered By: KMR
Date: 12/13/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_10.xls

Checked By: DPM
Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-3
Depth: 0-6"
Sample Number: TI-CS03-02A(0-6")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 12,025.00
Total Dry Weight of Sample (g): 11,659.26
Wet Weight of Sub-Sample (g): 54.113
Dry Weight of Sub-Sample (g): 50.658
Corrected Dry Weight of Sub-Sample - W(g): 110.127

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	32.0	26.0	19.7	0.0138	11.05	0.0459	23.6	2756.41	23.6
2	29.0	23.0	19.7	0.0138	11.54	0.0332	20.9	2438.36	20.9
5	26.0	20.0	19.7	0.0138	12.03	0.0214	18.2	2120.32	18.2
15	23.5	17.5	19.8	0.0138	12.44	0.0126	15.9	1855.28	15.9
30	22.3	16.3	20.0	0.0137	12.65	0.0089	14.8	1722.76	14.8
60	21.0	15.0	20.4	0.0137	12.85	0.0063	13.6	1590.24	13.6
120	19.5	13.5	20.9	0.0137	13.10	0.0045	12.3	1431.21	12.3
250	17.5	11.5	22.4	0.0133	13.42	0.0031	10.5	1219.18	10.5
1440	16.0	10.0	20.4	0.0137	13.67	0.0013	9.1	1060.16	9.1

Data Entered By: KMR
Date: 12/13/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_10.xls

Checked By: DPM
Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-6
Depth: 0-7"
Sample Number: TI-CS06-02A(0-7")
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	1206.82	0.00	1206.82	1206.82	86.0
3/4"	**19.05**	1901.60	0.00	1901.60	1901.60	64.0
3/8"	**9.525**	896.62	0.00	896.62	896.62	53.6
#4	**4.750**	172.60	0.00	172.60	172.60	51.6
#10	**2.000**	83.20	0.00	83.20	83.20	50.7
56.524g split out of -#10 material.						
#20	**0.850**	4.77	3.70	1.07	87.60	49.6
#40	**0.425**	4.97	3.90	1.07	87.03	48.6
#60	**0.250**	4.82	3.77	1.05	86.05	47.6
#100	**0.150**	7.90	3.69	4.21	343.80	43.7
#200	**0.075**	14.82	3.63	11.19	914.61	33.1

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 118.66
Weight of Dry Soil & Pan (g): 112.58
Weight of Water (g): 6.08
Weight of Pan (g): 3.69
Weight of Dry Soil (g): 108.89
Moisture (%): 5.6

General Sample Data

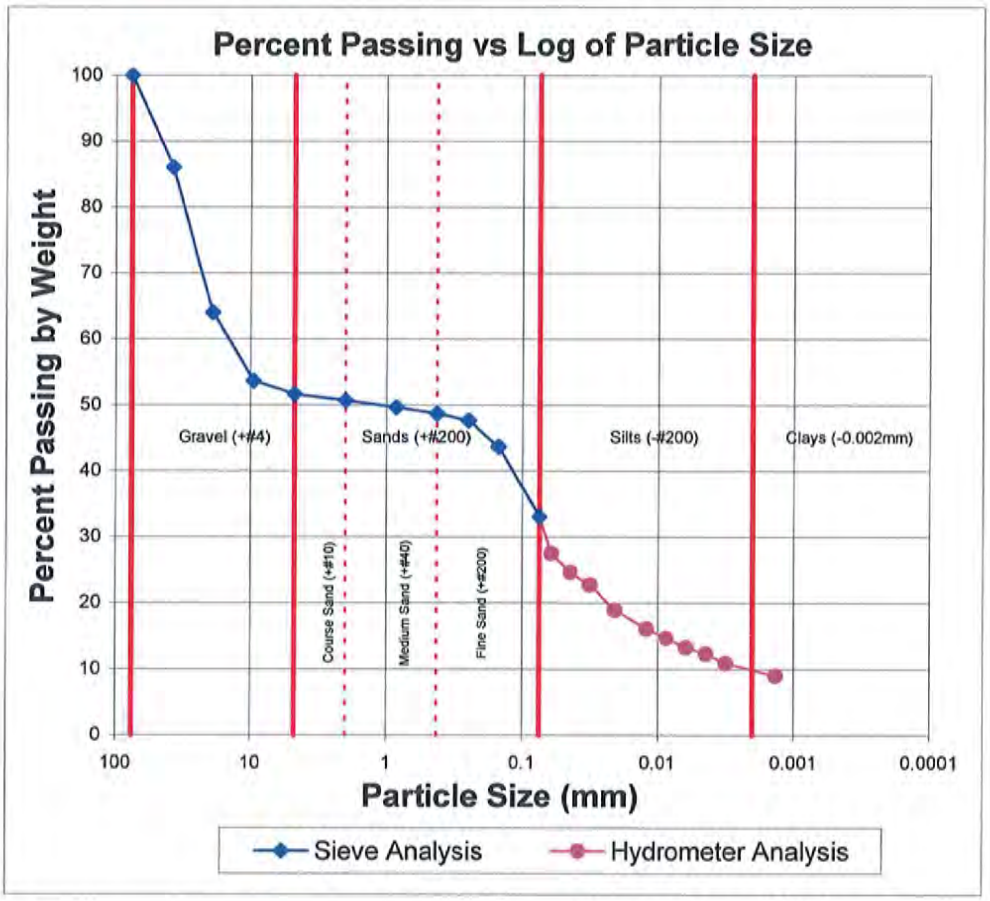
Total Wet Weight of Sample (g): 8,880.00
Total Dry Weight of Sample (g): 8,635.72
Calculated Weight Plus #200 (g): 5,779.94
Moisture of Total Sample (%): 2.8
Percent Retained #200 Sieve (%): 66.9

Plus Split Data

Original Weight of +#10 (g): 4,420.00
Calculated Weight of +#10 (g): 4,260.84

Minus Split Data

Original Weight of -#10 (g): 4,460.00
Calculated Dry Weight of -#10 (g): 4,374.88



Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_6.xls

Checked By: [signature]
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-6
Depth: 0-7"
Sample Number: TI-CS06-02A(0-7")
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 7.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 8,880.00
Total Dry Weight of Sample (g): 8,635.72
Wet Weight of Sub-Sample (g): 56.524
Dry Weight of Sub-Sample (g): 53.535
Corrected Dry Weight of Sub-Sample - W(g): 105.591

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	36.0	29.0	21.3	0.0135	10.39	0.0615	27.5	2374.98	27.5
1	33.0	26.0	21.3	0.0135	10.88	0.0445	24.7	2129.29	24.7
2	31.0	24.0	21.3	0.0135	11.21	0.0319	22.8	1965.50	22.8
5	27.0	20.0	21.6	0.0135	11.87	0.0208	19.0	1637.92	19.0
15	24.0	17.0	21.7	0.0135	12.36	0.0122	16.1	1392.23	16.1
30	22.5	15.5	22.2	0.0133	12.60	0.0086	14.7	1269.39	14.7
60	21.0	14.0	22.0	0.0133	12.85	0.0062	13.3	1146.54	13.3
120	20.0	13.0	21.8	0.0135	13.01	0.0044	12.3	1064.65	12.3
250	18.5	11.5	20.2	0.0137	13.26	0.0031	10.9	941.80	10.9
1440	16.5	9.5	18.7	0.0140	13.59	0.0014	9.0	778.01	9.0

Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_6.xls

Checked By: [illegible]
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-6
Depth: 7-24"
Sample Number: TI-CS06-04A(7-24")
Sampled Date: 11/13/2013
Test Date: 12/2/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	144.72	0.00	144.72	144.72	96.4
3/8"	**9.525**	80.77	0.00	80.77	80.77	94.3
#4	**4.750**	40.75	0.00	40.75	40.75	93.3
#10	**2.000**	10.25	0.00	10.25	10.25	93.0
57.274g split out of -#10 material.						
#20	**0.850**	4.50	3.62	0.89	59.53	91.5
#40	**0.425**	4.45	3.68	0.76	51.39	90.2
#60	**0.250**	4.58	3.56	1.02	68.48	88.5
#100	**0.150**	8.04	3.62	4.42	297.25	81.0
#200	**0.075**	16.69	3.76	12.93	869.56	59.1

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 125.91
Weight of Dry Soil & Pan (g): 120.93
Weight of Water (g): 4.98
Weight of Pan (g): 3.70
Weight of Dry Soil (g): 117.23
Moisture (%): 4.2

General Sample Data

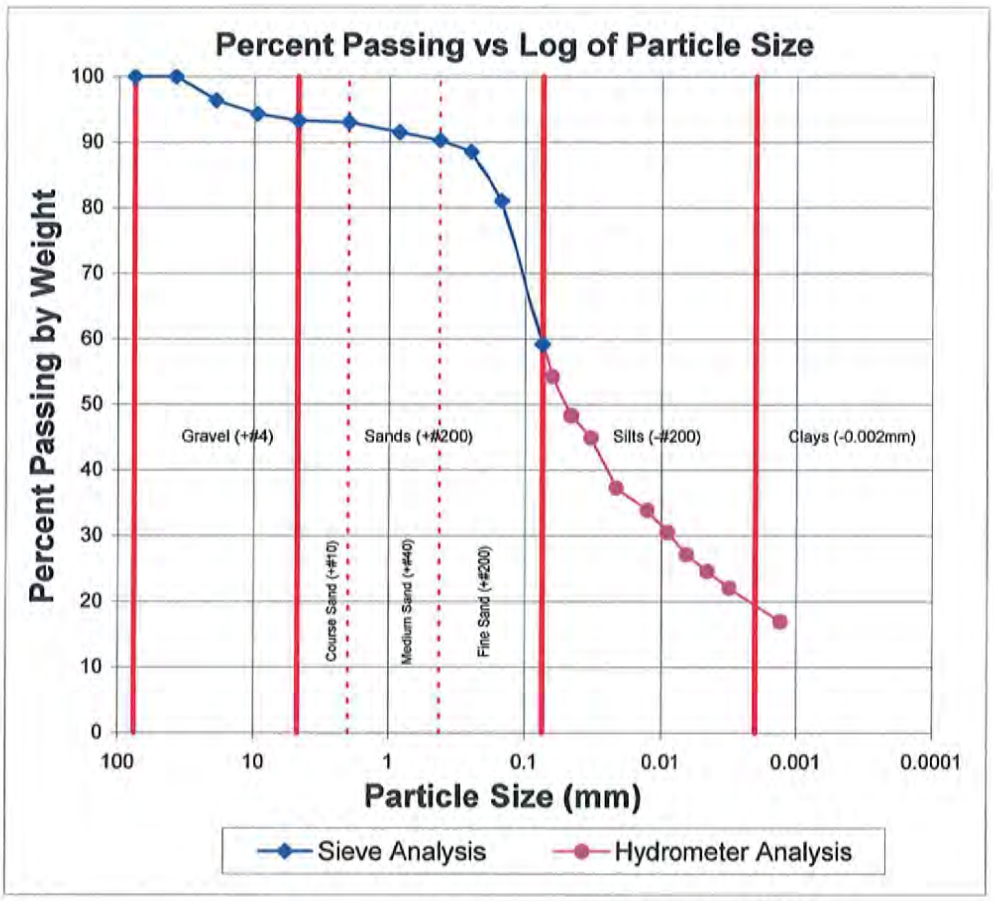
Total Wet Weight of Sample (g): 4,129.13
Total Dry Weight of Sample (g): 3,972.23
Calculated Weight Plus #200 (g): 1,622.70
Moisture of Total Sample (%): 3.9
Percent Retained #200 Sieve (%): 40.9

Plus Split Data

Original Weight of +#10 (g): 297.31
Calculated Weight of +#10 (g): 276.49

Minus Split Data

Original Weight of -#10 (g): 3,831.82
Calculated Dry Weight of -#10 (g): 3,695.74



Data Entered By: KMR
Date: 12/6/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_0.xls

Checked By: DPM
Date: 11/04/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-6
Depth: 7-24"
Sample Number: TI-CS06-04A(7-24")
Sampled Date: 11/13/2013
Test Date: 12/2/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 8.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 4,129.13
Total Dry Weight of Sample (g): 3,972.23
Wet Weight of Sub-Sample (g): 57.274
Dry Weight of Sub-Sample (g): 54.941
Corrected Dry Weight of Sub-Sample - W(g): 59.077

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	40.0	32.0	16.1	0.0144	9.73	0.0633	54.2	2154.56	54.2
1	36.5	28.5	16.1	0.0144	10.31	0.0461	48.3	1918.91	48.3
2	34.5	26.5	16.1	0.0144	10.64	0.0331	44.9	1784.25	44.9
5	30.0	22.0	16.2	0.0144	11.37	0.0216	37.3	1481.26	37.3
15	28.0	20.0	16.3	0.0144	11.70	0.0127	33.9	1346.60	33.9
30	26.0	18.0	16.7	0.0144	12.03	0.0091	30.5	1211.94	30.5
60	24.0	16.0	17.4	0.0142	12.36	0.0064	27.1	1077.28	27.1
120	22.5	14.5	18.1	0.0140	12.60	0.0045	24.6	976.29	24.6
250	21.0	13.0	19.8	0.0138	12.85	0.0031	22.0	875.29	22.0
1440	18.0	10.0	20.1	0.0137	13.34	0.0013	17.0	673.30	17.0

Data Entered By: KMR
Date: 12/6/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_0.xls

Checked By: DPM
Date: 12/09/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-8
Depth: 0-8"
Sample Number: TI-CS08-02A(0-8")
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	2615.00	0.00	2615.00	2615.00	75.2
3/4"	**19.05**	2585.00	0.00	2585.00	2585.00	50.6
3/8"	**9.525**	650.00	0.00	650.00	650.00	44.5
#4	**4.750**	120.00	0.00	120.00	120.00	43.3
#10	**2.000**	60.65	0.00	60.65	60.65	42.8
55.584g split out of -#10 material.						
#20	**0.850**	4.50	3.82	0.68	57.07	42.2
#40	**0.425**	4.39	3.74	0.65	54.48	41.7
#60	**0.250**	4.85	3.57	1.29	107.54	40.7
#100	**0.150**	10.17	3.63	6.54	546.29	35.5
#200	**0.075**	17.15	3.65	13.50	1127.67	24.8

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 118.63
Weight of Dry Soil & Pan (g): 115.18
Weight of Water (g): 3.45
Weight of Pan (g): 3.56
Weight of Dry Soil (g): 111.62
Moisture (%): 3.1

General Sample Data

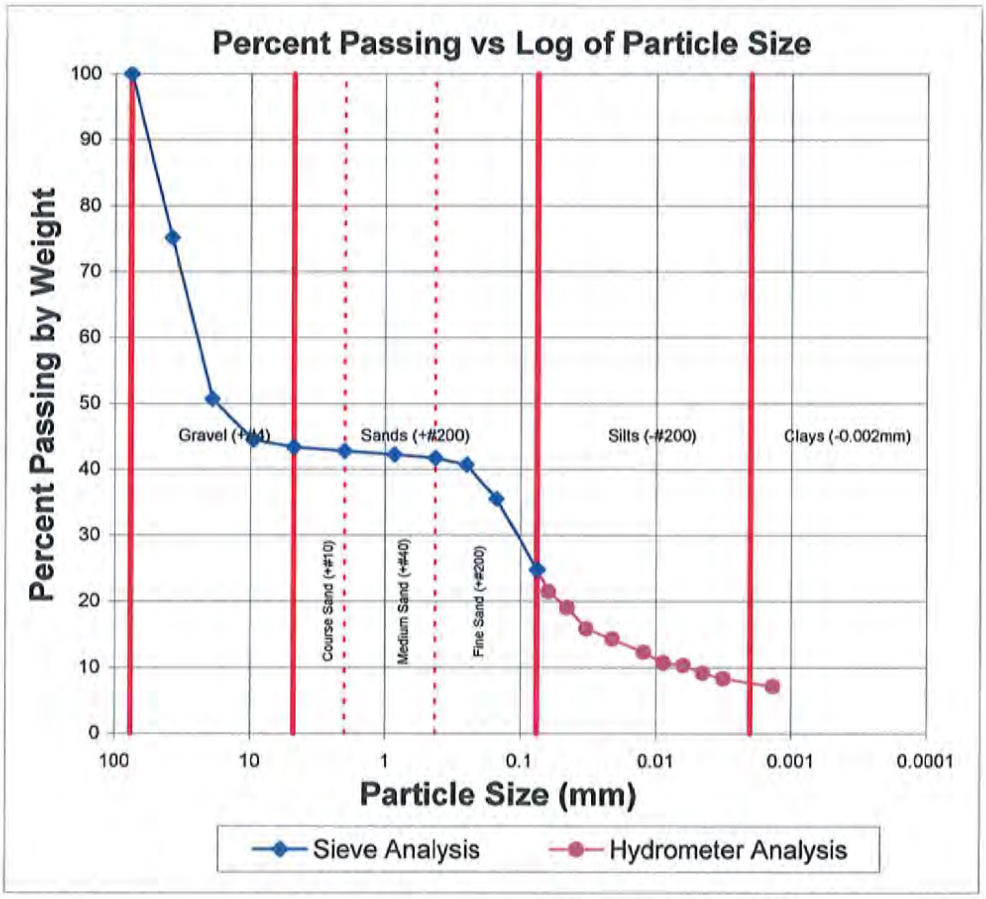
Total Wet Weight of Sample (g): 10,675.00
Total Dry Weight of Sample (g): 10,535.75
Calculated Weight Plus #200 (g): 7,923.68
Moisture of Total Sample (%): 1.3
Percent Retained #200 Sieve (%): 75.2

Plus Split Data

Original Weight of +#10 (g): 6,190.00
Calculated Weight of +#10 (g): 6,030.65

Minus Split Data

Original Weight of -#10 (g): 4,485.00
Calculated Dry Weight of -#10 (g): 4,505.10



Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_5.xls

Checked By: DPM
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-8
Depth: 0-8"
Sample Number: TI-CS08-02A(0-8")
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 7.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 10,675.00
Total Dry Weight of Sample (g): 10,535.75
Wet Weight of Sub-Sample (g): 55.584
Dry Weight of Sub-Sample (g): 53.917
Corrected Dry Weight of Sub-Sample - W(g): 125.975

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	34.0	27.0	21.5	0.0135	10.72	0.0624	21.5	2261.18	21.5
1	31.0	24.0	21.5	0.0135	11.21	0.0451	19.1	2009.94	19.1
2	27.0	20.0	21.5	0.0135	11.87	0.0328	15.9	1674.95	15.9
5	25.0	18.0	21.6	0.0135	12.19	0.0211	14.3	1507.45	14.3
15	22.5	15.5	21.7	0.0135	12.60	0.0124	12.3	1298.09	12.3
30	20.5	13.5	21.9	0.0135	12.93	0.0089	10.7	1130.59	10.7
60	20.0	13.0	21.9	0.0135	13.01	0.0063	10.3	1088.72	10.3
120	18.5	11.5	21.1	0.0135	13.26	0.0045	9.1	963.10	9.1
250	17.5	10.5	20.5	0.0137	13.42	0.0032	8.3	879.35	8.3
1440	16.0	9.0	18.9	0.0140	13.67	0.0014	7.2	753.73	7.2

Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_5.xls

Checked By: DPW
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-8
Depth: 8-28"
Sample Number: TI-CS08-04A(8-28")
Sampled Date: 11/13/2013
Test Date: 12/2/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 128.22
Weight of Dry Soil & Pan (g): 125.73
Weight of Water (g): 2.49
Weight of Pan (g): 3.72
Weight of Dry Soil (g): 122.01
Moisture (%): 2.0

General Sample Data

Total Wet Weight of Sample (g): 4,694.51
Total Dry Weight of Sample (g): 4,611.22
Calculated Weight Plus #200 (g): 2,135.59
Moisture of Total Sample (%): 1.8
Percent Retained #200 Sieve (%): 46.3

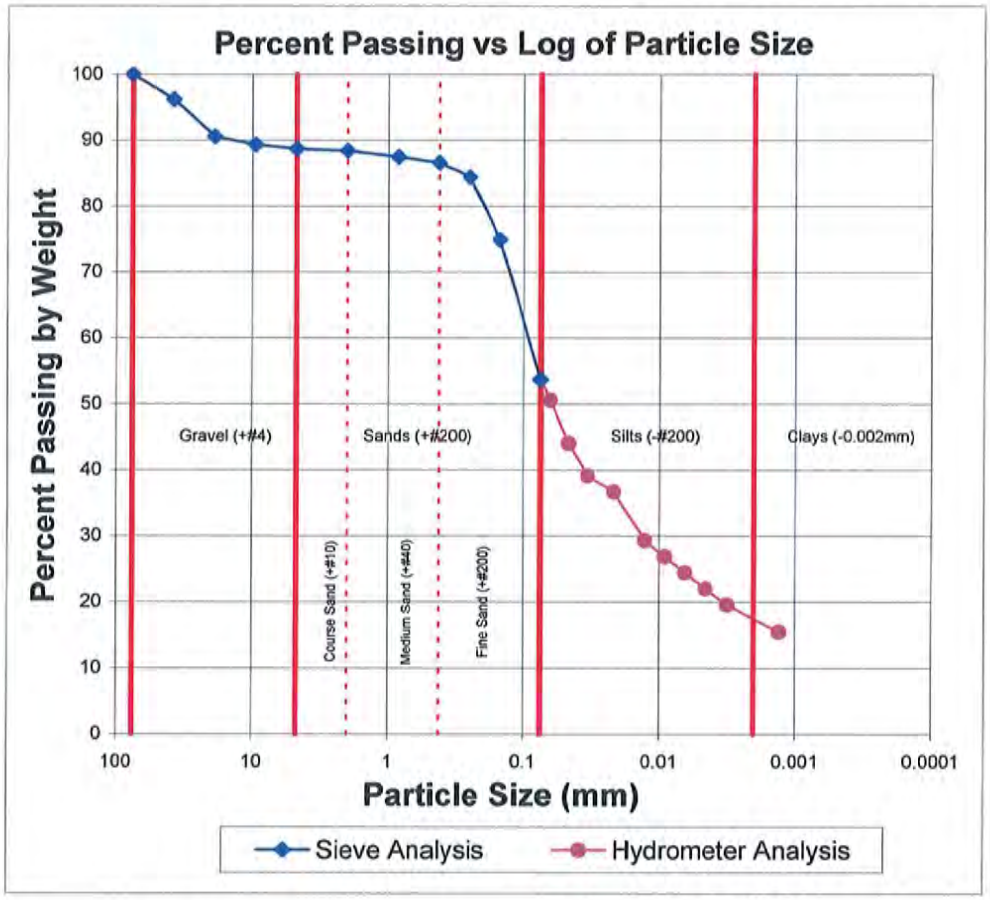
Plus Split Data

Original Weight of +#10 (g): 551.32
Calculated Weight of +#10 (g): 535.20

Minus Split Data

Original Weight of -#10 (g): 4,143.19
Calculated Dry Weight of -#10 (g): 4,076.02

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	175.09	0.00	175.09	175.09	96.2
3/4"	**19.05**	261.02	0.00	261.02	261.02	90.5
3/8"	**9.525**	54.75	0.00	54.75	54.75	89.4
#4	**4.750**	31.10	0.00	31.10	31.10	88.7
#10	**2.000**	13.24	0.00	13.24	13.24	88.4
55.178g split out of -#10 material.						
#20	**0.850**	4.34	3.77	0.57	42.67	87.5
#40	**0.425**	4.22	3.67	0.56	41.99	86.6
#60	**0.250**	5.06	3.75	1.31	98.82	84.4
#100	**0.150**	9.65	3.82	5.82	439.01	74.9
#200	**0.075**	16.77	3.80	12.97	977.90	53.7



Data Entered By: KMR
Date: 12/9/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_1.xls

Checked By: DPM
Date: 12/09/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-8
Depth: 8-28"
Sample Number: TI-CS08-04A(8-28")
Sampled Date: 11/13/2013
Test Date: 12/2/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.67
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 8.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 4,694.51
Total Dry Weight of Sample (g): 4,611.22
Wet Weight of Sub-Sample (g): 55.178
Dry Weight of Sub-Sample (g): 54.073
Corrected Dry Weight of Sub-Sample - W(g): 61.169

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	39.0	31.0	16.3	0.0144	9.90	0.0639	50.5	2330.36	50.5
1	35.0	27.0	16.3	0.0144	10.55	0.0466	44.0	2029.67	44.0
2	32.0	24.0	16.3	0.0144	11.05	0.0337	39.1	1804.15	39.1
5	30.5	22.5	16.4	0.0144	11.29	0.0216	36.7	1691.39	36.7
15	26.0	18.0	16.5	0.0144	12.03	0.0129	29.3	1353.11	29.3
30	24.5	16.5	16.9	0.0144	12.28	0.0092	26.9	1240.35	26.9
60	23.0	15.0	17.6	0.0142	12.52	0.0065	24.5	1127.59	24.5
120	21.5	13.5	18.1	0.0140	12.77	0.0046	22.0	1014.83	22.0
250	20.0	12.0	19.9	0.0138	13.01	0.0032	19.6	902.08	19.6
1440	17.5	9.5	20.1	0.0137	13.42	0.0013	15.5	714.14	15.5

Data Entered By: KMR
Date: 12/9/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_1.xls

Checked By: DPM
Date: 12/09/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-9
Depth: 0-9"
Sample Number: TI-CS09-02A(0-9")
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 119.55
Weight of Dry Soil & Pan (g): 115.83
Weight of Water (g): 3.72
Weight of Pan (g): 3.58
Weight of Dry Soil (g): 112.25
Moisture (%): 3.3

General Sample Data

Total Wet Weight of Sample (g): 9,180.00
Total Dry Weight of Sample (g): 9,043.04
Calculated Weight Plus #200 (g): 6,131.44
Moisture of Total Sample (%): 1.5
Percent Retained #200 Sieve (%): 67.8

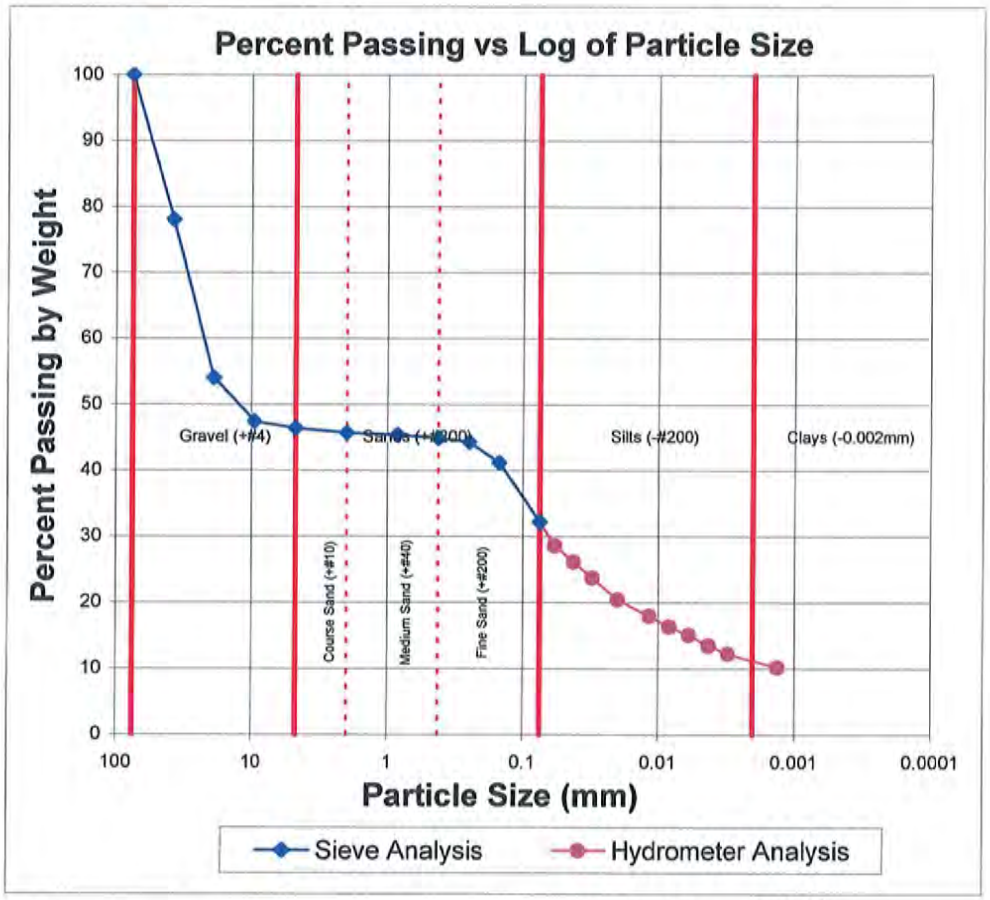
Plus Split Data

Original Weight of +#10 (g): 4,980.00
Calculated Weight of +#10 (g): 4,910.20

Minus Split Data

Original Weight of -#10 (g): 4,200.00
Calculated Dry Weight of -#10 (g): 4,132.84

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	1985.00	0.00	1985.00	1985.00	78.0
3/4"	**19.05**	2175.00	0.00	2175.00	2175.00	54.0
3/8"	**9.525**	595.00	0.00	595.00	595.00	47.4
#4	**4.750**	94.53	0.00	94.53	94.53	46.4
#10	**2.000**	60.67	0.00	60.67	60.67	45.7
57.839g split out of -#10 material.						
#20	**0.850**	4.27	3.84	0.43	31.52	45.4
#40	**0.425**	4.39	3.84	0.55	40.82	44.9
#60	**0.250**	4.50	3.75	0.75	55.15	44.3
#100	**0.150**	7.54	3.71	3.83	282.81	41.2
#200	**0.075**	14.68	3.70	10.99	810.94	32.2



Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_4.xls

Checked By: DAM
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-9
Depth: 0-9"
Sample Number: TI-CS09-02A(0-9")
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 7.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 9,180.00
Total Dry Weight of Sample (g): 9,043.04
Wet Weight of Sub-Sample (g): 57.839
Dry Weight of Sub-Sample (g): 55.984
Corrected Dry Weight of Sub-Sample - W(g): 122.503

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	42.0	35.0	21.5	0.0135	9.41	0.0585	28.6	2587.19	28.6
1	39.0	32.0	21.5	0.0135	9.90	0.0424	26.2	2365.43	26.2
2	36.0	29.0	21.5	0.0135	10.39	0.0307	23.7	2143.67	23.7
5	32.0	25.0	21.5	0.0135	11.05	0.0200	20.4	1848.00	20.4
15	29.0	22.0	22.0	0.0133	11.54	0.0117	18.0	1626.24	18.0
30	27.0	20.0	22.2	0.0133	11.87	0.0084	16.3	1478.40	16.3
60	25.5	18.5	22.1	0.0133	12.11	0.0060	15.1	1367.52	15.1
120	23.5	16.5	22.0	0.0133	12.44	0.0043	13.5	1219.68	13.5
250	22.0	15.0	20.3	0.0137	12.69	0.0031	12.3	1108.80	12.3
1440	19.5	12.5	18.9	0.0140	13.10	0.0013	10.2	924.00	10.2

Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_4.xls

Checked By: DPM
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-10
Depth: 0-7"
Sample Number: TI-CS10-02A(0-7")
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 124.45
Weight of Dry Soil & Pan (g): 120.39
Weight of Water (g): 4.06
Weight of Pan (g): 3.74
Weight of Dry Soil (g): 116.65
Moisture (%): 3.5

General Sample Data

Total Wet Weight of Sample (g): 10,845.00
Total Dry Weight of Sample (g): 10,629.43
Calculated Weight Plus #200 (g): 6,495.99
Moisture of Total Sample (%): 2.0
Percent Retained #200 Sieve (%): 61.1

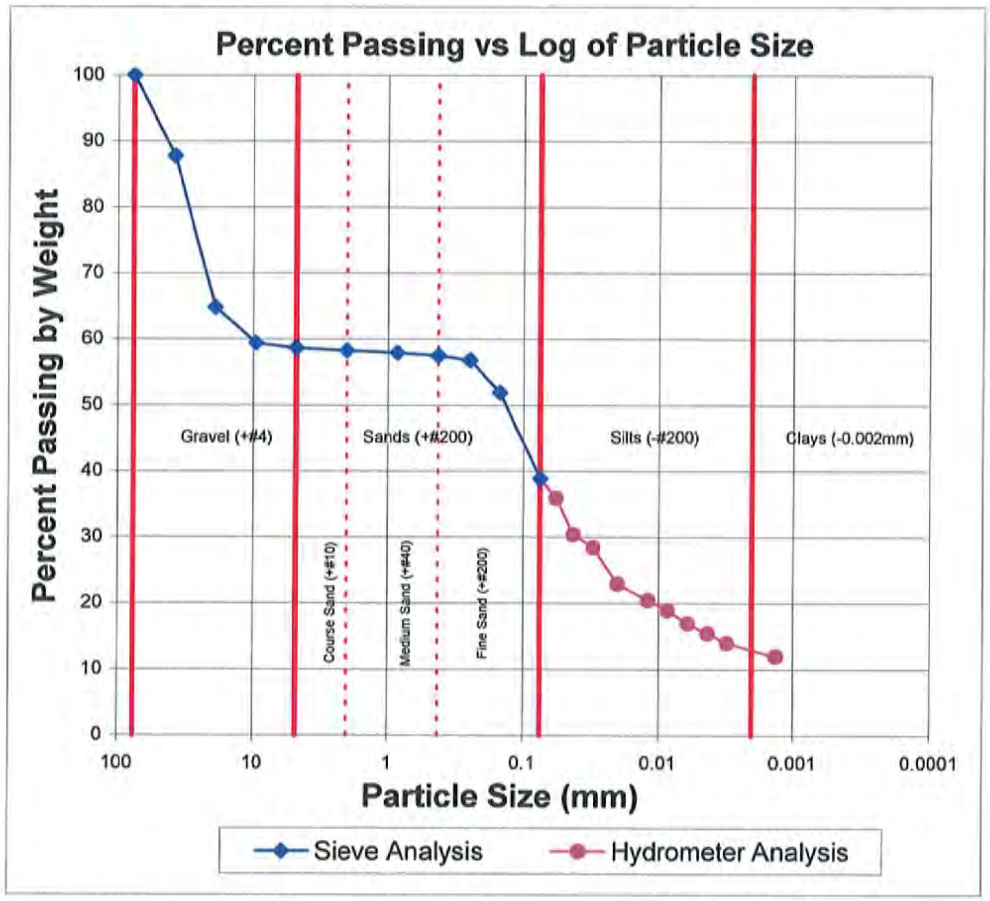
Plus Split Data

Original Weight of +#10 (g): 4,570.00
Calculated Weight of +#10 (g): 4,435.80

Minus Split Data

Original Weight of -#10 (g): 6,275.00
Calculated Dry Weight of -#10 (g): 6,193.63

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	1300.11	0.00	1300.11	1300.11	87.8
3/4"	19.05	2445.00	0.00	2445.00	2445.00	64.8
3/8"	9.525	570.45	0.00	570.45	570.45	59.4
#4	4.750	82.08	0.00	82.08	82.08	58.6
#10	2.000	38.16	0.00	38.16	38.16	58.3
60.577g split out of -#10 material.						
#20	0.850	4.21	3.84	0.37	39.04	57.9
#40	0.425	4.13	3.72	0.41	43.80	57.5
#60	0.250	4.26	3.54	0.72	76.18	56.8
#100	0.150	8.56	3.66	4.90	518.54	51.9
#200	0.075	16.76	3.69	13.07	1382.63	38.9



Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_2.xls

Checked By: DPM
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-10
Depth: 0-7"
Sample Number: TI-CS10-02A(0-7")
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 7.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 10,845.00
Total Dry Weight of Sample (g): 10,629.43
Wet Weight of Sub-Sample (g): 60.577
Dry Weight of Sub-Sample (g): 58.540
Corrected Dry Weight of Sub-Sample - W(g): 100.411

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	43.0	36.0	22.4	0.0133	9.24	0.0573	35.9	3816.13	35.9
1	37.5	30.5	22.4	0.0133	10.14	0.0424	30.4	3233.11	30.4
2	35.5	28.5	22.4	0.0133	10.47	0.0305	28.4	3021.11	28.4
5	30.0	23.0	22.2	0.0133	11.37	0.0201	22.9	2438.09	22.9
15	27.5	20.5	21.5	0.0135	11.78	0.0119	20.4	2173.08	20.4
30	26.0	19.0	21.7	0.0135	12.03	0.0085	18.9	2014.07	18.9
60	24.0	17.0	22.0	0.0133	12.36	0.0060	17.0	1802.06	17.0
120	22.5	15.5	22.3	0.0133	12.60	0.0043	15.5	1643.06	15.5
250	21.0	14.0	20.4	0.0137	12.85	0.0031	14.0	1484.05	14.0
1440	19.0	12.0	18.8	0.0140	13.18	0.0013	12.0	1272.04	12.0

Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_2.xls

Checked By: DPM
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-11
Depth: 0-9"
Sample Number: TI-CS11-02A(0-9")
Sampled Date: 11/13/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 138.61
Weight of Dry Soil & Pan (g): 131.50
Weight of Water (g): 7.11
Weight of Pan (g): 3.79
Weight of Dry Soil (g): 127.71
Moisture (%): 5.6

General Sample Data

Total Wet Weight of Sample (g): 21,550.00
Total Dry Weight of Sample (g): 20,754.50
Calculated Weight Plus #200 (g): 12,625.34
Moisture of Total Sample (%): 3.8
Percent Retained #200 Sieve (%): 60.8

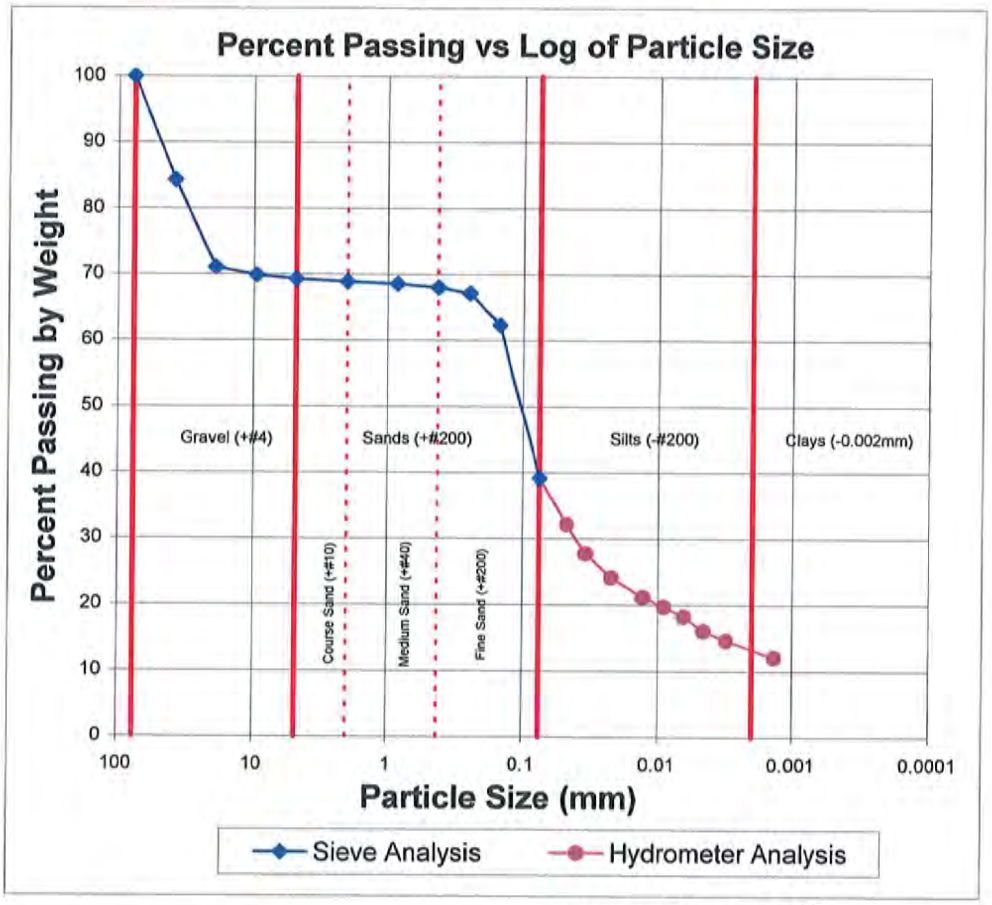
Plus Split Data

Original Weight of +#10 (g): 6,635.00
Calculated Weight of +#10 (g): 6,461.64

Minus Split Data

Original Weight of -#10 (g): 14,915.00
Calculated Dry Weight of -#10 (g): 14,292.86

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	3265.00	0.00	3265.00	3265.00	84.3
3/4"	19.05	2755.00	0.00	2755.00	2755.00	71.0
3/8"	9.525	236.70	0.00	236.70	236.70	69.9
#4	4.750	121.51	0.00	121.51	121.51	69.3
#10	2.000	83.43	0.00	83.43	83.43	68.9
49.818g split out of -#10 material.						
#20	0.850	4.04	3.82	0.22	66.03	68.5
#40	0.425	4.11	3.74	0.37	112.97	68.0
#60	0.250	4.21	3.62	0.59	178.39	67.1
#100	0.150	6.94	3.64	3.31	1000.98	62.3
#200	0.075	19.52	3.66	15.87	4805.33	39.2



Data Entered By: KMR
Date: 12/13/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_9.xls

Checked By: DPM
Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-11
Depth: 0-9"
Sample Number: TI-CS11-02A(0-9")
Sampled Date: 11/13/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 21,550.00
Total Dry Weight of Sample (g): 20,754.50
Wet Weight of Sub-Sample (g): 49.818
Dry Weight of Sub-Sample (g): 47.191
Corrected Dry Weight of Sub-Sample - W(g): 68.493

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	28.0	22.0	19.7	0.0138	11.70	0.0473	32.2	6675.48	32.2
2	25.0	19.0	19.7	0.0138	12.19	0.0341	27.8	5765.19	27.8
5	22.5	16.5	19.7	0.0138	12.60	0.0219	24.1	5006.61	24.1
15	20.5	14.5	19.9	0.0138	12.93	0.0128	21.2	4399.75	21.2
30	19.5	13.5	20.0	0.0137	13.10	0.0090	19.7	4096.32	19.7
60	18.5	12.5	20.3	0.0137	13.26	0.0064	18.3	3792.89	18.3
120	17.0	11.0	20.8	0.0137	13.51	0.0046	16.1	3337.74	16.1
250	16.0	10.0	22.2	0.0133	13.67	0.0031	14.6	3034.31	14.6
1440	14.3	8.3	20.3	0.0137	13.96	0.0013	12.1	2503.31	12.1

Data Entered By: KMR
Date: 12/13/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_9.xls

Checked By: DPM
Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-11
Depth: 9-24"
Sample Number: TI-CS11-04A(9-24')
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 130.26
Weight of Dry Soil & Pan (g): 126.16
Weight of Water (g): 4.10
Weight of Pan (g): 3.70
Weight of Dry Soil (g): 122.46
Moisture (%): 3.4

General Sample Data

Total Wet Weight of Sample (g): 4,640.86
Total Dry Weight of Sample (g): 4,498.12
Calculated Weight Plus #200 (g): 1,505.61
Moisture of Total Sample (%): 3.2
Percent Retained #200 Sieve (%): 33.5

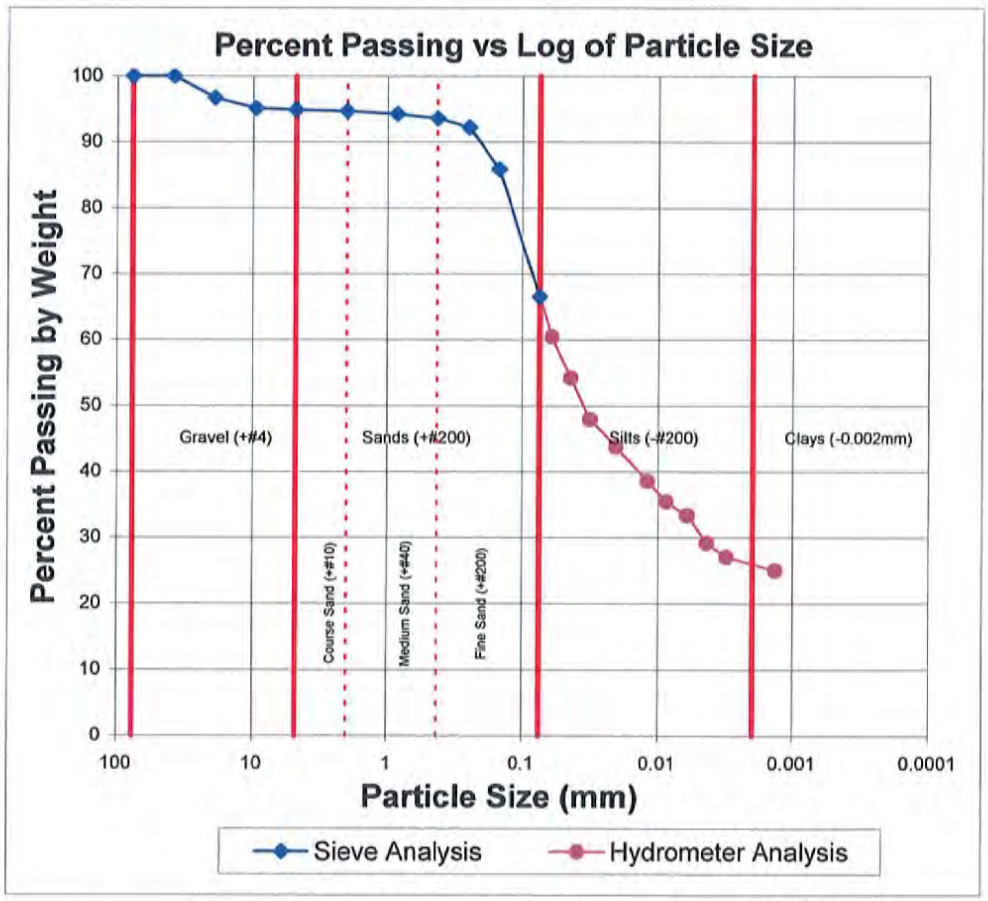
Plus Split Data

Original Weight of +#10 (g): 250.86
Calculated Weight of +#10 (g): 238.09

Minus Split Data

Original Weight of -#10 (g): 4,390.00
Calculated Dry Weight of -#10 (g): 4,260.03

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	148.98	0.00	148.98	148.98	96.7
3/8"	9.525	69.50	0.00	69.50	69.50	95.1
#4	4.750	10.77	0.00	10.77	10.77	94.9
#10	2.000	8.84	0.00	8.84	8.84	94.7
46.719g split out of -#10 material.						
#20	0.850	4.17	3.96	0.22	20.54	94.3
#40	0.425	4.16	3.83	0.33	31.10	93.6
#60	0.250	4.45	3.80	0.66	61.82	92.2
#100	0.150	6.74	3.73	3.01	283.85	85.9
#200	0.075	12.79	3.56	9.23	870.21	66.5



Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_3.xls

Checked By: DPM
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-11
Depth: 9-24"
Sample Number: TI-CS11-04A(9-24')
Sampled Date: 11/13/2013
Test Date: 12/5/2013

Sampled By: MWH
Technician: CAL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.68
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 7.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 4,640.86
Total Dry Weight of Sample (g): 4,498.12
Wet Weight of Sub-Sample (g): 46.719
Dry Weight of Sub-Sample (g): 45.204
Corrected Dry Weight of Sub-Sample - W(g): 47.734

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	36.0	29.0	22.0	0.0133	10.39	0.0607	60.5	2719.33	60.5
1	33.0	26.0	22.0	0.0133	10.88	0.0439	54.2	2438.02	54.2
2	30.0	23.0	22.0	0.0133	11.37	0.0318	47.9	2156.71	47.9
5	28.0	21.0	22.3	0.0133	11.70	0.0204	43.8	1969.17	43.8
15	25.5	18.5	22.3	0.0133	12.11	0.0120	38.6	1734.74	38.6
30	24.0	17.0	21.7	0.0135	12.36	0.0087	35.4	1594.09	35.4
60	23.0	16.0	22.0	0.0133	12.52	0.0061	33.4	1500.32	33.4
120	21.0	14.0	22.2	0.0133	12.85	0.0044	29.2	1312.78	29.2
250	20.0	13.0	20.3	0.0137	13.01	0.0031	27.1	1219.01	27.1
1440	19.0	12.0	18.8	0.0140	13.18	0.0013	25.0	1125.24	25.0

Data Entered By: KMR
Date: 12/11/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_3.xls

Checked By: DPM
Date: 12/11/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-12
Depth: 0-14"
Sample Number: TI-CS12-02A(0-14")
Sampled Date: 11/13/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 87.03
Weight of Dry Soil & Pan (g): 86.61
Weight of Water (g): 0.42
Weight of Pan (g): 3.57
Weight of Dry Soil (g): 83.04
Moisture (%): 0.5

General Sample Data

Total Wet Weight of Sample (g): 1,604.40
Total Dry Weight of Sample (g): 1,596.35
Calculated Weight Plus #200 (g): 479.94
Moisture of Total Sample (%): 0.5
Percent Retained #200 Sieve (%): 30.1

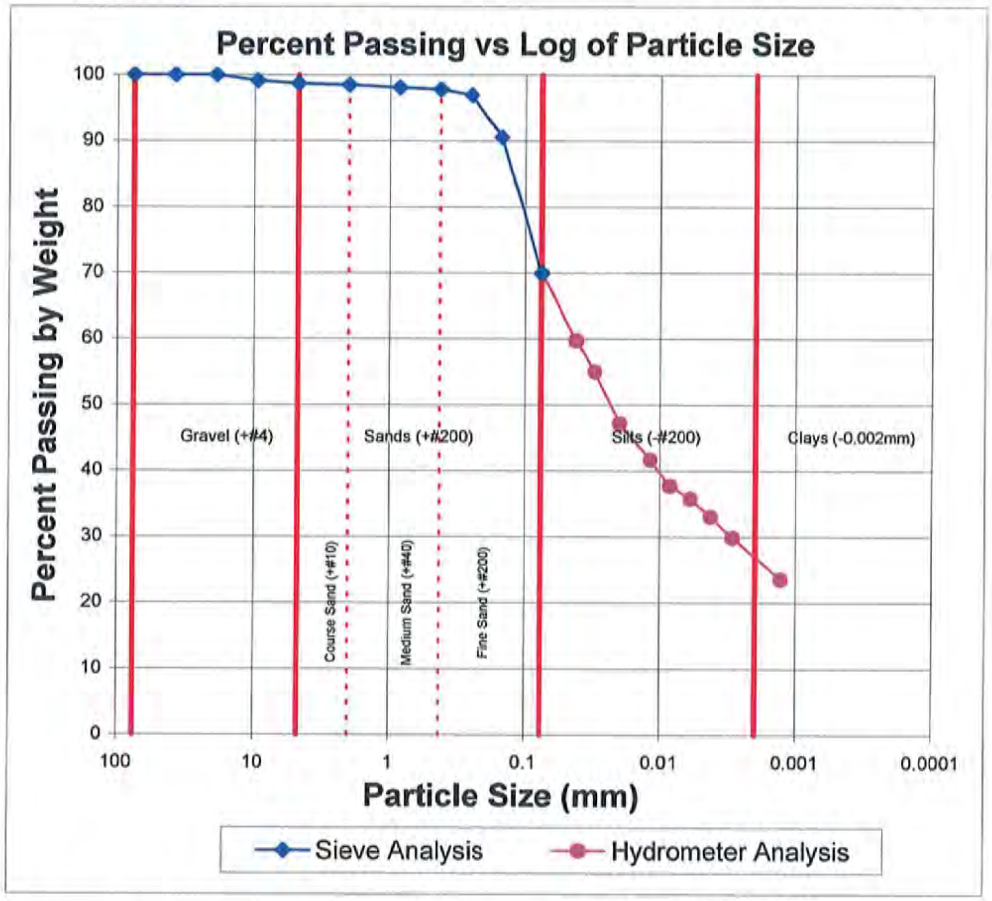
Plus Split Data

Original Weight of +#10 (g): 27.75
Calculated Weight of +#10 (g): 24.31

Minus Split Data

Original Weight of -#10 (g): 1,576.65
Calculated Dry Weight of -#10 (g): 1,572.05

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	13.72	0.00	13.72	13.72	99.1
#4	**4.750**	7.58	0.00	7.58	7.58	98.7
#10	**2.000**	3.01	0.00	3.01	3.01	98.5
63.085g split out of -#10 material.						
#20	**0.850**	4.04	3.80	0.24	5.91	98.1
#40	**0.425**	4.16	3.97	0.18	4.53	97.8
#60	**0.250**	4.40	3.82	0.58	14.58	96.9
#100	**0.150**	7.62	3.56	4.06	101.72	90.5
#200	**0.075**	16.75	3.62	13.13	328.89	69.9



Data Entered By: KMR
Date: 12/13/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_7.xls

Checked By: DPM
Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-12
Depth: 0-14"
Sample Number: TI-CS12-02A(0-14")
Sampled Date: 11/13/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 1,604.40
Total Dry Weight of Sample (g): 1,596.35
Wet Weight of Sub-Sample (g): 63.085
Dry Weight of Sub-Sample (g): 62.764
Corrected Dry Weight of Sub-Sample - W(g): 63.720

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	44.0	38.0	19.5	0.0138	9.08	0.0416	59.7	953.30	59.7
2	41.0	35.0	19.5	0.0138	9.57	0.0302	55.0	878.04	55.0
5	36.0	30.0	19.5	0.0138	10.39	0.0199	47.1	752.61	47.1
15	32.5	26.5	19.6	0.0138	10.96	0.0118	41.6	664.80	41.6
30	30.0	24.0	19.8	0.0138	11.37	0.0085	37.7	602.09	37.7
60	28.8	22.8	20.1	0.0137	11.58	0.0060	35.8	570.73	35.8
120	27.0	21.0	20.7	0.0137	11.87	0.0043	33.0	526.83	33.0
250	25.0	19.0	22.1	0.0133	12.19	0.0029	29.9	476.65	29.9
1440	21.0	15.0	20.3	0.0137	12.85	0.0013	23.6	376.30	23.6

Note: Removed one +3/4" rock out of the total sample weight of 6,280.0 grams.

Data Entered By: KMR
Date: 12/13/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_7.xls

Checked By: RPM
Date: 12/13/13

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-2
Depth: 10-24"
Sample Number: TI-CS02-04A(10-24")
Sampled Date: 11/12/2013
Test Date: 12/16/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 82.68
Weight of Dry Soil & Pan (g): 80.93
Weight of Water (g): 1.75
Weight of Pan (g): 3.72
Weight of Dry Soil (g): 77.21
Moisture (%): 2.3

General Sample Data

Total Wet Weight of Sample (g): 6,233.81
Total Dry Weight of Sample (g): 6,100.35
Calculated Weight Plus #200 (g): 2,948.76
Moisture of Total Sample (%): 2.2
Percent Retained #200 Sieve (%): 48.3

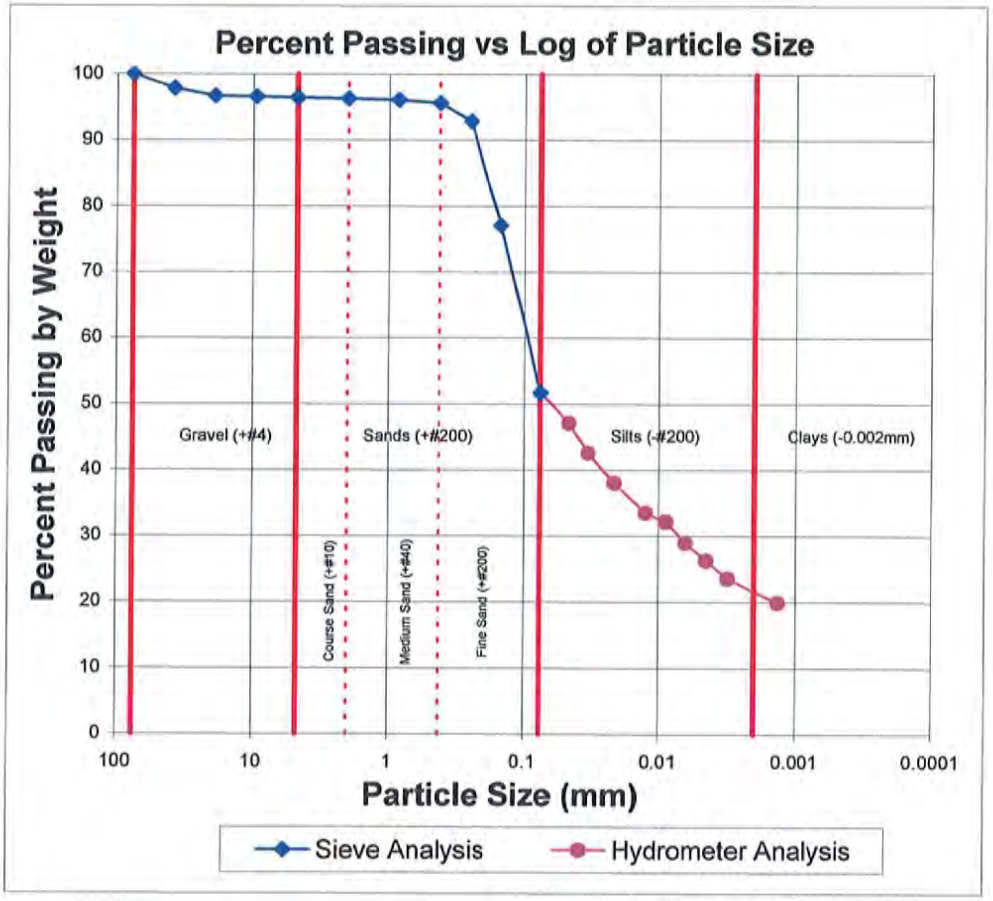
Plus Split Data

Original Weight of +#10 (g): 238.81
Calculated Weight of +#10 (g): 225.84

Minus Split Data

Original Weight of -#10 (g): 5,995.00
Calculated Dry Weight of -#10 (g): 5,874.51

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	129.85	0.00	129.85	129.85	97.9
3/4"	**19.05**	71.91	0.00	71.91	71.91	96.7
3/8"	**9.525**	7.27	0.00	7.27	7.27	96.6
#4	**4.750**	8.47	0.00	8.47	8.47	96.4
#10	**2.000**	8.34	0.00	8.34	8.34	96.3
54.411g split out of -#10 material.						
#20	**0.850**	3.90	3.78	0.12	13.25	96.1
#40	**0.425**	4.02	3.77	0.25	27.60	95.6
#60	**0.250**	5.28	3.74	1.54	170.04	92.8
#100	**0.150**	12.50	3.77	8.73	963.95	77.0
#200	**0.075**	17.62	3.60	14.02	1548.06	51.7



Data Entered By: DPM
Date: 12/18/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_18.xls

Checked By: CJ
Date: 12/18/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-2
Depth: 10-24"
Sample Number: TI-CS02-04A(10-24")
Sampled Date: 11/12/2013
Test Date: 12/16/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 6,233.81
Total Dry Weight of Sample (g): 6,100.35
Wet Weight of Sub-Sample (g): 54.411
Dry Weight of Sub-Sample (g): 53.202
Corrected Dry Weight of Sub-Sample - W(g): 55.246

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	31.0	26.0	19.2	0.0138	11.21	0.0463	47.1	2874.85	47.1
2	28.5	23.5	19.2	0.0138	11.62	0.0333	42.6	2598.42	42.6
5	26.0	21.0	19.2	0.0138	12.03	0.0214	38.1	2322.00	38.1
15	23.5	18.5	19.2	0.0138	12.44	0.0126	33.5	2045.57	33.5
30	22.8	17.8	19.4	0.0138	12.56	0.0089	32.2	1962.64	32.2
60	21.0	16.0	19.8	0.0138	12.85	0.0064	29.0	1769.14	29.0
120	19.5	14.5	20.2	0.0137	13.10	0.0045	26.3	1603.28	26.3
250	18.0	13.0	20.8	0.0137	13.34	0.0032	23.6	1437.43	23.6
1440	16.0	11.0	19.8	0.0138	13.67	0.0013	19.9	1216.28	19.9

Data Entered By: DPM
Date: 12/18/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_18.xls

Checked By: [illegible]
Date: 12/18/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-10
Depth: 7-25"
Sample Number: TI-CS10-04A(7-25")
Sampled Date: 11/13/2013
Test Date: 12/16/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 47.42
Weight of Dry Soil & Pan (g): 46.12
Weight of Water (g): 1.30
Weight of Pan (g): 3.69
Weight of Dry Soil (g): 42.44
Moisture (%): 3.1

General Sample Data

Total Wet Weight of Sample (g): 7,040.25
Total Dry Weight of Sample (g): 6,837.34
Calculated Weight Plus #200 (g): 2,855.58
Moisture of Total Sample (%): 3.0
Percent Retained #200 Sieve (%): 41.8

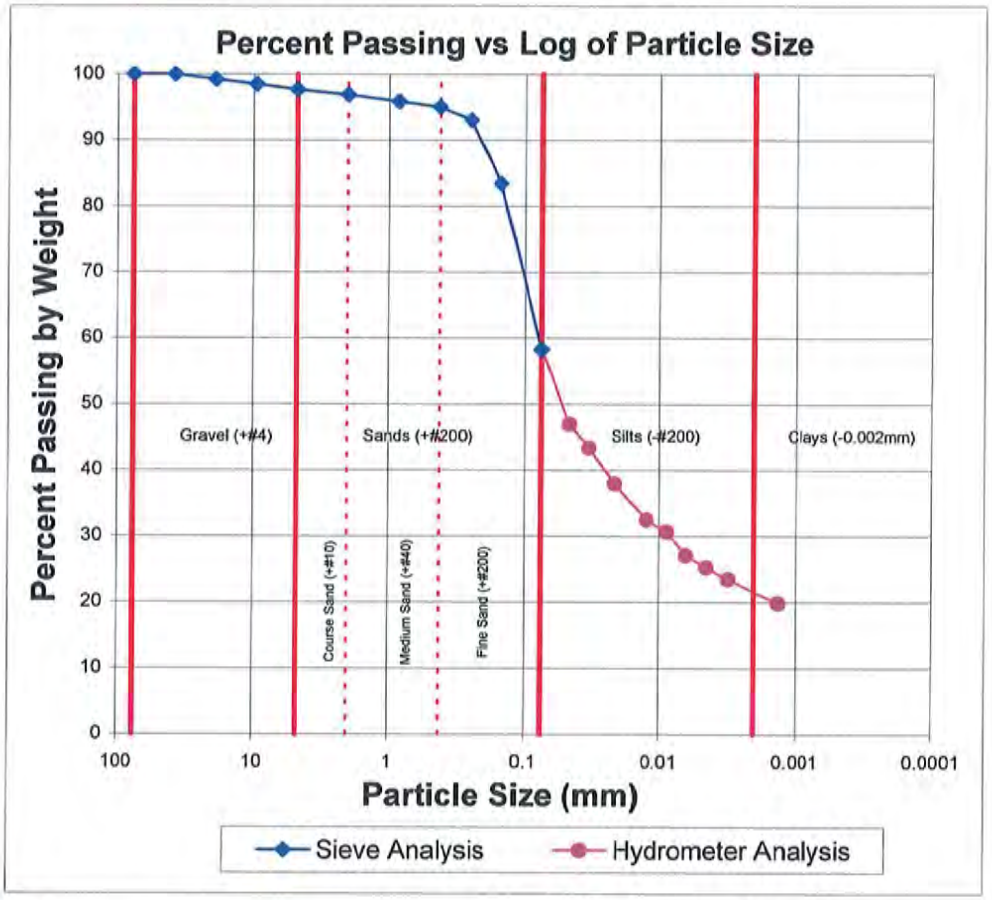
Plus Split Data

Original Weight of +#10 (g): 260.25
Calculated Weight of +#10 (g): 213.97

Minus Split Data

Original Weight of -#10 (g): 6,780.00
Calculated Dry Weight of -#10 (g): 6,623.37

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	53.49	0.00	53.49	53.49	99.2
3/8"	**9.525**	48.97	0.00	48.97	48.97	98.5
#4	**4.750**	56.68	0.00	56.68	56.68	97.7
#10	**2.000**	54.82	0.00	54.82	54.82	96.9
55.378g split out of -#10 material.						
#20	**0.850**	3.63	3.08	0.55	67.80	95.9
#40	**0.425**	4.28	3.81	0.47	57.94	95.0
#60	**0.250**	4.85	3.73	1.12	138.06	93.0
#100	**0.150**	9.08	3.78	5.30	653.31	83.5
#200	**0.075**	17.56	3.57	13.99	1724.50	58.2



Data Entered By: DPM
Date: 12/18/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_14.xls

Checked By: GJ
Date: 12/18/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-10
Depth: 7-25"
Sample Number: TI-CS10-04A(7-25")
Sampled Date: 11/13/2013
Test Date: 12/16/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 7,040.25
Total Dry Weight of Sample (g): 6,837.34
Wet Weight of Sub-Sample (g): 55.378
Dry Weight of Sub-Sample (g): 53.732
Corrected Dry Weight of Sub-Sample - W(g): 55.451

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	31.0	26.0	19.8	0.0138	11.21	0.0463	47.0	3210.29	47.0
2	29.0	24.0	19.8	0.0138	11.54	0.0332	43.3	2963.34	43.3
5	26.0	21.0	19.8	0.0138	12.03	0.0214	37.9	2592.92	37.9
15	23.0	18.0	20.0	0.0137	12.52	0.0125	32.5	2222.51	32.5
30	22.0	17.0	20.1	0.0137	12.69	0.0089	30.7	2099.03	30.7
60	20.0	15.0	20.4	0.0137	13.01	0.0064	27.1	1852.09	27.1
120	19.0	14.0	20.5	0.0137	13.18	0.0045	25.3	1728.62	25.3
250	18.0	13.0	21.1	0.0135	13.34	0.0031	23.5	1605.14	23.5
1440	16.0	11.0	19.8	0.0138	13.67	0.0013	19.9	1358.20	19.9

Data Entered By: DPM
Date: 12/18/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_14.xls

Checked By: CJ
Date: 12/18/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-5
Depth: 0-9"
Sample Number: TI-CS05-02A(0-9")
Sampled Date: -
Test Date: 12/16/2013

Sampled By: -
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 60.73
Weight of Dry Soil & Pan (g): 57.81
Weight of Water (g): 2.92
Weight of Pan (g): 3.71
Weight of Dry Soil (g): 54.11
Moisture (%): 5.4

General Sample Data

Total Wet Weight of Sample (g): 9,638.02
Total Dry Weight of Sample (g): 9,215.19
Calculated Weight Plus #200 (g): 4,451.48
Moisture of Total Sample (%): 4.6
Percent Retained #200 Sieve (%): 48.3

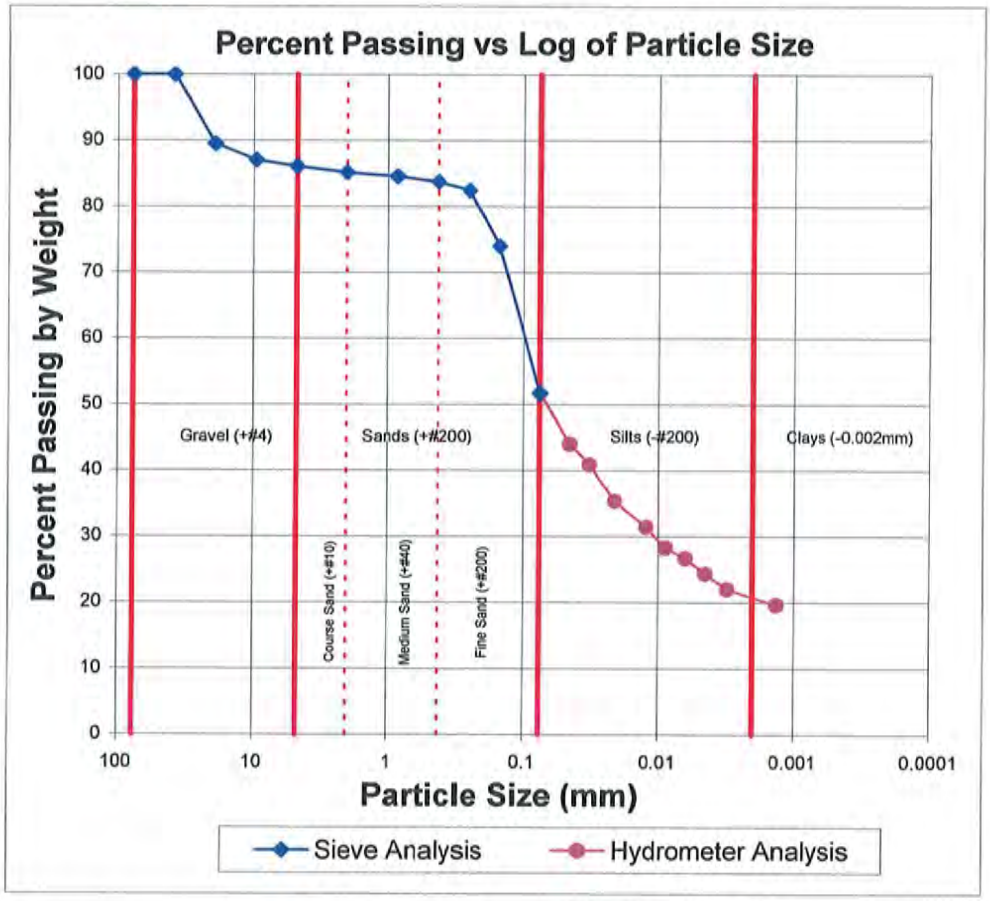
Plus Split Data

Original Weight of +#10 (g): 1,468.02
Calculated Weight of +#10 (g): 1,366.82

Minus Split Data

Original Weight of -#10 (g): 8,170.00
Calculated Dry Weight of -#10 (g): 7,848.37

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	967.87	0.00	967.87	967.87	89.5
3/8"	**9.525**	225.54	0.00	225.54	225.54	87.0
#4	**4.750**	90.53	0.00	90.53	90.53	86.1
#10	**2.000**	82.88	0.00	82.88	82.88	85.2
57.221g split out of -#10 material.						
#20	**0.850**	4.26	3.88	0.38	54.93	84.6
#40	**0.425**	4.24	3.70	0.54	78.06	83.7
#60	**0.250**	4.47	3.63	0.84	121.42	82.4
#100	**0.150**	9.12	3.76	5.36	774.78	74.0
#200	**0.075**	17.93	3.71	14.22	2055.48	51.7



Data Entered By: DPM
Date: 12/18/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_17.xls

Checked By: CJ
Date: 12/18/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: CS-5
Depth: 0-9"
Sample Number: TI-CS05-02A(0-9")
Sampled Date: -
Test Date: 12/16/2013

Sampled By: -
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 9,638.02
Total Dry Weight of Sample (g): 9,215.19
Wet Weight of Sub-Sample (g): 57.221
Dry Weight of Sub-Sample (g): 54.296
Corrected Dry Weight of Sub-Sample - W(g): 63.727

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	33.0	28.0	20.5	0.0137	10.88	0.0450	44.0	4054.41	44.0
2	31.0	26.0	20.5	0.0137	11.21	0.0323	40.9	3764.81	40.9
5	27.5	22.5	20.5	0.0137	11.78	0.0210	35.4	3258.01	35.4
15	25.0	20.0	20.5	0.0137	12.19	0.0123	31.4	2896.01	31.4
30	23.0	18.0	20.6	0.0137	12.52	0.0088	28.3	2606.40	28.3
60	22.0	17.0	20.9	0.0137	12.69	0.0063	26.7	2461.60	26.7
120	20.5	15.5	20.7	0.0137	12.93	0.0045	24.4	2244.40	24.4
250	19.0	14.0	21.2	0.0135	13.18	0.0031	22.0	2027.20	22.0
1440	17.5	12.5	19.9	0.0138	13.42	0.0013	19.6	1810.00	19.6

Data Entered By: DPM
Date: 12/18/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_17.xls

Checked By: CJ
Date: 12/18/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-3
Depth: 6-24"
Sample Number: TI-CS03-04A(6-24")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 160.12
Weight of Dry Soil & Pan (g): 155.95
Weight of Water (g): 4.17
Weight of Pan (g): 3.68
Weight of Dry Soil (g): 152.28
Moisture (%): 2.7

General Sample Data

Total Wet Weight of Sample (g): 9,980.00
Total Dry Weight of Sample (g): 9,731.58
Calculated Weight Plus #200 (g): 4,378.08
Moisture of Total Sample (%): 2.6
Percent Retained #200 Sieve (%): 45.0

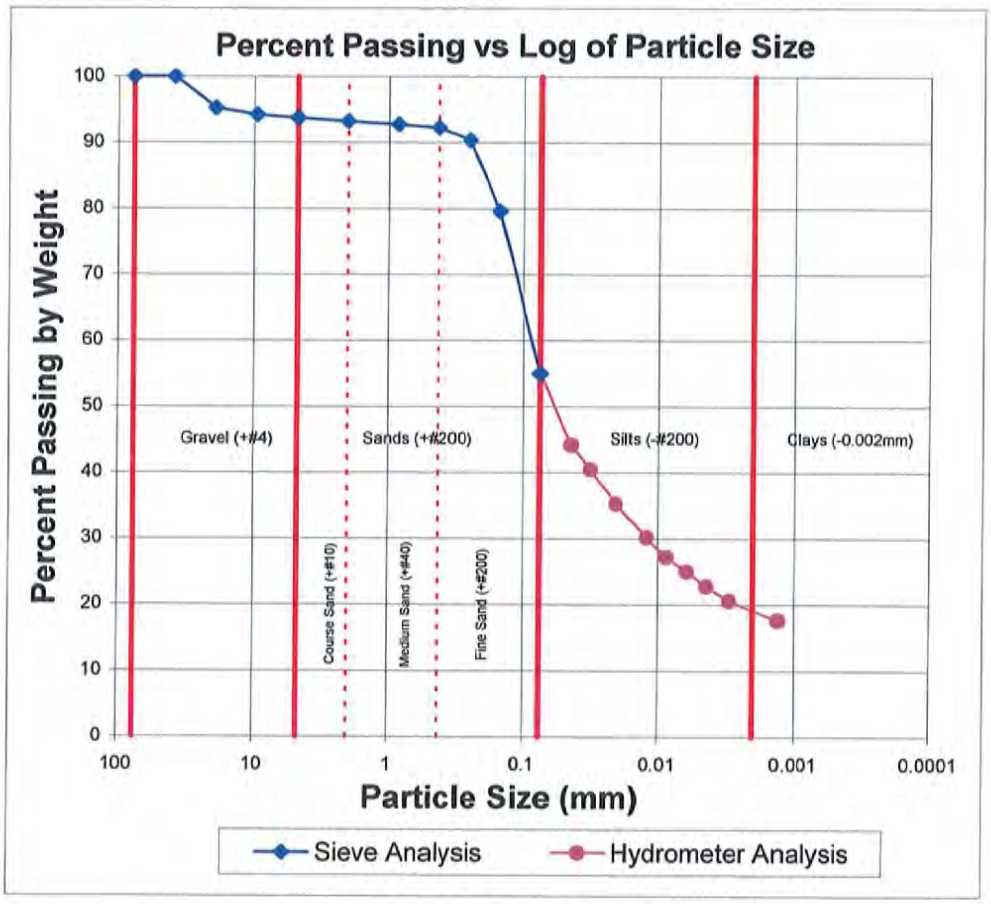
Plus Split Data

Original Weight of +#10 (g): 715.00
Calculated Weight of +#10 (g): 659.87

Minus Split Data

Original Weight of -#10 (g): 9,265.00
Calculated Dry Weight of -#10 (g): 9,071.71

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	465.17	0.00	465.17	465.17	95.2
3/8"	9.525	100.35	0.00	100.35	100.35	94.2
#4	4.750	48.26	0.00	48.26	48.26	93.7
#10	2.000	46.09	0.00	46.09	46.09	93.2
65.132g split out of -#10 material.						
#20	0.850	4.18	3.86	0.32	45.22	92.8
#40	0.425	4.05	3.70	0.35	50.51	92.2
#60	0.250	4.89	3.60	1.29	184.45	90.3
#100	0.150	11.01	3.69	7.32	1046.89	79.6
#200	0.075	20.27	3.56	16.71	2391.13	55.0



Data Entered By: DPM
Date: 12/16/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_11.xls

Checked By: CJ
Date: 12/16/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-3
Depth: 6-24"
Sample Number: TI-CS03-04A(6-24")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 9,980.00
Total Dry Weight of Sample (g): 9,731.58
Wet Weight of Sub-Sample (g): 65.132
Dry Weight of Sub-Sample (g): 63.396
Corrected Dry Weight of Sub-Sample - W(g): 68.021

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	36.0	30.0	20.6	0.0137	10.39	0.0440	44.2	4297.84	44.2
2	33.5	27.5	20.6	0.0137	10.80	0.0317	40.5	3939.69	40.5
5	30.0	24.0	20.6	0.0137	11.37	0.0206	35.3	3438.28	35.3
15	26.5	20.5	20.7	0.0137	11.95	0.0122	30.2	2936.86	30.2
30	24.5	18.5	20.9	0.0137	12.28	0.0087	27.2	2650.34	27.2
60	23.0	17.0	21.2	0.0135	12.52	0.0062	25.0	2435.45	25.0
120	21.5	15.5	21.9	0.0135	12.77	0.0044	22.8	2220.55	22.8
250	20.0	14.0	23.2	0.0132	13.01	0.0030	20.6	2005.66	20.6
1440	18.0	12.0	20.1	0.0137	13.34	0.0013	17.7	1719.14	17.7

Data Entered By: DPM
Date: 12/16/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_11.xls

Checked By: CJ
Date: 12/16/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-4
Depth: 0-10"
Sample Number: TI-CS04-02A(0-10")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 128.86
Weight of Dry Soil & Pan (g): 123.46
Weight of Water (g): 5.40
Weight of Pan (g): 3.77
Weight of Dry Soil (g): 119.70
Moisture (%): 4.5

General Sample Data

Total Wet Weight of Sample (g): 10,960.00
Total Dry Weight of Sample (g): 10,739.81
Calculated Weight Plus #200 (g): 7,713.64
Moisture of Total Sample (%): 2.1
Percent Retained #200 Sieve (%): 71.8

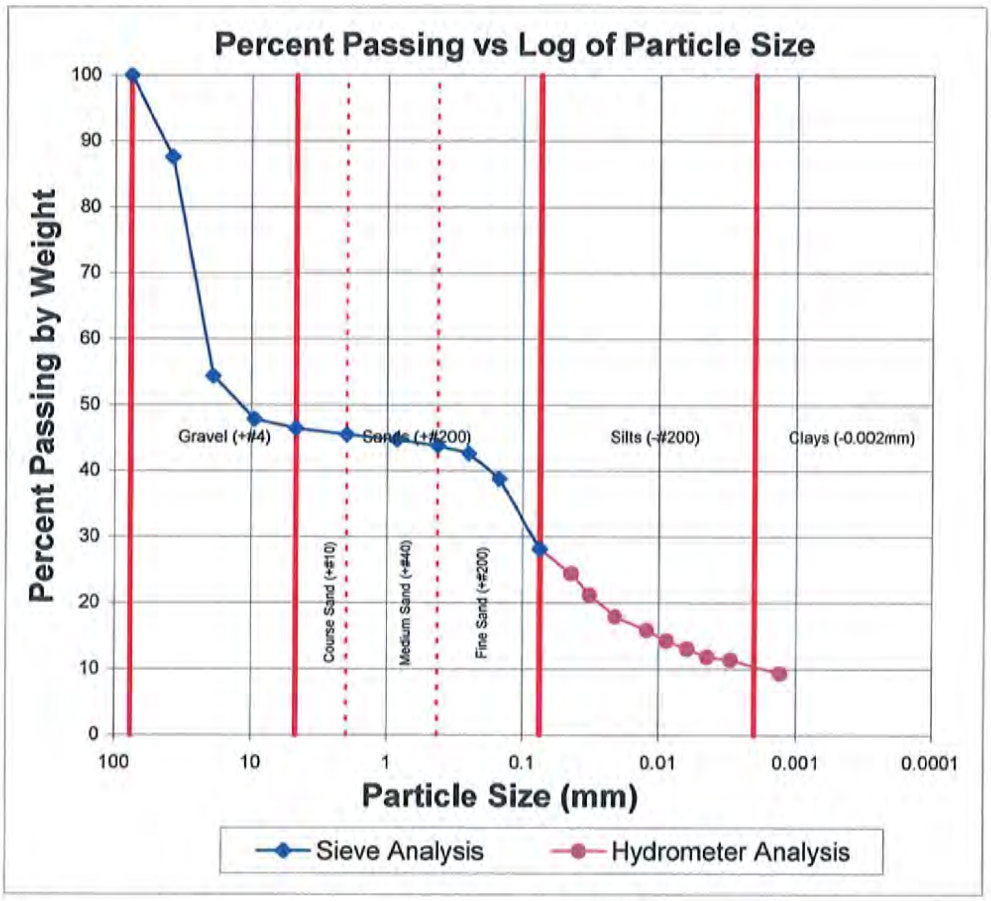
Plus Split Data

Original Weight of +#10 (g): 6,020.00
Calculated Weight of +#10 (g): 5,855.33

Minus Split Data

Original Weight of -#10 (g): 4,940.00
Calculated Dry Weight of -#10 (g): 4,884.48

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	1335.00	0.00	1335.00	1335.00	87.6
3/4"	**19.05**	3565.00	0.00	3565.00	3565.00	54.4
3/8"	**9.525**	701.85	0.00	701.85	701.85	47.8
#4	**4.750**	153.07	0.00	153.07	153.07	46.4
#10	**2.000**	100.41	0.00	100.41	100.41	45.5
58.444g split out of -#10 material.						
#20	**0.850**	4.74	3.78	0.97	84.29	44.7
#40	**0.425**	4.89	3.77	1.12	98.09	43.8
#60	**0.250**	5.13	3.72	1.41	122.89	42.6
#100	**0.150**	8.52	3.77	4.75	414.44	38.8
#200	**0.075**	16.73	3.69	13.04	1138.60	28.2



Data Entered By: DPM
Date: 12/16/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_13.xls

Checked By: CJ
Date: 12/16/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-4
Depth: 0-10"
Sample Number: TI-CS04-02A(0-10")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 10,960.00
Total Dry Weight of Sample (g): 10,739.81
Wet Weight of Sub-Sample (g): 58.444
Dry Weight of Sub-Sample (g): 55.923
Corrected Dry Weight of Sub-Sample - W(g): 122.908

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	36.0	30.0	20.4	0.0137	10.39	0.0440	24.4	2625.01	24.4
2	32.0	26.0	20.4	0.0137	11.05	0.0321	21.2	2275.01	21.2
5	28.0	22.0	20.4	0.0137	11.70	0.0209	17.9	1925.01	17.9
15	25.5	19.5	20.5	0.0137	12.11	0.0123	15.9	1706.25	15.9
30	23.5	17.5	20.7	0.0137	12.44	0.0088	14.3	1531.25	14.3
60	22.0	16.0	21.0	0.0135	12.69	0.0062	13.0	1400.00	13.0
120	20.5	14.5	21.7	0.0135	12.93	0.0044	11.8	1268.75	11.8
250	20.0	14.0	23.0	0.0132	13.01	0.0030	11.4	1225.00	11.4
1440	17.5	11.5	20.1	0.0137	13.42	0.0013	9.4	1006.25	9.4

Data Entered By: DPM
Date: 12/16/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_13.xls

Checked By: CJ
Date: 12/16/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-1
Depth: 0-11"
Sample Number: TI-CS01-02A(0-11")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 102.21
Weight of Dry Soil & Pan (g): 95.38
Weight of Water (g): 6.83
Weight of Pan (g): 3.71
Weight of Dry Soil (g): 91.68
Moisture (%): 7.5

General Sample Data

Total Wet Weight of Sample (g): 10,625.00
Total Dry Weight of Sample (g): 10,124.70
Calculated Weight Plus #200 (g): 5,737.76
Moisture of Total Sample (%): 4.9
Percent Retained #200 Sieve (%): 56.7

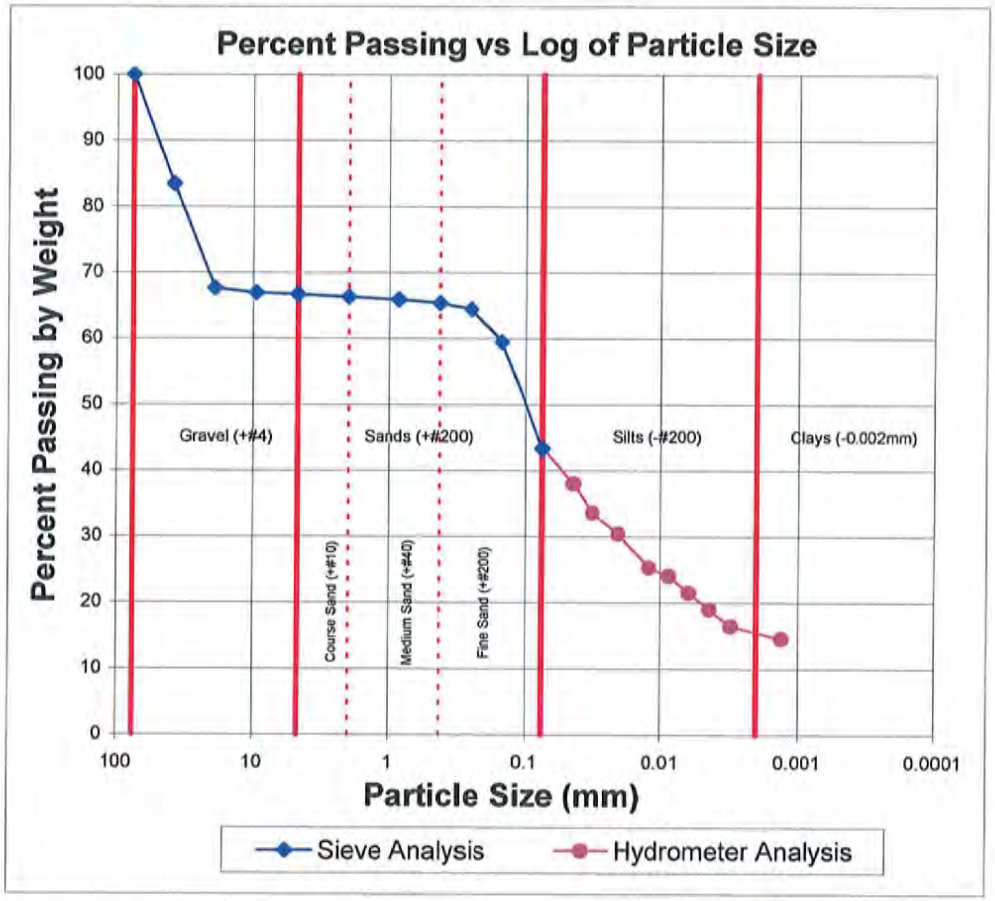
Plus Split Data

Original Weight of +#10 (g): 3,485.00
Calculated Weight of +#10 (g): 3,410.42

Minus Split Data

Original Weight of -#10 (g): 7,140.00
Calculated Dry Weight of -#10 (g): 6,714.28

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	1675.00	0.00	1675.00	1675.00	83.5
3/4"	**19.05**	1605.00	0.00	1605.00	1605.00	67.6
3/8"	**9.525**	69.87	0.00	69.87	69.87	66.9
#4	**4.750**	22.03	0.00	22.03	22.03	66.7
#10	**2.000**	38.52	0.00	38.52	38.52	66.3
56.276g split out of -#10 material.						
#20	**0.850**	4.16	3.83	0.32	41.41	65.9
#40	**0.425**	4.26	3.84	0.42	53.72	65.4
#60	**0.250**	4.48	3.74	0.74	95.00	64.4
#100	**0.150**	7.59	3.68	3.91	501.77	59.5
#200	**0.075**	16.29	3.54	12.76	1635.45	43.3



Data Entered By: DPM
Date: 12/16/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_12.xls

Checked By: CJ
Date: 12/16/2013

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: CS-1
Depth: 0-11"
Sample Number: TI-CS01-02A(0-11")
Sampled Date: 11/12/2013
Test Date: 12/11/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 1.00

Total Wet Weight of Sample (g): 10,625.00
Total Dry Weight of Sample (g): 10,124.70
Wet Weight of Sub-Sample (g): 56.276
Dry Weight of Sub-Sample (g): 52.374
Corrected Dry Weight of Sub-Sample - W(g): 78.995

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	36.0	30.0	20.1	0.0137	10.39	0.0440	38.0	3850.32	38.0
2	32.5	26.5	20.1	0.0137	10.96	0.0320	33.6	3401.12	33.6
5	30.0	24.0	20.1	0.0137	11.37	0.0206	30.4	3080.26	30.4
15	26.0	20.0	20.2	0.0137	12.03	0.0122	25.4	2566.88	25.4
30	25.0	19.0	20.3	0.0137	12.19	0.0087	24.1	2438.54	24.1
60	23.0	17.0	20.5	0.0137	12.52	0.0062	21.5	2181.85	21.5
120	21.0	15.0	21.3	0.0135	12.85	0.0044	19.0	1925.16	19.0
250	19.0	13.0	22.8	0.0133	13.18	0.0031	16.5	1668.47	16.5
1440	17.5	11.5	20.4	0.0137	13.42	0.0013	14.6	1475.96	14.6

Data Entered By: DPM
Date: 12/16/2013
File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_12.xls

Checked By: CJ
Date: 12/16/2013

ATT
ADVANCED TERRA TESTING

Specific Gravity
ASTM D 854 - Method B

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	Tailings Impoundment
PROJECT NO. -			

BORING NO.	CS-1	CS-4
DEPTH	11-24"	10-24"
SAMPLE NO.	TI-CS01-04A (11-24")	TI-CS04-041 (10-24")
DATE SAMPLED	11/12/13 MWH	11/12/13 MWH
DATE TESTED	12/20/13 MLM	12/20/13 MLM

Pycnometer #	Big 10	Big 12
Weight of oven dry soil (g) (Wo)	70.52	50.89
Weight of flask, soil, and water. (g) (Wb)	716.14	704.46
Temperature (deg. C) (Tx)	24.3	24.2
Weight of water & flask at Tx (from cal. curve)(Wa)	671.95	672.56
Specific Gravity*	2.68	2.68

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: DAW Date: 12/27/2013
Checked by: CAL Date: 12/27/13
File name: 2512_77_SpecificGravity-ASTM-854-R1_0.xls

ATT
ADVANCED TERRA TESTING

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT: MWH JOB NO. 2512-77

PROJECT: Church Rock

BORING NO.	CS-8	CS-11
DEPTH	8-28"	9-24"
SAMPLE NO.	TI-CS08-04A(8-28")	TI-CS11-04A(9-24")
DATE SAMPLED	11/13/13 MWH	11/13/13 MWH
DATE TESTED	12/03/13 CAL	12/6/13 KMR
LOCATION	Tailings Impoundment	Tailings Impoundment
Pycnometer #	FF	AA
Weight of oven dry soil (g) (Wo)	30.797	30.853
Weight of flask, soil, and water. (g) (Wb)	184.109	184.409
Temperature (deg. C) (Tx)	20.8	19.0
Weight of water & flask at Tx (from cal. curve)(Wa)	164.828	165.088
Specific Gravity*	2.67	2.68

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*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: CAL Date: 12/09/2013

Data checked by: JRM Date: 12/10/13

FileName: MWSGAS31

ADVANCED TERRA TESTING, INC. ATT

COMPACTION TEST
ASTM D 698 A

CLIENT:	MWH		JOB NO. 2512-77
BORING NO.	CS-11	DATE SAMPLED	11/13/13
DEPTH	9-24"	DATE TESTED	12/5/13
SAMPLE NO.	TI-CS11-04A(9-24")	LOCATION	Tailings Impoundment
SOIL DESCR.	Church Rock		

Moisture Determination

	1	2	3	4	5
Wt of Moisture added (ml)	240.00	200.00	160.00	120.00	80.00
Wt. of soil & dish (g)	536.48	509.58	585.73	577.59	616.55
Dry wt. soil & dish (g)	456.88	441.11	513.44	515.08	559.20
Net loss of moisture (g)	79.60	68.47	72.29	62.51	57.35
Wt. of dish (g)	6.63	6.57	6.51	6.51	6.56
Net wt. of dry soil (g)	450.25	434.54	506.93	508.57	552.64
Moisture Content (%)	17.68	15.76	14.26	12.29	10.38
Corrected Moisture Content					

Density determination

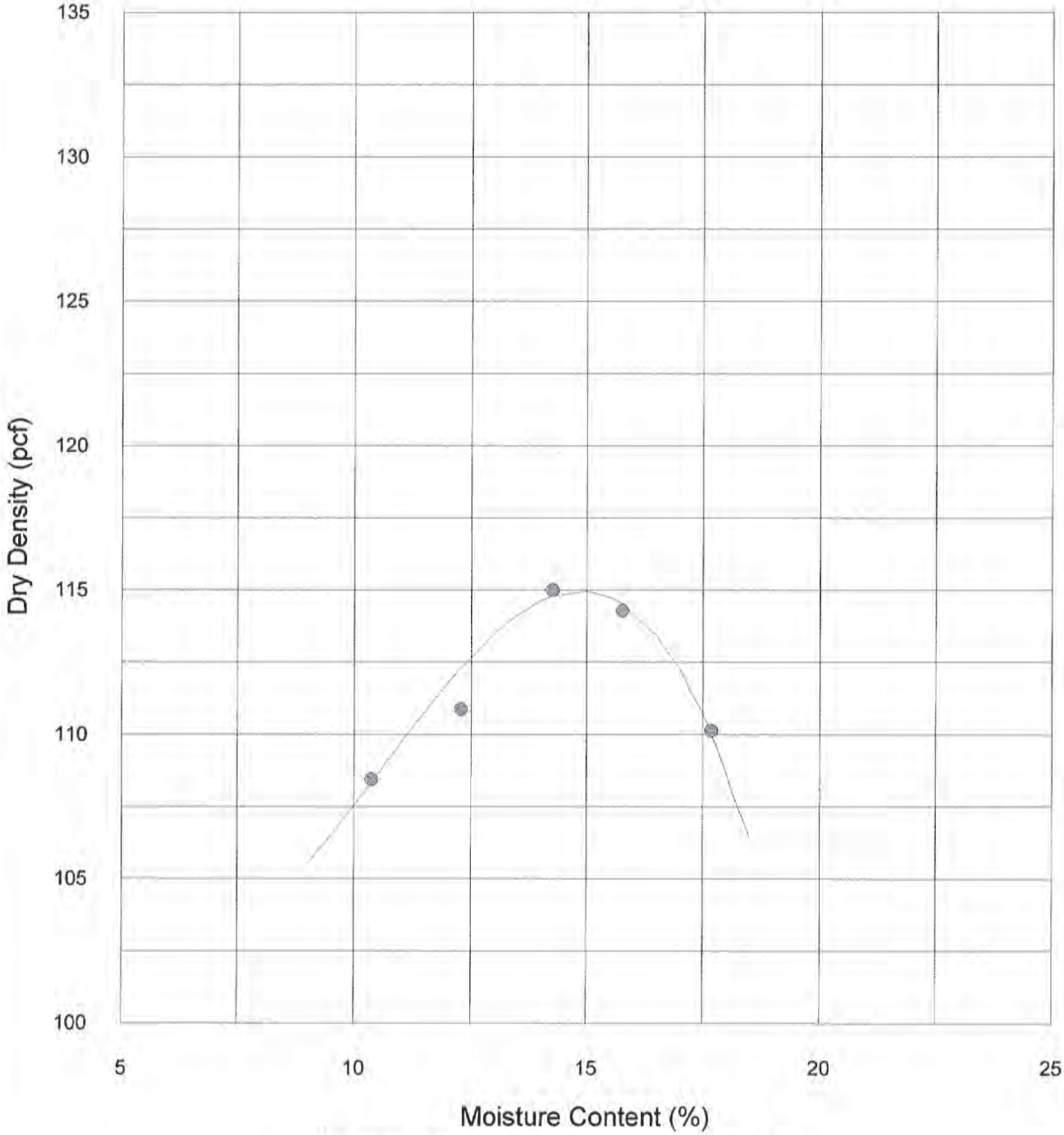
Wt of soil & mold (lb)	9.68	9.77	9.74	9.51	9.35
Wt. of mold (lb)	5.36	5.36	5.36	5.36	5.36
Net wt. of wet soil (lb)	4.32	4.41	4.38	4.15	3.99
Net wt of dry soil (lb)	3.67	3.81	3.83	3.70	3.61
Dry Density, (pcf)	110.13	114.29	115.00	110.87	108.45
Corrected Dry Density (pcf)					
Volume Factor	30	30	30	30	30

Data entered by: KMR Date: 12/09/2013
Data checked by: DPM Date: 12/09/13
FileName: MW68913

ADVANCED TERRA TESTING, INC. ATT

Proctor Compaction Test

CS-11, 9-24", TI-CS11-04A(9-24")



OPTIMUM MOISTURE CONTENT = 14.9 MAXIMUM DRY DENSITY = 115.0
ASTM D 698 A, Rock correction applied? N

COMPACTION TEST
ASTM D 698 A

CLIENT:	MWH		JOB NO. 2512-77
BORING NO.	CS-8	DATE SAMPLED	11/13/13 MWH
DEPTH	8-28"	DATE TESTED	11/26/13 CAL
SAMPLE NO.	TI-CS08-04A(8-28")	LOCATION	Tailings Impoundment
PROJECT	Church Rock		

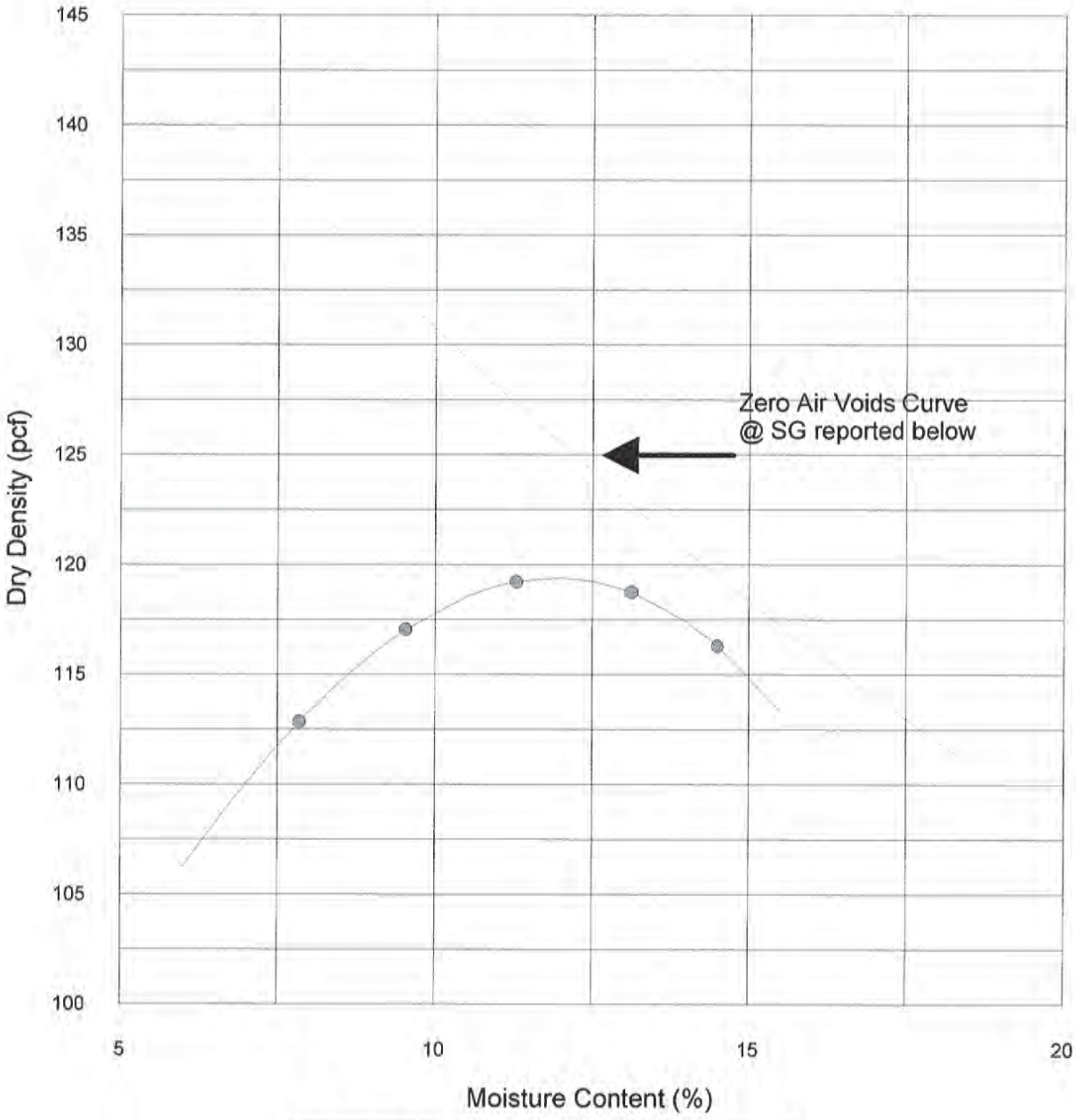
Moisture Determination	1	2	3	4	5
Wt of Moisture added (ml)	200.00	160.00	120.00	80.00	40.00
Wt. of soil & dish (g)	529.30	542.40	549.41	351.60	529.41
Dry wt. soil & dish (g)	456.21	474.04	488.43	318.31	487.18
Net loss of moisture (g)	73.09	68.36	60.98	33.29	42.23
Wt. of dish (g)	6.55	9.25	6.56	6.56	6.62
Net wt. of dry soil (g)	449.66	464.79	481.87	311.75	480.56
Moisture Content (%)	16.25	14.71	12.65	10.68	8.79
Corrected Moisture Content	14.50	13.12	11.29	9.53	7.85
Density determination					
Wt of soil & mold (lb)	9.72	9.76	9.70	9.54	9.31
Wt. of mold (lb)	5.37	5.37	5.37	5.37	5.37
Net wt. of wet soil (lb)	4.35	4.39	4.33	4.17	3.94
Net wt of dry soil (lb)	3.74	3.83	3.84	3.77	3.62
Dry Density, (pcf)	112.25	114.81	115.31	113.03	108.65
Corrected Dry Density (pcf)	116.31	118.75	119.22	117.05	112.85
Volume Factor	30	30	30	30	30

Data entered by: CAL Date: 12/02/2013
Data checked by: KR Date: 12/3/13
FileName: MWD69812

ADVANCED TERRA TESTING, INC. ATT

Proctor Compaction Test

CS-8, 8-28", TI-CS08-04A(8-28")



■ Best Fit Curve ▲ Zero Air VoidsCurve @ SG = 2.65
● Actual Data

OPTIMUM MOISTURE CONTENT = 11.9 MAXIMUM DRY DENSITY = 119.4
ASTM D 698 A, Rock correction applied? Y

COMPACTION TEST
ASTM D 698 A

CLIENT:	MWH		JOB NO. 2512-77
BORING NO.	CS-1	DATE SAMPLED	11/12/2013 MWH
DEPTH	11-24"	DATE TESTED	12/18/2013 TMR
SAMPLE NO.	TI-CS01-04A(11-24")	LOCATION	Tailings Impoundment
PROJECT	Church Rock		

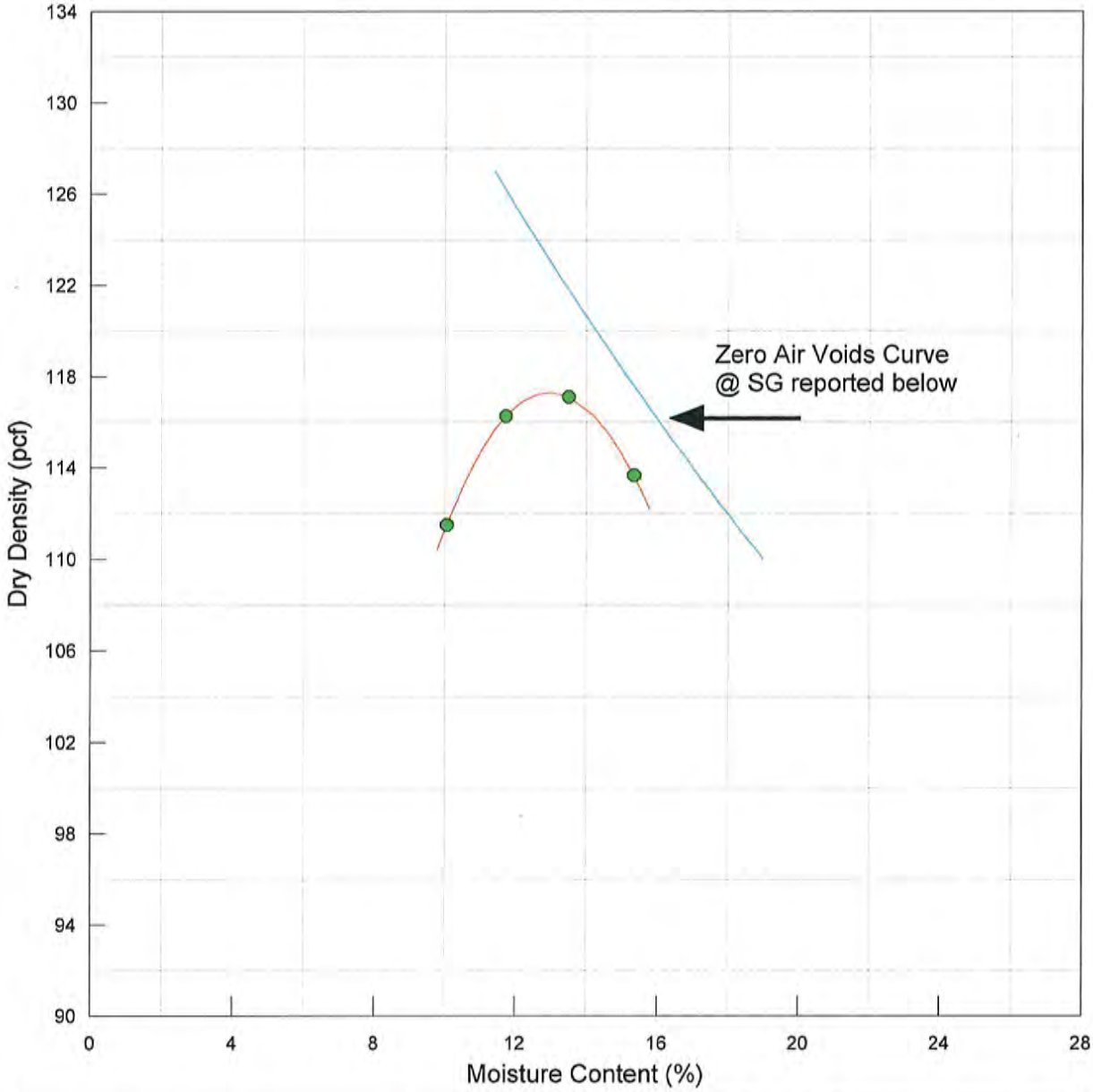
Moisture Determination	1	2	3	4
Wt of Moisture added (ml)	280.00	240.00	200.00	160.00
Wt. of soil & dish (g)	559.52	662.30	586.92	539.94
Dry wt. soil & dish (g)	485.98	584.29	526.00	491.20
Net loss of moisture (g)	73.54	78.01	60.92	48.74
Wt. of dish (g)	6.66	6.57	6.75	6.50
Net wt. of dry soil (g)	479.32	577.72	519.25	484.70
Moisture Content (%)	15.34	13.50	11.73	10.06
Corrected Moisture Content				
Density determination				
Wt of soil & mold (lb)	14.16	14.22	14.12	13.88
Wt. of mold (lb)	9.79	9.79	9.79	9.79
Net wt. of wet soil (lb)	4.37	4.43	4.33	4.09
Net wt of dry soil (lb)	3.79	3.90	3.88	3.72
Dry Density, (pcf)	113.66	117.09	116.26	111.49
Corrected Dry Density (pcf)				
Volume Factor	30	30	30	30

Data entered by: TMR Date: 12/27/2013
Data checked by: SLL Date: 12/29/13
FileName: PRCS0102

ADVANCED TERRA TESTING, INC. ATT

Proctor Compaction Test

CS-1, 11-24", TI-CS01-04A(11-24")



Best Fit Curve | Actual Data | Zero Air VoidsCurve @ SG = 2.65

OPTIMUM MOISTURE CONTENT = 13.0 MAXIMUM DRY DENSITY = 117.3
ASTM D 698 A, Rock correction applied? N

COMPACTION TEST
ASTM D 698 A

CLIENT:	MWH		JOB NO. 2512-77
BORING NO.	CS-4	DATE SAMPLED	11/12/2013 MWH
DEPTH	10-24"	DATE TESTED	12/18/2013 TMR
SAMPLE NO.	TI-CS04-04A(10-24")	LOCATION	Tailings Impoundment
PROJECT	Church Rock		

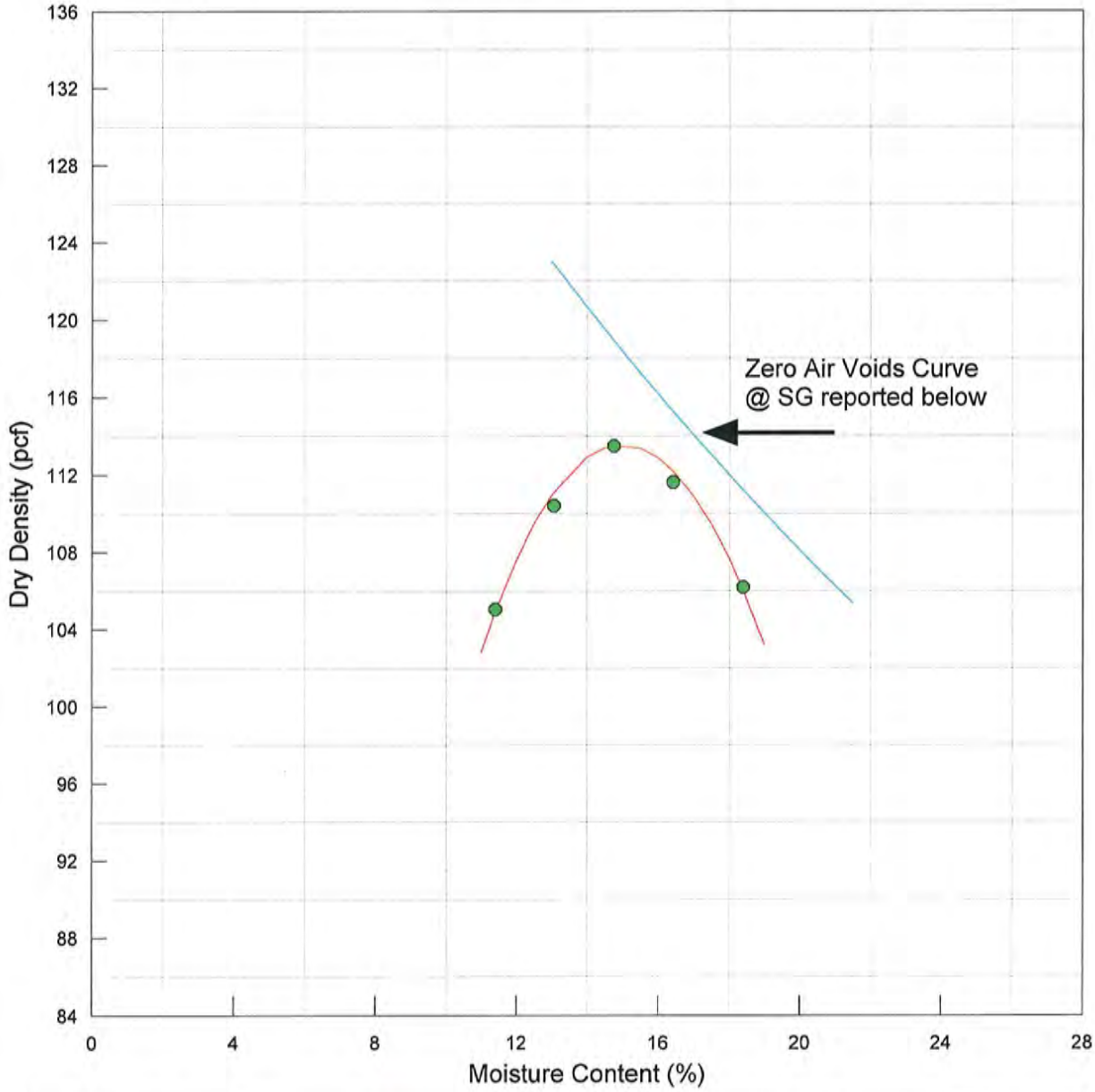
Moisture Determination	1	2	3	4	5
Wt of Moisture added (ml)	320.00	280.00	360.00	240.00	200.00
Wt. of soil & dish (g)	566.98	562.35	626.62	585.89	562.19
Dry wt. soil & dish (g)	487.95	491.15	530.55	518.98	505.52
Net loss of moisture (g)	79.03	71.20	96.07	66.91	56.67
Wt. of dish (g)	6.58	8.20	8.38	6.58	8.22
Net wt. of dry soil (g)	481.37	482.95	522.17	512.40	497.30
Moisture Content (%)	16.42	14.74	18.40	13.06	11.40
Corrected Moisture Content					
Density determination					
Wt of soil & mold (lb)	14.12	14.13	13.98	13.95	13.69
Wt. of mold (lb)	9.79	9.79	9.79	9.79	9.79
Net wt. of wet soil (lb)	4.33	4.34	4.19	4.16	3.90
Net wt of dry soil (lb)	3.72	3.78	3.54	3.68	3.50
Dry Density, (pcf)	111.58	113.47	106.17	110.39	105.03
Corrected Dry Density (pcf)					
Volume Factor	30	30	30	30	30

Data entered by: TMR Date: 12/27/2013
Data checked by: SM Date: 12/29/13
FileName: PRCS401

ADVANCED TERRA TESTING, INC. ATT

Proctor Compaction Test

CS-4, 10-24", TI-CS04-04A(10-24")



Best Fit Curve | Actual Data | Zero Air VoidsCurve @ SG = 2.65

OPTIMUM MOISTURE CONTENT = 15.0 MAXIMUM DRY DENSITY = 113.5
ASTM D 698 A, Rock correction applied? N

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	10-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS04-04A (10-24")	TEST FINISHED	02/13/14 CAL
LOCATION	Church Rock	CELL NUMBER	16S
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 90%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	420.7	445.7
Wt. Wet Soil & Pan (g)	427.3	452.3
Wt. Dry Soil & Pan (g)	373.9	373.9
Wt. Lost Moisture (g)	53.4	78.4
Wt. of Pan Only (g)	6.7	6.7
Wt. of Dry Soil (g)	367.3	367.3
Moisture Content %	14.5	21.3
Wet Density PCF	117.8	133.6
Dry Density PCF	102.8	110.1

Init. Diameter (in)	2.404	(cm)	6.106
Init. Area (sq in)	4.539	(sq cm)	29.286
Init. Height (in)	2.998	(cm)	7.615
Vol. Bef. Consol. (cu ft)	0.00787		
Vol. After Consol. (cu ft)	0.00735		
Porosity %	37.66		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	8
Percentage of Pump setting	100
Q (cc/s)	5.70E-04
Height	2.963
Diameter	2.336
Pressure (psi)	0.480
Area after consol. (cm*cm)	27.661
Gradient	4.484
Permeability k (cm/s)	4.6E-06
Permeability k (m/s)	4.6E-08
Back Pressure (psi)	88.0
Cell Pressure (psi)	96.0
Ave. Effective Stress (psi)	7.760
Average temperature degree C:	22.1

Data entry by: DAW Date: 02/18/2014
Checked by: CAL Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_6.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	10-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS04-04A (10-24")	TEST FINISHED	02/13/14 CAL
LOCATION	Church Rock	SETUP NO.	16S
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 90%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	3.9	17.6				
50.0	48.0	17.8	19.6	38.3	46.6	8.3	0.83
60.0	58.0	19.6	20.7	48.4	57.0	8.6	0.86
70.0	68.0	21.2	22.1	58.5	67.5	9.0	0.90
80.0	78.0	22.2	22.8	68.3	77.7	9.4	0.94
90.0	88.0	23.0	23.7	78.4	87.7	9.3	0.93
100.0		23.7	23.8	88.5	98.1	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.00	0.00
0.25	0.50	2.50	-2.50
0.5	0.71	3.20	-3.20
1	1.00	3.80	-3.80
2	1.41	4.40	-4.40
4	2.00	5.00	-5.00
9	3.00	5.60	-5.60
16	4.00	5.90	-5.90
30	5.48	6.30	-6.30
60	7.75	6.70	-6.70
120	10.95	6.80	-6.80
240	15.49	7.00	-7.00
360	18.97	7.20	-7.20

Initial Height (in)	2.998	Init. Vol. (CC)	223.033
Height Change (in)	0.035	Vol. Change (CC)	28.400
Ht. After Cons. (in)	2.963	Cell Exp. (CC)	13.585
Initial Area (sq in)	4.539	Net Change (CC)	14.815
Area After Cons. (sq in)	4.288	Cons. Vol. (CC)	208.218

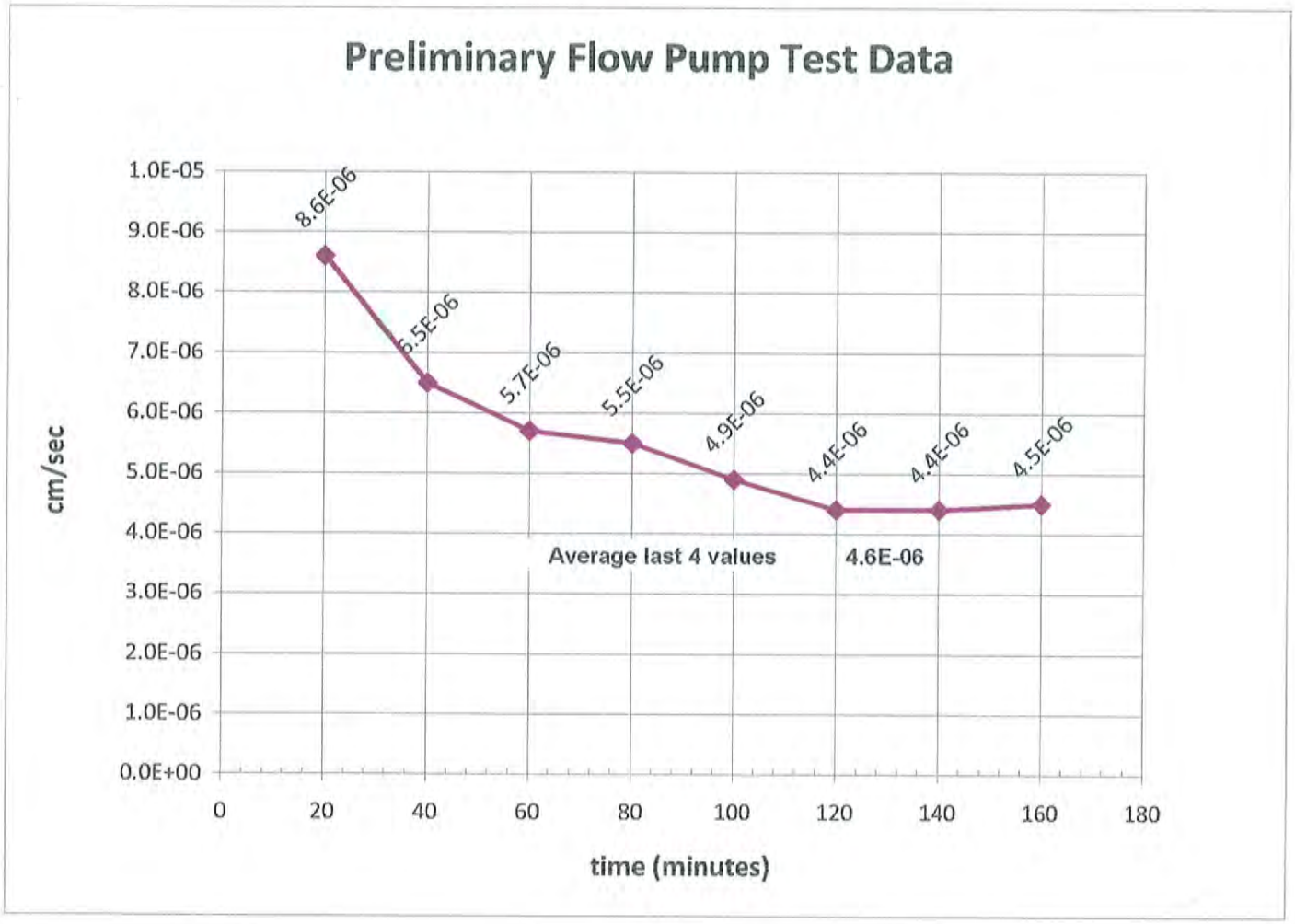
Data entry by: DAW Date: 02/18/2014
Checked by: CAL Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_6.xls

ATT ADVANCED TERRA TESTING

ADVANCED TERRA TESTING

Preliminary Flow Pump Test Data
ASTM D5084

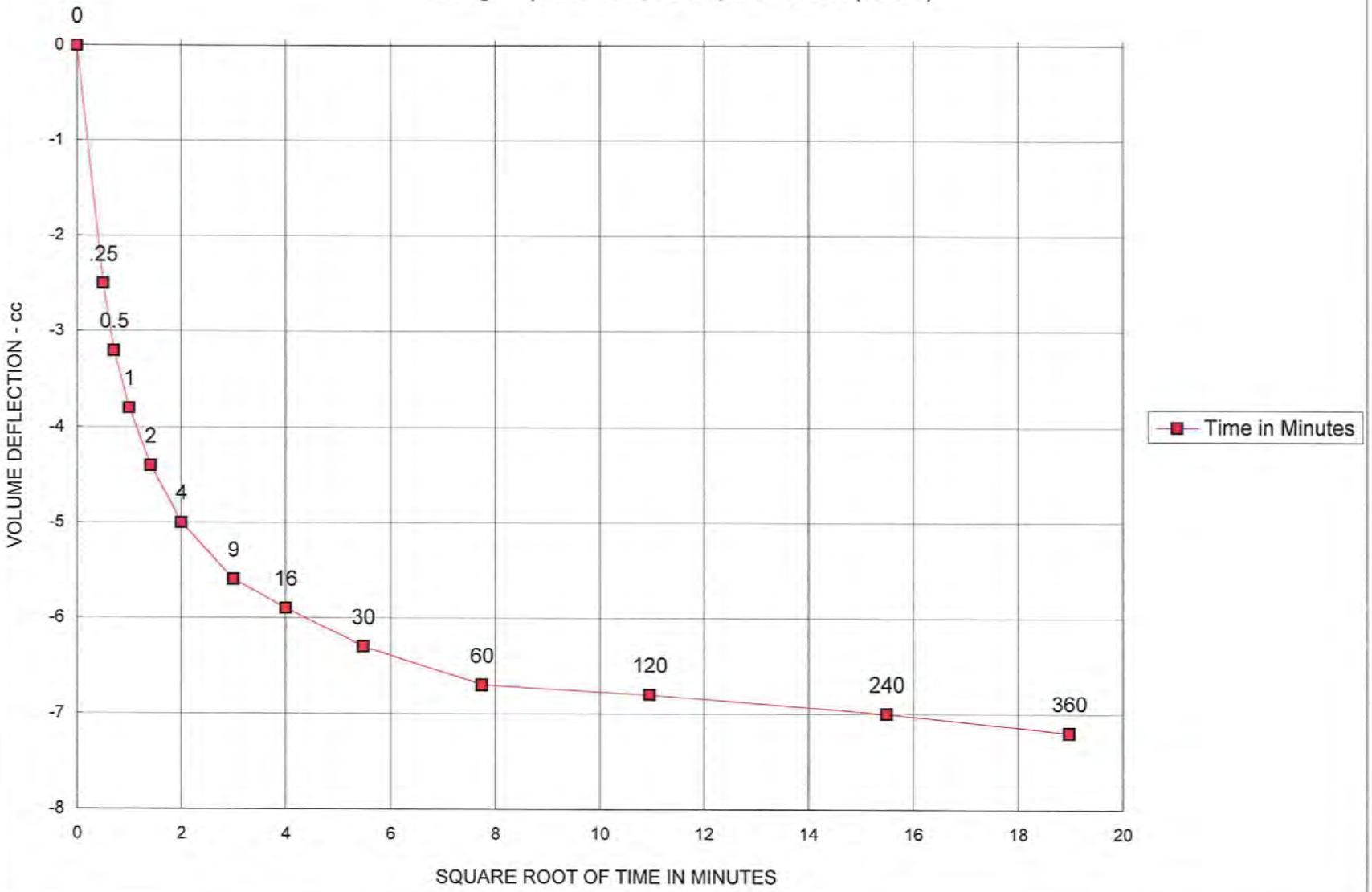
Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512-77	Depth:	10-24"		
Project:	--	Sample Number:	TI-CS04-04A @ 90% D698		
Location:	Church Rock	Sampled Date:	-	Sampled By:	MWH
Project Number:	--	Test Date:	2/13/2014	Technician:	CAL

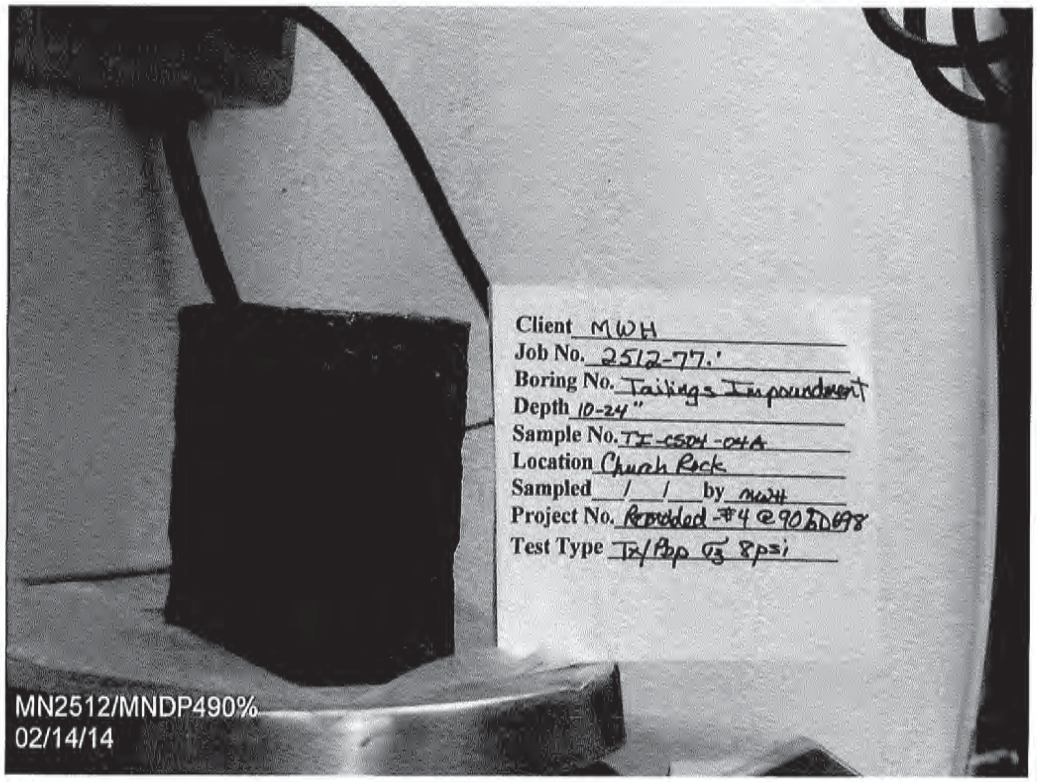


Data Entered By:	CAL		
Date:	2/13/2014	Checked By:	DHW
File Name:	2512_77_PrelimPerm_ASTMD-5084-methodD_8.xls	Date:	02/14/14

CONSOLIDATION DATA

Tailings Impoundment, 10-24", TI-CS04-04A (10-24")




Client MWH
Job No. 2512-77.'
Boring No. Tailings Impoundment
Depth 10-24"
Sample No. TI-CS04-04A
Location Church Rock
Sampled / / by MWH
Project No. Provided #4 @ 90 BD098
Test Type Tx/Bop σ3 8psi
MN2512/MNDP490%
02/14/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	10-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS04-04A (10-24")	TEST FINISHED	02/11/14 CAL
LOCATION	Church Rock	CELL NUMBER	7S
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 95%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	444.0	466.5
Wt. Wet Soil & Pan (g)	450.5	473.0
Wt. Dry Soil & Pan (g)	393.0	393.0
Wt. Lost Moisture (g)	57.6	80.0
Wt. of Pan Only (g)	6.5	6.5
Wt. of Dry Soil (g)	386.5	386.5
Moisture Content %	14.9	20.7
Wet Density PCF	124.2	133.7
Dry Density PCF	108.1	110.8

Init. Diameter (in)	2.404	(cm)	6.106
Init. Area (sq in)	4.539	(sq cm)	29.286
Init. Height (in)	3.000	(cm)	7.620
Vol. Bef. Consol. (cu ft)	0.00788		
Vol. After Consol. (cu ft)	0.00769		
Porosity %	36.72		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	8
Percentage of Pump setting	100
Q (cc/s)	5.70E-04
Height	2.987
Diameter	2.380
Pressure (psi)	0.345
Area after consol. (cm*cm)	28.711
Gradient	3.197
Permeability k (cm/s)	6.2E-06
Permeability k (m/s)	6.2E-08
Back Pressure (psi)	78.0
Cell Pressure (psi)	86.0
Ave. Effective Stress (psi)	7.828
Average temperature degree C:	23.3

Data entry by: SKL Date: 02/12/2014
Checked by: CAL Date: 2/13/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_3.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	10-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS04-04A (10-24")	TEST FINISHED	02/11/14 CAL
LOCATION	Church Rock	SETUP NO.	7S
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 95%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.9	12.9				
50.0	48.0	11.6	13.2	38.0	46.3	8.3	0.83
60.0	58.0	12.9	14.0	48.1	56.9	8.8	0.88
70.0	68.0	14.3	15.2	58.5	67.7	9.2	0.92
80.0	78.0	15.3	16.1	68.4	77.8	9.4	0.94
90.0		16.4	16.5	78.3	87.9	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.10	0.00
0.25	0.50	1.80	-1.70
0.5	0.71	2.10	-2.00
1	1.00	2.50	-2.40
2	1.41	2.90	-2.80
4	2.00	3.30	-3.20
9	3.00	3.70	-3.60
16	4.00	3.90	-3.80
30	5.48	4.10	-4.00
60	7.75	4.30	-4.20
120	10.95	4.50	-4.40
240	15.49	4.65	-4.55
360	18.97	4.70	-4.60

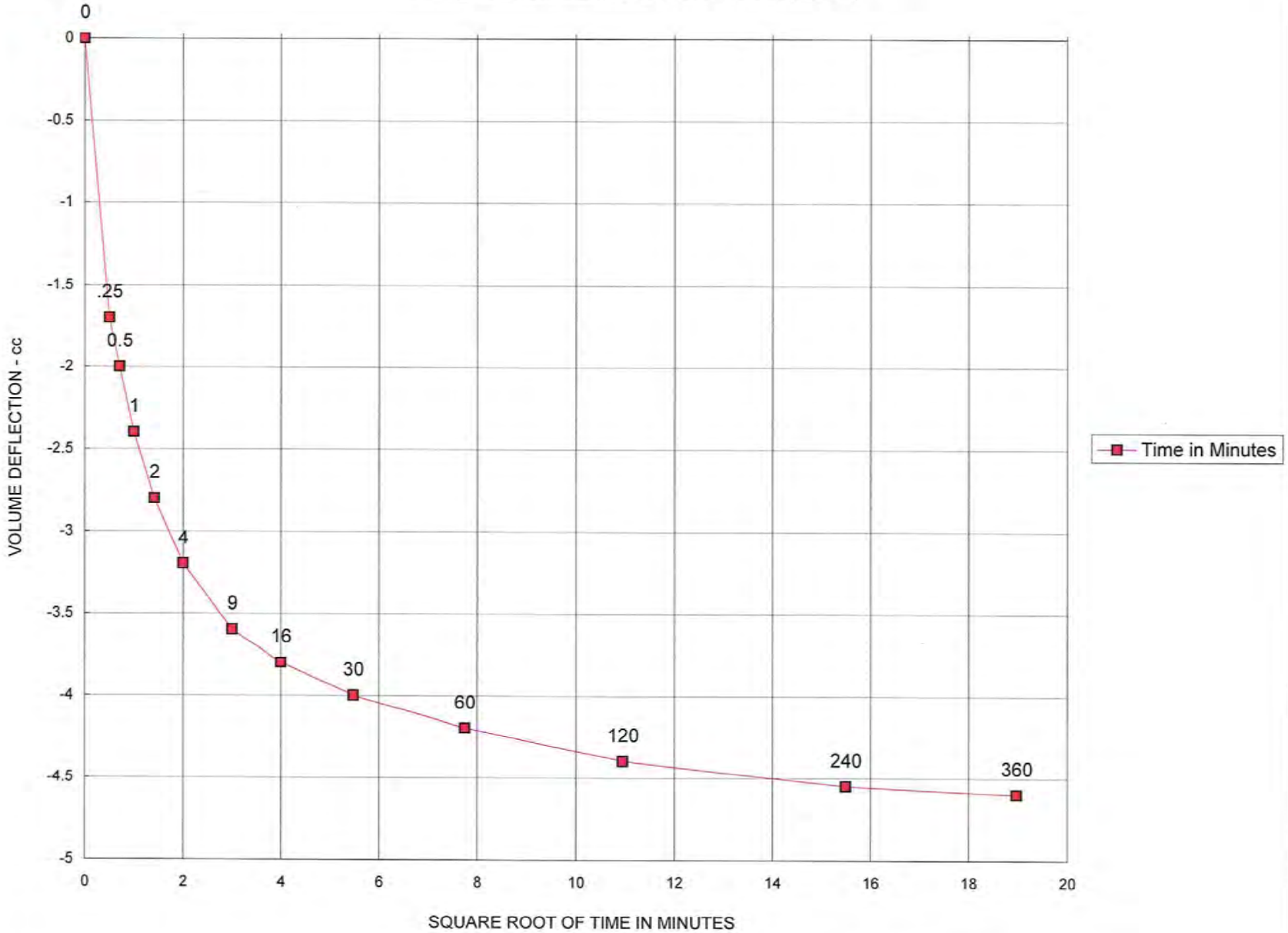
Initial Height (in)	3.000	Init. Vol. (CC)	223.182
Height Change (in)	0.013	Vol. Change (CC)	19.100
Ht. After Cons. (in)	2.987	Cell Exp. (CC)	13.786
Initial Area (sq in)	4.539	Net Change (CC)	5.314
Area After Cons. (sq in)	4.450	Cons. Vol. (CC)	217.868

Data entry by: SKL Date: 02/12/2014
Checked by: CAL Date: 2/13/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_3.xls

ATT
ADVANCED TERRA TESTING

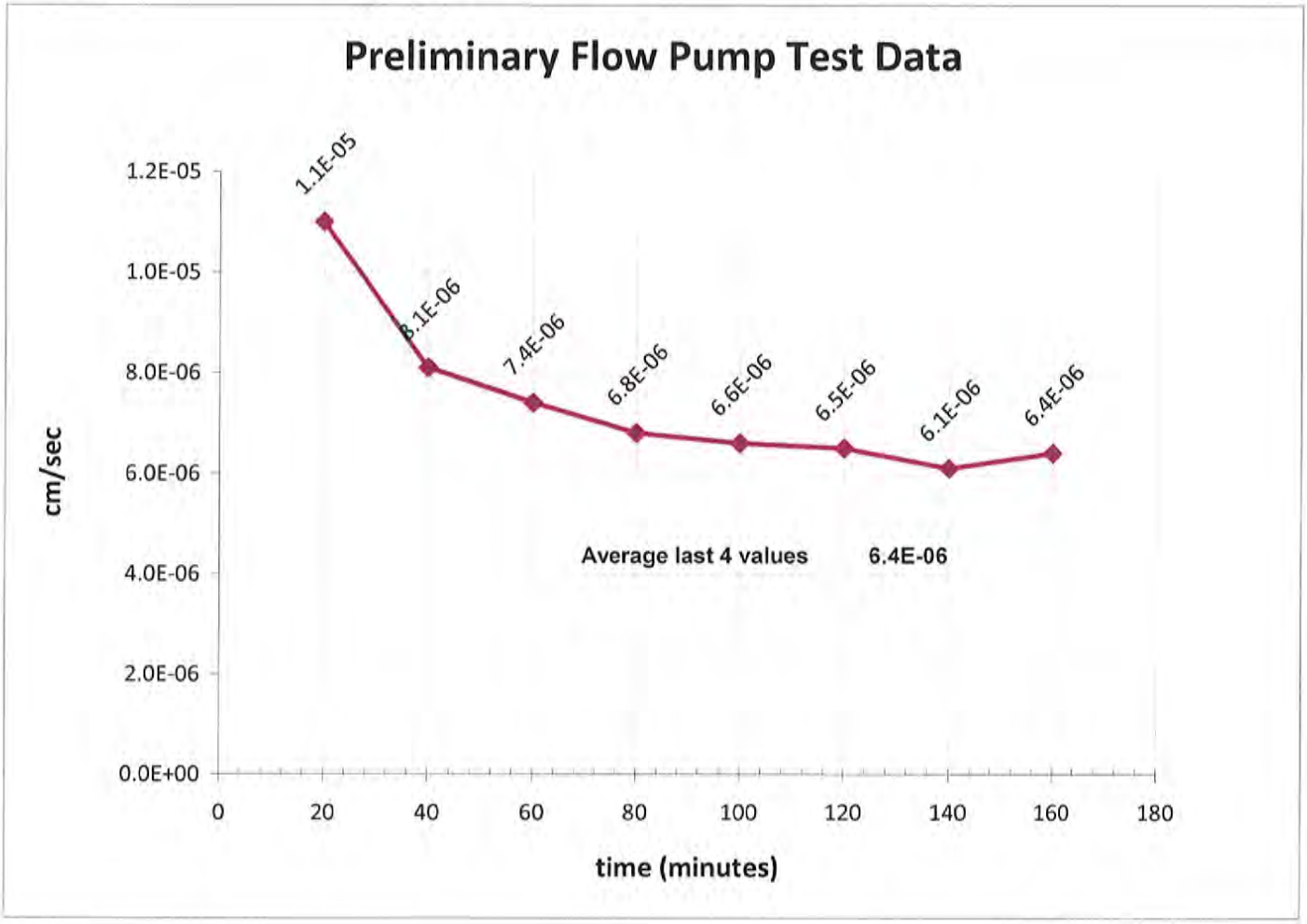
CONSOLIDATION DATA

Tailings Impoundment, 10-24", TI-CS04-04A (10-24")



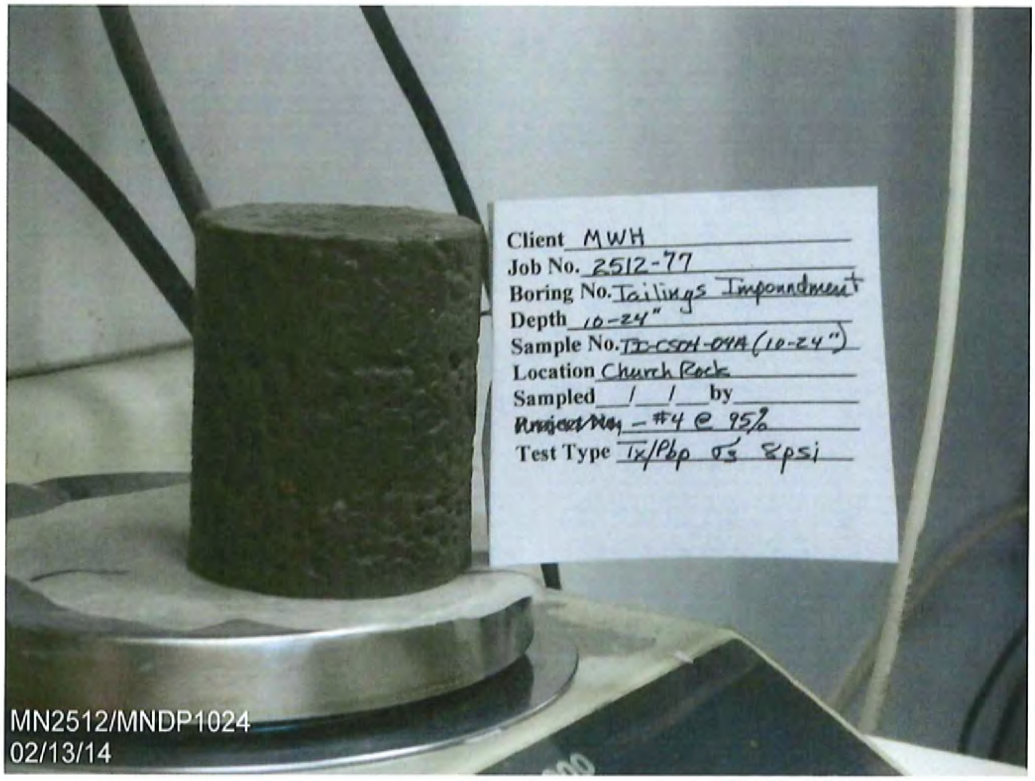
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512_77	Depth:	10-24"		
Project:	--	Sample Number:	TI-CS04-04A @ 95% D698		
Location:	Church Rock	Sampled Date:	-	Sampled By:	MWH
Project Number:	--	Test Date:	2/11/2014	Technician:	CAL



Data Entered By: CAL
Date: 2/12/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_7.xls

Checked By: CAL
Date: 2/13/14


Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 10-24"
Sample No. TI-CSOH-04A (10-24")
Location Church Rock
Sampled / / by
Project No. - #4 @ 95%
Test Type Tx/Pbp σ3 8psi
MN2512/MNDP1024
02/13/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	10-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS04-04A (10-24")	TEST FINISHED	02/12/14 CAL
LOCATION	Church Rock	CELL NUMBER	21S
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 100%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	467.1	482.6
Wt. Wet Soil & Pan (g)	473.6	489.2
Wt. Dry Soil & Pan (g)	411.6	411.6
Wt. Lost Moisture (g)	62.0	77.6
Wt. of Pan Only (g)	6.5	6.5
Wt. of Dry Soil (g)	405.0	405.0
Moisture Content %	15.3	19.2
Wet Density PCF	130.2	134.7
Dry Density PCF	112.9	113.1

Init. Diameter (in)	2.406	(cm)	6.111
Init. Area (sq in)	4.547	(sq cm)	29.334
Init. Height (in)	3.006	(cm)	7.635
Vol. Bef. Consol. (cu ft)	0.00791		
Vol. After Consol. (cu ft)	0.00790		
Porosity %	34.69		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	11
Percentage of Pump setting	100
Q (cc/s)	5.71E-05
Height	3.007
Diameter	2.404
Pressure (psi)	0.910
Area after consol. (cm*cm)	29.275
Gradient	8.377
Permeability k (cm/s)	2.3E-07
Permeability k (m/s)	2.3E-09
Back Pressure (psi)	68.0
Cell Pressure (psi)	76.0
Ave. Effective Stress (psi)	7.545
Average temperature degree C:	22.6

Data entry by: DAW Date: 02/14/2014

Checked by: CAC Date: 2/18/14

FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_7.xls

ATT ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	10-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS04-04A (10-24")	TEST FINISHED	02/12/14 CAL
LOCATION	Church Rock	SETUP NO.	21S
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 100%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.1	14.4				
50.0	48.0	11.1	12.3	37.5	45.9	8.4	0.84
60.0	58.0	12.1	13.0	47.5	56.3	8.8	0.88
70.0	68.0	12.9	13.7	57.3	66.7	9.4	0.94
80.0		13.8	13.8	67.4	76.9	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.10	0.00
0.25	0.50	0.90	-0.80
0.5	0.71	1.00	-0.90
1	1.00	1.20	-1.10
2	1.41	1.45	-1.35
4	2.00	1.70	-1.60
9	3.00	2.00	-1.90
16	4.00	2.30	-2.20
30	5.48	2.60	-2.50
60	7.75	2.80	-2.70
120	10.95	3.00	-2.90
240	15.49	3.15	-3.05
360	18.97	3.20	-3.10

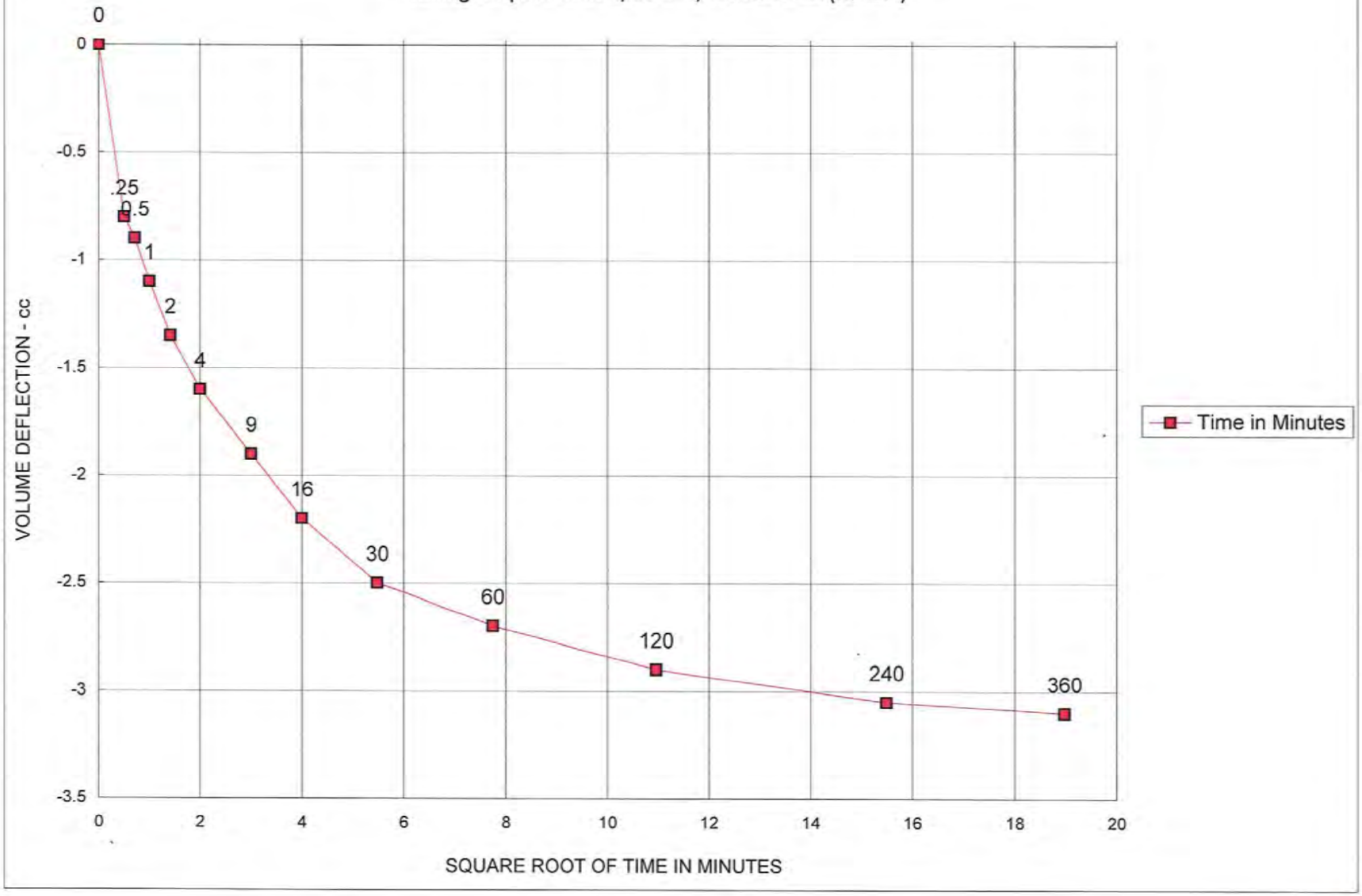
Initial Height (in)	3.006	Init. Vol. (CC)	224.001
Height Change (in)	-0.001	Vol. Change (CC)	15.400
Ht. After Cons. (in)	3.007	Cell Exp. (CC)	15.037
Initial Area (sq in)	4.547	Net Change (CC)	0.363
Area After Cons. (sq in)	4.538	Cons. Vol. (CC)	223.637

Data entry by: DAW Date: 02/14/2014
Checked by: CAL Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_7.xls

ATT
ADVANCED TERRA TESTING

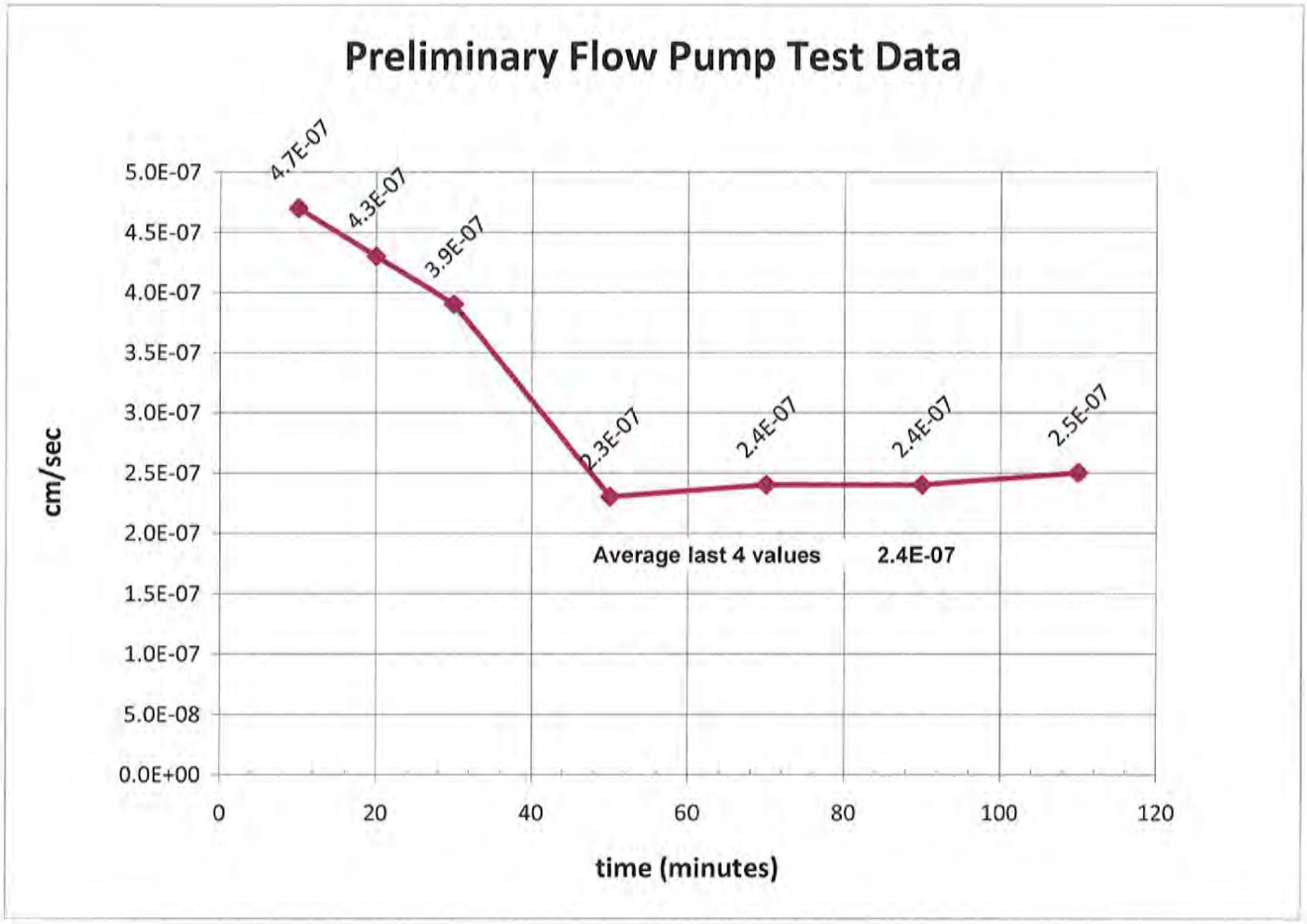
CONSOLIDATION DATA

Tailings Impoundment, 10-24", TI-CS04-04A (10-24")



Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512_77	Depth:	10-24"		
Project:	--	Sample Number:	TI-CS04-04A		
Location:	Church Rock	Sampled Date:	-	Sampled By:	MWH
Project Number:	--	Test Date:	2/12/2014	Technician:	CAL



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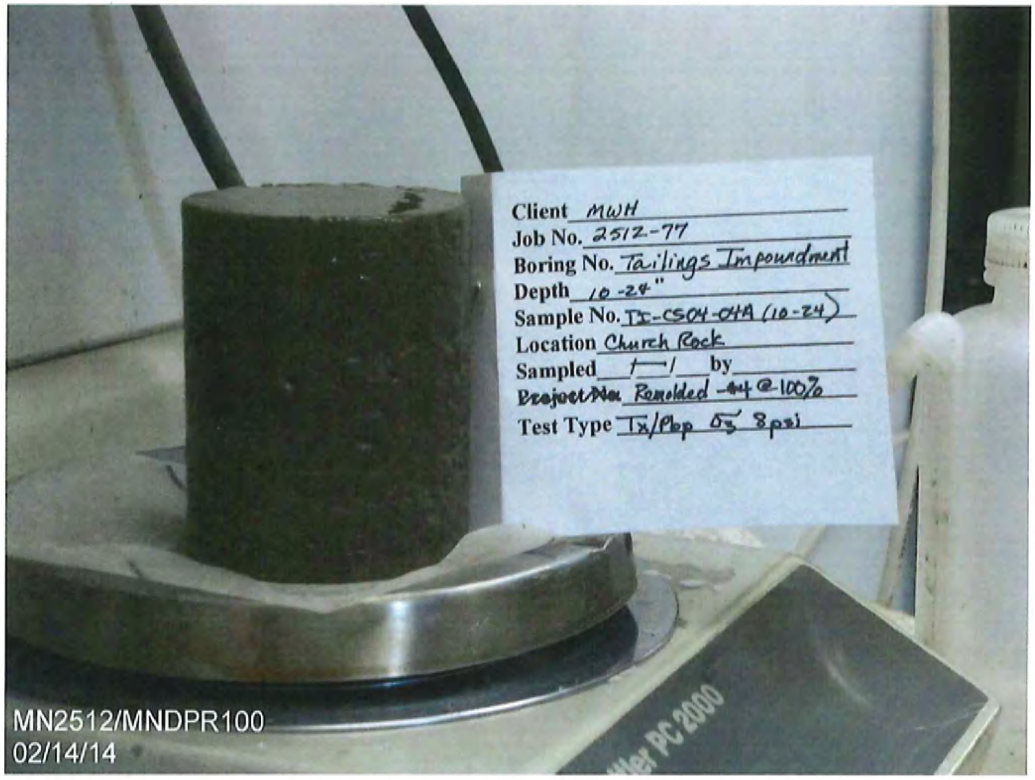
Checked By: DAW
Date: 02/14/14


Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 10-24"
Sample No. TI-CS04-04A (10-24)
Location Church Rock
Sampled / / by
Project No. Remolded -#4 @ 100%
Test Type Tx/Pbp σ3 8psi
MN2512/MNDPR100
02/14/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	11-24"	TEST STARTED	1/28/14 CAL
SAMPLE NO.	TI-CS01-04A	TEST FINISHED	2/14/14 CAL
LOCATION	Church Rock	CELL NUMBER	4P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @90%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	427.0	457.9
Wt. Wet Soil & Pan (g)	433.6	464.5
Wt. Dry Soil & Pan (g)	385.1	385.1
Wt. Lost Moisture (g)	48.5	79.4
Wt. of Pan Only (g)	6.6	6.6
Wt. of Dry Soil (g)	378.5	378.5
Moisture Content %	12.8	21.0
Wet Density PCF	119.5	131.3
Dry Density PCF	106.0	108.6

Init. Diameter (in)	2.406	(cm)	6.111
Init. Area (sq in)	4.547	(sq cm)	29.334
Init. Height (in)	2.993	(cm)	7.602
Vol. Bef. Consol. (cu ft)	0.00787		
Vol. After Consol. (cu ft)	0.00769		
Porosity %	36.47		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	4
Percentage of Pump setting	100
Q (cc/s)	1.16E-02
Height	2.977
Diameter	2.383
Pressure (psi)	0.143
Area after consol. (cm*cm)	28.785
Gradient	1.330
Permeability k (cm/s)	3.0E-04
Permeability k (m/s)	3.0E-06
Back Pressure (psi)	68.0
Cell Pressure (psi)	76.0
Ave. Effective Stress (psi)	7.929
Average temperature degree C:	22.0

Data entry by: SKL Date: 02/17/2014
Checked by: CAC Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_8.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	11-24"	TEST STARTED	1/28/14 CAL
SAMPLE NO.	TI-CS01-04A	TEST FINISHED	2/14/14 CAL
LOCATION	Church Rock	SETUP NO.	4P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @90%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.9	13.5				
50.0	48.0	13.5	14.7	37.3	45.4	8.1	0.81
60.0	58.0	15.0	15.9	47.4	56.0	8.6	0.86
70.0	68.0	15.8	16.6	57.3	66.4	9.1	0.91
80.0		16.7	17.0	67.0	76.6	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.20	0.00
0.25	0.50	2.50	-2.30
0.5	0.71	2.65	-2.45
1	1.00	2.80	-2.60
2	1.41	2.90	-2.70
4	2.00	3.10	-2.90
9	3.00	3.20	-3.00
16	4.00	3.35	-3.15
30	5.48	3.40	-3.20
60	7.75	3.60	-3.40
120	10.95	3.75	-3.55
240	15.49	3.90	-3.70
360	18.97	3.90	-3.70

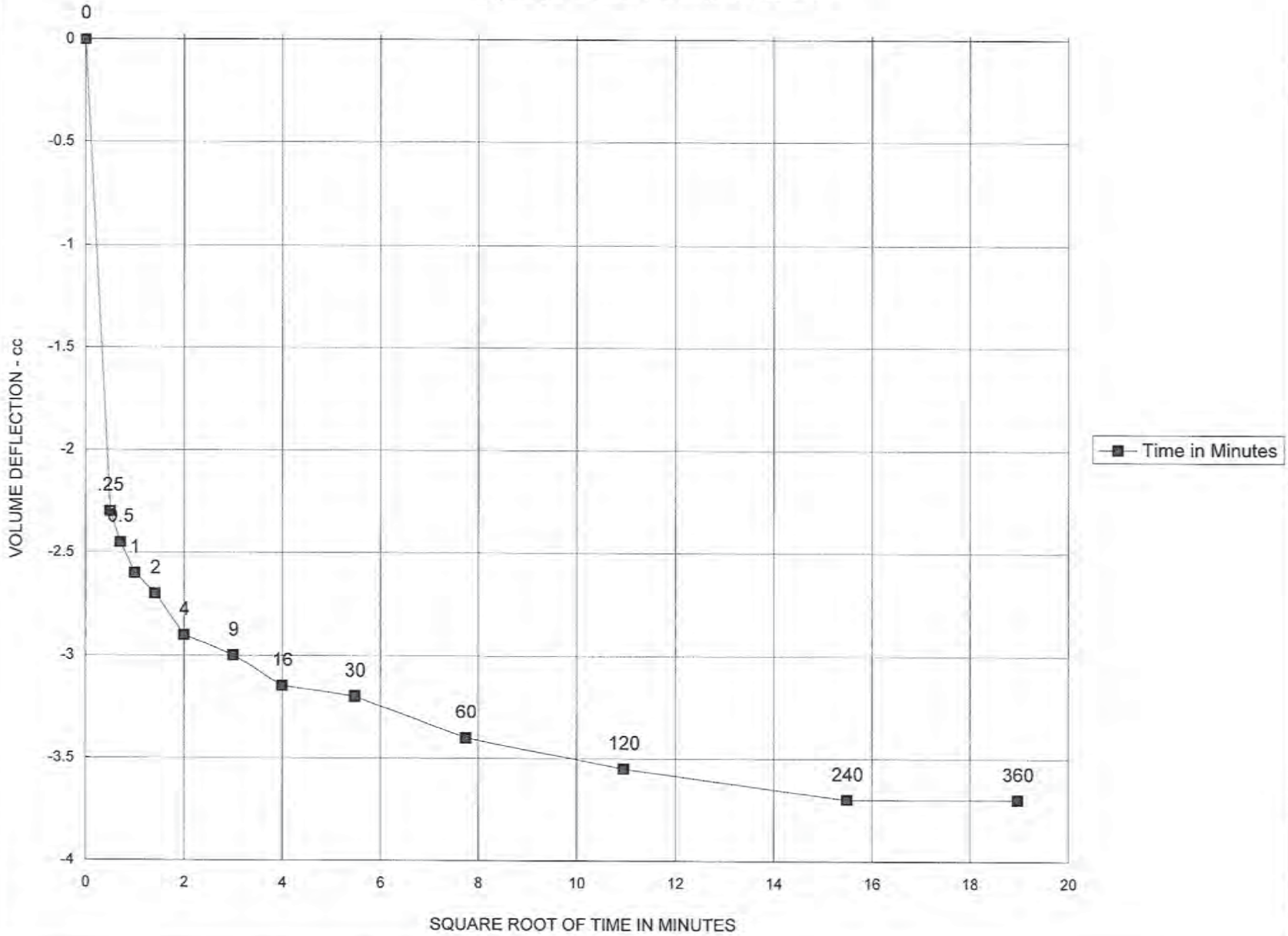
Initial Height (in)	2.993	Init. Vol. (CC)	223.032
Height Change (in)	0.016	Vol. Change (CC)	20.300
Ht. After Cons. (in)	2.977	Cell Exp. (CC)	14.968
Initial Area (sq in)	4.547	Net Change (CC)	5.332
Area After Cons. (sq in)	4.462	Cons. Vol. (CC)	217.700

Data entry by: SKL Date: 02/17/2014
Checked by: OK Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_8.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

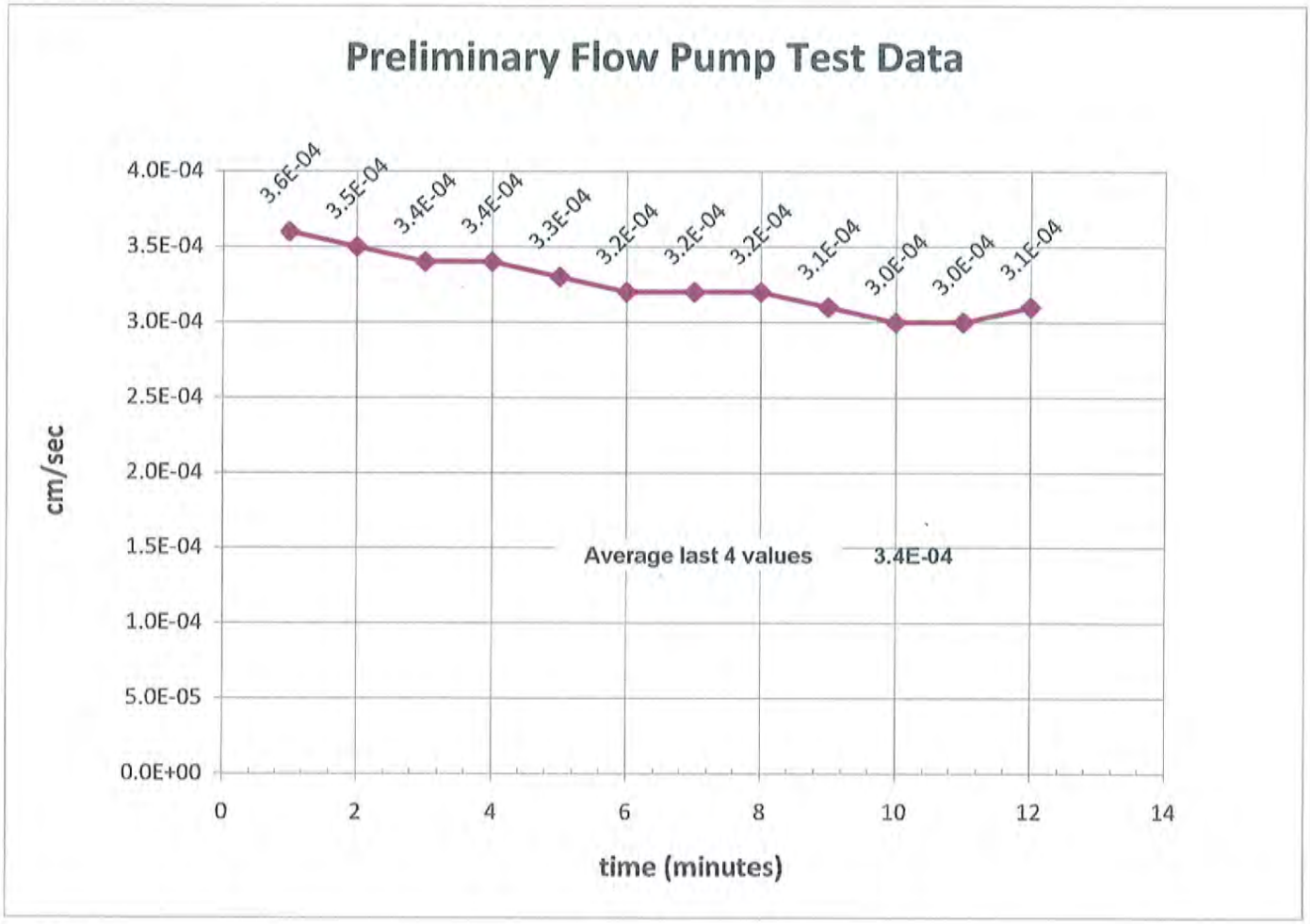
Tailings Impoundment, 11-24", TI-CS01-04A



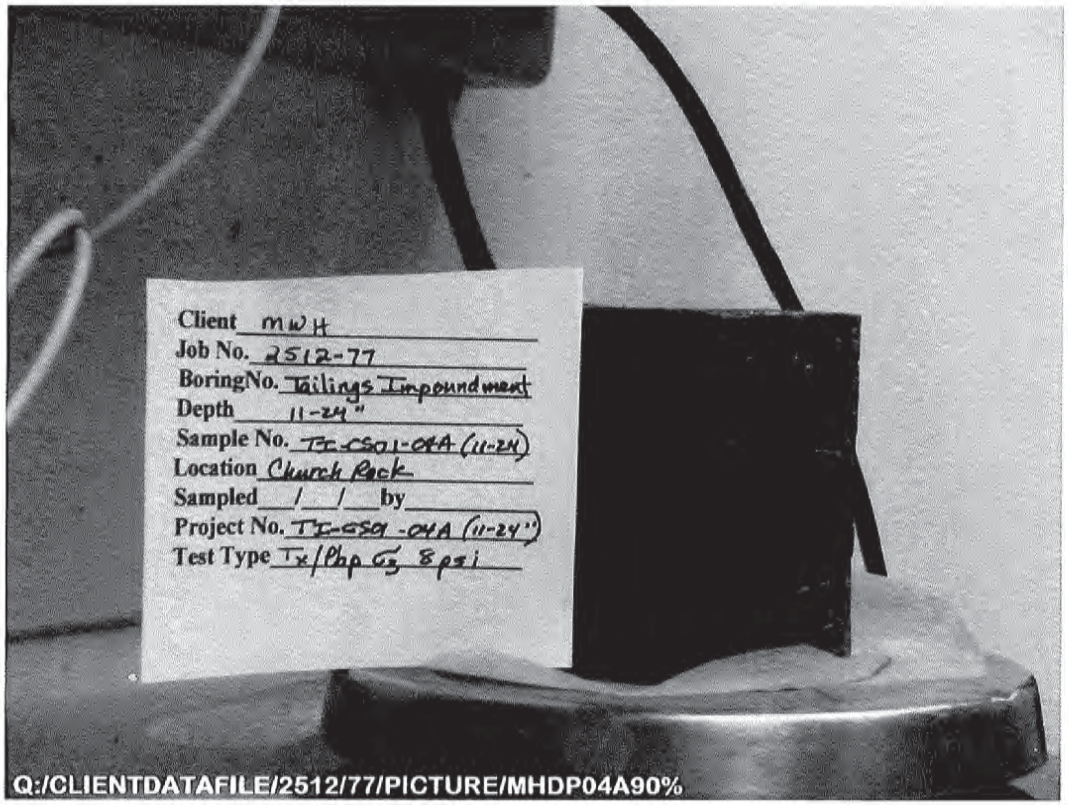
ADVANCED TERRA TESTING

Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512-77	Depth:	11-24"		
Project:	--	Sample Number:	TI-CS01-04A (11-24)		
Location:	Church Rock	Sampled Date:	--	Sampled By:	MWH
Project Number:	--	Test Date:	2/14/2014	Technician:	CAL



Data Entered By:	CAL		
Date:	2/14/2014	Checked By:	SM
File Name:	2512_77_PrelimPerm_ASTMD-5084-methodD_9.xls	Date:	2/17/14



Q:/CLIENTDATAFILE/2512/77/PICTURE/MHDP04A90%

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	11-24"	TEST STARTED	1/28/14 CAL
SAMPLE NO.	TI-CS01-04A(11-24")	TEST FINISHED	2/14/14 CAL
LOCATION	Church Rock	CELL NUMBER	2P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @95%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	450.8	476.3
Wt. Wet Soil & Pan (g)	457.4	482.8
Wt. Dry Soil & Pan (g)	405.7	405.7
Wt. Lost Moisture (g)	51.7	77.1
Wt. of Pan Only (g)	6.5	6.5
Wt. of Dry Soil (g)	399.2	399.2
Moisture Content %	12.9	19.3
Wet Density PCF	125.6	138.2
Dry Density PCF	111.2	115.8

Init. Diameter (in)	2.406	(cm)	6.111
Init. Area (sq in)	4.547	(sq cm)	29.334
Init. Height (in)	3.008	(cm)	7.640
Vol. Bef. Consol. (cu ft)	0.00791		
Vol. After Consol. (cu ft)	0.00760		
Porosity %	35.82		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	6
Percentage of Pump setting	100
Q (cc/s)	2.31E-03
Height	2.993
Diameter	2.363
Pressure (psi)	0.191
Area after consol. (cm*cm)	28.304
Gradient	1.766
Permeability k (cm/s)	4.6E-05
Permeability k (m/s)	4.6E-07
Back Pressure (psi)	88.0
Cell Pressure (psi)	96.0
Ave. Effective Stress (psi)	7.905
Average temperature degree C:	22.9

Data entry by: SKL Date: 02/17/2014

Checked by: CAC Date: 2/18/14

FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_9.xls

ATT ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	11-24"	TEST STARTED	1/28/14 CAL
SAMPLE NO.	TI-CS01-04A(11-24")	TEST FINISHED	2/14/14 CAL
LOCATION	Church Rock	SETUP NO.	2P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @95%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	3.2	12.4				
50.0	48.0	13.6	15.2	37.4	45.3	7.9	0.79
60.0	58.0	15.7	17.0	47.5	55.9	8.4	0.84
70.0	68.0	17.3	18.6	57.4	66.3	8.9	0.89
80.0	78.0	19.5	20.6	67.1	76.4	9.3	0.93
90.0	88.0	21.0	22.1	77.3	86.7	9.4	0.94
100.0		22.4	22.7	87.3	96.8	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.00	0.00
0.25	0.50	2.00	-2.00
0.5	0.71	2.20	-2.20
1	1.00	2.40	-2.40
2	1.41	2.50	-2.50
4	2.00	2.60	-2.60
9	3.00	2.70	-2.70
16	4.00	2.80	-2.80
30	5.48	2.90	-2.90
60	7.75	3.00	-3.00
120	10.95	3.10	-3.10
240	15.49	3.10	-3.10
360	18.97	3.10	-3.10

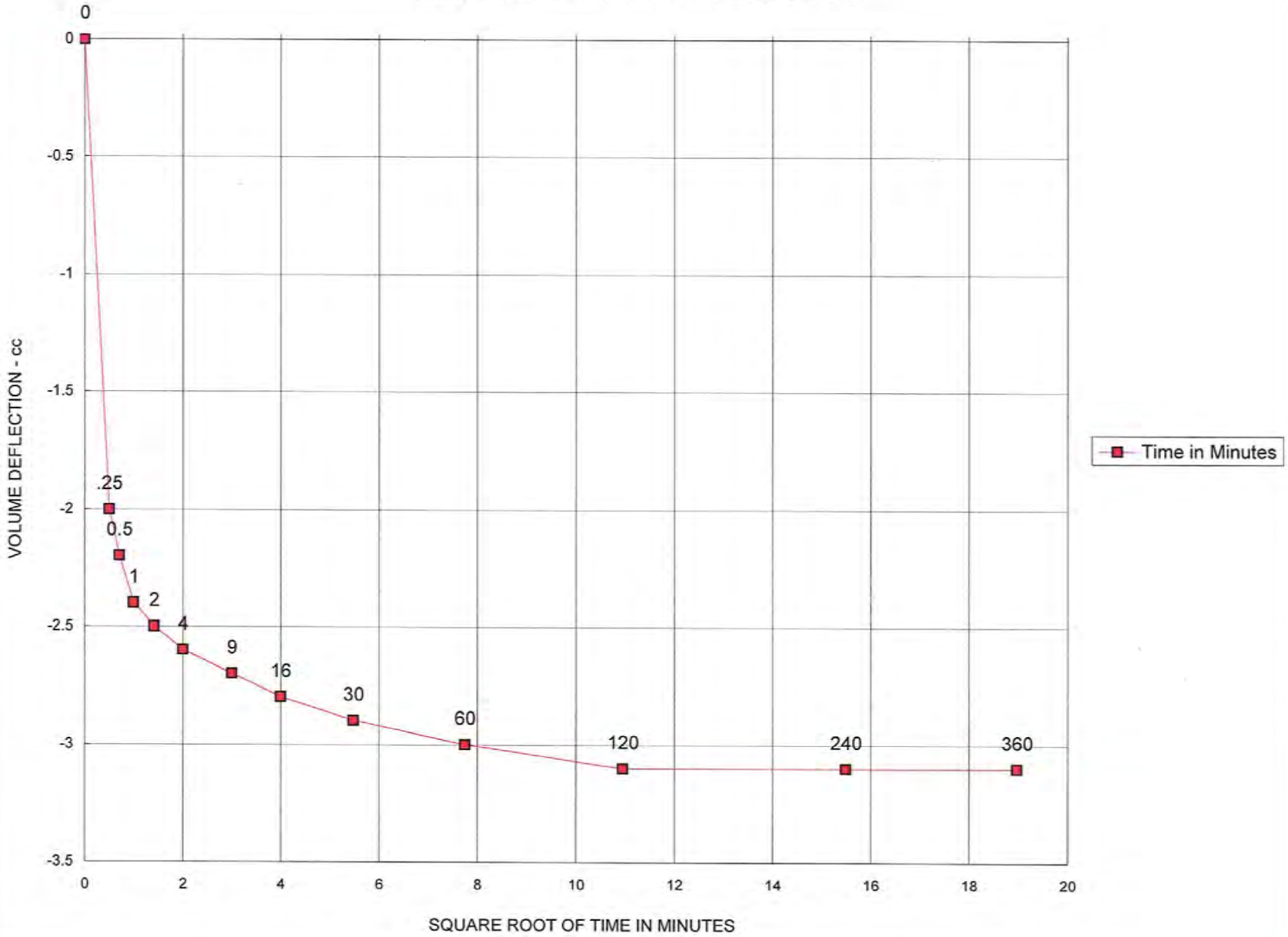
Initial Height (in)	3.008	Init. Vol. (CC)	224.150
Height Change (in)	0.015	Vol. Change (CC)	25.150
Ht. After Cons. (in)	2.993	Cell Exp. (CC)	16.216
Initial Area (sq in)	4.547	Net Change (CC)	8.934
Area After Cons. (sq in)	4.387	Cons. Vol. (CC)	215.216

Data entry by: SKL Date: 02/17/2014
Checked by: CAL Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_9.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

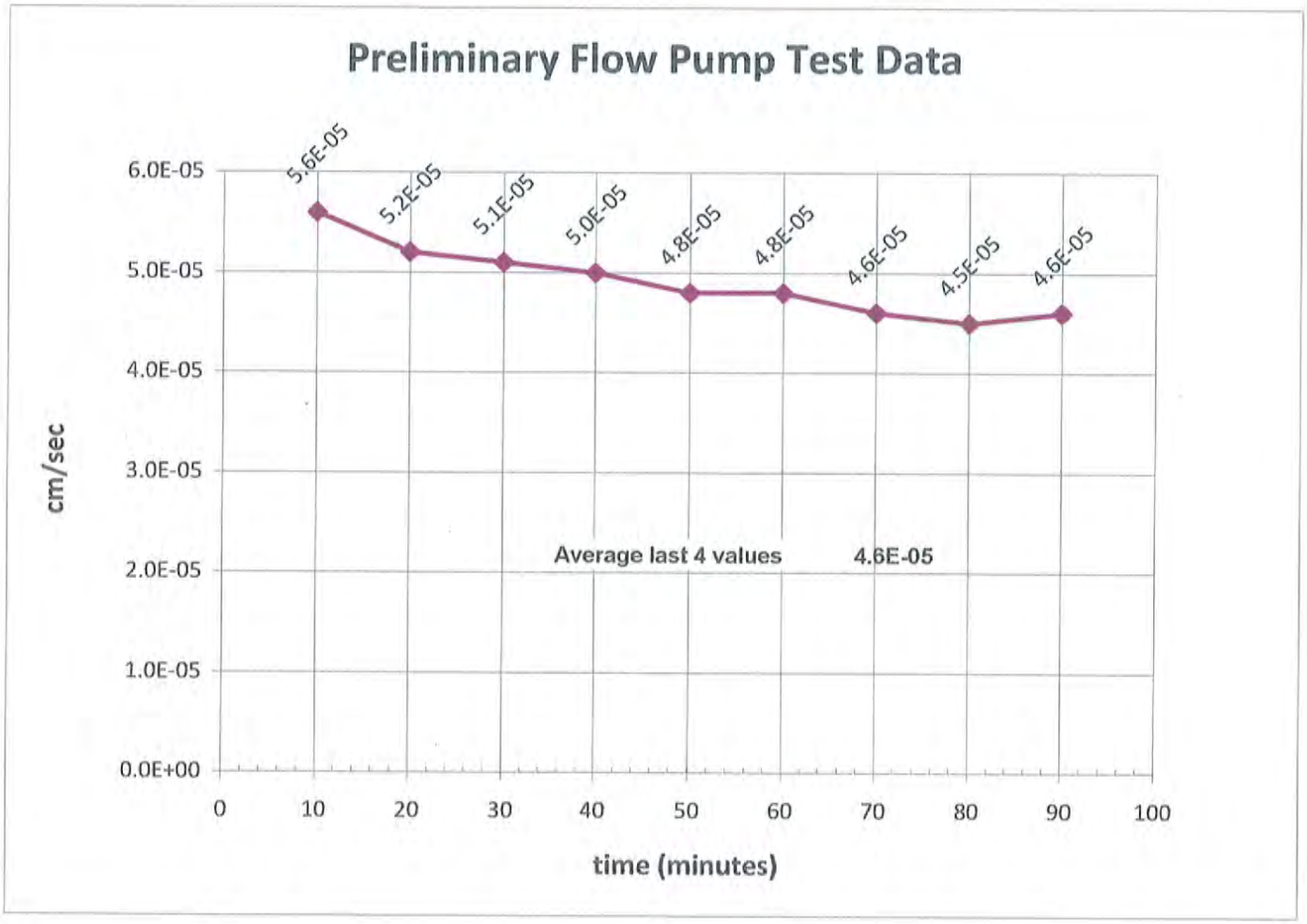
Tailings Impoundment, 11-24", TI-CS01-04A(11-24")



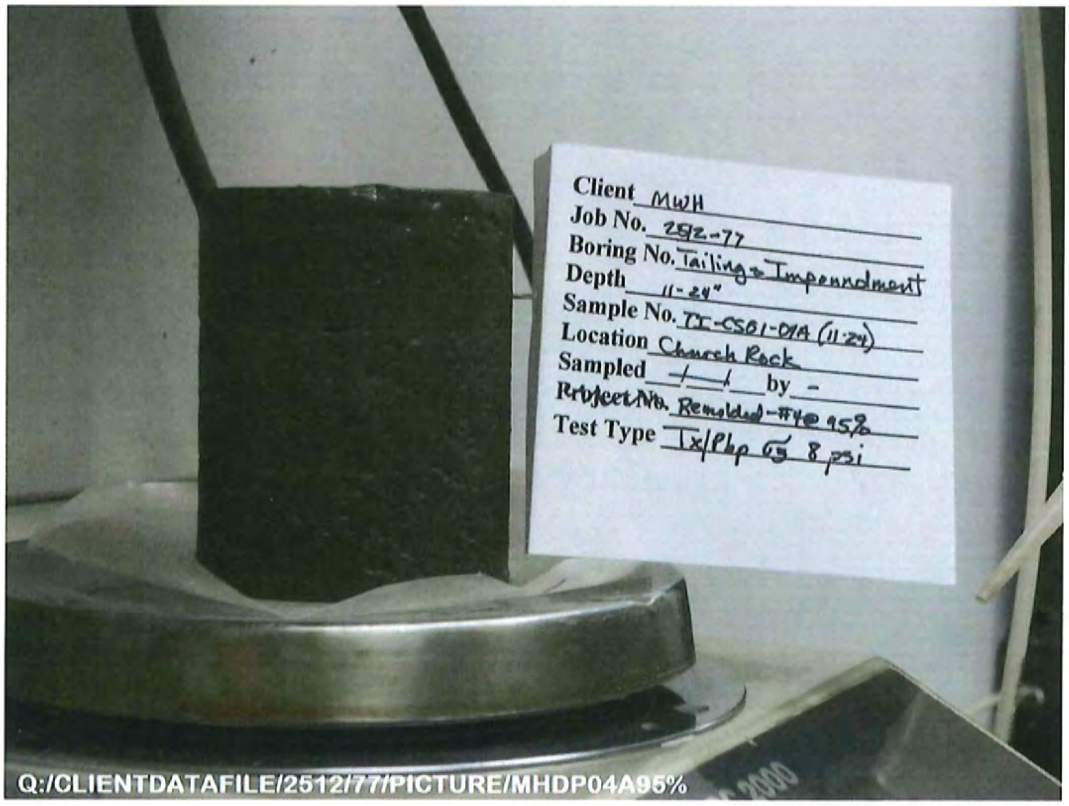
ADVANCED TERRA TESTING

Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512-77	Depth:	11-24"		
Project:	--	Sample Number:	TI-CS01-04A (11-24)		
Location:	Church Rock	Sampled Date:	--	Sampled By:	MWH
Project Number:	--	Test Date:	2/14/2014	Technician:	CAL



Data Entered By:	CAL		
Date:	2/14/2014	Checked By:	SM
File Name:	PrelimPerm_ASTMD-5084-methodD.XLS	Date:	2/17/14


Client MWH
Job No. 2512-77
Boring No. Tailing Impoundment
Depth 11-24"
Sample No. TI-CS01-01A (11-24)
Location Church Rock
Sampled / / by -
Project No. Remolded - #4 @ 95%
Test Type Tx/Pbp @ 8 psi
Q:/CLIENTDATAFILE/2512/77/PICTURE/MHDP04A95%

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	11-24"	TEST STARTED	01/28/14 CAL
SAMPLE NO.	TI-CS01-04 (11-24")	TEST FINISHED	02/17/14 CAL
LOCATION	Church Rock	CELL NUMBER	1P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 100%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	474.5	490.9
Wt. Wet Soil & Pan (g)	488.3	504.7
Wt. Dry Soil & Pan (g)	433.5	433.5
Wt. Lost Moisture (g)	54.8	71.2
Wt. of Pan Only (g)	13.8	13.8
Wt. of Dry Soil (g)	419.7	419.7
Moisture Content %	13.1	17.0
Wet Density PCF	132.0	142.9
Dry Density PCF	116.7	122.1

Init. Diameter (in)	2.406	(cm)	6.111
Init. Area (sq in)	4.547	(sq cm)	29.334
Init. Height (in)	3.013	(cm)	7.653
Vol. Bef. Consol. (cu ft)	0.00793		
Vol. After Consol. (cu ft)	0.00758		
Porosity %	33.18		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	9
Percentage of Pump setting	100
Q (cc/s)	2.28E-04
Height	2.995
Diameter	2.359
Pressure (psi)	1.120
Area after consol. (cm*cm)	28.199
Gradient	10.351
Permeability k (cm/s)	7.8E-07
Permeability k (m/s)	7.8E-09
Back Pressure (psi)	68.0
Cell Pressure (psi)	76.0
Ave. Effective Stress (psi)	7.440
Average temperature degree C:	22.4

Data entry by: DAW Date: 02/18/2014
Checked by: aac Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_10.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	11-24"	TEST STARTED	01/28/14 CAL
SAMPLE NO.	TI-CS01-04 (11-24")	TEST FINISHED	02/17/14 CAL
LOCATION	Church Rock	SETUP NO.	1P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 100%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	1152

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.8	12.6				
50.0	48.0	11.6	13.1	37.5	45.7	8.2	0.82
60.0	58.0	13.6	15.0	47.4	56.1	8.7	0.87
70.0	68.0	15.4	16.7	57.6	66.7	9.1	0.91
80.0		17.6	17.8	67.2	76.7	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.30	0.00
0.25	0.50	1.60	-1.30
0.5	0.71	1.80	-1.50
1	1.00	1.95	-1.65
2	1.41	2.20	-1.90
4	2.00	2.60	-2.30
9	3.00	2.70	-2.40
16	4.00	2.80	-2.50
30	5.48	2.90	-2.60
60	7.75	3.00	-2.70
120	10.95	3.10	-2.80
240	15.49	3.20	-2.90
360	18.97	3.20	-2.90

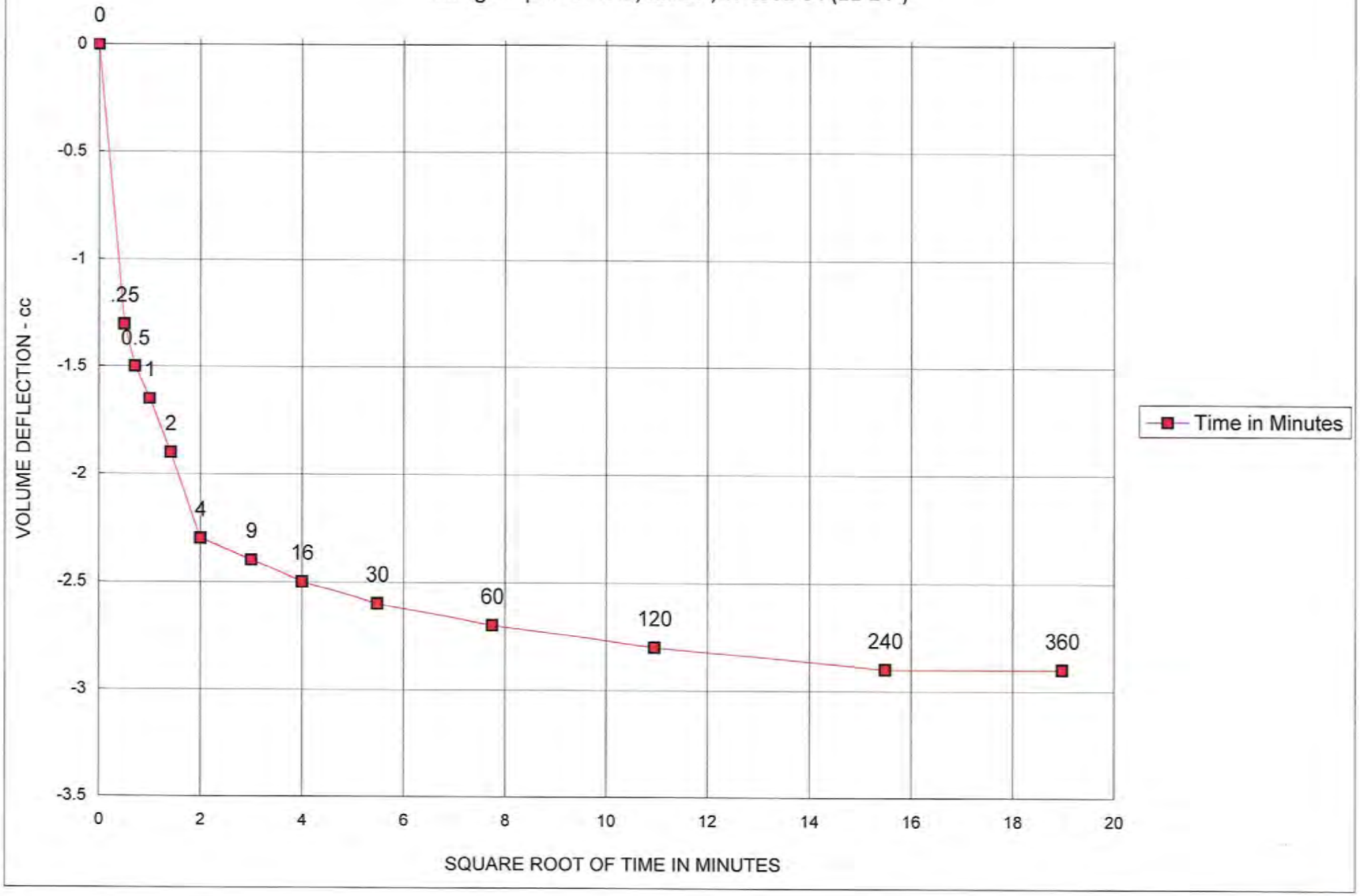
Initial Height (in)	3.013	Init. Vol. (CC)	224.522
Height Change (in)	0.018	Vol. Change (CC)	22.300
Ht. After Cons. (in)	2.995	Cell Exp. (CC)	12.338
Initial Area (sq in)	4.547	Net Change (CC)	9.962
Area After Cons. (sq in)	4.371	Cons. Vol. (CC)	214.560

Data entry by: DAW Date: 02/18/2014
Checked by: CAL Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_10.xls

ATT
ADVANCED TERRA TESTING

CONSOLIDATION DATA

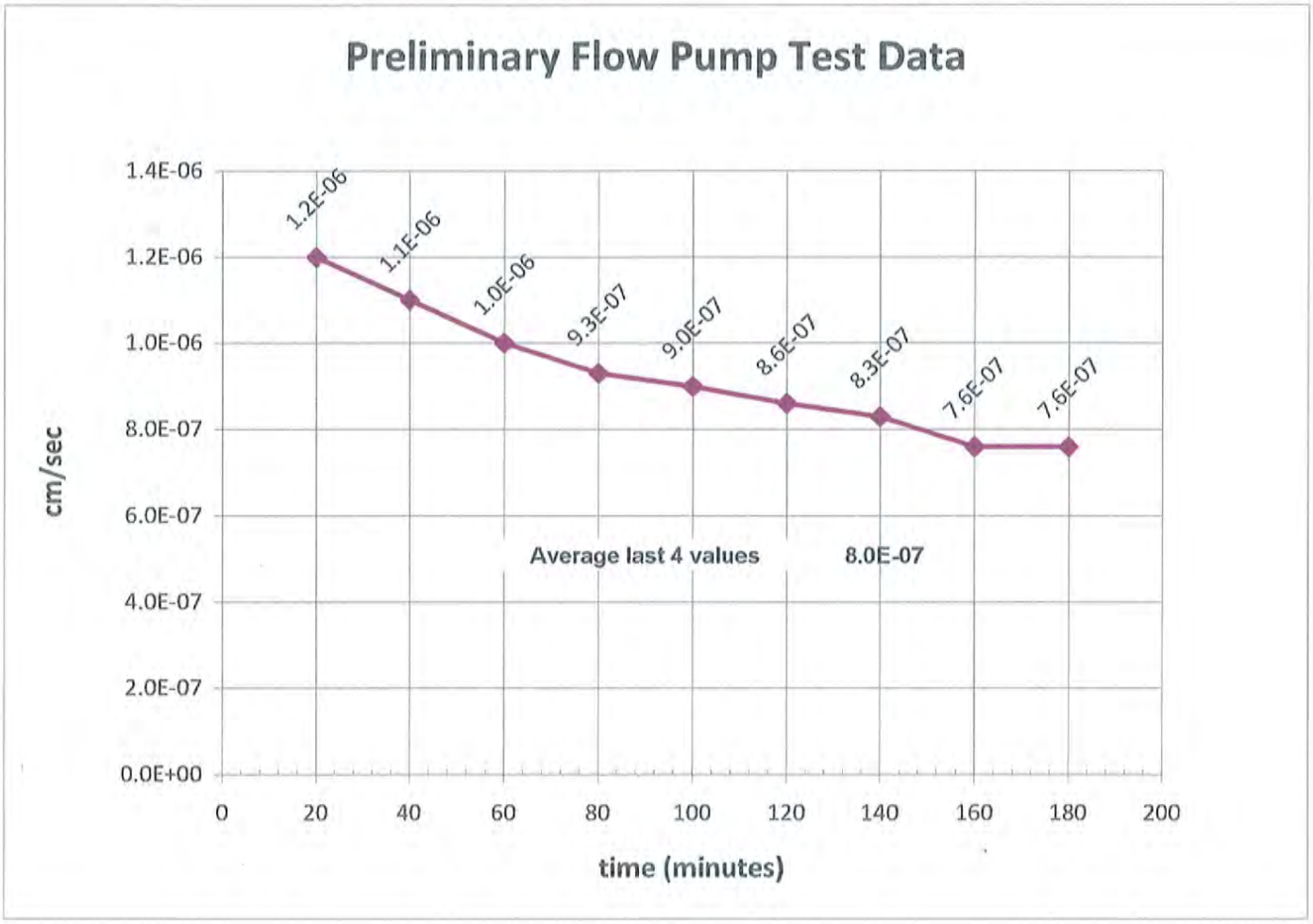
Tailings Impoundment, 11-24", TI-CS01-04 (11-24")



ADVANCED TERRA TESTING

Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512-77	Depth:	11-24"		
Project:	--	Sample Number:	TI-CS01-04A		
Location:	Church Rock	Sampled Date:	-	Sampled By:	MWH
Project Number:	--	Test Date:	2/17/2014	Technician:	CAL



Data Entered By:	CAL		
Date:	2/17/2014	Checked By:	DAW
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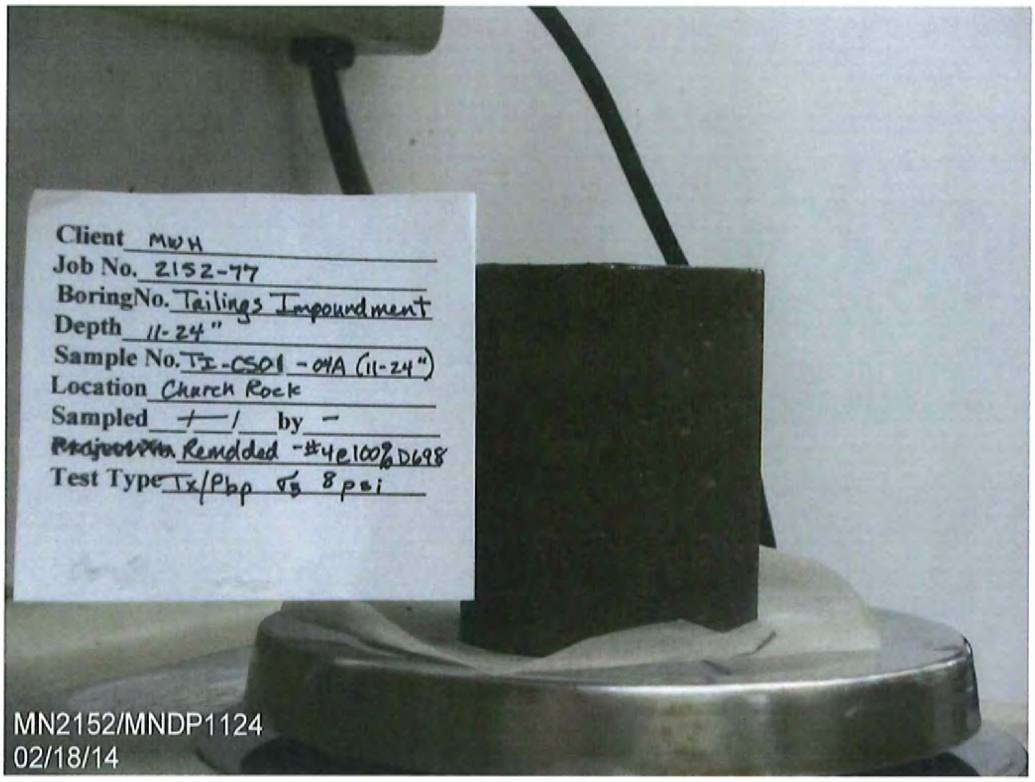

Client MWH
Job No. 2152-77
BoringNo. Tailings Impoundment
Depth 11-24"
Sample No. TI-CS01 -04A (11-24")
Location Church Rock
Sampled -/-/- by -
Remolded -#4 @ 100% D698
Test Type Tx/Pbp σ3 8 psi
MN2152/MNDP1124
02/18/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD

ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	9-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS11-04A (9-24")	TEST FINISHED	02/10/14 CAL
LOCATION	Church Rock	CELL NUMBER	9P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 90%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	425.8	440.7
Wt. Wet Soil & Pan (g)	432.3	447.2
Wt. Dry Soil & Pan (g)	378.2	378.2
Wt. Lost Moisture (g)	54.1	69.0
Wt. of Pan Only (g)	6.5	6.5
Wt. of Dry Soil (g)	371.7	371.7
Moisture Content %	14.6	18.6
Wet Density PCF	119.2	140.6
Dry Density PCF	104.1	118.6

Init. Diameter (in)	2.402	(cm)	6.101
Init. Area (sq in)	4.531	(sq cm)	29.237
Init. Height (in)	3.002	(cm)	7.625
Vol. Bef. Consol. (cu ft)	0.00787		
Vol. After Consol. (cu ft)	0.00691		
Porosity %	35.28		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	11
Percentage of Pump setting	100
Q (cc/s)	5.71E-05
Height	2.917
Diameter	2.283
Pressure (psi)	3.010
Area after consol. (cm*cm)	26.408
Gradient	28.563
Permeability k (cm/s)	7.6E-08
Permeability k (m/s)	7.6E-10
Back Pressure (psi)	68.0
Cell Pressure (psi)	92.0
Ave. Effective Stress (psi)	22.495
Average temperature degree C:	22.2

Data entry by: DAW Date: 02/11/2014

Checked by: CAL Date: 2/12/14

FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_2.xls

ATT ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	9-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS11-04A (9-24")	TEST FINISHED	02/10/14 CAL
LOCATION	Church Rock	SETUP NO.	9P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 90%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	3.4	17.1				
50.0	48.0	16.9	18.4	38.2	46.7	8.5	0.85
60.0	58.0	19.7	20.8	48.3	57.2	8.9	0.89
70.0	68.0	22.3	23.2	58.5	67.9	9.4	0.94
80.0		23.5	23.6	68.6	78.2	9.6	0.96

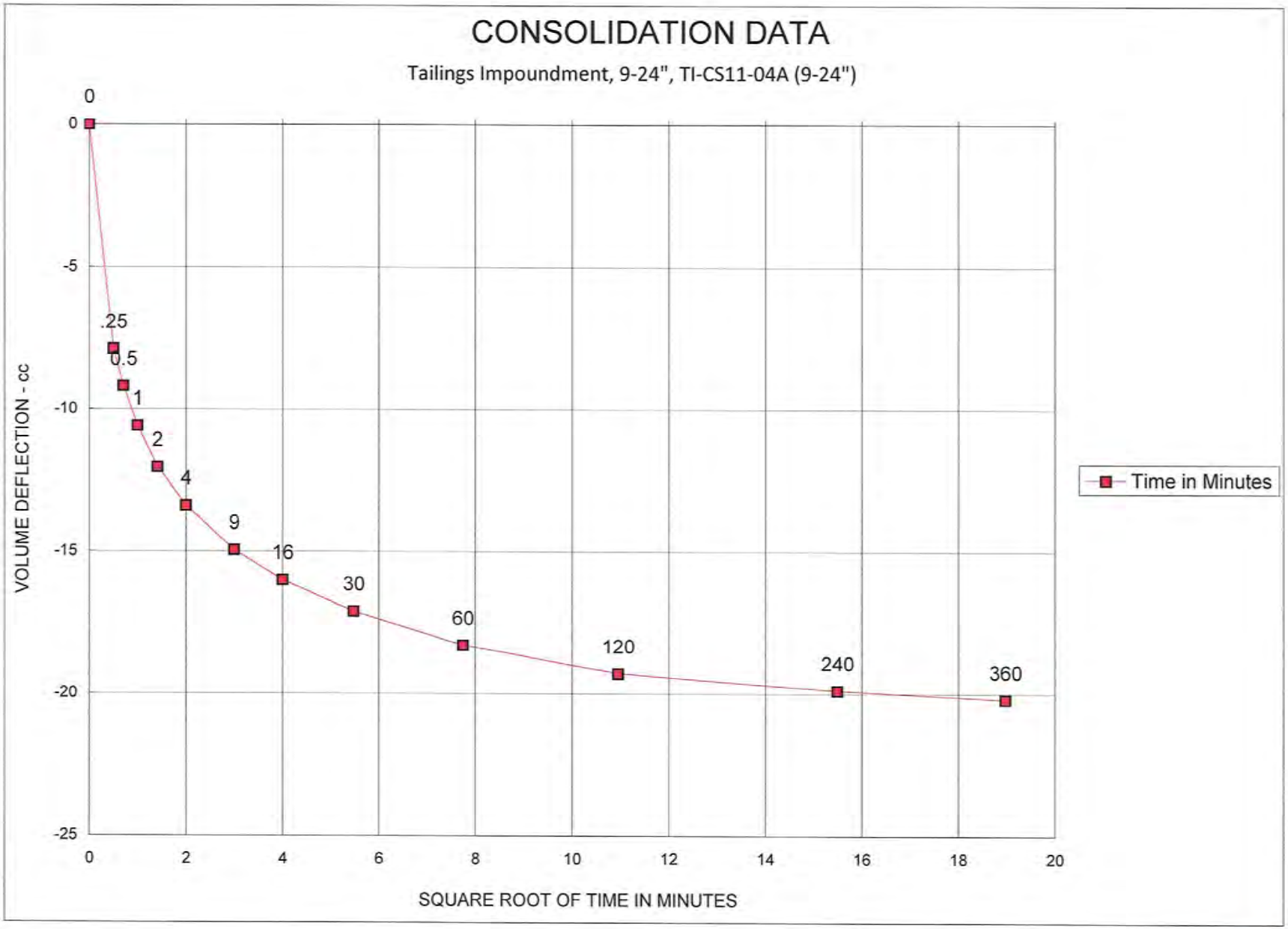
CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.50	0.00
0.25	0.50	8.40	-7.90
0.5	0.71	9.70	-9.20
1	1.00	11.10	-10.60
2	1.41	12.55	-12.05
4	2.00	13.90	-13.40
9	3.00	15.45	-14.95
16	4.00	16.50	-16.00
30	5.48	17.60	-17.10
60	7.75	18.80	-18.30
120	10.95	19.80	-19.30
240	15.49	20.40	-19.90
360	18.97	20.70	-20.20

Initial Height (in)	3.002	Init. Vol. (CC)	222.959
Height Change (in)	0.085	Vol. Change (CC)	42.000
Ht. After Cons. (in)	2.917	Cell Exp. (CC)	14.735
Initial Area (sq in)	4.531	Net Change (CC)	27.265
Area After Cons. (sq in)	4.093	Cons. Vol. (CC)	195.694

Data entry by: DAW Date: 02/11/2014
Checked by: CK Date: 2/12/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_2.xls

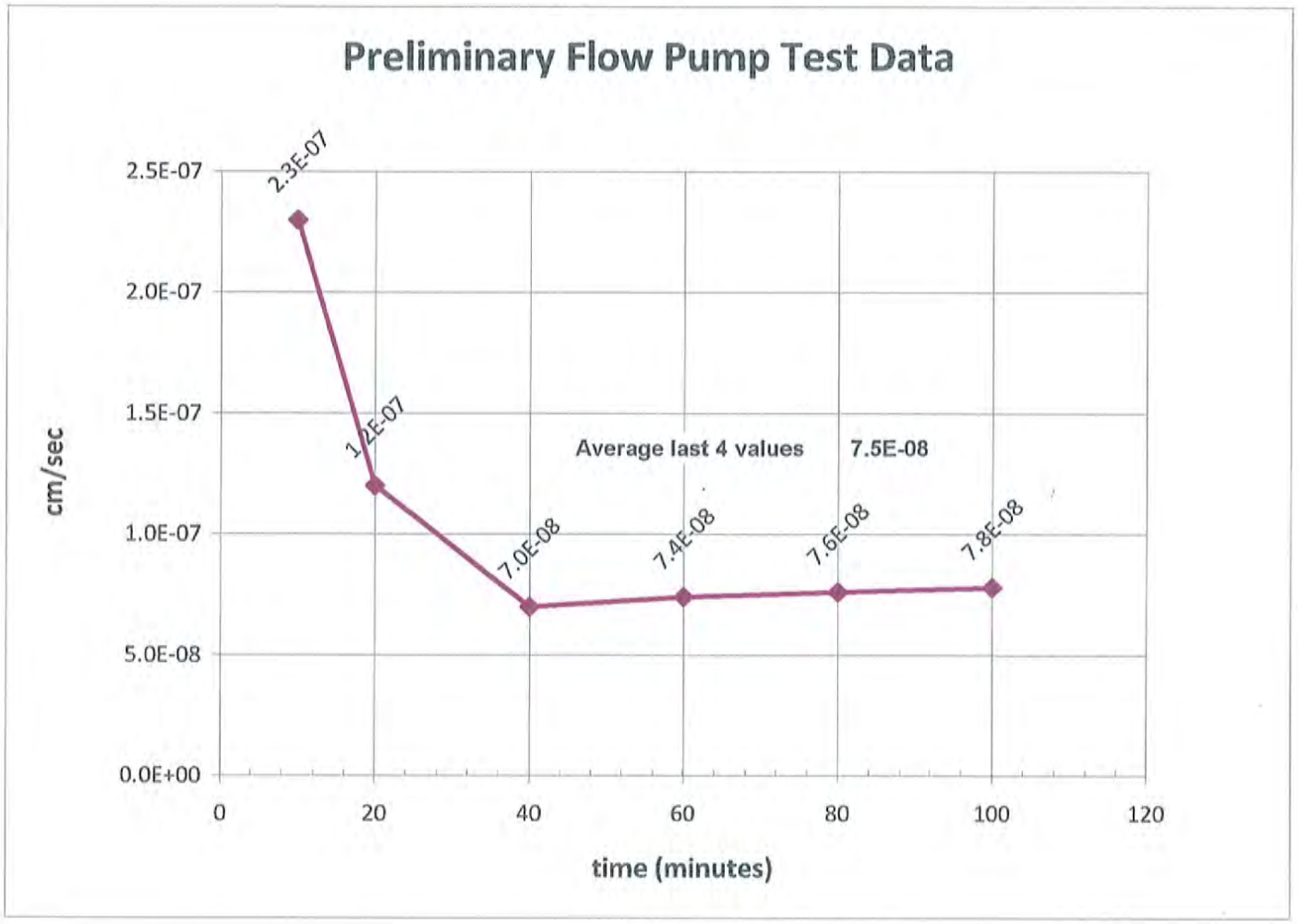
ATT
ADVANCED TERRA TESTING


CONSOLIDATION DATA
Tailings Impoundment, 9-24", TI-CS11-04A (9-24")
VOLUME DEFLECTION - cc
SQUARE ROOT OF TIME IN MINUTES
Time in Minutes
0
.25
0.5
1
2
4
9
16
30
60
120
240
360
0
-5
-10
-15
-20
-25
0
2
4
6
8
10
12
14
16
18
20

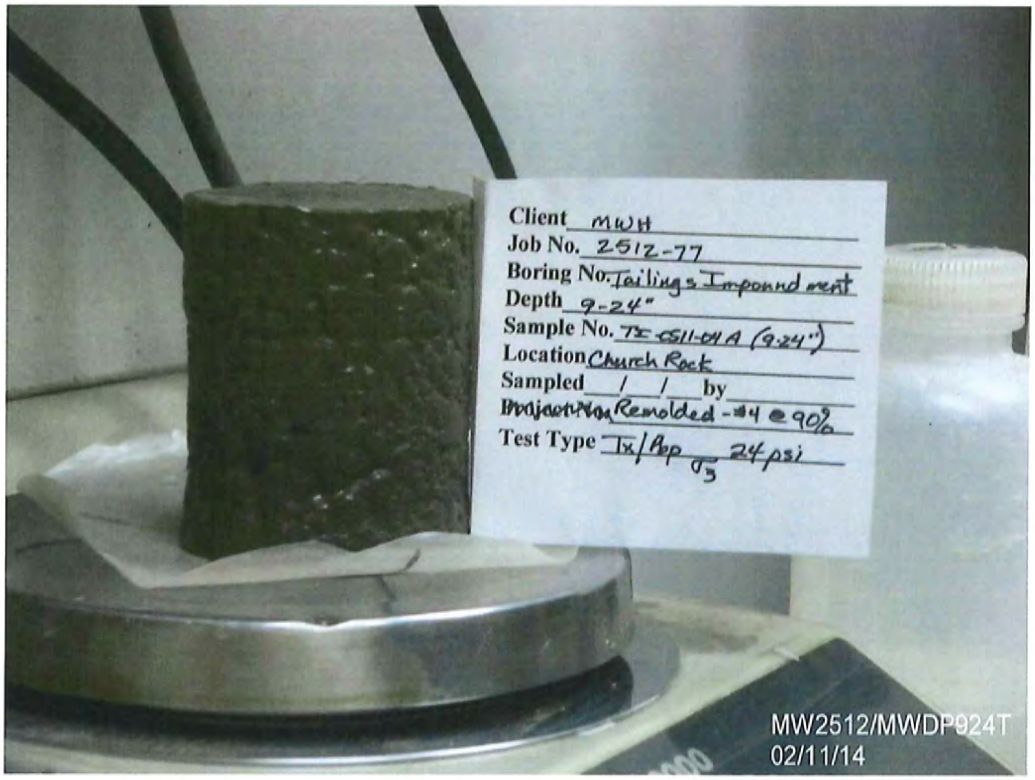
ADVANCED TERRA TESTING

Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512-77	Depth:	9-24"		
Project:	--	Sample Number:	TI-CS11-04A @90%D698		
Location:	Church Rock	Sampled Date:	-	Sampled By:	MWH
Project Number:	--	Test Date:	2/10/2014	Technician:	CAL



Data Entered By:	CAL		
Date:	2/13/2014	Checked By:	CAL
File Name:	2512_77_PrelimPerm_ASTMD-5084-methodD_1.xls	Date:	2/13/14


Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 9-24"
Sample No. TI-CS11-04A (9-24")
Location Church Rock
Sampled / / by
Remolded - #4 @ 90%
Test Type Tx/Rep σ_3 24 psi
MW2512/MWDP924T
02/11/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	9-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS11-04A (9-24")	TEST FINISHED	02/11/14 CAL
LOCATION	Church Rock	CELL NUMBER	8P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 95%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	449.5	463.8
Wt. Wet Soil & Pan (g)	456.3	470.5
Wt. Dry Soil & Pan (g)	398.7	398.7
Wt. Lost Moisture (g)	57.6	71.8
Wt. of Pan Only (g)	6.7	6.7
Wt. of Dry Soil (g)	392.0	392.0
Moisture Content %	14.7	18.3
Wet Density PCF	125.7	137.8
Dry Density PCF	109.6	116.5

Init. Diameter (in)	2.402	(cm)	6.101
Init. Area (sq in)	4.531	(sq cm)	29.237
Init. Height (in)	3.007	(cm)	7.638
Vol. Bef. Consol. (cu ft)	0.00789		
Vol. After Consol. (cu ft)	0.00742		
Porosity %	34.18		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	12
Percentage of Pump setting	100
Q (cc/s)	2.30E-05
Height	2.947
Diameter	2.353
Pressure (psi)	0.643
Area after consol. (cm*cm)	28.066
Gradient	6.040
Permeability k (cm/s)	1.4E-07
Permeability k (m/s)	1.4E-09
Back Pressure (psi)	58.0
Cell Pressure (psi)	82.0
Ave. Effective Stress (psi)	23.679
Average temperature degree C:	22.4

Data entry by: SKL Date: 02/12/2014
Checked by: CAL Date: 2/13/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_5.xls

ATT ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	9-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS11-04A (9-24")	TEST FINISHED	02/11/14 CAL
LOCATION	Church Rock	SETUP NO.	8P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 95%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	3.0	14.1				
50.0	48.0	13.1	14.4	38.7	47.3	8.6	0.86
60.0	58.0	14.7	15.5	48.1	57.2	9.1	0.91
70.0		15.8	16.1	58.9	68.4	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.50	0.00
0.25	0.50	6.50	-6.00
0.5	0.71	7.50	-7.00
1	1.00	8.70	-8.20
2	1.41	9.90	-9.40
4	2.00	11.00	-10.50
9	3.00	12.15	-11.65
16	4.00	12.90	-12.40
30	5.48	13.80	-13.30
60	7.75	14.25	-13.75
120	10.95	14.80	-14.30
240	15.49	15.10	-14.60
360	18.97	15.20	-14.70

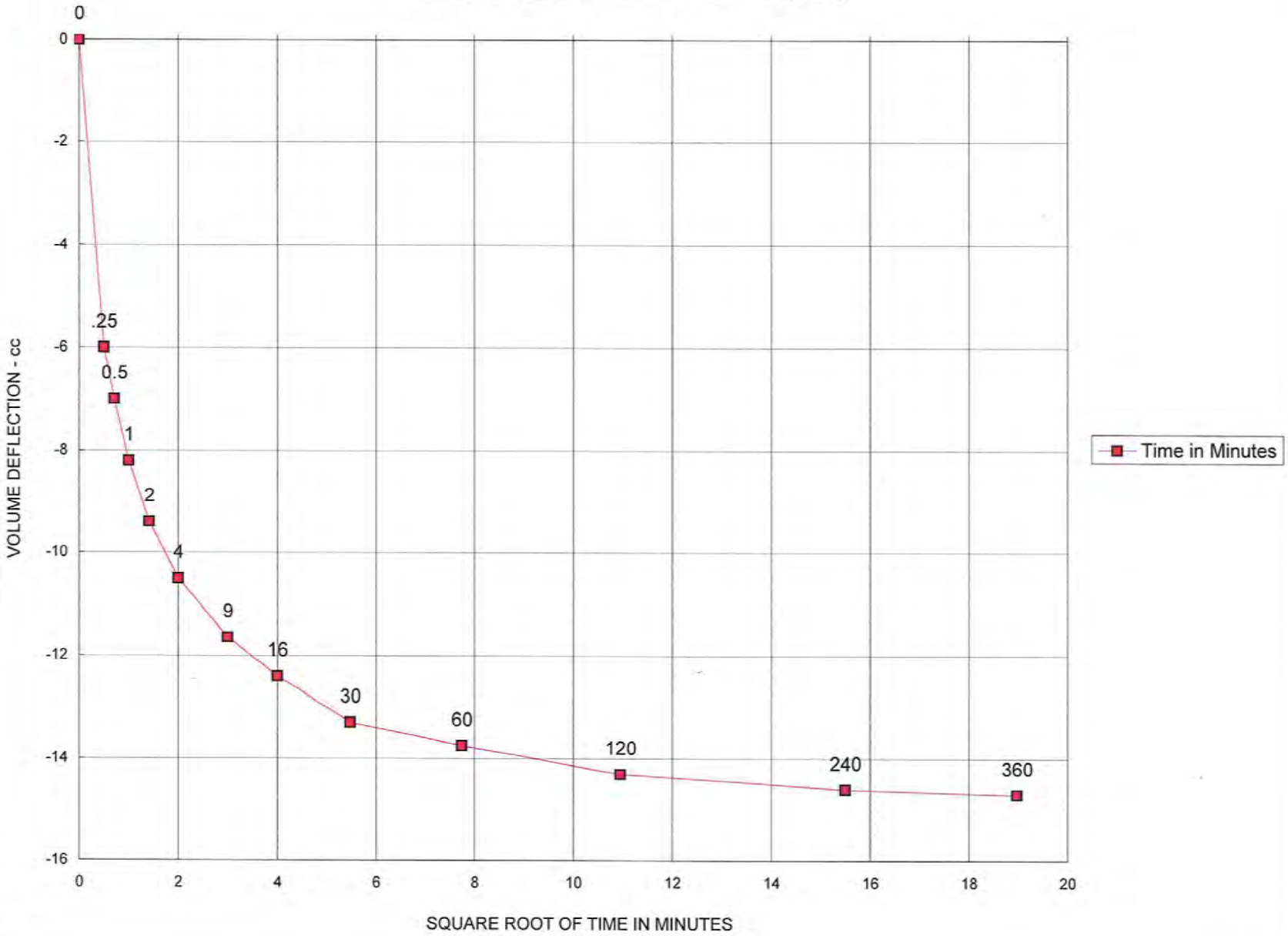
Initial Height (in)	3.007	Init. Vol. (CC)	223.331
Height Change (in)	0.060	Vol. Change (CC)	28.900
Ht. After Cons. (in)	2.947	Cell Exp. (CC)	15.693
Initial Area (sq in)	4.531	Net Change (CC)	13.207
Area After Cons. (sq in)	4.350	Cons. Vol. (CC)	210.123

Data entry by: SKL Date: 02/12/2014
Checked by: CAL Date: 2/13/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_5.xls

ATT
ADVANCED TERRA TESTING

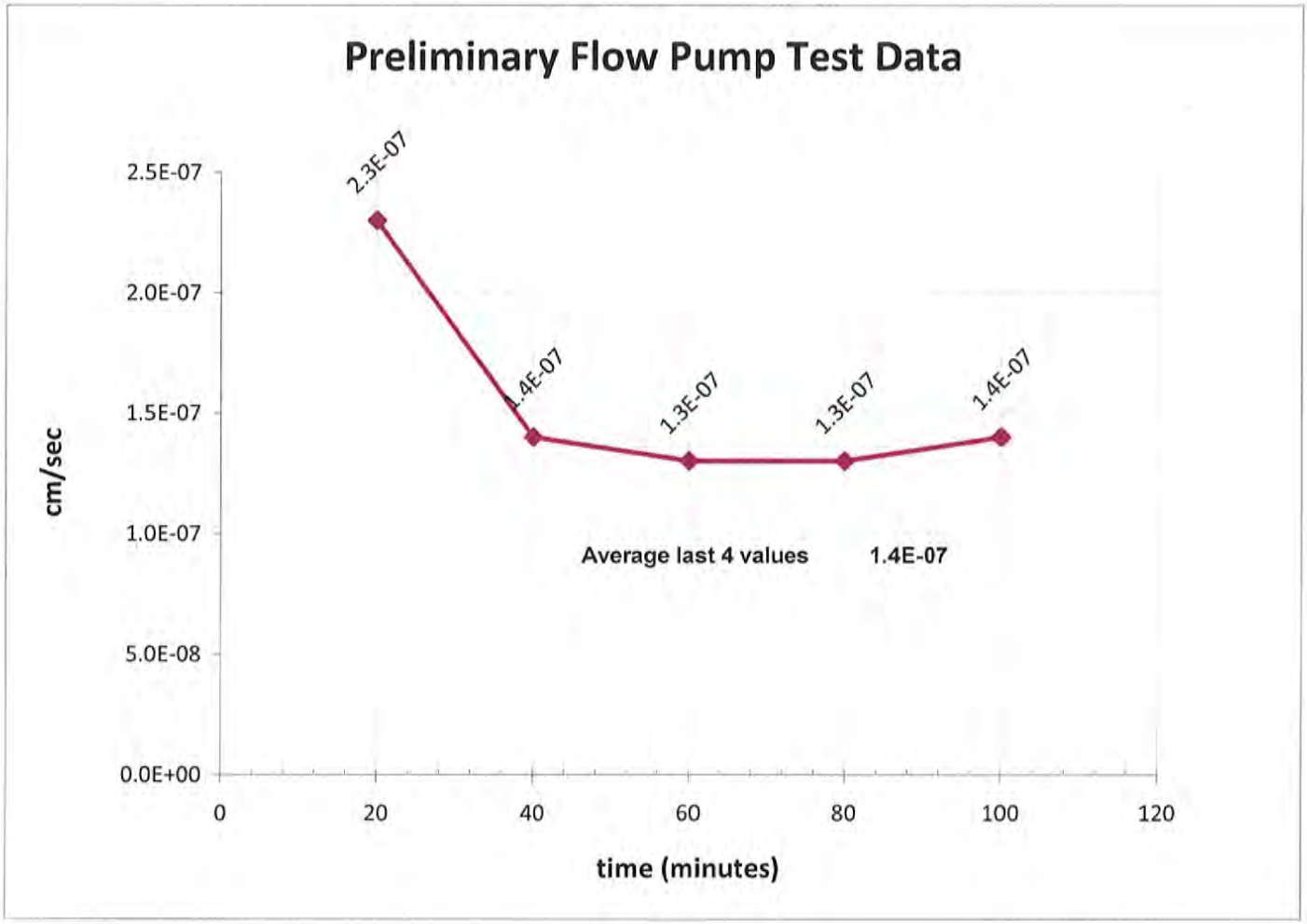
CONSOLIDATION DATA

Tailings Impoundment, 9-24", TI-CS11-04A (9-24")



Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512_77	Depth:	9-24"		
Project:	--	Sample Number:	TI-CS11-04A @ 95% D698		
Location:	Church Rock	Sampled Date:	-	Sampled By:	MWH
Project Number:	--	Test Date:	2/11/2014	Technician:	CAL



Data Entered By:	CAL		
Date:	2/12/2014	Checked By:	CAL
File Name:	2512_77_PrelimPerm_ASTMD-5084-methodD_5.xls	Date:	2/13/14

Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 9-24"
Sample No. TI-CS11-04A (9-24")
Location Church Rock
Sampled / / by
Project No. -#4 @ 95%
Test Type Tx/Rep σ3 24 psi
Mettler PC 2000
WO2512/WODPT924
02/13/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	9-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS11-04A (9-24")	TEST FINISHED	02/10/14 CAL
LOCATION	Church Rock	CELL NUMBER	7P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 100%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	472.9	485.0
Wt. Wet Soil & Pan (g)	479.5	491.6
Wt. Dry Soil & Pan (g)	419.7	419.7
Wt. Lost Moisture (g)	59.8	71.9
Wt. of Pan Only (g)	6.5	6.5
Wt. of Dry Soil (g)	413.1	413.1
Moisture Content %	14.5	17.4
Wet Density PCF	131.9	136.5
Dry Density PCF	115.3	116.2

Init. Diameter (in)	2.405	(cm)	6.109
Init. Area (sq in)	4.543	(sq cm)	29.310
Init. Height (in)	3.006	(cm)	7.635
Vol. Bef. Consol. (cu ft)	0.00790		
Vol. After Consol. (cu ft)	0.00784		
Porosity %	32.39		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	12
Percentage of Pump setting	100
Q (cc/s)	2.30E-05
Height	2.970
Diameter	2.409
Pressure (psi)	0.839
Area after consol. (cm*cm)	29.414
Gradient	7.819
Permeability k (cm/s)	1.0E-07
Permeability k (m/s)	1.0E-09
Back Pressure (psi)	68.0
Cell Pressure (psi)	92.0
Ave. Effective Stress (psi)	23.581
Average temperature degree C:	22.0

Data entry by: SKL Date: 02/12/2014
Checked by: CAL Date: 2/13/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_4.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	-
DEPTH	9-24"	TEST STARTED	01/29/14 CAL
SAMPLE NO.	TI-CS11-04A (9-24")	TEST FINISHED	02/10/14 CAL
LOCATION	Church Rock	SETUP NO.	7P
PROJECT NO.	-	SATURATED TEST	Yes
SOIL DESCR.	Remolded -#4 @ 100%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	3.3	16.3				
50.0	48.0	12.3	13.6	38.8	47.2	8.4	0.84
60.0	58.0	13.7	14.7	48.7	57.6	8.9	0.89
70.0	68.0	14.8	15.6	59.2	68.4	9.2	0.92
80.0		15.7	15.8	69.1	78.6	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.30	0.00
0.25	0.50	3.60	-3.30
0.5	0.71	3.90	-3.60
1	1.00	4.45	-4.15
2	1.41	5.10	-4.80
4	2.00	5.90	-5.60
9	3.00	7.00	-6.70
16	4.00	7.90	-7.60
30	5.48	8.70	-8.40
60	7.75	9.50	-9.20
120	10.95	10.00	-9.70
240	15.49	10.30	-10.00
360	18.97	10.40	-10.10

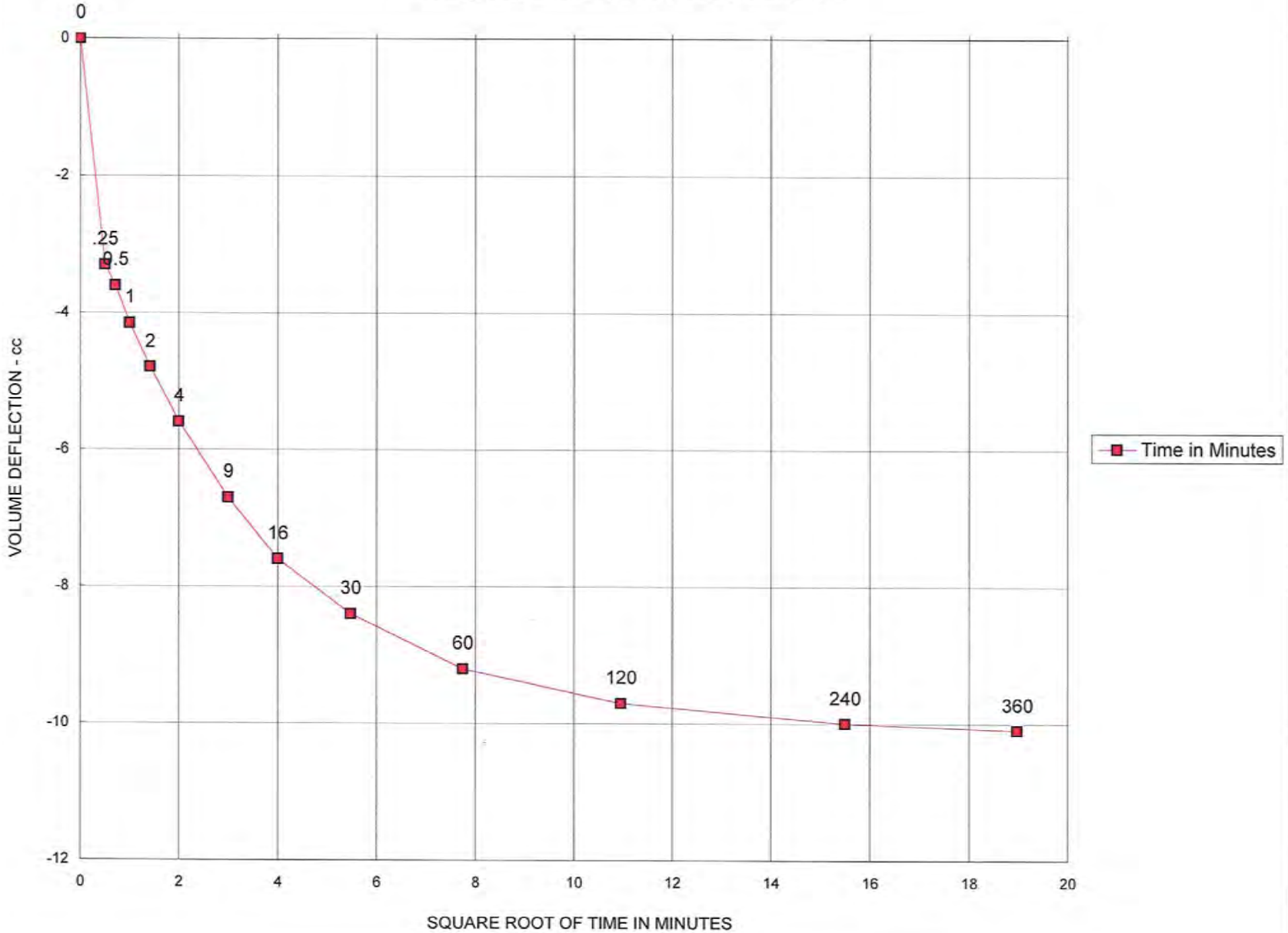
Initial Height (in)	3.006	Init. Vol. (CC)	223.814
Height Change (in)	0.036	Vol. Change (CC)	23.300
Ht. After Cons. (in)	2.970	Cell Exp. (CC)	21.415
Initial Area (sq in)	4.543	Net Change (CC)	1.885
Area After Cons. (sq in)	4.559	Cons. Vol. (CC)	221.930

Data entry by: SKL Date: 02/12/2014
Checked by: CAL Date: 2/13/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_4.xls

ATT
ADVANCED TERRA TESTING

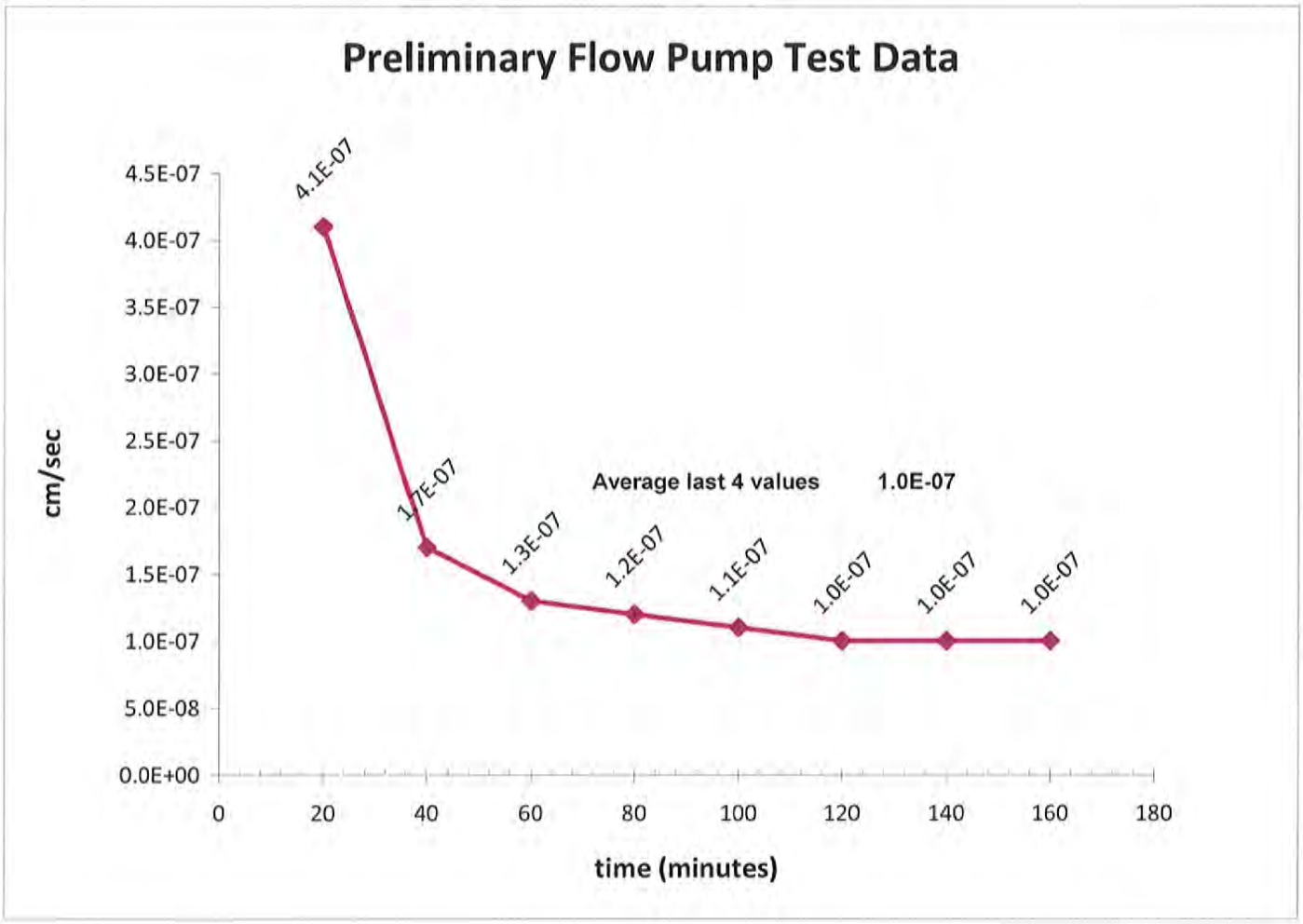
CONSOLIDATION DATA

Tailings Impoundment, 9-24", TI-CS11-04A (9-24")



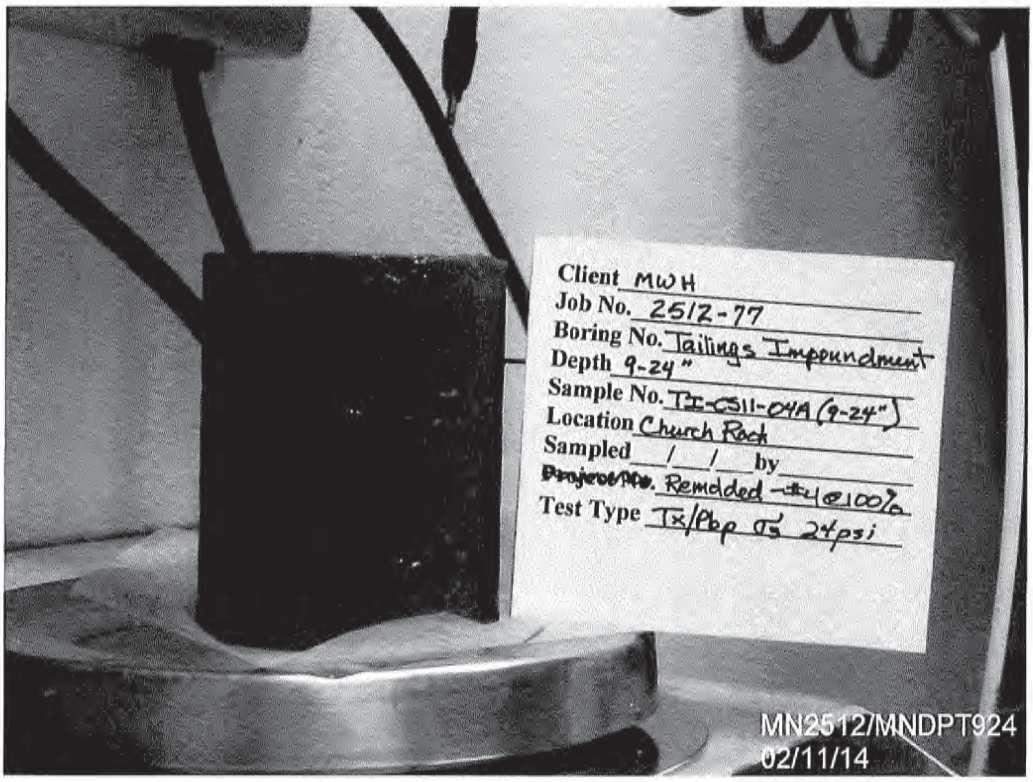
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512_77	Depth:	9-24"		
Project:	--	Sample Number:	TI-CS11-04A @ 100%		
Location:	Church Rock	Sampled Date:	-	Sampled By:	MWH
Project Number:	--	Test Date:	2/10/2014	Technician:	CAL



Data Entered By: CAL
Date: 2/13/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_7.xls

Checked By: CAL
Date: 2/13/14


Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 9-24"
Sample No. TI-CS11-04A (9-24")
Location Church Rock
Sampled / / by
Remolded -#4@100%
Test Type Tx/Pbp σ3 24psi
MN2512/MNDPT924
02/11/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	8-28"	TEST STARTED	01/27/14 CAL
SAMPLE NO.	TI-CS08-04A (8-28)	TEST FINISHED	02/05/14 CAL
LOCATION	Church Rock	CELL NUMBER	6P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	-#4 @ 90%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	430.7	457.7
Wt. Wet Soil & Pan (g)	437.3	464.3
Wt. Dry Soil & Pan (g)	392.3	392.3
Wt. Lost Moisture (g)	45.0	72.0
Wt. of Pan Only (g)	6.7	6.7
Wt. of Dry Soil (g)	385.7	385.7
Moisture Content %	11.7	18.7
Wet Density PCF	120.6	138.2
Dry Density PCF	108.0	116.5

Init. Diameter (in)	2.406	(cm)	6.111
Init. Area (sq in)	4.547	(sq cm)	29.334
Init. Height (in)	2.991	(cm)	7.597
Vol. Bef. Consol. (cu ft)	0.00787		
Vol. After Consol. (cu ft)	0.00730		
Porosity %	34.81		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	8
Percentage of Pump setting	100
Q (cc/s)	5.70E-04
Height	2.967
Diameter	2.327
Pressure (psi)	0.244
Area after consol. (cm*cm)	27.432
Gradient	2.276
Permeability k (cm/s)	9.1E-06
Permeability k (m/s)	9.1E-08
Back Pressure (psi)	88.0
Cell Pressure (psi)	112.0
Ave. Effective Stress (psi)	23.878
Average temperature degree C:	21.0

Data entry by: DAW Date: 02/06/2014
Checked by: CM Date: 2/06/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_0.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	8-28"	TEST STARTED	01/27/14 CAL
SAMPLE NO.	TI-CS08-04A (8-28)	TEST FINISHED	02/05/14 CAL
LOCATION	Church Rock	SETUP NO.	6P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	-#4 @ 90%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.0	13.0				
50.0	48.0	13.7	15.3	37.4	44.9	7.5	0.75
60.0	58.0	15.3	16.3	47.4	55.4	8.0	0.80
70.0	68.0	16.7	17.6	57.5	66.0	8.5	0.85
80.0	78.0	17.7	18.5	67.4	76.4	9.0	0.90
90.0	88.0	19.0	19.9	77.2	86.6	9.4	0.94
100.0		20.0	20.1	87.1	96.7	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.20	0.00
0.25	0.50	7.70	-7.50
0.5	0.71	9.00	-8.80
1	1.00	10.00	-9.80
2	1.41	10.80	-10.60
4	2.00	11.40	-11.20
9	3.00	12.20	-12.00
16	4.00	12.50	-12.30
30	5.48	12.75	-12.55
60	7.75	13.00	-12.80
120	10.95	13.10	-12.90
240	15.49	13.25	-13.05
360	18.97	13.30	-13.10

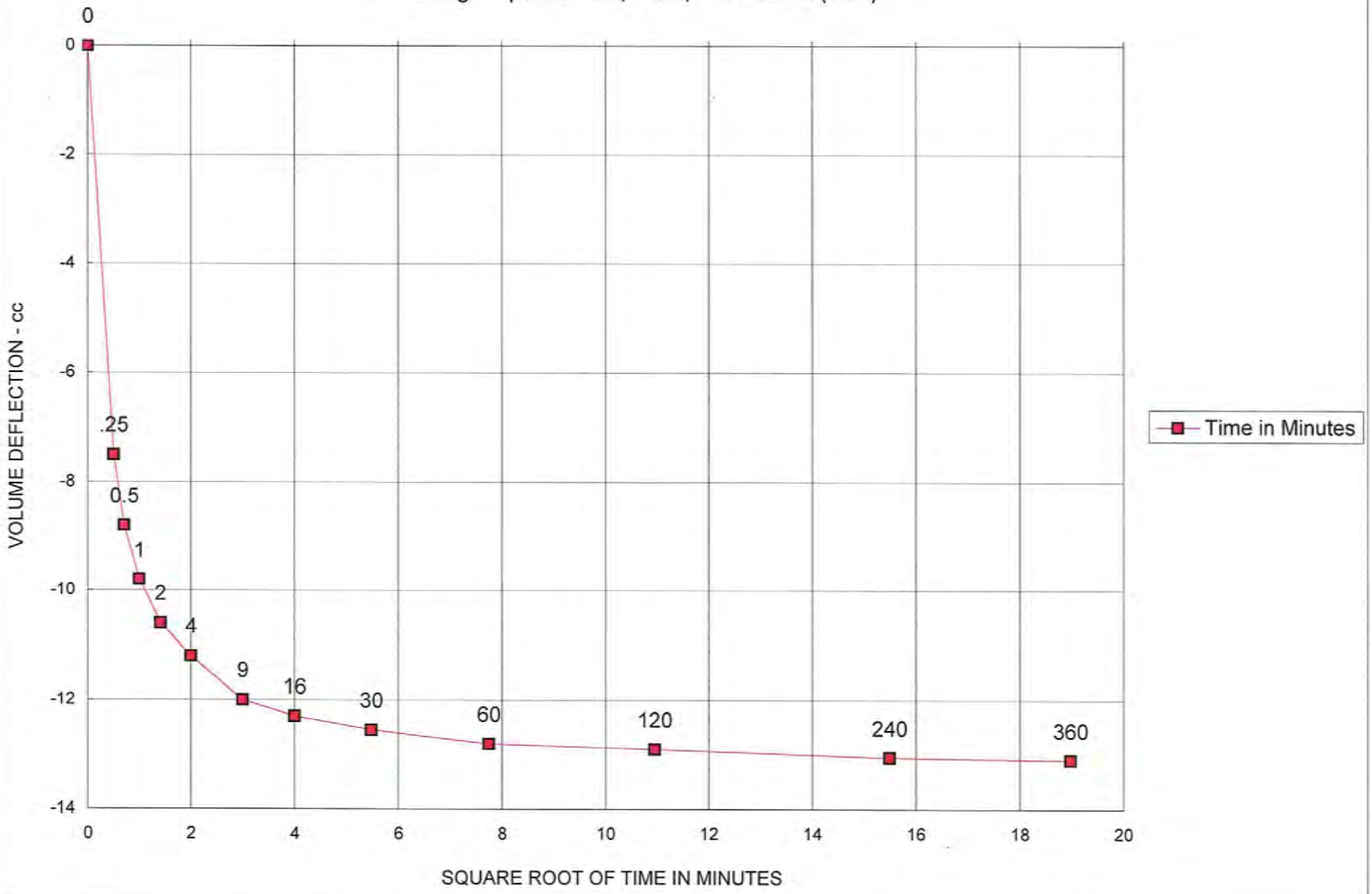
Initial Height (in)	2.991	Init. Vol. (CC)	222.883
Height Change (in)	0.024	Vol. Change (CC)	31.900
Ht. After Cons. (in)	2.967	Cell Exp. (CC)	15.784
Initial Area (sq in)	4.547	Net Change (CC)	16.116
Area After Cons. (sq in)	4.252	Cons. Vol. (CC)	206.767

Data entry by: DAW Date: 02/06/2014
Checked by: ae Date: 2/06/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_0.xls

ATT
ADVANCED TERRA TESTING

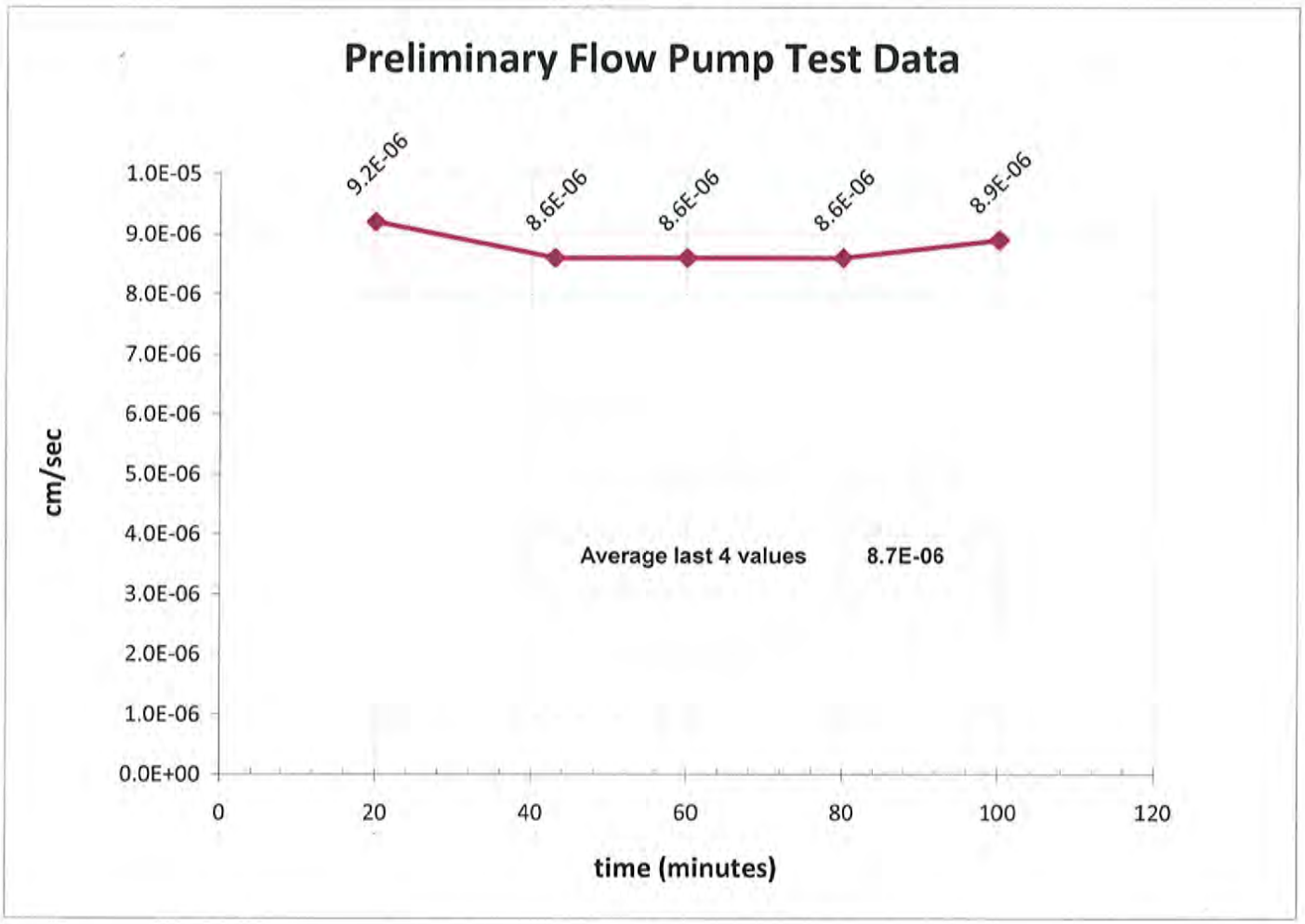
CONSOLIDATION DATA

Tailings Impoundment, 8-28", TI-CS08-04A (8-28)



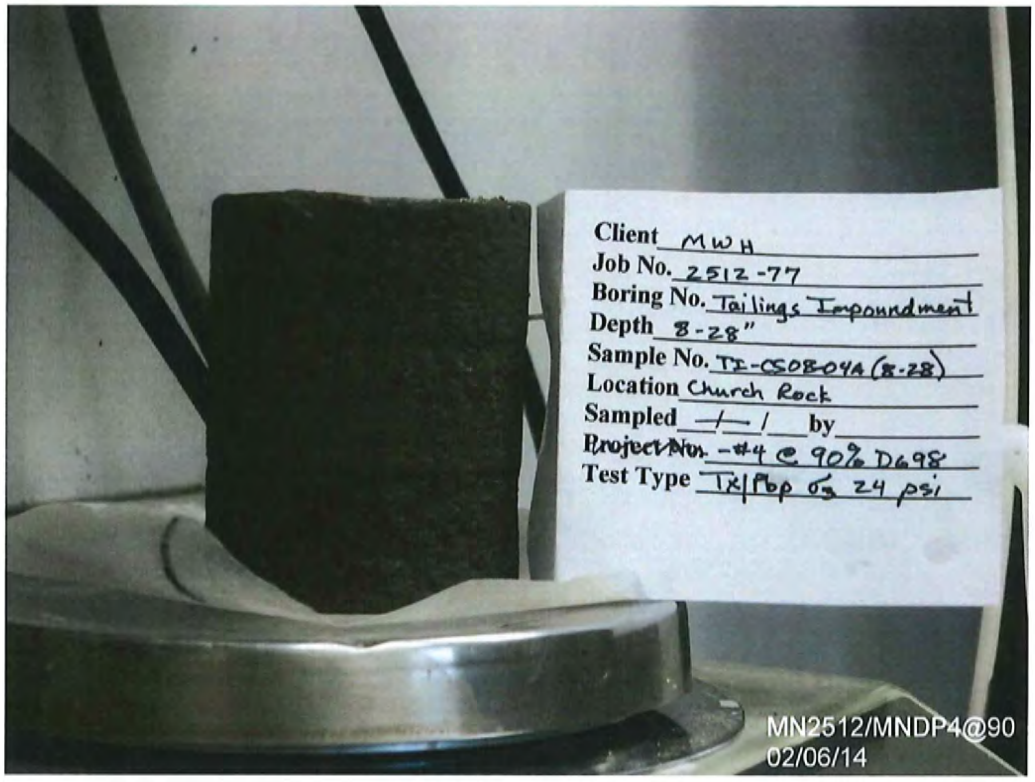
Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512_77	Depth:	8-28"		
Project:	--	Sample Number:	TI-CS08-04A @90% D698		
Location:	Church Rock	Sampled Date:	-	Sampled By:	MWH
Project Number:	--	Test Date:	2/5/2014	Technician:	CAL



Data Entered By: CAL
Date: 2/12/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_2.xls

Checked By: CAL
Date: 2/13/14


Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 8-28"
Sample No. TI-CS08-04A (8-28)
Location Church Rock
Sampled __/__/__ by
Project No. -#4 @ 90% D698
Test Type TX/Pop σ3 24 psi
MN2512/MNDP4@90
02/06/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	8-28"	TEST STARTED	01/27/14 CAL
SAMPLE NO.	TI-CS08-04A (8-28)	TEST FINISHED	02/06/14 CAL
LOCATION	Church Rock	CELL NUMBER	5P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	-#4 @ 95%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	454.4	478.6
Wt. Wet Soil & Pan (g)	461.4	485.6
Wt. Dry Soil & Pan (g)	413.4	413.4
Wt. Lost Moisture (g)	48.0	72.2
Wt. of Pan Only (g)	7.0	7.0
Wt. of Dry Soil (g)	406.4	406.4
Moisture Content %	11.8	17.8
Wet Density PCF	127.1	140.5
Dry Density PCF	113.7	119.3

Init. Diameter (in)	2.407	(cm)	6.114
Init. Area (sq in)	4.550	(sq cm)	29.359
Init. Height (in)	2.993	(cm)	7.602
Vol. Bef. Consol. (cu ft)	0.00788		
Vol. After Consol. (cu ft)	0.00751		
Porosity %	33.95		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	8
Percentage of Pump setting	100
Q (cc/s)	5.70E-04
Height	2.932
Diameter	2.374
Pressure (psi)	0.197
Area after consol. (cm*cm)	28.554
Gradient	1.860
Permeability k (cm/s)	1.1E-05
Permeability k (m/s)	1.1E-07
Back Pressure (psi)	78.0
Cell Pressure (psi)	102.0
Ave. Effective Stress (psi)	23.902
Average temperature degree C:	21.6

Data entry by: DAW Date: 02/07/2014
Checked by: cm Date: 2/10/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_0.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	8-28"	TEST STARTED	01/27/14 CAL
SAMPLE NO.	TI-CS08-04A (8-28)	TEST FINISHED	02/06/14 CAL
LOCATION	Church Rock	SETUP NO.	5P
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	-#4 @ 95%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.1	13.1				
50.0	48.0	13.6	15.1	37.3	45.4	8.1	0.81
60.0	58.0	15.2	16.2	47.4	55.9	8.5	0.85
70.0	68.0	16.2	17.1	57.3	66.3	9.0	0.90
80.0	78.0	17.6	18.4	67.1	76.5	9.4	0.94
90.0		18.4	18.6	77.2	86.9	9.7	0.97

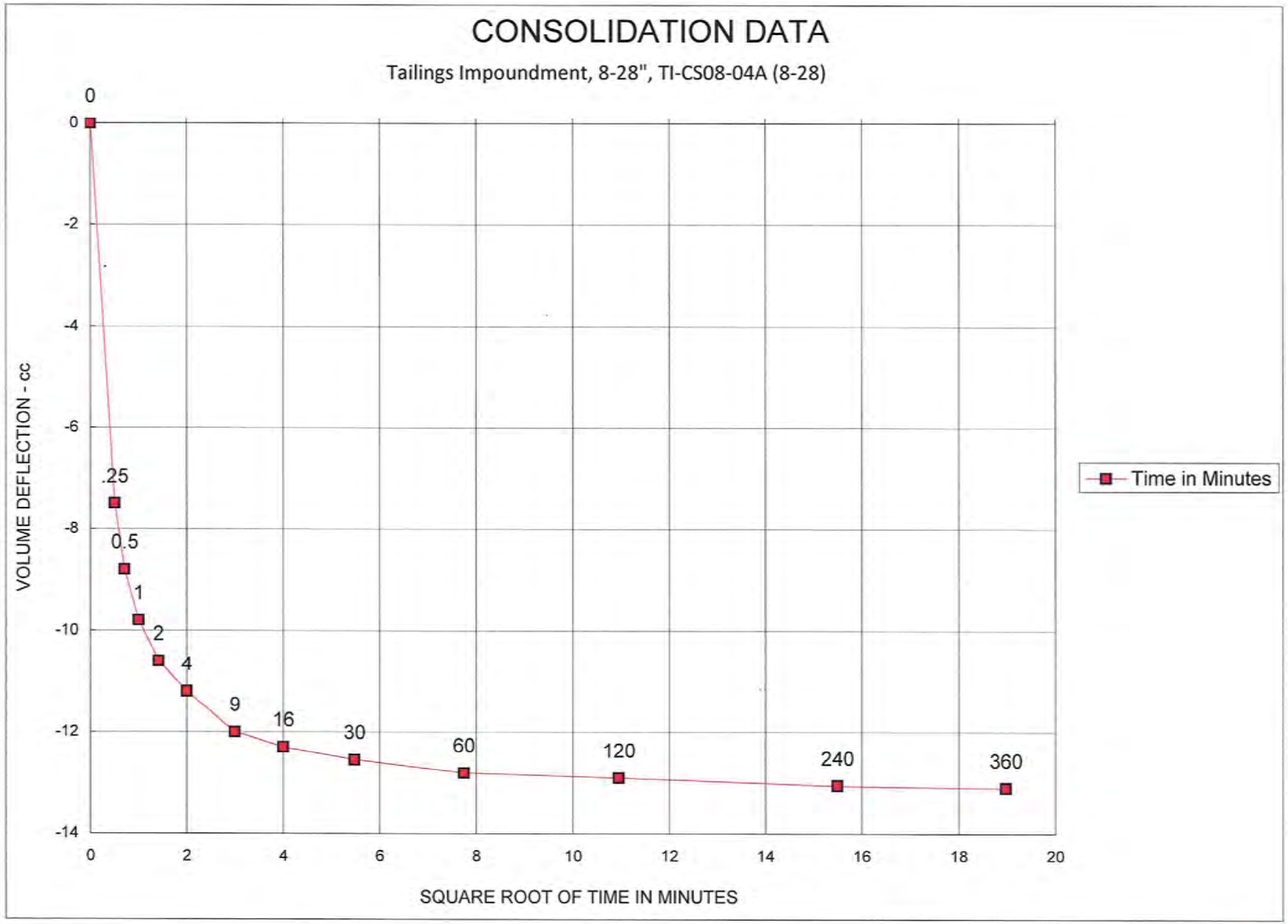
CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.30	0.00
0.25	0.50	6.20	-5.90
0.5	0.71	7.50	-7.20
1	1.00	8.25	-7.95
2	1.41	8.70	-8.40
4	2.00	8.90	-8.60
9	3.00	9.10	-8.80
16	4.00	9.20	-8.90
30	5.48	9.35	-9.05
60	7.75	9.50	-9.20
120	10.95	9.60	-9.30
240	15.49	9.70	-9.40
360	18.97	9.70	-9.40

Initial Height (in)	2.993	Init. Vol. (CC)	223.217
Height Change (in)	0.061	Vol. Change (CC)	26.500
Ht. After Cons. (in)	2.932	Cell Exp. (CC)	15.972
Initial Area (sq in)	4.550	Net Change (CC)	10.528
Area After Cons. (sq in)	4.426	Cons. Vol. (CC)	212.689

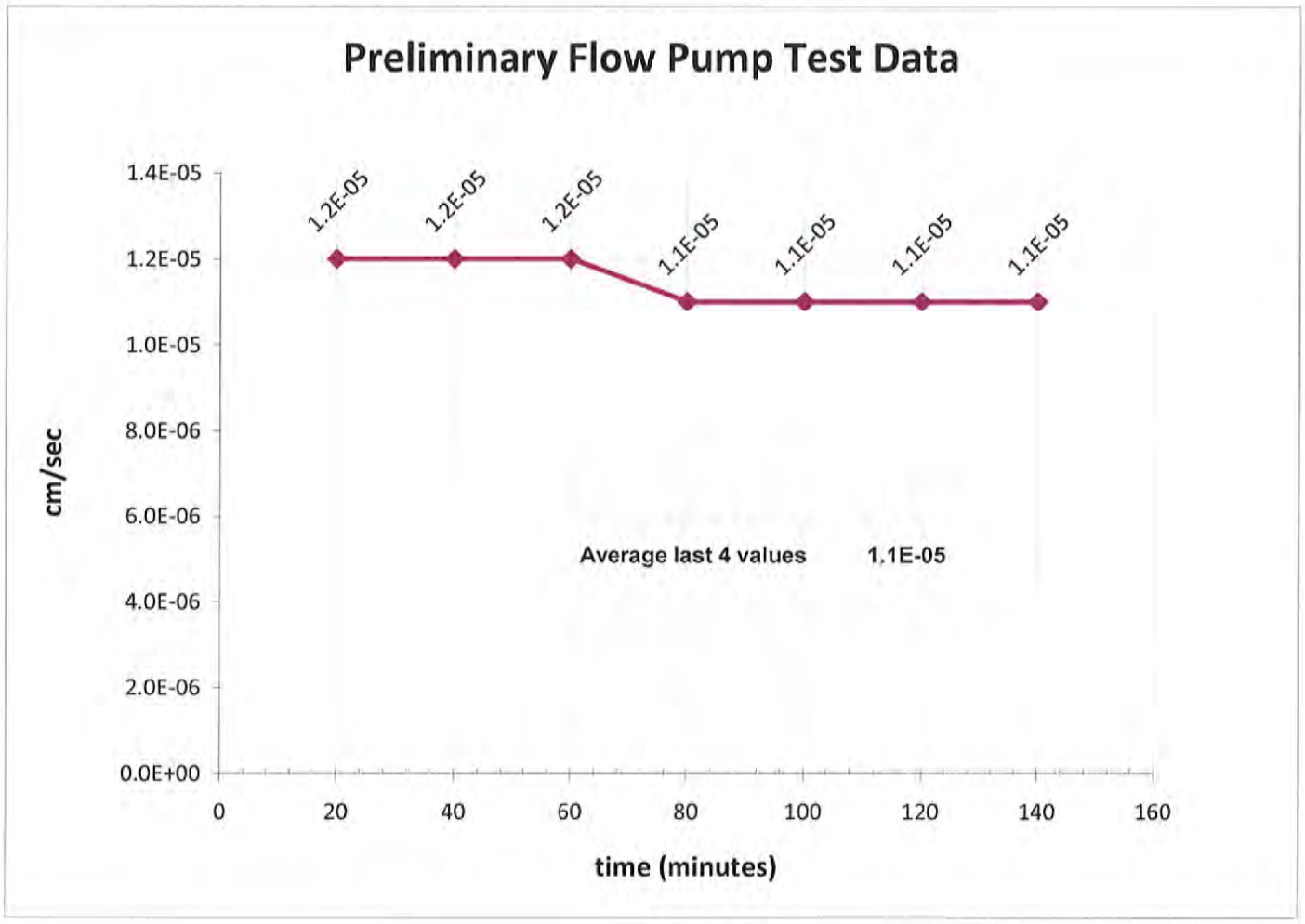
Data entry by: DAW Date: 02/07/2014
Checked by: cm Date: 2/10/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_0.xls

ATT
ADVANCED TECHNOLOGY TESTING


CONSOLIDATION DATA
Tailings Impoundment, 8-28", TI-CS08-04A (8-28)
VOLUME DEFLECTION - cc
SQUARE ROOT OF TIME IN MINUTES
Time in Minutes
0
.25
0.5
1
2
4
9
16
30
60
120
240
360
0
-2
-4
-6
-8
-10
-12
-14
0
2
4
6
8
10
12
14
16
18
20

Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512_77	Depth:	8-28"		
Project:	--	Sample Number:	TI-CS08-04A @ 95% D698		
Location:	Church Rock	Sampled Date:	--	Sampled By:	MWH
Project Number:	--	Test Date:	2/6/2014	Technician:	CAL



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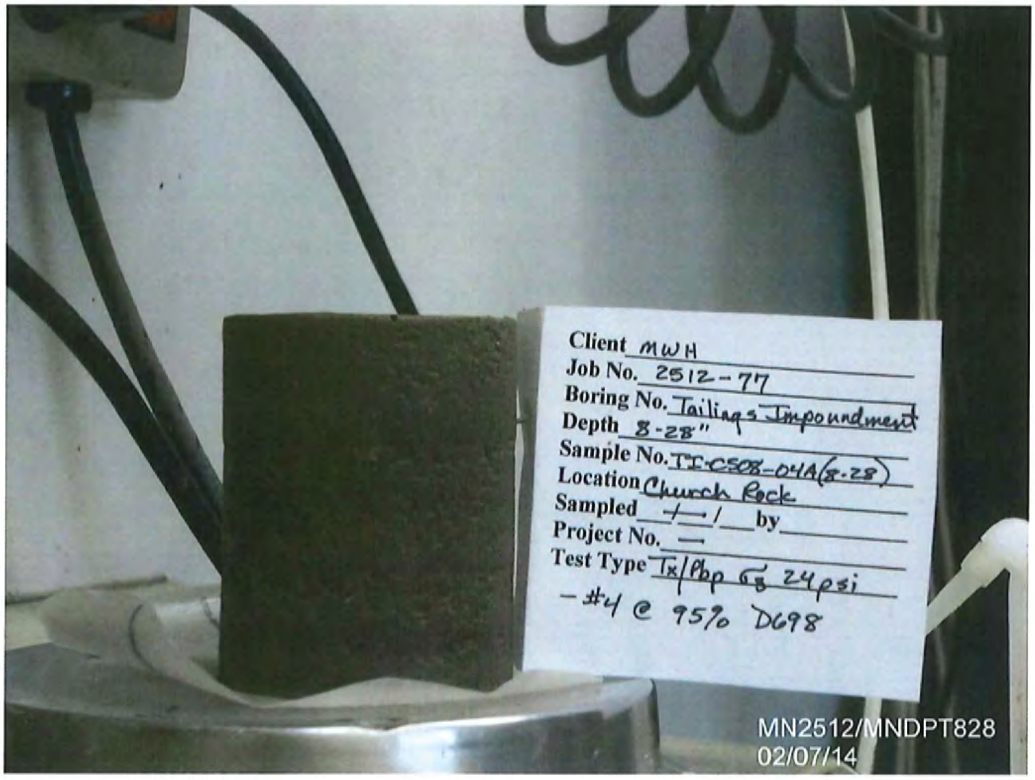
Date: 2/12/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_3.xls

Checked By: CAL
Date: 2/13/14


Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 8-28"
Sample No. TI-CSB-04A(8-28)
Location Church Rock
Sampled —/—/— by
Project No. —
Test Type Tx/Pbp σ3 24psi
-#4 @ 95% D698
MN2512/MNDPT828
02/07/14

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	8-28"	TEST STARTED	01/27/14 CAL
SAMPLE NO.	TI-CS08-04A (8-28)	TEST FINISHED	02/05/14 CAL
LOCATION	Church Rock	CELL NUMBER	19S
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	-#4 @ 100%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	478.2	495.7
Wt. Wet Soil & Pan (g)	484.8	502.4
Wt. Dry Soil & Pan (g)	434.9	434.9
Wt. Lost Moisture (g)	49.9	67.5
Wt. of Pan Only (g)	6.7	6.7
Wt. of Dry Soil (g)	428.2	428.2
Moisture Content %	11.7	15.8
Wet Density PCF	133.3	141.1
Dry Density PCF	119.4	121.9

Init. Diameter (in)	2.408	(cm)	6.116
Init. Area (sq in)	4.554	(sq cm)	29.383
Init. Height (in)	3.000	(cm)	7.620
Vol. Bef. Consol. (cu ft)	0.00791		
Vol. After Consol. (cu ft)	0.00775		
Porosity %	30.76		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	10
Percentage of Pump setting	100
Q (cc/s)	1.15E-04
Height	2.982
Diameter	2.391
Pressure (psi)	0.293
Area after consol. (cm*cm)	28.957
Gradient	2.720
Permeability k (cm/s)	1.5E-06
Permeability k (m/s)	1.5E-08
Back Pressure (psi)	78.0
Cell Pressure (psi)	102.0
Ave. Effective Stress (psi)	23.854
Average temperature degree C:	21.5

Data entry by: DAW Date: 02/06/2014
Checked by: CH Date: 2/06/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_1.xls

ATT
ADVANCED TERRA TESTING

TRIAXAL TEST DATA
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	Tailings Impoundment	SAMPLED	--
DEPTH	8-28"	TEST STARTED	01/27/14 CAL
SAMPLE NO.	TI-CS08-04A (8-28)	TEST FINISHED	02/05/14 CAL
LOCATION	Church Rock	SETUP NO.	19S
PROJECT NO.	--	SATURATED TEST	Yes
SOIL DESCR.	-#4 @ 100%	TEST TYPE	TX/Pbp/Tap Water
		CONF. PRES. PSF	3456

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.7	12.1				
50.0	48.0	8.7	9.9	37.3	44.8	7.5	0.75
60.0	58.0	9.7	10.7	47.2	55.4	8.2	0.82
70.0	68.0	10.7	11.7	57.4	66.2	8.8	0.88
80.0	78.0	11.7	12.4	67.4	76.4	9.0	0.90
90.0		12.8	12.8	77.2	86.7	9.5	0.95

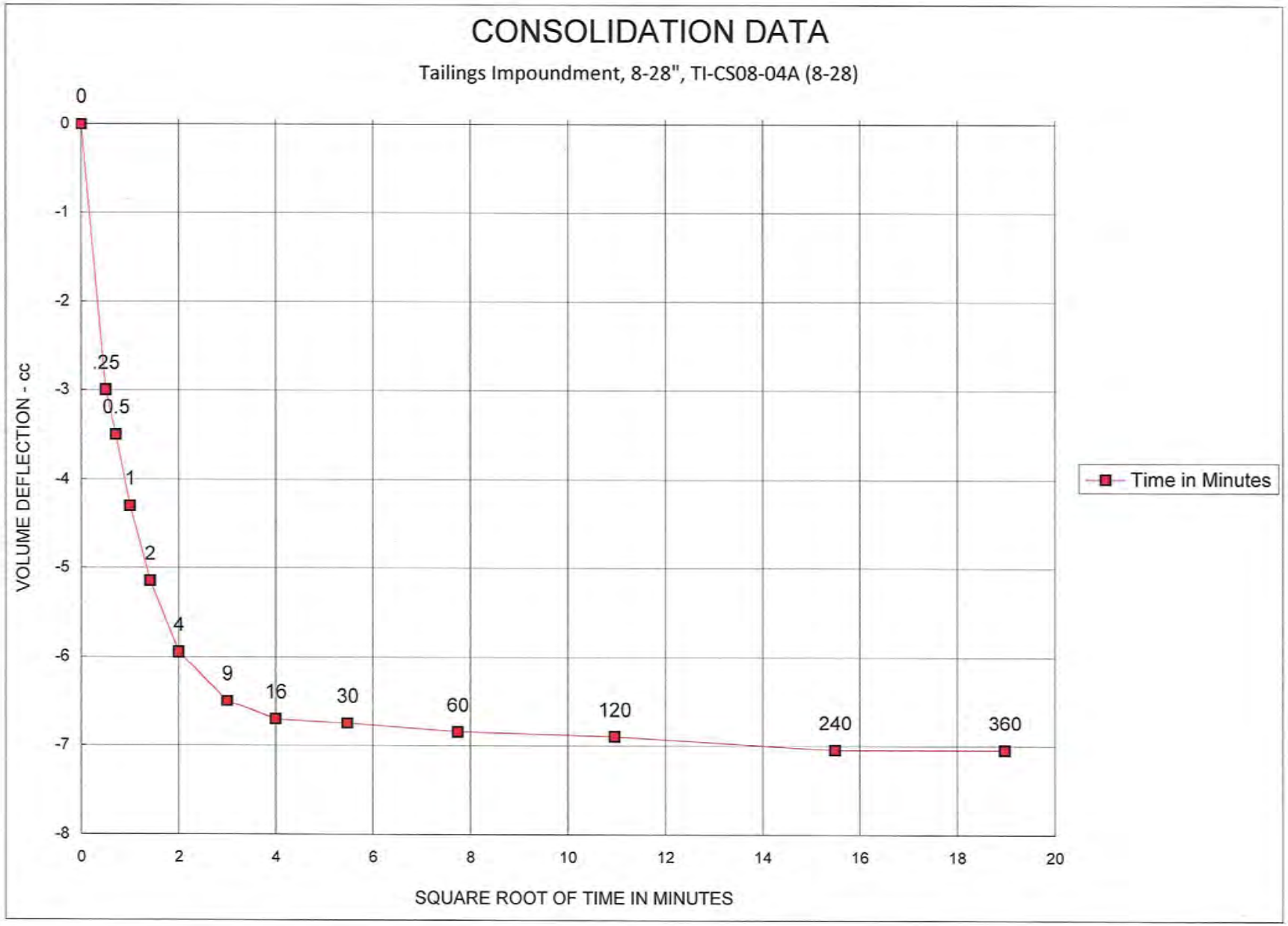
CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.30	0.00
0.25	0.50	3.30	-3.00
0.5	0.71	3.80	-3.50
1	1.00	4.60	-4.30
2	1.41	5.45	-5.15
4	2.00	6.25	-5.95
9	3.00	6.80	-6.50
16	4.00	7.00	-6.70
30	5.48	7.05	-6.75
60	7.75	7.15	-6.85
120	10.95	7.20	-6.90
240	15.49	7.35	-7.05
360	18.97	7.35	-7.05

Initial Height (in)	3.000	Init. Vol. (CC)	223.925
Height Change (in)	0.018	Vol. Change (CC)	17.700
Ht. After Cons. (in)	2.982	Cell Exp. (CC)	13.146
Initial Area (sq in)	4.554	Net Change (CC)	4.554
Area After Cons. (sq in)	4.488	Cons. Vol. (CC)	219.371

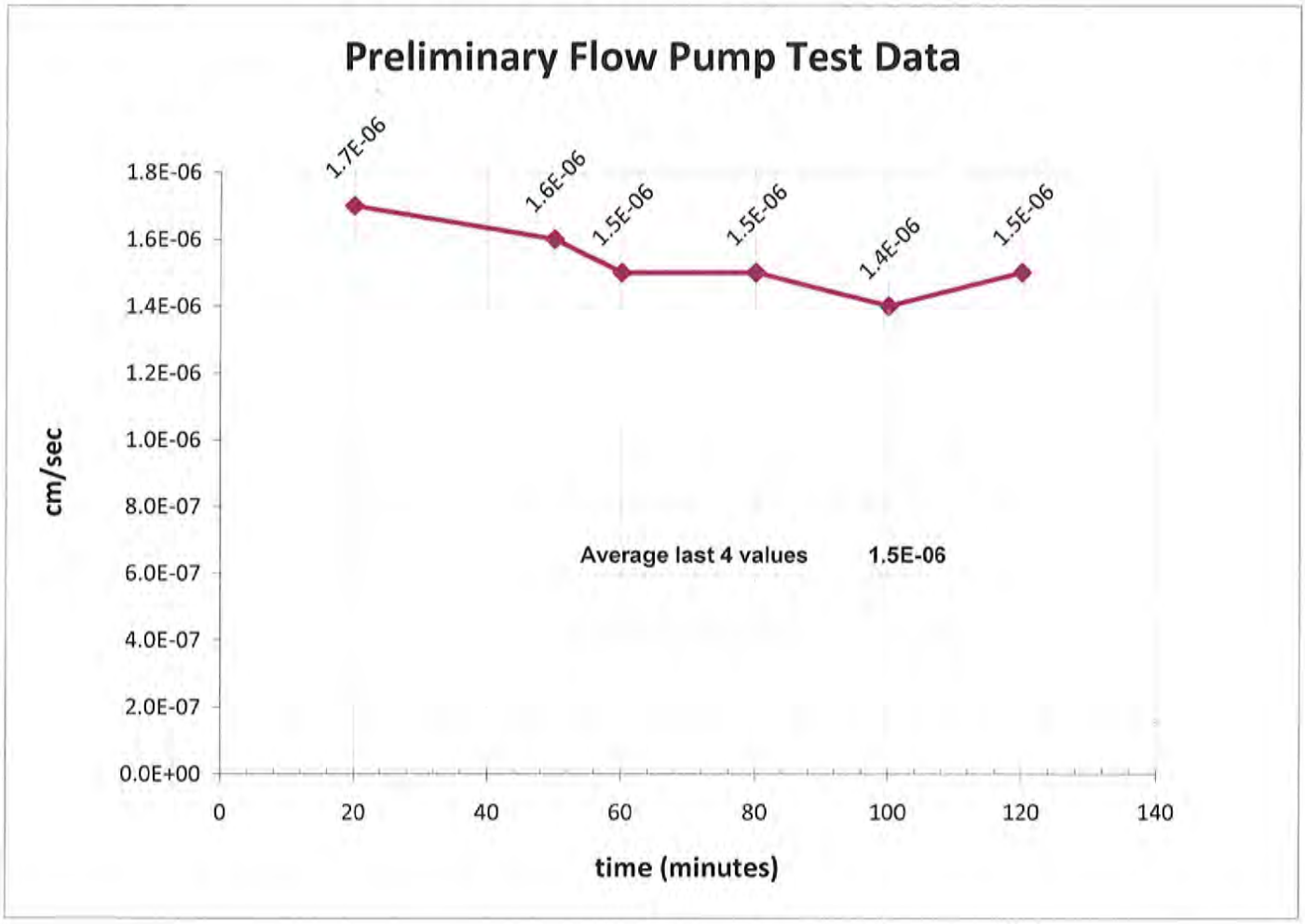
Data entry by: DAW Date: 02/06/2014
Checked by: CAL Date: 2/06/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_1.xls

ATT ADVANCED TERRA TESTING

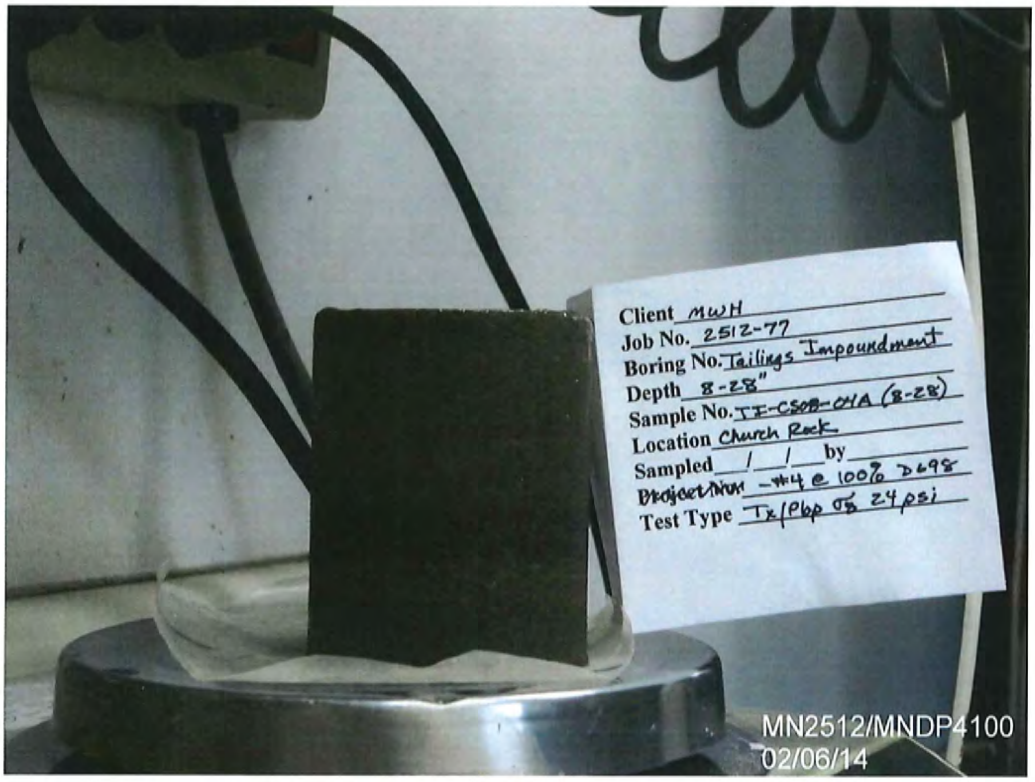

CONSOLIDATION DATA
Tailings Impoundment, 8-28", TI-CS08-04A (8-28)
VOLUME DEFLECTION - cc
SQUARE ROOT OF TIME IN MINUTES
Time in Minutes
0
.25
0.5
1
2
4
9
16
30
60
120
240
360
0
-1
-2
-3
-4
-5
-6
-7
-8
0
2
4
6
8
10
12
14
16
18
20

Preliminary Flow Pump Test Data
ASTM D5084

Client:	MWH	Boring Number:	Tailings Impoundment		
Job Number:	2512_77	Depth:	8-28"		
Project:	--	Sample Number:	TI-CS08-04A @ 100% D698		
Location:	Church Rock	Sampled Date:	--	Sampled By:	CAL
Project Number:	--	Test Date:	2/5/2014	Technician:	CAL



Data Entered By:	CAL		
Date:	2/12/2014	Checked By:	CAL
File Name:	2512_77_PrelimPerm_ASTMD-5084-methodD_4.xls	Date:	2/13/14


Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 8-28"
Sample No. IF-CS08-CHA (8-28)
Location Church Rock
Sampled / / by
Test Type Tx/Pbp σ3 24 psi
MN2512/MNDP4100
02/06/14

Project Name: Church Rock (ATT Job No. 2512-77)
Quarry Source: Church Rock
Project Number: 143002

Specific Gravity of Coarse Aggregate (ASTM C-127)

Sample: TI-CS02-02A

Trial Number	1	2	3	Average
SSD Aggregate Weight	1399.2	1397.4	1405.9	
Immersed Agg. Weight	742.1	897.5	910.3	
Tare No.	R-16	R-19	R-24	
Dry Agg. & Tare Weight	1512.9	1494.8	1520.4	
Tare Weight	130.2	115.2	124.4	
Dry Aggregate Weight	1382.7	1379.6	1396.0	
Apparent Specific Gravity	2.873	2.862	2.874	2.870
Bulk(SSD) Specific Gravity	2.811	2.795	2.837	2.814
Bulk(Oven Dry) Spec. Gravity	2.778	2.760	2.817	2.785
Percent Absorption	1.193	1.290	0.709	1.064

Specific Gravity of Coarse Aggregate (ASTM C-127)

Sample: TI-CS06-02A

Trial Number	1	2	3	Average
SSD Aggregate Weight	1407.2	1406.1	1402.6	
Immersed Agg. Weight	898.7	898.5	896.2	
Tare No.	R-17	R-20	R-21	
Dry Agg. & Tare Weight	1498.6	1500.4	1503.2	
Tare Weight	117.4	120.6	127.1	
Dry Aggregate Weight	1381.2	1379.8	1376.1	
Apparent Specific Gravity	2.863	2.867	2.867	2.866
Bulk(SSD) Specific Gravity	2.767	2.770	2.770	2.769
Bulk(Oven Dry) Spec. Gravity	2.716	2.718	2.717	2.717
Percent Absorption	1.882	1.906	1.926	1.905

CTC-GEOTEK, INC
ENGINEERING TESTING INSPECTION

Specific Gravity of Coarse Aggregate (ASTM C-127)

Sample: TI-CS09-02A

Trial Number	1	2	3	Average
SSD Aggregate Weight	1413.5	1414.9	1415.4	
Immersed Agg. Weight	908.2	903.8	903.3	
Tare No.	R-15	R-18	R-23	
Dry Agg. & Tare Weight	1529.5	1527.4	1515.7	
Tare Weight	133.4	132.8	127.2	
Dry Aggregate Weight	1396.1	1394.6	1388.5	
Apparent Specific Gravity	2.861	2.841	2.862	2.855
Bulk(SSD) Specific Gravity	2.797	2.768	2.764	2.776
Bulk(Oven Dry) Spec. Gravity	2.763	2.729	2.711	2.734
Percent Absorption	1.246	1.456	1.937	1.546

155 SOUTH NAVAJO STREET DENVER, COLORADO 80223 303 698 1050 (FAX) 303 698 1053

CTC-GEOTEK, INC.
155 South Navajo Street
Denver, Colorado 80223

Date: 6-20-2014
Technician: JW

Project Name: Church Rock (ATT Job No. 2512 - 77)
Quarry Source: Church Rock
Project Number: 143002

ASTM C 88-93, "Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate"

Sample Identification: **TI - CS02 - 02A**

Chemical Used: **Sodium Sulfate** (Na_2SO_2)

QUANTITATIVE EXAMINATION

	INITIAL INDEPENDENT GRADING		FINAL COMBINED FRACTION GRADING				
	Required Amount (gm)	Actual Amount (gm)	Grading of Original Sample (%)	Weight of Test Fractions Before Test (gm)	Weight of Test Fractions After Test (gm)	Percent Passing Designated Seive After Test	Weighted Percentage Loss
2 1/2" (63.0 mm) to 1 1/2" (37.5 mm)	**5000 ± 300**	**0.0**	—	—	—	—	—
2 1/2" (63.0 mm) to 2.0" (50.0 mm)	3000 ± 300	—					
2.0" (50.0 mm) to 1 1/2" (37.5 mm)	2000 ± 200	—					
1 1/2" (37.5 mm) to 3/4" (19.0 mm)	**1500 ± 50**	**1503.1**	100.0	1503.1	1498.1	0.3	0.33
1 1/2" (37.5 mm) to 1.0" (25.0 mm)	1000 ± 50	1000.8					
1.0 (25.0 mm) to 3/4" (19.0 mm)	500 ± 30	502.3					
3/4" (19.0 mm) to 3/8" (9.5 mm)	**1000 ± 10**	**1005.3**	100.0	1005.3	1001.6	0.4	0.37
3/4" (19.0 mm) to 1/2" (12.5 mm)	670 ± 10	673.4					
1/2" (12.5 mm) to 3/8" (9.5 mm)	330 ± 10	331.9					
3/8" (9.5 mm) to No. 4 (4.75 mm)	**300 ± 5**	**302.1**	100.0	302.1	298.4	1.2	1.22
3/8" (9.5 mm) to No. 4 (4.75 mm)	300 ± 5	302.1					

* "Grading of Original Sample" is compared to the average grading of No. 467 (Coarse Aggregate) of ASTM C 33-93.

QUALITATIVE EXAMINATION

	Particles Exhibiting Distress								Total Number of Test Particles	
	Splitting		Crumbling		Cracking		Flaking			
	No.	%	No.	%	No.	%	No.	%	Initial	Final
2 1/2" (63.0 mm) to 1 1/2" (37.5 mm)	—	—	—	—	—	—	—	—	—	—
1 1/2" (37.5 mm) to 3/4" 19.0 mm)	0	0.0	0	0.0	0	0.0	0	0.0	41	41

CTC-GEOTEK, INC.

155 South Navajo Street
Denver, Colorado 80223

Date: 6-20-2014
Technician: JW

Project Name: Church Rock (ATT Job No. 2512 - 77)
Quarry Source: Church Rock
Project Number: 143002

ASTM C 88-93, "Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate"

Sample Identification: **TI - CS06 - 02A**

Chemical Used: **Sodium Sulfate** **(Na_2SO_2)**

QUANTITATIVE EXAMINATION

	INITIAL INDEPENDENT GRADING		FINAL COMBINED FRACTION GRADING				
	Required Amount (gm)	Actual Amount (gm)	Grading of Original Sample (%)	Weight of Test Fractions Before Test (gm)	Weight of Test Fractions After Test (gm)	Percent Passing Designated Seive After Test	Weighted Percentage Loss
2 1/2" (63.0 mm) to 1 1/2" (37.5 mm)	**5000 ± 300**	**0.0**	—	—	—	—	—
2 1/2" (63.0 mm) to 2.0" (50.0 mm)	3000 ± 300	—					
2.0" (50.0 mm) to 1 1/2" (37.5 mm)	2000 ± 200	—					
1 1/2" (37.5 mm) to 3/4" (19.0 mm)	**1500 ± 50**	**1513.2**	100.0	1513.2	1487.8	1.7	1.68
1 1/2" (37.5 mm) to 1.0" (25.0 mm)	1000 ± 50	1012.3					
1.0 (25.0 mm) to 3/4" (19.0 mm)	500 ± 30	500.9					
3/4" (19.0 mm) to 3/8" (9.5 mm)	**1000 ± 10**	**1004.3**	100.0	1004.3	1002.9	0.1	0.14
3/4" (19.0 mm) to 1/2" (12.5 mm)	670 ± 10	670.2					
1/2" (12.5 mm) to 3/8" (9.5 mm)	330 ± 10	334.1					
3/8" (9.5 mm) to No. 4 (4.75 mm)	**300 ± 5**	**301.7**	100.0	301.7	298.7	1.0	0.99
3/8" (9.5 mm) to No. 4 (4.75 mm)	300 ± 5	301.7					

* "Grading of Original Sample" is compared to the average grading of No. 467 (Coarse Aggregate) of ASTM C 33-93.

QUALITATIVE EXAMINATION

	Particles Exhibiting Distress								Total Number of Test Particles	
	Splitting		Crumbling		Cracking		Flaking			
	No.	%	No.	%	No.	%	No.	%	Initial	Final
2 1/2" (63.0 mm) to 1 1/2" (37.5 mm)	—	—	—	—	—	—	—	—	—	—
1 1/2" (37.5 mm) to 3/4" 19.0 mm)	1	1.9	1	1.9	5	9.3	0	0.0	54	54

CTC-GEOTEK, INC.
155 South Navajo Street
Denver, Colorado 80223

Date: 6-20-2014
Technician: JW

Project Name: Church Rock (ATT Job No. 2512 - 77)
Quarry Source: Church Rock
Project Number: 143002

ASTM C 88-93, "Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate"

Sample Identification: **TI - CS09 - 02A**

Chemical Used: **Sodium Sulfate (Na_2SO_2)**

QUANTITATIVE EXAMINATION

	INITIAL INDEPENDENT GRADING		FINAL COMBINED FRACTION GRADING				
	Required Amount (gm)	Actual Amount (gm)	Grading of Original Sample (%)	Weight of Test Fractions Before Test (gm)	Weight of Test Fractions After Test (gm)	Percent Passing Designated Seive After Test	Weighted Percentage Loss
2 1/2" (63.0 mm) to 1 1/2" (37.5 mm)	**5000 ± 300**	**0.0**	—	—	—	—	—
2 1/2" (63.0 mm) to 2.0" (50.0 mm)	3000 ± 300	—					
2.0" (50.0 mm) to 1 1/2" (37.5 mm)	2000 ± 200	—					
1 1/2" (37.5 mm) to 3/4" (19.0 mm)	**1500 ± 50**	**1507.1**	100.0	1507.1	1488.0	1.3	1.27
1 1/2" (37.5 mm) to 1.0" (25.0 mm)	1000 ± 50	1001.1					
1.0 (25.0 mm) to 3/4" (19.0 mm)	500 ± 30	506.0					
3/4" (19.0 mm) to 3/8" (9.5 mm)	**1000 ± 10**	**1001.4**	100.0	1001.4	989.7	1.2	1.17
3/4" (19.0 mm) to 1/2" (12.5 mm)	670 ± 10	669.3					
1/2" (12.5 mm) to 3/8" (9.5 mm)	330 ± 10	332.1					
3/8" (9.5 mm) to No. 4 (4.75 mm)	**300 ± 5**	**301.6**	100.0	301.6	295.1	2.2	2.16
3/8" (9.5 mm) to No. 4 (4.75 mm)	300 ± 5	301.6					

* "Grading of Original Sample" is compared to the average grading of No. 467 (Coarse Aggregate) of ASTM C 33-93.

QUALITATIVE EXAMINATION

	Particles Exhibiting Distress								Total Number of Test Particles	
	Splitting		Crumbling		Cracking		Flaking			
	No.	%	No.	%	No.	%	No.	%	Initial	Final
2 1/2" (63.0 mm) to 1 1/2" (37.5 mm)	—	—	—	—	—	—	—	—	—	—
1 1/2" (37.5 mm) to 3/4" 19.0 mm)	0	0.0	1	2.2	1	2.2	0	0.0	46	46

CTC-GEOTEK, INC.
155 South Navajo Street
Denver, Colorado 80223

Date: 6-20-2014
Technician: JW

Project Name: Church Rock (ATT Job No. 2512 -77)
Quarry Source: Church Rock
Project Number: 143002

ASTM C 131, "Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine"

Grading Used: Grading "A"

Sieve Size		Required Grading (gm)	Actual Grading Weights			
Passing	Retained		TI - CS02 - 02A	TI -CS06 -02A	TI - CS09 - 02A	
1 1/2 in. (37.5 mm)	1.0 in. (25.0 mm)	1250 ± 25	1252.8	1252.5	1250.7	
1.0 in. (25.0 mm)	3/4 in. (19.0 mm)	1250 ± 25	1255.2	1253.8	1249.6	
3/4 in. (19.0 mm)	1/2 in. (12.5 mm)	1250 ± 10	1253.5	1252.9	1253.9	
1/2 in. (12.5 mm)	3/8 in. (9.5 mm)	1250 ± 10	1248.4	1250.0	1250.8	
Total Aggregate Accumulated		5000 ± 10	5009.9	5009.2	5005.0	

Initial Weight (gm)	5009.9	5009.2	5005.0	
Unwashed Weight at 100 Rev. (gm)	4820.0	4724.9	4750.1	
Washed Weight at 500 Rev. (gm)	4157.6	3835.5	3860.2	

Percent Loss at 100 Revolutions	3.8	5.7	5.1	
Percent Loss at 500 Revolutions	17.0	23.4	22.9	
Uniform Hardness Ratio	0.223	0.242	0.223	

*No. 12 (1.70 mm) Sieve was used to determine "Percent Loss"

Moisture Content Determinations
ASTM D 2216

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	Tailings Impoundı
PROJECT NO.	-		

BORING NO.	TI-B10-03
DEPTH	12.5-14'
SAMPLE NO.	-
DATE SAMPLED	11/26/13 MWH
DATE TESTED	12/18/13 DPM
SOIL DESCRIPTION	-

MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	228.27
Wt. of Dry Soil & Dish (gms)	208.77
Net Loss of Moisture (gms)	19.50
Wt. of Dish (gms)	15.90
Wt. of Dry Soil (gms)	192.87
Moisture Content (%)	10.1

Data entry by: DPM Date: 12/18/2013
Checked by: CJ Date: 12/19/2013
File name: 2512_77_M&D-ASTM-D2216-D2937-R0_0.xls

ATT ADVANCED TERRA TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	Tailings Impound
PROJECT NO.	-		

BORING NO.	TI-B10-02
DEPTH	10-12.5'
SAMPLE NO.	-
DATE SAMPLED	11/26/13 MWH
DATE TESTED	12/17/13 DPM
SOIL DESCRIPTION	-

DENSITY DETERMINATIONS	
Sample Height (IN)	0.914
Sample Diameter (IN)	2.875
Wt of Wet Soil (GMs)	143.65
Sample Volume (CU Ft)	0.00343
WET DENSITY (PCF)	92.2
DRY DENSITY (PCF)	85.8

MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	150.26
Wt. of Dry Soil & Dish (gms)	140.31
Net Loss of Moisture (gms)	9.95
Wt. of Dish (gms)	6.61
Wt. of Dry Soil (gms)	133.70
Moisture Content (%)	7.4

Data entry by:	DPM	Date:	12/18/2013
Checked by:	CJ	Date:	12/18/2013
File name:	2512_77_M&D-ASTM-D2216-D2937-R0_0.xls		

ATT
ADVANCED TERRA TESTING

Moisture Content Determinations
ASTM D 2216

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	
PROJECT NO.	-	Tailings Impoundment	

BORING NO.	TI-B15-04	TI-B15-10
DEPTH	13.5-14.0'	28.5-29.5'
SAMPLE NO.	-	-
DATE SAMPLED	12/05/13 MWH	12/05/13 MWH
DATE TESTED	03/20/14 DPM	03/20/14 DPM
SOIL DESCRIPTION	Clayey Sand Tailings	Clayey fine Sand Tails
MOISTURE DETERMINATIONS		
Wt. of Wet Soil & Dish (gms)	208.565	926.32
Wt. of Dry Soil & Dish (gms)	181.732	778.78
Net Loss of Moisture (gms)	26.833	147.54
Wt. of Dish (gms)	6.520	15.84
Wt. of Dry Soil (gms)	175.212	762.94
Moisture Content (%)	15.3	19.3

Data entry by:	DPM	Date:	3/21/2014
Checked by:	DJ	Date:	03/24/14
File name:	M&D-ASTMD-2216-2937-R0-15.xls		

ATT
ADVANCED TERRA TESTING

Moisture Content Determinations
ASTM D 2216

CLIENT:	MWH		JOB NO.	2512-77
PROJECT	Church Rock		LOCATION	
PROJECT NO.	-		Tailings Impoundment	

BORING NO.	TI-B2-07	TI-B1-12
DEPTH	13.5-14.5'	32-33'
SAMPLE NO.	-	-
DATE SAMPLED	11/20/13 MWH	11/21/13 MWH
DATE TESTED	01/27/14 DPM	03/01/14 DPM
SOIL DESCRIPTION	Sand Tailings	Sand Tailings
MOISTURE DETERMINATIONS		
Wt. of Wet Soil & Dish (gms)	498.44	278.84
Wt. of Dry Soil & Dish (gms)	356.31	217.22
Net Loss of Moisture (gms)	142.13	61.62
Wt. of Dish (gms)	15.82	6.56
Wt. of Dry Soil (gms)	340.49	210.66
Moisture Content (%)	41.7	29.3

Data entry by:	DPM	Date:	3/13/2014
Checked by:	[illegible]	Date:	3/14/14
File name:	M&D-ASTMD-2216-2937-R0-14.xls		

ATT
ADVANCED TERRA TESTING

Moisture Content Determinations
ASTM D 2216

CLIENT:	MWH		JOB NO.	2512-77
PROJECT	Church Rock		LOCATION	
PROJECT NO.	-		Tailings Impoundment	

BORING NO.	TI-B1-07B	TI-B1-07B	TI-B1-11C	TI-B1-11C
DEPTH	20.5-21.0'	20.5-21.0'	30.0-30.5'	30.0-30.5'
SAMPLE NO.	60c MC	110c MC	60c MC	110c MC
DATE SAMPLED	11/21/13 MWH	11/21/13 MWH	11/21/13 MWH	11/21/13 MWH
DATE TESTED	04/19/14 DPM	04/21/14 DPM	04/19/14 DPM	04/21/14 DPM
SOIL DESCRIPTION	Sand Tailings	Sand Tailings	Sand Tailings (V. Fine)	Sand Tailings (V. Fine)
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	543.38	543.38	486.55	486.55
Wt. of Dry Soil & Dish (gms)	514.71	512.95	430.63	429.19
Net Loss of Moisture (gms)	28.67	30.43	55.92	57.36
Wt. of Dish (gms)	15.85	15.85	15.72	15.72
Wt. of Dry Soil (gms)	498.86	497.10	414.91	413.47
Moisture Content (%)	5.7	6.1	13.5	13.9

BORING NO.	TI-B10-08B	TI-B10-08B	TI-B10-12B	TI-B10-12B
DEPTH	25.75-26.0	25.75-26.0	35.5-36'	35.5-36'
SAMPLE NO.	60c MC	110c MC	60c MC	110c MC
DATE SAMPLED	11/26/13 MWH	11/26/13 MWH	11/26/13 MWH	11/26/13 MWH
DATE TESTED	04/19/14 DPM	04/21/14 DPM	04/19/14 DPM	04/21/14 DPM
SOIL DESCRIPTION	Clayey Silt Tailings	Clayey Silt Tailings	Clayey Silt Tailings	Clayey Silt Tailings
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	272.86	272.86	497.85	497.85
Wt. of Dry Soil & Dish (gms)	198.08	194.68	334.16	328.44
Net Loss of Moisture (gms)	74.78	78.18	163.69	169.41
Wt. of Dish (gms)	15.81	15.81	15.79	15.79
Wt. of Dry Soil (gms)	182.27	178.87	318.37	312.65
Moisture Content (%)	41.0	43.7	51.4	54.2

BORING NO.	TI-B11-07B	TI-B11-07B	TI-B8-04	TI-B8-04
DEPTH	45.5-46.0'	45.5-46.0'	31.0-31.5'	31.0-31.5'
SAMPLE NO.	60c MC	110c MC	60c MC	110c MC
DATE SAMPLED	12/02/13 MWH	12/02/13 MWH	12/03/13 MWH	12/03/13 MWH
DATE TESTED	04/19/14 DPM	04/21/14 DPM	04/19/14 DPM	04/21/14 DPM
SOIL DESCRIPTION	Clayey Silt Tailings	Clayey Silt Tailings	Clayey Silt/Sand	Clayey Silt/Sand
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	432.66	432.66	1281.90	1281.90
Wt. of Dry Soil & Dish (gms)	236.70	207.70	970.10	954.78
Net Loss of Moisture (gms)	195.96	224.96	311.80	327.12
Wt. of Dish (gms)	15.82	15.82	216.52	216.52
Wt. of Dry Soil (gms)	220.88	191.88	753.58	738.26
Moisture Content (%)	88.7	117.2	41.4	44.3

Data entry by: DPM Date: 4/23/2014
Checked by: bd Date: 4/23/14
File name: M&D-ASTMD-2216-2937-R0-17.xls

ATT ADVANCED TERRA TESTING

Moisture Content Determinations - 60c M.C. to 110c M.C.
ASTM D 2216

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	
PROJECT NO.	-	Tailings Impoundment	

BORING NO.	TI-B1-17	TI-B1-17	TI-B1-17	TI-B1-17
DEPTH	45-46'	45-46'	45-46'	45-46'
SAMPLE NO.	Before Test 60c	After Test 60c	Before Test 110c	After Test 110c
DATE SAMPLED	11/21/13 MWH	11/21/13 MWH	11/21/13 MWH	11/21/13 MWH
DATE TESTED	04/23/14 DPM	04/23/14 DPM	05/01/14 DPM	05/01/14 DPM
SOIL DESCRIPTION	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	803.37	792.43	803.37	792.43
Wt. of Dry Soil & Dish (gms)	665.72	665.72	661.53	661.53
Net Loss of Moisture (gms)	137.65	126.71	141.84	130.90
Wt. of Dish (gms)	15.76	15.76	15.76	15.76
Wt. of Dry Soil (gms)	649.96	649.96	645.77	645.77
Moisture Content (%)	21.2	19.5	22.0	20.3

BORING NO.	TI-B3-03	TI-B3-03	TI-B3-03	TI-B3-03
DEPTH	21-22'	21-22'	21-22'	21-22'
SAMPLE NO.	Before Test 60c	After Test 60c	Before Test 110c	After Test 110c
DATE SAMPLED	11/19/13 MWH	11/19/13 MWH	11/19/13 MWH	11/19/13 MWH
DATE TESTED	04/23/14 DPM	04/23/14 DPM	05/01/14 DPM	05/01/14 DPM
SOIL DESCRIPTION	Silty Clay	Silty Clay	Silty Clay	Silty Clay
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	786.84	823.83	786.84	823.83
Wt. of Dry Soil & Dish (gms)	698.27	698.27	694.35	694.35
Net Loss of Moisture (gms)	88.57	125.56	92.49	129.48
Wt. of Dish (gms)	15.79	15.79	15.79	15.79
Wt. of Dry Soil (gms)	682.48	682.48	678.56	678.56
Moisture Content (%)	13.0	18.4	13.6	19.1

BORING NO.	TI-B3-10	TI-B3-10	TI-B3-10	TI-B3-10
DEPTH	56-57'	56-57'	56-57'	56-57'
SAMPLE NO.	Before Test 60c	After Test 60c	Before Test 110c	After Test 110c
DATE SAMPLED	11/19/13 MWH	11/19/13 MWH	11/19/13 MWH	11/19/13 MWH
DATE TESTED	04/22/14 DPM	04/22/14 DPM	05/01/14 DPM	05/01/14 DPM
SOIL DESCRIPTION	Silty Clay	Silty Clay	Silty Clay	Silty Clay
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	159.884	158.614	159.884	158.614
Wt. of Dry Soil & Dish (gms)	135.805	135.805	134.591	134.591
Net Loss of Moisture (gms)	24.079	22.809	25.293	24.023
Wt. of Dish (gms)	3.846	3.846	3.846	3.846
Wt. of Dry Soil (gms)	131.959	131.959	130.745	130.745
Moisture Content (%)	18.2	17.3	19.3	18.4

Data entry by:	DPM	Date:	5/23/2014
Checked by:	DAW	Date:	05/23/14
File name:	M&D-ASTMD-2216-2937-R0-20.xls		

ATT
ADVANCED TERRA TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	Tailings Impound
PROJECT NO.	-		

BORING NO.	TI-B8-02A	TI-B8-02B	TI-B8-08
DEPTH	26-26.5	25.5-26'	40-42.5
SAMPLE NO.	-	-	-
DATE SAMPLED	12/03/13 MWH	12/03/13 MWH	12/04/13 MWH
DATE TESTED	12/18/13 DPM	12/18/13 DPM	12/18/13 DPM
SOIL DESCRIPTION	-	-	-
DENSITY DETERMINATIONS			
Sample Height (IN)	5.617	5.617	1.411
Sample Diameter (IN)	1.938	1.938	2.876
Wt of Wet Soil (GMs)	465.56	460.21	262.92
Sample Volume (CU Ft)	0.00959	0.00959	0.00530
WET DENSITY (PCF)	107.0	105.8	109.3
DRY DENSITY (PCF)	91.7	99.6	75.4
MOISTURE DETERMINATIONS			
Wt. of Wet Soil & Dish (gms)	40.68	82.88	278.72
Wt. of Dry Soil & Dish (gms)	35.79	78.55	197.18
Net Loss of Moisture (gms)	4.89	4.33	81.54
Wt. of Dish (gms)	6.63	9.25	15.82
Wt. of Dry Soil (gms)	29.16	69.30	181.36
Moisture Content (%)	16.8	6.2	45.0

Data entry by: DPM Date: 12/18/2013
Checked by: CJ Date: 12/18/2013
File name: 2512-77-M&D-ASTMD-2216-2937-R0-9.xls

ATT ADVANCED TERRA TESTING

Moisture Content Determinations
ASTM D 2216

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	Tailings Impoundı
PROJECT NO.	-		

BORING NO.	TI-B8-09
DEPTH	43.5-44.5'
SAMPLE NO.	-
DATE SAMPLED	12/04/13 MWH
DATE TESTED	12/18/13 DPM
SOIL DESCRIPTION	-

MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	286.95
Wt. of Dry Soil & Dish (gms)	208.54
Net Loss of Moisture (gms)	78.41
Wt. of Dish (gms)	15.78
Wt. of Dry Soil (gms)	192.76
Moisture Content (%)	40.7

Data entry by: DPM Date: 12/18/2013
Checked by: CJ Date: 12/18/2013
File name: 2512-77-M&D-ASTMD-2216-2937-R0-9.xls

ATT ADVANCED TERRA TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH		JOB NO.	2512-77
PROJECT	Church Rock		LOCATION	
PROJECT NO.	-		Tailings Impoundment	

BORING NO.	TI-B23-03	TI-B23-03
DEPTH	17.25-17.5'	15.5-15.75
SAMPLE NO.	Bottom of Tube	Top of Tube
DATE SAMPLED	12/06/13 MWH	12/06/13 MWH
DATE TESTED	03/27/14 DPM	04/11/14 DPM
SOIL DESCRIPTION	Silty Clay	Sand Tailings
DENSITY DETERMINATIONS		
Sample Height (IN)	2.119	2.901
Sample Diameter (IN)	2.868	2.878
Wt of Wet Soil (GMs)	448.73	524.20
Sample Volume (CU Ft)	0.00792	0.01092
WET DENSITY (PCF)	124.9	105.8
DRY DENSITY (PCF)	101.9	87.7
MOISTURE DETERMINATIONS		
Wt. of Wet Soil & Dish (gms)	129.48	140.34
Wt. of Dry Soil & Dish (gms)	107.22	117.42
Net Loss of Moisture (gms)	22.26	22.92
Wt. of Dish (gms)	8.44	6.65
Wt. of Dry Soil (gms)	98.78	110.77
Moisture Content (%)	22.5	20.7

Data entry by:	DPM	Date:	4/20/2014
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ATT
ADVANCED TERRA TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	
PROJECT NO.	-	Tailings Impoundment	

BORING NO.	TI-B8-10A	TI-B8-12A	TI-B11-01A	TI-B11-04A
DEPTH	46.0-46.5'	56.0-56.5'	6.0-6.5'	21.0-21.5'
SAMPLE NO.	-	-	-	-
DATE SAMPLED	12/04/13 MWH	12/04/13 MWH	12/02/13 MWH	12/02/13 MWH
DATE TESTED	03/18/14 DPM	03/18/14 DPM	03/20/14 DPM	03/20/14 DPM
SOIL DESCRIPTION	Silty Clayey Sand	Silty Clayey Sand	Silty Clayey Sand	Sandy Clay
DENSITY DETERMINATIONS				
Sample Height (IN)	5.672	3.442	5.668	5.219
Sample Diameter (IN)	1.926	1.931	1.889	1.876
Wt of Wet Soil (GMs)	503.15	290.63	423.67	457.57
Sample Volume (CU Ft)	0.00956	0.00583	0.00919	0.00835
WET DENSITY (PCF)	116.0	109.8	101.6	120.8
DRY DENSITY (PCF)	95.2	97.6	93.5	107.6
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	115.109	72.977	211.667	191.081
Wt. of Dry Soil & Dish (gms)	95.602	65.566	195.348	170.829
Net Loss of Moisture (gms)	19.507	7.411	16.319	20.252
Wt. of Dish (gms)	6.542	6.550	6.520	6.567
Wt. of Dry Soil (gms)	89.060	59.016	188.828	164.262
Moisture Content (%)	21.9	12.6	8.6	12.3

BORING NO.	TI-B11-12A	TI-B11-13A	TI-B11-17A
DEPTH	61.0-61.5'	66.0-66.5'	81.0-81.5'
SAMPLE NO.	-	-	-
DATE SAMPLED	12/02/13 MWH	12/02/13 MWH	12/02/13 MWH
DATE TESTED	03/20/14 DPM	03/20/14 DPM	03/20/14 DPM
SOIL DESCRIPTION	Clayey Sand	Silty Sand	Gravely Sand
DENSITY DETERMINATIONS			
Sample Height (IN)	5.598	5.234	5.303
Sample Diameter (IN)	1.913	1.919	1.918
Wt of Wet Soil (GMs)	467.05	436.67	480.31
Sample Volume (CU Ft)	0.00931	0.00876	0.00887
WET DENSITY (PCF)	110.6	109.9	119.4
DRY DENSITY (PCF)	95.4	96.2	107.6
MOISTURE DETERMINATIONS			
Wt. of Wet Soil & Dish (gms)	122.783	187.577	121.771
Wt. of Dry Soil & Dish (gms)	106.799	165.024	110.540
Net Loss of Moisture (gms)	15.984	22.553	11.231
Wt. of Dish (gms)	6.594	6.619	8.374
Wt. of Dry Soil (gms)	100.205	158.405	102.166
Moisture Content (%)	16.0	14.2	11.0

Data entry by:	DPM	Date:	4/10/2014
Checked by:	bj	Date:	4/11/14
File name:	M&D-ASTMD-2216-2937-R0-15.xls		

ATT
ADVANCED TERRA TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	
PROJECT NO.	-	Tailings Impoundment	

BORING NO.	TI-B15-14A	TI-B15-17A	TI-B15-19A
DEPTH	41.0-41.5'	56.0-56.5'	66.0-66.5'
SAMPLE NO.	60c MC	60c MC	60c MC
DATE SAMPLED	12/05/13 MWH	12/05/13 MWH	12/05/13 MWH
DATE TESTED	04/26/14 DPM	04/26/14 DPM	04/26/14 DPM
SOIL DESCRIPTION	Clayey Sand	Silty Clay	Clayey Sand
DENSITY DETERMINATIONS			
Sample Height (IN)	5.612	5.950	5.612
Sample Diameter (IN)	1.938	1.938	1.938
Wt of Wet Soil (GMs)	421.89	535.67	493.18
Sample Volume (CU Ft)	0.00958	0.01016	0.00958
WET DENSITY (PCF)	97.1	116.3	113.5
DRY DENSITY (PCF)	88.1	105.3	101.5
MOISTURE DETERMINATIONS			
Wt. of Wet Soil & Dish (gms)	160.33	541.08	282.13
Wt. of Dry Soil & Dish (gms)	146.16	490.49	253.00
Net Loss of Moisture (gms)	14.17	50.59	29.13
Wt. of Dish (gms)	6.59	6.50	6.63
Wt. of Dry Soil (gms)	139.57	483.99	246.37
Moisture Content (%)	10.1	10.5	11.8

BORING NO.	TI-B15-14A	TI-B15-17A	TI-B15-19A
DEPTH	41.0-41.5'	56.0-56.5'	66.0-66.5'
SAMPLE NO.	110c MC	110c MC	110c MC
DATE SAMPLED	12/05/13 MWH	12/05/13 MWH	12/05/13 MWH
DATE TESTED	04/26/14 DPM	04/26/14 DPM	04/26/14 DPM
SOIL DESCRIPTION	Clayey Sand	Silty Clay	Clayey Sand
DENSITY DETERMINATIONS			
Sample Height (IN)			
Sample Diameter (IN)			
Wt of Wet Soil (GMs)			
Sample Volume (CU Ft)			
WET DENSITY (PCF)			
DRY DENSITY (PCF)			
MOISTURE DETERMINATIONS			
Wt. of Wet Soil & Dish (gms)	160.33	541.08	282.13
Wt. of Dry Soil & Dish (gms)	144.61	485.26	251.13
Net Loss of Moisture (gms)	15.72	55.82	31.00
Wt. of Dish (gms)	6.59	6.50	6.63
Wt. of Dry Soil (gms)	138.02	478.76	244.50
Moisture Content (%)	11.4	11.7	12.7

Data entry by:	DPM	Date:	5/23/2014
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File name:	M&D-ASTMD-2216-2937-R0-19.xls		

ATT
ADVANCED TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	
PROJECT NO.	-	Tailings Impoundment	

BORING NO.	TI-B15-01A	TI-B15-03A	TI-B15-07A	TI-B15-11A
DEPTH	6.0-6.5'	11.0-11.5'	21.0-21.5	31.0-31.5'
SAMPLE NO.	-	-	-	-
DATE SAMPLED	12/05/13 MWH	12/05/13 MWH	12/05/13 MWH	12/05/13 MWH
DATE TESTED	04/16/14 DPM	04/16/14 DPM	03/27/14 DPM	04/16/14 DPM
SOIL DESCRIPTION	Sand Tailings	Sand Tailings	Fine Sand Tailings	Silty Clay
DENSITY DETERMINATIONS				
Sample Height (IN)	5.613	5.613	5.603	5.602
Sample Diameter (IN)	1.938	1.938	1.925	1.926
Wt of Wet Soil (GMs)	463.13	435.38	481.44	510.64
Sample Volume (CU Ft)	0.00958	0.00958	0.00944	0.00944
WET DENSITY (PCF)	106.6	100.2	112.5	119.2
DRY DENSITY (PCF)	101.1	93.8	99.8	101.8
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	235.60	146.64	105.19	89.10
Wt. of Dry Soil & Dish (gms)	223.97	137.67	94.09	77.07
Net Loss of Moisture (gms)	11.64	8.97	11.10	12.02
Wt. of Dish (gms)	6.64	6.65	6.66	6.64
Wt. of Dry Soil (gms)	217.33	131.02	87.43	70.43
Moisture Content (%)	5.4	6.8	12.7	17.1

BORING NO.	TI-B15-15A
DEPTH	46.0-46.5'
SAMPLE NO.	-
DATE SAMPLED	12/05/13 MWH
DATE TESTED	04/20/14 DPM
SOIL DESCRIPTION	Clayey Sand
DENSITY DETERMINATIONS	
Sample Height (IN)	5.613
Sample Diameter (IN)	1.935
Wt of Wet Soil (GMs)	505.04
Sample Volume (CU Ft)	0.00955
WET DENSITY (PCF)	116.6
DRY DENSITY (PCF)	99.3
MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	65.05
Wt. of Dry Soil & Dish (gms)	56.40
Net Loss of Moisture (gms)	8.65
Wt. of Dish (gms)	6.52
Wt. of Dry Soil (gms)	49.88
Moisture Content (%)	17.3

Data entry by:	DPM	Date:	5/23/2014
Checked by:	DMW	Date:	5/23/14
File name:	M&D-ASTMD-2216-2937-R0-18.xls		

ATT ADVANCED TECH TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	
PROJECT NO.	-	Tailings Impoundment	

BORING NO.	TI-B3-01A	TI-B3-05A	TI-B3-07A	TI-B3-08A
DEPTH	11.0-11.5'	31.0-31.5'	41.0-41.5'	46.0-46.5'
SAMPLE NO.	-	-	-	-
DATE SAMPLED	11/19/13 MWH	11/19/13 MWH	11/19/13 MWH	11/19/13 MWH
DATE TESTED	01/23/14 DPM	01/23/14 DPM	01/23/14 DPM	01/23/14 DPM
SOIL DESCRIPTION	Sand	Silty Clay	Silty Clay	Silty Clay
DENSITY DETERMINATIONS				
Sample Height (IN)	5.358	4.454	5.979	5.460
Sample Diameter (IN)	1.938	1.892	1.935	1.895
Wt of Wet Soil (GMs)	473.05	413.46	508.06	499.82
Sample Volume (CU Ft)	0.00915	0.00725	0.01018	0.00891
WET DENSITY (PCF)	114.0	125.8	110.1	123.6
DRY DENSITY (PCF)	108.4	108.4	90.6	104.8
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	148.94	421.87	196.17	199.16
Wt. of Dry Soil & Dish (gms)	142.07	364.61	162.63	169.76
Net Loss of Moisture (gms)	6.87	57.27	33.54	29.41
Wt. of Dish (gms)	8.37	8.41	6.61	6.56
Wt. of Dry Soil (gms)	133.70	356.19	156.02	163.20
Moisture Content (%)	5.1	16.1	21.5	18.0

BORING NO.	TI-B3-11A	TI-B3-04A
DEPTH	61.0-61.5'	26.0-26.5'
SAMPLE NO.	-	-
DATE SAMPLED	11/19/13 MWH	11/19/13 MWH
DATE TESTED	01/23/14 DPM	01/23/14 DPM
SOIL DESCRIPTION	Silty Sand	Silty Clay
DENSITY DETERMINATIONS		
Sample Height (IN)	5.610	5.866
Sample Diameter (IN)	1.929	1.900
Wt of Wet Soil (GMs)	536.02	522.33
Sample Volume (CU Ft)	0.00949	0.00962
WET DENSITY (PCF)	124.5	119.7
DRY DENSITY (PCF)	99.0	106.8
MOISTURE DETERMINATIONS		
Wt. of Wet Soil & Dish (gms)	256.64	226.83
Wt. of Dry Soil & Dish (gms)	205.38	203.20
Net Loss of Moisture (gms)	51.26	23.62
Wt. of Dish (gms)	6.58	6.46
Wt. of Dry Soil (gms)	198.80	196.74
Moisture Content (%)	25.8	12.0

Data entry by:	DPM	Date:	2/5/2014
Checked by:	bj	Date:	02/06/14
File name:	2512-77-M&D-ASTMD-2216-2937-R0-11.xls		

ATT
ADVANCED TERRA TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	
PROJECT NO.	-	Tailings Impoundment	

BORING NO.	TI-B2-02A	TI-B2-05A	TI-B2-11A	TI-B2-8C
DEPTH	6.0-6.5'	11.0-11.5'	21.0-21.5'	15.0-15.5
SAMPLE NO.	-	-	-	-
DATE SAMPLED	11/20/13 MWH	11/20/13 MWH	11/20/13 MWH	11/20/13 MWH
DATE TESTED	01/27/14 DPM	02/05/14 DPM	02/05/14 DPM	02/05/14 DPM
SOIL DESCRIPTION	Silty Sand with Gravel	Clayey Sand	Silty Sand	Silty Sand
DENSITY DETERMINATIONS				
Sample Height (IN)	4.570	5.415	5.680	5.925
Sample Diameter (IN)	1.938	1.938	1.938	1.938
Wt of Wet Soil (GMs)	382.63	396.51	430.30	443.40
Sample Volume (CU Ft)	0.00780	0.00924	0.00970	0.01011
WET DENSITY (PCF)	108.1	94.6	97.8	96.6
DRY DENSITY (PCF)	100.4	75.9	91.4	90.4
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	435.86	102.26	147.33	449.49
Wt. of Dry Soil & Dish (gms)	405.77	83.39	138.10	420.93
Net Loss of Moisture (gms)	30.09	18.87	9.24	28.56
Wt. of Dish (gms)	15.85	6.45	6.48	6.48
Wt. of Dry Soil (gms)	389.92	76.93	131.62	414.45
Moisture Content (%)	7.7	24.5	7.0	6.9

BORING NO.	TI-B2-14A
DEPTH	26.0-26.5'
SAMPLE NO.	-
DATE SAMPLED	11/20/13 MWH
DATE TESTED	02/05/14 DPM
SOIL DESCRIPTION	Silty Clay
DENSITY DETERMINATIONS	
Sample Height (IN)	5.392
Sample Diameter (IN)	1.932
Wt of Wet Soil (GMs)	477.52
Sample Volume (CU Ft)	0.00915
WET DENSITY (PCF)	115.1
DRY DENSITY (PCF)	93.2
MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	90.46
Wt. of Dry Soil & Dish (gms)	74.46
Net Loss of Moisture (gms)	16.00
Wt. of Dish (gms)	6.48
Wt. of Dry Soil (gms)	67.98
Moisture Content (%)	23.5

Data entry by: DPM Date: 2/6/2014
Checked by: bs Date: 02/06/14
File name: 2512_77_M&D-ASTMD-2216-2937-R0-12.xls

ATT
ADVANCED TERRA TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Curch Rock	LOCATION	
PROJECT NO.	-	Tailings Impoundment	

BORING NO.	TI-B10-04C	TI-B10-04A	TI-B10-08A	TI-B10-12C
DEPTH	15.0-15.5'	16.0-16.5'	26.0-26.5'	35.0-35.5'
SAMPLE NO.	-	-	-	-
DATE SAMPLED	11/26/13 MWH	11/26/13 MWH	11/26/13 MWH	11/26/13 MWH
DATE TESTED	02/06/14 DPM	02/06/14 DPM	02/06/14 DPM	02/06/14 DPM
SOIL DESCRIPTION	Sand Tailings	Sand Tailings	Clayey Silt Tailings	Clayey Silt Tailings
DENSITY DETERMINATIONS				
Sample Height (IN)	5.356	5.752	5.685	5.848
Sample Diameter (IN)	1.938	1.938	1.920	1.928
Wt of Wet Soil (GMs)	466.97	474.57	437.41	479.99
Sample Volume (CU Ft)	0.00914	0.00982	0.00953	0.00988
WET DENSITY (PCF)	112.6	106.6	101.2	107.1
DRY DENSITY (PCF)	103.0	100.0	63.1	71.3
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	482.57	69.14	58.91	97.86
Wt. of Dry Soil & Dish (gms)	442.76	65.30	39.18	70.46
Net Loss of Moisture (gms)	39.81	3.85	19.73	27.40
Wt. of Dish (gms)	15.77	6.49	6.49	15.88
Wt. of Dry Soil (gms)	426.99	58.81	32.69	54.58
Moisture Content (%)	9.3	6.5	60.4	50.2

BORING NO.	TI-B10-12A	TI-B10-16A	TI-B10-20A	TI-B10-21A
DEPTH	36.0-36.5'	46.0-46.5'	66.0-66.5'	71.0-71.5'
SAMPLE NO.	-	-	-	-
DATE SAMPLED	11/26/13 MWH	11/26/13 MWH	11/26/13 MWH	11/26/13 MWH
DATE TESTED	02/06/14 DPM	02/13/14 DPM	02/13/14 DPM	02/13/14 DPM
SOIL DESCRIPTION	Clayey Silt Tailings	Silty Sand	Silty Sand	Silty Sand w/Clay
DENSITY DETERMINATIONS				
Sample Height (IN)	5.016	5.006	5.902	5.849
Sample Diameter (IN)	1.927	1.938	1.938	1.919
Wt of Wet Soil (GMs)	446.13	406.60	491.75	528.40
Sample Volume (CU Ft)	0.00846	0.00855	0.01008	0.00979
WET DENSITY (PCF)	116.2	104.9	107.6	119.0
DRY DENSITY (PCF)	86.7	95.4	94.5	100.8
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	67.61	107.69	110.84	211.84
Wt. of Dry Soil & Dish (gms)	52.13	98.54	98.18	181.86
Net Loss of Moisture (gms)	15.48	9.14	12.67	29.98
Wt. of Dish (gms)	6.52	6.59	6.50	15.84
Wt. of Dry Soil (gms)	45.61	91.95	91.68	166.02
Moisture Content (%)	33.9	9.9	13.8	18.1

Data entry by:	DPM	Date:	3/13/2014
Checked by:	bj	Date:	3/14/14
File name:	M&D-ASTMD-2216-2937-R0-13.xls		

ATT
ADVANCED TERRA TESTING

Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:	MWH	JOB NO.	2512-77
PROJECT	Church Rock	LOCATION	
PROJECT NO.	-	Tailings Impoundment	

BORING NO.	TI-B1-05A	TI-B10-25A	TI-B10-10	TI-B10-10
DEPTH	16.0-16.5'	91.0-91.5'	32.0-32.5'	30.3-30.7'
SAMPLE NO.	-	-	Bottom of Tube	Top of Tube
DATE SAMPLED	11/21/13 MWH	11/26/13 MWH	11/26/13 MWH	11/26/13 MWH
DATE TESTED	02/05/14 DPM	02/13/14 DPM	03/03/14 DPM	03/03/14 DPM
SOIL DESCRIPTION	Silty Clay w/ Sand	Clayey Sand	Coarse	Fine
DENSITY DETERMINATIONS				
Sample Height (IN)	5.687	5.002	4.049	2.632
Sample Diameter (IN)	1.938	1.932	2.876	2.878
Wt of Wet Soil (GMs)	535.63	482.32	797.23	479.45
Sample Volume (CU Ft)	0.00971	0.00849	0.01522	0.00991
WET DENSITY (PCF)	121.6	125.3	115.5	106.7
DRY DENSITY (PCF)	104.7	105.6	100.1	72.2
MOISTURE DETERMINATIONS				
Wt. of Wet Soil & Dish (gms)	76.56	146.63	255.47	86.16
Wt. of Dry Soil & Dish (gms)	66.81	124.69	222.23	60.47
Net Loss of Moisture (gms)	9.74	21.94	33.24	25.69
Wt. of Dish (gms)	6.52	6.86	6.47	6.56
Wt. of Dry Soil (gms)	60.29	117.83	215.76	53.91
Moisture Content (%)	16.2	18.6	15.4	47.7

BORING NO.	TI-B2-16
DEPTH	38.4-38.7'
SAMPLE NO.	-
DATE SAMPLED	11/20/13 MWH
DATE TESTED	03/03/14 DPM
SOIL DESCRIPTION	Weathered Sandstone
DENSITY DETERMINATIONS	
Sample Height (IN)	Density
Sample Diameter (IN)	Not
Wt of Wet Soil (GMs)	Possible
Sample Volume (CU Ft)	
WET DENSITY (PCF)	
DRY DENSITY (PCF)	
MOISTURE DETERMINATIONS	
Wt. of Wet Soil & Dish (gms)	478.55
Wt. of Dry Soil & Dish (gms)	423.68
Net Loss of Moisture (gms)	54.87
Wt. of Dish (gms)	15.81
Wt. of Dry Soil (gms)	407.87
Moisture Content (%)	13.5

Data entry by:	DPM	Date:	3/13/2014
Checked by:	bj	Date:	3/14/14
File name:	M&D-ASTMD-2216-2937-R0-14.xls		

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-12A
Depth: 56.0-56.5'
Sample Number: Silty/Clayey Sand
Test Date: 3/29/2014
Technician: DPM
Sampled Date: 12/4/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 4/10/2014
File Name: atterberg-ASTM_4318-R6_28.xls

Data Checked By: bj
Date: 4/11/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-11A
Depth: 31.0-31.5'
Sample Number: Silty Clay
Test Date: 5/5/2014
Technician: DPM
Sampled Date: 12/5/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 5/6/2014
File Name: atterberg-ASTM_4318-R6_43.xls

Data Checked By: BDF
Date: 5/7/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-04
Depth: 13.5-14.0' (11.5-14')
Sample Number: Clayey Sand Tailings
Test Date: 4/29/2014
Technician: DPM
Sampled Date: 12/5/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 5/2/2014
File Name: atterberg-ASTM_4318-R6_38.xls

Data Checked By: BDF
Date: 5/7/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-08
Depth: 51.5-52.5' (50-52.5')
Sample Number: Fine Tailings
Test Date: 4/30/2014
Technician: DPM
Sampled Date: 12/2/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

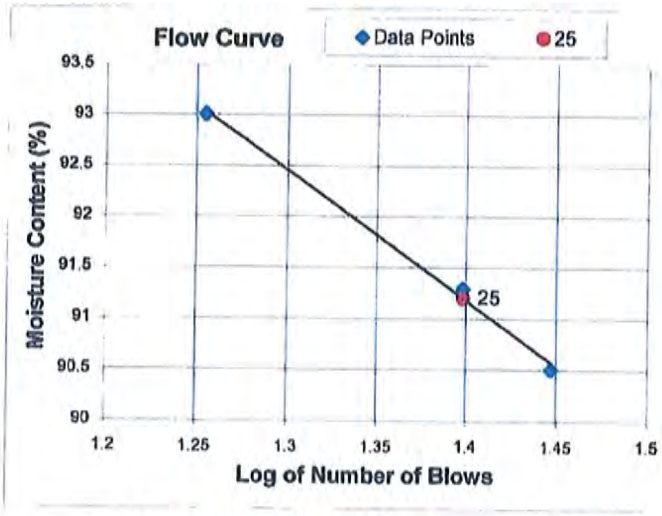
	Sample 1	Sample 2
Weight of Wet Soil & Pan (g):	5.964	5.997
Weight of Dry Soil & Pan (g):	4.847	4.890
Weight of Water (g):	1.117	1.107
Weight of Pan (g):	1.138	1.137
Moisture Content (%):	30.1	29.5

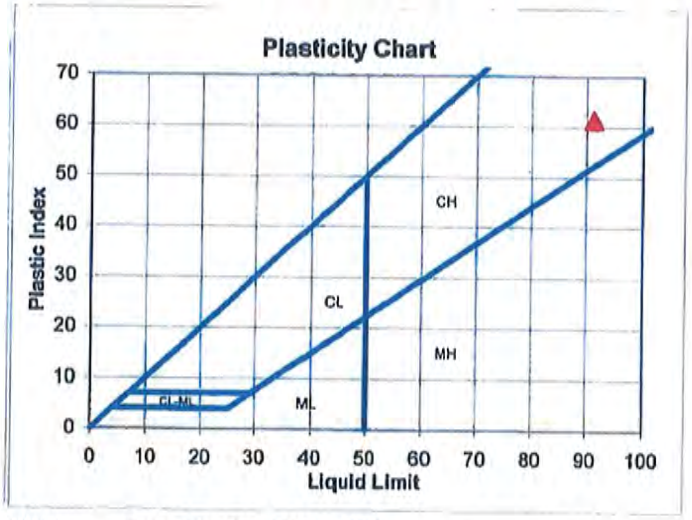
Average: 29.8%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	25	28	18
Weight of Wet Soil & Pan (g):	12.330	12.685	12.216
Weight of Dry Soil & Pan (g):	7.003	7.204	6.884
Weight of Water (g):	5.327	5.481	5.332
Weight of Pan (g):	1.168	1.148	1.151
Moisture Content (%):	91.3	90.5	93.0

Plastic Limit: 30
Liquid Limit: 91
Plastic Index: 61
Atterberg Classification CH





Data Entered By: DPM Date: 5/4/2014
File Name: atterberg-ASTM_4318-R6_40.xls

Data Checked By: BDF
Date: 5/7/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-15A
Depth: 46.0-46.5'
Sample Number: Clayey Sand
Test Date: 5/5/2014
Technician: DPM
Sampled Date: 12/5/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 5/6/2014
File Name: atterberg-ASTM_4318-R6_42.xls

Data Checked By: BDF
Date: 5/7/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-08
Depth: 41-42' (40-42.5')
Sample Number: Clayey Silt
Test Date: 3/6/2014
Technician: DPM
Sampled Date: 12/4/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

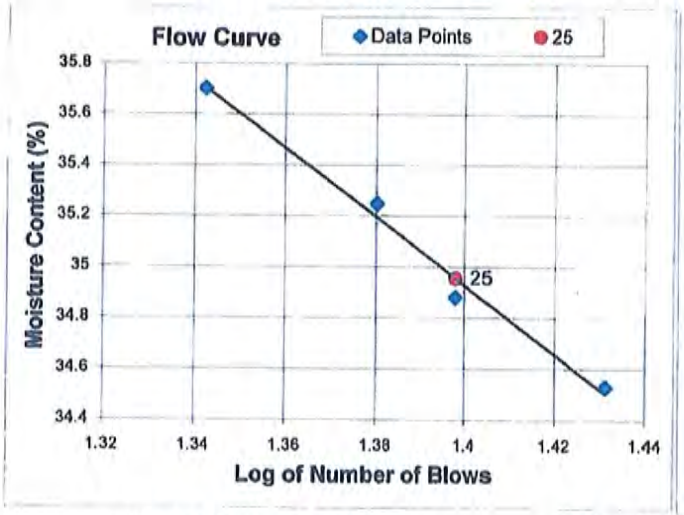
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.571	6.348	6.358
Weight of Dry Soil & Pan (g):	5.787	5.580	5.610
Weight of Water (g):	0.784	0.768	0.748
Weight of Pan (g):	0.758	0.766	0.757
Moisture Content (%):	15.6	16.0	15.4

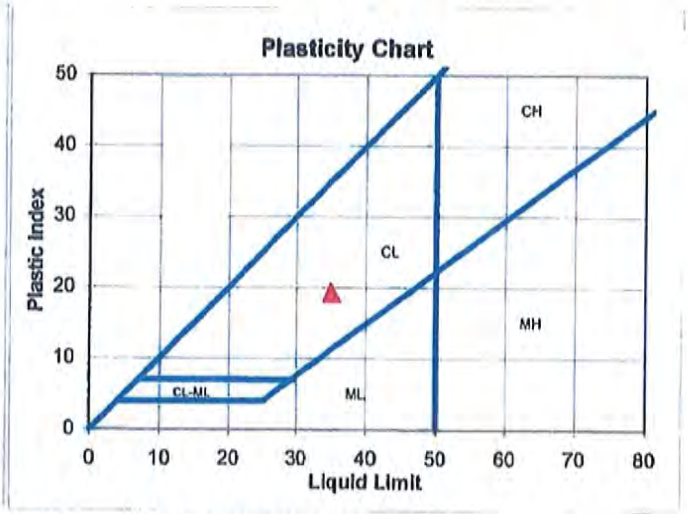
Average: 15.7%
Standard Deviation: 0.3%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	24	25	27	22
Weight of Wet Soil & Pan (g):	11.695	11.436	10.790	11.968
Weight of Dry Soil & Pan (g):	8.841	8.670	8.210	9.013
Weight of Water (g):	2.854	2.766	2.580	2.955
Weight of Pan (g):	0.744	0.740	0.738	0.736
Moisture Content (%):	35.2	34.9	34.5	35.7

Plastic Limit: 16
Liquid Limit: 35
Plastic Index: 19
Atterberg Classification CL





Data Entered By: DPM Date: 3/13/2014
File Name: atterberg-ASTM_4318-R6_19.xls

Data Checked By: KJ
Date: 3/14/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-10
Depth: 56-57' (55-57')
Sample Number: Silty Sand
Test Date: 2/28/2014
Technician: DPM
Sampled Date: 12/2/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 3/4/2014
File Name: atterberg-ASTM_4318-R6_18.xls

Data Checked By: [illegible]
Date: 03/06/2014

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-02A
Depth: 26.0-26.5'
Sample Number: Clayey Silt
Test Date: 2/28/2014
Technician: DPM
Sampled Date: 12/3/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits Non-Plastic

Liquid Limits Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 3/4/2014 Data Checked By: hj
File Name: 2512_77_atterberg-ASTM_4318-R6_16.x Date: 03/06/2014

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-06
Depth: 30.5-31.5' (30.0-31.7')
Sample Number: Sandy Clay
Test Date: 4/30/2014
Technician: DPM
Sampled Date: 12/2/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 60c.

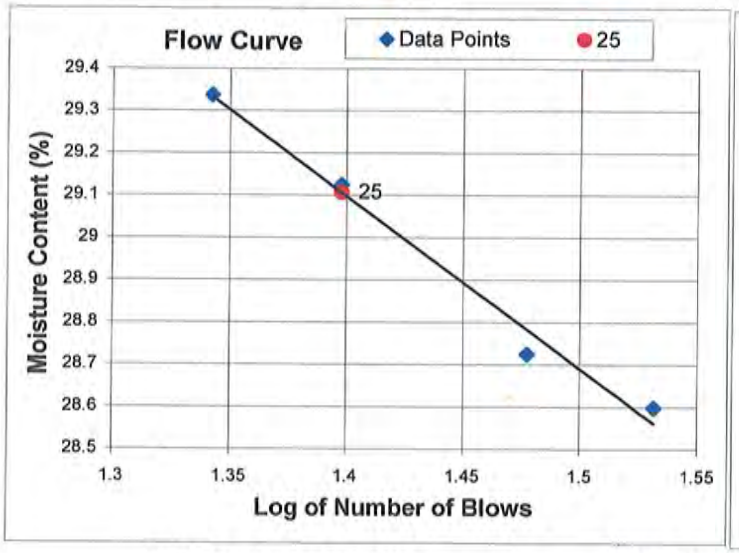
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	7.476	7.494	7.450
Weight of Dry Soil & Pan (g):	6.752	6.788	6.742
Weight of Water (g):	0.724	0.706	0.708
Weight of Pan (g):	1.144	1.146	1.134
Moisture Content (%):	12.9	12.5	12.6

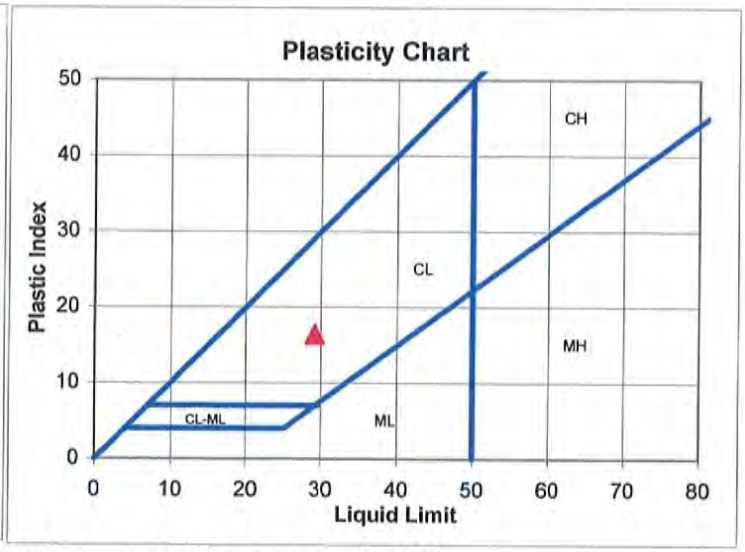
Average: 12.7%
Standard Deviation: 0.2%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	34	25	22	30
Weight of Wet Soil & Pan (g):	17.434	14.027	14.368	14.923
Weight of Dry Soil & Pan (g):	13.812	11.121	11.378	11.846
Weight of Water (g):	3.622	2.906	2.990	3.077
Weight of Pan (g):	1.147	1.143	1.186	1.134
Moisture Content (%):	28.6	29.1	29.3	28.7

Plastic Limit: 13
Liquid Limit: 29
Plastic Index: 16
Atterberg Classification CL





Data Entered By: DPM Date: 5/9/2014
File Name: atterberg-ASTM_4318-R6_37-60c.xls

Data Checked By: DAW
Date: 05/22/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-06
Depth: 30.5-31.5' (30.0-31.7')
Sample Number: Sandy Clay
Test Date: 4/30/2014
Technician: DPM
Sampled Date: 12/2/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 110c.

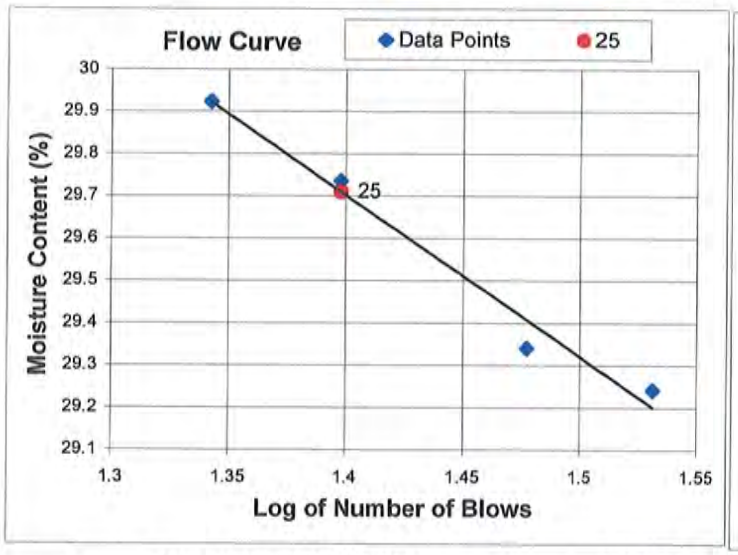
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	7.476	7.494	7.450
Weight of Dry Soil & Pan (g):	6.726	6.765	6.715
Weight of Water (g):	0.750	0.729	0.735
Weight of Pan (g):	1.144	1.146	1.134
Moisture Content (%):	13.4	13.0	13.2

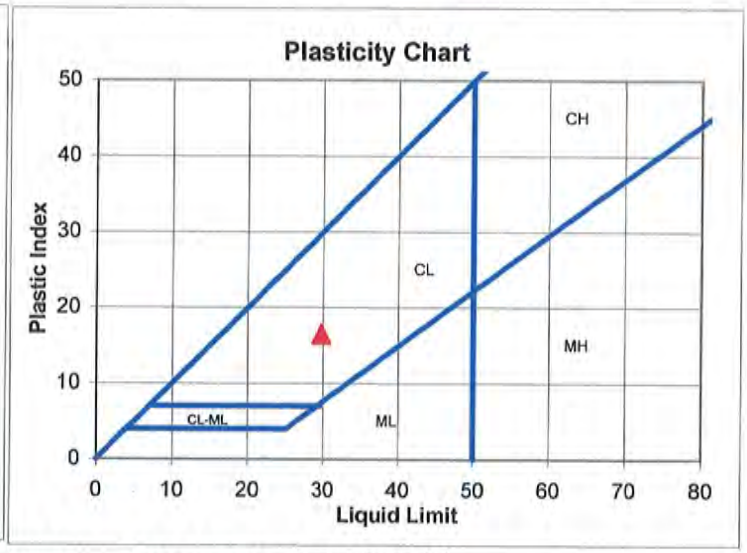
Average: 13.2%
Standard Deviation: 0.2%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	34	25	22	30
Weight of Wet Soil & Pan (g):	17.434	14.027	14.368	14.923
Weight of Dry Soil & Pan (g):	13.749	11.074	11.332	11.795
Weight of Water (g):	3.685	2.953	3.036	3.128
Weight of Pan (g):	1.147	1.143	1.186	1.134
Moisture Content (%):	29.2	29.7	29.9	29.3

Plastic Limit: 13
Liquid Limit: 30
Plastic Index: 17
Atterberg Classification CL





Data Entered By: DPM Date: 5/9/2014
File Name: atterberg-ASTM_4318-R6_37-110c.xls

Data Checked By: DAW
Date: 05/22/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-04
Depth: 30.0-31.0' (30-32')
Sample Number: Clayey Silt/Sand
Test Date: 5/3/2014
Technician: DPM
Sampled Date: 12/3/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 60c.

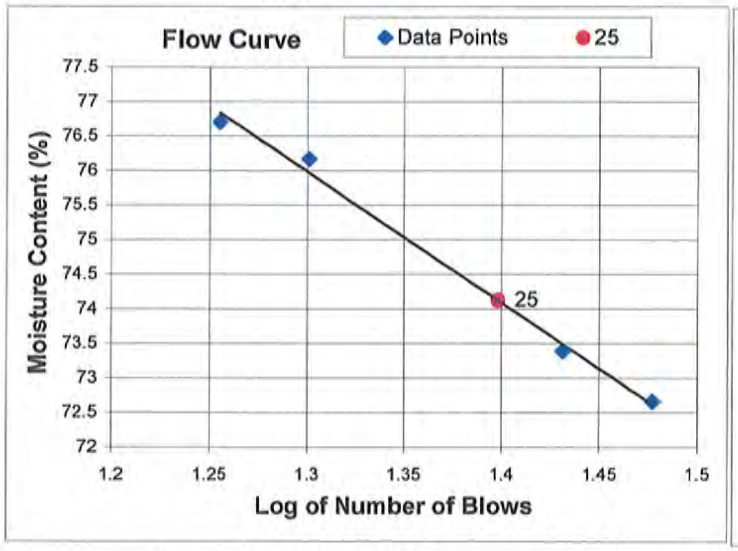
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.384	6.499	6.420
Weight of Dry Soil & Pan (g):	5.325	5.431	5.370
Weight of Water (g):	1.059	1.068	1.050
Weight of Pan (g):	1.174	1.137	1.140
Moisture Content (%):	25.5	24.9	24.8

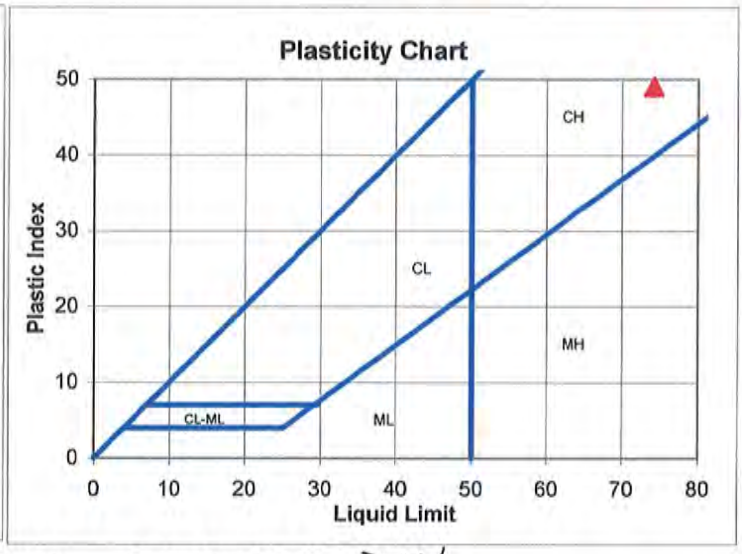
Average: 25.1%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	30	27	20	18
Weight of Wet Soil & Pan (g):	11.360	14.173	12.090	12.695
Weight of Dry Soil & Pan (g):	7.055	8.649	7.357	7.685
Weight of Water (g):	4.305	5.524	4.733	5.010
Weight of Pan (g):	1.130	1.122	1.143	1.153
Moisture Content (%):	72.7	73.4	76.2	76.7

Plastic Limit: 25
Liquid Limit: 74
Plastic Index: 49
Atterberg Classification CH





Data Entered By: DPM Date: 5/8/2014
File Name: atterberg-ASTM_4318-R6_39-60c.xls

Data Checked By: DAW
Date: 05/23/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-04
Depth: 30.0-31.0' (30-32')
Sample Number: Clayey Silt/Sand
Test Date: 5/3/2014
Technician: DPM
Sampled Date: 12/3/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 110c.

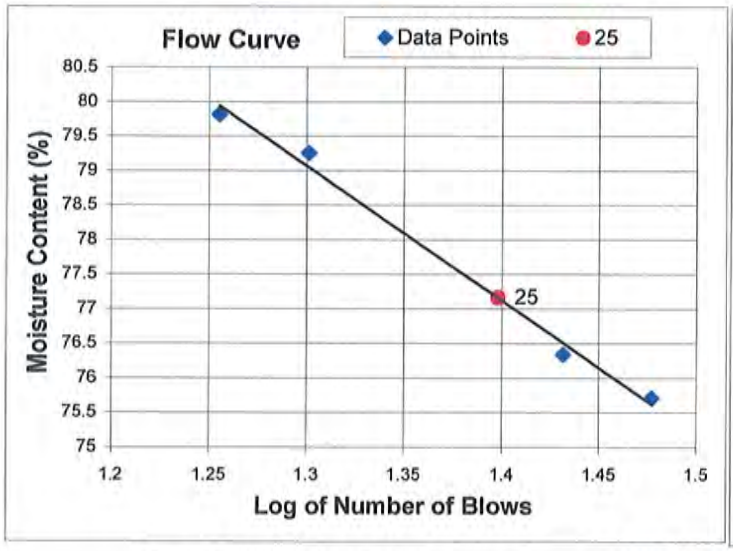
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.384	6.499	6.420
Weight of Dry Soil & Pan (g):	5.257	5.362	5.300
Weight of Water (g):	1.127	1.137	1.120
Weight of Pan (g):	1.174	1.137	1.140
Moisture Content (%):	27.6	26.9	26.9

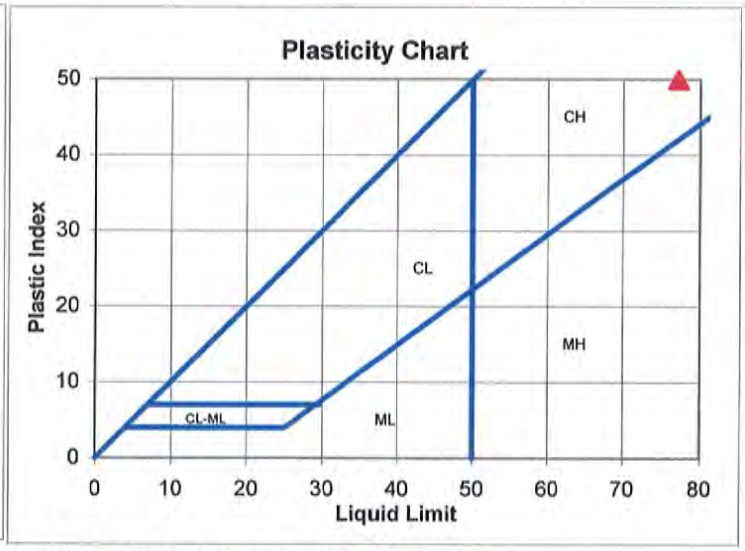
Average: 27.1%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	30	27	20	18
Weight of Wet Soil & Pan (g):	11.360	14.173	12.090	12.695
Weight of Dry Soil & Pan (g):	6.952	8.523	7.250	7.572
Weight of Water (g):	4.408	5.650	4.840	5.123
Weight of Pan (g):	1.130	1.122	1.143	1.153
Moisture Content (%):	75.7	76.3	79.3	79.8

Plastic Limit: 27
Liquid Limit: 77
Plastic Index: 50
Atterberg Classification CH





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File Name: atterberg-ASTM_4318-R6_39-110c.xls Date: 5/23/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-10A
Depth: 46.0-46.5'
Sample Number: Silty/Clayey Sand
Test Date: 4/29/2014
Technician: DPM
Sampled Date: 12/4/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 60c.

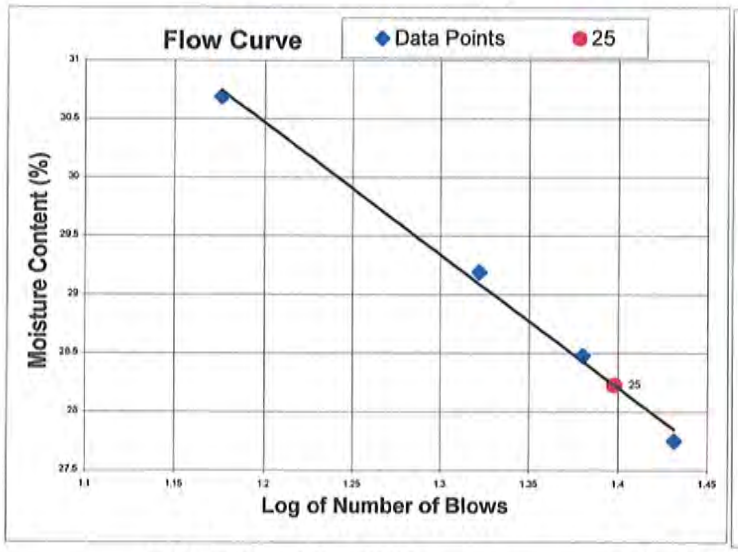
	Sample 1	Sample 2
Weight of Wet Soil & Pan (g):	6.348	6.498
Weight of Dry Soil & Pan (g):	5.602	5.752
Weight of Water (g):	0.746	0.746
Weight of Pan (g):	0.743	0.739
Moisture Content (%):	15.4	14.9

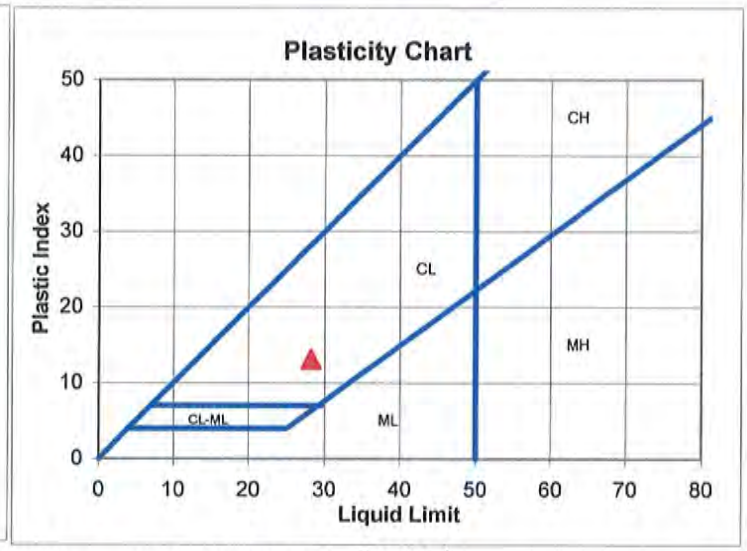
Average: 15.1%
Standard Deviation: 0.3%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	27	24	21	15
Weight of Wet Soil & Pan (g):	14.758	14.824	17.478	14.979
Weight of Dry Soil & Pan (g):	11.718	11.704	13.700	11.641
Weight of Water (g):	3.040	3.120	3.778	3.338
Weight of Pan (g):	0.763	0.741	0.756	0.764
Moisture Content (%):	27.7	28.5	29.2	30.7

Plastic Limit: 15
Liquid Limit: 28
Plastic Index: 13
Atterberg Classification CL





Data Entered By: DPM Date: 5/9/2014 Data Checked By: DAW
File Name: atterberg-ASTM_4318-R6_36-60c.xls Date: 5/22/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-10A
Depth: 46.0-46.5'
Sample Number: Silty/Clayey Sand
Test Date: 4/29/2014
Technician: DPM
Sampled Date: 12/4/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 110c.

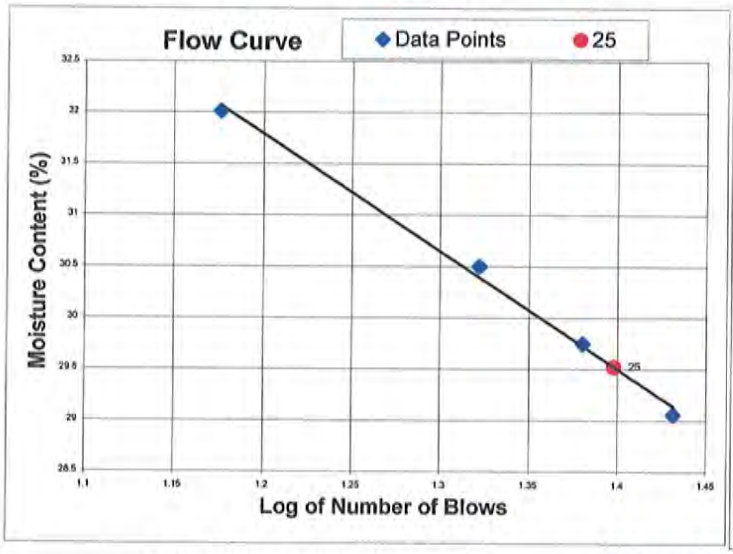
	Sample 1	Sample 2
Weight of Wet Soil & Pan (g):	6.348	6.498
Weight of Dry Soil & Pan (g):	5.555	5.704
Weight of Water (g):	0.793	0.794
Weight of Pan (g):	0.743	0.739
Moisture Content (%):	16.5	16.0

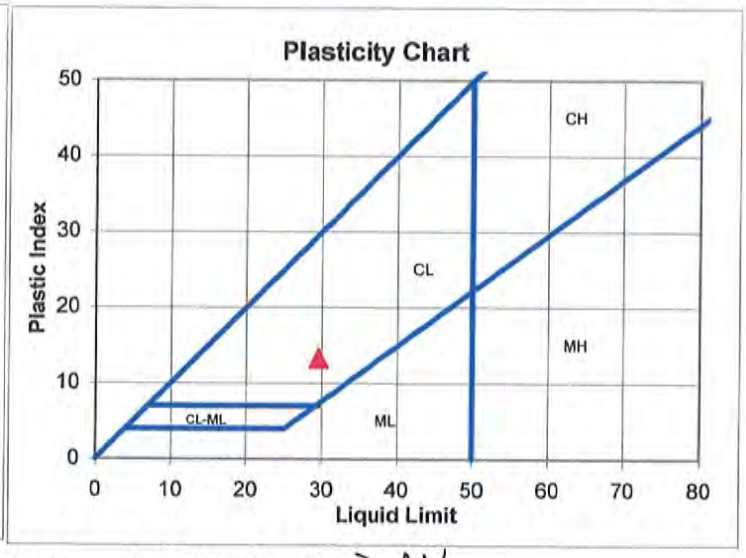
Average: 16.2%
Standard Deviation: 0.3%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	27	24	21	15
Weight of Wet Soil & Pan (g):	14.758	14.824	17.478	14.979
Weight of Dry Soil & Pan (g):	11.607	11.595	13.570	11.532
Weight of Water (g):	3.151	3.229	3.908	3.447
Weight of Pan (g):	0.763	0.741	0.756	0.764
Moisture Content (%):	29.1	29.7	30.5	32.0

Plastic Limit: 16
Liquid Limit: 30
Plastic Index: 13
Atterberg Classification CL





Data Entered By: DPM Date: 5/9/2014 Data Checked By: DAW
File Name: atterberg-ASTM_4318-R6_36-110c.xls Date: 05/22/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B23-06
Depth: 26-27' (25-27.5')
Sample Number: Silty Clay
Test Date: 4/22/2014
Technician: DPM
Sampled Date: 12/6/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

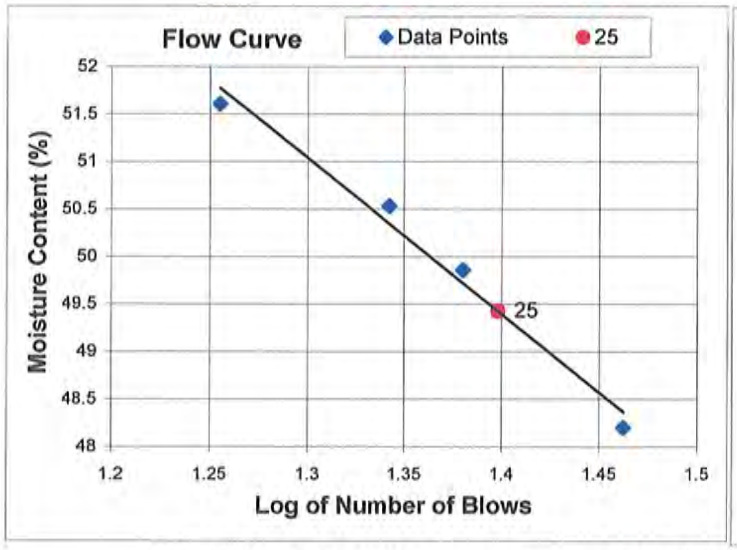
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.535	6.193	6.199
Weight of Dry Soil & Pan (g):	5.623	5.369	5.345
Weight of Water (g):	0.912	0.824	0.854
Weight of Pan (g):	0.772	0.770	0.774
Moisture Content (%):	18.8	17.9	18.7

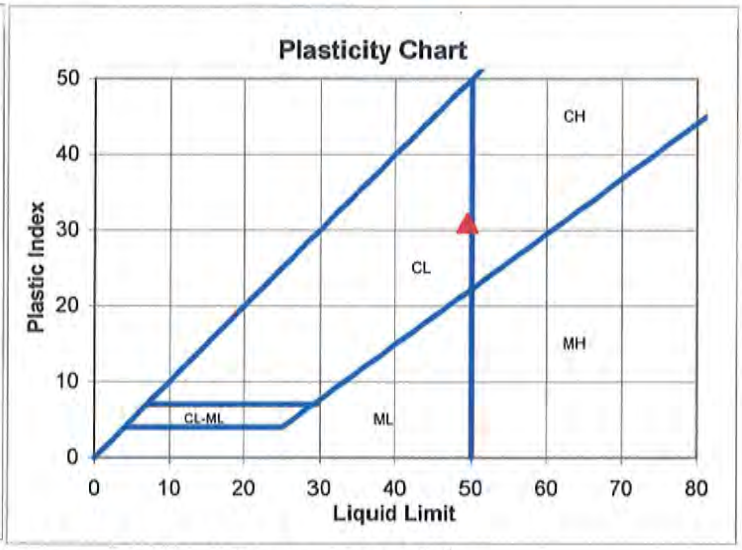
Average: 18.5%
Standard Deviation: 0.5%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	29	24	22	18
Weight of Wet Soil & Pan (g):	16.288	16.376	13.533	15.741
Weight of Dry Soil & Pan (g):	11.240	11.187	9.248	10.639
Weight of Water (g):	5.048	5.189	4.285	5.102
Weight of Pan (g):	0.767	0.779	0.768	0.753
Moisture Content (%):	48.2	49.9	50.5	51.6

Plastic Limit: 18
Liquid Limit: 49
Plastic Index: 31
Atterberg Classification CL





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File Name: 2512_77_atterberg-ASTM_4318-R6_32.x Date: 05/23/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-10
Depth: 28.5-29.5' (27-29.5')
Sample Number: Clayey Fine Sand Tails
Test Date: 4/22/2014
Technician: DPM
Sampled Date: 12/5/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 4/24/2014
File Name: atterberg-ASTM_4318-R6_35.xls

Data Checked By: CKP
Date: 4/29/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-07A
Depth: 21.0-21.5'
Sample Number: Fine Sand Tailings
Test Date: 4/23/2014
Technician: DPM
Sampled Date: 11/27/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 4/24/2014 Data Checked By: CKP
File Name: atterberg-ASTM_4318-R6_33.xls Date: 4/29/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-05
Depth: 15.5-16.0' (15-17.5')
Sample Number: Sand Tailings
Test Date: 4/23/2014
Technician: DPM
Sampled Date: 12/5/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 4/24/2014 Data Checked By: CKP
File Name: atterberg-ASTM_4318-R6_34.xls Date: 4/29/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-04A
Depth: 16.0-16.5'
Sample Number: Sand Tailings
Test Date: 2/28/2014
Technician: DPM
Sampled Date: 11/26/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 3/4/2014
File Name: atterberg-ASTM_4318-R6_17.xls

Data Checked By: bj
Date: 03/06/2014

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-05A
Depth: 16.0-16.5'
Sample Number: Silty Clay w/ Sand
Test Date: 3/12/2014
Technician: DPM
Sampled Date: 11/21/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

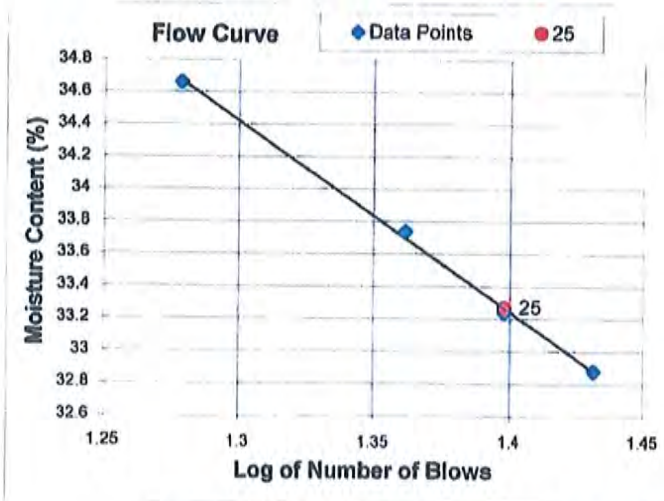
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.756	6.485	6.429
Weight of Dry Soil & Pan (g):	6.059	5.821	5.784
Weight of Water (g):	0.697	0.664	0.645
Weight of Pan (g):	0.764	0.749	0.759
Moisture Content (%):	13.2	13.1	12.8

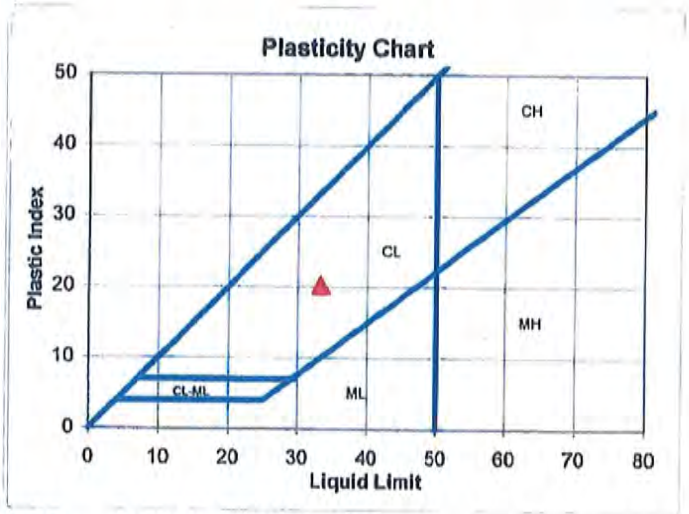
Average: 13.0%
Standard Deviation: 0.2%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	25	27	23	19
Weight of Wet Soil & Pan (g):	13.892	15.609	14.942	16.233
Weight of Dry Soil & Pan (g):	10.615	11.931	11.362	12.246
Weight of Water (g):	3.277	3.678	3.580	3.987
Weight of Pan (g):	0.756	0.744	0.750	0.743
Moisture Content (%):	33.2	32.9	33.7	34.7

Plastic Limit: 13
Liquid Limit: 33
Plastic Index: 20
Atterberg Classification CL





Data Entered By: DPM Date: 3/13/2014
File Name: atterberg-ASTM_4318-R6_21.xls

Data Checked By: hj
Date: 3/14/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-12A
Depth: 36.0-36.5'
Sample Number: Clayey Silt Tailings
Test Date: 3/7/2014
Technician: DPM
Sampled Date: 11/26/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

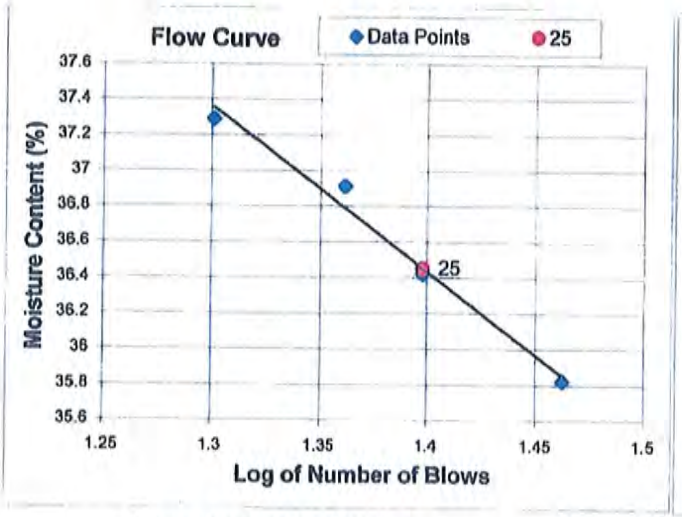
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	5.950	6.088	6.209
Weight of Dry Soil & Pan (g):	5.238	5.367	5.473
Weight of Water (g):	0.712	0.721	0.736
Weight of Pan (g):	0.761	0.729	0.769
Moisture Content (%):	15.9	15.5	15.6

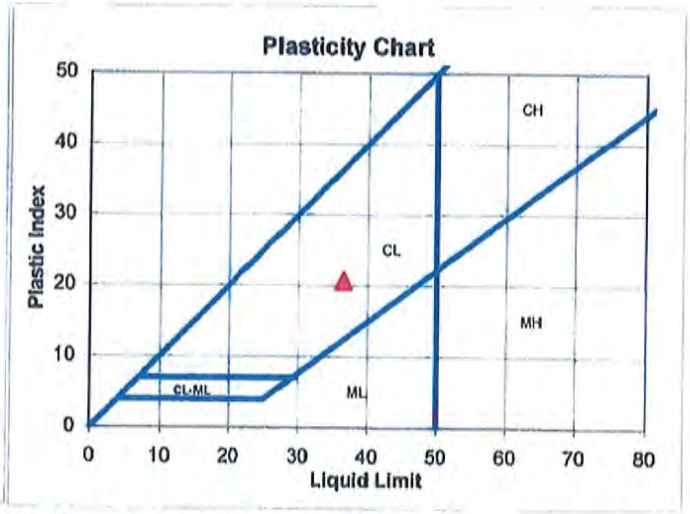
Average: 15.7%
Standard Deviation: 0.2%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	29	23	25	20
Weight of Wet Soil & Pan (g):	13.507	13.608	12.995	12.497
Weight of Dry Soil & Pan (g):	10.147	10.146	9.731	9.311
Weight of Water (g):	3.360	3.462	3.264	3.186
Weight of Pan (g):	0.767	0.767	0.769	0.767
Moisture Content (%):	35.8	36.9	36.4	37.3

Plastic Limit: 16
Liquid Limit: 36
Plastic Index: 21
Atterberg Classification CL





Data Entered By: DPM Date: 3/13/2014
File Name: atterberg-ASTM_4318-R6_20.xls

Data Checked By: bj
Date: 3/14/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-09
Depth: 27.0-27.5' (25-27.5')
Sample Number: Sand Tailings
Test Date: 3/29/2014
Technician: DPM
Sampled Date: 11/21/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Non-Plastic

Liquid Limits

Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 4/10/2014 Data Checked By: KJ
File Name: atterberg-ASTM_4318-R6_27.xls Date: 4/11/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-14A
Depth: 26.0-26.5'
Sample Number: Silty Clay
Test Date: 3/14/2014
Technician: DPM
Sampled Date: 11/20/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

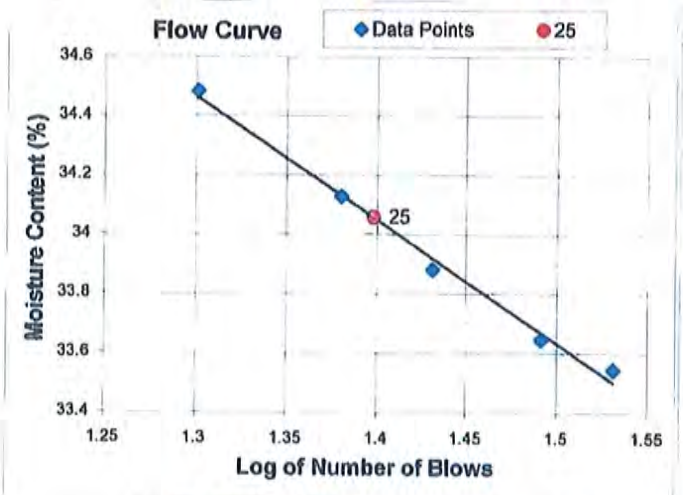
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.828	6.399	6.297
Weight of Dry Soil & Pan (g):	6.038	5.610	5.513
Weight of Water (g):	0.790	0.789	0.784
Weight of Pan (g):	1.024	0.751	0.744
Moisture Content (%):	15.8	16.2	16.4

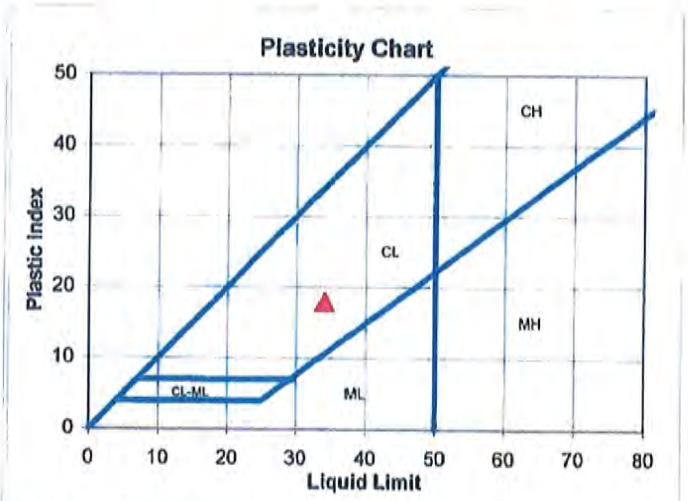
Average: 16.1%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	20	24	27	31	34
Weight of Wet Soil & Pan (g):	14.208	16.872	14.876	15.734	16.537
Weight of Dry Soil & Pan (g):	10.760	12.772	11.306	11.967	12.574
Weight of Water (g):	3.448	4.100	3.570	3.767	3.963
Weight of Pan (g):	0.761	0.758	0.769	0.771	0.760
Moisture Content (%):	34.5	34.1	33.9	33.6	33.5

Plastic Limit: 16
Liquid Limit: 34
Plastic Index: 18
Atterberg Classification CL





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Data Checked By: [illegible]
Date: 4/11/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impounment
Project Number:

Boring Number: TI-B10-14
Depth: 40.0-41.0' (40-42.5')
Sample Number: Clayey Silt Tailings
Test Date: 3/29/2014
Technician: DPM
Sampled Date: 11/26/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

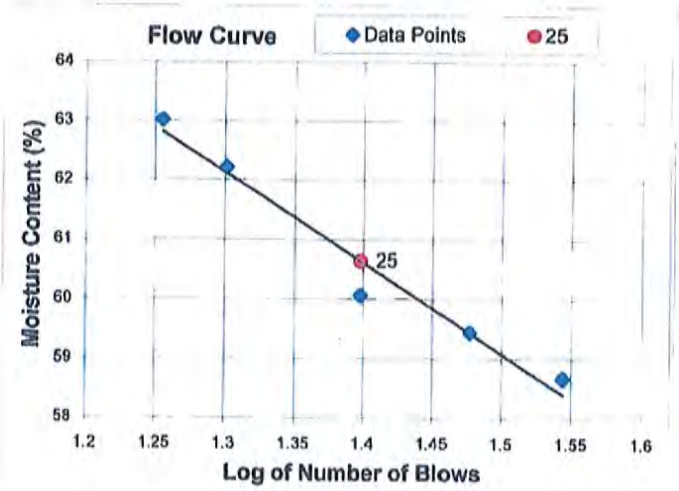
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.020	6.032	5.837
Weight of Dry Soil & Pan (g):	5.155	5.182	5.016
Weight of Water (g):	0.865	0.850	0.821
Weight of Pan (g):	1.012	1.004	1.008
Moisture Content (%):	20.9	20.3	20.5

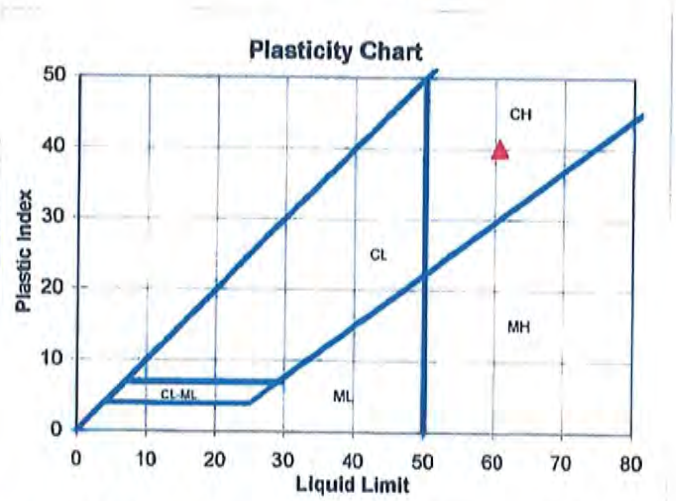
Average: 20.6%
Standard Deviation: 0.3%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	35	30	25	20	18
Weight of Wet Soil & Pan (g):	15.070	12.400	13.564	11.815	14.478
Weight of Dry Soil & Pan (g):	9.874	8.152	8.849	7.681	9.274
Weight of Water (g):	5.196	4.248	4.715	4.134	5.204
Weight of Pan (g):	1.018	1.006	0.999	1.036	1.016
Moisture Content (%):	58.7	59.4	60.1	62.2	63.0

Plastic Limit: 21
Liquid Limit: 61
Plastic Index: 40
Atterberg Classification CH





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File Name: atterberg-ASTM_4318-R6_29.xls

Data Checked By: bj
Date: 4/11/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-08A
Depth: 26.0-26.5'
Sample Number: Clayey Silt Tailings
Test Date: 3/14/2014
Technician: DPM
Sampled Date: 11/26/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

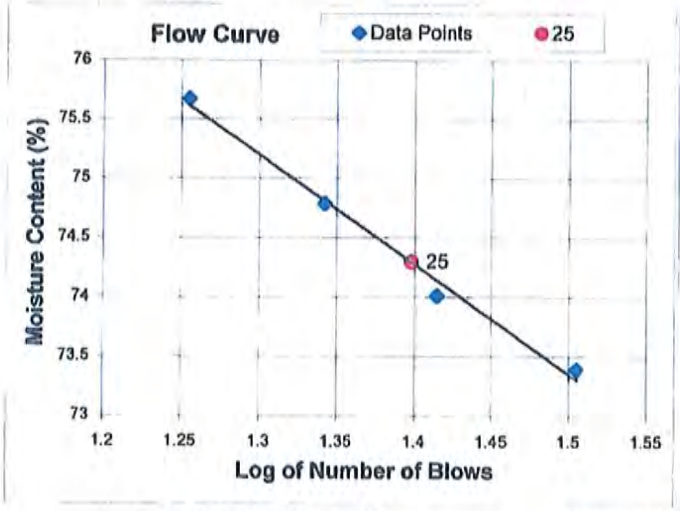
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.081	6.082	5.875
Weight of Dry Soil & Pan (g):	5.003	4.993	4.850
Weight of Water (g):	1.078	1.089	1.025
Weight of Pan (g):	0.997	1.009	1.025
Moisture Content (%):	26.9	27.3	26.8

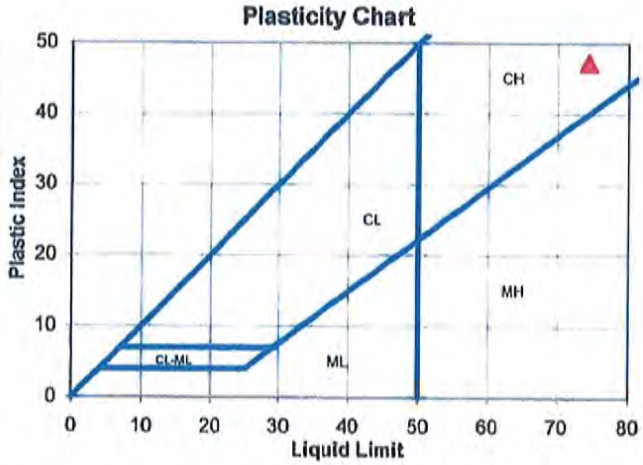
Average: 27.0%
Standard Deviation: 0.3%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	32	26	25	18	22
Weight of Wet Soil & Pan (g):	14.462	14.569	14.101	13.907	16.284
Weight of Dry Soil & Pan (g):	8.785	8.803	8.524	8.355	9.750
Weight of Water (g):	5.677	5.766	5.577	5.552	6.534
Weight of Pan (g):	1.050	1.012	1.018	1.018	1.013
Moisture Content (%):	73.4	74.0	74.3	75.7	74.8

Plastic Limit: 27
Liquid Limit: 74
Plastic Index: 47
Atterberg Classification CH





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File Name: atterberg-ASTM_4318-R6_23.xls

Data Checked By: bj
Date: 4/11/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-10
Depth: 32-32.5' (30.0-32.5')
Sample Number: Bottom of the tube
Test Date: 3/21/2014
Technician: DPM
Sampled Date: 11/26/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits Non-Plastic

Liquid Limits Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 4/10/2014 Data Checked By: hj
File Name: atterberg-ASTM_4318-R6_26.xls Date: 4/11/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-15A
Depth: 41.1-41.5'
Sample Number: Sandy Clay
Test Date: 3/29/2014
Technician: DPM
Sampled Date: 11/21/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

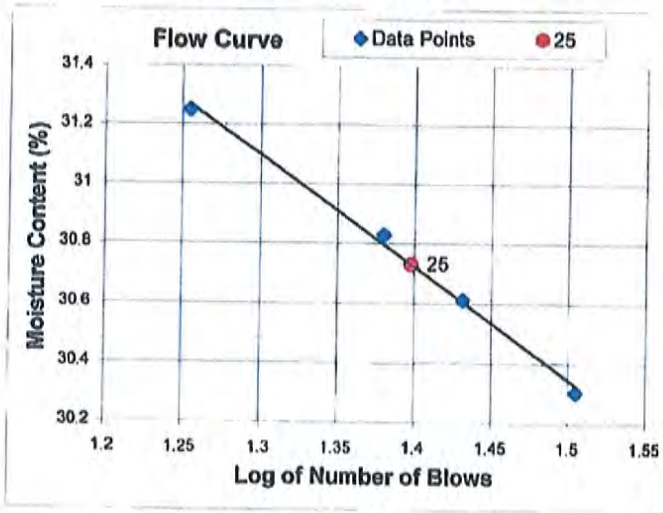
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.790	6.830	6.911
Weight of Dry Soil & Pan (g):	6.051	6.093	6.164
Weight of Water (g):	0.739	0.737	0.747
Weight of Pan (g):	1.005	0.981	0.967
Moisture Content (%):	14.6	14.4	14.4

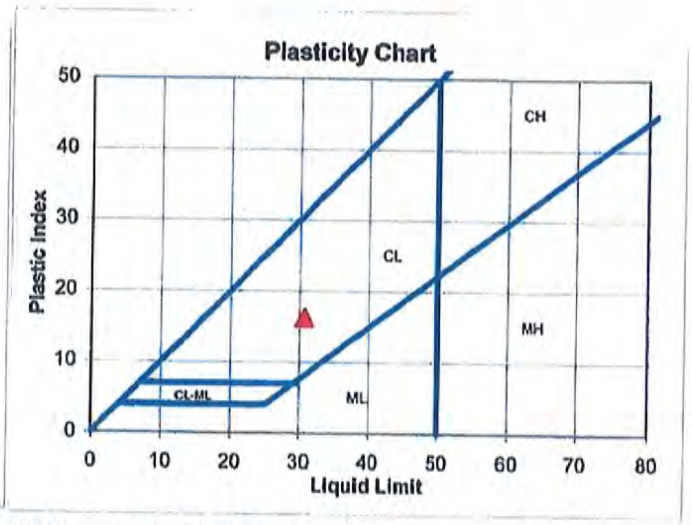
Average: 14.5%
Standard Deviation: 0.1%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	18	24	27	32
Weight of Wet Soil & Pan (g):	15.605	15.144	14.679	14.080
Weight of Dry Soil & Pan (g):	12.127	11.808	11.477	11.048
Weight of Water (g):	3.478	3.336	3.202	3.032
Weight of Pan (g):	0.997	0.987	1.017	1.043
Moisture Content (%):	31.2	30.8	30.6	30.3

Plastic Limit: 14
Liquid Limit: 31
Plastic Index: 16
Atterberg Classification CL





Data Entered By: DPM
Date: 4/14/2014
File Name: atterberg-ASTM_4318-R6_24.xls

Data Checked By: bj
Date: 4/18/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-12
Depth: 32-33' (32-34.5')
Sample Number: Sand Tailings (V. fine, Clayey)
Test Date: 4/15/2014
Technician: DPM
Sampled Date: 11/21/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

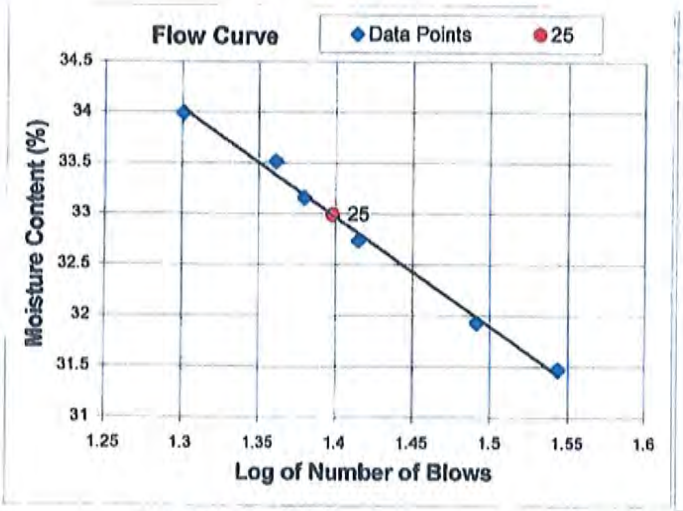
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.599	6.284	6.556
Weight of Dry Soil & Pan (g):	5.795	5.523	5.794
Weight of Water (g):	0.804	0.761	0.762
Weight of Pan (g):	0.742	0.729	0.760
Moisture Content (%):	15.9	15.9	15.1

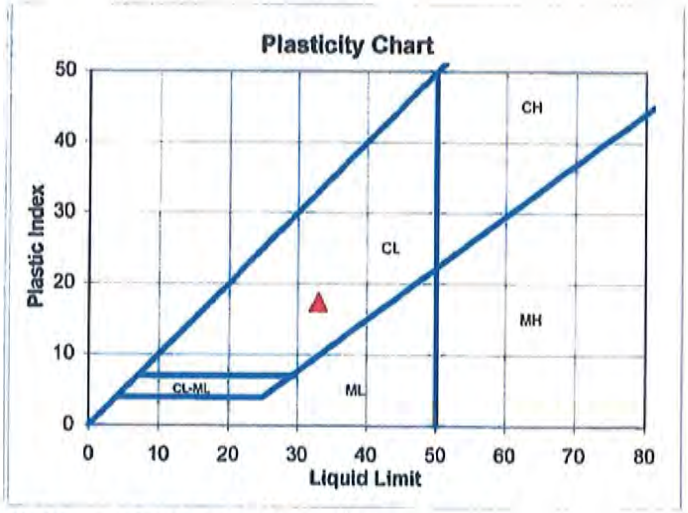
Average: 15.6%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Number of Blows:	20	23	24	26	31	35
Weight of Wet Soil & Pan (g):	12.709	13.846	13.569	12.908	13.336	13.679
Weight of Dry Soil & Pan (g):	9.679	10.563	10.382	9.909	10.290	10.583
Weight of Water (g):	3.030	3.283	3.187	2.999	3.046	3.096
Weight of Pan (g):	0.765	0.767	0.769	0.747	0.750	0.744
Moisture Content (%):	34.0	33.5	33.2	32.7	31.9	31.5

Plastic Limit: 16
Liquid Limit: 33
Plastic Index: 17
Atterberg Classification CL





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File Name: atterberg-ASTM_4318-R6_30.xls

Data Checked By: bs
Date: 4/18/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-10
Depth: 30.3-30.7' (30-32.5')
Sample Number: Top of Tube - Fine
Test Date: 4/16/2014
Technician: DPM
Sampled Date: 11/26/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

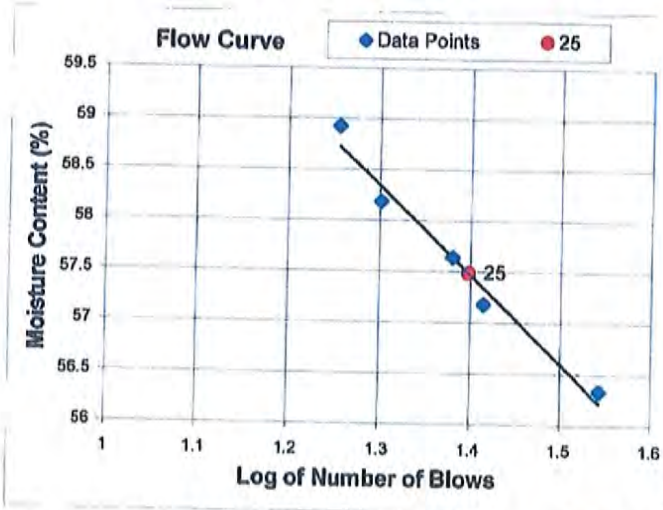
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.017	6.004	6.050
Weight of Dry Soil & Pan (g):	5.048	5.044	5.081
Weight of Water (g):	0.969	0.960	0.969
Weight of Pan (g):	0.754	0.735	0.756
Moisture Content (%):	22.6	22.3	22.4

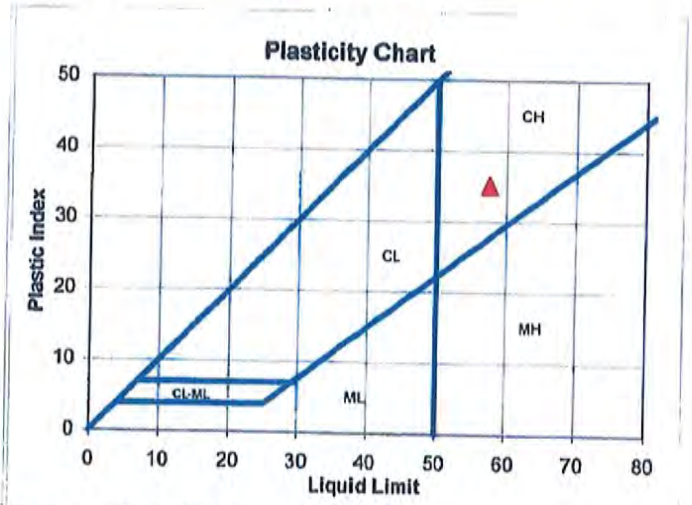
Average: 22.4%
Standard Deviation: 0.1%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	35	26	24	20	18
Weight of Wet Soil & Pan (g):	12.559	12.938	15.069	12.788	14.269
Weight of Dry Soil & Pan (g):	8.307	8.507	9.837	8.359	9.261
Weight of Water (g):	4.252	4.431	5.232	4.429	5.008
Weight of Pan (g):	0.759	0.758	0.760	0.747	0.762
Moisture Content (%):	56.3	57.2	57.6	58.2	58.9

Plastic Limit: 22
Liquid Limit: 57
Plastic Index: 35
Atterberg Classification CH





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Date: 4/17/2014
File Name: atterberg-ASTM_4318-R6_31.xls

Data Checked By: bj
Date: 4/18/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: TI-B3-08A
Depth: 46.0-46.5'
Sample Number: Silty Clay
Test Date: 2/10/2014
Technician: DPM
Sampled Date: 11/19/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

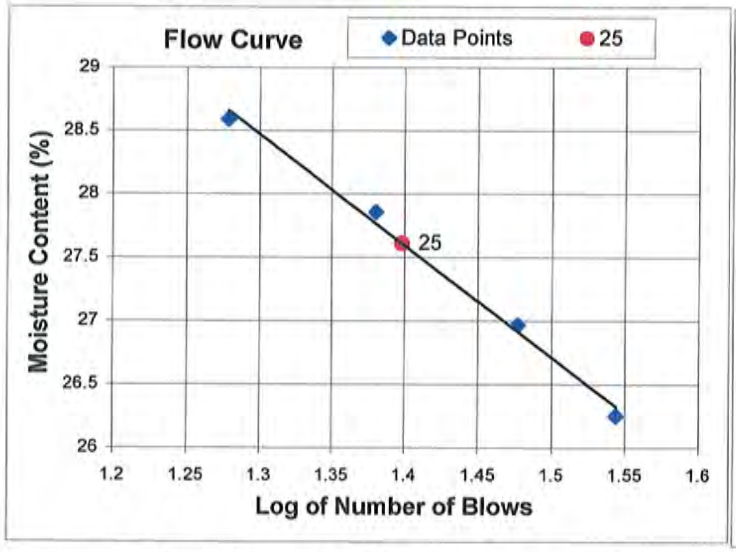
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.938	6.725	6.502
Weight of Dry Soil & Pan (g):	6.241	6.035	5.872
Weight of Water (g):	0.697	0.690	0.630
Weight of Pan (g):	0.757	0.766	0.748
Moisture Content (%):	12.7	13.1	12.3

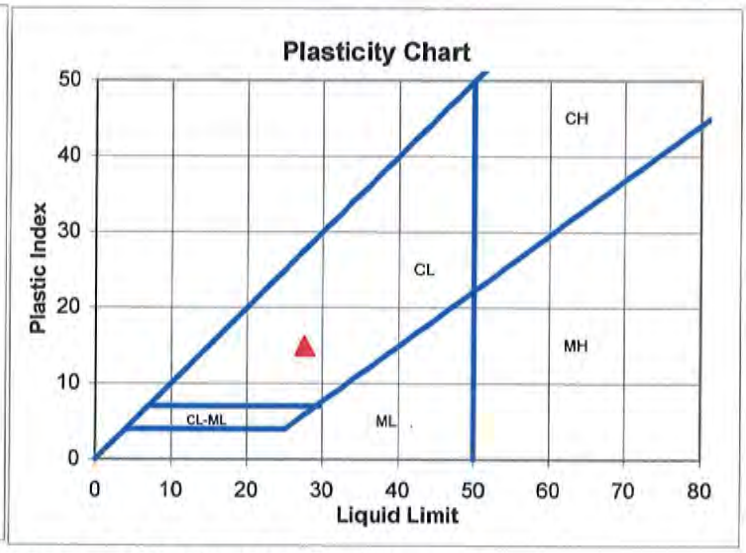
Average: 12.7%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	35	30	24	19
Weight of Wet Soil & Pan (g):	16.804	14.996	15.489	11.259
Weight of Dry Soil & Pan (g):	13.465	11.971	12.276	8.925
Weight of Water (g):	3.339	3.025	3.213	2.334
Weight of Pan (g):	0.746	0.753	0.742	0.761
Moisture Content (%):	26.3	27.0	27.9	28.6

Plastic Limit: 13
Liquid Limit: 28
Plastic Index: 15
Atterberg Classification CL





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File Name: atterberg-ASTM_4318-R6_14.xls

Data Checked By: bj
Date: 2/14/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: TI-B3-04A
Depth: 26.0-26.5'
Sample Number: Silty Clay
Test Date: 2/10/2014
Technician: DPM
Sampled Date: 11/19/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

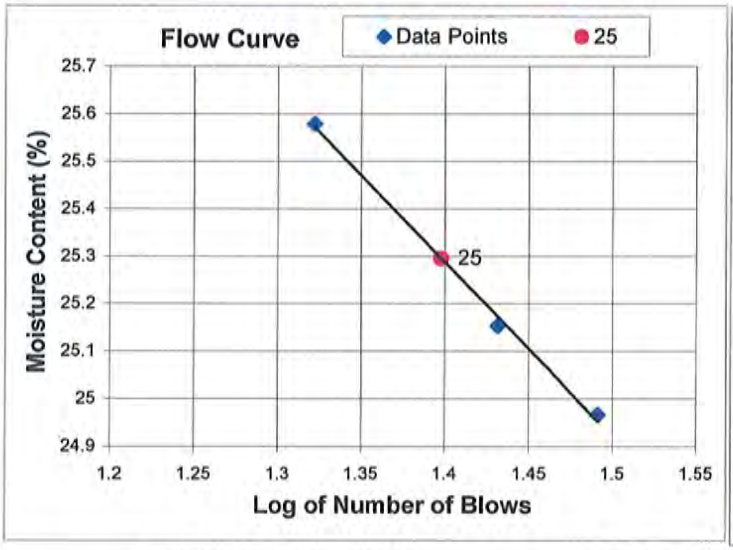
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.682	6.361	6.429
Weight of Dry Soil & Pan (g):	5.977	5.701	5.794
Weight of Water (g):	0.705	0.660	0.635
Weight of Pan (g):	0.730	0.773	0.777
Moisture Content (%):	13.4	13.4	12.7

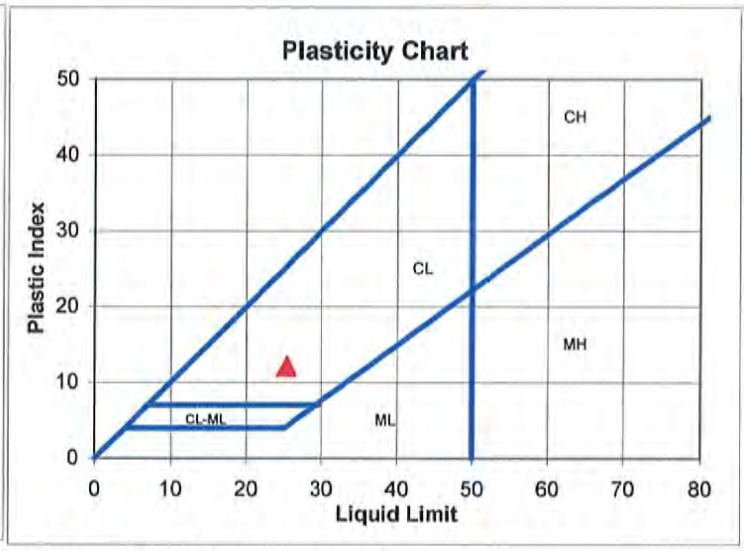
Average: 13.2%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	21	27	31
Weight of Wet Soil & Pan (g):	15.310	16.899	15.564
Weight of Dry Soil & Pan (g):	12.348	13.655	12.608
Weight of Water (g):	2.962	3.244	2.956
Weight of Pan (g):	0.768	0.758	0.768
Moisture Content (%):	25.6	25.2	25.0

Plastic Limit: 13
Liquid Limit: 25
Plastic Index: 12
Atterberg Classification CL





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File Name: atterberg-ASTM_4318-R6_13.xls

Data Checked By: bi
Date: 2/14/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-20A
Depth: 66.0-66.5'
Sample Number: Silty Sand
Test Date: 3/17/2014
Technician: DPM
Sampled Date: 11/26/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits Non-Plastic

Liquid Limits Non-Plastic

Atterberg Classification NP

Data Entered By: DPM Date: 3/21/2014 Data Checked By: bj
File Name: atterberg-ASTM_4318-R6_25.xls Date: 03/24/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-11A
Depth: 31.0-31.5'
Sample Number: Sand Tailings (V. Fine Clayey)
Test Date: 5/7/2014
Technician: DPM
Sampled Date: 11/21/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 60c.

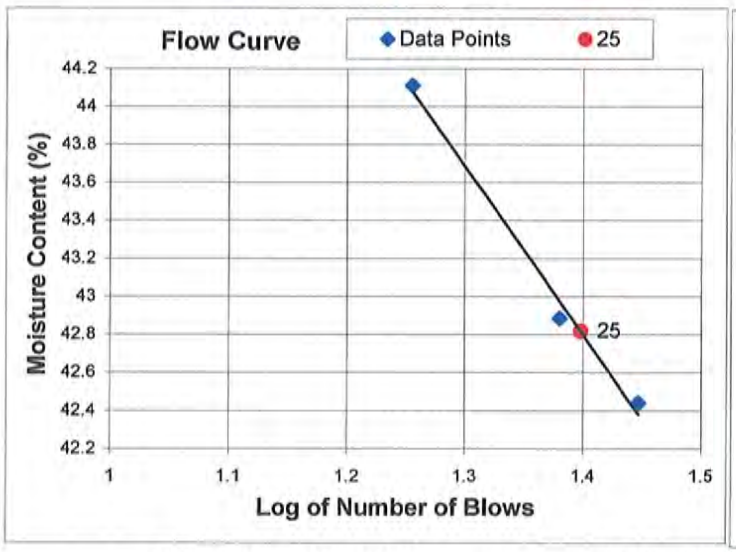
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.846	6.782	6.784
Weight of Dry Soil & Pan (g):	6.030	6.003	6.010
Weight of Water (g):	0.816	0.779	0.774
Weight of Pan (g):	1.149	1.121	1.136
Moisture Content (%):	16.7	16.0	15.9

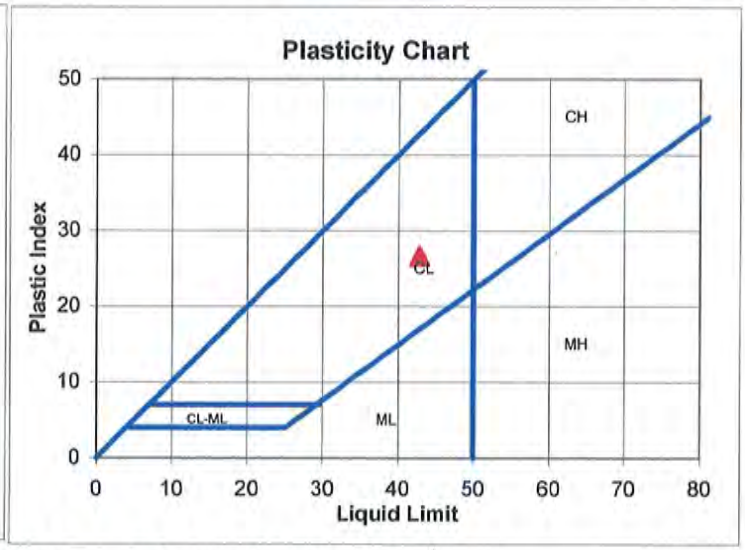
Average: 16.2%
Standard Deviation: 0.5%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	28	24	18
Weight of Wet Soil & Pan (g):	14.338	12.470	13.759
Weight of Dry Soil & Pan (g):	10.417	9.065	9.891
Weight of Water (g):	3.921	3.405	3.868
Weight of Pan (g):	1.178	1.125	1.122
Moisture Content (%):	42.4	42.9	44.1

Plastic Limit: 16
Liquid Limit: 43
Plastic Index: 27
Atterberg Classification CL





Data Entered By: DPM Date: 5/9/2014
File Name: atterberg-ASTM_4318-R6_44-60c.xls

Data Checked By: DAW
Date: 05/23/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-11A
Depth: 31.0-31.5'
Sample Number: Sand Tailings (V. Fine Clayey)
Test Date: 5/7/2014
Technician: DPM
Sampled Date: 11/21/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 110c.

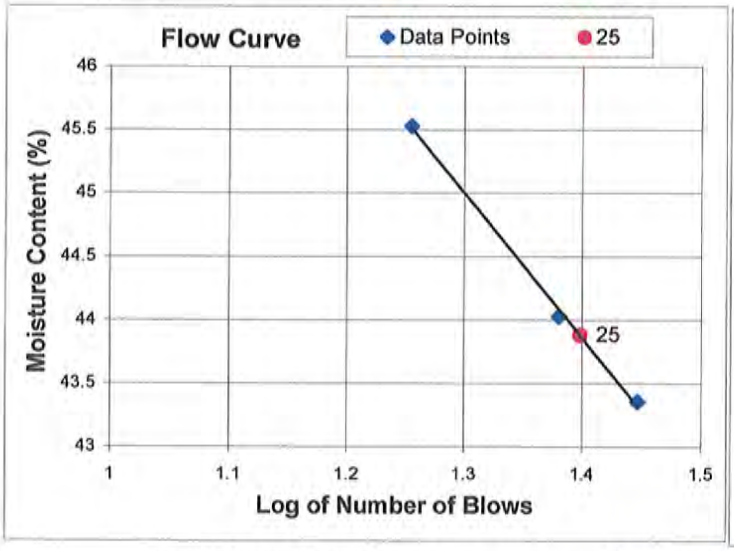
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.846	6.782	6.784
Weight of Dry Soil & Pan (g):	5.994	5.969	5.973
Weight of Water (g):	0.852	0.813	0.811
Weight of Pan (g):	1.149	1.121	1.136
Moisture Content (%):	17.6	16.8	16.8

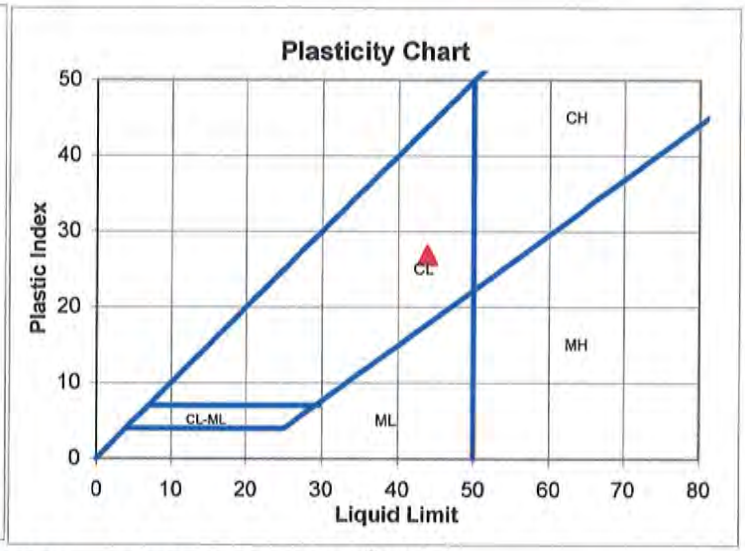
Average: 17.0%
Standard Deviation: 0.5%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	28	24	18
Weight of Wet Soil & Pan (g):	14.338	12.470	13.860
Weight of Dry Soil & Pan (g):	10.358	9.002	9.878
Weight of Water (g):	3.980	3.468	3.982
Weight of Pan (g):	1.178	1.125	1.132
Moisture Content (%):	43.4	44.0	45.5

Plastic Limit: 17
Liquid Limit: 44
Plastic Index: 27
Atterberg Classification CL





Data Entered By: DPM Date: 5/9/2014 Data Checked By: DAW
File Name: atterberg-ASTM_4318-R6_44-110c.xls Date: 05/23/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-10
Depth: 56-57' (55-57')
Sample Number: Silty Clay
Test Date: 5/7/2014
Technician: DPM
Sampled Date: 11/19/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 60c.

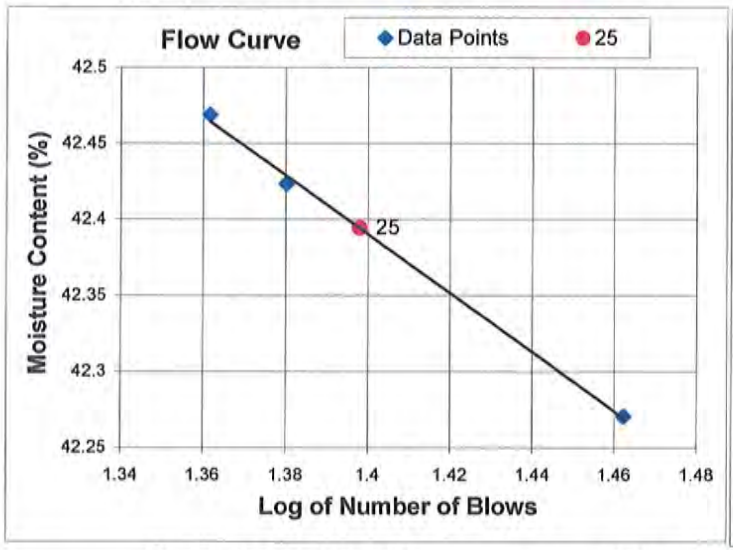
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.685	6.577	6.669
Weight of Dry Soil & Pan (g):	6.068	5.967	6.055
Weight of Water (g):	0.617	0.610	0.614
Weight of Pan (g):	1.141	1.145	1.147
Moisture Content (%):	12.5	12.7	12.5

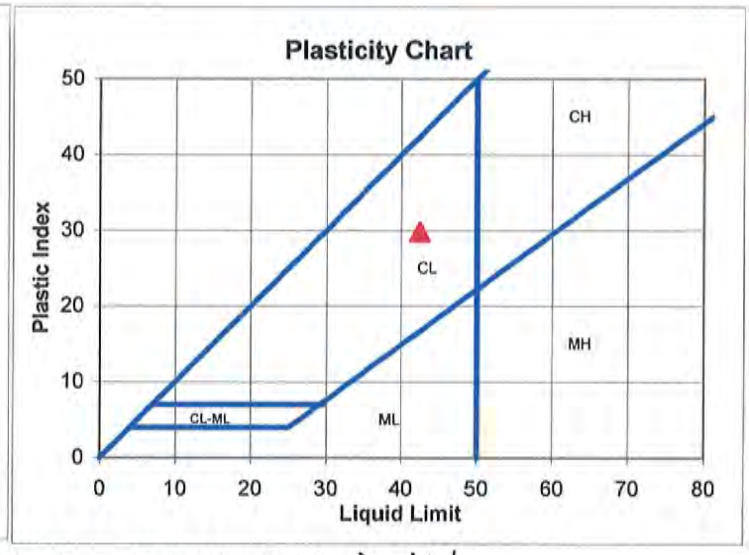
Average: 12.6%
Standard Deviation: 0.1%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	23	24	29
Weight of Wet Soil & Pan (g):	12.698	15.305	13.182
Weight of Dry Soil & Pan (g):	9.247	11.086	9.600
Weight of Water (g):	3.451	4.219	3.582
Weight of Pan (g):	1.121	1.141	1.126
Moisture Content (%):	42.5	42.4	42.3

Plastic Limit: 13
Liquid Limit: 42
Plastic Index: 30
Atterberg Classification CL





Data Entered By: DPM Date: 5/9/2014
File Name: atterberg-ASTM_4318-R6_49.xls

Data Checked By: DAW
Date: 05/23/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-10
Depth: 56-57' (55-57')
Sample Number: Silty Clay
Test Date: 5/7/2014
Technician: DPM
Sampled Date: 11/19/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 110c.

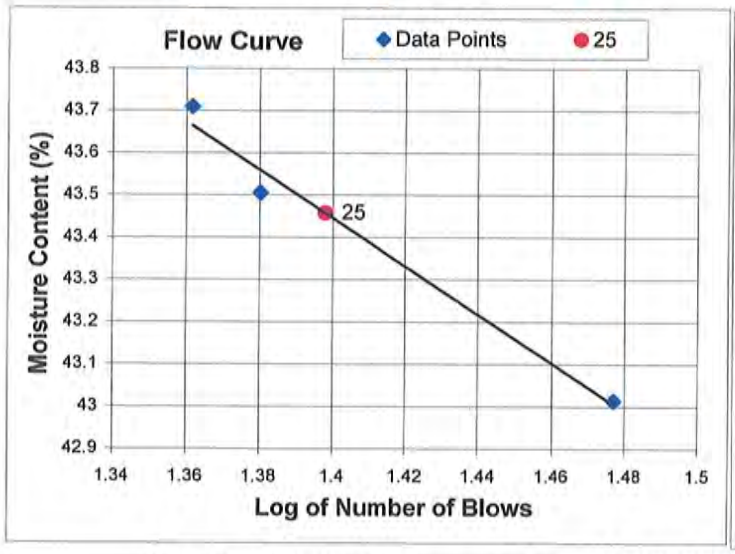
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.685	6.577	6.669
Weight of Dry Soil & Pan (g):	6.024	5.925	6.014
Weight of Water (g):	0.661	0.652	0.655
Weight of Pan (g):	1.141	1.145	1.147
Moisture Content (%):	13.5	13.6	13.5

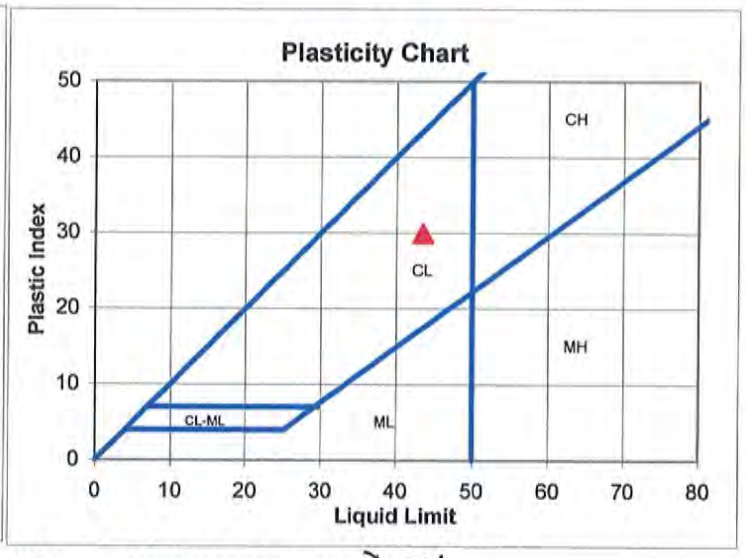
Average: 13.5%
Standard Deviation: 0.1%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	24	30	23
Weight of Wet Soil & Pan (g):	15.305	14.857	14.719
Weight of Dry Soil & Pan (g):	11.011	10.732	10.595
Weight of Water (g):	4.294	4.125	4.124
Weight of Pan (g):	1.141	1.142	1.160
Moisture Content (%):	43.5	43.0	43.7

Plastic Limit: 14
Liquid Limit: 43
Plastic Index: 30
Atterberg Classification CL





Data Entered By: DPM Date: 5/9/2014 Data Checked By: DAW
File Name: atterberg-ASTM_4318-R6_49-110c.xls Date: 05/23/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-03
Depth: 21.0-22.0' (20-22.4')
Sample Number: Silty Clay
Test Date: 5/5/2014
Technician: DPM
Sampled Date: 11/19/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 60c.

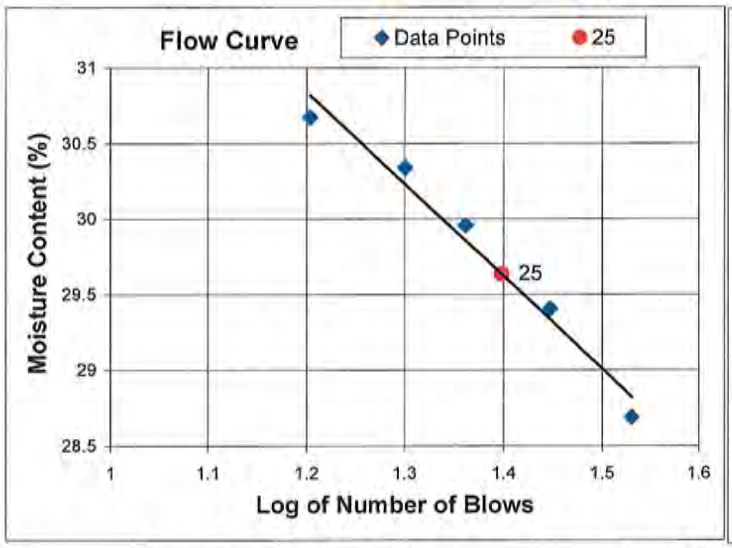
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.241	6.394	6.368
Weight of Dry Soil & Pan (g):	5.659	5.815	5.757
Weight of Water (g):	0.582	0.579	0.611
Weight of Pan (g):	0.773	0.746	0.763
Moisture Content (%):	11.9	11.4	12.2

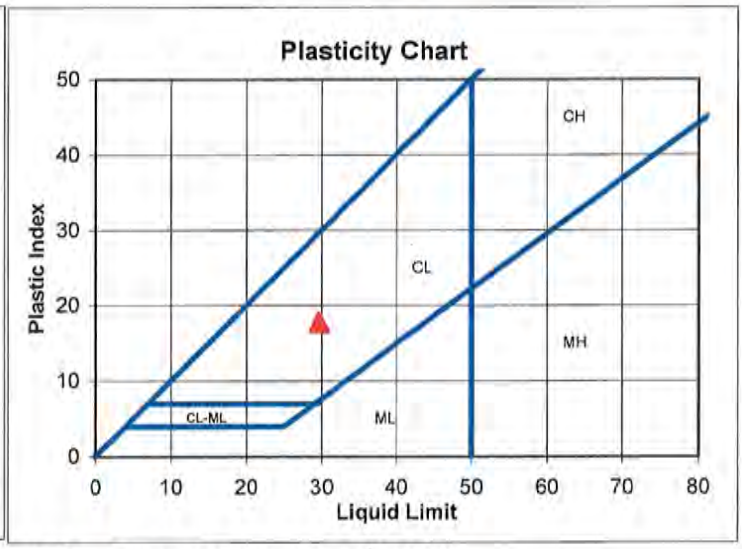
Average: 11.9%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	16	20	23	28	34
Weight of Wet Soil & Pan (g):	14.153	15.194	12.727	17.673	14.217
Weight of Dry Soil & Pan (g):	11.009	11.935	10.060	13.917	11.300
Weight of Water (g):	3.144	3.259	2.667	3.756	2.917
Weight of Pan (g):	0.758	1.192	1.157	1.143	1.132
Moisture Content (%):	30.7	30.3	30.0	29.4	28.7

Plastic Limit: 12
Liquid Limit: 30
Plastic Index: 18
Atterberg Classification CL





Data Entered By: DPM Date: 5/23/2014 Data Checked By: DAW
File Name: atterberg-ASTM_4318-R6_41-60c.xls Date: 05/23/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-03
Depth: 21.0-22.0' (20-22.4')
Sample Number: Silty Clay
Test Date: 5/5/2014
Technician: DPM
Sampled Date: 11/19/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 110c.

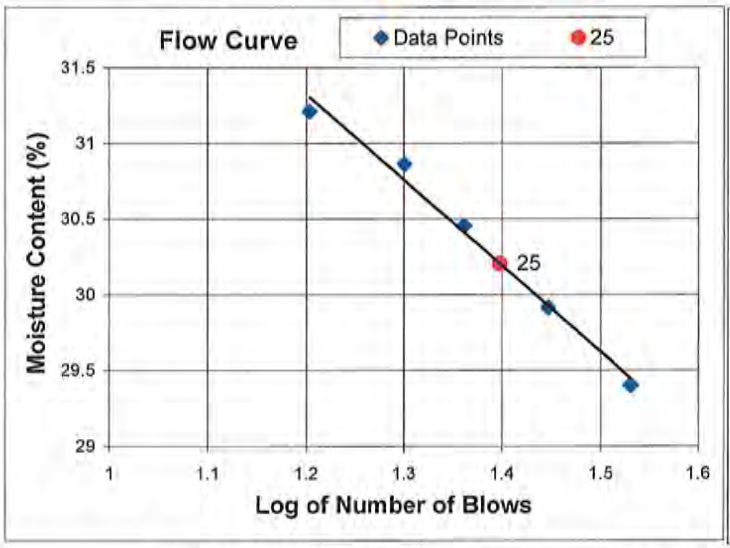
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.241	6.394	6.368
Weight of Dry Soil & Pan (g):	5.644	5.798	5.740
Weight of Water (g):	0.597	0.596	0.628
Weight of Pan (g):	0.773	0.746	0.763
Moisture Content (%):	12.3	11.8	12.6

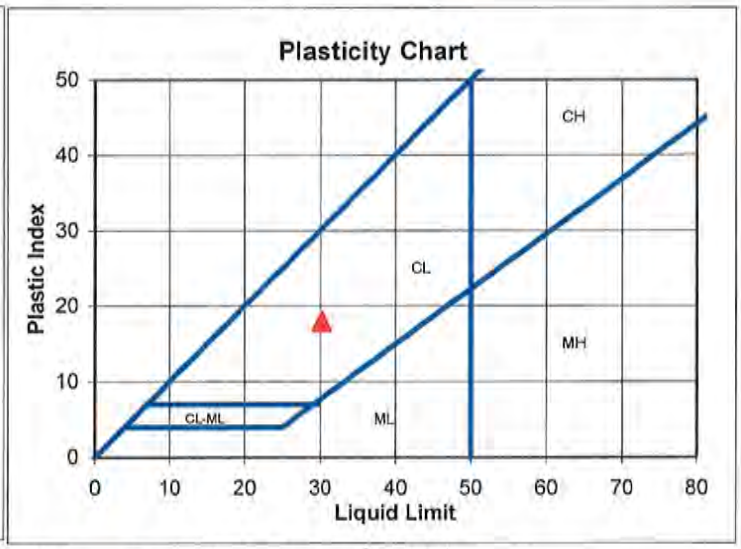
Average: 12.2%
Standard Deviation: 0.4%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	16	20	23	28	34
Weight of Wet Soil & Pan (g):	14.153	15.194	12.727	17.673	14.217
Weight of Dry Soil & Pan (g):	10.967	11.892	10.026	13.867	11.244
Weight of Water (g):	3.186	3.302	2.701	3.806	2.973
Weight of Pan (g):	0.758	1.192	1.157	1.143	1.132
Moisture Content (%):	31.2	30.9	30.5	29.9	29.4

Plastic Limit: 12
Liquid Limit: 30
Plastic Index: 18
Atterberg Classification CL





Data Entered By: DPM Date: 5/23/2014 Data Checked By: DAW
File Name: atterberg-ASTM_4318-R6_41-110c.xls Date: 05/23/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-06
Depth: 35-36' (35-37.3')
Sample Number: Silty Clay
Test Date: 5/7/2014
Technician: DPM
Sampled Date: 11/19/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 60c.

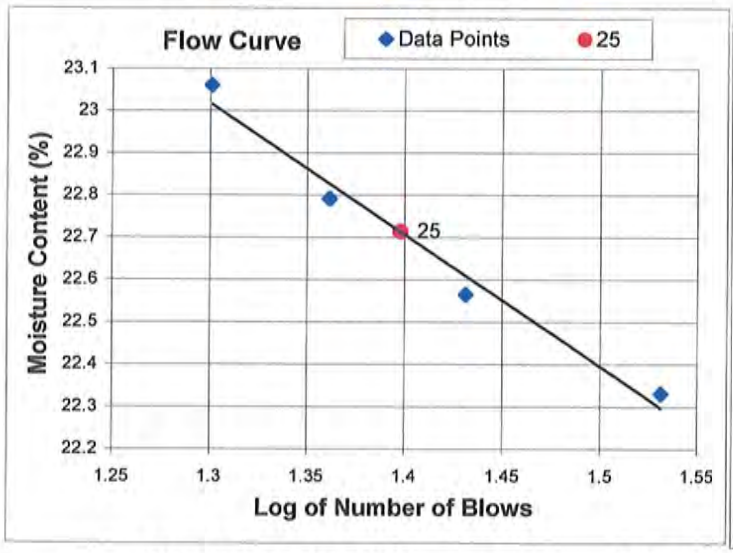
	Sample 1	Sample 2
Weight of Wet Soil & Pan (g):	7.147	7.001
Weight of Dry Soil & Pan (g):	6.420	6.329
Weight of Water (g):	0.727	0.672
Weight of Pan (g):	1.144	1.143
Moisture Content (%):	13.8	13.0

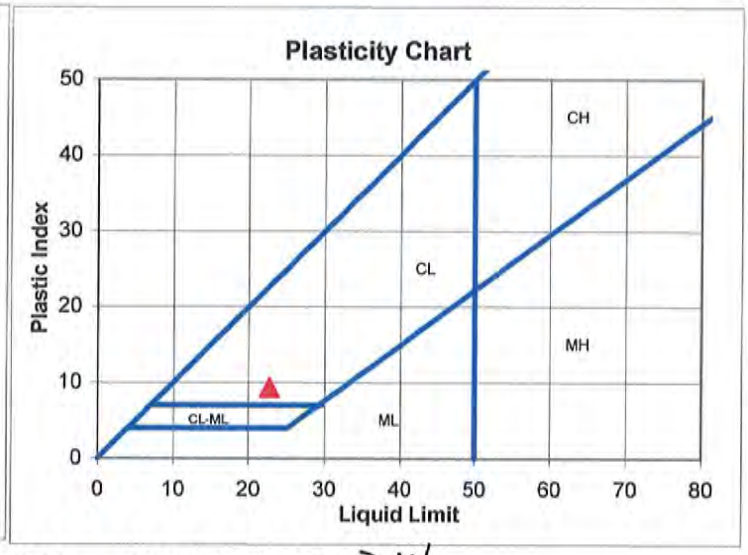
Average: 13.4%
Standard Deviation: 0.6%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	20	23	27	34
Weight of Wet Soil & Pan (g):	16.589	13.566	14.396	13.991
Weight of Dry Soil & Pan (g):	13.691	11.257	11.962	11.644
Weight of Water (g):	2.898	2.309	2.434	2.347
Weight of Pan (g):	1.124	1.126	1.175	1.134
Moisture Content (%):	23.1	22.8	22.6	22.3

Plastic Limit: 13
Liquid Limit: 23
Plastic Index: 9
Atterberg Classification CL





Data Entered By: DPM Date: 5/9/2014
File Name: atterberg-ASTM_4318-R6_51-60c.xls

Data Checked By: DAW
Date: 05/22/14

ATT
ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-06
Depth: 35-36' (35-37.3')
Sample Number: Silty Clay
Test Date: 5/7/2014
Technician: DPM
Sampled Date: 11/19/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

Note: The sample was dried at 110c.

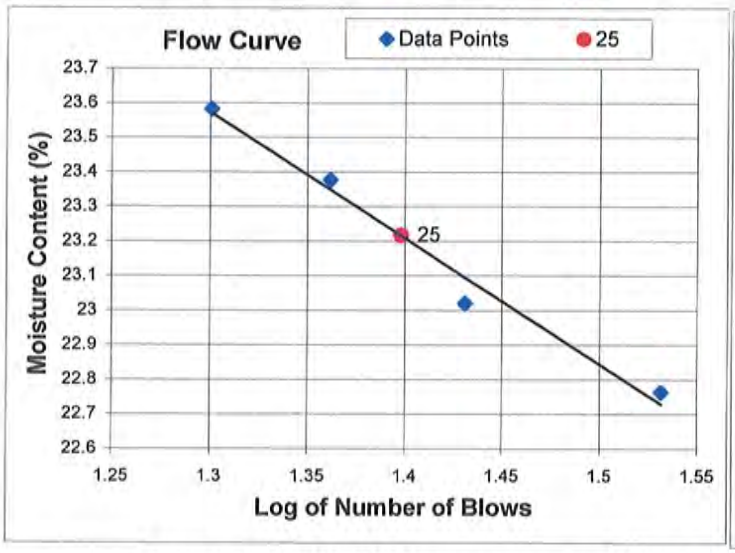
	Sample 1	Sample 2
Weight of Wet Soil & Pan (g):	7.147	7.001
Weight of Dry Soil & Pan (g):	6.396	6.301
Weight of Water (g):	0.751	0.700
Weight of Pan (g):	1.144	1.143
Moisture Content (%):	14.3	13.6

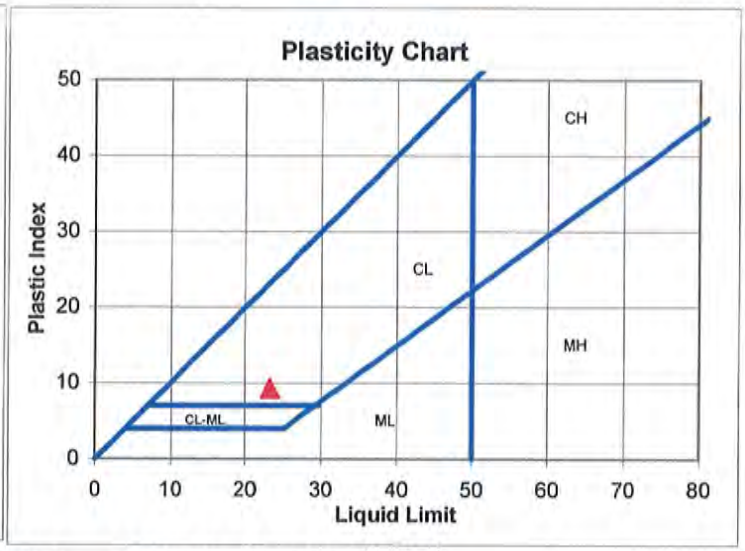
Average: 13.9%
Standard Deviation: 0.5%

Liquid Limits

	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	20	23	27	34
Weight of Wet Soil & Pan (g):	16.589	13.566	14.396	13.991
Weight of Dry Soil & Pan (g):	13.638	11.209	11.922	11.607
Weight of Water (g):	2.951	2.357	2.474	2.384
Weight of Pan (g):	1.124	1.126	1.175	1.134
Moisture Content (%):	23.6	23.4	23.0	22.8

Plastic Limit: 14
Liquid Limit: 23
Plastic Index: 9
Atterberg Classification CL





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File Name: atterberg-ASTM_4318-R6_51-110c.xls Date: 05/22/14

ADVANCED TERRA TESTING

Atterberg Limits Test
ASTM D 4318

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: -

Boring Number: TI-B10-06
Depth: 21.5-22.5' (20.0-22.5')
Sample Number: Clayey Silt Tailings
Test Date: 2/11/2014
Technician: DPM
Sampled Date: 11/26/2013
Sampled By: MWH
Method: Method A

Test Configuration

Liquid Limits Device: 1080
Material Size of Fines: -#40

Plastic Limits

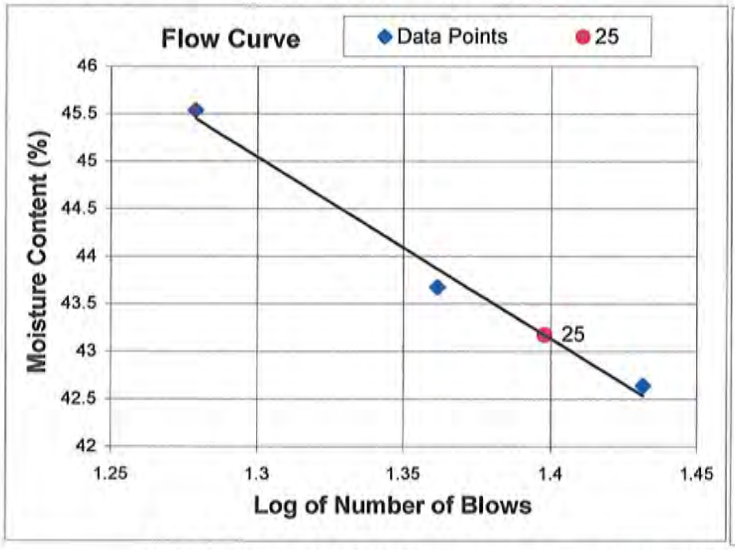
	Sample 1	Sample 2	Sample 3
Weight of Wet Soil & Pan (g):	6.443	6.361	6.268
Weight of Dry Soil & Pan (g):	5.547	5.473	5.415
Weight of Water (g):	0.896	0.888	0.853
Weight of Pan (g):	0.764	0.761	0.760
Moisture Content (%):	18.7	18.8	18.3

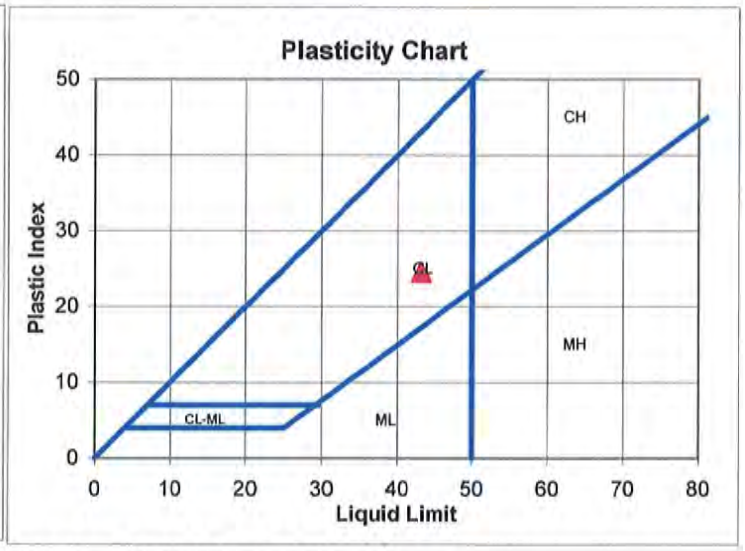
Average: 18.6%
Standard Deviation: 0.3%

Liquid Limits

	Sample 1	Sample 2	Sample 3
Number of Blows:	19	23	27
Weight of Wet Soil & Pan (g):	14.949	13.477	15.777
Weight of Dry Soil & Pan (g):	10.506	9.608	11.285
Weight of Water (g):	4.443	3.869	4.492
Weight of Pan (g):	0.749	0.749	0.750
Moisture Content (%):	45.5	43.7	42.6

Plastic Limit: 19
Liquid Limit: 43
Plastic Index: 25
Atterberg Classification CL





Data Entered By: DPM Date: 2/12/2014
File Name: atterberg-ASTM_4318-R6_15.xls

Data Checked By: bj
Date: 2/14/14

ADVANCED TERRA TESTING

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT:	MWH	JOB NO.	2512-77
SOIL DESCR.	Church Rock	LOCATION	Tailings Impoundment

BORING NO.	TI-B8-06	TI-B11-10	TI-B11-03	TI-B11-08
DEPTH	35-36'	56-57'	15-16'	51.5-52.5'
SAMPLE NO.	-	-	-	-
DATE SAMPLED	-	12/02/13 MWH	12/02/13 MWH	12/02/13 MWH
DATE TESTED	01/30/14 DPM	01/31/14 DPM	03/14/14 DPM	03/19/14 DPM
Pycnometer #	AA	EE	EE	SS
Weight of oven dry soil (g) (Wo)	26.669	26.156	27.411	26.199
Weight of flask, soil, and water. (g) (Wb)	181.824	179.781	180.640	185.088
Temperature (deg. C) (Tx)	20.7	20.0	21.1	19.9
Weight of water & flask at Tx (from cal. curve)(Wa)	165.052	163.519	163.498	168.405
Specific Gravity*	2.69	2.64	2.67	2.75

BORING NO.	TI-B8-10A	TI-B8-12A	TI-B15-04	TI-B15-10
DEPTH	46.0-46.5'	56.0-56.5'	13.5-14.0'	28.5-29.5'
SAMPLE NO.	-	-	-	-
DATE SAMPLED	12/04/13 MWH	12/04/13 MWH	12/05/13 MWH	12/05/13 MWH
DATE TESTED	03/21/14 DPM	03/21/14 DPM	3/28/14 DPM	3/28/14 DPM
Pycnometer #	1	AA	AA	1
Weight of oven dry soil (g) (Wo)	25.506	25.839	25.036	26.340
Weight of flask, soil, and water. (g) (Wb)	178.040	181.273	180.751	178.401
Temperature (deg. C) (Tx)	22.3	22.5	20.6	20.9
Weight of water & flask at Tx (from cal. curve)(Wa)	161.904	165.011	165.054	161.949
Specific Gravity*	2.72	2.70	2.68	2.66

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: DPM Date: 04/10/2014
Data checked by: [illegible] Date: 4/11/14
FileName: MWSGAS51

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT: MWH JOB NO. 2512-77

PROJECT: Church Rock LOCATION: Tailings Impoundment

BORING NO.	TI-B23-06	TI-B11-17A	TI-B23-03	TI-B15-05
DEPTH	26-27'	81.0-81.5'	17.25-17.5'	15.5-16.0'
SAMPLE NO.	-	-	Bottom of Tube	-
DATE SAMPLED	12/06/13 MWH	12/02/13 MWH	12/06/13 MWH	12/05/13 MWH
DATE TESTED	03/28/14 DPM	03/28/14 DPM	04/14/14 DPM	04/17/14 DPM
Soil Description	Silty Clay	Gravely Sand	Silty Clay	Sand Tailings
Pycnometer #	EE	SS	FF	1
Weight of oven dry soil (g) (Wo)	25.397	26.928	25.984	28.463
Weight of flask, soil, and water. (g) (Wb)	179.582	185.514	181.274	179.643
Temperature (deg. C) (Tx)	20.9	20.9	21.3	22.5
Weight of water & flask at Tx (from cal. curve)(Wa)	163.502	168.356	164.816	161.897
Specific Gravity*	2.73	2.76	2.73	2.66

BORING NO.	TI-B23-03	TI-B15-07A	TI-B15-15A	TI-B15-11A
DEPTH	15.5-15.75'	21.0-21.5'	46.0-46.5'	31.0-31.5
SAMPLE NO.	Top of Tube	-	-	-
DATE SAMPLED	12/06/13 MWH	12/05/13 MWH	12/05/13 MWH	12/05/13 MWH
DATE TESTED	04/17/14 DPM	04/17/14 DPM	04/25/14 DPM	04/25/14 DPM
Soil Description	Sand Tailings	Fine Sand Tailings	Clayey Sand	Silty Clay
Pycnometer #	SS	FF	SS	FF
Weight of oven dry soil (g) (Wo)	25.469	26.544	26.578	25.240
Weight of flask, soil, and water. (g) (Wb)	184.548	181.429	185.372	180.692
Temperature (deg. C) (Tx)	22.4	22.7	23.1	23.0
Weight of water & flask at Tx (from cal. curve)(Wa)	168.280	164.779	168.245	164.771
Specific Gravity*	2.77	2.68	2.81	2.71

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: DPM Date: 05/23/2014

Data checked by: DAW Date: 05/23/14

FileName: MWSGAS81

ADVANCED TERRA TESTING, INC. ATT

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT: MWH JOB NO. 2512-77

LOCATION Church Rock

BORING NO.	TI-B10-03	TI-B10-02	TI-B8-08	TI-B8-09
DEPTH	12.5-14.0'	10.0-11.0'	41.0-42.0'	44.5-44.6'
SAMPLE NO.	--	--	--	--
DATE SAMPLED	11/26/13 MWH	11/26/13 MWH	12/04/13 MWH	--
DATE TESTED	--	--	--	--
SOIL DESCR.	Sand Tailings	Sand Tailings	Clayey Silt	Clayey Silt
Pycnometer #	AA	1	EE	FF
Weight of oven dry soil (g) (Wo)	30.870	32.918	30.086	33.013
Weight of flask, soil, and water. (g) (Wb)	184.055	182.218	181.999	184.935
Temperature (deg. C) (Tx)	27.7	27.7	27.7	27.7
Weight of water & flask at Tx (from cal. curve)(Wa)	164.882	161.712	163.335	164.630
Specific Gravity*	2.64	2.65	2.63	2.60

BORING NO.	TI-B8-02C	TI-B10-14	TI-B8-06
DEPTH	25.0-25.5'	40.0-41.0'	35.0-36.0'
SAMPLE NO.	--	--	--
DATE SAMPLED	12/03/13 MWH	11/26/13 MWH	12/04/13 MWH
DATE TESTED	--	--	--
SOIL DESCR.	Sand Tailings	Clayey Silt Tailings	Clayey Silt/Sand
Pycnometer #	SS	DD	HH
Weight of oven dry soil (g) (Wo)	31.870	30.990	31.575
Weight of flask, soil, and water. (g) (Wb)	188.147	182.100	184.303
Temperature (deg. C) (Tx)	27.7	27.7	27.7
Weight of water & flask at Tx (from cal. curve)(Wa)	168.005	163.229	164.563
Specific Gravity*	2.72	2.56	2.67

NOTE: Sample dried at 60 degrees Celsius.

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: DAW Date: 06/04/2014

Data checked by: KR Date: 6/4/14

FileName: MNSA1214.WK4

ADVANCED TERRA TESTING, INC. ATT

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT: MWH JOB NO. 2512-77

LOCATION Church Rock

BORING NO.	TI-B10-03	TI-B10-02	TI-B8-08	TI-B8-09
DEPTH	12.5-14.0'	10.0-11.0'	41.0-42.0'	44.5-44.6'
SAMPLE NO.	--	--	--	--
DATE SAMPLED	11/26/13 MWH	11/26/13 MWH	12/04/13 MWH	--
DATE TESTED	--	--	--	--
SOIL DESCR.	Sand Tailings	Sand Tailings	Clayey Silt	Clayey Silt
Pycnometer #	AA	1	EE	FF
Weight of oven dry soil (g) (Wo)	30.568	32.646	29.695	32.856
Weight of flask, soil, and water. (g) (Wb)	184.055	182.218	181.999	184.935
Temperature (deg. C) (Tx)	27.7	27.7	27.7	27.7
Weight of water & flask at Tx (from cal. curve)(Wa)	164.882	161.712	163.335	164.630
Specific Gravity*	2.68	2.69	2.69	2.62

BORING NO.	TI-B8-02C	TI-B10-14	TI-B8-06
DEPTH	25.0-25.5'	40.0-41.0'	35.0-36.0'
SAMPLE NO.	--	--	--
DATE SAMPLED	12/03/13 MWH	11/26/13 MWH	12/04/13 MWH
DATE TESTED	--	--	--
SOIL DESCR.	Sand Tailings	Clayey Silt Tailings	Clayey Silt/Sand
Pycnometer #	SS	DD	HH
Weight of oven dry soil (g) (Wo)	31.856	30.787	31.533
Weight of flask, soil, and water. (g) (Wb)	188.147	182.100	184.303
Temperature (deg. C) (Tx)	27.7	27.7	27.7
Weight of water & flask at Tx (from cal. curve)(Wa)	168.005	163.229	164.563
Specific Gravity*	2.72	2.58	2.67

NOTE: Sample dried at 110 degrees Celsius.

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: DAW Date: 06/04/2014

Data checked by: KR Date: 6/4/14

FileName: MNSA1011.WK4

ADVANCED TERRA TESTING, INC. ATT

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT: MWH JOB NO. 2512-77

LOCATION Church Rock

BORING NO.	TI-B10-03	TI-B10-02	TI-B8-08	TI-B8-09
DEPTH	12.5-14.0'	10.0-11.0'	41.0-42.0'	44.5-44.6'
SAMPLE NO.	--	--	--	--
DATE SAMPLED	11/26/13 MWH	11/26/13 MWH	12/04/13 MWH	--
DATE TESTED	--	--	--	--
SOIL DESCR.	Sand Tailings	Sand Tailings	Clayey Silt	Clayey Silt
Pycnometer #	AA	1	EE	FF
Weight of oven dry soil (g) (Wo)	30.568	32.646	29.695	32.856
Weight of flask, soil, and water. (g) (Wb)	183.753	181.946	181.608	184.778
Temperature (deg. C) (Tx)	27.7	27.7	27.7	27.7
Weight of water & flask at Tx (from cal. curve)(Wa)	164.882	161.712	163.335	164.630
Specific Gravity*	2.61	2.63	2.60	2.59

BORING NO.	TI-B8-02C	TI-B10-14	TI-B8-06
DEPTH	25.0-25.5'	40.0-41.0'	35.0-36.0'
SAMPLE NO.	--	--	--
DATE SAMPLED	12/03/13 MWH	11/26/13 MWH	12/04/13 MWH
DATE TESTED	--	--	--
SOIL DESCR.	Sand Tailings	Clayey Silt Tailings	Clayey Silt/Sand
Pycnometer #	SS	DD	HH
Weight of oven dry soil (g) (Wo)	31.856	30.787	31.533
Weight of flask, soil, and water. (g) (Wb)	188.133	181.897	184.261
Temperature (deg. C) (Tx)	27.7	27.7	27.7
Weight of water & flask at Tx (from cal. curve)(Wa)	168.005	163.229	164.563
Specific Gravity*	2.72	2.54	2.66

NOTE: Sample dried at 110 degrees Celsius.

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: DAW Date: 06/06/2014

Data checked by: CJ Date: 06/06/2014

FileName: MNSA101B.WK4

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT: MWH JOB NO. 2512-77

PROJECT: Church Rock LOCATION Tailings Impoundment

BORING NO.	TI-B10-25A	TI-B1-09	TI-B3-10	TI-B3-06
DEPTH	91.0-91.5'	27-27.5	56-57'	35-36'
SAMPLE NO.	Rerun	-	-	-
DATE SAMPLED	11/26/13 MWH	11/21/13 MWH	11/19/13 MWH	11/19/13 MWH
DATE TESTED	04/14/14 DPM	04/14/14 DPM	04/25/14 DPM	04/25/14 DPM
SOIL DESCRIPTION	Clayey Sand	Sand Tailings	Silty Clay	Silty Clay
Pycnometer #	EE	AA	EE	AA
Weight of oven dry soil (g) (Wo)	25.471	26.410	25.476	26.113
Weight of flask, soil, and water. (g) (Wb)	179.408	181.567	179.556	181.327
Temperature (deg. C) (Tx)	21.2	21.2	23.1	23.1
Weight of water & flask at Tx (from cal. curve)(Wa)	163.496	165.040	163.456	164.997
Specific Gravity*	2.66	2.67	2.72	2.67

BORING NO.	TI-BI-11A
DEPTH	31.0-31.5'
SAMPLE NO.	--
DATE SAMPLED	11/21/13 MWH
DATE TESTED	05/08/14 DPM
SOIL DESCRIPTION	Sand Tailings
Pycnometer #	EE
Weight of oven dry soil (g) (Wo)	25.772
Weight of flask, soil, and water. (g) (Wb)	179.603
Temperature (deg. C) (Tx)	23.4
Weight of water & flask at Tx (from cal. curve)(Wa)	163.449
Specific Gravity*	2.68

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: DPM/DAW Date: 05/19/2014

Data checked by: BKL Date: 5/21/14

FileName: MWGAS91.WK4

ADVANCED TERRA TESTING, INC. ATT

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT:	MWH	JOB NO.	2512-77
SOIL DESCR.	Church Rock	LOCATION	Tailings Impoundment

BORING NO.	TI-B3-01A	TI-B2-02A	TI-B2-8C	TI-B10-04A
DEPTH	11.0-11.5'	6.0-6.5'	15.0-15.5'	16.0-16.5'
SAMPLE NO.	-	-	-	-
DATE SAMPLED	11/19/13 MWH	11/20/13 MWH	11/20/13 MWH	11/26/13 MWH
DATE TESTED	01/30/14 DPM	01/31/14 DPM	02/10/14 DPM	02/10/14 DPM
Pycnometer #	1	SS	FF	EE
Weight of oven dry soil (g) (Wo)	27.046	25.518	26.806	25.364
Weight of flask, soil, and water. (g) (Wb)	178.748	184.414	181.607	179.304
Temperature (deg. C) (Tx)	20.9	19.8	21.1	21.1
Weight of water & flask at Tx (from cal. curve)(Wa)	161.949	168.410	164.821	163.498
Specific Gravity*	2.64	2.68	2.68	2.65

BORING NO.	TI-B10-12A	TI-B10-08A	TI-B2-11A	TI-B2-05A
DEPTH	36.0-36.5'	26.0-26.5'	21.0-21.5'	11.0-11.5'
SAMPLE NO.	-	-	-	-
DATE SAMPLED	11/26/13 MWH	11/26/13 MWH	11/20/13 MWH	11/20/13 MWH
DATE TESTED	02/10/14 DPM	02/10/14 DPM	02/12/14 DPM	02/13/14 DPM
Pycnometer #	1	AA	SS	FF
Weight of oven dry soil (g) (Wo)	25.046	25.502	25.035	28.858
Weight of flask, soil, and water. (g) (Wb)	177.623	181.150	184.279	183.096
Temperature (deg. C) (Tx)	21.4	21.1	20.6	22.2
Weight of water & flask at Tx (from cal. curve)(Wa)	161.933	165.043	168.371	164.792
Specific Gravity*	2.68	2.71	2.74	2.73

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: DPM Date: 02/25/2014
Data checked by: bj Date: 3/1/14
FileName: MWSGAS61

ADVANCED TERRA TESTING, INC. ATT

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT: MWH JOB NO. 2512-77

PROJECT: Church Rock LOCATION: Tailings Impoundment

BORING NO.	TI-B10-16A	TI-B10-25A	TI-B1-13A	TI-B10-10
DEPTH	46.0-46.5'	91.0-91.5'	36.0-36.5'	32.0-32.5'
SAMPLE NO.	-	-	-	Bottom of Tube
DATE SAMPLED	11/26/13 MWH	11/26/13 MWH	11/21/13 MWH	11/26/13 MWH
DATE TESTED	02/20/14 DPM	02/20/14 DPM	02/27/14 DPM	03/07/14 DPM
Soil Description	Silty Sand	Clayey Sand	Clayey Sand	Coarse
Pycnometer #	SS	FF	EE	1
Weight of oven dry soil (g) (Wo)	27.998	25.777	25.041	25.622
Weight of flask, soil, and water. (g) (Wb)	186.128	183.244	179.367	177.973
Temperature (deg. C) (Tx)	21.4	21.5	21.0	21.2
Weight of water & flask at Tx (from cal. curve)(Wa)	168.331	164.811	163.500	161.940
Specific Gravity*	2.74	3.51	2.73	2.67

BORING NO.	TI-B10-10
DEPTH	30.3-30.7'
SAMPLE NO.	Top of Tube
DATE SAMPLED	11/26/13 MWH
DATE TESTED	03/07/14 DPM
Soil Description	Fine
Pycnometer #	AA
Weight of oven dry soil (g) (Wo)	24.980
Weight of flask, soil, and water. (g) (Wb)	180.813
Temperature (deg. C) (Tx)	21.4
Weight of water & flask at Tx (from cal. curve)(Wa)	165.036
Specific Gravity*	2.71

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: DPM Date: 03/13/2014

Data checked by: bj Date: 3/14/14

FileName: MWSGAS71

ADVANCED TERRA TESTING, INC. ATT

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-15A
Depth: 46.0-46.5'
Sample Number: Clayey Sand
Sampled Date: 12/5/2013
Test Date: 4/25/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 41.27
Weight of Dry Soil & Pan (g): 39.83
Weight of Water (g): 1.45
Weight of Pan (g): 3.58
Weight of Dry Soil (g): 36.25
Moisture (%): 4.0

General Sample Data

Total Wet Weight of Sample (g): 60.71
Total Dry Weight of Sample (g): 58.38
Calculated Weight Plus #200 (g): 21.59
Moisture of Total Sample (%): 4.0
Percent Retained #200 Sieve (%): 37.0

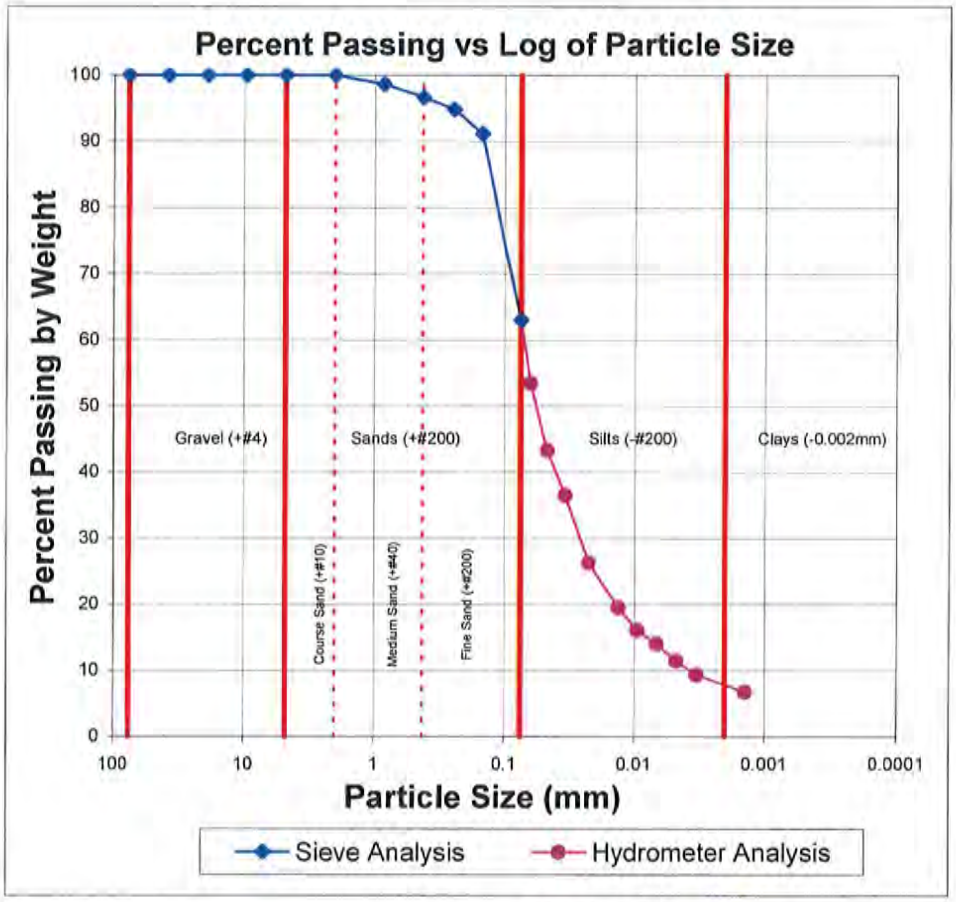
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 60.71
Calculated Dry Weight of -#10 (g): 58.38

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
60.705g split out of -#10 material.						
#20	**0.850**	4.51	3.72	0.79	0.79	98.6
#40	**0.425**	4.24	3.08	1.16	1.16	96.6
#60	**0.250**	4.13	3.06	1.07	1.07	94.8
#100	**0.150**	5.24	3.09	2.15	2.15	91.1
#200	**0.075**	19.50	3.07	16.42	16.42	63.0



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_69.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-15A
Depth: 46.0-46.5'
Sample Number: Clayey Sand
Sampled Date: 12/5/2013
Test Date: 4/25/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 60.71
Total Dry Weight of Sample (g): 58.38
Wet Weight of Sub-Sample (g): 60.705
Dry Weight of Sub-Sample (g): 58.376
Corrected Dry Weight of Sub-Sample - W(g): 58.376

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	37.0	31.5	17.6	0.0140	10.23	0.0631	53.5	31.21	53.5
1	31.0	25.5	17.6	0.0140	11.21	0.0467	43.3	25.27	43.3
2	27.0	21.5	17.6	0.0140	11.87	0.0340	36.5	21.30	36.5
5	21.0	15.5	17.6	0.0140	12.85	0.0224	26.3	15.36	26.3
15	17.0	11.5	17.7	0.0140	13.51	0.0132	19.5	11.40	19.5
30	15.0	9.5	17.7	0.0140	13.83	0.0095	16.1	9.41	16.1
60	13.8	8.3	17.8	0.0140	14.04	0.0068	14.0	8.18	14.0
120	12.3	6.8	18.0	0.0138	14.29	0.0048	11.5	6.69	11.5
250	11.0	5.5	18.9	0.0138	14.49	0.0033	9.3	5.45	9.3
1440	9.5	4.0	18.4	0.0138	14.74	0.0014	6.8	3.96	6.8

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_69.xls

Checked By: KK
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-01A
Depth: 6.0-6.5'
Sample Number: Sand Tailings
Sampled Date: 12/5/2013
Test Date: 4/20/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 35.25
Weight of Dry Soil & Pan (g): 35.13
Weight of Water (g): 0.12
Weight of Pan (g): 3.08
Weight of Dry Soil (g): 32.05
Moisture (%): 0.4

General Sample Data

Total Wet Weight of Sample (g): 244.64
Total Dry Weight of Sample (g): 243.74
Calculated Weight Plus #200 (g): 213.32
Moisture of Total Sample (%): 0.4
Percent Retained #200 Sieve (%): 87.5

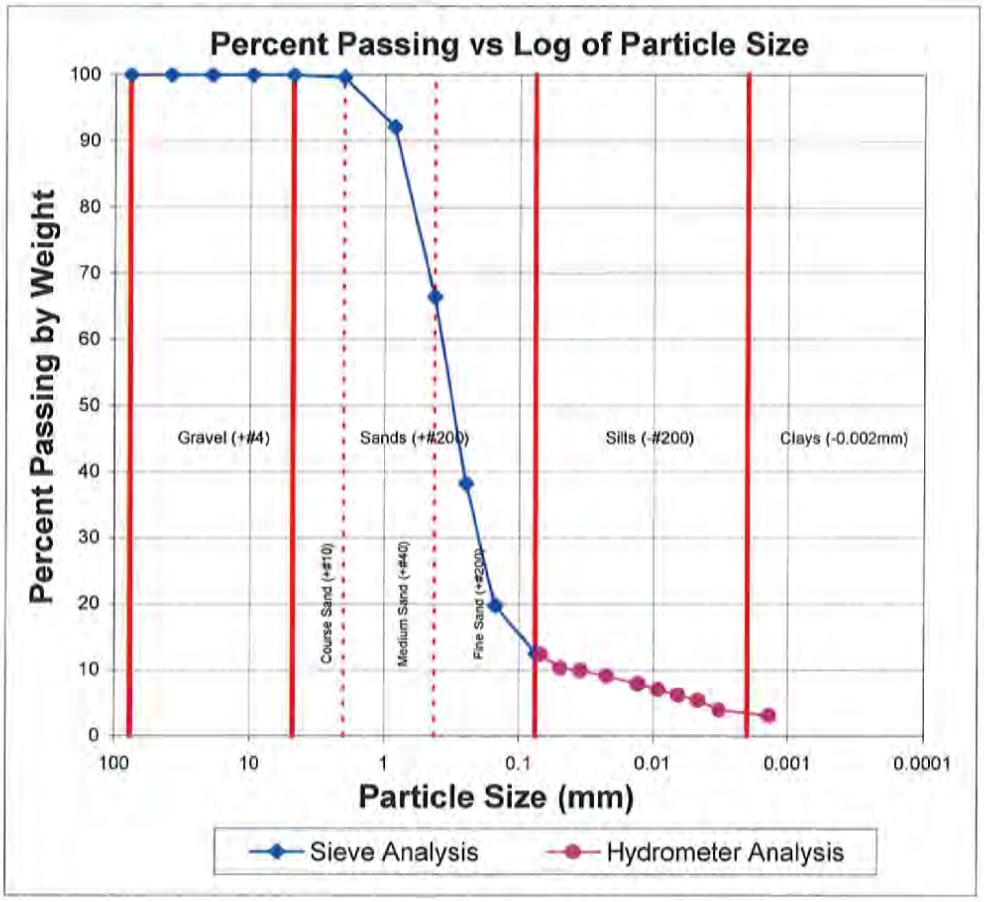
Plus Split Data

Original Weight of +#10 (g): 1.46
Calculated Weight of +#10 (g): 1.01

Minus Split Data

Original Weight of -#10 (g): 243.18
Calculated Dry Weight of -#10 (g): 242.73

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	1.01	0.00	1.01	1.01	99.6
120.244g split out of -#10 material.						
#20	0.850	12.10	3.10	9.00	18.23	92.1
#40	0.425	33.97	3.12	30.85	62.51	66.5
#60	0.250	37.08	3.07	34.01	68.91	38.2
#100	0.150	25.38	3.08	22.29	45.17	19.7
#200	0.075	11.76	3.12	8.64	17.50	12.5



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_66.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-01A
Depth: 6.0-6.5'
Sample Number: Sand Tailings
Sampled Date: 12/5/2013
Test Date: 4/20/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 244.64
Total Dry Weight of Sample (g): 243.74
Wet Weight of Sub-Sample (g): 120.244
Dry Weight of Sub-Sample (g): 119.799
Corrected Dry Weight of Sub-Sample - W(g): 120.280

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	20.5	15.0	20.2	0.0134	12.93	0.0684	12.4	30.12	12.4
1	18.0	12.5	20.2	0.0134	13.34	0.0491	10.3	25.10	10.3
2	17.5	12.0	20.2	0.0134	13.42	0.0348	9.9	24.10	9.9
5	16.5	11.0	20.2	0.0134	13.59	0.0222	9.1	22.09	9.1
15	15.0	9.5	20.3	0.0134	13.83	0.0129	7.8	19.08	7.8
30	14.0	8.5	20.4	0.0134	14.00	0.0092	7.0	17.07	7.0
60	13.0	7.5	20.4	0.0134	14.16	0.0065	6.2	15.06	6.2
120	12.0	6.5	20.8	0.0134	14.33	0.0046	5.4	13.05	5.4
250	10.3	4.8	21.2	0.0133	14.61	0.0032	3.9	9.54	3.9
1440	9.3	3.8	20.9	0.0134	14.78	0.0014	3.1	7.53	3.1

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_66.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-05
Depth: 15.5-16.0' (15-17.5')
Sample Number: Sand Tailings
Sampled Date: 12/5/2013
Test Date: 4/15/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 118.52
Weight of Dry Soil & Pan (g): 118.17
Weight of Water (g): 0.35
Weight of Pan (g): 3.57
Weight of Dry Soil (g): 114.61
Moisture (%): 0.3

General Sample Data

Total Wet Weight of Sample (g): 916.56
Total Dry Weight of Sample (g): 913.76
Calculated Weight Plus #200 (g): 776.14
Moisture of Total Sample (%): 0.3
Percent Retained #200 Sieve (%): 84.9

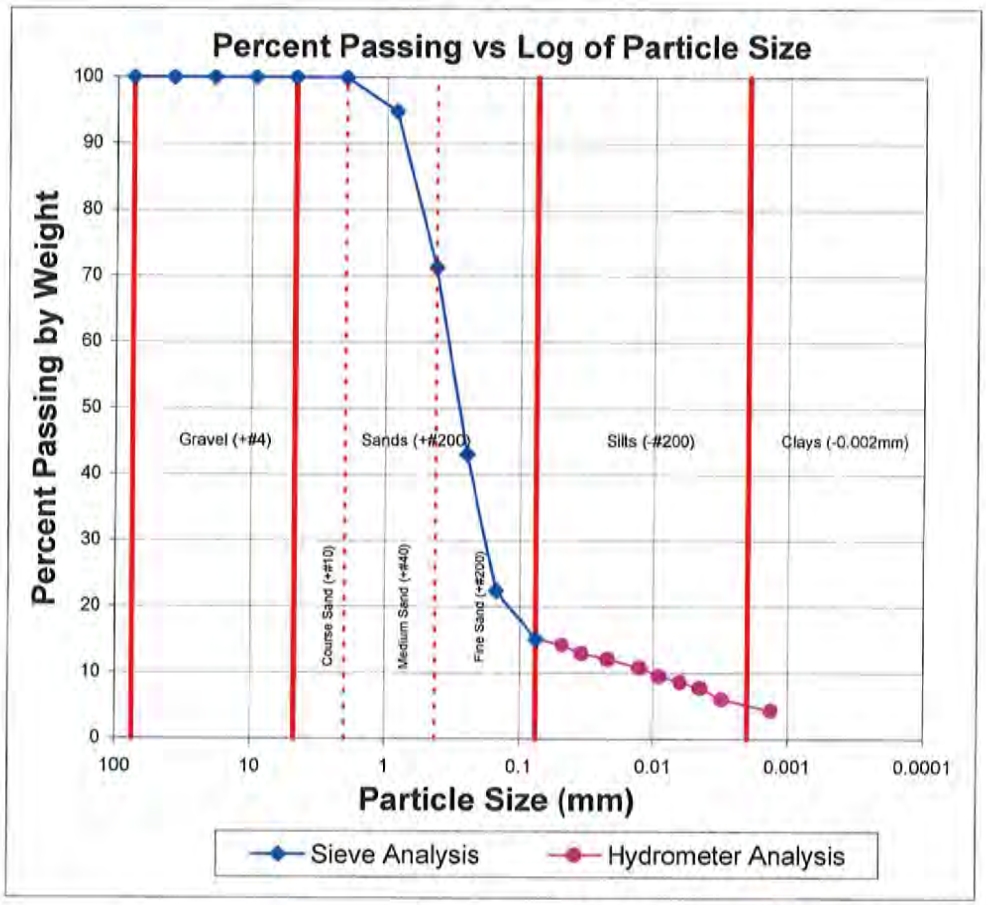
Plus Split Data

Original Weight of +#10 (g): 0.32
Calculated Weight of +#10 (g): 0.25

Minus Split Data

Original Weight of -#10 (g): 916.24
Calculated Dry Weight of -#10 (g): 913.50

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.25	0.00	0.25	0.25	100.0
115.146g split out of -#10 material.						
#20	**0.850**	9.68	3.77	5.91	47.01	94.8
#40	**0.425**	30.79	3.71	27.08	215.51	71.2
#60	**0.250**	36.11	3.71	32.40	257.83	43.0
#100	**0.150**	26.83	3.09	23.74	188.92	22.4
#200	**0.075**	11.45	3.08	8.37	66.61	15.1



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Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_63.xls

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Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-05
Depth: 15.5-16.0' (15-17.5')
Sample Number: Sand Tailings
Sampled Date: 12/5/2013
Test Date: 4/15/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 916.56
Total Dry Weight of Sample (g): 913.76
Wet Weight of Sub-Sample (g): 115.146
Dry Weight of Sub-Sample (g): 114.793
Corrected Dry Weight of Sub-Sample - W(g): 114.793

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	21.5	16.5	20.5	0.0134	12.77	0.0480	14.2	130.15	14.2
2	20.0	15.0	20.5	0.0134	13.01	0.0343	12.9	118.31	12.9
5	19.0	14.0	20.5	0.0134	13.18	0.0218	12.1	110.43	12.1
15	17.5	12.5	20.7	0.0134	13.42	0.0127	10.8	98.60	10.8
30	16.0	11.0	20.6	0.0134	13.67	0.0091	9.5	86.76	9.5
60	15.0	10.0	21.1	0.0133	13.83	0.0064	8.6	78.88	8.6
120	14.0	9.0	21.6	0.0133	14.00	0.0045	7.8	70.99	7.8
250	12.0	7.0	22.5	0.0131	14.33	0.0031	6.0	55.21	6.0
1440	10.0	5.0	20.7	0.0134	14.65	0.0014	4.3	39.44	4.3

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_63.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B23-03
Depth: 15.5-15.75' (15-17.5')
Sample Number: Top of Tube - Sand Tailings
Sampled Date: 12/6/2013 Sampled By: MWH
Test Date: 4/15/2014 Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 60.35
Weight of Dry Soil & Pan (g): 59.73
Weight of Water (g): 0.63
Weight of Pan (g): 3.78
Weight of Dry Soil (g): 55.95
Moisture (%): 1.1

General Sample Data

Total Wet Weight of Sample (g): 113.21
Total Dry Weight of Sample (g): 111.96
Calculated Weight Plus #200 (g): 70.30
Moisture of Total Sample (%): 1.1
Percent Retained #200 Sieve (%): 62.8

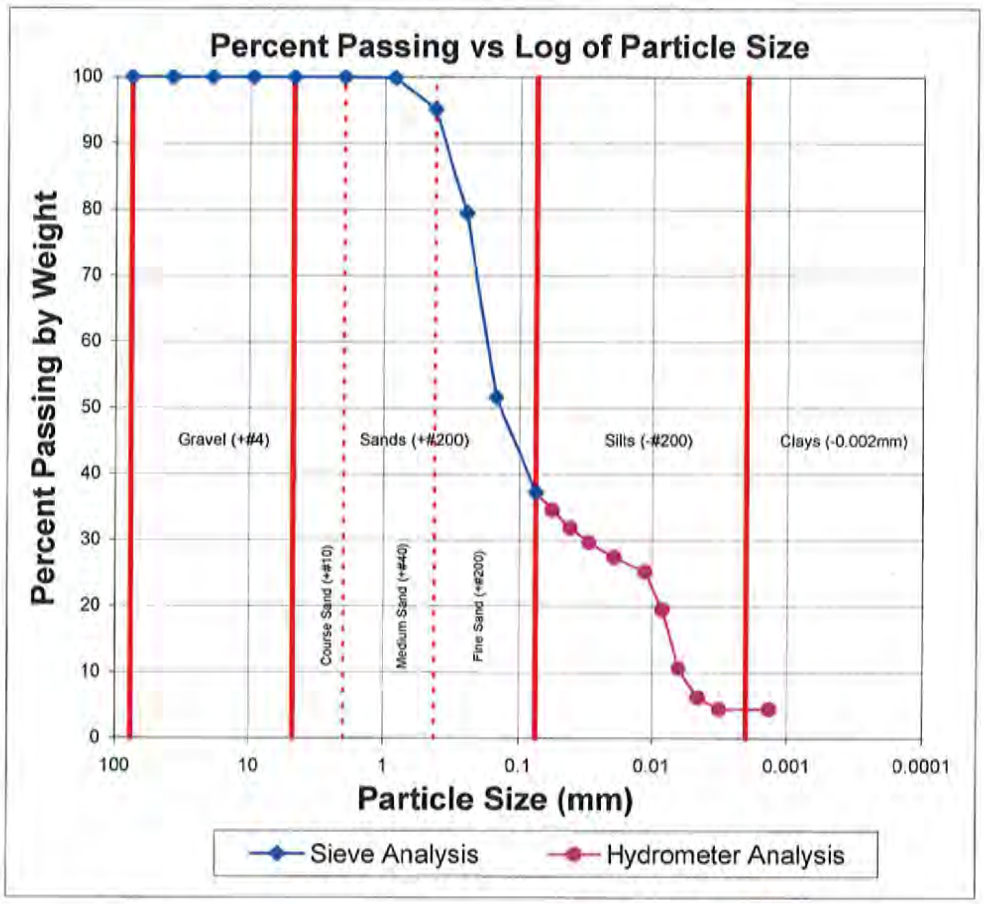
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 113.21
Calculated Dry Weight of -#10 (g): 111.96

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
113.21g split out of -#10 material.						
#20	**0.850**	3.82	3.70	0.12	0.12	99.9
#40	**0.425**	9.13	3.83	5.31	5.31	95.2
#60	**0.250**	21.31	3.70	17.60	17.60	79.4
#100	**0.150**	34.27	3.11	31.16	31.16	51.6
#200	**0.075**	19.18	3.07	16.11	16.11	37.2



Note: The sample started showing signs of flocculation at the 60 minute reading.
At the 24 hour reading the supernate was barely cloudy.

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_64.xls

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Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B23-03
Depth: 15.5-15.75' (15-17.5')
Sample Number: Top of Tube - Sand Tailings
Sampled Date: 12/6/2013 Sampled By: MWH
Test Date: 4/15/2014 Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 113.21
Total Dry Weight of Sample (g): 111.96
Wet Weight of Sub-Sample (g): 113.210
Dry Weight of Sub-Sample (g): 111.955
Corrected Dry Weight of Sub-Sample - W(g): 111.955

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	44.0	39.0	20.6	0.0134	9.08	0.0573	34.5	38.65	34.5
1	41.0	36.0	20.6	0.0134	9.57	0.0416	31.9	35.67	31.9
2	38.5	33.5	20.6	0.0134	9.98	0.0300	29.7	33.20	29.7
5	36.0	31.0	20.6	0.0134	10.39	0.0194	27.4	30.72	27.4
15	33.5	28.5	20.7	0.0134	10.80	0.0114	25.2	28.24	25.2
30	27.0	22.0	20.8	0.0134	11.87	0.0085	19.5	21.80	19.5
60	17.0	12.0	20.9	0.0134	13.51	0.0064	10.6	11.89	10.6
120	12.0	7.0	21.3	0.0133	14.33	0.0046	6.2	6.94	6.2
250	10.0	5.0	22.2	0.0131	14.65	0.0032	4.4	4.95	4.4
1440	10.0	5.0	20.4	0.0134	14.65	0.0014	4.4	4.95	4.4

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_64.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-11A
Depth: 31.0-31.5'
Sample Number: Silty Clay
Sampled Date: 12/5/2013
Test Date: 4/20/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 28.58
Weight of Dry Soil & Pan (g): 28.27
Weight of Water (g): 0.31
Weight of Pan (g): 3.08
Weight of Dry Soil (g): 25.20
Moisture (%): 1.2

General Sample Data

Total Wet Weight of Sample (g): 449.52
Total Dry Weight of Sample (g): 444.48
Calculated Weight Plus #200 (g): 258.34
Moisture of Total Sample (%): 1.1
Percent Retained #200 Sieve (%): 58.1

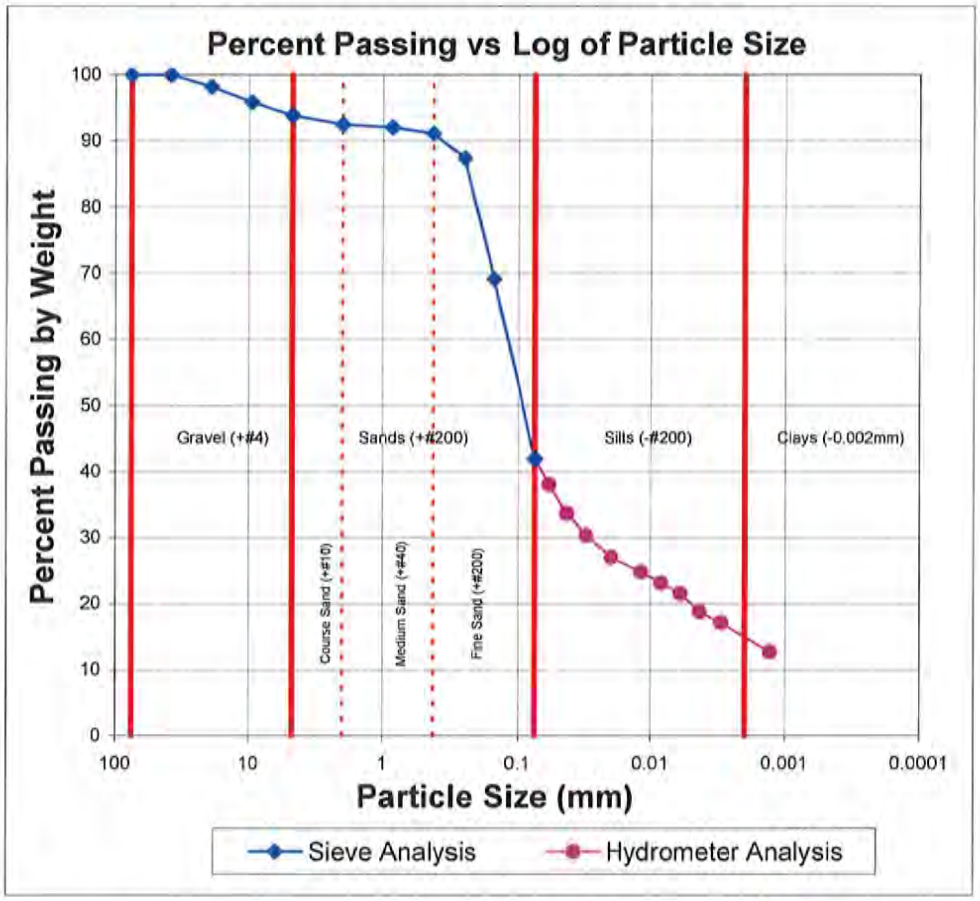
Plus Split Data

Original Weight of +#10 (g): 37.36
Calculated Weight of +#10 (g): 33.31

Minus Split Data

Original Weight of -#10 (g): 412.16
Calculated Dry Weight of -#10 (g): 411.17

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	8.00	0.00	8.00	8.00	98.2
3/8"	**9.525**	10.38	0.00	10.38	10.38	95.9
#4	**4.750**	8.97	0.00	8.97	8.97	93.8
#10	**2.000**	5.96	0.00	5.96	5.96	92.5
84.13g split out of -#10 material.						
#20	**0.850**	2.71	2.30	0.42	2.06	92.0
#40	**0.425**	3.18	2.36	0.81	4.03	91.1
#60	**0.250**	7.01	3.65	3.36	16.64	87.4
#100	**0.150**	20.19	3.76	16.43	81.28	69.1
#200	**0.075**	28.15	3.69	24.46	121.02	41.9



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_62.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-11A
Depth: 31.0-31.5'
Sample Number: Silty Clay
Sampled Date: 12/5/2013
Test Date: 4/20/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 449.52
Total Dry Weight of Sample (g): 444.48
Wet Weight of Sub-Sample (g): 84.130
Dry Weight of Sub-Sample (g): 83.111
Corrected Dry Weight of Sub-Sample - W(g): 89.849

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	40.0	34.5	20.6	0.0134	9.73	0.0593	38.0	169.12	38.0
1	36.0	30.5	20.6	0.0134	10.39	0.0433	33.6	149.51	33.6
2	33.0	27.5	20.6	0.0134	10.88	0.0314	30.3	134.80	30.3
5	30.0	24.5	20.6	0.0134	11.37	0.0203	27.0	120.10	27.0
15	28.0	22.5	20.4	0.0134	11.70	0.0119	24.8	110.29	24.8
30	26.5	21.0	20.4	0.0134	11.95	0.0085	23.2	102.94	23.2
60	25.0	19.5	20.5	0.0134	12.19	0.0061	21.5	95.59	21.5
120	22.5	17.0	20.7	0.0134	12.60	0.0044	18.7	83.33	18.7
250	21.0	15.5	21.2	0.0133	12.85	0.0030	17.1	75.98	17.1
1440	17.0	11.5	20.5	0.0134	13.51	0.0013	12.7	56.37	12.7

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_62.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-07A
Depth: 21.0-21.5'
Sample Number: Fine Sand Tailings
Sampled Date: 12/5/2013
Test Date: 4/15/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 58.80
Weight of Dry Soil & Pan (g): 58.55
Weight of Water (g): 0.25
Weight of Pan (g): 3.73
Weight of Dry Soil (g): 54.82
Moisture (%): 0.5

General Sample Data

Total Wet Weight of Sample (g): 363.15
Total Dry Weight of Sample (g): 361.52
Calculated Weight Plus #200 (g): 291.38
Moisture of Total Sample (%): 0.5
Percent Retained #200 Sieve (%): 80.6

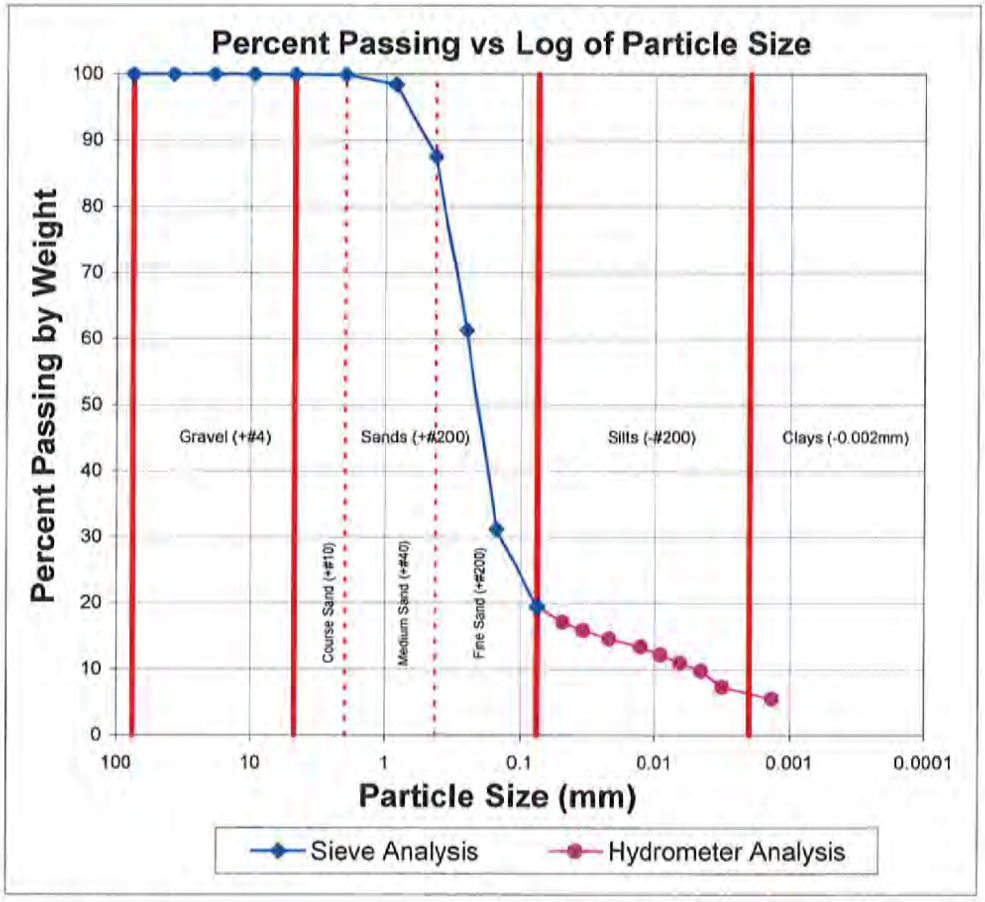
Plus Split Data

Original Weight of +#10 (g): 0.31
Calculated Weight of +#10 (g): 0.28

Minus Split Data

Original Weight of -#10 (g): 362.84
Calculated Dry Weight of -#10 (g): 361.24

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.13	0.00	0.13	0.13	100.0
#10	2.000	0.15	0.00	0.15	0.15	99.9
81.531g split out of -#10 material.						
#20	0.850	3.50	2.29	1.20	5.35	98.4
#40	0.425	11.18	2.32	8.87	39.47	87.5
#60	0.250	25.06	3.72	21.34	94.98	61.3
#100	0.150	27.51	3.07	24.43	108.74	31.2
#200	0.075	12.63	3.07	9.56	42.56	19.4



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_61.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-07A
Depth: 21.0-21.5'
Sample Number: Fine Sand Tailings
Sampled Date: 12/5/2013
Test Date: 4/15/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 363.15
Total Dry Weight of Sample (g): 361.52
Wet Weight of Sub-Sample (g): 81.531
Dry Weight of Sub-Sample (g): 81.165
Corrected Dry Weight of Sub-Sample - W(g): 81.247

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	19.0	14.0	20.4	0.0134	13.18	0.0488	17.1	61.73	17.1
2	18.0	13.0	20.4	0.0134	13.34	0.0347	15.9	57.32	15.9
5	17.0	12.0	20.4	0.0134	13.51	0.0221	14.6	52.91	14.6
15	16.0	11.0	20.5	0.0134	13.67	0.0128	13.4	48.50	13.4
30	15.0	10.0	20.7	0.0134	13.83	0.0091	12.2	44.09	12.2
60	14.0	9.0	20.9	0.0134	14.00	0.0065	11.0	39.68	11.0
120	13.0	8.0	21.5	0.0133	14.16	0.0046	9.8	35.27	9.8
250	11.0	6.0	22.3	0.0131	14.49	0.0032	7.3	26.46	7.3
1440	9.5	4.5	20.4	0.0134	14.74	0.0014	5.5	19.84	5.5

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_61.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B23-03
Depth: 17.25-17.5' (15-17.5')
Sample Number: Bottom of Tube -Silty Clay
Sampled Date: 12/6/2013 Sampled By: MWH
Test Date: 4/11/2014 Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 46.22
Weight of Dry Soil & Pan (g): 45.39
Weight of Water (g): 0.82
Weight of Pan (g): 3.56
Weight of Dry Soil (g): 41.84
Moisture (%): 2.0

General Sample Data

Total Wet Weight of Sample (g): 63.05
Total Dry Weight of Sample (g): 61.84
Calculated Weight Plus #200 (g): 19.21
Moisture of Total Sample (%): 2.0
Percent Retained #200 Sieve (%): 31.1

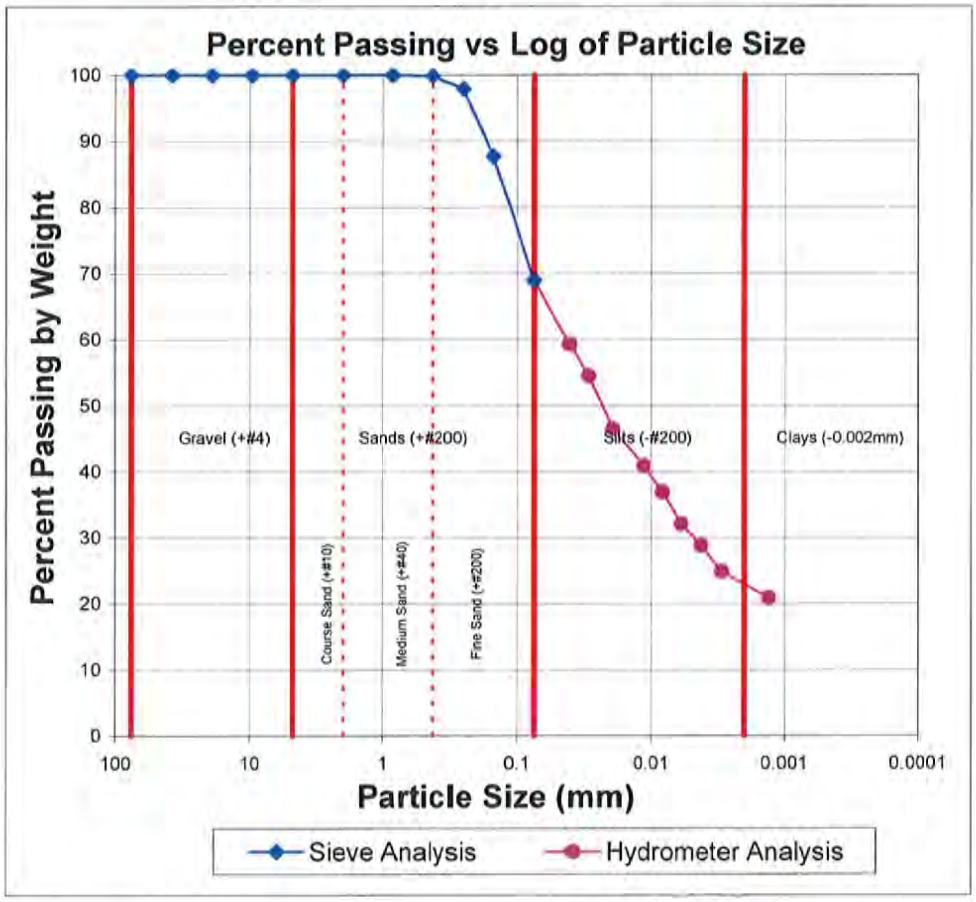
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 63.05
Calculated Dry Weight of -#10 (g): 61.84

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
63.053g split out of -#10 material.						
#20	**0.850**	2.37	2.37	0.00	0.00	100.0
#40	**0.425**	2.35	2.28	0.08	0.08	99.9
#60	**0.250**	4.85	3.62	1.23	1.23	97.9
#100	**0.150**	9.37	3.08	6.29	6.29	87.7
#200	**0.075**	14.70	3.08	11.62	11.62	68.9



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_60.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B23-03
Depth: 17.25-17.5' (15-17.5')
Sample Number: Bottom of Tube -Silty Clay
Sampled Date: 12/6/2013 Sampled By: MWH
Test Date: 4/11/2014 Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 63.05
Total Dry Weight of Sample (g): 61.84
Wet Weight of Sub-Sample (g): 63.053
Dry Weight of Sub-Sample (g): 61.840
Corrected Dry Weight of Sub-Sample - W(g): 61.840

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	42.0	37.0	21.1	0.0133	9.41	0.0407	59.3	36.66	59.3
2	39.0	34.0	21.1	0.0133	9.90	0.0295	54.5	33.69	54.5
5	34.0	29.0	21.1	0.0133	10.72	0.0194	46.5	28.74	46.5
15	30.5	25.5	21.2	0.0133	11.29	0.0115	40.9	25.27	40.9
30	28.0	23.0	21.4	0.0133	11.70	0.0083	36.9	22.79	36.9
60	25.0	20.0	21.7	0.0133	12.19	0.0060	32.0	19.82	32.0
120	23.0	18.0	22.4	0.0131	12.52	0.0042	28.8	17.84	28.8
250	20.5	15.5	23.4	0.0130	12.93	0.0029	24.8	15.36	24.8
1440	18.0	13.0	19.6	0.0136	13.34	0.0013	20.8	12.88	20.8

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_60.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-10
Depth: 28.5-29.5' (27-29.5')
Sample Number: Clayey Fine Sand Tails
Sampled Date: 12/5/2013 Sampled By: MWH
Test Date: 3/25/2014 Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 58.56
Weight of Dry Soil & Pan (g): 58.28
Weight of Water (g): 0.28
Weight of Pan (g): 3.84
Weight of Dry Soil (g): 54.44
Moisture (%): 0.5

General Sample Data

Total Wet Weight of Sample (g): 55.18
Total Dry Weight of Sample (g): 54.89
Calculated Weight Plus #200 (g): 35.88
Moisture of Total Sample (%): 0.5
Percent Retained #200 Sieve (%): 65.4

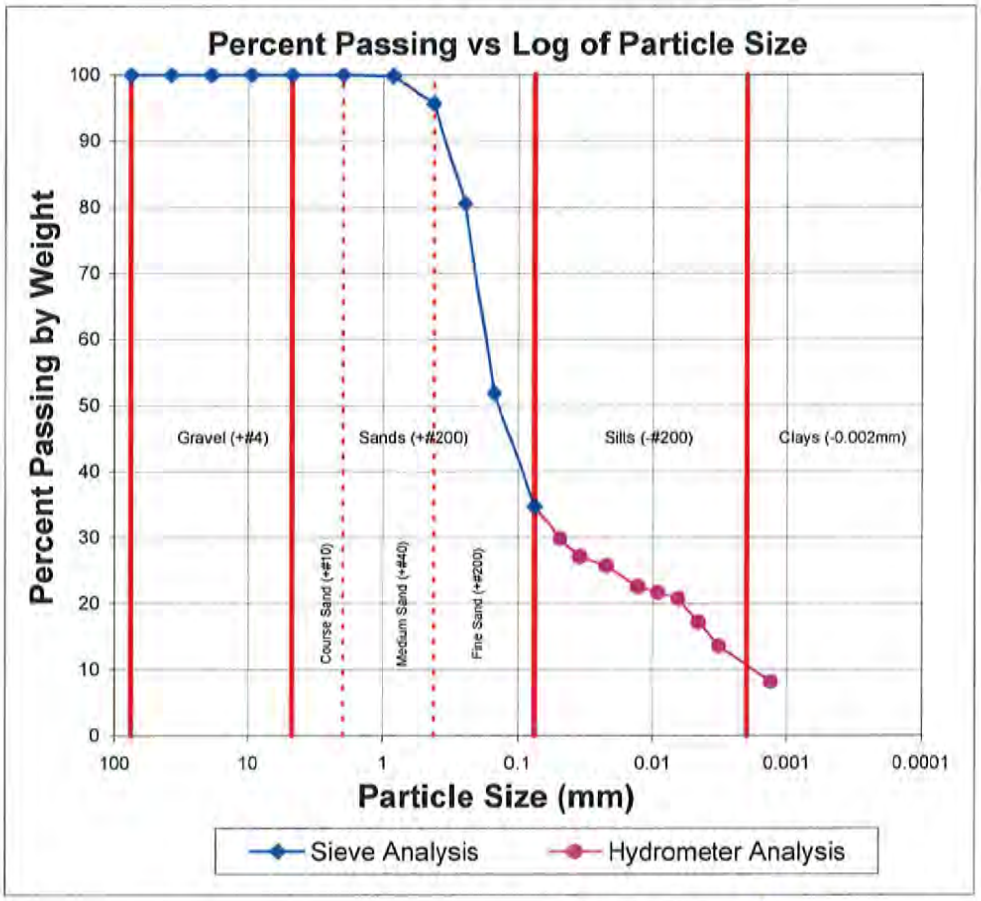
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 55.18
Calculated Dry Weight of -#10 (g): 54.89

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
55.175g split out of -#10 material.						
#20	**0.850**	2.47	2.36	0.11	0.11	99.8
#40	**0.425**	4.57	2.29	2.29	2.29	95.6
#60	**0.250**	12.00	3.70	8.30	8.30	80.5
#100	**0.150**	19.54	3.79	15.75	15.75	51.8
#200	**0.075**	12.49	3.06	9.43	9.43	34.6



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_58.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-10
Depth: 28.5-29.5' (27-29.5')
Sample Number: Clayey Fine Sand Tails
Sampled Date: 12/5/2013 Sampled By: MWH
Test Date: 3/25/2014 Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 55.18
Total Dry Weight of Sample (g): 54.89
Wet Weight of Sub-Sample (g): 55.175
Dry Weight of Sub-Sample (g): 54.892
Corrected Dry Weight of Sub-Sample - W(g): 54.892

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	22.0	16.5	18.3	0.0138	12.69	0.0491	29.8	16.35	29.8
2	20.5	15.0	18.3	0.0138	12.93	0.0350	27.1	14.86	27.1
5	19.8	14.3	18.3	0.0138	13.06	0.0223	25.7	14.12	25.7
15	18.0	12.5	18.2	0.0138	13.34	0.0130	22.6	12.39	22.6
30	17.5	12.0	18.3	0.0138	13.42	0.0092	21.7	11.89	21.7
60	17.0	11.5	18.5	0.0138	13.51	0.0065	20.8	11.40	20.8
120	15.0	9.5	19.1	0.0136	13.83	0.0046	17.1	9.41	17.1
250	13.0	7.5	20.0	0.0134	14.16	0.0032	13.5	7.43	13.5
1440	10.0	4.5	22.0	0.0131	14.65	0.0013	8.1	4.46	8.1

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_58.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-04
Depth: 13.5-14.0' (11.5-14.0')
Sample Number: Clayey Sand Tailings
Sampled Date: 12/5/2013 Sampled By: MWH
Test Date: 3/25/2014 Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 34.62
Weight of Dry Soil & Pan (g): 34.20
Weight of Water (g): 0.41
Weight of Pan (g): 3.70
Weight of Dry Soil (g): 30.50
Moisture (%): 1.4

General Sample Data

Total Wet Weight of Sample (g): 746.42
Total Dry Weight of Sample (g): 736.45
Calculated Weight Plus #200 (g): 512.84
Moisture of Total Sample (%): 1.4
Percent Retained #200 Sieve (%): 69.6

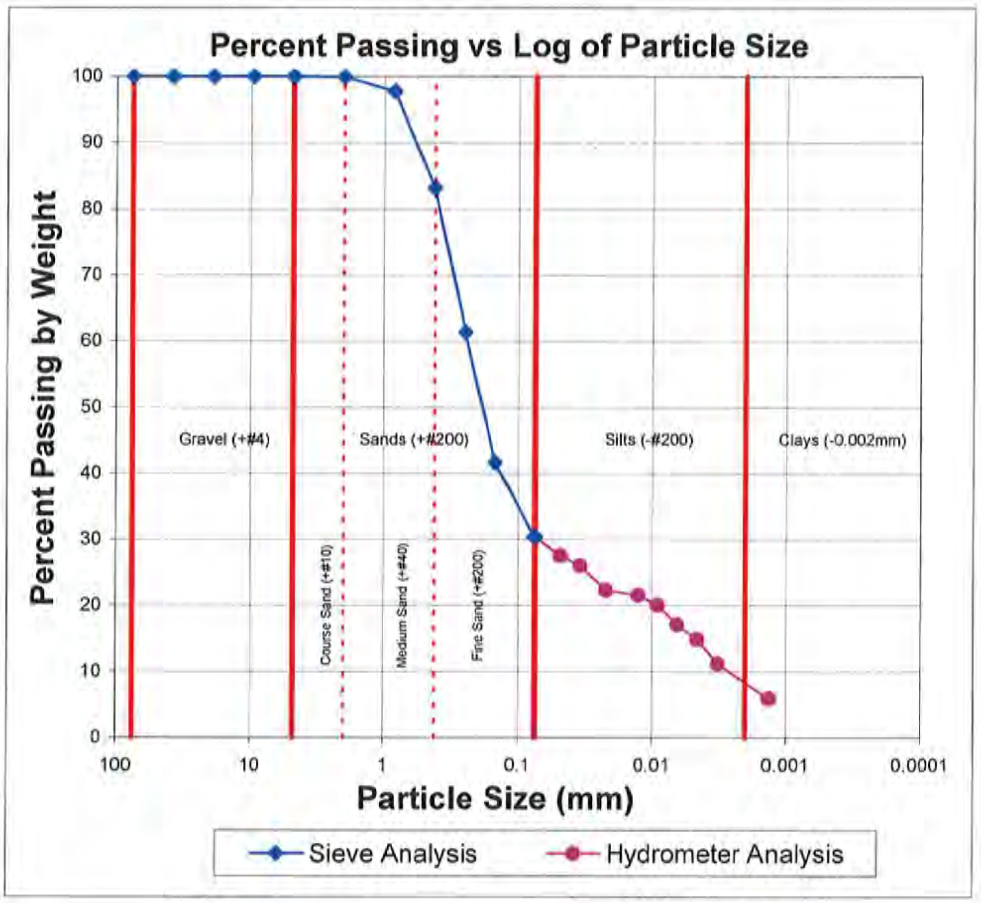
Plus Split Data

Original Weight of +#10 (g): 0.37
Calculated Weight of +#10 (g): 0.30

Minus Split Data

Original Weight of -#10 (g): 746.05
Calculated Dry Weight of -#10 (g): 736.15

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.15	0.00	0.15	0.15	100.0
#10	**2.000**	0.15	0.00	0.15	0.15	100.0
67.509g split out of -#10 material.						
#20	**0.850**	3.83	2.37	1.46	16.15	97.8
#40	**0.425**	12.06	2.32	9.74	107.65	83.1
#60	**0.250**	18.25	3.72	14.53	160.60	61.3
#100	**0.150**	16.22	3.07	13.16	145.41	41.6
#200	**0.075**	10.59	3.11	7.49	82.74	30.4



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_57.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B15-04
Depth: 13.5-14.0' (11.5-14.0')
Sample Number: Clayey Sand Tailings
Sampled Date: 12/5/2013 Sampled By: MWH
Test Date: 3/25/2014 Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 746.42
Total Dry Weight of Sample (g): 736.45
Wet Weight of Sub-Sample (g): 67.509
Dry Weight of Sub-Sample (g): 66.607
Corrected Dry Weight of Sub-Sample - W(g): 66.607

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	24.0	18.5	18.1	0.0138	12.36	0.0484	27.5	202.69	27.5
2	23.0	17.5	18.1	0.0138	12.52	0.0345	26.0	191.73	26.0
5	20.5	15.0	18.1	0.0138	12.93	0.0222	22.3	164.34	22.3
15	20.0	14.5	18.1	0.0138	13.01	0.0128	21.6	158.86	21.6
30	19.0	13.5	18.3	0.0138	13.18	0.0091	20.1	147.91	20.1
60	17.0	11.5	18.5	0.0138	13.51	0.0065	17.1	126.00	17.1
120	15.5	10.0	19.1	0.0136	13.75	0.0046	14.9	109.56	14.9
250	13.0	7.5	19.9	0.0136	14.16	0.0032	11.2	82.17	11.2
1440	9.5	4.0	22.0	0.0131	14.74	0.0013	6.0	43.82	6.0

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_57.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-10A
Depth: 46.0-46.5'
Sample Number: Silty/Clayey Sand
Sampled Date: 12/4/2013
Test Date: 3/20/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 34.09
Weight of Dry Soil & Pan (g): 32.63
Weight of Water (g): 1.45
Weight of Pan (g): 3.85
Weight of Dry Soil (g): 28.78
Moisture (%): 5.1

General Sample Data

Total Wet Weight of Sample (g): 77.84
Total Dry Weight of Sample (g): 74.09
Calculated Weight Plus #200 (g): 20.68
Moisture of Total Sample (%): 5.1
Percent Retained #200 Sieve (%): 27.9

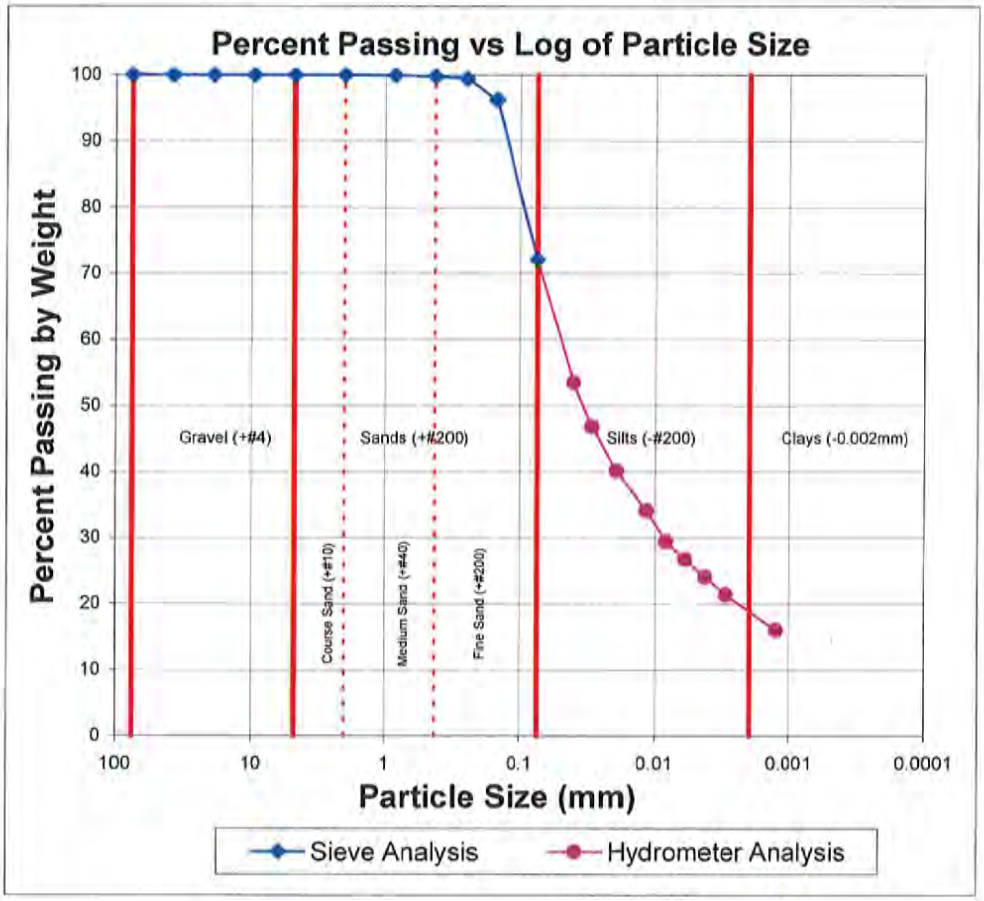
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 77.84
Calculated Dry Weight of -#10 (g): 74.09

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
77.838g split out of -#10 material.						
#20	**0.850**	2.32	2.28	0.04	0.04	99.9
#40	**0.425**	2.48	2.37	0.11	0.11	99.8
#60	**0.250**	2.59	2.35	0.24	0.24	99.5
#100	**0.150**	6.22	3.85	2.38	2.38	96.3
#200	**0.075**	20.98	3.07	17.91	17.91	72.1



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_56.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-10A
Depth: 46.0-46.5'
Sample Number: Silty/Clayey Sand
Sampled Date: 12/4/2013
Test Date: 3/20/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 77.84
Total Dry Weight of Sample (g): 74.09
Wet Weight of Sub-Sample (g): 77.838
Dry Weight of Sub-Sample (g): 74.095
Corrected Dry Weight of Sub-Sample - W(g): 74.095

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	45.0	40.0	20.9	0.0134	8.91	0.0401	53.5	39.64	53.5
2	40.0	35.0	20.9	0.0134	9.73	0.0297	46.8	34.68	46.8
5	35.0	30.0	20.9	0.0134	10.55	0.0195	40.1	29.73	40.1
15	30.5	25.5	20.9	0.0134	11.29	0.0117	34.1	25.27	34.1
30	27.0	22.0	20.9	0.0134	11.87	0.0085	29.4	21.80	29.4
60	25.0	20.0	20.9	0.0134	12.19	0.0061	26.7	19.82	26.7
120	23.0	18.0	21.1	0.0133	12.52	0.0043	24.1	17.84	24.1
250	21.0	16.0	21.8	0.0133	12.85	0.0030	21.4	15.85	21.4
1440	17.0	12.0	22.1	0.0131	13.51	0.0013	16.0	11.89	16.0

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_56.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-12A
Depth: 56.0-56.5'
Sample Number: Silty/Clayey Sand
Sampled Date: 12/4/2013
Test Date: 3/20/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 30.23
Weight of Dry Soil & Pan (g): 29.94
Weight of Water (g): 0.30
Weight of Pan (g): 3.78
Weight of Dry Soil (g): 26.16
Moisture (%): 1.1

General Sample Data

Total Wet Weight of Sample (g): 379.47
Total Dry Weight of Sample (g): 375.24
Calculated Weight Plus #200 (g): 213.74
Moisture of Total Sample (%): 1.1
Percent Retained #200 Sieve (%): 57.0

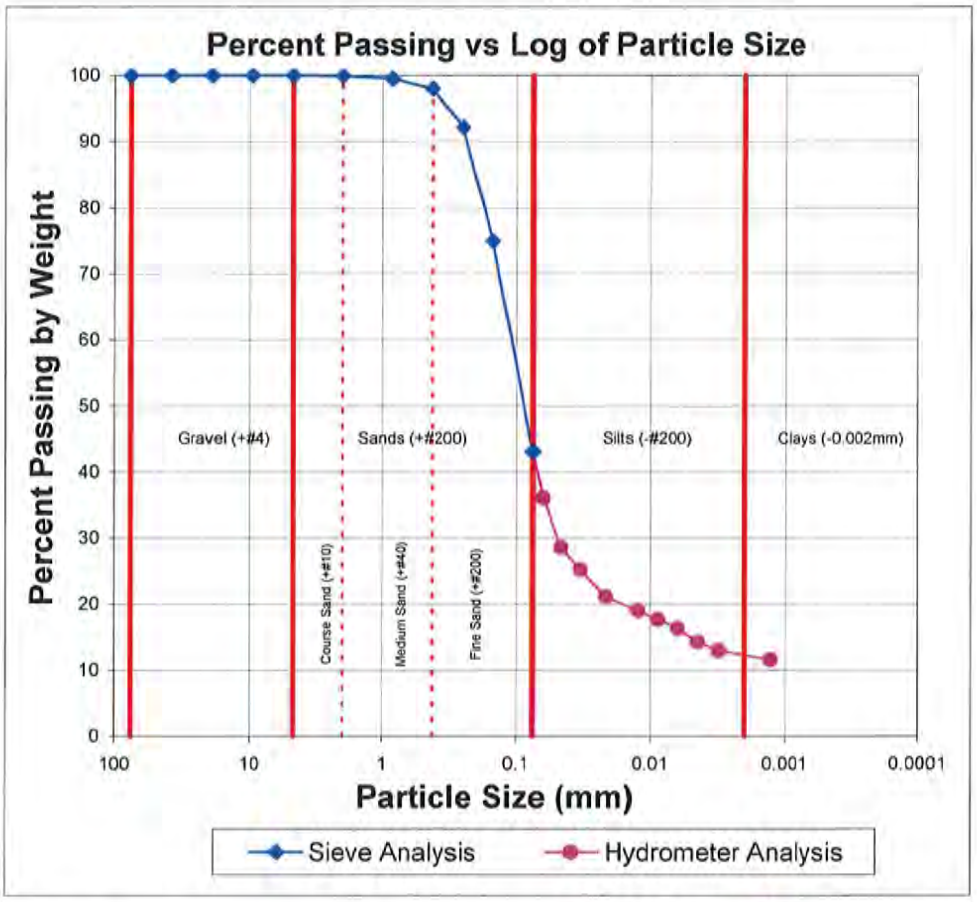
Plus Split Data

Original Weight of +#10 (g): 0.22
Calculated Weight of +#10 (g): 0.19

Minus Split Data

Original Weight of -#10 (g): 379.25
Calculated Dry Weight of -#10 (g): 375.05

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	0.19	0.00	0.19	0.19	99.9
73.529g split out of -#10 material.						
#20	0.850	2.68	2.35	0.33	1.71	99.5
#40	0.425	3.47	2.38	1.10	5.66	98.0
#60	0.250	6.64	2.38	4.27	22.01	92.1
#100	0.150	16.25	3.77	12.47	64.34	75.0
#200	0.075	26.30	3.07	23.23	119.83	43.0



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_55.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-12A
Depth: 56.0-56.5'
Sample Number: Silty/Clayey Sand
Sampled Date: 12/4/2013
Test Date: 3/20/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 379.47
Total Dry Weight of Sample (g): 375.24
Wet Weight of Sub-Sample (g): 73.529
Dry Weight of Sub-Sample (g): 72.709
Corrected Dry Weight of Sub-Sample - W(g): 72.782

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	31.5	26.5	21.1	0.0133	11.13	0.0627	36.1	135.38	36.1
1	26.0	21.0	21.1	0.0133	12.03	0.0461	28.6	107.29	28.6
2	23.5	18.5	21.1	0.0133	12.44	0.0331	25.2	94.51	25.2
5	20.5	15.5	21.1	0.0133	12.93	0.0214	21.1	79.19	21.1
15	19.0	14.0	21.1	0.0133	13.18	0.0124	19.1	71.52	19.1
30	18.0	13.0	21.1	0.0133	13.34	0.0089	17.7	66.41	17.7
60	17.0	12.0	21.1	0.0133	13.51	0.0063	16.3	61.31	16.3
120	15.5	10.5	21.1	0.0133	13.75	0.0045	14.3	53.64	14.3
250	14.5	9.5	21.7	0.0133	13.92	0.0031	12.9	48.53	12.9
1440	13.5	8.5	22.2	0.0131	14.08	0.0013	11.6	43.43	11.6

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_55.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-12A
Depth: 61.0-61.5'
Sample Number: Clayey Sand
Sampled Date: 12/2/2013
Test Date: 3/21/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 84.76
Weight of Dry Soil & Pan (g): 83.75
Weight of Water (g): 1.02
Weight of Pan (g): 3.80
Weight of Dry Soil (g): 79.94
Moisture (%): 1.3

General Sample Data

Total Wet Weight of Sample (g): 82.28
Total Dry Weight of Sample (g): 81.25
Calculated Weight Plus #200 (g): 31.41
Moisture of Total Sample (%): 1.3
Percent Retained #200 Sieve (%): 38.7

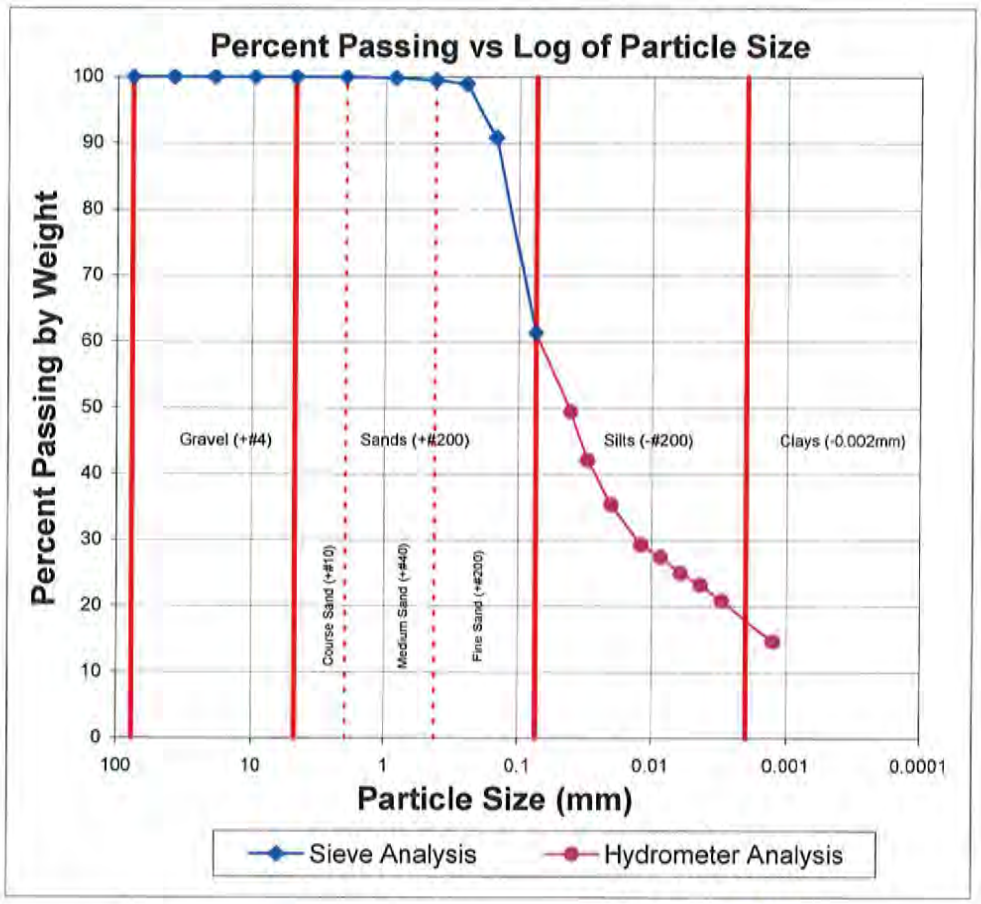
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 82.28
Calculated Dry Weight of -#10 (g): 81.25

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
82.284g split out of -#10 material.						
#20	**0.850**	2.50	2.39	0.11	0.11	99.9
#40	**0.425**	3.36	3.07	0.29	0.29	99.5
#60	**0.250**	3.51	3.08	0.43	0.43	99.0
#100	**0.150**	9.68	3.07	6.61	6.61	90.8
#200	**0.075**	27.08	3.11	23.97	23.97	61.3



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_54.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-12A
Depth: 61.0-61.5'
Sample Number: Clayey Sand
Sampled Date: 12/2/2013
Test Date: 3/21/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 82.28
Total Dry Weight of Sample (g): 81.25
Wet Weight of Sub-Sample (g): 82.284
Dry Weight of Sub-Sample (g): 81.249
Corrected Dry Weight of Sub-Sample - W(g): 81.249

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	46.0	40.5	18.3	0.0138	8.75	0.0408	49.4	40.13	49.4
2	40.0	34.5	18.3	0.0138	9.73	0.0304	42.1	34.19	42.1
5	34.5	29.0	18.3	0.0138	10.64	0.0201	35.4	28.74	35.4
15	29.5	24.0	18.5	0.0138	11.46	0.0120	29.3	23.78	29.3
30	28.0	22.5	18.6	0.0138	11.70	0.0086	27.4	22.30	27.4
60	26.0	20.5	18.9	0.0138	12.03	0.0062	25.0	20.31	25.0
120	24.5	19.0	19.4	0.0136	12.28	0.0044	23.2	18.83	23.2
250	22.5	17.0	20.2	0.0134	12.60	0.0030	20.7	16.85	20.7
1440	17.5	12.0	22.0	0.0131	13.42	0.0013	14.6	11.89	14.6

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_54.xls

Checked By: KP
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B23-06
Depth: 26-27' (25-27.5')
Sample Number: Silty Clay
Sampled Date: 12/6/2013
Test Date: 3/25/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 45.76
Weight of Dry Soil & Pan (g): 44.98
Weight of Water (g): 0.78
Weight of Pan (g): 3.82
Weight of Dry Soil (g): 41.16
Moisture (%): 1.9

General Sample Data

Total Wet Weight of Sample (g): 54.45
Total Dry Weight of Sample (g): 53.43
Calculated Weight Plus #200 (g): 4.69
Moisture of Total Sample (%): 1.9
Percent Retained #200 Sieve (%): 8.8

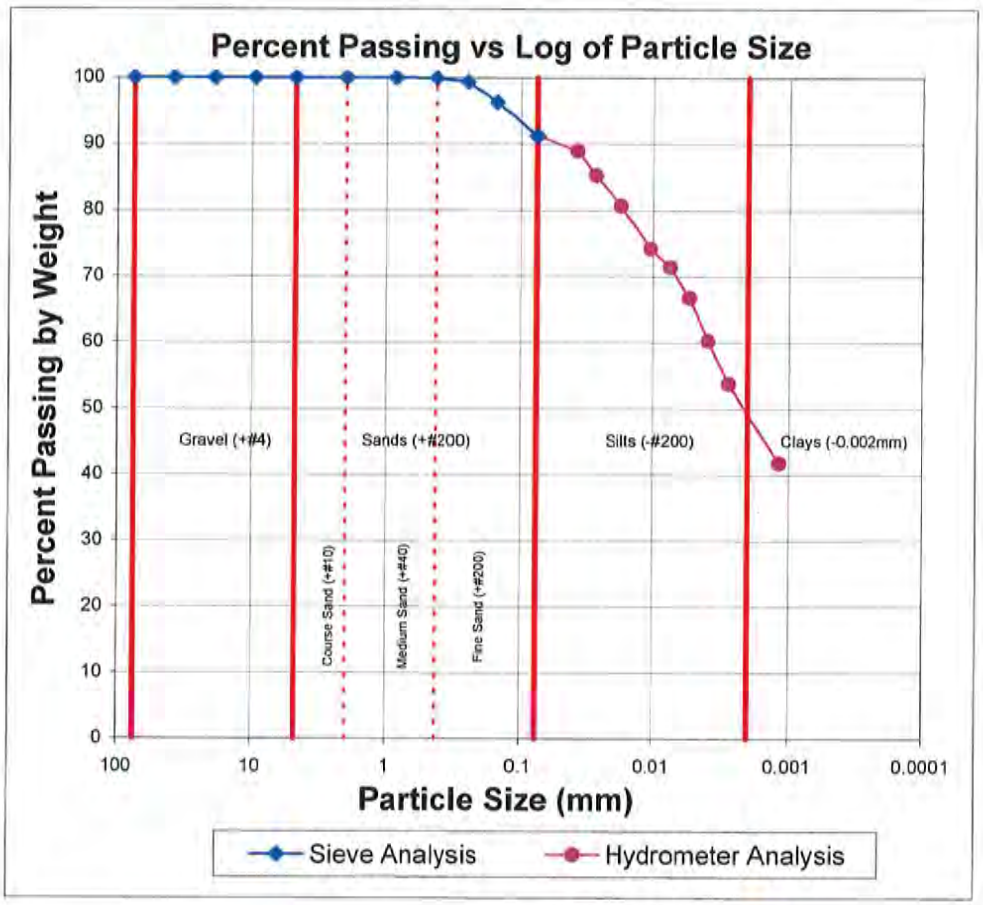
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 54.45
Calculated Dry Weight of -#10 (g): 53.43

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
54.448g split out of -#10 material.						
#20	**0.850**	2.38	2.37	0.01	0.01	100.0
#40	**0.425**	3.73	3.70	0.02	0.02	99.9
#60	**0.250**	3.40	3.09	0.32	0.32	99.3
#100	**0.150**	4.73	3.09	1.64	1.64	96.3
#200	**0.075**	5.78	3.08	2.70	2.70	91.2



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_53.xls

Checked By: KK
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B23-06
Depth: 26-27' (25-27.5')
Sample Number: Silty Clay
Sampled Date: 12/6/2013
Test Date: 3/25/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 54.45
Total Dry Weight of Sample (g): 53.43
Wet Weight of Sub-Sample (g): 54.448
Dry Weight of Sub-Sample (g): 53.433
Corrected Dry Weight of Sub-Sample - W(g): 53.433

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	53.5	48.0	18.2	0.0138	7.52	0.0378	89.0	47.56	89.0
2	51.5	46.0	18.2	0.0138	7.85	0.0273	85.3	45.58	85.3
5	49.0	43.5	18.2	0.0138	8.26	0.0177	80.7	43.10	80.7
15	45.5	40.0	18.3	0.0138	8.83	0.0106	74.2	39.64	74.2
30	44.0	38.5	18.4	0.0138	9.08	0.0076	71.4	38.15	71.4
60	41.5	36.0	18.8	0.0138	9.49	0.0055	66.8	35.67	66.8
120	38.0	32.5	19.2	0.0136	10.06	0.0039	60.3	32.20	60.3
250	34.5	29.0	20.0	0.0134	10.64	0.0028	53.8	28.74	53.8
1440	28.0	22.5	22.1	0.0131	11.70	0.0012	41.7	22.30	41.7

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_53.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-17
Depth: 81.0-81.5'
Sample Number: Gravely Sand
Sampled Date: 12/2/2013
Test Date: 3/27/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	19.14	0.00	19.14	19.14	94.8
#4	**4.750**	28.35	0.00	28.35	28.35	87.1
#10	**2.000**	23.02	0.00	23.02	23.02	80.8
110.396g split out of -#10 material.						
#20	**0.850**	8.05	3.09	4.96	13.44	77.2
#40	**0.425**	9.69	3.10	6.60	17.86	72.3
#60	**0.250**	16.10	3.09	13.01	35.22	62.7
#100	**0.150**	38.68	6.50	32.18	87.10	39.0
#200	**0.075**	26.81	3.07	23.74	64.27	21.5

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 37.77
Weight of Dry Soil & Pan (g): 37.55
Weight of Water (g): 0.22
Weight of Pan (g): 3.67
Weight of Dry Soil (g): 33.88
Moisture (%): 0.6

General Sample Data

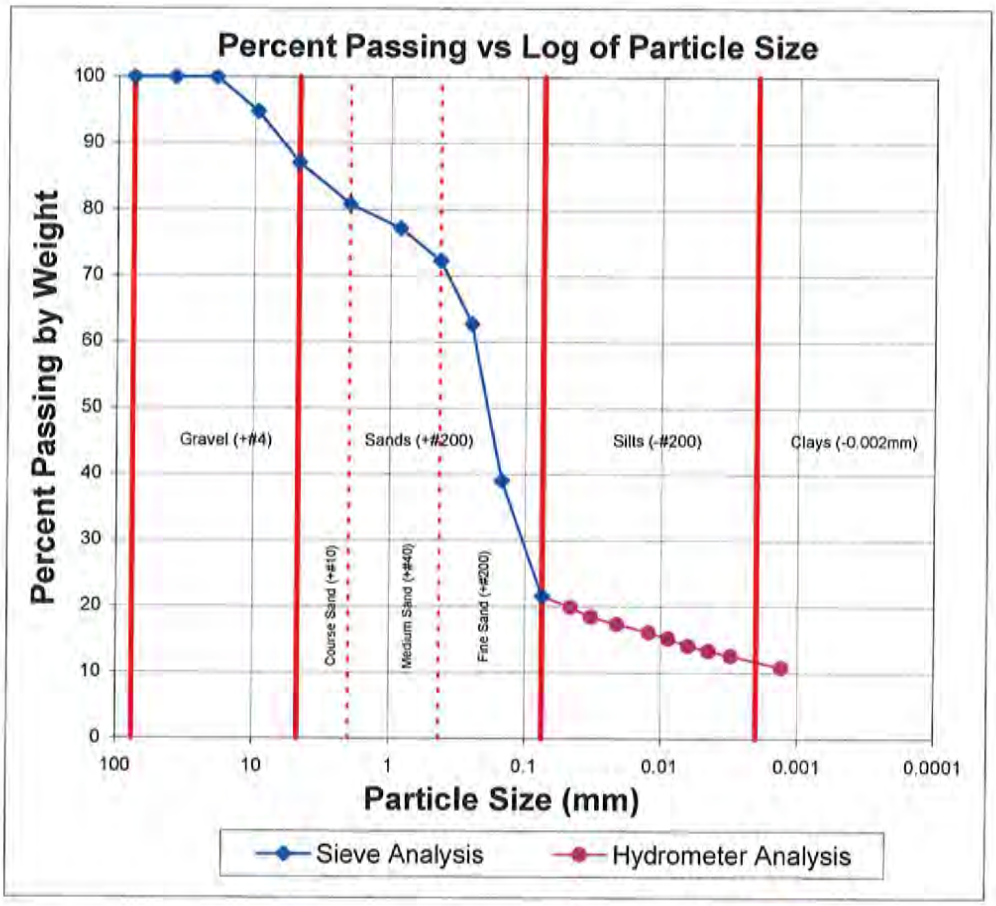
Total Wet Weight of Sample (g): 369.35
Total Dry Weight of Sample (g): 367.44
Calculated Weight Plus #200 (g): 288.39
Moisture of Total Sample (%): 0.5
Percent Retained #200 Sieve (%): 78.5

Plus Split Data

Original Weight of +#10 (g): 79.60
Calculated Weight of +#10 (g): 70.51

Minus Split Data

Original Weight of -#10 (g): 289.75
Calculated Dry Weight of -#10 (g): 296.93



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_52.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-17
Depth: 81.0-81.5'
Sample Number: Gravely Sand
Sampled Date: 12/2/2013
Test Date: 3/27/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 2.8
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 369.35
Total Dry Weight of Sample (g): 367.44
Wet Weight of Sub-Sample (g): 110.396
Dry Weight of Sub-Sample (g): 109.690
Corrected Dry Weight of Sub-Sample - W(g): 135.755

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	30.0	27.2	19.3	0.0136	11.37	0.0459	19.9	73.06	19.9
2	28.0	25.2	19.3	0.0136	11.70	0.0329	18.4	67.69	18.4
5	26.5	23.7	19.3	0.0136	11.95	0.0210	17.3	63.67	17.3
15	24.8	22.0	19.4	0.0136	12.24	0.0123	16.1	58.98	16.1
30	23.5	20.7	19.4	0.0136	12.44	0.0088	15.1	55.63	15.1
60	22.0	19.2	19.5	0.0136	12.69	0.0063	14.0	51.60	14.0
120	21.0	18.2	19.8	0.0136	12.85	0.0045	13.3	48.92	13.3
250	20.0	17.2	20.4	0.0134	13.01	0.0031	12.6	46.24	12.6
1456	17.5	14.7	19.3	0.0136	13.42	0.0013	10.8	39.53	10.8

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_52.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-06
Depth: 30.5-31.5' (30.0-31.5')
Sample Number: Sandy Clay
Sampled Date: 12/2/2013
Test Date: 3/27/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	15.70	0.00	15.70	15.70	99.0
3/8"	**9.525**	66.17	0.00	66.17	66.17	94.8
#4	**4.750**	29.88	0.00	29.88	29.88	92.9
#10	**2.000**	23.05	0.00	23.05	23.05	91.4
76.482g split out of -#10 material.						
#20	**0.850**	4.64	3.68	0.96	18.27	90.3
#40	**0.425**	5.44	3.76	1.68	32.03	88.2
#60	**0.250**	6.62	3.56	3.07	58.46	84.5
#100	**0.150**	12.02	3.62	8.39	160.11	74.3
#200	**0.075**	22.39	3.66	18.73	357.22	51.6

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 30.25
Weight of Dry Soil & Pan (g): 29.86
Weight of Water (g): 0.40
Weight of Pan (g): 3.07
Weight of Dry Soil (g): 26.79
Moisture (%): 1.5

General Sample Data

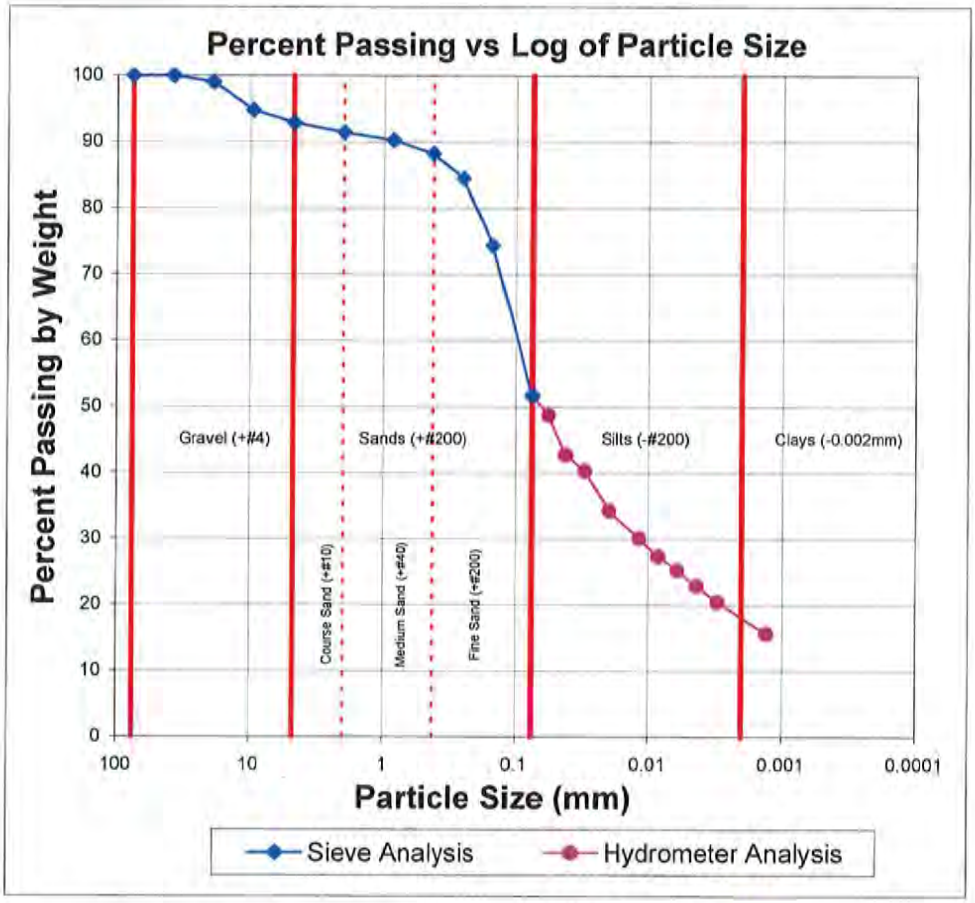
Total Wet Weight of Sample (g): 1,593.60
Total Dry Weight of Sample (g): 1,572.35
Calculated Weight Plus #200 (g): 760.87
Moisture of Total Sample (%): 1.4
Percent Retained #200 Sieve (%): 48.4

Plus Split Data

Original Weight of +#10 (g): 176.19
Calculated Weight of +#10 (g): 134.79

Minus Split Data

Original Weight of -#10 (g): 1,417.41
Calculated Dry Weight of -#10 (g): 1,437.56



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_51.xls

Checked By: KP
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-06
Depth: 30.5-31.5' (30.0-31.5')
Sample Number: Sandy Clay
Sampled Date: 12/2/2013
Test Date: 3/27/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 1,593.60
Total Dry Weight of Sample (g): 1,572.35
Wet Weight of Sub-Sample (g): 76.482
Dry Weight of Sub-Sample (g): 75.368
Corrected Dry Weight of Sub-Sample - W(g): 82.459

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	46.0	40.5	19.3	0.0136	8.75	0.0569	48.7	765.24	48.7
1	41.0	35.5	19.3	0.0136	9.57	0.0421	42.7	670.77	42.7
2	39.0	33.5	19.3	0.0136	9.90	0.0303	40.3	632.98	40.3
5	34.0	28.5	19.3	0.0136	10.72	0.0199	34.2	538.50	34.2
15	30.5	25.0	19.3	0.0136	11.29	0.0118	30.0	472.37	30.0
30	28.3	22.8	19.4	0.0136	11.66	0.0085	27.3	429.86	27.3
60	26.5	21.0	19.5	0.0136	11.95	0.0061	25.2	396.79	25.2
120	24.5	19.0	19.9	0.0136	12.28	0.0044	22.8	359.00	22.8
250	22.5	17.0	20.6	0.0134	12.60	0.0030	20.4	321.21	20.4
1451	18.5	13.0	19.1	0.0136	13.26	0.0013	15.6	245.63	15.6

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_51.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-03
Depth: 15-16'
Sample Number: Sand
Sampled Date: 12/2/2013
Test Date: 3/13/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 117.71
Weight of Dry Soil & Pan (g): 116.58
Weight of Water (g): 1.13
Weight of Pan (g): 3.77
Weight of Dry Soil (g): 112.81
Moisture (%): 1.0

General Sample Data

Total Wet Weight of Sample (g): 524.04
Total Dry Weight of Sample (g): 519.10
Calculated Weight Plus #200 (g): 319.02
Moisture of Total Sample (%): 1.0
Percent Retained #200 Sieve (%): 61.5

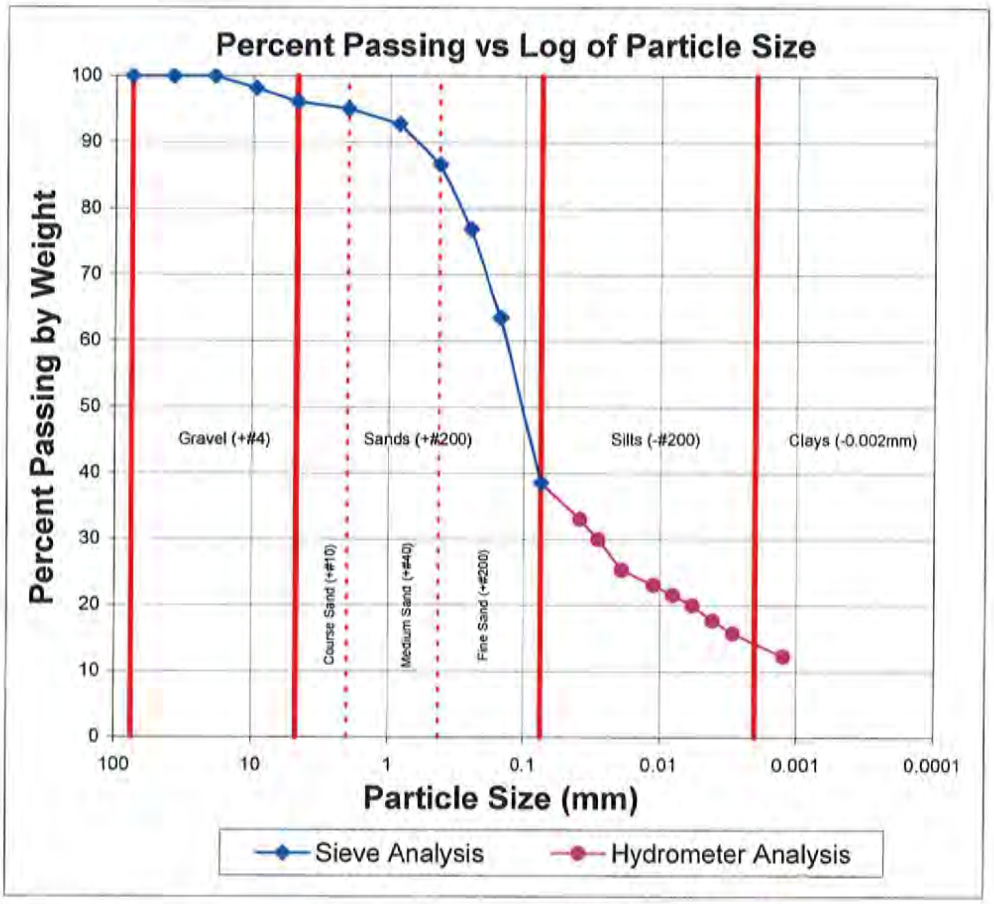
Plus Split Data

Original Weight of +#10 (g): 50.06
Calculated Weight of +#10 (g): 25.62

Minus Split Data

Original Weight of -#10 (g): 473.98
Calculated Dry Weight of -#10 (g): 493.48

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	9.47	0.00	9.47	9.47	98.2
#4	4.750	10.53	0.00	10.53	10.53	96.1
#10	2.000	5.63	0.00	5.63	5.63	95.1
123.923g split out of -#10 material.						
#20	0.850	5.24	2.30	2.94	11.82	92.8
#40	0.425	10.23	2.30	7.93	31.89	86.6
#60	0.250	15.65	3.10	12.55	50.47	76.9
#100	0.150	20.38	3.06	17.33	69.69	63.5
#200	0.075	35.27	3.07	32.21	129.54	38.5



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_50.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-03
Depth: 15-16'
Sample Number: Sand
Sampled Date: 12/2/2013
Test Date: 3/13/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 524.04
Total Dry Weight of Sample (g): 519.10
Wet Weight of Sub-Sample (g): 123.923
Dry Weight of Sub-Sample (g): 122.693
Corrected Dry Weight of Sub-Sample - W(g): 129.015

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	48.0	43.0	21.4	0.0133	8.42	0.0385	33.0	171.44	33.0
2	44.0	39.0	21.4	0.0133	9.08	0.0283	30.0	155.49	30.0
5	38.0	33.0	21.4	0.0133	10.06	0.0188	25.3	131.57	25.3
15	35.0	30.0	21.5	0.0133	10.55	0.0111	23.0	119.61	23.0
30	33.0	28.0	21.6	0.0133	10.88	0.0080	21.5	111.64	21.5
60	31.0	26.0	21.8	0.0133	11.21	0.0057	20.0	103.66	20.0
120	28.0	23.0	22.1	0.0131	11.70	0.0041	17.7	91.70	17.7
250	25.5	20.5	22.5	0.0131	12.11	0.0029	15.7	81.73	15.7
1440	21.0	16.0	21.1	0.0133	12.85	0.0013	12.3	63.79	12.3

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_50.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-08
Depth: 51.5-52.5' (50-52.5')
Sample Number: Finer Tailings
Sampled Date: 12/2/2013
Test Date: 3/17/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 44.00
Weight of Dry Soil & Pan (g): 42.74
Weight of Water (g): 1.26
Weight of Pan (g): 3.72
Weight of Dry Soil (g): 39.02
Moisture (%): 3.2

General Sample Data

Total Wet Weight of Sample (g): 62.35
Total Dry Weight of Sample (g): 60.41
Calculated Weight Plus #200 (g): 1.62
Moisture of Total Sample (%): 3.2
Percent Retained #200 Sieve (%): 2.7

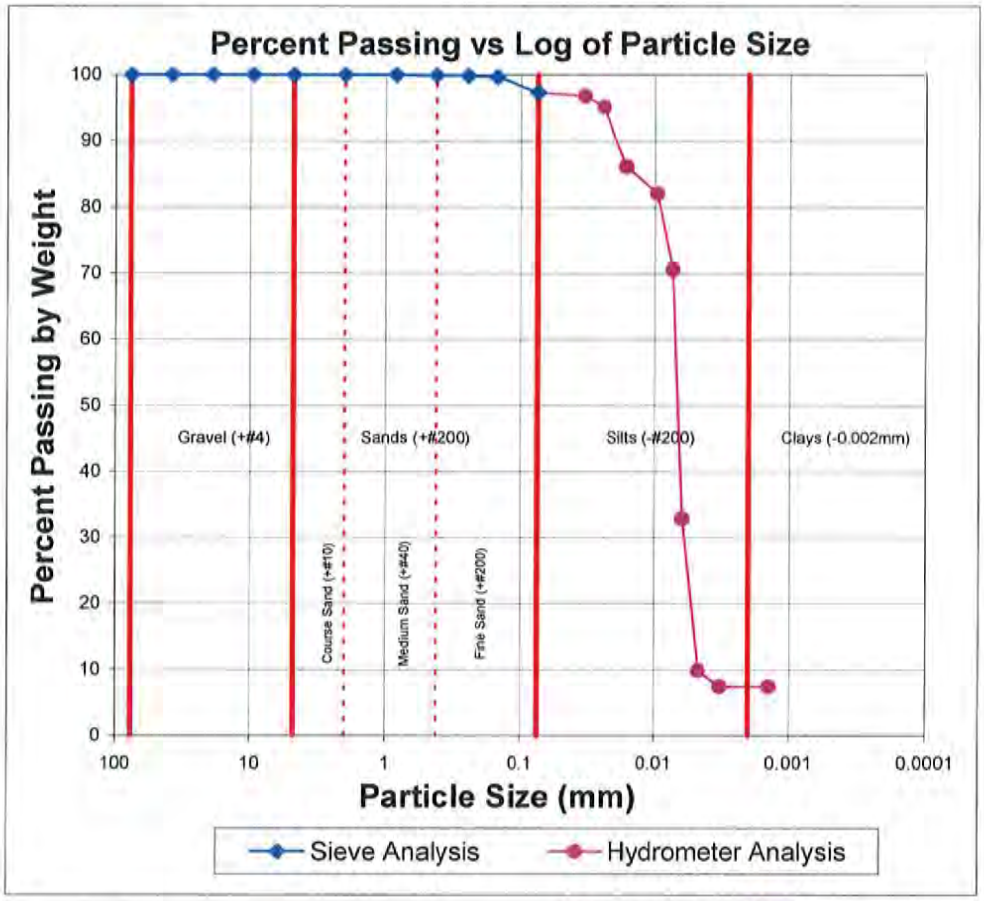
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 62.35
Calculated Dry Weight of -#10 (g): 60.41

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
62.352g split out of -#10 material.						
#20	**0.850**	2.32	2.31	0.01	0.01	100.0
#40	**0.425**	2.40	2.36	0.04	0.04	99.9
#60	**0.250**	2.33	2.30	0.03	0.03	99.9
#100	**0.150**	3.24	3.12	0.12	0.12	99.7
#200	**0.075**	5.00	3.58	1.42	1.42	97.3



Notes:
The sample started showing signs of flocculation at the one minute reading.
At the four hour reading the suppurate was barely cloudy.
At the 24 hour reading the suppurate was clear

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_49.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-08
Depth: 51.5-52.5' (50-52.5')
Sample Number: Finer Tailings
Sampled Date: 12/2/2013
Test Date: 3/17/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 62.35
Total Dry Weight of Sample (g): 60.41
Wet Weight of Sub-Sample (g): 62.352
Dry Weight of Sub-Sample (g): 60.406
Corrected Dry Weight of Sub-Sample - W(g): 60.406

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	64.0	59.0	17.8	0.0140	5.80	0.0336	96.8	58.46	96.8
2	63.0	58.0	17.8	0.0140	5.96	0.0241	95.1	57.47	95.1
5	57.5	52.5	17.8	0.0140	6.86	0.0164	86.1	52.02	86.1
15	55.0	50.0	18.0	0.0138	7.27	0.0096	82.0	49.55	82.0
30	48.0	43.0	18.2	0.0138	8.42	0.0073	70.5	42.61	70.5
60	25.0	20.0	18.6	0.0138	12.19	0.0062	32.8	19.82	32.8
120	11.0	6.0	19.2	0.0136	14.49	0.0047	9.8	5.95	9.8
250	9.5	4.5	20.1	0.0134	14.74	0.0033	7.4	4.46	7.4
1440	9.5	4.5	18.6	0.0138	14.74	0.0014	7.4	4.46	7.4

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_49.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-04
Depth: 30.0-31.0' (30-32')
Sample Number: Clayey Silt / Sand
Sampled Date: 12/3/2013
Test Date: 3/17/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 29.33
Weight of Dry Soil & Pan (g): 28.31
Weight of Water (g): 1.01
Weight of Pan (g): 3.70
Weight of Dry Soil (g): 24.62
Moisture (%): 4.1

General Sample Data

Total Wet Weight of Sample (g): 54.42
Total Dry Weight of Sample (g): 52.27
Calculated Weight Plus #200 (g): 4.83
Moisture of Total Sample (%): 4.1
Percent Retained #200 Sieve (%): 9.2

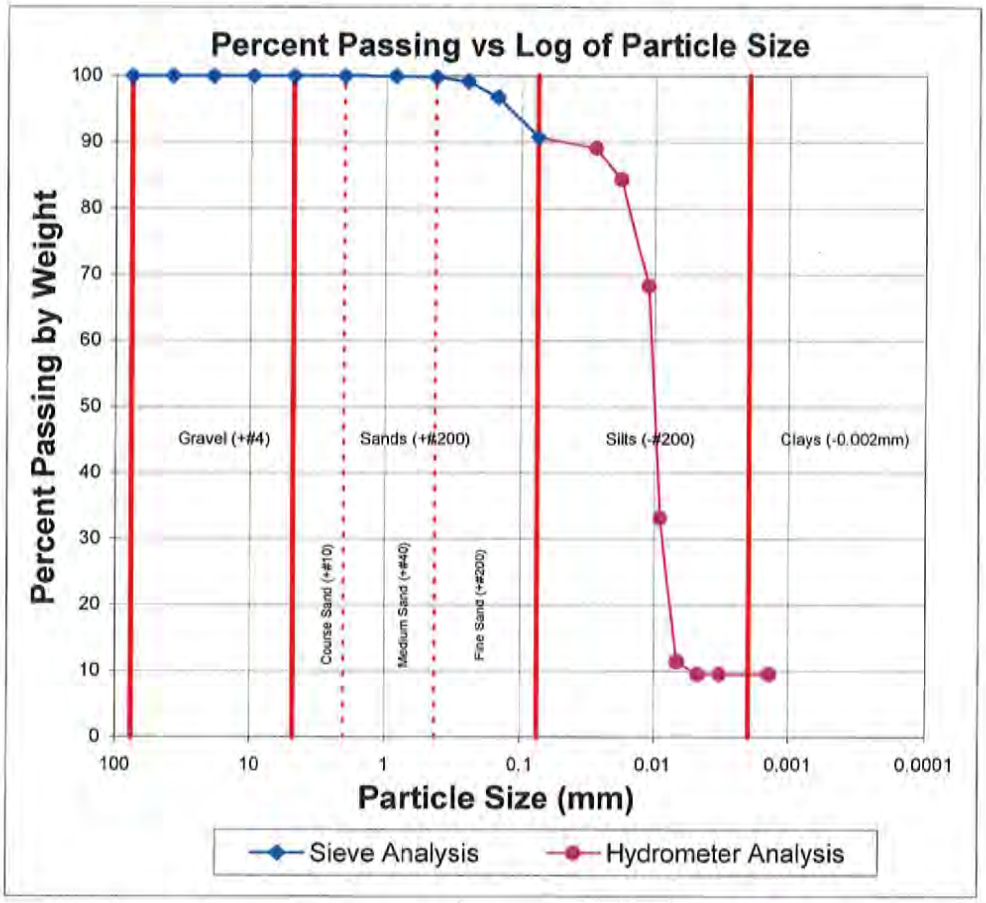
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 54.42
Calculated Dry Weight of -#10 (g): 52.27

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
54.417g split out of -#10 material.						
#20	**0.850**	2.34	2.32	0.02	0.02	100.0
#40	**0.425**	2.43	2.35	0.08	0.08	99.8
#60	**0.250**	2.64	2.29	0.35	0.35	99.2
#100	**0.150**	4.35	3.11	1.24	1.24	96.8
#200	**0.075**	6.27	3.12	3.15	3.15	90.8



Notes:
The sample started showing signs of flocculation within 30 seconds of starting the test.
At the two hour reading the suppurate was barely cloudy.
At the 24 hour reading the suppurate was completely clear.

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_48.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-04
Depth: 30.0-31.0' (30-32')
Sample Number: Clayey Silt / Sand
Sampled Date: 12/3/2013
Test Date: 3/17/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 54.42
Total Dry Weight of Sample (g): 52.27
Wet Weight of Sub-Sample (g): 54.417
Dry Weight of Sub-Sample (g): 52.266
Corrected Dry Weight of Sub-Sample - W(g): 52.266

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
2	52.0	47.0	17.5	0.0140	7.77	0.0275	89.1	46.57	89.1
5	49.5	44.5	17.5	0.0140	8.18	0.0179	84.4	44.10	84.4
15	41.0	36.0	17.8	0.0140	9.57	0.0112	68.3	35.67	68.3
30	22.5	17.5	17.9	0.0140	12.60	0.0090	33.2	17.34	33.2
60	11.0	6.0	18.3	0.0138	14.49	0.0068	11.4	5.95	11.4
120	10.0	5.0	19.0	0.0136	14.65	0.0048	9.5	4.95	9.5
250	10.0	5.0	20.1	0.0134	14.65	0.0033	9.5	4.95	9.5
1440	10.0	5.0	18.5	0.0138	14.65	0.0014	9.5	4.95	9.5

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_48.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-02A
Depth: 26.0-26.5'
Sample Number: Clayey Silt
Sampled Date: 12/3/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	0.21	0.00	0.21	0.21	99.9
55.699g split out of -#10 material.						
#20	0.850	5.06	3.87	1.19	8.16	97.8
#40	0.425	12.25	3.73	8.53	58.32	82.2
#60	0.250	17.16	3.07	14.08	96.29	56.4
#100	0.150	15.84	3.56	12.28	83.96	34.0
#200	0.075	9.28	3.79	5.49	37.55	24.0

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 26.90
Weight of Dry Soil & Pan (g): 26.48
Weight of Water (g): 0.42
Weight of Pan (g): 3.73
Weight of Dry Soil (g): 22.75
Moisture (%): 1.8

General Sample Data

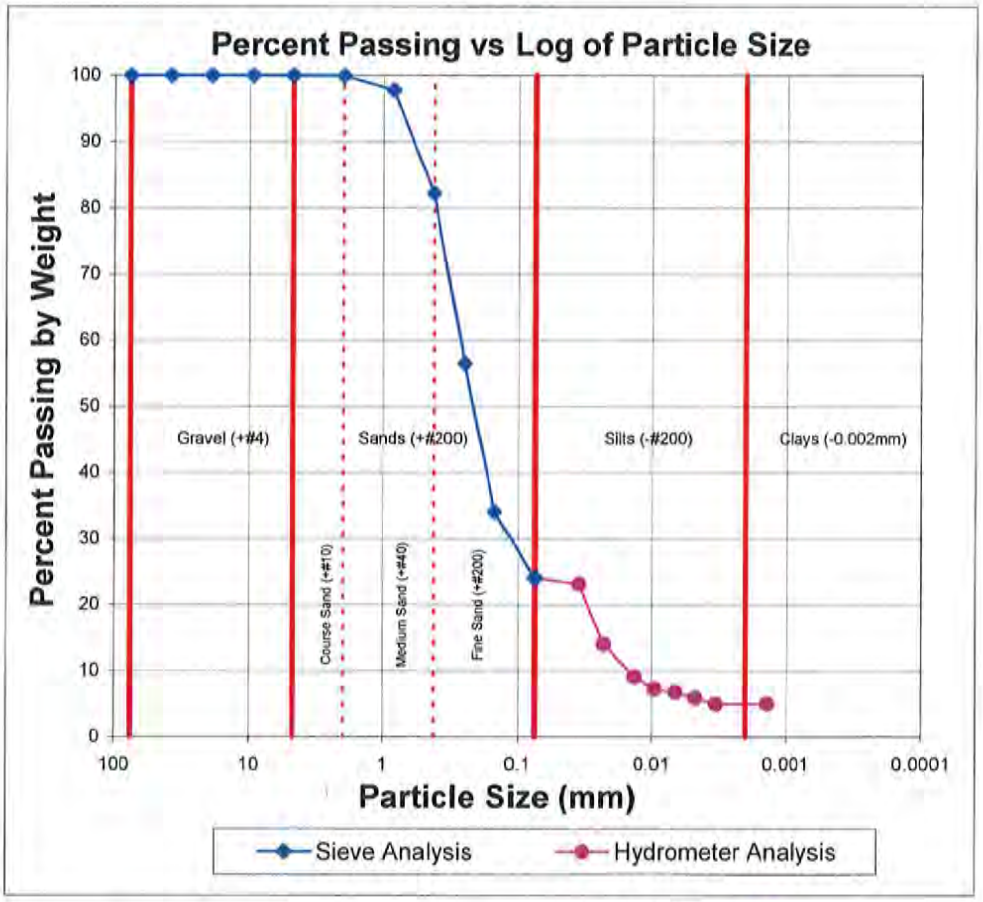
Total Wet Weight of Sample (g): 381.08
Total Dry Weight of Sample (g): 374.17
Calculated Weight Plus #200 (g): 284.49
Moisture of Total Sample (%): 1.8
Percent Retained #200 Sieve (%): 76.0

Plus Split Data

Original Weight of +#10 (g): 0.22
Calculated Weight of +#10 (g): 0.21

Minus Split Data

Original Weight of -#10 (g): 380.86
Calculated Dry Weight of -#10 (g): 373.97



Notes:
1. At the 5min. reading the sample started showing signs of flocculation.

2. At the 24 hour reading the suspension is almost completely clear. Any reading above zero is due to dissolved solids.

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_30.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-02A
Depth: 26.0-26.5'
Sample Number: Clayey Silt
Sampled Date: 12/3/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 381.08
Total Dry Weight of Sample (g): 374.17
Wet Weight of Sub-Sample (g): 55.699
Dry Weight of Sub-Sample (g): 54.689
Corrected Dry Weight of Sub-Sample - W(g): 54.744

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
2	18.0	12.8	19.9	0.0136	13.34	0.0352	23.1	86.35	23.1
5	13.0	7.8	19.9	0.0136	14.16	0.0229	14.0	52.49	14.0
15	10.3	5.0	19.9	0.0136	14.61	0.0134	9.1	33.86	9.1
30	9.3	4.0	19.9	0.0136	14.78	0.0096	7.2	27.09	7.2
60	9.0	3.8	20.0	0.0134	14.82	0.0067	6.8	25.40	6.8
120	8.5	3.3	20.0	0.0134	14.90	0.0047	5.9	22.01	5.9
250	8.0	2.8	19.9	0.0136	14.98	0.0033	5.0	18.63	5.0
1440	8.0	2.8	19.1	0.0136	14.98	0.0014	5.0	18.63	5.0

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_30.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-10
Depth: 56-57' (55-57')
Sample Number: Silty Sand
Sampled Date: 12/2/2013
Test Date: 1/29/2013

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 47.25
Weight of Dry Soil & Pan (g): 46.66
Weight of Water (g): 0.59
Weight of Pan (g): 3.11
Weight of Dry Soil (g): 43.55
Moisture (%): 1.4

General Sample Data

Total Wet Weight of Sample (g): 107.14
Total Dry Weight of Sample (g): 105.71
Calculated Weight Plus #200 (g): 63.85
Moisture of Total Sample (%): 1.4
Percent Retained #200 Sieve (%): 60.4

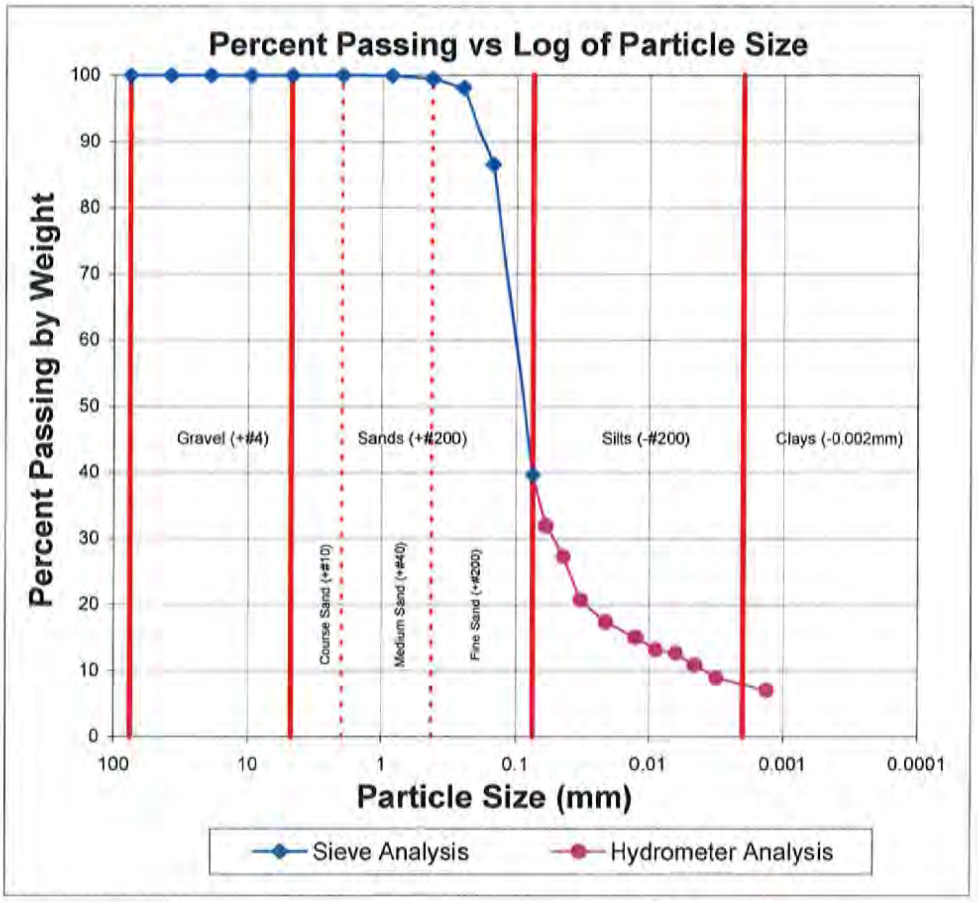
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 107.14
Calculated Dry Weight of -#10 (g): 105.71

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	0.00	0.00	0.00	0.00	100.0
107.139g split out of -#10 material.						
#20	0.850	2.42	2.36	0.06	0.06	99.9
#40	0.425	2.85	2.35	0.50	0.50	99.5
#60	0.250	4.52	3.08	1.44	1.44	98.1
#100	0.150	15.35	3.08	12.27	12.27	86.5
#200	0.075	52.68	3.09	49.60	49.60	39.6



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_28.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B11-10
Depth: 56-57' (55-57')
Sample Number: Silty Sand
Sampled Date: 12/2/2013
Test Date: 1/29/2013

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 107.14
Total Dry Weight of Sample (g): 105.71
Wet Weight of Sub-Sample (g): 107.139
Dry Weight of Sub-Sample (g): 105.712
Corrected Dry Weight of Sub-Sample - W(g): 105.712

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	40.0	34.0	19.7	0.0136	9.73	0.0601	31.9	33.69	31.9
1	35.0	29.0	19.7	0.0136	10.55	0.0442	27.2	28.74	27.2
2	28.0	22.0	19.7	0.0136	11.70	0.0329	20.6	21.80	20.6
5	24.5	18.5	19.7	0.0136	12.28	0.0213	17.3	18.33	17.3
15	22.0	16.0	19.6	0.0136	12.69	0.0125	15.0	15.85	15.0
30	20.0	14.0	19.7	0.0136	13.01	0.0090	13.1	13.87	13.1
60	19.5	13.5	19.7	0.0136	13.10	0.0064	12.7	13.38	12.7
120	17.5	11.5	19.8	0.0136	13.42	0.0046	10.8	11.40	10.8
250	15.5	9.5	20.2	0.0134	13.75	0.0032	8.9	9.41	8.9
1440	13.5	7.5	20.7	0.0134	14.08	0.0013	7.0	7.43	7.0

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_28.xls

Checked By: KP
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-08
Depth: 41-42' (40-42.5')
Sample Number: Clayey Silt
Sampled Date: 12/4/2013
Test Date: 1/29/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
62.257g split out of -#10 material.						
#20	**0.850**	2.33	2.29	0.04	0.04	99.9
#40	**0.425**	3.37	2.30	1.07	1.07	98.2
#60	**0.250**	8.20	3.11	5.09	5.09	89.9
#100	**0.150**	16.87	3.06	13.81	13.81	67.4
#200	**0.075**	14.50	3.07	11.43	11.43	48.8

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 40.21
Weight of Dry Soil & Pan (g): 39.69
Weight of Water (g): 0.52
Weight of Pan (g): 3.57
Weight of Dry Soil (g): 36.12
Moisture (%): 1.4

General Sample Data

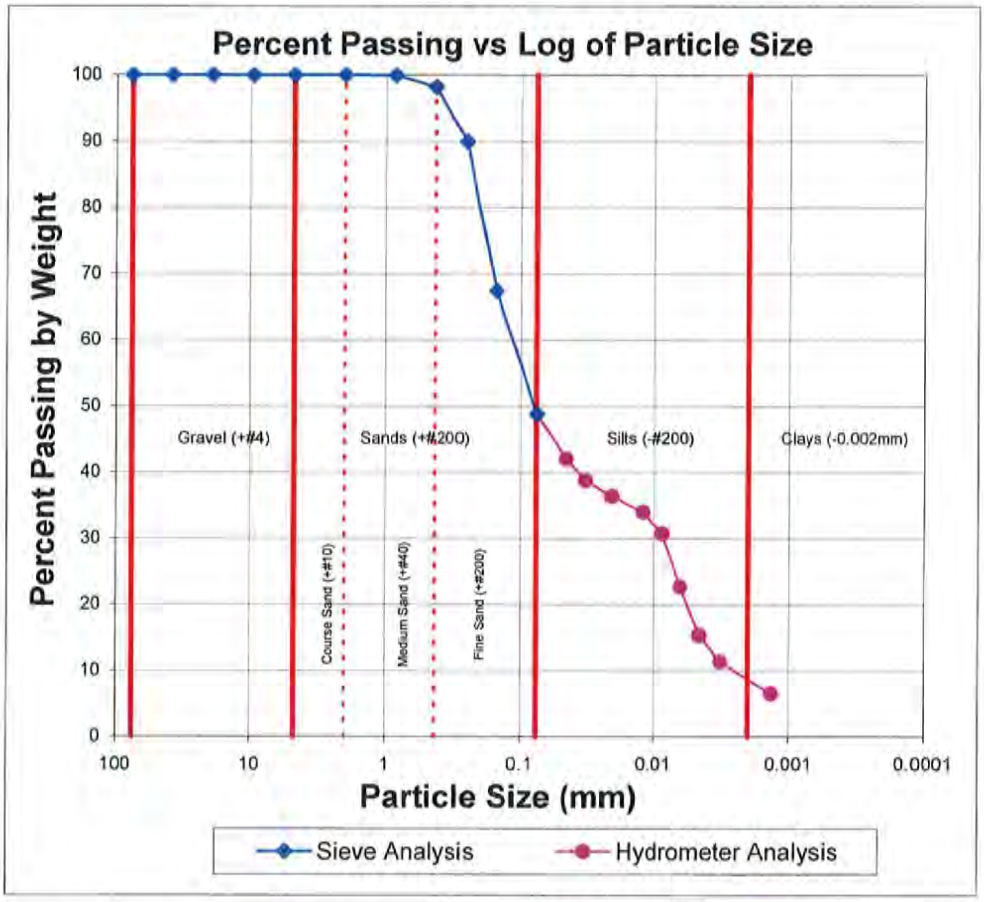
Total Wet Weight of Sample (g): 62.26
Total Dry Weight of Sample (g): 61.37
Calculated Weight Plus #200 (g): 31.43
Moisture of Total Sample (%): 1.4
Percent Retained #200 Sieve (%): 51.2

Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 62.26
Calculated Dry Weight of -#10 (g): 61.37



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_27.xls

Checked By: KP
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-08
Depth: 41-42' (40-42.5')
Sample Number: Clayey Silt
Sampled Date: 12/4/2013
Test Date: 1/29/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 62.26
Total Dry Weight of Sample (g): 61.37
Wet Weight of Sub-Sample (g): 62.257
Dry Weight of Sub-Sample (g): 61.370
Corrected Dry Weight of Sub-Sample - W(g): 61.370

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	32.0	26.0	19.6	0.0136	11.05	0.0452	42.0	25.76	42.0
2	30.0	24.0	19.6	0.0136	11.37	0.0325	38.8	23.78	38.8
5	28.5	22.5	19.6	0.0136	11.62	0.0207	36.3	22.30	36.3
15	27.0	21.0	19.6	0.0136	11.87	0.0121	33.9	20.81	33.9
30	25.0	19.0	19.6	0.0136	12.19	0.0087	30.7	18.83	30.7
60	20.0	14.0	19.7	0.0136	13.01	0.0063	22.6	13.87	22.6
120	15.5	9.5	19.9	0.0136	13.75	0.0046	15.3	9.41	15.3
250	13.0	7.0	20.2	0.0134	14.16	0.0032	11.3	6.94	11.3
1445	10.0	4.0	20.8	0.0134	14.65	0.0014	6.5	3.96	6.5

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_27.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-09
Depth: 43.5-44.5' (42.5-45.0')
Sample Number: Clayey Silt
Sampled Date: -
Test Date: 1/29/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
59.889g split out of -#10 material.						
#20	**0.850**	2.39	2.38	0.01	0.01	100.0
#40	**0.425**	2.35	2.30	0.05	0.05	99.9
#60	**0.250**	2.68	2.30	0.37	0.37	99.3
#100	**0.150**	4.83	2.33	2.50	2.50	95.0
#200	**0.075**	8.59	3.06	5.53	5.53	85.5

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 34.37
Weight of Dry Soil & Pan (g): 33.63
Weight of Water (g): 0.74
Weight of Pan (g): 3.07
Weight of Dry Soil (g): 30.56
Moisture (%): 2.4

General Sample Data

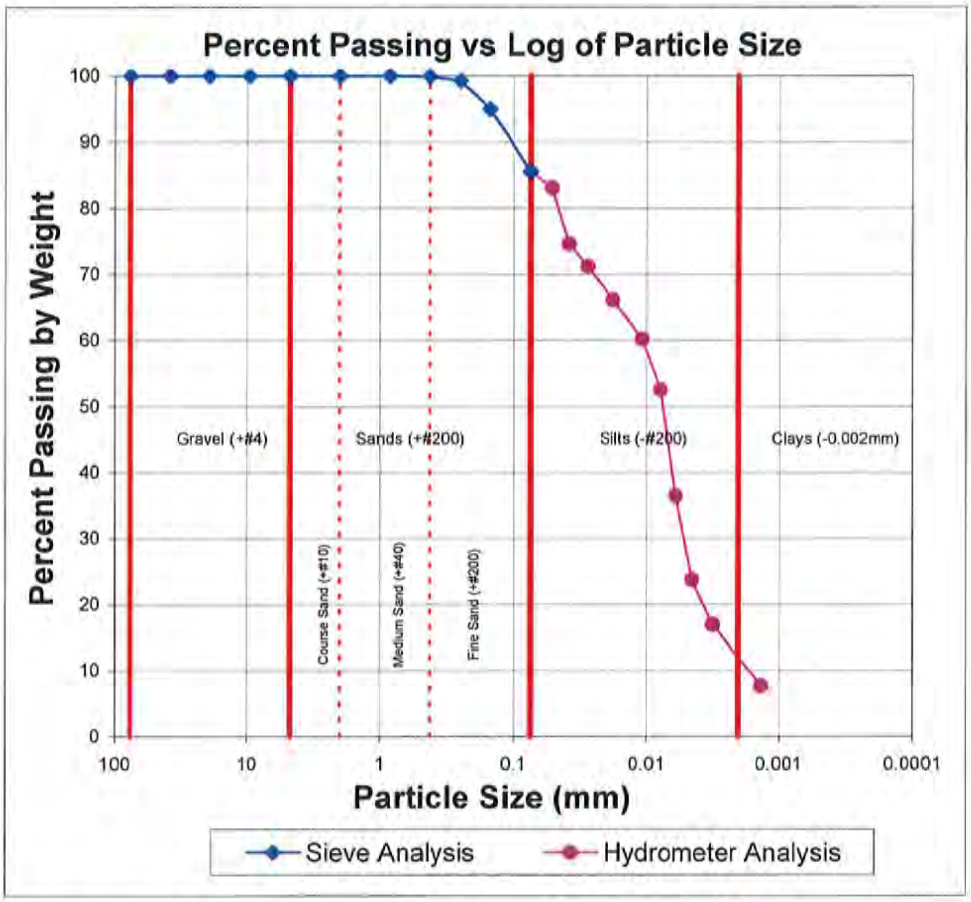
Total Wet Weight of Sample (g): 59.89
Total Dry Weight of Sample (g): 58.47
Calculated Weight Plus #200 (g): 8.46
Moisture of Total Sample (%): 2.4
Percent Retained #200 Sieve (%): 14.5

Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 59.89
Calculated Dry Weight of -#10 (g): 58.47



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_24.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-09
Depth: 43.5-44.5' (42.5-45.0')
Sample Number: Clayey Silt
Sampled Date: -
Test Date: 1/29/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 59.89
Total Dry Weight of Sample (g): 58.47
Wet Weight of Sub-Sample (g): 59.889
Dry Weight of Sub-Sample (g): 58.475
Corrected Dry Weight of Sub-Sample - W(g): 58.475

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	55.0	49.0	19.6	0.0136	7.27	0.0519	83.0	48.55	83.0
1	50.0	44.0	19.6	0.0136	8.09	0.0387	74.6	43.60	74.6
2	48.0	42.0	19.6	0.0136	8.42	0.0279	71.2	41.62	71.2
5	45.0	39.0	19.6	0.0136	8.91	0.0182	66.1	38.65	66.1
15	41.5	35.5	19.7	0.0136	9.49	0.0108	60.2	35.18	60.2
30	37.0	31.0	19.7	0.0136	10.23	0.0079	52.5	30.72	52.5
60	27.5	21.5	19.8	0.0136	11.78	0.0060	36.4	21.30	36.4
120	20.0	14.0	19.9	0.0136	13.01	0.0045	23.7	13.87	23.7
250	16.0	10.0	20.3	0.0134	13.67	0.0031	16.9	9.91	16.9
1440	10.5	4.5	20.8	0.0134	14.57	0.0014	7.6	4.46	7.6

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_24.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-02B
Depth: 25.5-26.0'
Sample Number: Sand Tailings
Sampled Date: 12/3/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 100.38
Weight of Dry Soil & Pan (g): 100.06
Weight of Water (g): 0.33
Weight of Pan (g): 3.59
Weight of Dry Soil (g): 96.46
Moisture (%): 0.3

General Sample Data

Total Wet Weight of Sample (g): 391.68
Total Dry Weight of Sample (g): 390.35
Calculated Weight Plus #200 (g): 340.89
Moisture of Total Sample (%): 0.3
Percent Retained #200 Sieve (%): 87.3

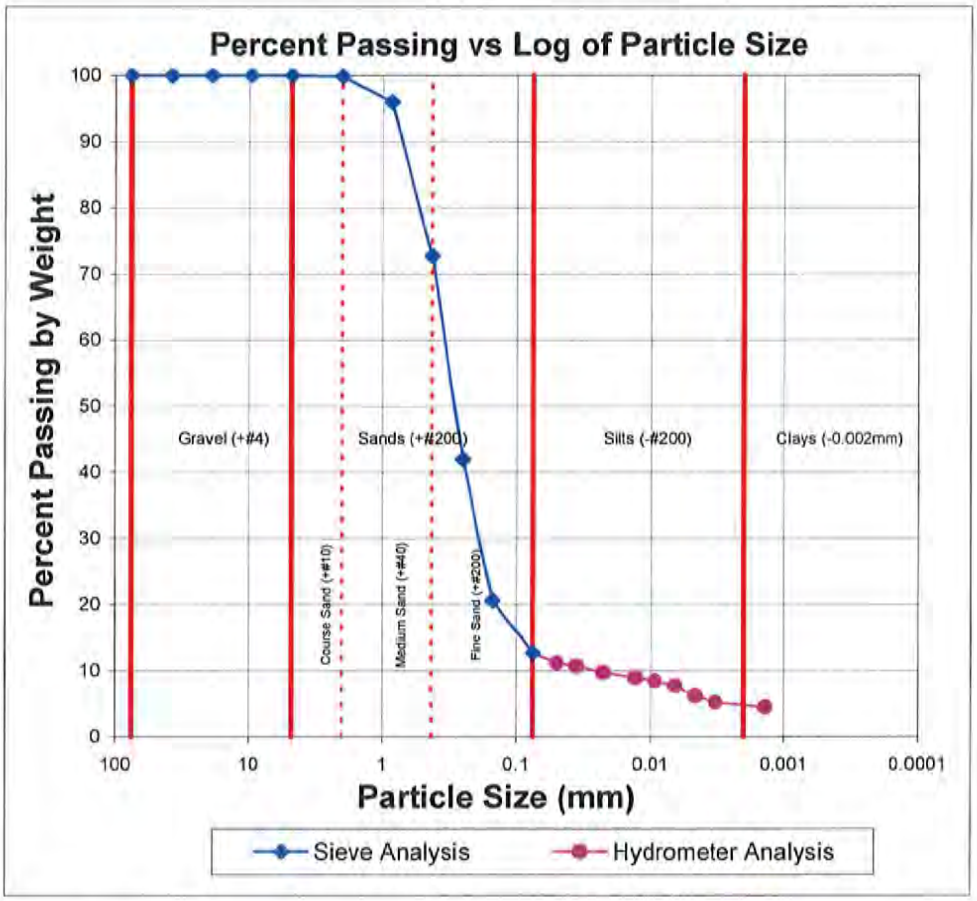
Plus Split Data

Original Weight of +#10 (g): 0.67
Calculated Weight of +#10 (g): 0.64

Minus Split Data

Original Weight of -#10 (g): 391.01
Calculated Dry Weight of -#10 (g): 389.72

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.64	0.00	0.64	0.64	99.8
100.111g split out of -#10 material.						
#20	**0.850**	7.74	3.85	3.90	15.21	95.9
#40	**0.425**	26.99	3.77	23.23	90.72	72.7
#60	**0.250**	34.49	3.77	30.72	120.01	42.0
#100	**0.150**	25.09	3.74	21.36	83.42	20.6
#200	**0.075**	11.54	3.63	7.91	30.89	12.7



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_23.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B8-02B
Depth: 25.5-26.0'
Sample Number: Sand Tailings
Sampled Date: 12/3/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 391.68
Total Dry Weight of Sample (g): 390.35
Wet Weight of Sub-Sample (g): 100.111
Dry Weight of Sub-Sample (g): 99.771
Corrected Dry Weight of Sub-Sample - W(g): 99.971

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	16.5	11.3	19.6	0.0136	13.59	0.0502	11.2	43.53	11.2
2	16.0	10.8	19.6	0.0136	13.67	0.0356	10.7	41.59	10.7
5	15.0	9.8	19.6	0.0136	13.83	0.0226	9.7	37.72	9.7
15	14.3	9.0	19.7	0.0136	13.96	0.0131	8.9	34.82	8.9
30	13.8	8.5	19.9	0.0136	14.04	0.0093	8.4	32.89	8.4
60	13.0	7.8	19.9	0.0136	14.16	0.0066	7.7	29.99	7.7
120	11.5	6.3	20.0	0.0134	14.41	0.0047	6.2	24.18	6.2
250	10.5	5.3	20.1	0.0134	14.57	0.0032	5.2	20.31	5.2
1440	9.8	4.5	19.7	0.0136	14.70	0.0014	4.5	17.41	4.5

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_23.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-06
Depth: 21.5-22.5' (20.0-22.5')
Sample Number: Clayey Silt Tailings
Sampled Date: 11/26/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 46.61
Weight of Dry Soil & Pan (g): 45.80
Weight of Water (g): 0.81
Weight of Pan (g): 3.65
Weight of Dry Soil (g): 42.15
Moisture (%): 1.9

General Sample Data

Total Wet Weight of Sample (g): 67.85
Total Dry Weight of Sample (g): 66.57
Calculated Weight Plus #200 (g): 28.63
Moisture of Total Sample (%): 1.9
Percent Retained #200 Sieve (%): 43.0

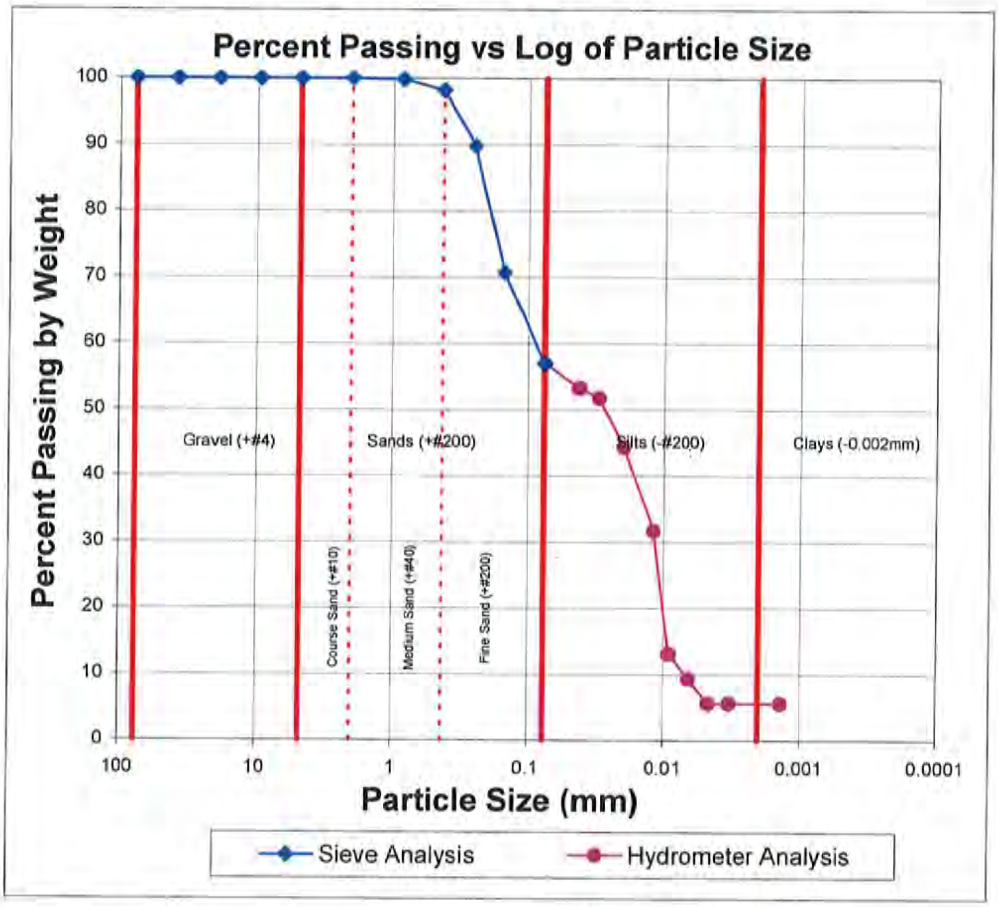
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 67.85
Calculated Dry Weight of -#10 (g): 66.57

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
67.849g split out of -#10 material.						
#20	**0.850**	3.87	3.76	0.11	0.11	99.8
#40	**0.425**	5.05	3.97	1.09	1.09	98.2
#60	**0.250**	9.42	3.81	5.61	5.61	89.8
#100	**0.150**	15.77	3.09	12.68	12.68	70.7
#200	**0.075**	12.84	3.69	9.15	9.15	57.0



Notes:
1. At the 15min. Reading the sample started to show signs of flocculation.

2. At the 24 hour reading, the suspension is almost completely clear. Any reading above zero is due to dissolved solids.

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_19.xls

Checked By: KB
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-06
Depth: 21.5-22.5' (20.0-22.5')
Sample Number: Clayey Silt Tailings
Sampled Date: 11/26/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 67.85
Total Dry Weight of Sample (g): 66.57
Wet Weight of Sub-Sample (g): 67.849
Dry Weight of Sub-Sample (g): 66.567
Corrected Dry Weight of Sub-Sample - W(g): 66.567

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	41.0	35.8	19.9	0.0136	9.57	0.0421	53.2	35.43	53.2
2	40.0	34.8	19.9	0.0136	9.73	0.0300	51.7	34.43	51.7
5	35.0	29.8	19.9	0.0136	10.55	0.0198	44.3	29.48	44.3
15	26.5	21.3	20.0	0.0134	11.95	0.0120	31.6	21.06	31.6
30	14.0	8.8	20.0	0.0134	14.00	0.0092	13.0	8.67	13.0
60	11.5	6.3	20.0	0.0134	14.41	0.0066	9.3	6.19	9.3
120	9.0	3.8	20.0	0.0134	14.82	0.0047	5.6	3.72	5.6
250	9.0	3.8	19.9	0.0136	14.82	0.0033	5.6	3.72	5.6
1440	9.0	3.8	19.1	0.0136	14.82	0.0014	5.6	3.72	5.6

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_19.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-11A
Depth: 61.0-61.5'
Sample Number: Silty Sand
Sampled Date: 11/19/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 64.54
Weight of Dry Soil & Pan (g): 63.65
Weight of Water (g): 0.89
Weight of Pan (g): 3.56
Weight of Dry Soil (g): 60.09
Moisture (%): 1.5

General Sample Data

Total Wet Weight of Sample (g): 61.06
Total Dry Weight of Sample (g): 60.17
Calculated Weight Plus #200 (g): 13.27
Moisture of Total Sample (%): 1.5
Percent Retained #200 Sieve (%): 22.0

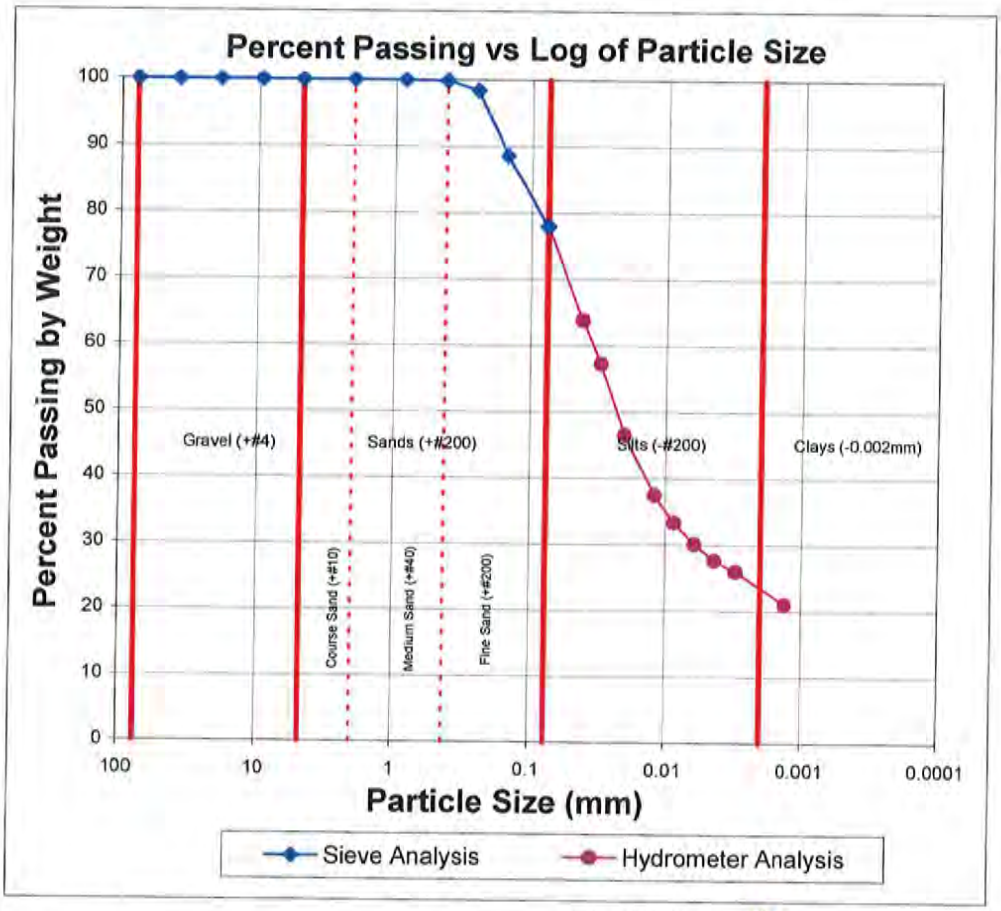
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 61.06
Calculated Dry Weight of -#10 (g): 60.17

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	0.00	0.00	0.00	0.00	100.0
61.064g split out of -#10 material.						
#20	0.850	3.91	3.91	0.00	0.00	100.0
#40	0.425	3.75	3.70	0.05	0.05	99.9
#60	0.250	4.64	3.73	0.91	0.91	98.4
#100	0.150	9.69	3.77	5.92	5.92	88.6
#200	0.075	10.00	3.62	6.38	6.38	78.0



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_21.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-11A
Depth: 61.0-61.5'
Sample Number: Silty Sand
Sampled Date: 11/19/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 61.06
Total Dry Weight of Sample (g): 60.17
Wet Weight of Sub-Sample (g): 61.064
Dry Weight of Sub-Sample (g): 60.171
Corrected Dry Weight of Sub-Sample - W(g): 60.171

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	44.0	38.8	19.7	0.0136	9.08	0.0410	63.8	38.40	63.8
2	40.0	34.8	19.7	0.0136	9.73	0.0300	57.2	34.43	57.2
5	33.5	28.3	19.7	0.0136	10.80	0.0200	46.5	27.99	46.5
15	28.0	22.8	19.8	0.0136	11.70	0.0120	37.5	22.54	37.5
30	25.5	20.3	19.9	0.0136	12.11	0.0086	33.3	20.07	33.3
60	23.5	18.3	20.0	0.0134	12.44	0.0061	30.1	18.08	30.1
120	22.0	16.8	20.1	0.0134	12.69	0.0044	27.6	16.60	27.6
250	21.0	15.8	20.1	0.0134	12.85	0.0030	25.9	15.61	25.9
1440	18.0	12.8	19.7	0.0136	13.34	0.0013	21.0	12.63	21.0

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_21.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoudment
Project Number:

Boring Number: TI-B3-01A
Depth: 11.0-11,5'
Sample Number: Sand
Sampled Date: 11/19/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 120.58
Weight of Dry Soil & Pan (g): 120.36
Weight of Water (g): 0.23
Weight of Pan (g): 3.71
Weight of Dry Soil (g): 116.65
Moisture (%): 0.2

General Sample Data

Total Wet Weight of Sample (g): 342.11
Total Dry Weight of Sample (g): 341.50
Calculated Weight Plus #200 (g): 273.70
Moisture of Total Sample (%): 0.2
Percent Retained #200 Sieve (%): 80.1

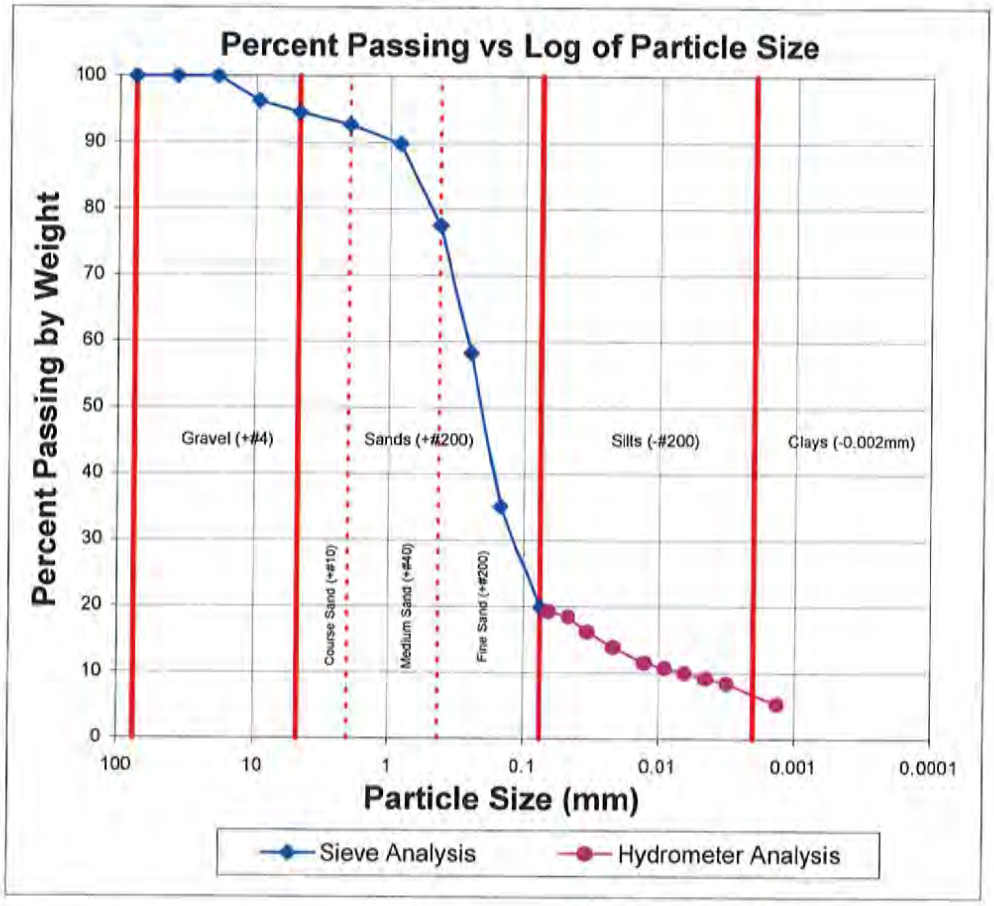
Plus Split Data

Original Weight of +#10 (g): 27.65
Calculated Weight of +#10 (g): 24.98

Minus Split Data

Original Weight of -#10 (g): 314.46
Calculated Dry Weight of -#10 (g): 316.52

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	12.60	0.00	12.60	12.60	96.3
#4	**4.750**	5.95	0.00	5.95	5.95	94.6
#10	**2.000**	6.43	0.00	6.43	6.43	92.7
118.375g split out of -#10 material.						
#20	**0.850**	7.49	3.83	3.66	9.80	89.8
#40	**0.425**	19.51	3.85	15.67	41.97	77.5
#60	**0.250**	28.26	3.71	24.55	65.78	58.3
#100	**0.150**	33.31	3.72	29.59	79.28	35.0
#200	**0.075**	22.98	3.61	19.37	51.88	19.9



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_22.xls

Checked By: VR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoudment
Project Number:

Boring Number: TI-B3-01A
Depth: 11.0-11,5'
Sample Number: Sand
Sampled Date: 11/19/2013
Test Date: 1/27/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 342.11
Total Dry Weight of Sample (g): 341.50
Wet Weight of Sub-Sample (g): 118.375
Dry Weight of Sub-Sample (g): 118.147
Corrected Dry Weight of Sub-Sample - W(g): 127.451

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	30.0	24.8	19.6	0.0136	11.37	0.0649	19.2	65.71	19.2
1	29.0	23.8	19.6	0.0136	11.54	0.0462	18.5	63.06	18.5
2	26.0	20.8	19.6	0.0136	12.03	0.0334	16.1	55.09	16.1
5	23.0	17.8	19.6	0.0136	12.52	0.0215	13.8	47.13	13.8
15	20.0	14.8	19.6	0.0136	13.01	0.0127	11.5	39.16	11.5
30	19.0	13.8	19.7	0.0136	13.18	0.0090	10.7	36.51	10.7
60	18.0	12.8	19.8	0.0136	13.34	0.0064	9.9	33.85	9.9
120	17.0	11.8	20.1	0.0134	13.51	0.0045	9.1	31.20	9.1
250	16.0	10.8	20.1	0.0134	13.67	0.0031	8.4	28.54	8.4
1440	12.0	6.8	19.9	0.0136	14.33	0.0014	5.2	17.92	5.2

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_22.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-02A
Depth: 6.0-6.5'
Sample Number: Silty Sand with Gravel
Sampled Date: 11/20/2013
Sampled By: MWH
Test Date: 1/29/2014
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 28.80
Weight of Dry Soil & Pan (g): 28.69
Weight of Water (g): 0.11
Weight of Pan (g): 3.08
Weight of Dry Soil (g): 25.62
Moisture (%): 0.4

General Sample Data

Total Wet Weight of Sample (g): 390.43
Total Dry Weight of Sample (g): 389.32
Calculated Weight Plus #200 (g): 221.32
Moisture of Total Sample (%): 0.3
Percent Retained #200 Sieve (%): 56.8

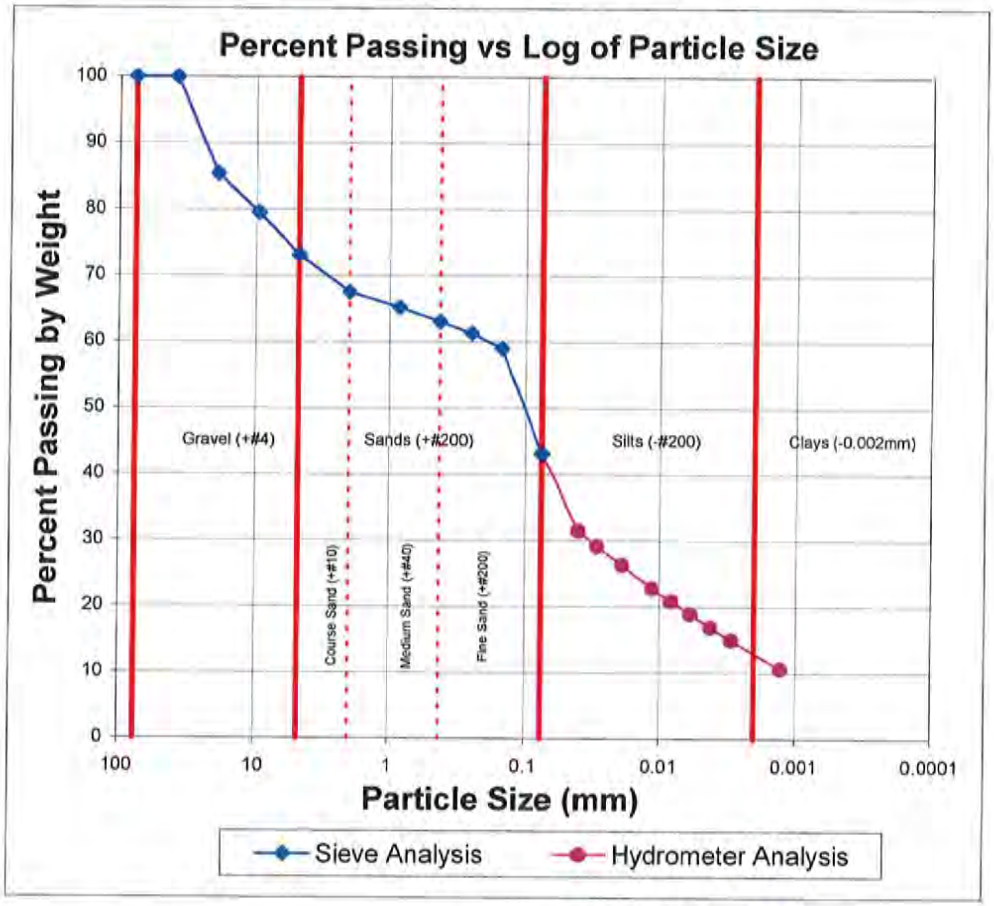
Plus Split Data

Original Weight of +#10 (g): 166.99
Calculated Weight of +#10 (g): 126.40

Minus Split Data

Original Weight of -#10 (g): 223.44
Calculated Dry Weight of -#10 (g): 262.92

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	56.89	0.00	56.89	56.89	85.4
3/8"	**9.525**	23.00	0.00	23.00	23.00	79.5
#4	**4.750**	24.93	0.00	24.93	24.93	73.1
#10	**2.000**	21.58	0.00	21.58	21.58	67.5
85.385g split out of -#10 material.						
#20	**0.850**	5.20	2.28	2.92	9.03	65.2
#40	**0.425**	5.08	2.38	2.70	8.35	63.1
#60	**0.250**	4.57	2.38	2.19	6.76	61.3
#100	**0.150**	5.94	3.06	2.88	8.89	59.0
#200	**0.075**	23.08	3.07	20.02	61.89	43.2



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_25.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-02A
Depth: 6.0-6.5'
Sample Number: Silty Sand with Gravel
Sampled Date: 11/20/2013
Sampled By: MWH
Test Date: 1/29/2014
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 390.43
Total Dry Weight of Sample (g): 389.32
Wet Weight of Sub-Sample (g): 85.385
Dry Weight of Sub-Sample (g): 85.027
Corrected Dry Weight of Sub-Sample - W(g): 125.965

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	46.0	40.0	19.7	0.0136	8.75	0.0403	31.5	122.50	31.5
2	43.0	37.0	19.7	0.0136	9.24	0.0293	29.1	113.32	29.1
5	39.5	33.5	19.7	0.0136	9.82	0.0191	26.4	102.60	26.4
15	35.0	29.0	19.7	0.0136	10.55	0.0114	22.8	88.82	22.8
30	32.5	26.5	19.8	0.0136	10.96	0.0082	20.8	81.16	20.8
60	30.0	24.0	19.8	0.0136	11.37	0.0059	18.9	73.50	18.9
120	27.5	21.5	20.0	0.0134	11.78	0.0042	16.9	65.85	16.9
250	25.0	19.0	20.3	0.0134	12.19	0.0030	14.9	58.19	14.9
1440	19.5	13.5	20.8	0.0134	13.10	0.0013	10.6	41.35	10.6

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_25.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-03
Depth: 12.5-14'
Sample Number: Sand Tailings
Sampled Date: 11/26/2013
Test Date: 1/29/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 77.29
Weight of Dry Soil & Pan (g): 76.79
Weight of Water (g): 0.50
Weight of Pan (g): 3.14
Weight of Dry Soil (g): 73.66
Moisture (%): 0.7

General Sample Data

Total Wet Weight of Sample (g): 1,360.35
Total Dry Weight of Sample (g): 1,351.31
Calculated Weight Plus #200 (g): 975.06
Moisture of Total Sample (%): 0.7
Percent Retained #200 Sieve (%): 72.2

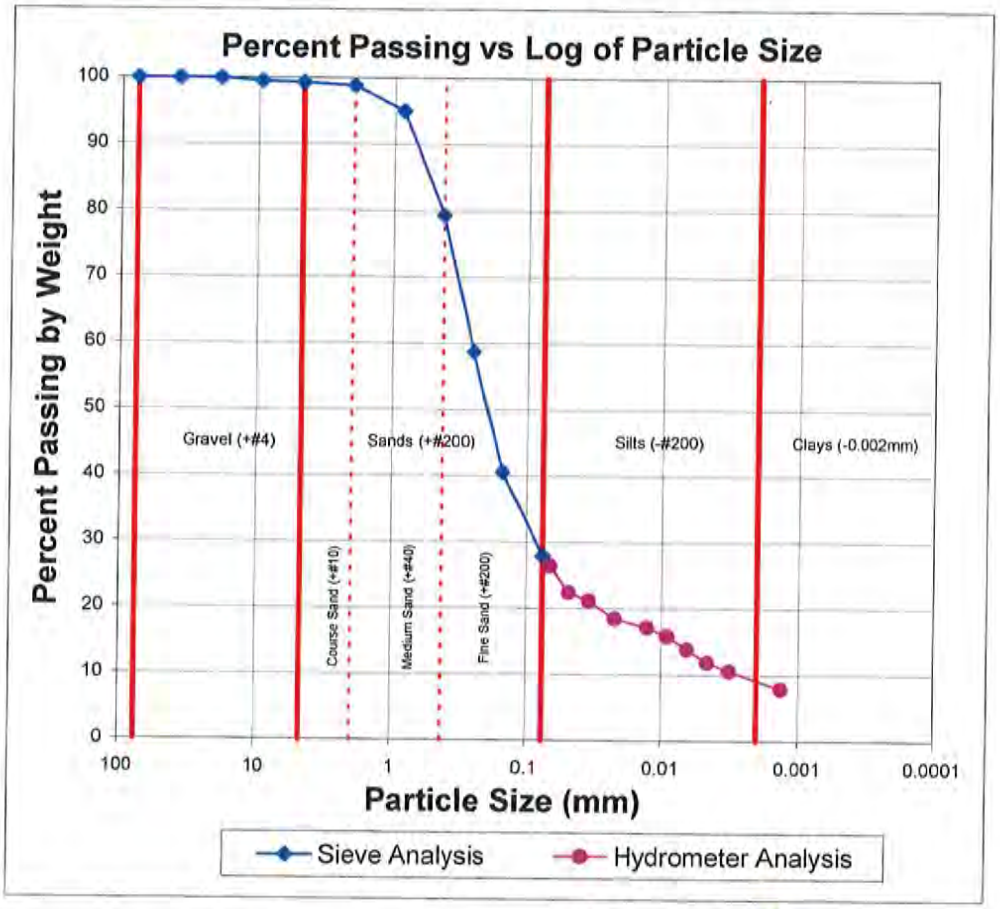
Plus Split Data

Original Weight of +#10 (g): 34.02
Calculated Weight of +#10 (g): 14.94

Minus Split Data

Original Weight of -#10 (g): 1,326.33
Calculated Dry Weight of -#10 (g): 1,336.38

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	6.79	0.00	6.79	6.79	99.5
#4	**4.750**	2.39	0.00	2.39	2.39	99.3
#10	**2.000**	5.75	0.00	5.75	5.75	98.9
74.812g split out of -#10 material.						
#20	**0.850**	5.23	2.34	2.89	51.96	95.0
#40	**0.425**	14.12	2.28	11.84	212.93	79.3
#60	**0.250**	17.76	2.30	15.46	278.07	58.7
#100	**0.150**	16.74	3.08	13.66	245.64	40.5
#200	**0.075**	12.64	3.10	9.54	171.53	27.8



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_26.xls

Checked By: KP
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-03
Depth: 12.5-14'
Sample Number: Sand Tailings
Sampled Date: 11/26/2013
Test Date: 1/29/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 1,360.35
Total Dry Weight of Sample (g): 1,351.31
Wet Weight of Sub-Sample (g): 74.812
Dry Weight of Sub-Sample (g): 74.310
Corrected Dry Weight of Sub-Sample - W(g): 75.136

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	26.0	20.0	19.6	0.0136	12.03	0.0668	26.4	356.43	26.4
1	23.0	17.0	19.6	0.0136	12.52	0.0482	22.4	302.96	22.4
2	22.0	16.0	19.6	0.0136	12.69	0.0343	21.1	285.14	21.1
5	20.0	14.0	19.6	0.0136	13.01	0.0220	18.5	249.50	18.5
15	19.0	13.0	19.6	0.0136	13.18	0.0128	17.1	231.68	17.1
30	18.0	12.0	19.6	0.0136	13.34	0.0091	15.8	213.86	15.8
60	16.5	10.5	19.7	0.0136	13.59	0.0065	13.8	187.12	13.8
120	15.0	9.0	19.8	0.0136	13.83	0.0046	11.9	160.39	11.9
250	14.0	8.0	20.1	0.0134	14.00	0.0032	10.6	142.57	10.6
1440	12.0	6.0	20.6	0.0134	14.33	0.0013	7.9	106.93	7.9

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_26.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-07
Depth: 13.5-14.5'
Sample Number: Sand Tailings
Sampled Date: 11/20/2013
Test Date: 1/29/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 67.64
Weight of Dry Soil & Pan (g): 62.05
Weight of Water (g): 5.59
Weight of Pan (g): 3.77
Weight of Dry Soil (g): 58.28
Moisture (%): 9.6

General Sample Data

Total Wet Weight of Sample (g): 61.71
Total Dry Weight of Sample (g): 56.31
Calculated Weight Plus #200 (g): 13.01
Moisture of Total Sample (%): 9.6
Percent Retained #200 Sieve (%): 23.1

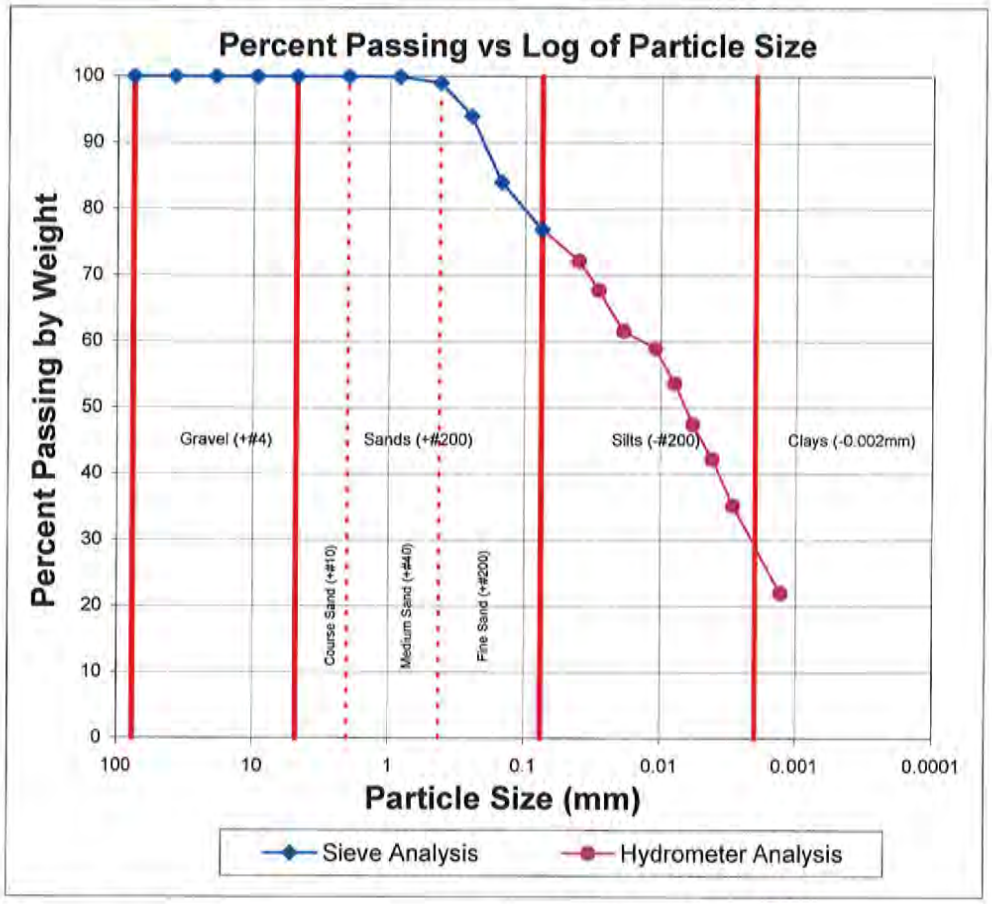
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 61.71
Calculated Dry Weight of -#10 (g): 56.31

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
61.707g split out of -#10 material.						
#20	**0.850**	2.37	2.35	0.01	0.01	100.0
#40	**0.425**	2.85	2.32	0.53	0.53	99.0
#60	**0.250**	5.91	3.09	2.82	2.82	94.0
#100	**0.150**	8.72	3.09	5.63	5.63	84.0
#200	**0.075**	7.12	3.11	4.01	4.01	76.9



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_29.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-07
Depth: 13.5-14.5'
Sample Number: Sand Tailings
Sampled Date: 11/20/2013
Test Date: 1/29/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 6.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 61.71
Total Dry Weight of Sample (g): 56.31
Wet Weight of Sub-Sample (g): 61.707
Dry Weight of Sub-Sample (g): 56.308
Corrected Dry Weight of Sub-Sample - W(g): 56.308

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	47.0	41.0	19.4	0.0136	8.59	0.0399	72.2	40.63	72.2
2	44.5	38.5	19.4	0.0136	9.00	0.0289	67.8	38.15	67.8
5	41.0	35.0	19.4	0.0136	9.57	0.0188	61.6	34.68	61.6
15	39.5	33.5	19.4	0.0136	9.82	0.0110	59.0	33.20	59.0
30	36.5	30.5	19.5	0.0136	10.31	0.0080	53.7	30.22	53.7
60	33.0	27.0	19.5	0.0136	10.88	0.0058	47.5	26.75	47.5
120	30.0	24.0	19.8	0.0136	11.37	0.0042	42.2	23.78	42.2
250	26.0	20.0	20.1	0.0134	12.03	0.0029	35.2	19.82	35.2
1440	18.5	12.5	20.7	0.0134	13.26	0.0013	22.0	12.39	22.0

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_29.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-05A
Depth: 16.0-16.5'
Sample Number: Silty Clay with Sand
Sampled Date: 11/21/2013
Test Date: 2/12/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 47.38
Weight of Dry Soil & Pan (g): 46.47
Weight of Water (g): 0.92
Weight of Pan (g): 3.07
Weight of Dry Soil (g): 43.40
Moisture (%): 2.1

General Sample Data

Total Wet Weight of Sample (g): 430.66
Total Dry Weight of Sample (g): 421.80
Calculated Weight Plus #200 (g): 115.92
Moisture of Total Sample (%): 2.1
Percent Retained #200 Sieve (%): 27.5

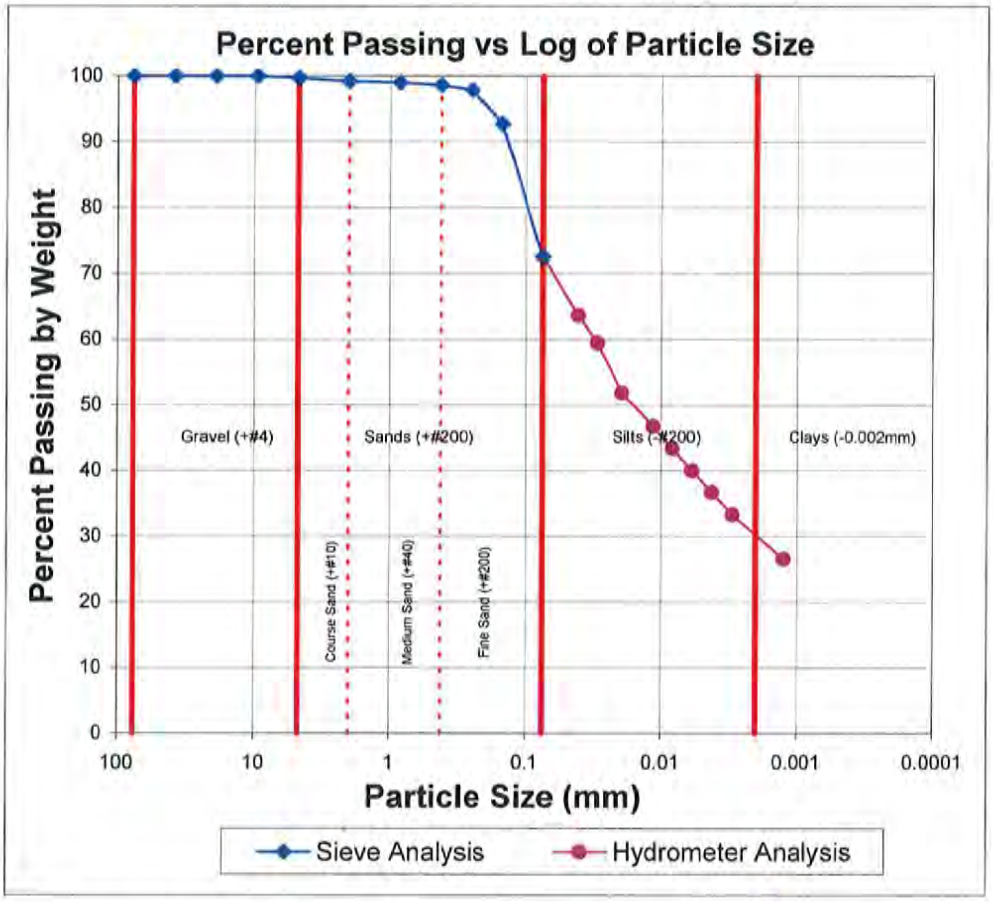
Plus Split Data

Original Weight of +#10 (g): 4.30
Calculated Weight of +#10 (g): 3.23

Minus Split Data

Original Weight of -#10 (g): 426.36
Calculated Dry Weight of -#10 (g): 418.57

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	1.18	0.00	1.18	1.18	99.7
#10	**2.000**	2.05	0.00	2.05	2.05	99.2
59.554g split out of -#10 material.						
#20	**0.850**	3.97	3.84	0.14	0.98	99.0
#40	**0.425**	3.28	3.07	0.21	1.52	98.6
#60	**0.250**	3.53	3.09	0.44	3.18	97.9
#100	**0.150**	6.10	3.08	3.03	21.71	92.7
#200	**0.075**	14.96	3.07	11.89	85.31	72.5



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_31.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-05A
Depth: 16.0-16.5'
Sample Number: Silty Clay with Sand
Sampled Date: 11/21/2013
Test Date: 2/12/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 430.66
Total Dry Weight of Sample (g): 421.80
Wet Weight of Sub-Sample (g): 59.554
Dry Weight of Sub-Sample (g): 58.320
Corrected Dry Weight of Sub-Sample - W(g): 58.791

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	43.0	37.8	20.3	0.0134	9.24	0.0409	63.6	268.38	63.6
2	40.5	35.3	20.3	0.0134	9.65	0.0295	59.4	250.61	59.4
5	36.0	30.8	20.3	0.0134	10.39	0.0194	51.8	218.61	51.8
15	33.0	27.8	20.3	0.0134	10.88	0.0114	46.8	197.29	46.8
30	31.0	25.8	20.3	0.0134	11.21	0.0082	43.4	183.07	43.4
60	29.0	23.8	20.3	0.0134	11.54	0.0059	40.0	168.85	40.0
120	27.0	21.8	20.4	0.0134	11.87	0.0042	36.7	154.63	36.7
250	25.0	19.8	20.6	0.0134	12.19	0.0030	33.3	140.41	33.3
1440	21.0	15.8	21.9	0.0133	12.85	0.0013	26.5	111.97	26.5

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_31.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-12A
Depth: 36.0-36.5'
Sample Number: Clayey Silt Tailings
Sampled Date: 11/26/2013
Test Date: 2/12/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 40.35
Weight of Dry Soil & Pan (g): 37.66
Weight of Water (g): 2.69
Weight of Pan (g): 3.90
Weight of Dry Soil (g): 33.76
Moisture (%): 8.0

General Sample Data

Total Wet Weight of Sample (g): 61.65
Total Dry Weight of Sample (g): 57.09
Calculated Weight Plus #200 (g): 28.88
Moisture of Total Sample (%): 8.0
Percent Retained #200 Sieve (%): 50.6

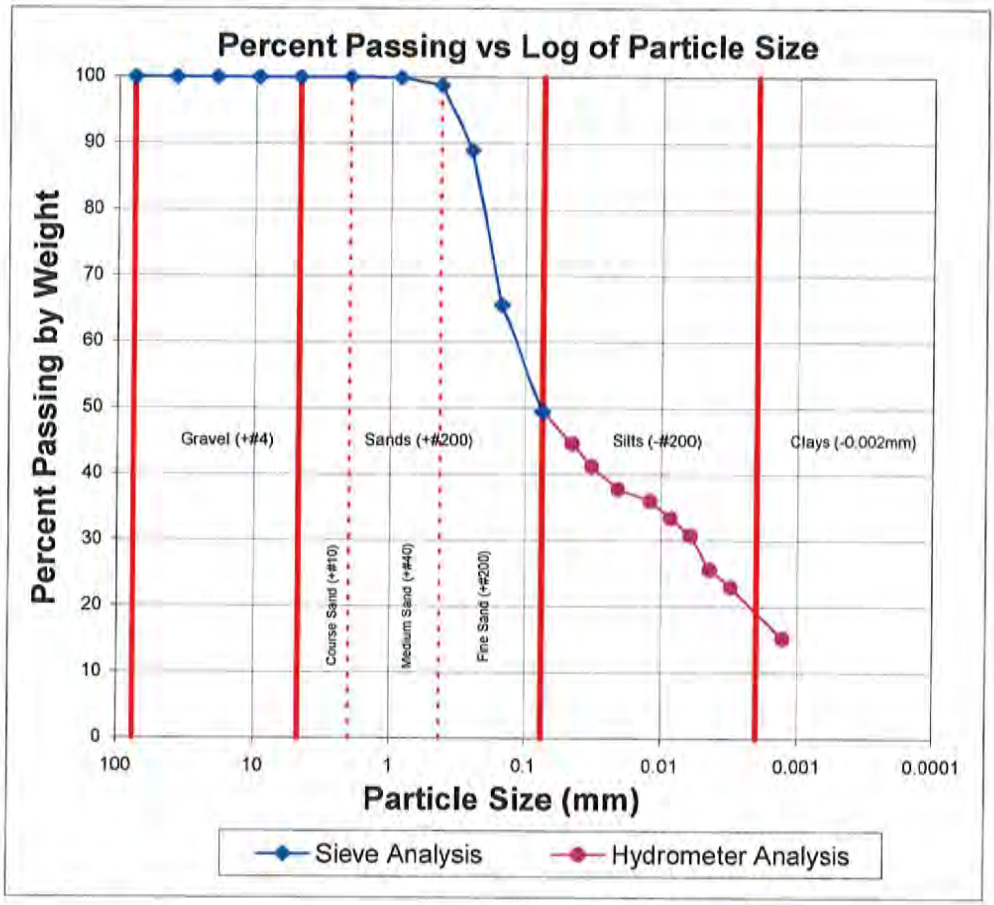
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 61.65
Calculated Dry Weight of -#10 (g): 57.09

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
61.648g split out of -#10 material.						
#20	**0.850**	3.76	3.73	0.03	0.03	99.9
#40	**0.425**	4.36	3.70	0.66	0.66	98.8
#60	**0.250**	8.68	3.06	5.62	5.62	89.0
#100	**0.150**	16.44	3.11	13.34	13.34	65.6
#200	**0.075**	12.30	3.07	9.24	9.24	49.4



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_32.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-12A
Depth: 36.0-36.5'
Sample Number: Clayey Silt Tailings
Sampled Date: 11/26/2013
Test Date: 2/12/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 61.65
Total Dry Weight of Sample (g): 57.09
Wet Weight of Sub-Sample (g): 61.648
Dry Weight of Sub-Sample (g): 57.095
Corrected Dry Weight of Sub-Sample - W(g): 57.095

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	31.0	25.8	20.3	0.0134	11.21	0.0450	44.7	25.52	44.7
2	29.0	23.8	20.3	0.0134	11.54	0.0323	41.2	23.53	41.2
5	27.0	21.8	20.3	0.0134	11.87	0.0207	37.7	21.55	37.7
15	26.0	20.8	20.4	0.0134	12.03	0.0120	36.0	20.56	36.0
30	24.5	19.3	20.4	0.0134	12.28	0.0086	33.4	19.08	33.4
60	23.0	17.8	20.4	0.0134	12.52	0.0061	30.8	17.59	30.8
120	20.0	14.8	20.6	0.0134	13.01	0.0044	25.6	14.62	25.6
250	18.5	13.3	20.8	0.0134	13.26	0.0031	23.0	13.13	23.0
1440	14.0	8.8	22.1	0.0131	14.00	0.0013	15.2	8.67	15.2

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_32.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-15A
Depth: 41.0-41.5'
Sample Number: Sandy Clay
Sampled Date: 11/21/2013
Test Date: 2/24/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 38.16
Weight of Dry Soil & Pan (g): 37.57
Weight of Water (g): 0.59
Weight of Pan (g): 3.69
Weight of Dry Soil (g): 33.89
Moisture (%): 1.7

General Sample Data

Total Wet Weight of Sample (g): 71.05
Total Dry Weight of Sample (g): 69.85
Calculated Weight Plus #200 (g): 12.71
Moisture of Total Sample (%): 1.7
Percent Retained #200 Sieve (%): 18.2

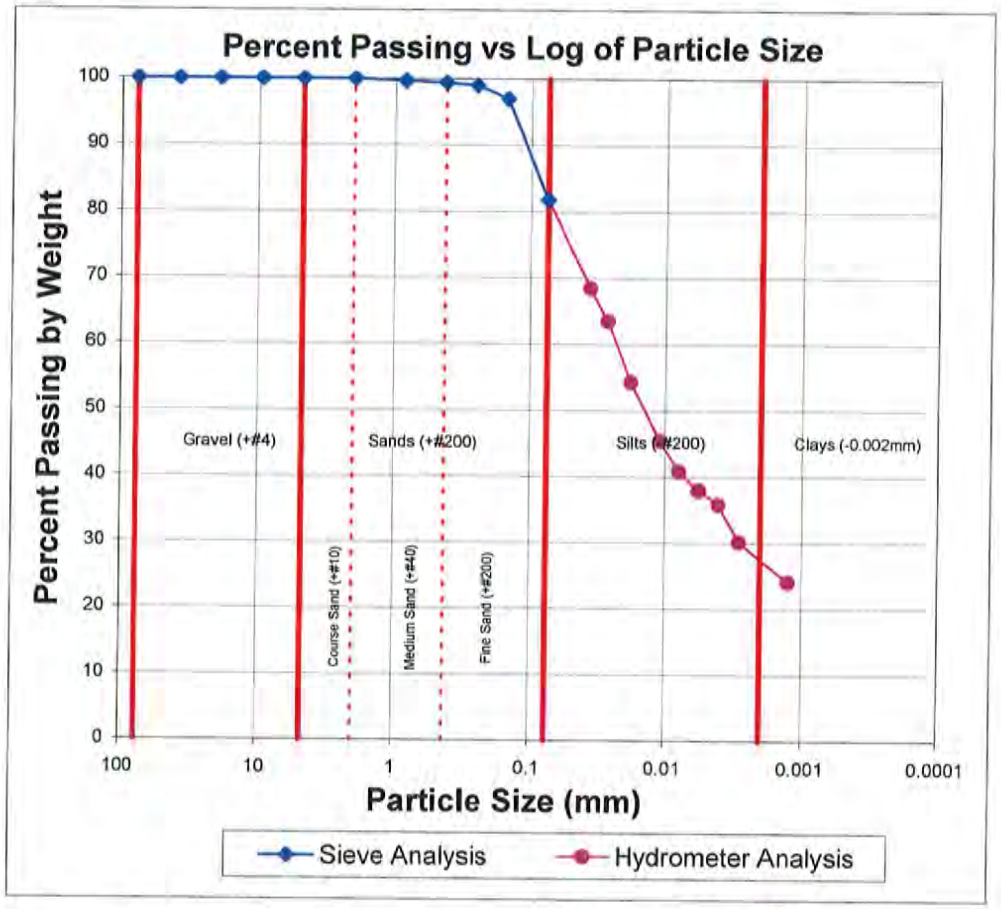
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 71.05
Calculated Dry Weight of -#10 (g): 69.85

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
71.053g split out of -#10 material.						
#20	**0.850**	2.54	2.33	0.21	0.21	99.7
#40	**0.425**	2.49	2.28	0.21	0.21	99.4
#60	**0.250**	2.63	2.38	0.25	0.25	99.0
#100	**0.150**	4.49	3.08	1.41	1.41	97.0
#200	**0.075**	13.69	3.07	10.63	10.63	81.8



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_33.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-15A
Depth: 41.0-41.5'
Sample Number: Sandy Clay
Sampled Date: 11/21/2013
Test Date: 2/24/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 71.05
Total Dry Weight of Sample (g): 69.85
Wet Weight of Sub-Sample (g): 71.053
Dry Weight of Sub-Sample (g): 69.847
Corrected Dry Weight of Sub-Sample - W(g): 69.847

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	53.5	48.3	21.2	0.0133	7.52	0.0364	68.5	47.81	68.5
2	50.0	44.8	21.2	0.0133	8.09	0.0267	63.5	44.34	63.5
5	43.5	38.3	21.2	0.0133	9.16	0.0180	54.3	37.90	54.3
15	37.3	32.0	21.2	0.0133	10.19	0.0109	45.4	31.71	45.4
30	34.0	28.8	21.3	0.0133	10.72	0.0079	40.8	28.49	40.8
60	32.0	26.8	21.4	0.0133	11.05	0.0057	37.9	26.51	37.9
120	30.5	25.3	21.6	0.0133	11.29	0.0041	35.8	25.02	35.8
250	26.5	21.3	22.2	0.0131	11.95	0.0029	30.1	21.06	30.1
1440	22.3	17.0	20.8	0.0134	12.65	0.0013	24.1	16.85	24.1

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_33.xls

Checked By: 6/18/14
Date: KR

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-04A
Depth: 16.0-16.5'
Sample Number: Sand Tailings
Sampled Date: 11/26/2013
Test Date: 2/12/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 56.00
Weight of Dry Soil & Pan (g): 55.73
Weight of Water (g): 0.27
Weight of Pan (g): 3.09
Weight of Dry Soil (g): 52.64
Moisture (%): 0.5

General Sample Data

Total Wet Weight of Sample (g): 404.23
Total Dry Weight of Sample (g): 402.24
Calculated Weight Plus #200 (g): 340.77
Moisture of Total Sample (%): 0.5
Percent Retained #200 Sieve (%): 84.7

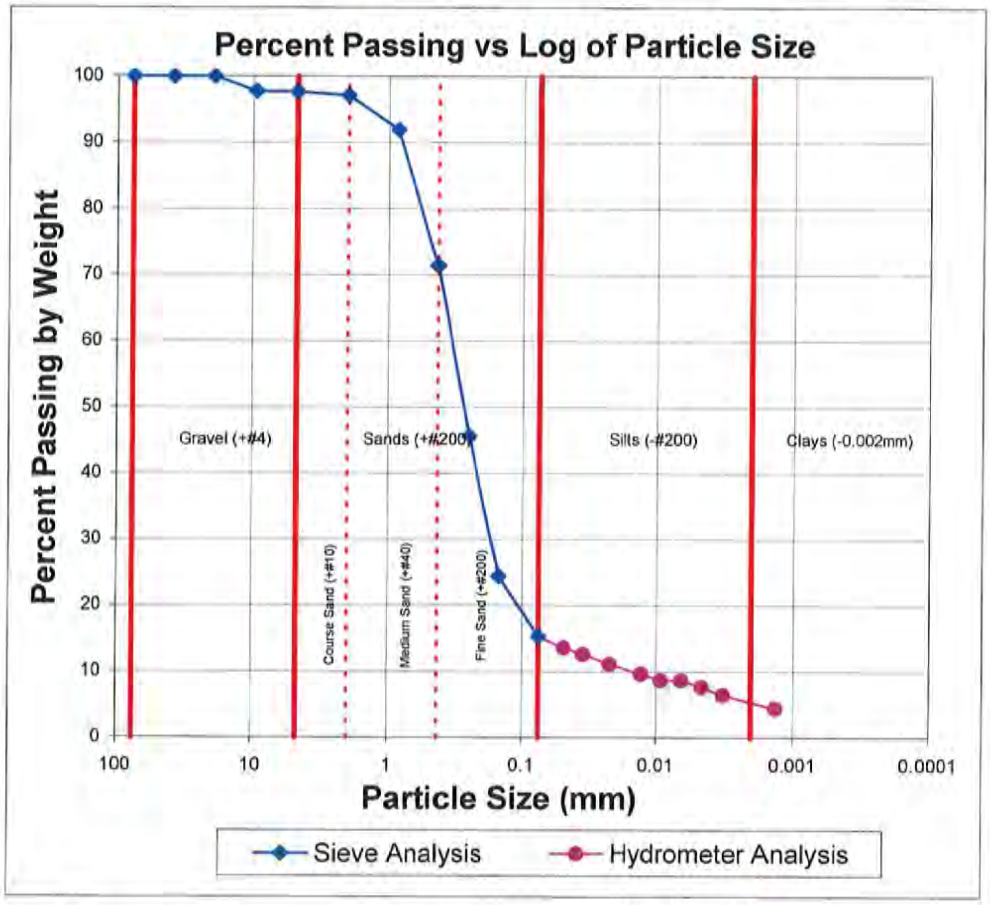
Plus Split Data

Original Weight of +#10 (g): 12.64
Calculated Weight of +#10 (g): 11.54

Minus Split Data

Original Weight of -#10 (g): 391.59
Calculated Dry Weight of -#10 (g): 390.71

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	9.03	0.00	9.03	9.03	97.8
#4	**4.750**	0.46	0.00	0.46	0.46	97.6
#10	**2.000**	2.05	0.00	2.05	2.05	97.1
97.771g split out of -#10 material.						
#20	**0.850**	9.07	3.83	5.24	21.03	91.9
#40	**0.425**	24.23	3.71	20.52	82.43	71.4
#60	**0.250**	29.54	3.70	25.84	103.79	45.6
#100	**0.150**	24.32	3.08	21.24	85.30	24.4
#200	**0.075**	12.23	3.09	9.13	36.69	15.3



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_34.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-04A
Depth: 16.0-16.5'
Sample Number: Sand Tailings
Sampled Date: 11/26/2013
Test Date: 2/12/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 404.23
Total Dry Weight of Sample (g): 402.24
Wet Weight of Sub-Sample (g): 97.771
Dry Weight of Sub-Sample (g): 97.276
Corrected Dry Weight of Sub-Sample - W(g): 100.181

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	19.0	13.8	20.3	0.0134	13.18	0.0488	13.6	54.71	13.6
2	18.0	12.8	20.3	0.0134	13.34	0.0347	12.6	50.73	12.6
5	16.5	11.3	20.3	0.0134	13.59	0.0222	11.1	44.76	11.1
15	15.0	9.8	20.2	0.0134	13.83	0.0129	9.6	38.79	9.6
30	14.0	8.8	20.2	0.0134	14.00	0.0092	8.7	34.81	8.7
60	14.0	8.8	20.3	0.0134	14.00	0.0065	8.7	34.81	8.7
120	13.0	7.8	20.4	0.0134	14.16	0.0046	7.7	30.83	7.7
250	11.8	6.5	20.6	0.0134	14.37	0.0032	6.4	25.86	6.4
1440	9.8	4.5	21.9	0.0133	14.70	0.0013	4.5	17.90	4.5

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_34.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-05A
Depth: 11.0-11.5'
Sample Number: Clayey Sand
Sampled Date: 11/20/2013
Test Date: 2/20/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 65.09
Weight of Dry Soil & Pan (g): 63.17
Weight of Water (g): 1.92
Weight of Pan (g): 3.85
Weight of Dry Soil (g): 59.32
Moisture (%): 3.2

General Sample Data

Total Wet Weight of Sample (g): 263.22
Total Dry Weight of Sample (g): 255.00
Calculated Weight Plus #200 (g): 166.88
Moisture of Total Sample (%): 3.2
Percent Retained #200 Sieve (%): 65.4

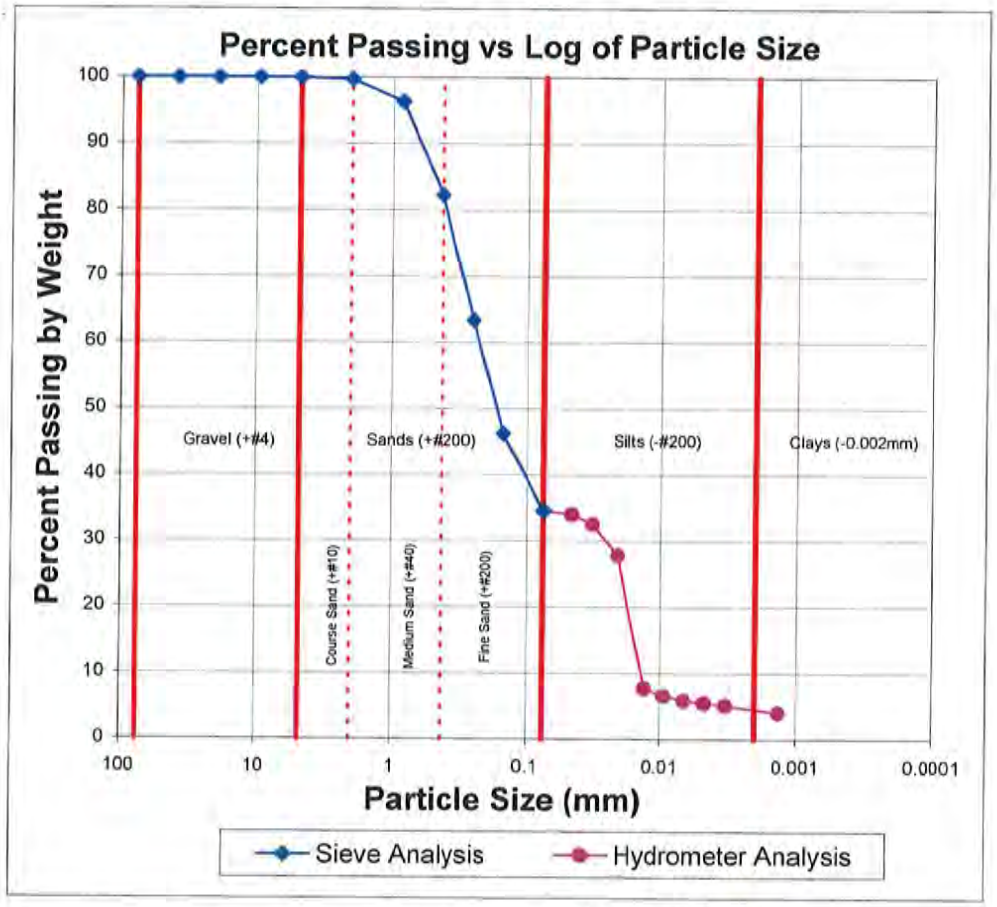
Plus Split Data

Original Weight of +#10 (g): 0.77
Calculated Weight of +#10 (g): 0.70

Minus Split Data

Original Weight of -#10 (g): 262.45
Calculated Dry Weight of -#10 (g): 254.31

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.70	0.00	0.70	0.70	99.7
69.714g split out of -#10 material.						
#20	**0.850**	6.06	3.77	2.29	8.64	96.3
#40	**0.425**	13.34	3.76	9.57	36.05	82.2
#60	**0.250**	16.43	3.63	12.80	48.20	63.3
#100	**0.150**	14.67	3.11	11.56	43.54	46.2
#200	**0.075**	10.97	3.06	7.90	29.76	34.6



NOTES: At the fifteen minute reading the sample was showing signs of flocculation. At the 24 hour reading the supernate was completely clear; any reading above zero is due to dissolved solids.

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_35.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-05A
Depth: 11.0-11.5'
Sample Number: Clayey Sand
Sampled Date: 11/20/2013
Test Date: 2/20/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 263.22
Total Dry Weight of Sample (g): 255.00
Wet Weight of Sub-Sample (g): 69.714
Dry Weight of Sub-Sample (g): 67.532
Corrected Dry Weight of Sub-Sample - W(g): 67.735

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	28.5	23.3	20.2	0.0134	11.62	0.0458	34.0	86.73	34.0
2	27.5	22.3	20.2	0.0134	11.78	0.0326	32.6	83.00	32.6
5	24.3	19.0	20.2	0.0134	12.32	0.0211	27.8	70.88	27.8
15	10.5	5.3	20.2	0.0134	14.57	0.0132	7.7	19.58	7.7
30	9.8	4.5	20.2	0.0134	14.70	0.0094	6.6	16.79	6.6
60	9.3	4.0	20.2	0.0134	14.78	0.0067	5.9	14.92	5.9
120	9.0	3.8	20.1	0.0134	14.82	0.0047	5.5	13.99	5.5
250	8.8	3.5	20.3	0.0134	14.86	0.0033	5.1	13.06	5.1
1440	8.0	2.8	21.5	0.0133	14.98	0.0014	4.0	10.26	4.0

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_35.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-11A
Depth: 21.0-21.5'
Sample Number: Silty Sand
Sampled Date: 11/20/2013
Test Date: 2/12/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 35.68
Weight of Dry Soil & Pan (g): 35.32
Weight of Water (g): 0.36
Weight of Pan (g): 3.55
Weight of Dry Soil (g): 31.77
Moisture (%): 1.1

General Sample Data

Total Wet Weight of Sample (g): 99.93
Total Dry Weight of Sample (g): 98.82
Calculated Weight Plus #200 (g): 81.97
Moisture of Total Sample (%): 1.1
Percent Retained #200 Sieve (%): 82.9

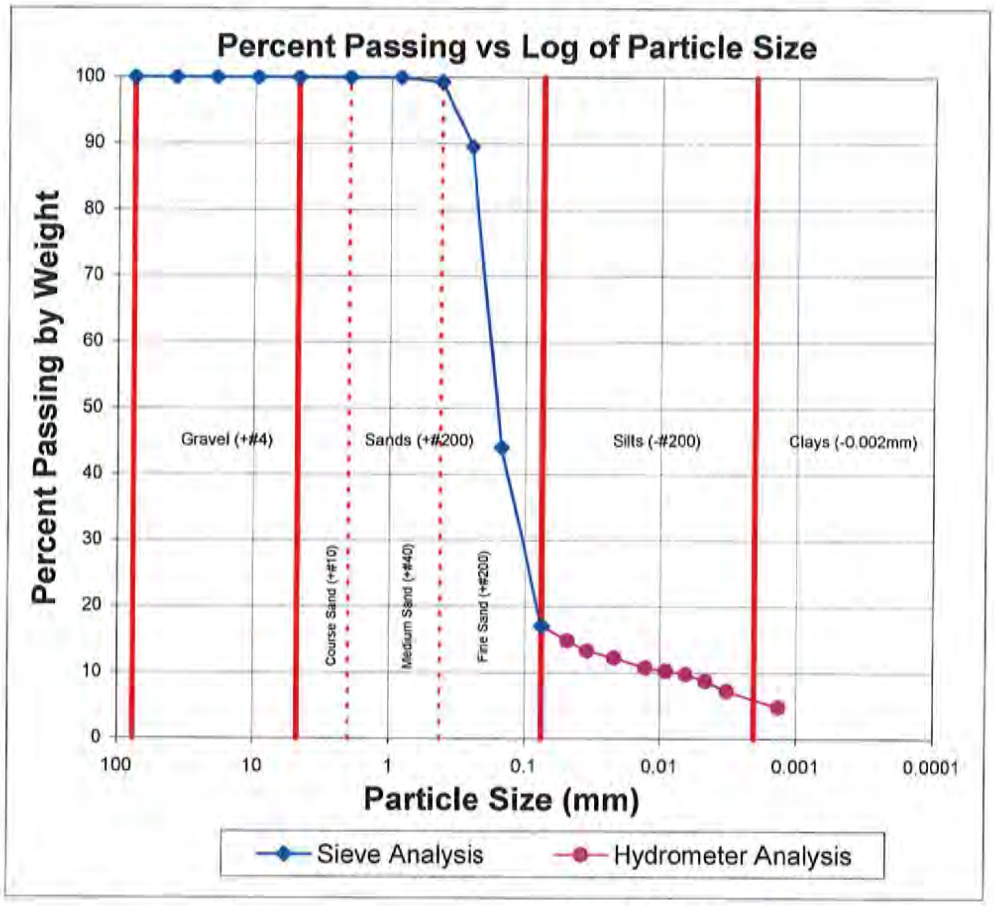
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 99.93
Calculated Dry Weight of -#10 (g): 98.82

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
99.926g split out of -#10 material.						
#20	**0.850**	3.81	3.79	0.02	0.02	100.0
#40	**0.425**	4.37	3.73	0.65	0.65	99.3
#60	**0.250**	12.76	3.06	9.70	9.70	89.5
#100	**0.150**	48.02	3.08	44.94	44.94	44.0
#200	**0.075**	29.72	3.07	26.66	26.66	17.1



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_36.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-11A
Depth: 21.0-21.5'
Sample Number: Silty Sand
Sampled Date: 11/20/2013
Test Date: 2/12/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 99.93
Total Dry Weight of Sample (g): 98.82
Wet Weight of Sub-Sample (g): 99.926
Dry Weight of Sub-Sample (g): 98.816
Corrected Dry Weight of Sub-Sample - W(g): 98.816

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	20.0	14.8	20.3	0.0134	13.01	0.0485	14.8	14.62	14.8
2	18.5	13.3	20.3	0.0134	13.26	0.0346	13.3	13.13	13.3
5	17.5	12.3	20.3	0.0134	13.42	0.0220	12.3	12.14	12.3
15	16.0	10.8	20.3	0.0134	13.67	0.0128	10.8	10.65	10.8
30	15.5	10.3	20.3	0.0134	13.75	0.0091	10.3	10.16	10.3
60	15.0	9.8	20.3	0.0134	13.83	0.0065	9.8	9.66	9.8
120	14.0	8.8	20.4	0.0134	14.00	0.0046	8.8	8.67	8.8
250	12.5	7.3	20.6	0.0134	14.24	0.0032	7.3	7.18	7.3
1440	10.0	4.8	21.9	0.0133	14.65	0.0013	4.8	4.71	4.8

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_36.xls

Checked By: KL
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-16A
Depth: 46.0-46.5'
Sample Number: Silty Sand
Sampled Date: 11/26/2013
Test Date: 2/24/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 66.33
Weight of Dry Soil & Pan (g): 65.78
Weight of Water (g): 0.55
Weight of Pan (g): 3.56
Weight of Dry Soil (g): 62.22
Moisture (%): 0.9

General Sample Data

Total Wet Weight of Sample (g): 96.83
Total Dry Weight of Sample (g): 95.99
Calculated Weight Plus #200 (g): 63.19
Moisture of Total Sample (%): 0.9
Percent Retained #200 Sieve (%): 65.8

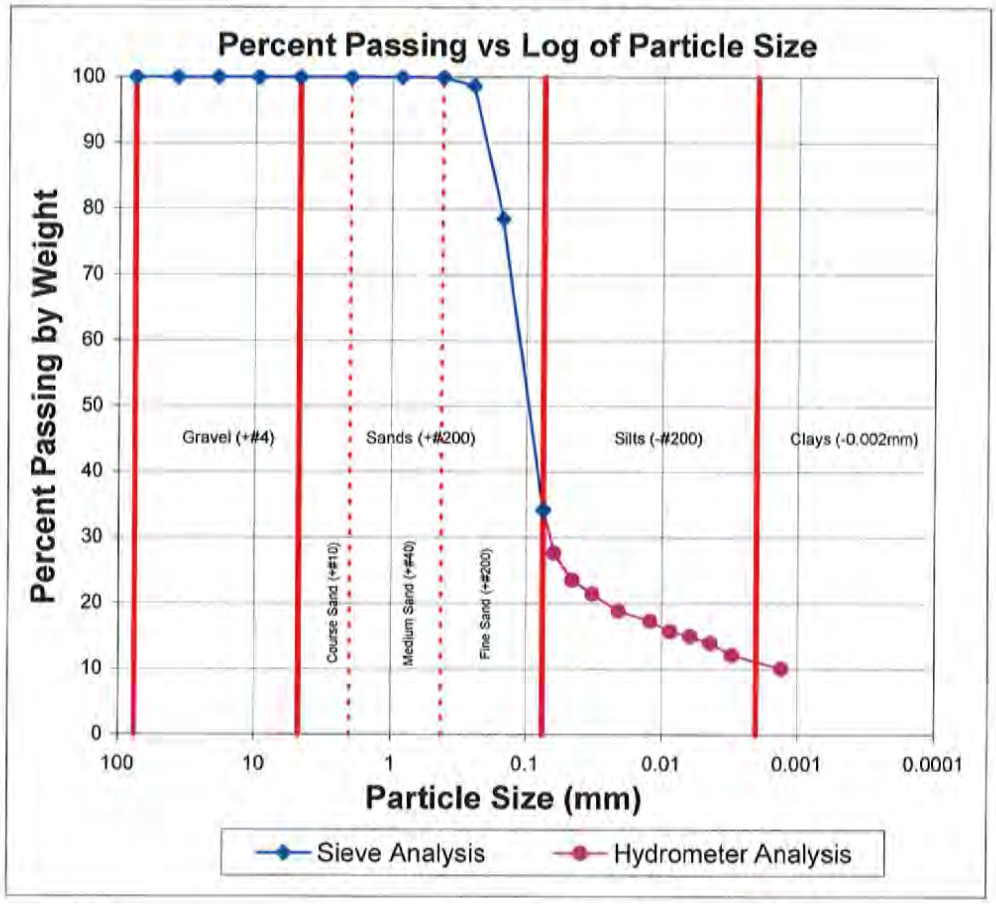
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 96.83
Calculated Dry Weight of -#10 (g): 95.99

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
96.833g split out of -#10 material.						
#20	**0.850**	3.73	3.73	0.00	0.00	100.0
#40	**0.425**	3.58	3.55	0.03	0.03	100.0
#60	**0.250**	4.88	3.65	1.23	1.23	98.7
#100	**0.150**	23.04	3.59	19.44	19.44	78.4
#200	**0.075**	46.05	3.56	42.48	42.48	34.2



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_37.xls

Checked By: KA
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-16A
Depth: 46.0-46.5'
Sample Number: Silty Sand
Sampled Date: 11/26/2013
Test Date: 2/24/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 96.83
Total Dry Weight of Sample (g): 95.99
Wet Weight of Sub-Sample (g): 96.833
Dry Weight of Sub-Sample (g): 95.986
Corrected Dry Weight of Sub-Sample - W(g): 95.986

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	32.0	26.8	21.2	0.0133	11.05	0.0624	27.6	26.51	27.6
1	28.0	22.8	21.2	0.0133	11.70	0.0454	23.5	22.54	23.5
2	26.0	20.8	21.2	0.0133	12.03	0.0326	21.4	20.56	21.4
5	23.5	18.3	21.2	0.0133	12.44	0.0209	18.8	18.08	18.8
15	22.0	16.8	21.2	0.0133	12.69	0.0122	17.3	16.60	17.3
30	20.5	15.3	21.3	0.0133	12.93	0.0087	15.7	15.11	15.7
60	19.8	14.5	21.4	0.0133	13.06	0.0062	15.0	14.37	15.0
120	18.8	13.5	21.5	0.0133	13.22	0.0044	13.9	13.38	13.9
250	17.0	11.8	22.2	0.0131	13.51	0.0030	12.1	11.64	12.1
1440	15.0	9.8	20.8	0.0134	13.83	0.0013	10.1	9.66	10.1

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_37.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-08A
Depth: 26.0-26.5'
Sample Number: Clayey Silt Tailings
Sampled Date: 11/26/2013
Test Date: 2/24/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 35.41
Weight of Dry Soil & Pan (g): 34.21
Weight of Water (g): 1.20
Weight of Pan (g): 3.09
Weight of Dry Soil (g): 31.13
Moisture (%): 3.9

General Sample Data

Total Wet Weight of Sample (g): 66.33
Total Dry Weight of Sample (g): 63.87
Calculated Weight Plus #200 (g): 6.39
Moisture of Total Sample (%): 3.9
Percent Retained #200 Sieve (%): 10.0

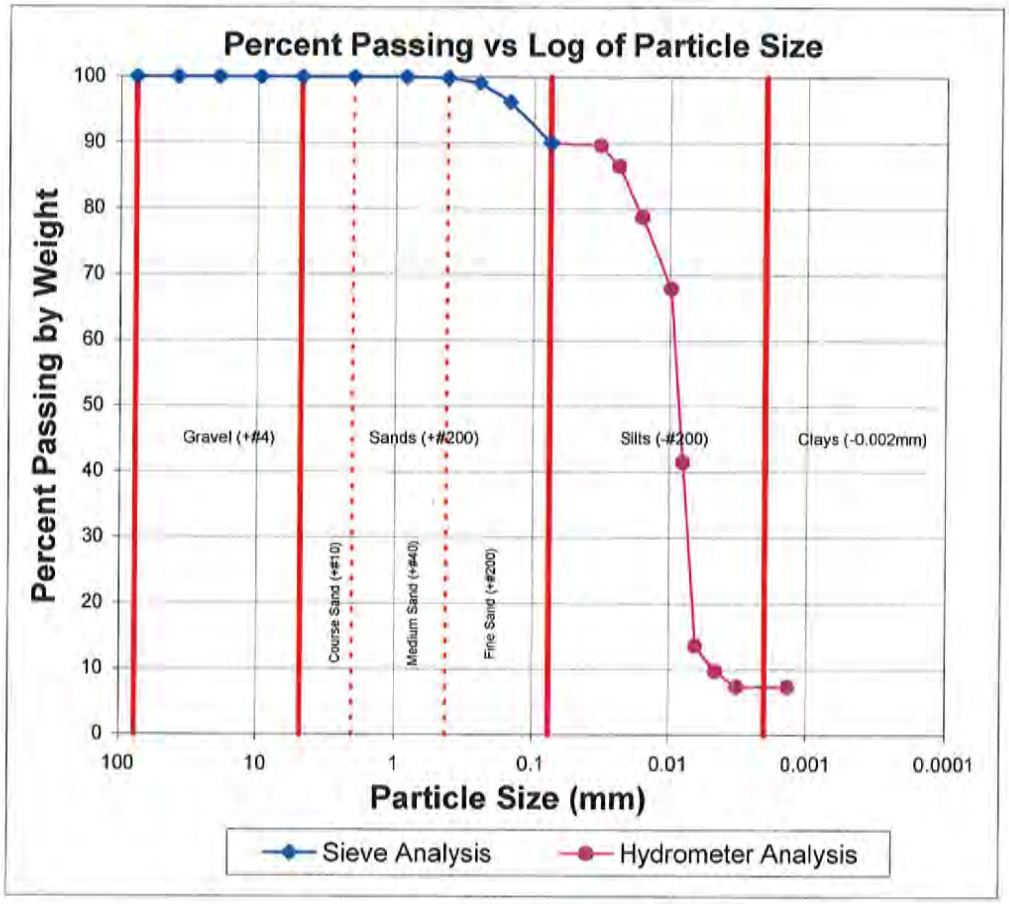
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 66.33
Calculated Dry Weight of -#10 (g): 63.87

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
66.328g split out of -#10 material.						
#20	**0.850**	2.29	2.28	0.01	0.01	100.0
#40	**0.425**	2.39	2.30	0.09	0.09	99.8
#60	**0.250**	2.82	2.37	0.45	0.45	99.1
#100	**0.150**	4.95	3.08	1.87	1.87	96.2
#200	**0.075**	7.05	3.08	3.96	3.96	90.0



Notes: The sample started showing signs of flocculation within 30 seconds of starting the test. (See photos.)
At the 24 hour reading, the suppernate was clear. Any reading above zero is due to dissolved solids.

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_38.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-08A
Depth: 26.0-26.5'
Sample Number: Clayey Silt Tailings
Sampled Date: 11/26/2013
Test Date: 2/24/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 66.33
Total Dry Weight of Sample (g): 63.87
Wet Weight of Sub-Sample (g): 66.328
Dry Weight of Sub-Sample (g): 63.868
Corrected Dry Weight of Sub-Sample - W(g): 63.868

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	63.0	57.8	20.9	0.0134	5.96	0.0328	89.6	57.23	89.6
2	61.0	55.8	20.9	0.0134	6.29	0.0238	86.5	55.24	86.5
5	56.0	50.8	20.9	0.0134	7.11	0.0160	78.7	50.29	78.7
15	49.0	43.8	21.0	0.0133	8.26	0.0099	67.9	43.35	67.9
30	32.0	26.8	21.2	0.0133	11.05	0.0081	41.5	26.51	41.5
60	14.0	8.8	21.2	0.0133	14.00	0.0064	13.6	8.67	13.6
120	11.5	6.3	21.4	0.0133	14.41	0.0046	9.7	6.19	9.7
250	10.0	4.8	21.7	0.0133	14.65	0.0032	7.4	4.71	7.4
1440	10.0	4.8	20.3	0.0134	14.65	0.0014	7.4	4.71	7.4

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_38.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-14
Depth: 40.0-41.0' (40-42.5')
Sample Number: Clayey Silt Tailings
Sampled Date: 11/26/2013
Test Date: 2/24/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 39.56
Weight of Dry Soil & Pan (g): 38.42
Weight of Water (g): 1.13
Weight of Pan (g): 3.57
Weight of Dry Soil (g): 34.85
Moisture (%): 3.3

General Sample Data

Total Wet Weight of Sample (g): 59.30
Total Dry Weight of Sample (g): 57.43
Calculated Weight Plus #200 (g): 11.89
Moisture of Total Sample (%): 3.3
Percent Retained #200 Sieve (%): 20.7

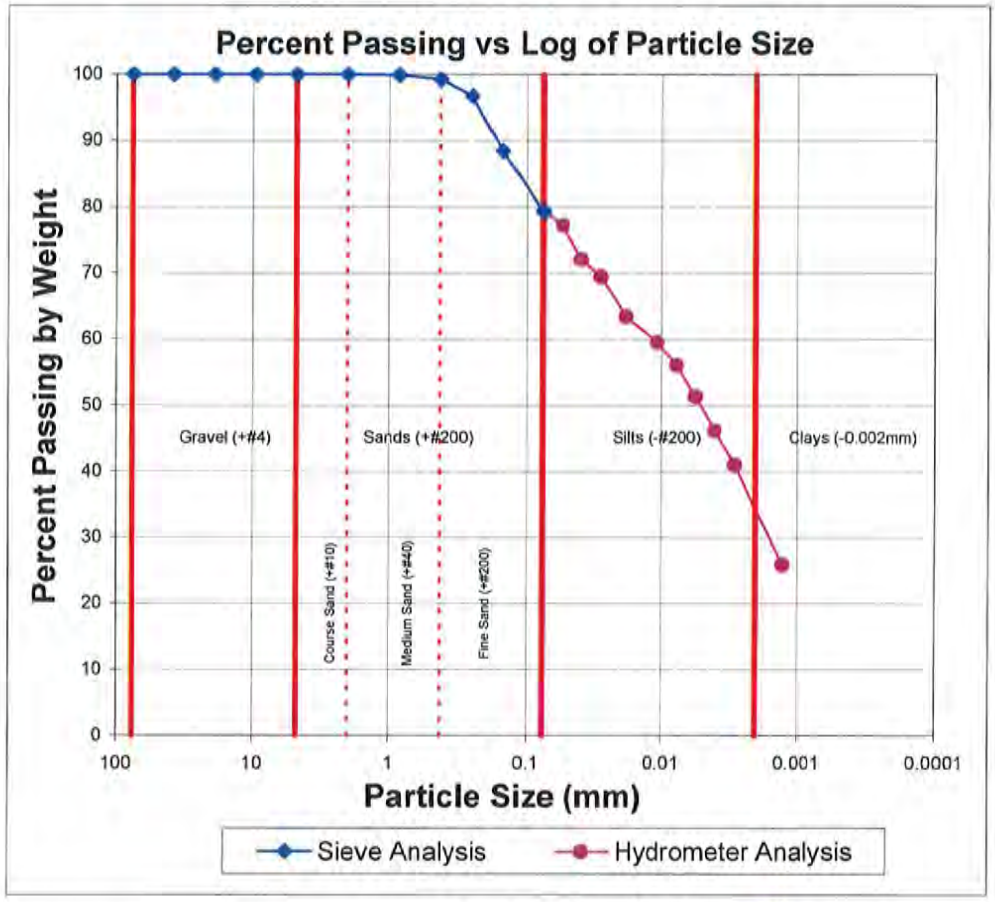
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 59.30
Calculated Dry Weight of -#10 (g): 57.43

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
59.297g split out of -#10 material.						
#20	**0.850**	2.42	2.36	0.07	0.07	99.9
#40	**0.425**	2.72	2.38	0.35	0.35	99.3
#60	**0.250**	3.86	2.38	1.49	1.49	96.7
#100	**0.150**	7.88	3.12	4.76	4.76	88.4
#200	**0.075**	8.81	3.57	5.24	5.24	79.3



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_39.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-14
Depth: 40.0-41.0' (40-42.5')
Sample Number: Clayey Silt Tailings
Sampled Date: 11/26/2013
Test Date: 2/24/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 59.30
Total Dry Weight of Sample (g): 57.43
Wet Weight of Sub-Sample (g): 59.297
Dry Weight of Sub-Sample (g): 57.428
Corrected Dry Weight of Sub-Sample - W(g): 57.428

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	50.0	44.8	21.0	0.0133	8.09	0.0534	77.2	44.34	77.2
1	47.0	41.8	21.0	0.0133	8.59	0.0389	72.0	41.37	72.0
2	45.5	40.3	21.0	0.0133	8.83	0.0279	69.5	39.88	69.5
5	42.0	36.8	21.0	0.0133	9.41	0.0182	63.4	36.42	63.4
15	39.8	34.5	21.2	0.0133	9.78	0.0107	59.5	34.19	59.5
30	37.8	32.5	21.2	0.0133	10.10	0.0077	56.1	32.20	56.1
60	35.0	29.8	21.3	0.0133	10.55	0.0056	51.3	29.48	51.3
120	32.0	26.8	21.5	0.0133	11.05	0.0040	46.2	26.51	46.2
250	29.0	23.8	21.9	0.0133	11.54	0.0029	41.0	23.53	41.0
1440	20.3	15.0	20.6	0.0134	12.97	0.0013	25.9	14.86	25.9

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_39.xls

Checked By: KP
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-07A
Depth: 21.0-21.5'
Sample Number: Sand Tailings
Sampled Date: 11/21/2013
Test Date: 2/25/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 47.01
Weight of Dry Soil & Pan (g): 46.92
Weight of Water (g): 0.09
Weight of Pan (g): 3.70
Weight of Dry Soil (g): 43.22
Moisture (%): 0.2

General Sample Data

Total Wet Weight of Sample (g): 346.30
Total Dry Weight of Sample (g): 345.58
Calculated Weight Plus #200 (g): 313.34
Moisture of Total Sample (%): 0.2
Percent Retained #200 Sieve (%): 90.7

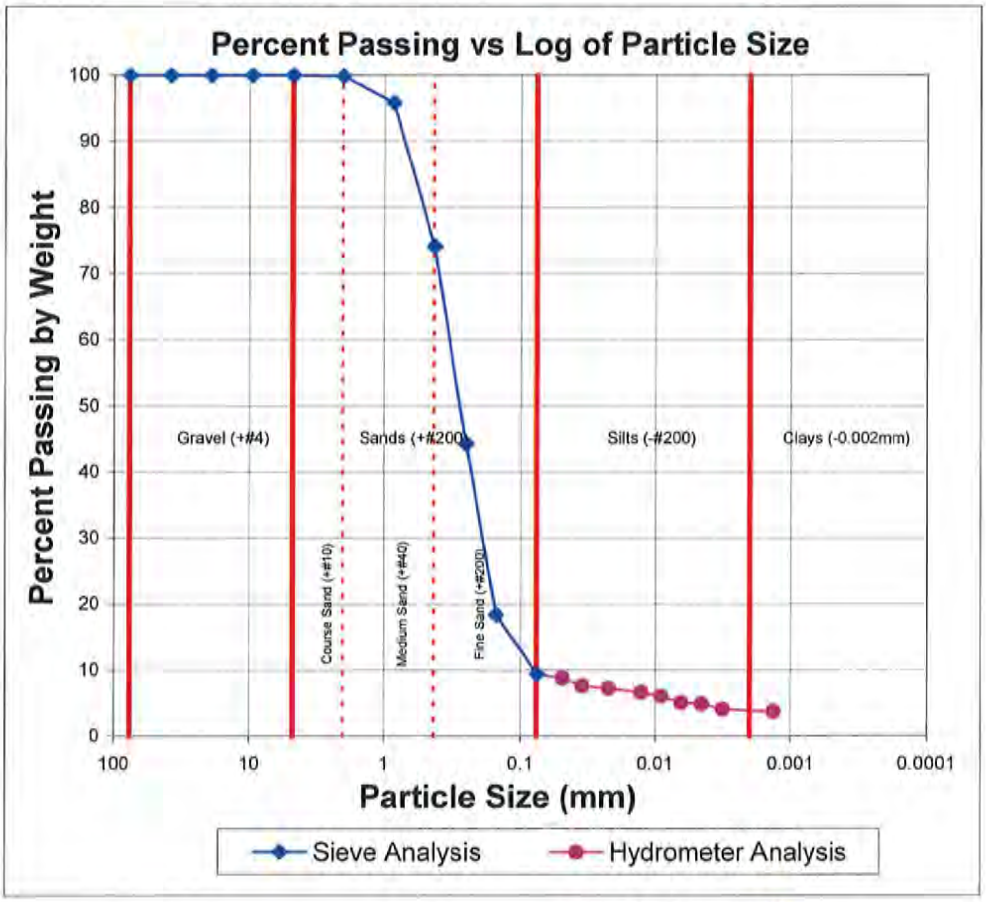
Plus Split Data

Original Weight of +#10 (g): 0.83
Calculated Weight of +#10 (g): 0.47

Minus Split Data

Original Weight of -#10 (g): 345.47
Calculated Dry Weight of -#10 (g): 345.11

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.47	0.00	0.47	0.47	99.9
127.148g split out of -#10 material.						
#20	**0.850**	7.43	2.30	5.13	13.96	95.8
#40	**0.425**	31.49	3.85	27.64	75.18	74.1
#60	**0.250**	41.53	3.62	37.91	103.10	44.2
#100	**0.150**	36.05	3.12	32.92	89.54	18.3
#200	**0.075**	14.55	3.12	11.43	31.09	9.3



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_40.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-07A
Depth: 21.0-21.5'
Sample Number: Sand Tailings
Sampled Date: 11/21/2013
Test Date: 2/25/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 4.8
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 346.30
Total Dry Weight of Sample (g): 345.58
Wet Weight of Sub-Sample (g): 127.148
Dry Weight of Sub-Sample (g): 126.884
Corrected Dry Weight of Sub-Sample - W(g): 127.011

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	16.0	11.3	22.2	0.0131	13.67	0.0485	8.8	30.33	8.8
2	14.5	9.8	22.2	0.0131	13.92	0.0346	7.6	26.29	7.6
5	14.0	9.3	22.2	0.0131	14.00	0.0220	7.2	24.94	7.2
15	13.3	8.5	22.3	0.0131	14.12	0.0127	6.6	22.92	6.6
30	12.5	7.8	22.3	0.0131	14.24	0.0090	6.0	20.90	6.0
60	11.3	6.5	22.3	0.0131	14.45	0.0064	5.1	17.52	5.1
120	11.0	6.3	22.3	0.0131	14.49	0.0046	4.9	16.85	4.9
250	10.0	5.3	22.6	0.0131	14.65	0.0032	4.1	14.15	4.1
1440	9.5	4.8	21.1	0.0133	14.74	0.0013	3.7	12.81	3.7

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_40.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-20A
Depth: 66.0-66.5'
Sample Number: Silty Sand
Sampled Date: 11/26/2013
Test Date: 2/25/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 57.97
Weight of Dry Soil & Pan (g): 57.34
Weight of Water (g): 0.63
Weight of Pan (g): 3.62
Weight of Dry Soil (g): 53.72
Moisture (%): 1.2

General Sample Data

Total Wet Weight of Sample (g): 85.83
Total Dry Weight of Sample (g): 84.84
Calculated Weight Plus #200 (g): 42.54
Moisture of Total Sample (%): 1.2
Percent Retained #200 Sieve (%): 50.1

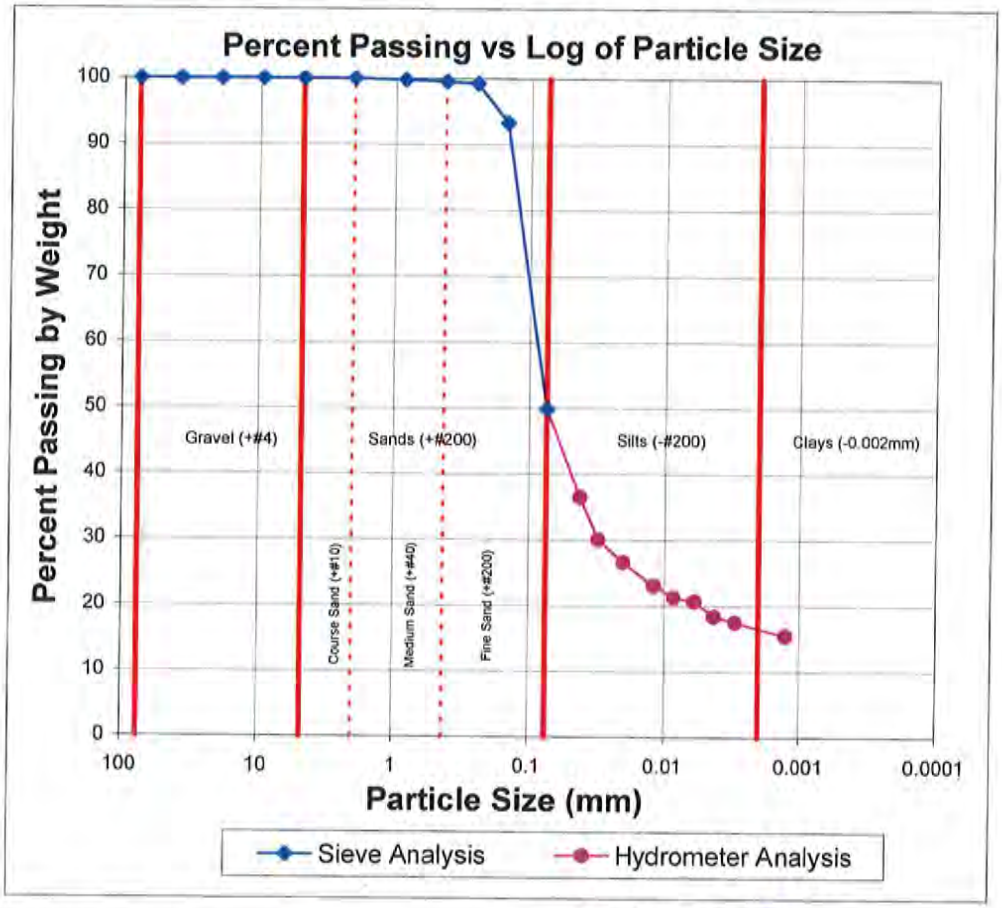
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 85.83
Calculated Dry Weight of -#10 (g): 84.84

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
85.832g split out of -#10 material.						
#20	**0.850**	2.55	2.37	0.17	0.17	99.8
#40	**0.425**	2.52	2.30	0.22	0.22	99.5
#60	**0.250**	3.31	3.08	0.23	0.23	99.3
#100	**0.150**	8.14	3.09	5.05	5.05	93.3
#200	**0.075**	39.97	3.11	36.86	36.86	49.9



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_41.xls

Checked By: KP
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-20A
Depth: 66.0-66.5'
Sample Number: Silty Sand
Sampled Date: 11/26/2013
Test Date: 2/25/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 4.8
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 85.83
Total Dry Weight of Sample (g): 84.84
Wet Weight of Sub-Sample (g): 85.832
Dry Weight of Sub-Sample (g): 84.839
Corrected Dry Weight of Sub-Sample - W(g): 84.839

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	36.0	31.3	22.6	0.0131	10.39	0.0423	36.5	30.97	36.5
2	30.5	25.8	22.6	0.0131	11.29	0.0312	30.1	25.52	30.1
5	27.5	22.8	22.6	0.0131	11.78	0.0201	26.6	22.54	26.6
15	24.5	19.8	22.7	0.0131	12.28	0.0119	23.1	19.57	23.1
30	23.0	18.3	22.6	0.0131	12.52	0.0085	21.3	18.08	21.3
60	22.5	17.8	22.5	0.0131	12.60	0.0060	20.7	17.59	20.7
120	20.5	15.8	22.4	0.0131	12.93	0.0043	18.4	15.61	18.4
250	19.8	15.0	22.6	0.0131	13.06	0.0030	17.5	14.86	17.5
1440	18.0	13.3	21.3	0.0133	13.34	0.0013	15.5	13.13	15.5

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_41.xls

Checked By: _____
Date: _____

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-02
Depth: 10-11' (10-12.5')
Sample Number: Sand Tailings
Sampled Date: 11/26/2013
Test Date: 2/25/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 108.28
Weight of Dry Soil & Pan (g): 107.54
Weight of Water (g): 0.74
Weight of Pan (g): 3.86
Weight of Dry Soil (g): 103.68
Moisture (%): 0.7

General Sample Data

Total Wet Weight of Sample (g): 436.38
Total Dry Weight of Sample (g): 433.30
Calculated Weight Plus #200 (g): 312.23
Moisture of Total Sample (%): 0.7
Percent Retained #200 Sieve (%): 72.1

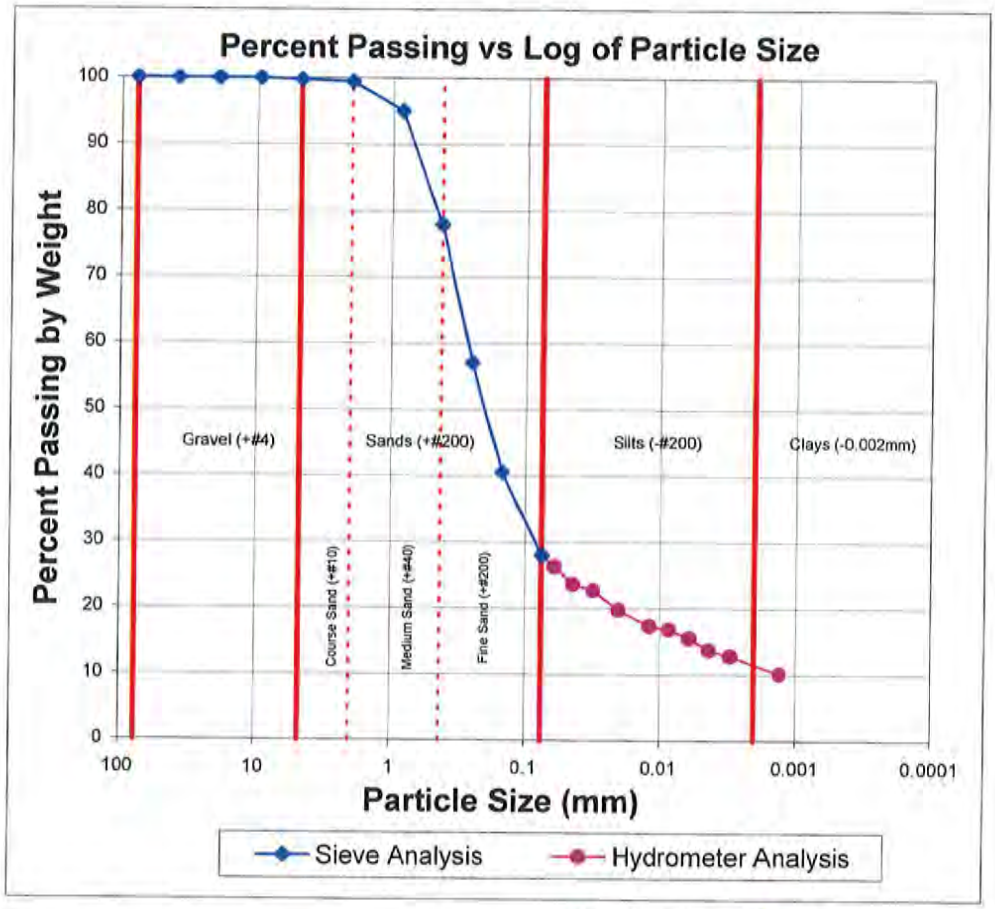
Plus Split Data

Original Weight of +#10 (g): 3.79
Calculated Weight of +#10 (g): 2.32

Minus Split Data

Original Weight of -#10 (g): 432.59
Calculated Dry Weight of -#10 (g): 430.98

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.97	0.00	0.97	0.97	99.8
#10	**2.000**	1.35	0.00	1.35	1.35	99.5
110.374g split out of -#10 material.						
#20	**0.850**	7.18	2.29	4.89	19.23	95.0
#40	**0.425**	21.16	2.29	18.86	74.18	77.9
#60	**0.250**	25.28	2.31	22.97	90.33	57.1
#100	**0.150**	22.01	3.77	18.24	71.75	40.5
#200	**0.075**	16.91	3.07	13.84	54.43	27.9



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_42.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-02
Depth: 10-11' (10-12.5')
Sample Number: Sand Tailings
Sampled Date: 11/26/2013
Test Date: 2/25/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 4.8
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 436.38
Total Dry Weight of Sample (g): 433.30
Wet Weight of Sub-Sample (g): 110.374
Dry Weight of Sub-Sample (g): 109.591
Corrected Dry Weight of Sub-Sample - W(g): 110.141

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	34.0	29.3	22.3	0.0131	10.72	0.0607	26.3	114.02	26.3
1	31.0	26.3	22.3	0.0131	11.21	0.0439	23.6	102.33	23.6
2	30.0	25.3	22.3	0.0131	11.37	0.0313	22.7	98.43	22.7
5	26.8	22.0	22.3	0.0131	11.91	0.0202	19.8	85.76	19.8
15	24.0	19.3	22.3	0.0131	12.36	0.0119	17.3	75.04	17.3
30	23.5	18.8	22.2	0.0131	12.44	0.0084	16.9	73.09	16.9
60	22.0	17.3	22.1	0.0131	12.69	0.0060	15.5	67.24	15.5
120	20.0	15.3	22.0	0.0131	13.01	0.0043	13.7	59.45	13.7
250	19.0	14.3	22.1	0.0131	13.18	0.0030	12.8	55.55	12.8
1440	16.0	11.3	20.9	0.0134	13.67	0.0013	10.1	43.86	10.1

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_42.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-14A
Depth: 26.0-26.5'
Sample Number: Silty Clay
Sampled Date: 11/20/2013
Test Date: 2/25/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 38.02
Weight of Dry Soil & Pan (g): 37.28
Weight of Water (g): 0.74
Weight of Pan (g): 3.07
Weight of Dry Soil (g): 34.22
Moisture (%): 2.2

General Sample Data

Total Wet Weight of Sample (g): 64.71
Total Dry Weight of Sample (g): 63.35
Calculated Weight Plus #200 (g): 13.23
Moisture of Total Sample (%): 2.2
Percent Retained #200 Sieve (%): 20.9

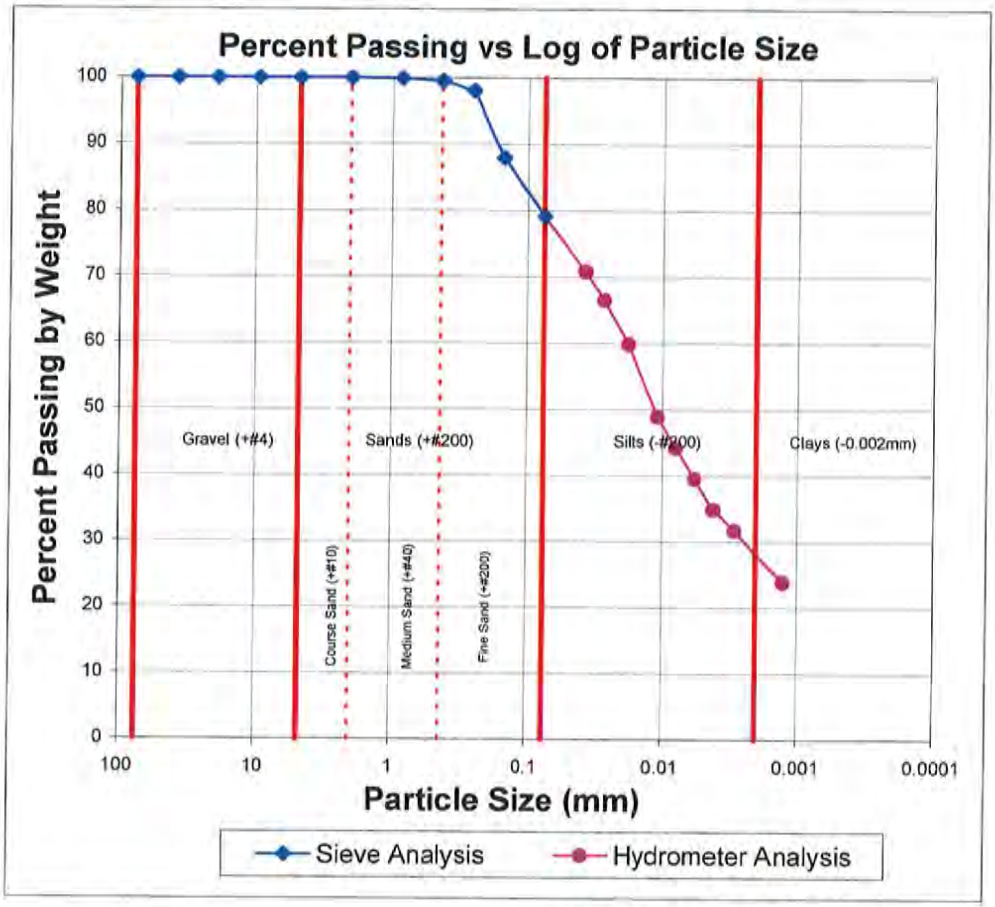
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 64.71
Calculated Dry Weight of -#10 (g): 63.35

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
64.714g split out of -#10 material.						
#20	**0.850**	2.36	2.31	0.05	0.05	99.9
#40	**0.425**	2.60	2.35	0.25	0.25	99.5
#60	**0.250**	3.31	2.36	0.95	0.95	98.0
#100	**0.150**	8.68	2.29	6.40	6.40	87.9
#200	**0.075**	9.27	3.69	5.58	5.58	79.1



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_43.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B2-14A
Depth: 26.0-26.5'
Sample Number: Silty Clay
Sampled Date: 11/20/2013
Test Date: 2/25/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 4.8
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 64.71
Total Dry Weight of Sample (g): 63.35
Wet Weight of Sub-Sample (g): 64.714
Dry Weight of Sub-Sample (g): 63.349
Corrected Dry Weight of Sub-Sample - W(g): 63.349

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	50.0	45.3	22.2	0.0131	8.09	0.0373	70.8	44.84	70.8
2	47.3	42.5	22.2	0.0131	8.55	0.0271	66.5	42.11	66.5
5	43.0	38.3	22.2	0.0131	9.24	0.0178	59.8	37.90	59.8
15	36.0	31.3	22.2	0.0131	10.39	0.0109	48.9	30.97	48.9
30	33.0	28.3	22.0	0.0131	10.88	0.0079	44.2	27.99	44.2
60	30.0	25.3	22.0	0.0131	11.37	0.0057	39.5	25.02	39.5
120	27.0	22.3	22.0	0.0131	11.87	0.0041	34.8	22.05	34.8
250	25.0	20.3	22.1	0.0131	12.19	0.0029	31.7	20.07	31.7
1440	20.0	15.3	20.8	0.0134	13.01	0.0013	23.9	15.11	23.9

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_43.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-13A
Depth: 36.0-36.5'
Sample Number: Clayey Sand
Sampled Date: 11/21/2013
Test Date: 2/27/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 78.50
Weight of Dry Soil & Pan (g): 76.42
Weight of Water (g): 2.08
Weight of Pan (g): 3.96
Weight of Dry Soil (g): 72.46
Moisture (%): 2.9

General Sample Data

Total Wet Weight of Sample (g): 76.30
Total Dry Weight of Sample (g): 74.17
Calculated Weight Plus #200 (g): 46.33
Moisture of Total Sample (%): 2.9
Percent Retained #200 Sieve (%): 62.5

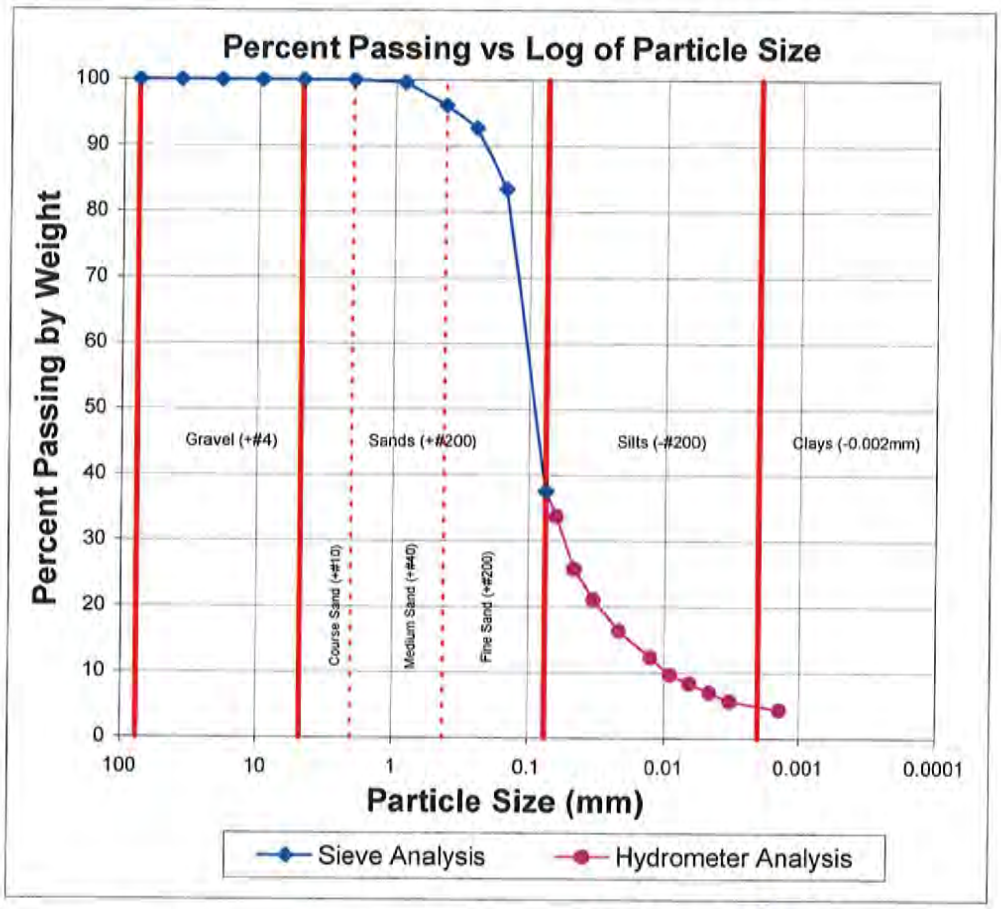
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 76.30
Calculated Dry Weight of -#10 (g): 74.17

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
76.295g split out of -#10 material.						
#20	**0.850**	2.60	2.30	0.31	0.31	99.6
#40	**0.425**	4.86	2.30	2.56	2.56	96.1
#60	**0.250**	6.39	3.83	2.56	2.56	92.7
#100	**0.150**	10.58	3.72	6.86	6.86	83.4
#200	**0.075**	37.66	3.61	34.05	34.05	37.5



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_44.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-13A
Depth: 36.0-36.5'
Sample Number: Clayey Sand
Sampled Date: 11/21/2013
Test Date: 2/27/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 4.8
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 76.30
Total Dry Weight of Sample (g): 74.17
Wet Weight of Sub-Sample (g): 76.295
Dry Weight of Sub-Sample (g): 74.166
Corrected Dry Weight of Sub-Sample - W(g): 74.166

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	30.0	25.3	22.2	0.0131	11.37	0.0626	33.7	25.02	33.7
1	24.0	19.3	22.2	0.0131	12.36	0.0461	25.7	19.08	25.7
2	20.5	15.8	22.2	0.0131	12.93	0.0334	21.0	15.61	21.0
5	17.0	12.3	22.2	0.0131	13.51	0.0216	16.4	12.14	16.4
15	14.0	9.3	22.0	0.0131	14.00	0.0127	12.4	9.17	12.4
30	12.0	7.3	22.0	0.0131	14.33	0.0091	9.7	7.18	9.7
60	11.0	6.3	21.8	0.0133	14.49	0.0065	8.4	6.19	8.4
120	10.0	5.3	21.4	0.0133	14.65	0.0046	7.0	5.20	7.0
250	9.0	4.3	21.7	0.0133	14.82	0.0032	5.7	4.21	5.7
1440	8.0	3.3	19.3	0.0136	14.98	0.0014	4.3	3.22	4.3

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_44.xls

Checked By: LR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-12
Depth: 32-33' (32-34.5')
Sample Number: Sand Tailings (V. Fine, Clayey)
Sampled Date: 11/21/2013 Sampled By: MWH
Test Date: 3/13/2014 Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 28.08
Weight of Dry Soil & Pan (g): 27.83
Weight of Water (g): 0.24
Weight of Pan (g): 3.08
Weight of Dry Soil (g): 24.75
Moisture (%): 1.0

General Sample Data

Total Wet Weight of Sample (g): 55.00
Total Dry Weight of Sample (g): 54.46
Calculated Weight Plus #200 (g): 25.42
Moisture of Total Sample (%): 1.0
Percent Retained #200 Sieve (%): 46.7

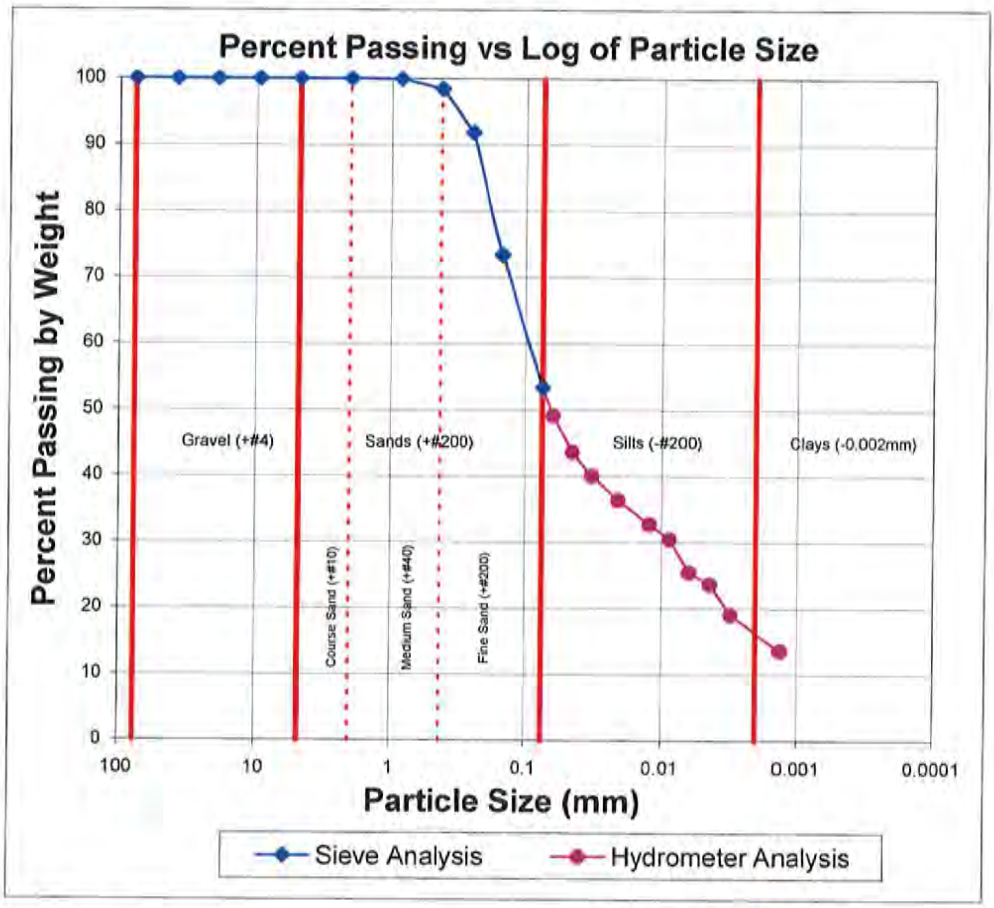
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 55.00
Calculated Dry Weight of -#10 (g): 54.46

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
54.998g split out of -#10 material.						
#20	**0.850**	2.33	2.29	0.03	0.03	99.9
#40	**0.425**	3.20	2.37	0.83	0.83	98.4
#60	**0.250**	7.29	3.71	3.58	3.58	91.8
#100	**0.150**	13.58	3.55	10.04	10.04	73.4
#200	**0.075**	14.58	3.64	10.94	10.94	53.3



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_45.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-12
Depth: 32-33' (32-34.5')
Sample Number: Sand Tailings (V. Fine, Clayey)
Sampled Date: 11/21/2013 Sampled By: MWH
Test Date: 3/13/2014 Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 55.00
Total Dry Weight of Sample (g): 54.46
Wet Weight of Sub-Sample (g): 54.998
Dry Weight of Sub-Sample (g): 54.461
Corrected Dry Weight of Sub-Sample - W(g): 54.461

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	32.0	27.0	21.5	0.0133	11.05	0.0624	49.1	26.75	49.1
1	29.0	24.0	21.5	0.0133	11.54	0.0451	43.7	23.78	43.7
2	27.0	22.0	21.5	0.0133	11.87	0.0323	40.0	21.80	40.0
5	25.0	20.0	21.5	0.0133	12.19	0.0207	36.4	19.82	36.4
15	23.0	18.0	21.5	0.0133	12.52	0.0121	32.8	17.84	32.8
30	21.8	16.8	21.6	0.0133	12.73	0.0087	30.5	16.60	30.5
60	19.0	14.0	21.8	0.0133	13.18	0.0062	25.5	13.87	25.5
120	18.0	13.0	22.0	0.0131	13.34	0.0044	23.7	12.88	23.7
250	15.5	10.5	22.4	0.0131	13.75	0.0031	19.1	10.40	19.1
1445	12.5	7.5	21.1	0.0133	14.24	0.0013	13.6	7.43	13.6

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_45.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-10
Depth: 30.3-30.7' (30-32.5')
Sample Number: Top of Tube - Fine
Sampled Date: 11/26/2013
Test Date: 3/13/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 38.17
Weight of Dry Soil & Pan (g): 37.31
Weight of Water (g): 0.86
Weight of Pan (g): 3.07
Weight of Dry Soil (g): 34.24
Moisture (%): 2.5

General Sample Data

Total Wet Weight of Sample (g): 57.80
Total Dry Weight of Sample (g): 56.39
Calculated Weight Plus #200 (g): 13.68
Moisture of Total Sample (%): 2.5
Percent Retained #200 Sieve (%): 24.3

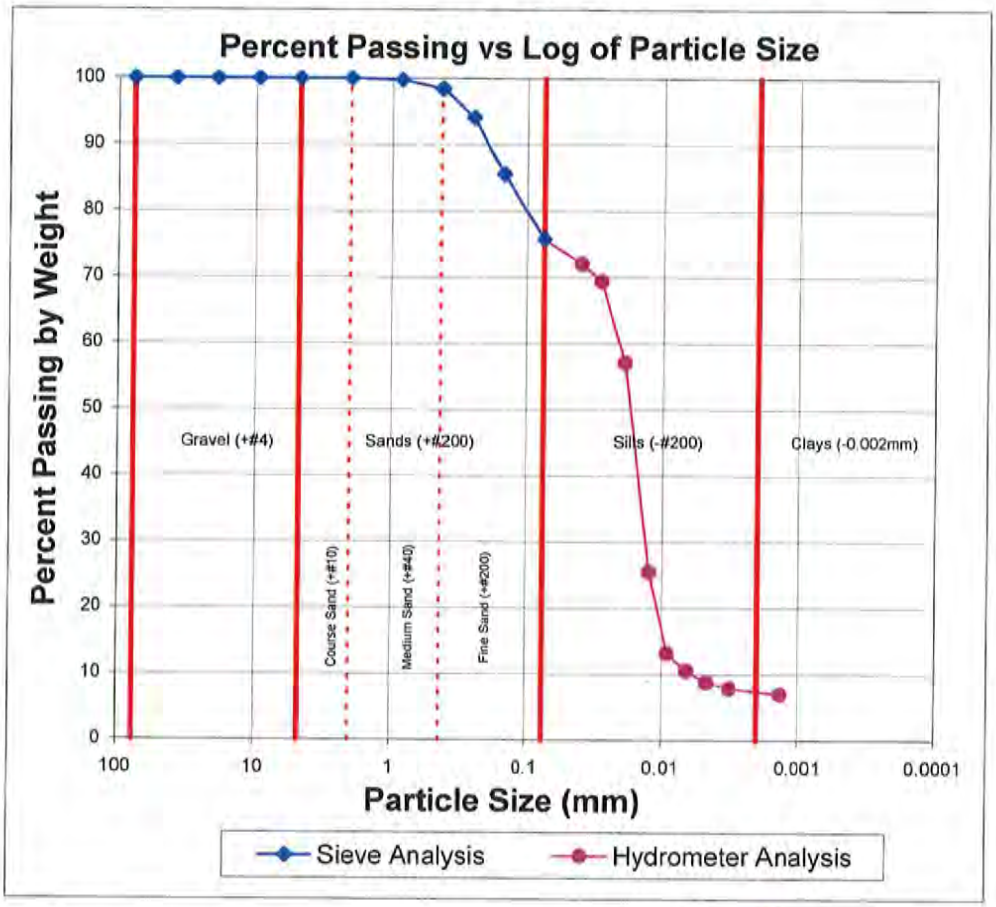
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 57.80
Calculated Dry Weight of -#10 (g): 56.39

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
57.801g split out of -#10 material.						
#20	**0.850**	2.43	2.31	0.13	0.13	99.8
#40	**0.425**	3.04	2.30	0.74	0.74	98.5
#60	**0.250**	4.83	2.36	2.47	2.47	94.1
#100	**0.150**	7.88	3.08	4.79	4.79	85.6
#200	**0.075**	8.63	3.08	5.55	5.55	75.7



Notes:
The sample started showing signs of flocculation at the five minute reading.

At the 24 hour reading the supernate was clear.

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_46.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B10-10
Depth: 30.3-30.7' (30-32.5')
Sample Number: Top of Tube - Fine
Sampled Date: 11/26/2013
Test Date: 3/13/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 57.80
Total Dry Weight of Sample (g): 56.39
Wet Weight of Sub-Sample (g): 57.801
Dry Weight of Sub-Sample (g): 56.387
Corrected Dry Weight of Sub-Sample - W(g): 56.387

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	46.0	41.0	21.4	0.0133	8.75	0.0393	72.1	40.63	72.1
2	44.5	39.5	21.4	0.0133	9.00	0.0282	69.4	39.14	69.4
5	37.5	32.5	21.4	0.0133	10.14	0.0189	57.1	32.20	57.1
15	19.5	14.5	21.4	0.0133	13.10	0.0124	25.5	14.37	25.5
30	12.5	7.5	21.4	0.0133	14.24	0.0092	13.2	7.43	13.2
60	11.0	6.0	21.5	0.0133	14.49	0.0065	10.5	5.95	10.5
120	10.0	5.0	21.8	0.0133	14.65	0.0046	8.8	4.95	8.8
250	9.5	4.5	22.2	0.0131	14.74	0.0032	7.9	4.46	7.9
1440	9.0	4.0	20.8	0.0134	14.82	0.0014	7.0	3.96	7.0

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_46.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoudment
Project Number:

Boring Number: TI-B10-10
Depth: 32.0-32.5' (30-32.5')
Sample Number: Bottom of Tube - Coarse
Sampled Date: 11/26/2013 Sampled By: MWH
Test Date: 3/13/2014 Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 99.67
Weight of Dry Soil & Pan (g): 98.56
Weight of Water (g): 1.11
Weight of Pan (g): 3.83
Weight of Dry Soil (g): 94.73
Moisture (%): 1.2

General Sample Data

Total Wet Weight of Sample (g): 93.81
Total Dry Weight of Sample (g): 92.72
Calculated Weight Plus #200 (g): 77.07
Moisture of Total Sample (%): 1.2
Percent Retained #200 Sieve (%): 83.1

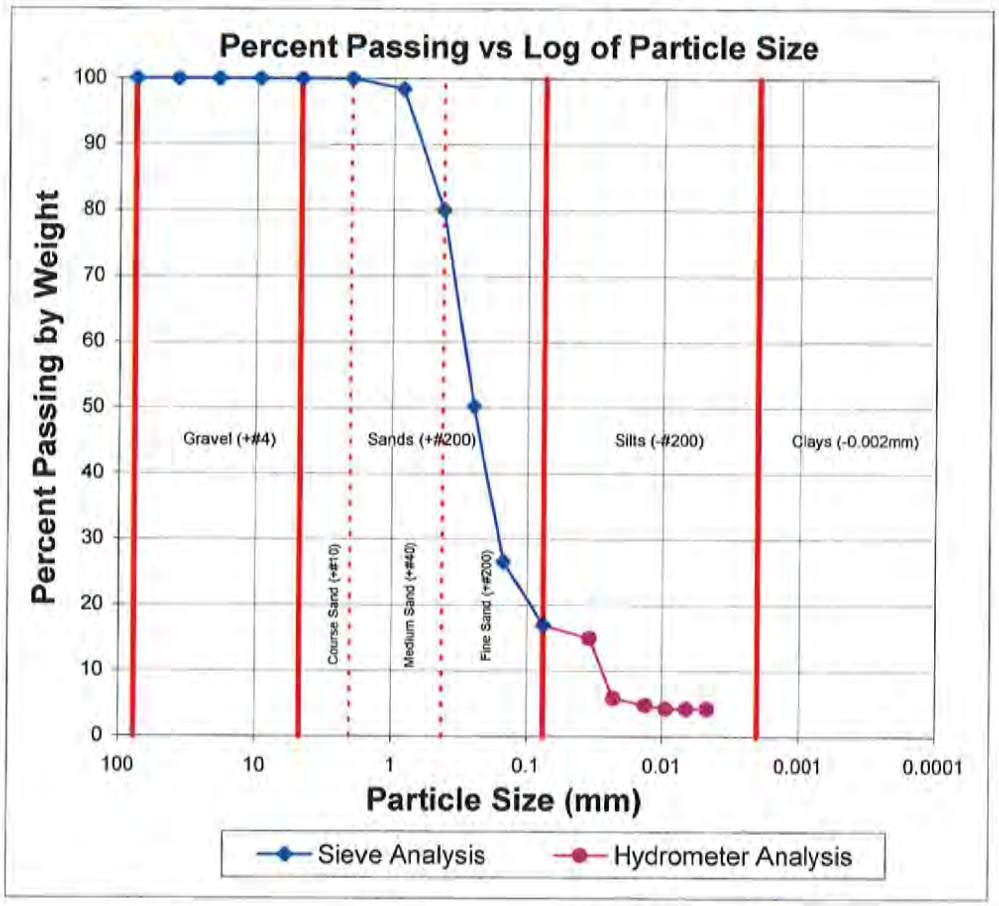
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 93.81
Calculated Dry Weight of -#10 (g): 92.72

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
93.807g split out of -#10 material.						
#20	**0.850**	3.73	2.30	1.43	1.43	98.5
#40	**0.425**	19.37	2.28	17.10	17.10	80.0
#60	**0.250**	30.76	3.08	27.67	27.67	50.2
#100	**0.150**	25.01	3.08	21.94	21.94	26.5
#200	**0.075**	12.00	3.07	8.94	8.94	16.9



Notes:
The sample started showing signs of flocculation within 30 seconds of starting the test.

The test was terminated at the 120 minute reading. The reading was the same for three times in a row, and the supernate was completely clear.

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_47.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoudment
Project Number:

Boring Number: TI-B10-10
Depth: 32.0-32.5' (30-32.5')
Sample Number: Bottom of Tube - Coarse
Sampled Date: 11/26/2013 Sampled By: MWH
Test Date: 3/13/2014 Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 93.81
Total Dry Weight of Sample (g): 92.72
Wet Weight of Sub-Sample (g): 93.807
Dry Weight of Sub-Sample (g): 92.722
Corrected Dry Weight of Sub-Sample - W(g): 92.722

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
2	19.0	14.0	21.4	0.0133	13.18	0.0341	15.0	13.87	15.0
5	10.5	5.5	21.4	0.0133	14.57	0.0227	5.9	5.45	5.9
15	9.5	4.5	21.5	0.0133	14.74	0.0132	4.8	4.46	4.8
30	9.0	4.0	21.5	0.0133	14.82	0.0093	4.3	3.96	4.3
60	9.0	4.0	21.6	0.0133	14.82	0.0066	4.3	3.96	4.3
120	9.0	4.0	21.7	0.0133	14.82	0.0047	4.3	3.96	4.3

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_47.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-09
Depth: 27.0-27.5' (25-27.5')
Sample Number: Sand Tailings
Sampled Date: 11/21/2013
Test Date: 4/11/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 43.68
Weight of Dry Soil & Pan (g): 43.57
Weight of Water (g): 0.11
Weight of Pan (g): 3.86
Weight of Dry Soil (g): 39.71
Moisture (%): 0.3

General Sample Data

Total Wet Weight of Sample (g): 115.08
Total Dry Weight of Sample (g): 114.77
Calculated Weight Plus #200 (g): 106.35
Moisture of Total Sample (%): 0.3
Percent Retained #200 Sieve (%): 92.7

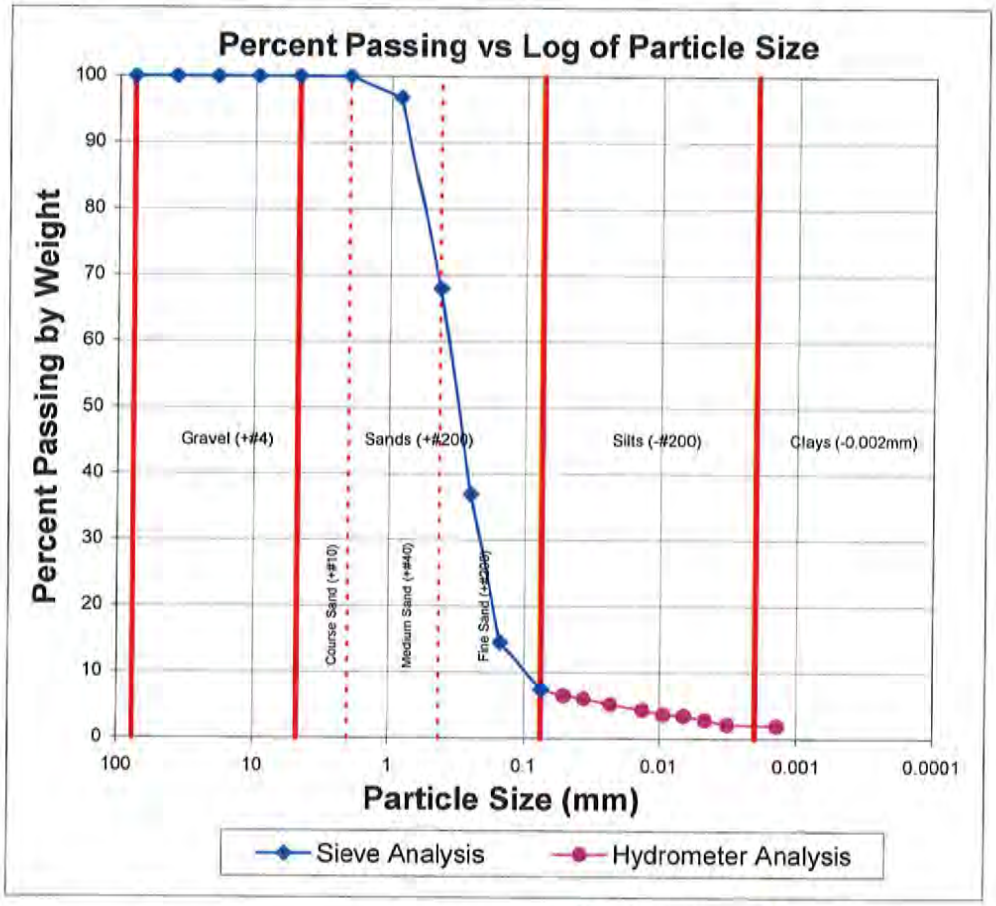
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 115.08
Calculated Dry Weight of -#10 (g): 114.77

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
115.079g split out of -#10 material.						
#20	**0.850**	5.97	2.29	3.68	3.68	96.8
#40	**0.425**	35.45	2.35	33.10	33.10	68.0
#60	**0.250**	38.80	3.11	35.69	35.69	36.9
#100	**0.150**	28.76	3.08	25.69	25.69	14.5
#200	**0.075**	11.29	3.10	8.19	8.19	7.3



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_59.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B1-09
Depth: 27.0-27.5' (25-27.5')
Sample Number: Sand Tailings
Sampled Date: 11/21/2013
Test Date: 4/11/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 115.08
Total Dry Weight of Sample (g): 114.77
Wet Weight of Sub-Sample (g): 115.079
Dry Weight of Sub-Sample (g): 114.767
Corrected Dry Weight of Sub-Sample - W(g): 114.767

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	12.5	7.5	20.8	0.0134	14.24	0.0507	6.5	7.43	6.5
2	12.0	7.0	20.8	0.0134	14.33	0.0360	6.0	6.94	6.0
5	11.0	6.0	20.8	0.0134	14.49	0.0229	5.2	5.95	5.2
15	10.0	5.0	20.9	0.0134	14.65	0.0133	4.3	4.95	4.3
30	9.3	4.3	21.1	0.0133	14.78	0.0093	3.7	4.21	3.7
60	9.0	4.0	21.5	0.0133	14.82	0.0066	3.5	3.96	3.5
120	8.3	3.3	22.1	0.0131	14.94	0.0046	2.8	3.22	2.8
250	7.5	2.5	23.3	0.0130	15.06	0.0032	2.2	2.48	2.2
1440	7.3	2.3	19.4	0.0136	15.11	0.0014	1.9	2.23	1.9

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_59.xls

Checked By: KA
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-10
Depth: 56-57' (55-57')
Sample Number: Silty Clay
Sampled Date: 11/19/2013
Test Date: 4/25/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 36.27
Weight of Dry Soil & Pan (g): 35.20
Weight of Water (g): 1.08
Weight of Pan (g): 3.07
Weight of Dry Soil (g): 32.13
Moisture (%): 3.4

General Sample Data

Total Wet Weight of Sample (g): 58.91
Total Dry Weight of Sample (g): 57.00
Calculated Weight Plus #200 (g): 6.69
Moisture of Total Sample (%): 3.4
Percent Retained #200 Sieve (%): 11.7

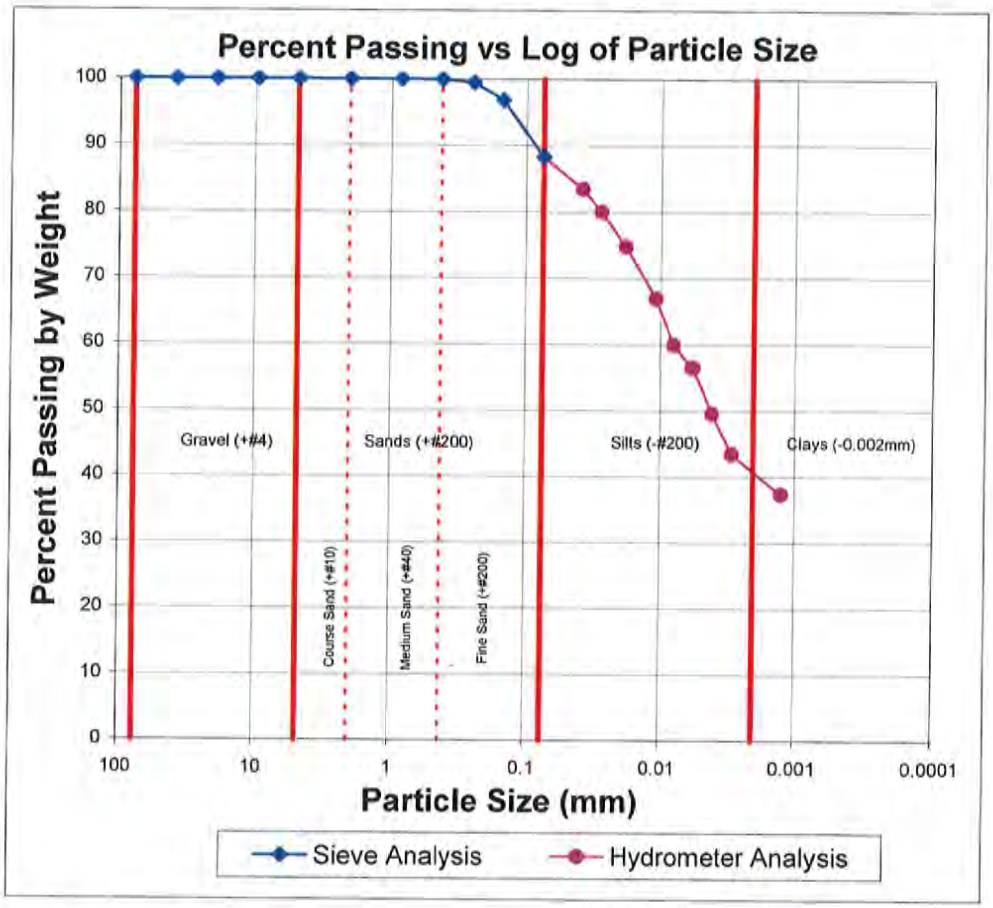
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 58.91
Calculated Dry Weight of -#10 (g): 57.00

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
58.913g split out of -#10 material.						
#20	**0.850**	3.74	3.73	0.00	0.00	100.0
#40	**0.425**	3.72	3.69	0.03	0.03	99.9
#60	**0.250**	3.97	3.70	0.27	0.27	99.5
#100	**0.150**	5.21	3.70	1.51	1.51	96.8
#200	**0.075**	7.95	3.07	4.88	4.88	88.3



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_65.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-10
Depth: 56-57' (55-57')
Sample Number: Silty Clay
Sampled Date: 11/19/2013
Test Date: 4/25/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 58.91
Total Dry Weight of Sample (g): 57.00
Wet Weight of Sub-Sample (g): 58.913
Dry Weight of Sub-Sample (g): 57.002
Corrected Dry Weight of Sub-Sample - W(g): 57.002

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	53.5	48.0	17.7	0.0140	7.52	0.0383	83.4	47.56	83.4
2	51.5	46.0	17.7	0.0140	7.85	0.0277	80.0	45.58	80.0
5	48.5	43.0	17.7	0.0140	8.34	0.0180	74.7	42.61	74.7
15	44.0	38.5	17.7	0.0140	9.08	0.0109	66.9	38.15	66.9
30	40.0	34.5	17.8	0.0140	9.73	0.0080	60.0	34.19	60.0
60	38.0	32.5	17.8	0.0140	10.06	0.0057	56.5	32.20	56.5
120	34.0	28.5	18.0	0.0138	10.72	0.0041	49.5	28.24	49.5
250	30.5	25.0	19.2	0.0136	11.29	0.0029	43.5	24.77	43.5
1440	27.0	21.5	18.4	0.0138	11.87	0.0013	37.4	21.30	37.4

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_65.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-03
Depth: 21.0-22.0' (20-22.4')
Sample Number: Silty Clay
Sampled Date: 11/19/2013
Test Date: 4/20/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 56.82
Weight of Dry Soil & Pan (g): 56.02
Weight of Water (g): 0.81
Weight of Pan (g): 3.09
Weight of Dry Soil (g): 52.93
Moisture (%): 1.5

General Sample Data

Total Wet Weight of Sample (g): 602.18
Total Dry Weight of Sample (g): 593.16
Calculated Weight Plus #200 (g): 194.76
Moisture of Total Sample (%): 1.5
Percent Retained #200 Sieve (%): 32.8

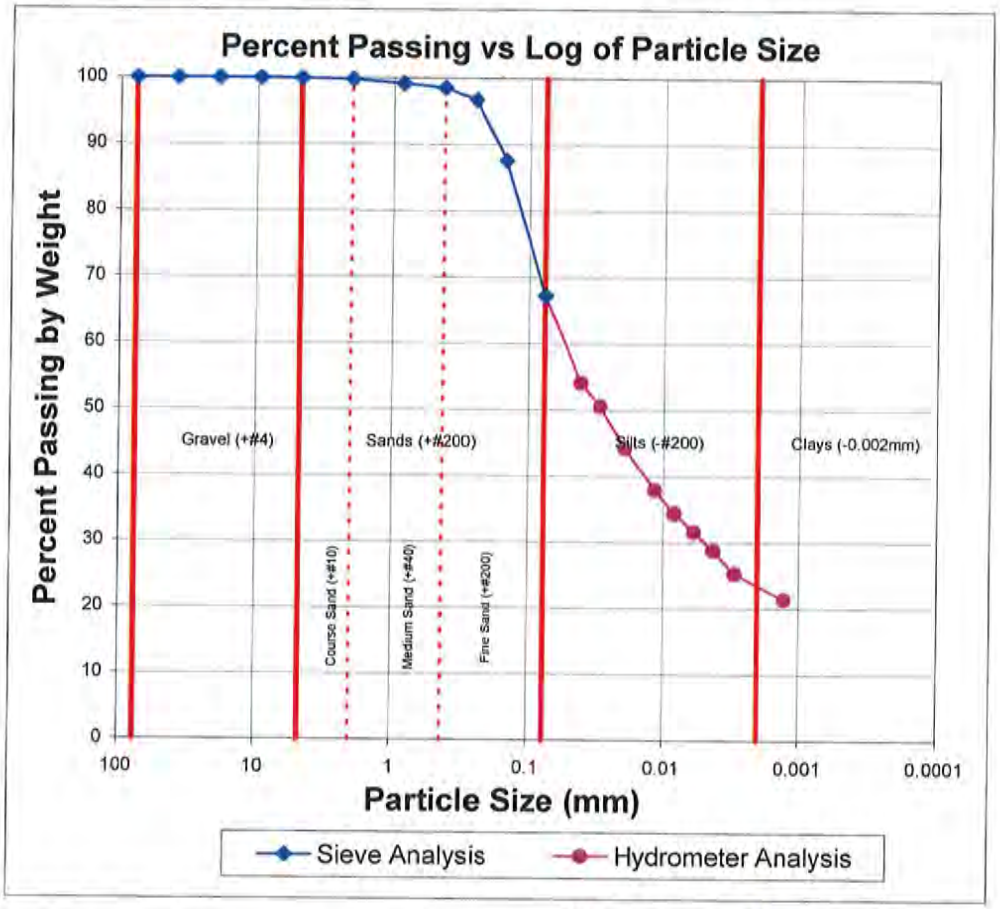
Plus Split Data

Original Weight of +#10 (g): 2.45
Calculated Weight of +#10 (g): 1.29

Minus Split Data

Original Weight of -#10 (g): 599.73
Calculated Dry Weight of -#10 (g): 591.88

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.16	0.00	0.16	0.16	100.0
#10	**2.000**	1.13	0.00	1.13	1.13	99.8
71.537g split out of -#10 material.						
#20	**0.850**	4.18	3.76	0.42	3.49	99.2
#40	**0.425**	4.09	3.61	0.48	4.00	98.5
#60	**0.250**	4.81	3.56	1.25	10.52	96.7
#100	**0.150**	10.08	3.61	6.47	54.30	87.6
#200	**0.075**	18.09	3.67	14.42	121.15	67.2



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_67.xls

Checked By: VR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-03
Depth: 21.0-22.0' (20-22.4')
Sample Number: Silty Clay
Sampled Date: 11/19/2013
Test Date: 4/20/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 602.18
Total Dry Weight of Sample (g): 593.16
Wet Weight of Sub-Sample (g): 71.537
Dry Weight of Sub-Sample (g): 70.464
Corrected Dry Weight of Sub-Sample - W(g): 70.605

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	44.0	38.5	20.2	0.0134	9.08	0.0405	54.0	320.50	54.0
2	41.5	36.0	20.2	0.0134	9.49	0.0293	50.5	299.69	50.5
5	37.0	31.5	20.2	0.0134	10.23	0.0192	44.2	262.23	44.2
15	32.5	27.0	20.2	0.0134	10.96	0.0115	37.9	224.77	37.9
30	30.0	24.5	20.3	0.0134	11.37	0.0083	34.4	203.96	34.4
60	28.0	22.5	20.4	0.0134	11.70	0.0059	31.6	187.31	31.6
120	26.0	20.5	20.7	0.0134	12.03	0.0043	28.8	170.66	28.8
250	23.5	18.0	21.1	0.0133	12.44	0.0030	25.3	149.85	25.3
1440	20.8	15.3	20.5	0.0134	12.89	0.0013	21.4	126.95	21.4

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_67.xls

Checked By: KA
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-06
Depth: 35-36' (35-37.3')
Sample Number: Silty Clay
Sampled Date: 11/19/2013
Test Date: 4/25/2014

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 58.03
Weight of Dry Soil & Pan (g): 57.22
Weight of Water (g): 0.81
Weight of Pan (g): 3.08
Weight of Dry Soil (g): 54.14
Moisture (%): 1.5

General Sample Data

Total Wet Weight of Sample (g): 792.52
Total Dry Weight of Sample (g): 781.25
Calculated Weight Plus #200 (g): 408.68
Moisture of Total Sample (%): 1.4
Percent Retained #200 Sieve (%): 52.3

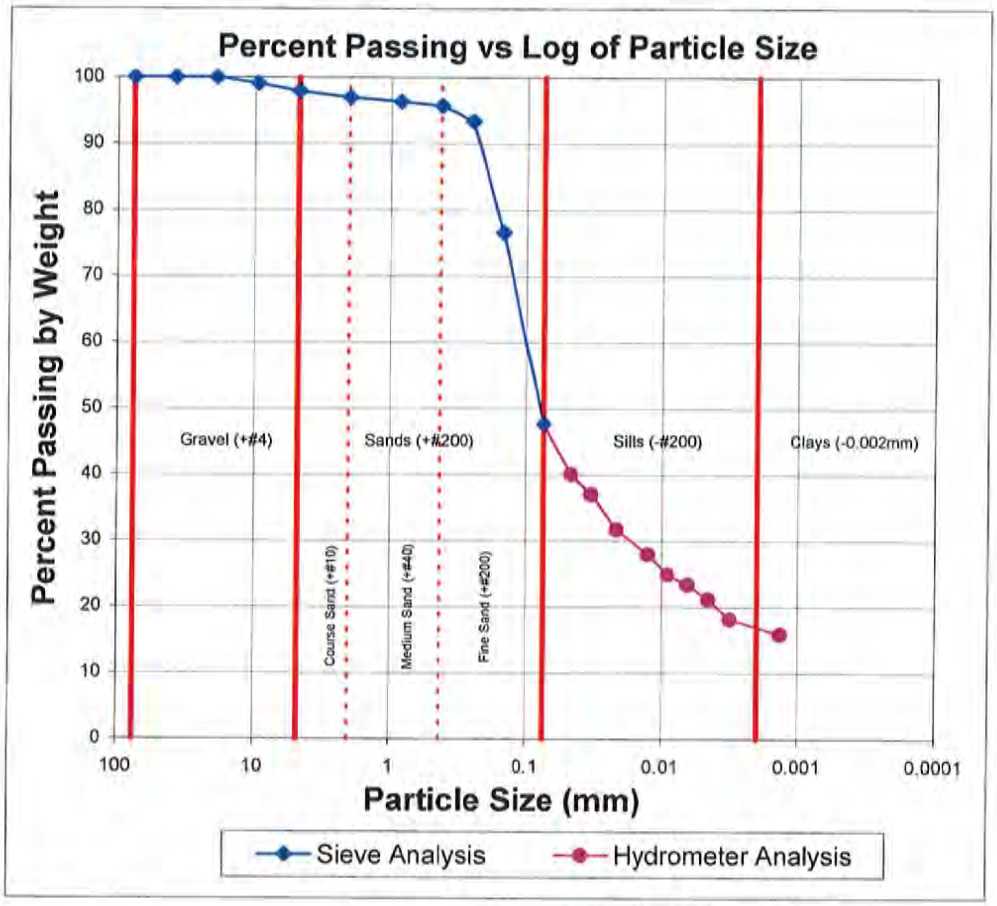
Plus Split Data

Original Weight of +#10 (g): 28.20
Calculated Weight of +#10 (g): 23.47

Minus Split Data

Original Weight of -#10 (g): 764.32
Calculated Dry Weight of -#10 (g): 757.78

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	7.13	0.00	7.13	7.13	99.1
#4	**4.750**	9.38	0.00	9.38	9.38	97.9
#10	**2.000**	6.96	0.00	6.96	6.96	97.0
64.479g split out of -#10 material.						
#20	**0.850**	4.13	3.70	0.43	5.13	96.3
#40	**0.425**	4.20	3.79	0.41	4.88	95.7
#60	**0.250**	4.60	3.06	1.53	18.30	93.4
#100	**0.150**	14.08	3.09	11.00	131.14	76.6
#200	**0.075**	22.02	3.09	18.93	225.77	47.7



Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_68.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number:

Boring Number: TI-B3-06
Depth: 35-36' (35-37.3')
Sample Number: Silty Clay
Sampled Date: 11/19/2013
Test Date: 4/25/2014

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 792.52
Total Dry Weight of Sample (g): 781.25
Wet Weight of Sub-Sample (g): 64.479
Dry Weight of Sub-Sample (g): 63.534
Corrected Dry Weight of Sub-Sample - W(g): 65.499

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	32.0	26.5	17.7	0.0140	11.05	0.0464	40.1	313.21	40.1
2	30.0	24.5	17.7	0.0140	11.37	0.0333	37.1	289.57	37.1
5	26.5	21.0	17.7	0.0140	11.95	0.0216	31.8	248.20	31.8
15	24.0	18.5	17.7	0.0140	12.36	0.0127	28.0	218.65	28.0
30	22.0	16.5	17.8	0.0140	12.69	0.0091	25.0	195.02	25.0
60	21.0	15.5	17.8	0.0140	12.85	0.0065	23.4	183.20	23.4
120	19.5	14.0	18.0	0.0138	13.10	0.0046	21.2	165.47	21.2
250	17.5	12.0	19.1	0.0136	13.42	0.0032	18.2	141.83	18.2
1440	16.0	10.5	18.2	0.0138	13.67	0.0013	15.9	124.10	15.9

Data Entered By: DPM
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_68.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: --

Boring Number: TI-BI-11A
Depth: 31.0-31.5'
Sample Number: Sand Tailings (V. Fine Clayey)
Sampled Date: 11/21/13 Sampled By: MWH
Test Date: 05/05/14 Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 32.60
Weight of Dry Soil & Pan (g): 32.40
Weight of Water (g): 0.21
Weight of Pan (g): 6.63
Weight of Dry Soil (g): 25.77
Moisture (%): 0.8

General Sample Data

Total Wet Weight of Sample (g): 70.50
Total Dry Weight of Sample (g): 69.94
Calculated Weight Plus #200 (g): 21.63
Moisture of Total Sample (%): 0.8
Percent Retained #200 Sieve (%): 30.9

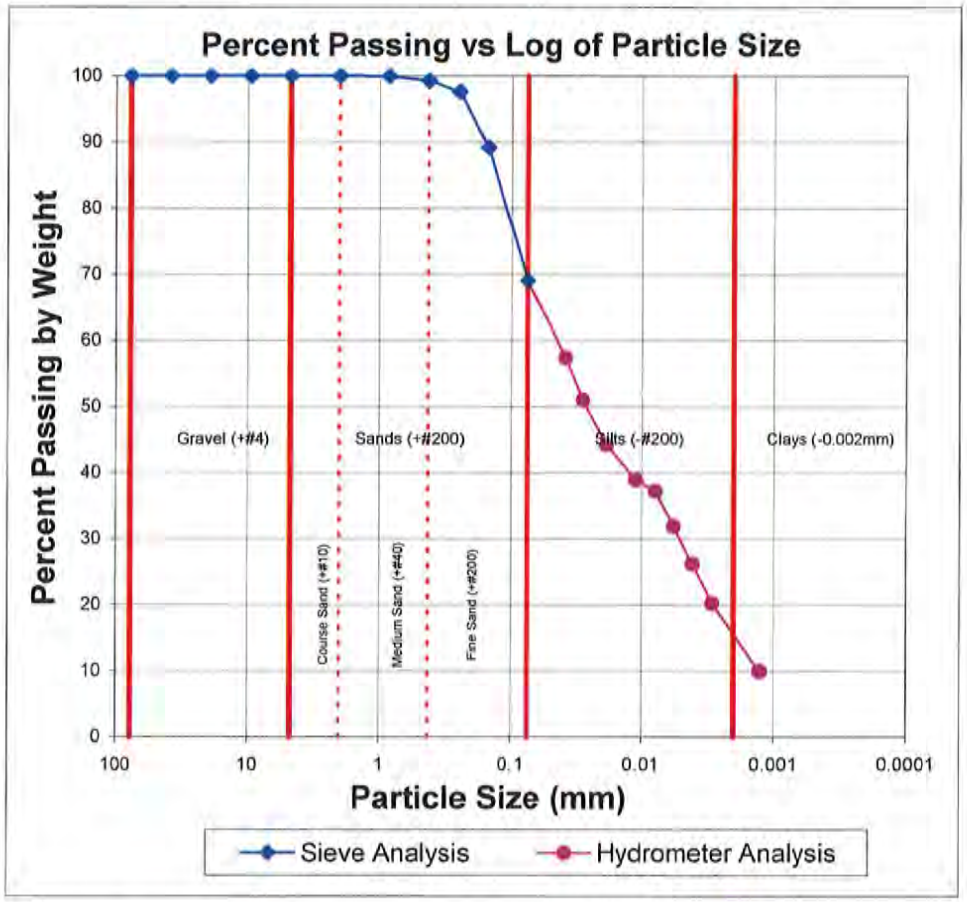
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 70.50
Calculated Dry Weight of -#10 (g): 69.94

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	0.00	0.00	0.00	0.00	100.0
70.503g split out of -#10 material.						
#20	0.850	3.15	3.10	0.04	0.04	99.9
#40	0.425	3.55	3.09	0.47	0.47	99.3
#60	0.250	4.28	3.11	1.17	1.17	97.6
#100	0.150	8.98	3.09	5.89	5.89	89.2
#200	0.075	17.14	3.09	14.06	14.06	69.1



Data Entered By: DAW
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_71.xls

Checked By: KP
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: --

Boring Number: TI-BI-11A
Depth: 31.0-31.5'
Sample Number: Sand Tailings (V. Fine Clayey)
Sampled Date: 11/21/13
Sampled By: MWH
Test Date: 05/05/14
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.5
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 70.50
Total Dry Weight of Sample (g): 69.94
Wet Weight of Sub-Sample (g): 70.503
Dry Weight of Sub-Sample (g): 69.936
Corrected Dry Weight of Sub-Sample - W(g): 69.936

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	46.0	40.5	23.3	0.0130	8.75	0.0384	57.4	40.13	57.4
2	41.5	36.0	23.3	0.0130	9.49	0.0283	51.0	35.67	51.0
5	36.8	31.3	23.3	0.0130	10.27	0.0186	44.3	30.97	44.3
15	33.0	27.5	23.3	0.0130	10.88	0.0110	39.0	27.25	39.0
30	31.8	26.3	23.4	0.0130	11.09	0.0079	37.2	26.01	37.2
60	28.0	22.5	23.6	0.0130	11.70	0.0057	31.9	22.30	31.9
120	24.0	18.5	24.0	0.0128	12.36	0.0041	26.2	18.33	26.2
250	19.8	14.3	25.2	0.0127	13.06	0.0029	20.2	14.12	20.2
1440	12.5	7.0	25.2	0.0127	14.24	0.0013	9.9	6.94	9.9

Data Entered By: DAW
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_71.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: --

Boring Number: TI-B3-07A
Depth: 41.0-41.5'
Sample Number: Silty Clay
Sampled Date: 11/19/13
Test Date: 01/27/14

Sampled By: MWH
Technician: DPM

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 72.92
Weight of Dry Soil & Pan (g): 71.59
Weight of Water (g): 1.33
Weight of Pan (g): 3.62
Weight of Dry Soil (g): 67.96
Moisture (%): 2.0

General Sample Data

Total Wet Weight of Sample (g): 65.05
Total Dry Weight of Sample (g): 63.80
Calculated Weight Plus #200 (g): 21.57
Moisture of Total Sample (%): 2.0
Percent Retained #200 Sieve (%): 33.8

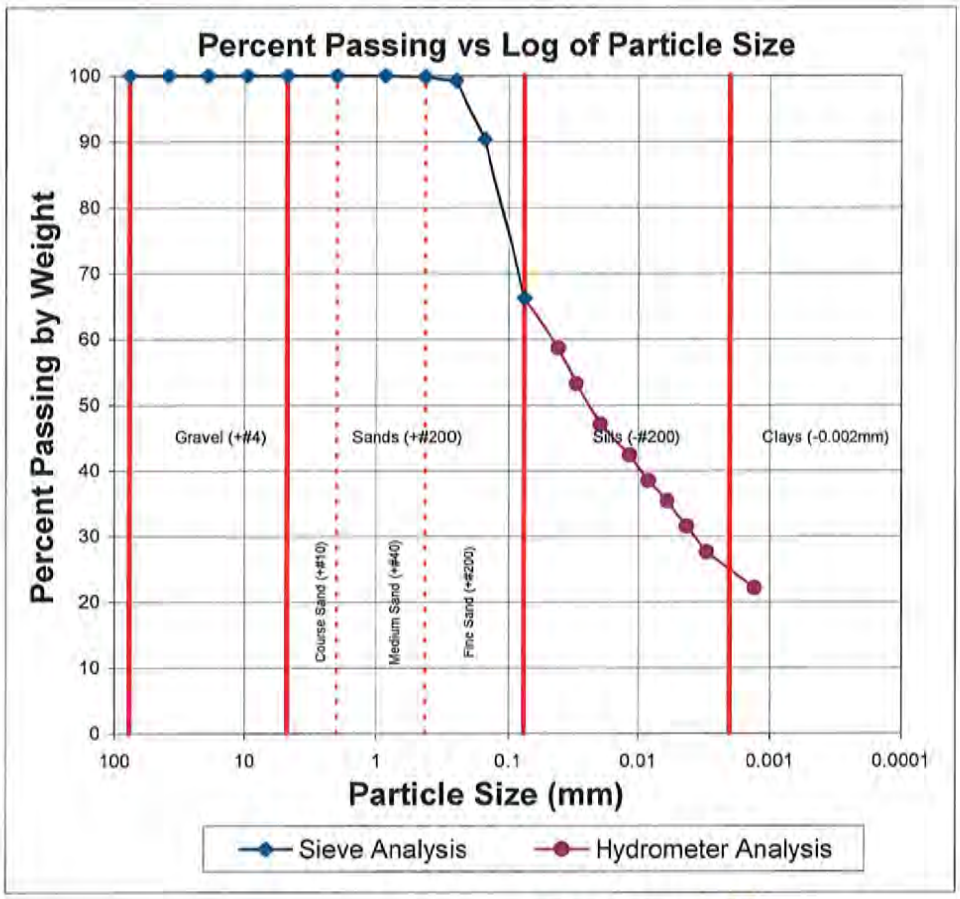
Plus Split Data

Original Weight of +#10 (g): 0.00
Calculated Weight of +#10 (g): 0.00

Minus Split Data

Original Weight of -#10 (g): 65.05
Calculated Dry Weight of -#10 (g): 63.80

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	**76.2**	0.00	0.00	0.00	0.00	100.0
1.5"	**38.10**	0.00	0.00	0.00	0.00	100.0
3/4"	**19.05**	0.00	0.00	0.00	0.00	100.0
3/8"	**9.525**	0.00	0.00	0.00	0.00	100.0
#4	**4.750**	0.00	0.00	0.00	0.00	100.0
#10	**2.000**	0.00	0.00	0.00	0.00	100.0
65.045g split out of -#10 material.						
#20	**0.850**	3.86	3.86	0.00	0.00	100.0
#40	**0.425**	3.98	3.85	0.13	0.13	99.8
#60	**0.250**	3.43	3.08	0.35	0.35	99.2
#100	**0.150**	9.27	3.58	5.70	5.70	90.3
#200	**0.075**	18.51	3.11	15.39	15.39	66.2



Data Entered By: DAW
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_91.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Particle Size Analysis of Soils
ASTM D 422

Client: MWH
Job Number: 2512-77
Project: Church Rock
Location: Tailings Impoundment
Project Number: --

Boring Number: TI-B3-07A
Depth: 41.0-41.5'
Sample Number: Silty Clay
Sampled Date: 11/19/13
Test Date: 01/27/14

Sampled By: MWH
Technician: DPM

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.70
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.3
Specific Gravity Correction Factor - α: 0.99

Total Wet Weight of Sample (g): 65.05
Total Dry Weight of Sample (g): 63.80
Wet Weight of Sub-Sample (g): 65.045
Dry Weight of Sub-Sample (g): 63.797
Corrected Dry Weight of Sub-Sample - W(g): 63.797

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	43.0	37.8	19.5	0.0136	9.24	0.0414	58.6	37.41	58.6
2	39.5	34.3	19.5	0.0136	9.82	0.0302	53.2	33.94	53.2
5	35.5	30.3	19.5	0.0136	10.47	0.0197	47.0	29.98	47.0
15	32.5	27.3	19.6	0.0136	10.96	0.0116	42.3	27.00	42.3
30	30.0	24.8	19.7	0.0136	11.37	0.0084	38.4	24.53	38.4
60	28.0	22.8	19.8	0.0136	11.70	0.0060	35.3	22.54	35.3
120	25.5	20.3	20.1	0.0134	12.11	0.0043	31.5	20.07	31.5
250	23.0	17.8	20.2	0.0134	12.52	0.0030	27.6	17.59	27.6
1440	19.5	14.3	19.7	0.0136	13.10	0.0013	22.1	14.12	22.1

Data Entered By: DAW
Date: 6/18/2014
File Name: 2512_77_hydrometer-ASTM-D422-R0_91.xls

Checked By: KR
Date: 6/18/14

ATT
ADVANCED TERRA TESTING

Identification and Classification of Dispersive Clay Soils by the Pinhole Test
ASTM D 4647

Client: MWH
Job No.: 2512-77
Project: --
Location: Church Rock
Project No.: --

Boring No.: TI-CS01-04A
Depth: 11-24"
Sample No.: --
Date Tested: 06/24/14
By: TBT

Before Test Moisture Content

Wet Weight Soil & Dish: 958.17g
Dry Weight Soil & Dish: 939.27g
Weight Of Water: 18.90g
Dish Weight: 809.21g
Dry Weight Soil: 130.06g
Moisture Content: 14.53%

Classification: ND3

Original Pinhole Diameter: 0.04in, 0.0010m
Final Pinhole Diameter: 0.04in, 0.0010m

Sample Type: Remolded

Before Test Density

Height: 1.50in, 0.0381m
Diameter: 1.94in, 0.0492m
Weight: 0.3284lbs, 148.96g
Wet Density: 128.25lbs/ft³, 2054kg/m³
Dry Density: 111.98lbs/ft³, 1794kg/m³

Test Data

Two Inch Head Height	Flow	Elapsed Time	Flow Rate	Turbidity	Observations
	36ml	60s	0.010gal/min, 0.6ml/s	Clear	
	36ml	60s	0.010gal/min, 0.6ml/s	Clear	
	36ml	60s	0.010gal/min, 0.6ml/s	Clear	
	38ml	60s	0.010gal/min, 0.6ml/s	Clear	
	36ml	60s	0.010gal/min, 0.6ml/s	Clear	
	36ml	60s	0.010gal/min, 0.6ml/s	Clear	
	36ml	60s	0.010gal/min, 0.6ml/s	Clear	
	36ml	60s	0.010gal/min, 0.6ml/s	Clear	
	38ml	60s	0.010gal/min, 0.6ml/s	Clear	
	37ml	60s	0.010gal/min, 0.6ml/s	Clear	
Seven Inch Head Height	**Flow**	**Elapsed Time**	**Flow Rate**	**Turbidity**	**Observations**
	83ml	60s	0.022gal/min, 1.4ml/s	Clear	
	81ml	60s	0.021gal/min, 1.4ml/s	Clear	
	85ml	60s	0.022gal/min, 1.4ml/s	Clear	
	88ml	60s	0.023gal/min, 1.5ml/s	Clear	
	85ml	60s	0.022gal/min, 1.4ml/s	Clear	
Fifteen Inch Head Height	**Flow**	**Elapsed Time**	**Flow Rate**	**Turbidity**	**Observations**
	132ml	60s	0.035gal/min, 2.2ml/s	Clear	
	127ml	60s	0.034gal/min, 2.1ml/s	Clear	
	143ml	60s	0.038gal/min, 2.4ml/s	Clear	
	117ml	60s	0.031gal/min, 2.0ml/s	Clear	
	129ml	60s	0.034gal/min, 2.2ml/s	Clear	

File Name: 2512_77_pinhole-ASTMD-4647-R2_2.xls
Entered By: DAW
Date: 6/25/2014

Data Checked By: KP
Date: 6/25/14

ATT
ADVANCED TERRA TESTING

CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B3-03	SAMPLED	11/19/13 MWH
DEPTH	21.0-22.0' (20-22.4')	TEST STARTED	04/13/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/14/14 DPM
SOIL DESCR.	Silty Clay	SETUP NO.	ATT-02
LOCATION	Tailings Impoundment		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring(s) (g)	196.6	198.1
Wt. Ring(s) (g)	42.1	42.1
Wt. Soil (g)	154.4	155.9
Wet Density PCF	129.0	131.1
Sample Diameter (in)	2.410	2.410
Sample Height (in)	1.000	0.993
Wt. Wet Soil & Pan (g)	158.2	159.7
Wt. Dry Soil & Pan (g)	136.9	136.9
Wt. Lost Moisture (g)	21.3	22.8
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	133.1	133.1
Moisture Content %	16.0	17.2
Dry Density PCF	111.1	111.9
Max. Dry Density PCF		
Percent Compaction		

	LOAD (PSF)	LOG LOAD	CONSOL. (IN.)	DEFL. (IN.)
	105	2.019	0.0000	0.0000
	2709	3.433	0.0063	-0.0063
Inundate	2709	3.433	0.0066	-0.0066

LOAD (PSF)	CONSOL. (IN.)
104.5	0.00000
2709	0.00630
2709	0.00660

Data Entered By: DPM Date: 04/17/2014
Data Checked By: bj Date: 4/18/14
Filename: MWSWB303

CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B3-03	SAMPLED	11/19/13 MWH
DEPTH	21.0-22.0' (20-22.4')	TEST STARTED	04/13/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/14/14 DPM
SOIL DESCR.	Silty Clay	SETUP NO.	ATT-02

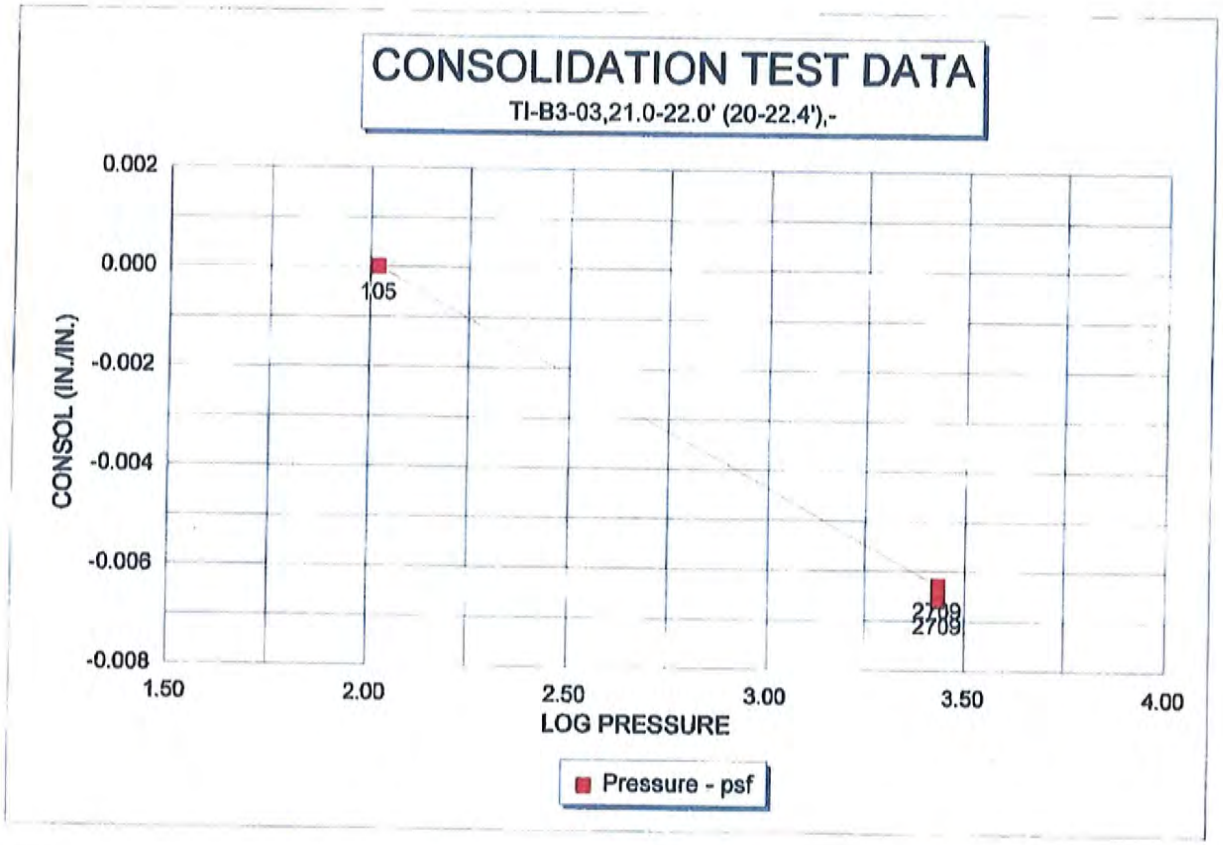
TIME READING DATA

2709 wet psf load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01200	0.00000
0.1	0.32	0.01220	-0.00020
0.3	0.50	0.01225	-0.00025
0.5	0.71	0.01230	-0.00030
1.0	1.00	0.01230	-0.00030
2.0	1.41	0.01230	-0.00030
4.0	2.00	0.01230	-0.00030
9.0	3.00	0.01230	-0.00030
16.0	4.00	0.01225	-0.00025
30.0	5.48	0.01220	-0.00020
60.0	7.75	0.01220	-0.00020
120.0	10.95	0.01220	-0.00020
240.0	15.49	0.01220	-0.00020
480.0	21.91	0.01220	-0.00020

Data Entered By: DPM Date: 04/17/2014
Data Checked By: bj Date: 4/18/14
Filename: MWSWB303

ADVANCED TERRA TESTING, INC. ATT


CONSOLIDATION TEST DATA
TI-B3-03,21.0-22.0' (20-22.4'),-
CONSOL (IN./IN.)
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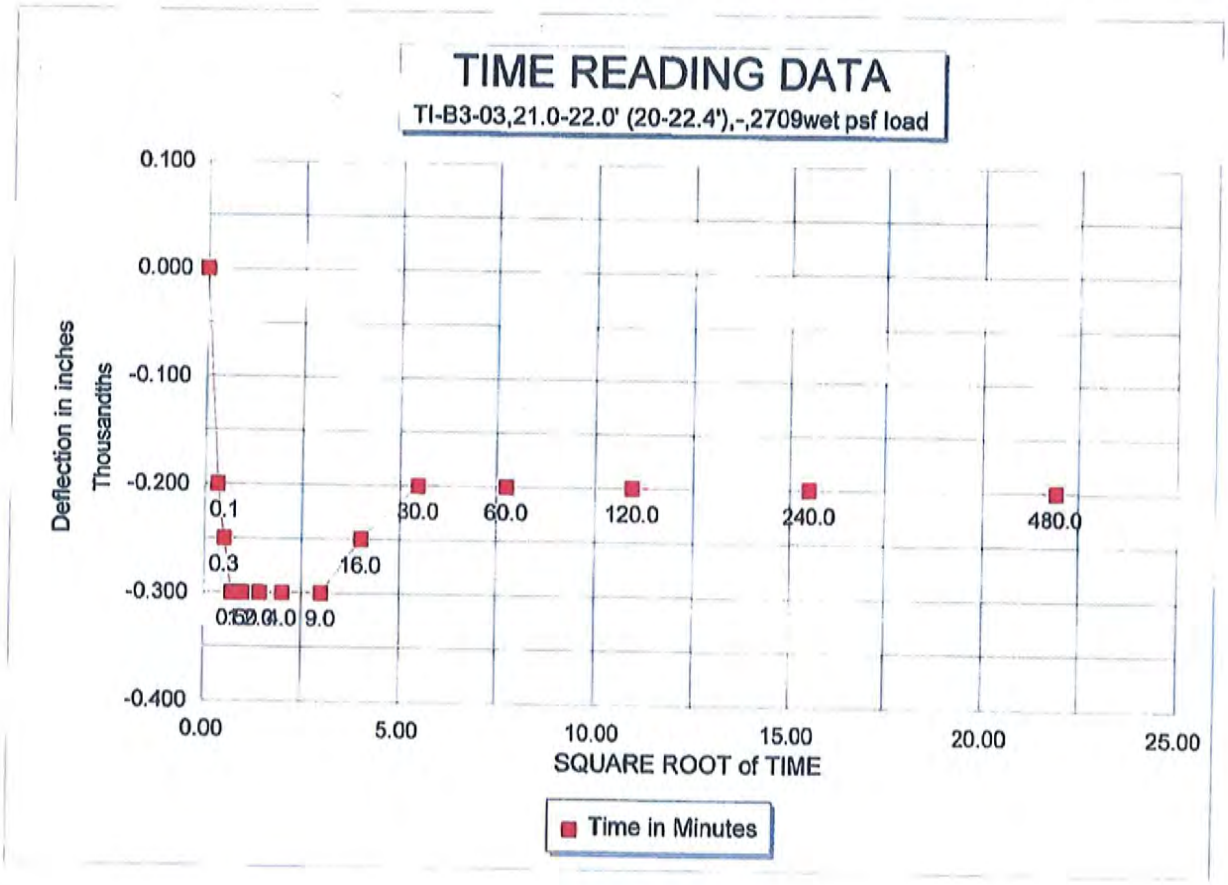
0.000
-0.002
-0.004
-0.006
-0.008
1.50
2.00
2.50
3.00
3.50
4.00
LOG PRESSURE
105
2709
2709
Pressure - psf


TIME READING DATA
TI-B3-03,21.0-22.0' (20-22.4'),-,2709wet psf load
Deflection in inches
Thousandths
0.100
0.000
-0.100
-0.200
-0.300
-0.400
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
0.1
0.3
16.0
9.0
30.0
60.0
120.0
240.0
480.0
Time in Minutes

CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B3-02C	SAMPLED	11/19/13 MWH
DEPTH	16.0-16.5'	TEST STARTED	02/05/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/06/14 DPM
SOIL DESCR.	Sand	SETUP NO.	ATT-05
LOCATION	Tailings Impoundment		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring(s) (g)	328.7	337.4
Wt. Ring(s) (g)	243.3	243.3
Wt. Soil (g)	85.4	94.0
Wet Density PCF	110.2	125.9
Sample Diameter (in)	1.938	1.938
Sample Height (in)	1.000	0.964
Wt. Wet Soil & Pan (g)	89.1	97.8
Wt. Dry Soil & Pan (g)	85.2	85.2
Wt. Lost Moisture (g)	3.8	12.5
Wt. of Pan Only (g)	3.7	3.7
Wt. of Dry Soil (g)	81.5	81.5
Moisture Content %	4.7	15.4
Dry Density PCF	105.3	109.1
Max. Dry Density PCF		
Percent Compaction		

	LOAD (PSF)	CONSOL. (IN.)
	154	0.00000
	2236	0.00815
	2236	0.03565

	LOAD (PSF)	LOG LOAD	CONSOL. (IN.)	DEFL. (IN.)
	154	2.187	0.0000	0.0000
	2236	3.349	0.0082	-0.0082
Inundate	2236	3.349	0.0357	-0.0357

Data Entered By: DPM Date: 02/25/2014
Data Checked By: BS Date: 3/6/2014
Filename: MWSW302C

ADVANCED TERRA TESTING, INC. ATT

CONSOLIDATION/SWELL TEST
ASTM D 4546

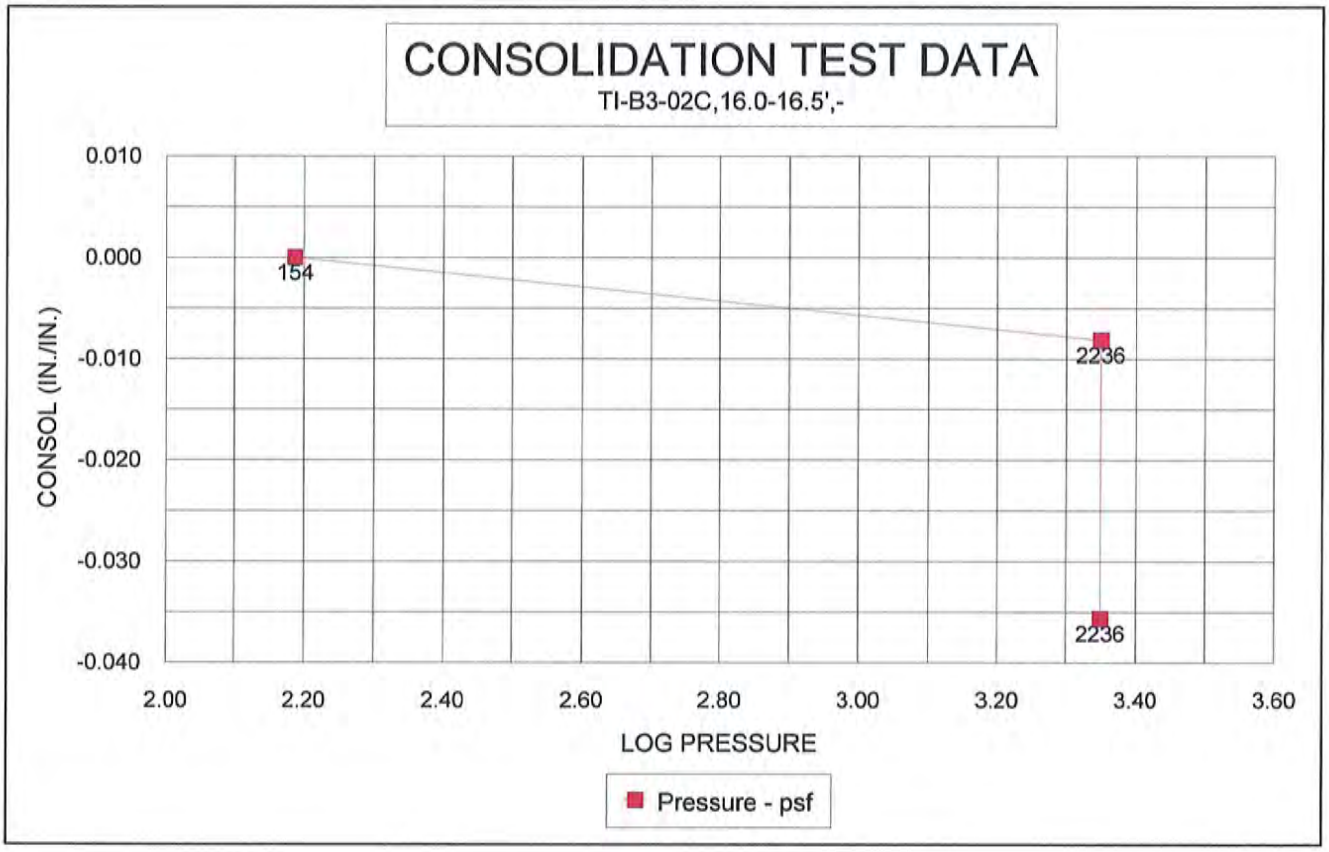
CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-02C	SAMPLED	11/19/13 MWH
DEPTH	16.0-16.5'	TEST STARTED	02/05/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/06/14 DPM
SOIL DESCR.	Sand	SETUP NO.	ATT-05

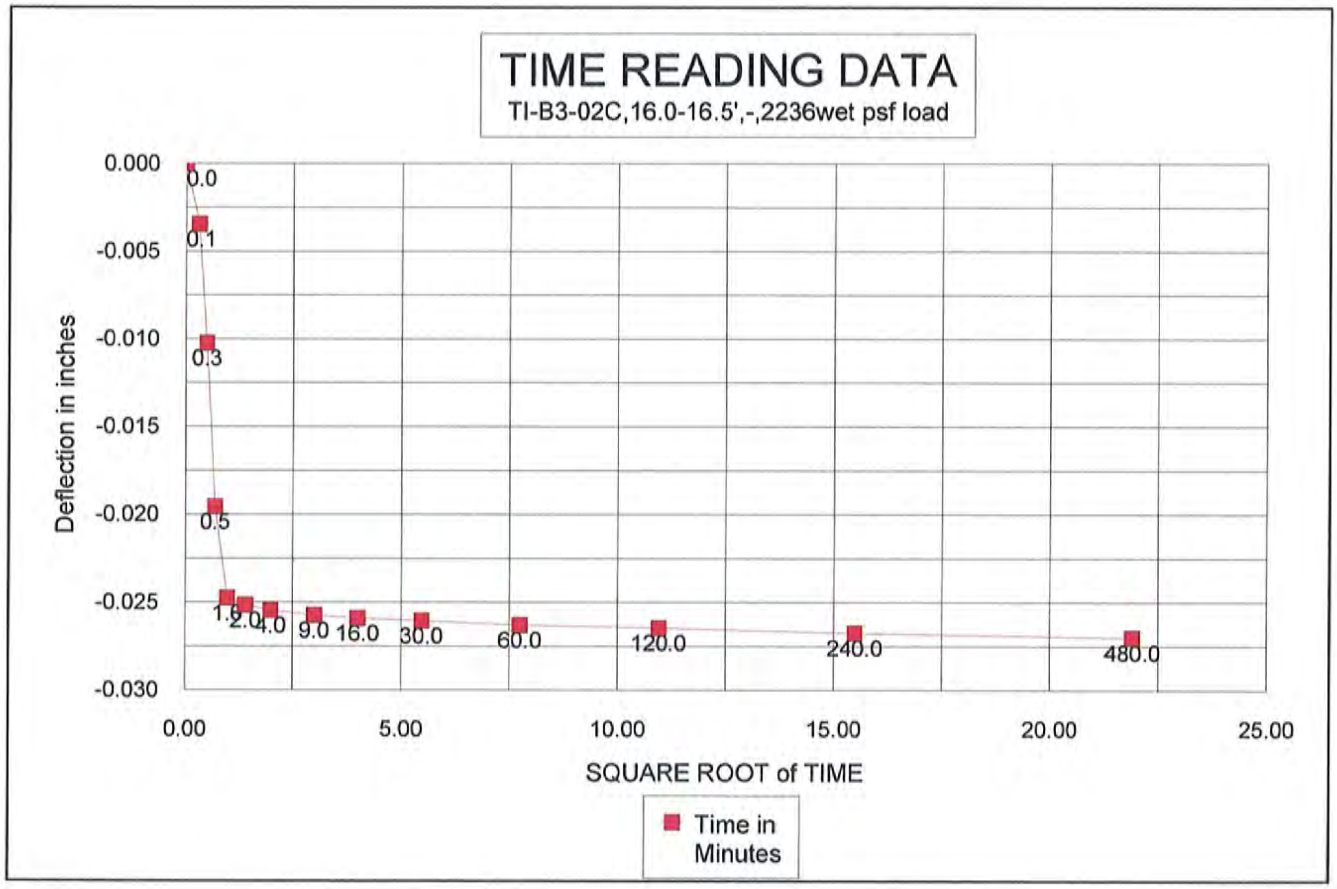
TIME READING DATA

2236 wet psf load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.0121	-0.0000
0.1	0.32	0.0155	-0.0035
0.3	0.50	0.0223	-0.0103
0.5	0.71	0.0316	-0.0196
1.0	1.00	0.0368	-0.0248
2.0	1.41	0.0372	-0.0252
4.0	2.00	0.0375	-0.0255
9.0	3.00	0.0378	-0.0258
16.0	4.00	0.0380	-0.0259
30.0	5.48	0.0381	-0.0261
60.0	7.75	0.0384	-0.0263
120.0	10.95	0.0385	-0.0265
240.0	15.49	0.0388	-0.0268
480.0	21.91	0.0391	-0.0270

Data Entered By: DPM Date: **********
Data Checked By: BS Date: 3/6/2014
Filename: MWSW302C


CONSOLIDATION TEST DATA
TI-B3-02C,16.0-16.5',-
CONSOL (IN./IN.)
0.010
0.000
-0.010
-0.020
-0.030
-0.040
154
2236
2236
2.00
2.20
2.40
2.60
2.80
3.00
3.20
3.40
3.60
LOG PRESSURE
Pressure - psf


TIME READING DATA
TI-B3-02C,16.0-16.5',-,2236wet psf load
Deflection in inches
0.000
-0.005
-0.010
-0.015
-0.020
-0.025
-0.030
0.0
0.1
0.3
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B3-6	SAMPLED	11/19/13 MWH
DEPTH	35-36' (35-37.3')	TEST STARTED	04/19/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/20/14 DPM
SOIL DESCR.	Silty Clay	SETUP NO.	ATT-05
LOCATION	Tailings Impoundment		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	182.5	186.8
Wt. Ring (s) (g)	42.0	42.0
Wt. Soil (g)	140.4	144.7
Wet Density PCF	117.3	126.1
Sample Diameter (in)	2.410	2.410
Sample Height (in)	1.000	0.958
Wt. Wet Soil & Pan (g)	144.3	148.6
Wt. Dry Soil & Pan (g)	126.2	126.2
Wt. Lost Moisture (g)	18.0	22.3
Wt. of Pan Only (g)	3.9	3.9
Wt. of Dry Soil (g)	122.4	122.4
Moisture Content %	14.7	18.2
Dry Density PCF	102.2	106.7
Max. Dry Density PCF		
Percent Compaction		

	LOAD (PSF)	LOG LOAD	CONSOL. (IN.)	DEFL. (IN.)
	99	1.997	0.0000	0.0000
	4608	3.664	0.0345	-0.0345
Inundate	4608	3.664	0.0417	-0.0417

LOAD (PSF)	CONSOL. (IN.)
99.4	0.00000
4608	0.03450
4608	0.04170

Data Entered By: DPM Date: 05/23/2014
Data Checked By: KR Date: 5/23/14
Filename: MWSWB306

ADVANCED TERRA TESTING, INC. ATT

CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-6	SAMPLED	11/19/13 MWH
DEPTH	35-36' (35-37.3')	TEST STARTED	04/19/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/20/14 DPM
SOIL DESCR.	Silty Clay	SETUP NO.	ATT-05

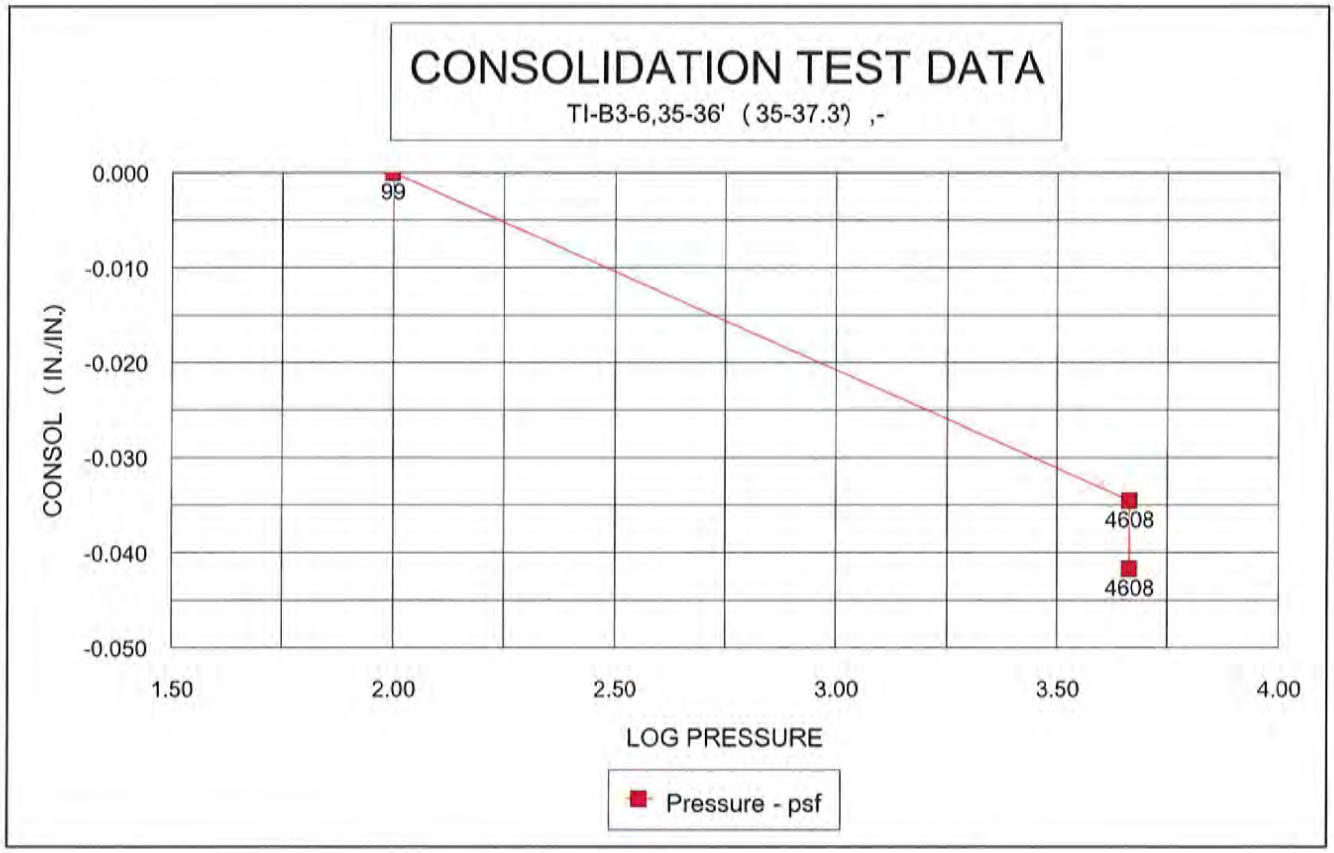
TIME READING DATA

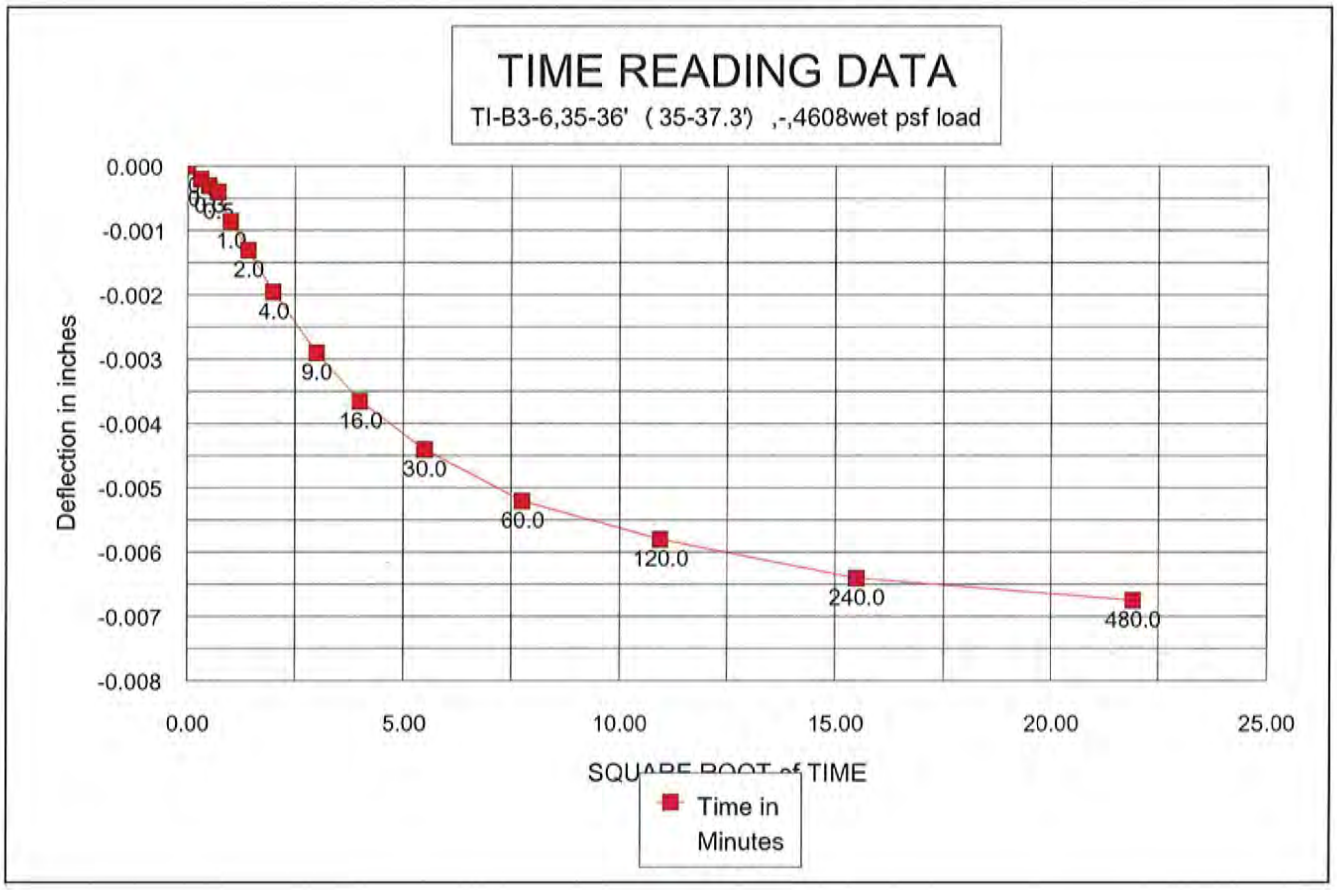
4608 wet psf load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.04140	-0.00000
0.1	0.32	0.04160	-0.00020
0.3	0.50	0.04170	-0.00030
0.5	0.71	0.04180	-0.00040
1.0	1.00	0.04225	-0.00085
2.0	1.41	0.04270	-0.00130
4.0	2.00	0.04335	-0.00195
9.0	3.00	0.04430	-0.00290
16.0	4.00	0.04505	-0.00365
30.0	5.48	0.04580	-0.00440
60.0	7.75	0.04660	-0.00520
120.0	10.95	0.04720	-0.00580
240.0	15.49	0.04780	-0.00640
480.0	21.91	0.04815	-0.00675

Data Entered By: DPM Date: 05/23/2014
Data Checked By: KR Date: 5/23/14
Filename: MWSWB306

ADVANCED TERRA TESTING, INC. ATT


CONSOLIDATION TEST DATA
TI-B3-6,35-36' (35-37.3') ,-
CONSOL (IN./IN.)
0.000
-0.010
-0.020
-0.030
-0.040
-0.050
99
4608
4608
1.50
2.00
2.50
3.00
3.50
4.00
LOG PRESSURE
Pressure - psf


TIME READING DATA
TI-B3-6,35-36' (35-37.3') ,-,4608wet psf load
Deflection in inches
0.000
-0.001
-0.002
-0.003
-0.004
-0.005
-0.006
-0.007
-0.008
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B3-10	SAMPLED	11/19/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	04/21/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/22/14 DPM
SOIL DESCR.	Silty Clay	SETUP NO.	ATT-02
LOCATION	Tailings Impoundment		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring(s) (g)	198.7	197.5
Wt. Ring(s) (g)	42.7	42.7
Wt. Soil (g)	156.0	154.8
Wet Density PCF	130.3	133.2
Sample Diameter (in)	2.410	2.410
Sample Height (in)	1.000	0.970
Wt. Wet Soil & Pan (g)	159.9	158.6
Wt. Dry Soil & Pan (g)	135.8	135.8
Wt. Lost Moisture (g)	24.1	22.8
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	132.0	132.0
Moisture Content %	18.2	17.3
Dry Density PCF	110.2	113.6
Max. Dry Density PCF		
Percent Compaction		

LOAD (PSF)	CONSOL. (IN.)
104.5	0.00000
7204	0.01455
7204	0.02995

	LOAD (PSF)	LOG LOAD	CONSOL. (IN.)	DEFL. (IN.)
	105	2.019	0.0000	0.0000
	7204	3.858	0.0146	-0.0146
Inundate	7204	3.858	0.0300	-0.0300

Data Entered By: DPM Date: 05/27/2014
Data Checked By: KH Date: 5/27/14
Filename: MWSWB310

ADVANCED TERRA TESTING, INC. ATT

CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-10	SAMPLED	11/19/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	04/21/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/22/14 DPM
SOIL DESCR.	Silty Clay	SETUP NO.	ATT-02

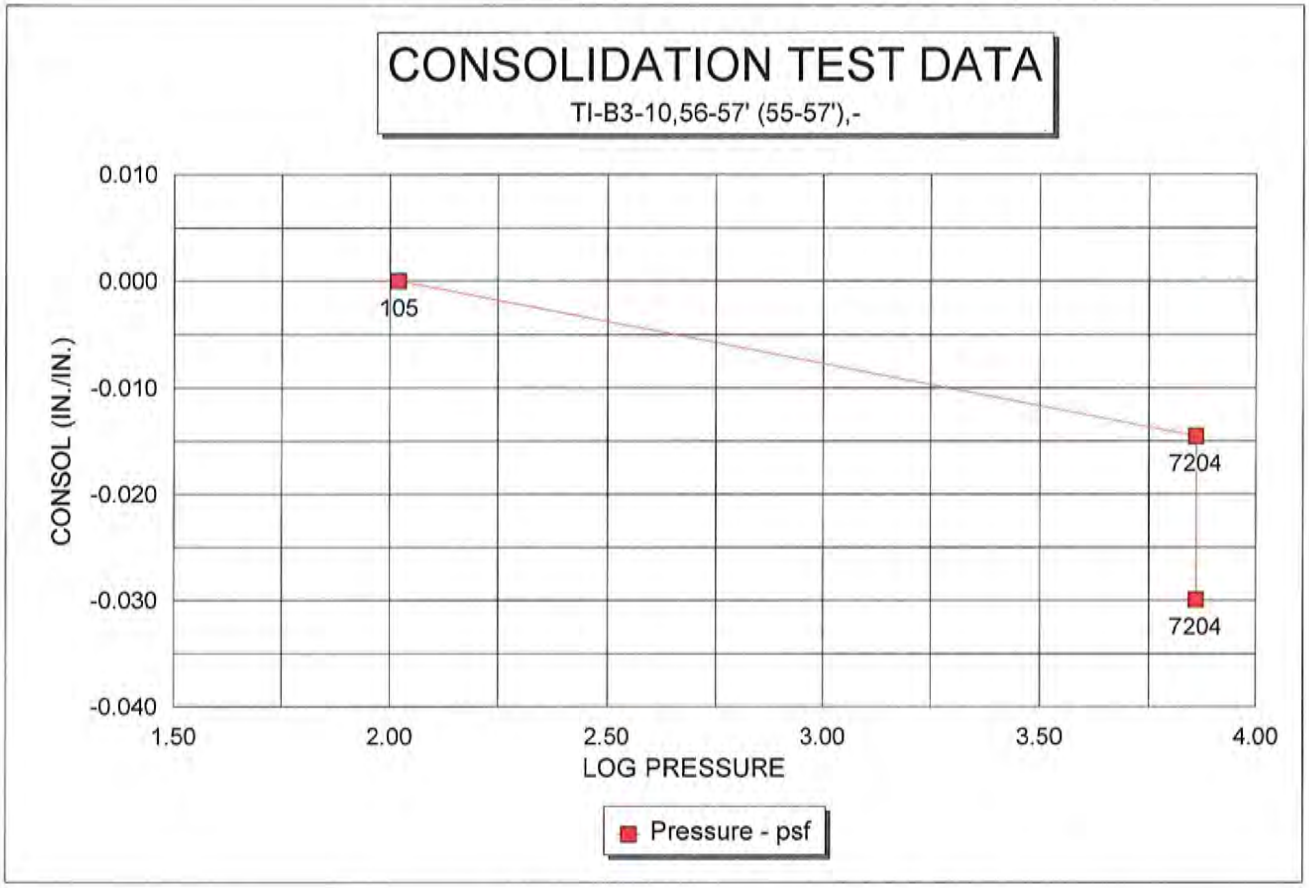
TIME READING DATA

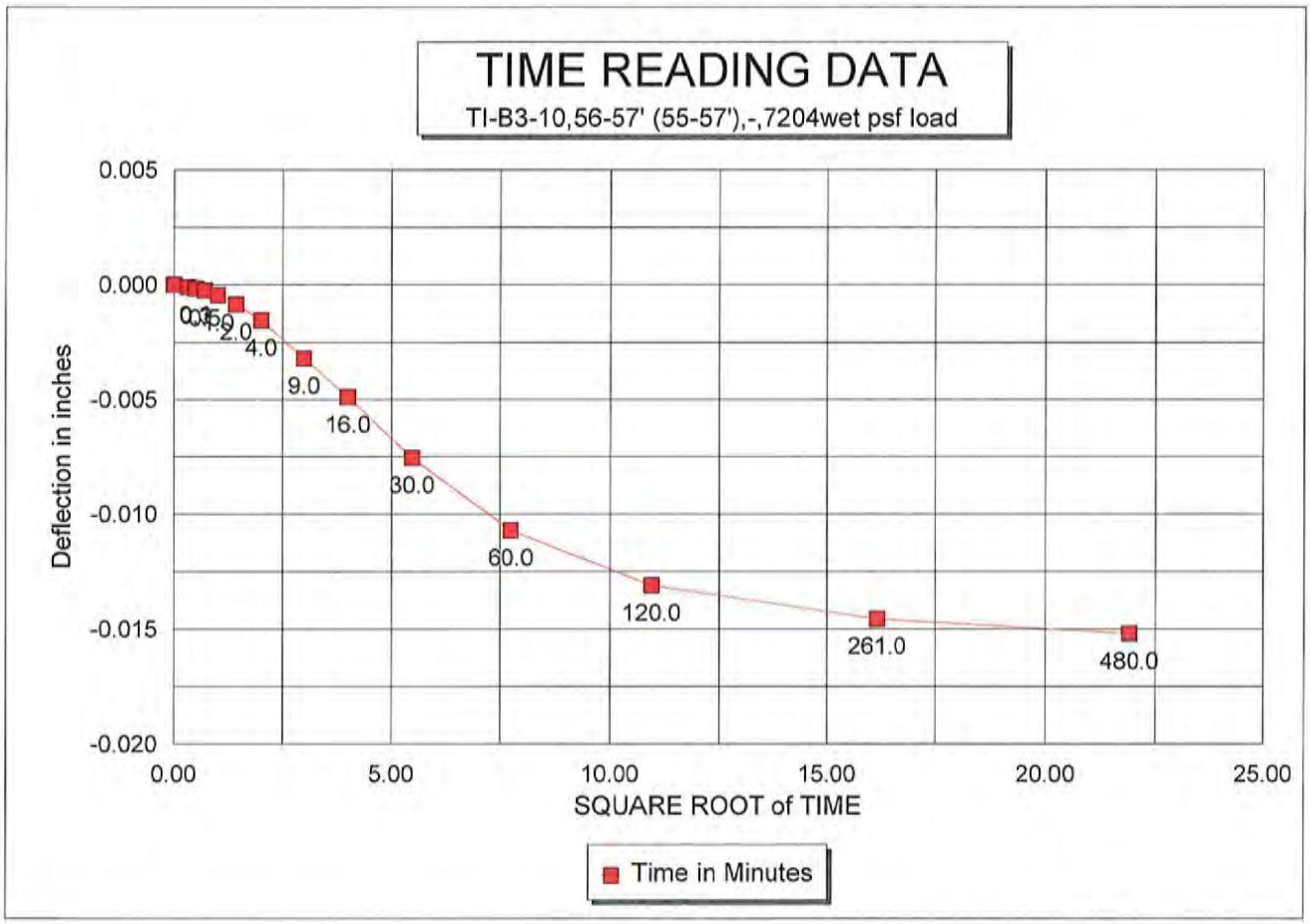
7204 wet psf load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02255	0.00000
0.1	0.32	0.02265	-0.00010
0.3	0.50	0.02270	-0.00015
0.5	0.71	0.02280	-0.00025
1.0	1.00	0.02300	-0.00045
2.0	1.41	0.02340	-0.00085
4.0	2.00	0.02410	-0.00155
9.0	3.00	0.02575	-0.00320
16.0	4.00	0.02745	-0.00490
30.0	5.48	0.03010	-0.00755
60.0	7.75	0.03325	-0.01070
120.0	10.95	0.03565	-0.01310
261.0	16.16	0.03710	-0.01455
480.0	21.91	0.03775	-0.01520

Data Entered By: DPM Date: 05/27/2014
Data Checked By: KL Date: 5/27/14
Filename: MWSWB310

ADVANCED TERRA TESTING, INC. ATT


CONSOLIDATION TEST DATA
TI-B3-10,56-57' (55-57'),-
0.010
0.000
-0.010
-0.020
-0.030
-0.040
CONSOL (IN./IN.)
105
7204
7204
1.50
2.00
2.50
3.00
3.50
4.00
LOG PRESSURE
Pressure - psf


TIME READING DATA
TI-B3-10,56-57' (55-57'),-,7204wet psf load
0.005
0.000
-0.005
-0.010
-0.015
-0.020
Deflection in inches
2.0
4.0
9.0
16.0
30.0
60.0
120.0
261.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B11-08	SAMPLED	12/02/13 MWH
DEPTH	51.5-52.5' (50-52.5')	TEST STARTED	03/06/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/18/14 DPM
SOIL DESCR.	Fine Tailings	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	163.9	151.9
Wt. Ring (s) (g)	42.0	42.0
Wt. Soil (g)	121.9	109.9
Wet Density PCF	101.8	110.4
Wt. Wet Soil & Pan (g)	125.7	113.7
Wt. Dry Soil & Pan (g)	78.6	78.6
Wt. Lost Moisture (g)	47.1	35.1
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	74.8	74.8
Moisture Content %	63.0	47.0
Dry Density PCF	62.5	75.1

LOAD (PSF)	CONSOL. (IN.)
108.9	0.00000
108.9	-0.00070
207.4	-0.00150
405.0	-0.00200
802.8	-0.00125
1604	0.00525
3204	0.01905
6377	0.04885
12869	0.12685
25491	0.21550
6377	0.20195
1604	0.16855

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	109	2.037	0.0000	0.0000	1.6990
Inundate	109	2.037	-0.0007	0.0007	1.7009
	207	2.317	-0.0015	0.0015	1.7030
	405	2.607	-0.0020	0.0020	1.7044
	803	2.905	-0.0013	0.0013	1.7024
	1604	3.205	0.0053	-0.0053	1.6848
	3204	3.506	0.0191	-0.0191	1.6476
	6377	3.805	0.0489	-0.0489	1.5671
	12869	4.110	0.1269	-0.1269	1.3566
	25491	4.406	0.2155	-0.2155	1.1174
	6377	3.805	0.2020	-0.2020	1.1539
	1604	3.205	0.1686	-0.1686	1.2441

% Saturation	100.1
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	0.941
Init. Ht. Voids (cm)	1.599
Init. Void Ratio	1.6990

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01108

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B11-08	SAMPLED	12/02/13 MWH
DEPTH	51.5-52.5' (50-52.5')	TEST STARTED	03/06/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/18/14 DPM
SOIL DESCR.	Fine Tailings	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		

TIME READING DATA

1604 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00220	-0.00000
0.1	0.32	0.00440	-0.00220
0.3	0.50	0.00490	-0.00270
0.5	0.71	0.00525	-0.00305
1.0	1.00	0.00575	-0.00355
2.0	1.41	0.00635	-0.00415
4.0	2.00	0.00695	-0.00475
9.0	3.00	0.00730	-0.00510
16.0	4.00	0.00755	-0.00535
30.0	5.48	0.00780	-0.00560
60.0	7.75	0.00800	-0.00580
120.0	10.95	0.00825	-0.00605
240.0	15.49	0.00845	-0.00625
480.0	21.91	0.00895	-0.00675

3204 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01065	0.00000
0.1	0.32	0.01275	-0.00210
0.3	0.50	0.01365	-0.00300
0.5	0.71	0.01445	-0.00380
1.0	1.00	0.01565	-0.00500
2.0	1.41	0.01725	-0.00660
4.0	2.00	0.01925	-0.00860
9.0	3.00	0.02110	-0.01045
16.0	4.00	0.02205	-0.01140
30.0	5.48	0.02270	-0.01205
60.0	7.75	0.02335	-0.01270
120.0	10.95	0.02390	-0.01325
240.0	15.49	0.02445	-0.01380
480.0	21.91	0.02500	-0.01435

6377 psf Load

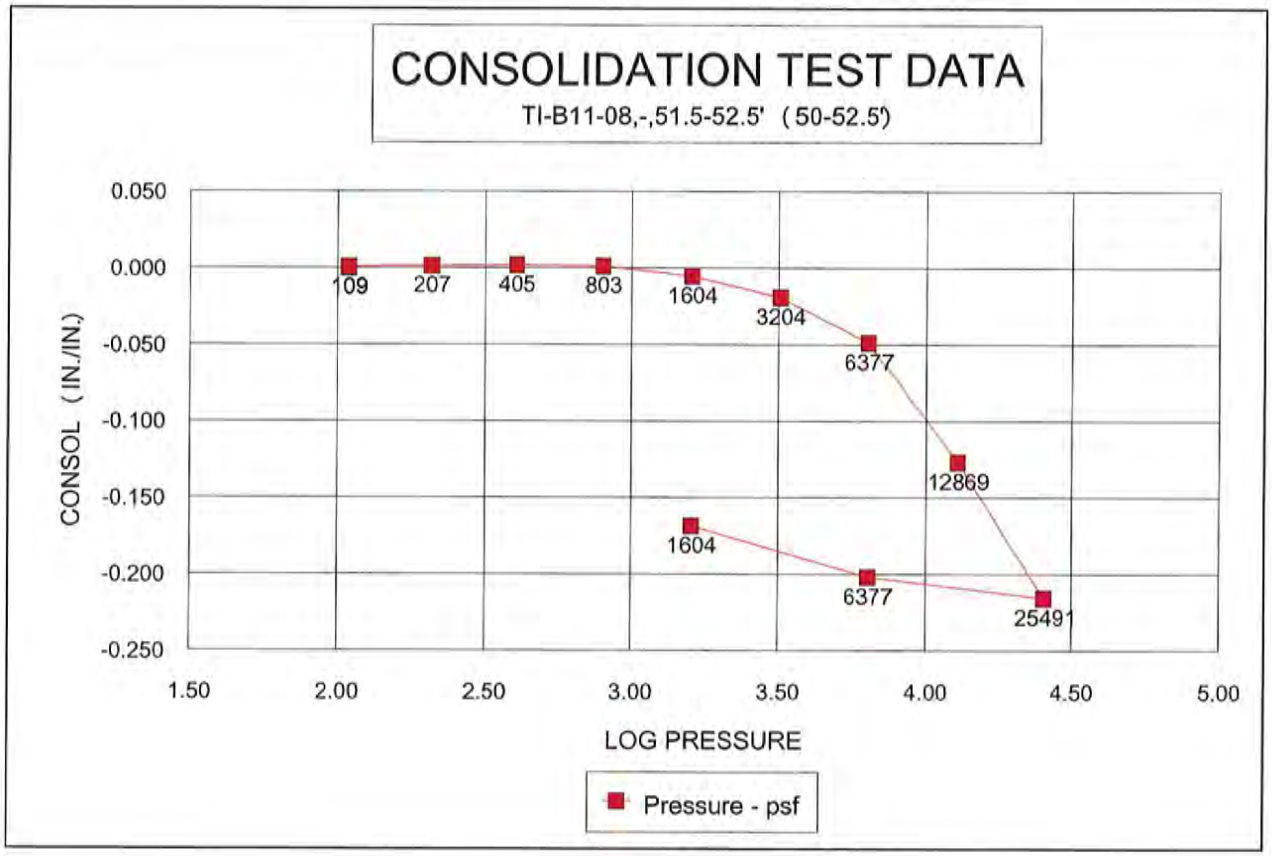
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02690	0.00000
0.1	0.32	0.03060	-0.00370
0.3	0.50	0.03215	-0.00525
0.5	0.71	0.03385	-0.00695
1.0	1.00	0.03620	-0.00930
2.0	1.41	0.03950	-0.01260
4.0	2.00	0.04335	-0.01645
9.0	3.00	0.04725	-0.02035
16.0	4.00	0.04910	-0.02220
30.0	5.48	0.05060	-0.02370
60.0	7.75	0.05200	-0.02510
120.0	10.95	0.05335	-0.02645
240.0	15.49	0.05480	-0.02790
480.0	21.91	0.05630	-0.02940

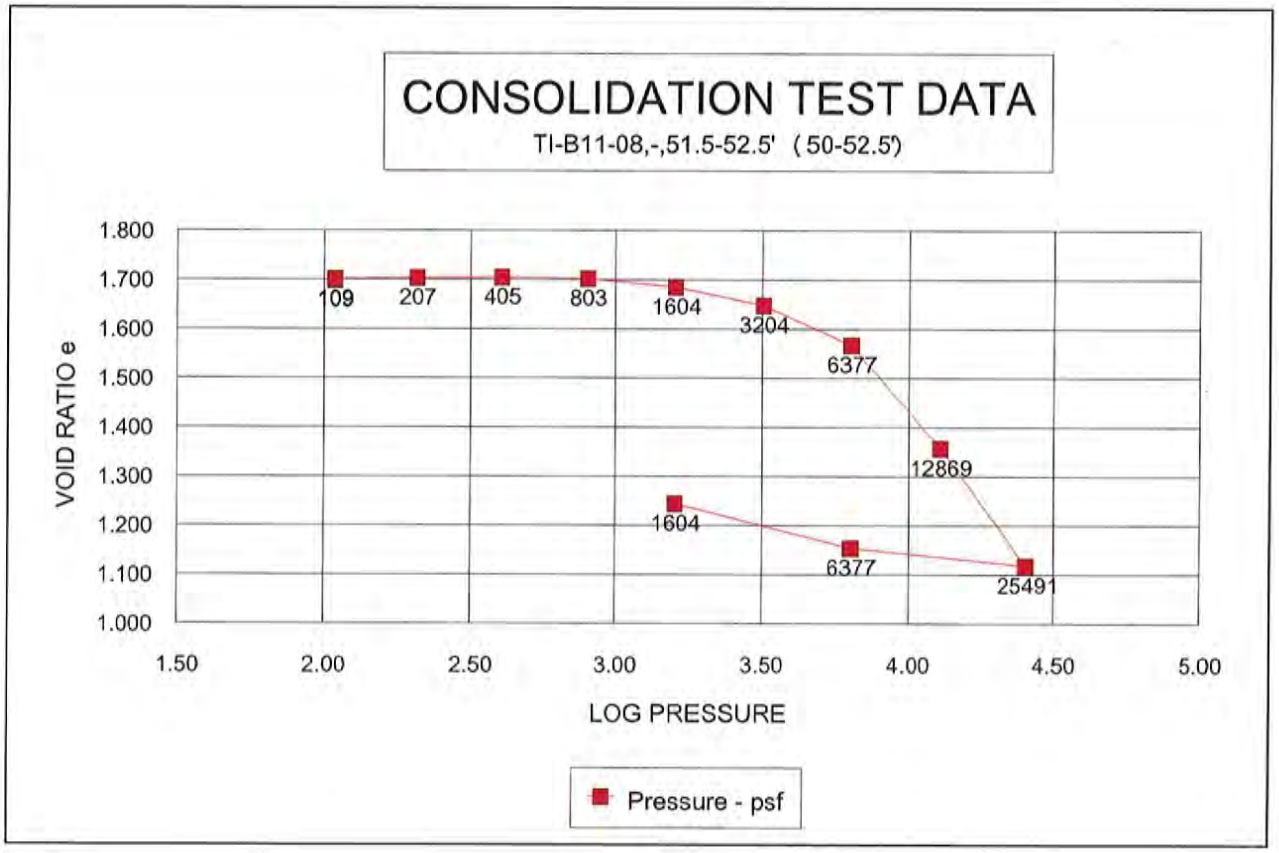
12869 psf Load

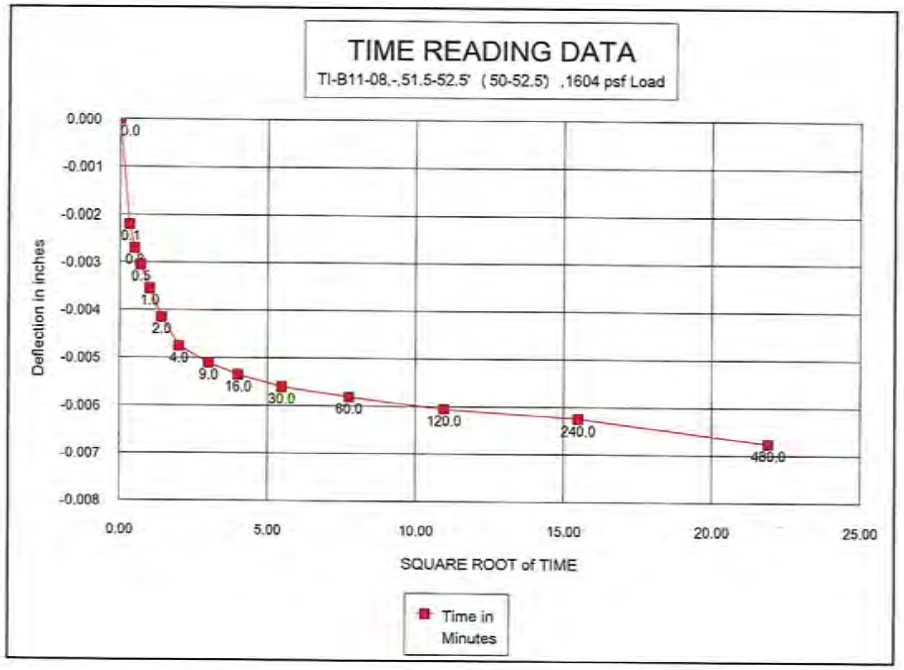
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.05850	0.00000
0.1	0.32	0.06600	-0.00750
0.3	0.50	0.06800	-0.00950
0.5	0.71	0.07040	-0.01190
1.0	1.00	0.07485	-0.01635
2.0	1.41	0.08130	-0.02280
4.0	2.00	0.08995	-0.03145
9.0	3.00	0.10155	-0.04305
16.0	4.00	0.10935	-0.05085
30.0	5.48	0.11600	-0.05750
60.0	7.75	0.12130	-0.06280
120.0	10.95	0.12540	-0.06690
247.0	15.72	0.12915	-0.07065
480.0	21.91	0.13245	-0.07395

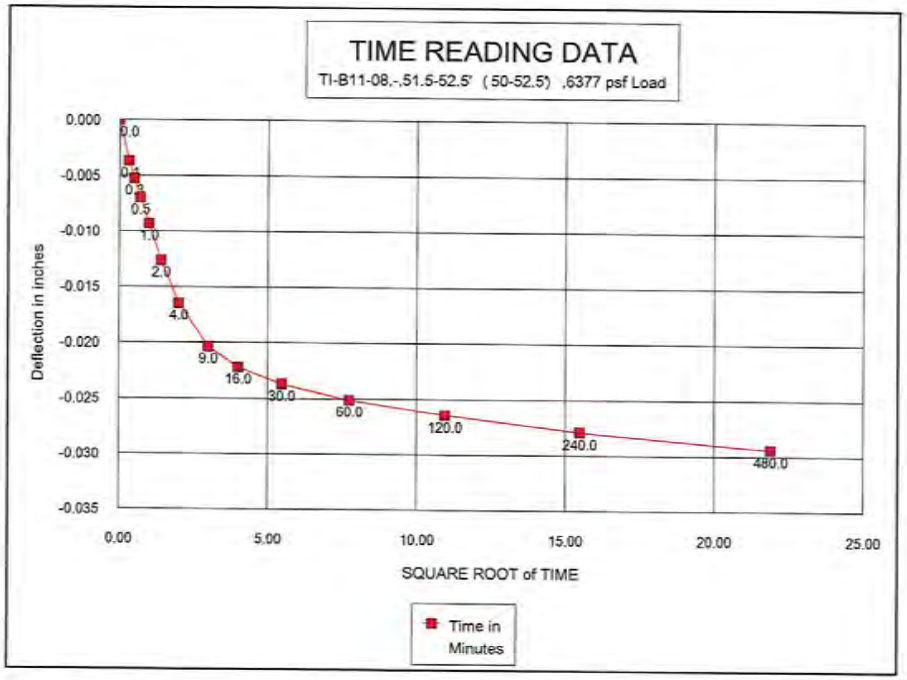
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01108

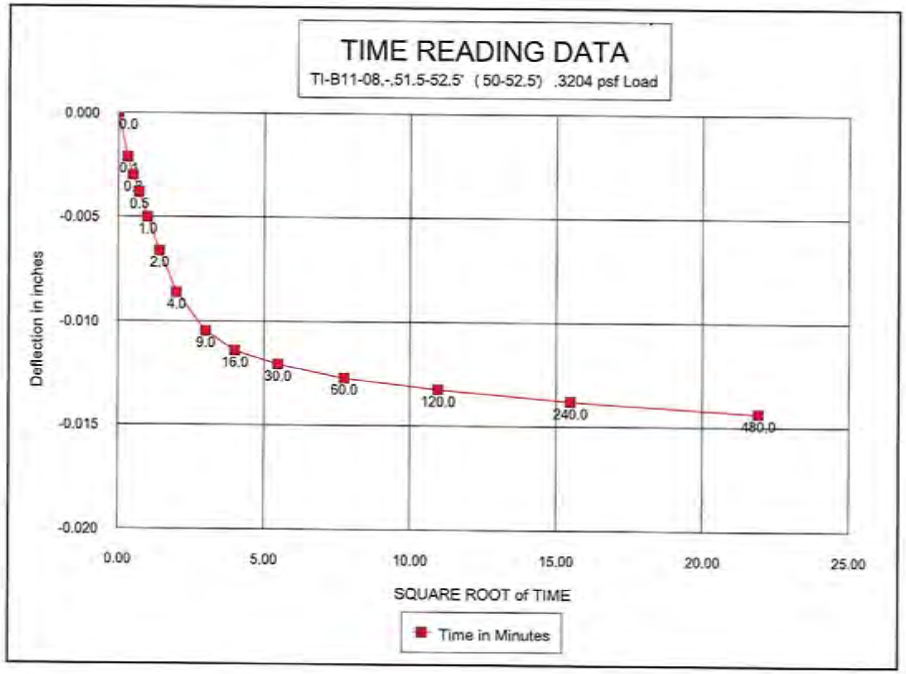
ADVANCED TERRA TESTING, Inc. ATT

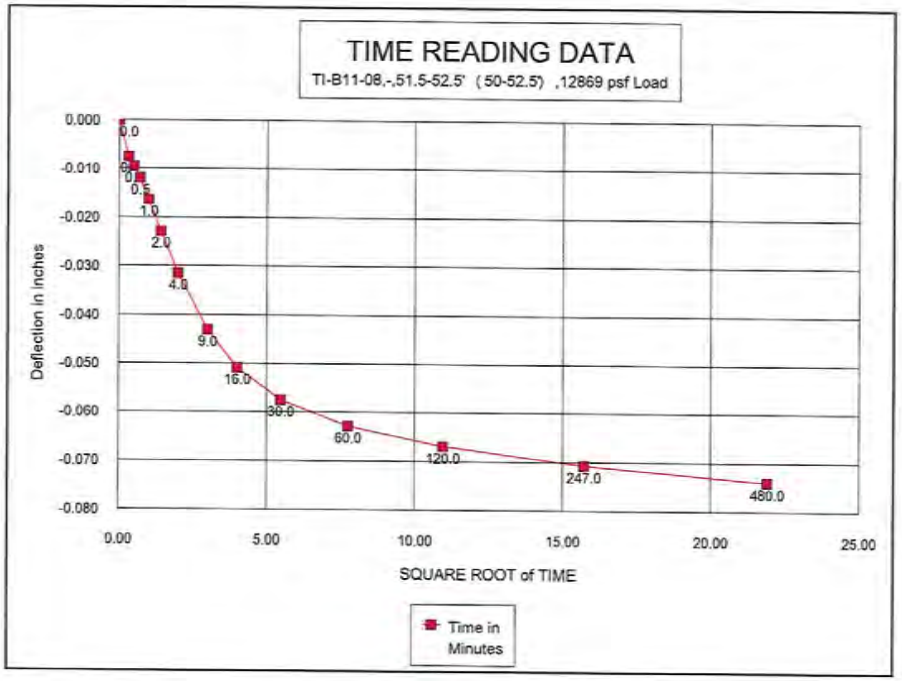

CONSOLIDATION TEST DATA
TI-B11-08,-,51.5-52.5' (50-52.5')
CONSOL (IN./IN.)
0.050
0.000
-0.050
-0.100
-0.150
-0.200
-0.250
109
207
405
803
1604
3204
6377
12869
1604
6377
25491
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


CONSOLIDATION TEST DATA
TI-B11-08,-,51.5-52.5' (50-52.5')
VOID RATIO e
1.800
1.700
1.600
1.500
1.400
1.300
1.200
1.100
1.000
109
207
405
803
1604
3204
6377
12869
1604
6377
25491
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


TIME READING DATA
TI-B11-08,-,51.5-52.5' (50-52.5) ,1604 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B11-08,-,51.5-52.5' (50-52.5) ,6377 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B11-08,-,51.5-52.5' (50-52.5) ,3204 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B11-08,-,51.5-52.5' (50-52.5) ,12869 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B8-08	SAMPLED	12/04/13 MWH
DEPTH	41-42', (40-42.5')	TEST STARTED	01/21/14 DPM
SAMPLE NO.	-	TEST FINISHED	01/30/14 DPM
SOIL DESCR.	Clayey Silt	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	176.6	168.8
Wt. Ring (s) (g)	42.1	42.1
Wt. Soil (g)	134.5	126.7
Wet Density PCF	112.3	118.1
Wt. Wet Soil & Pan (g)	138.3	130.5
Wt. Dry Soil & Pan (g)	98.6	98.6
Wt. Lost Moisture (g)	39.7	31.8
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	94.8	94.8
Moisture Content %	41.8	33.6
Dry Density PCF	79.2	88.4

LOAD (PSF)	CONSOL. (IN.)
109	0.00000
109	-0.00060
207	-0.00075
405	-0.00035
803	0.00200
1604	0.00995
3204	0.02520
6377	0.05690
12769	0.09905
25491	0.15795
6377	0.14955
1604	0.13065
405	0.10420

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	109	2.037	0.0000	0.0000	1.1284
Inundate	109	2.037	-0.0006	0.0006	1.1297
	207	2.317	-0.0008	0.0008	1.1300
	405	2.607	-0.0004	0.0004	1.1292
	803	2.905	0.0020	-0.0020	1.1242
	1604	3.205	0.0100	-0.0100	1.1072
	3204	3.506	0.0252	-0.0252	1.0748
	6377	3.805	0.0569	-0.0569	1.0073
	12769	4.106	0.0991	-0.0991	0.9176
	25491	4.406	0.1580	-0.1580	0.7922
	6377	3.805	0.1496	-0.1496	0.8101
	1604	3.205	0.1307	-0.1307	0.8503
	405	2.607	0.1042	-0.1042	0.9066

% Saturation	100.0
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.193
Init. Ht. Voids (cm)	1.347
Init. Void Ratio	1.1284

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC0B808

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B8-08	SAMPLED	12/04/13 MWH
DEPTH	41-42', (40-42.5')	TEST STARTED	01/21/14 DPM
SAMPLE NO.	-	TEST FINISHED	01/30/14 DPM
SOIL DESCR.	Clayey Silt	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		

TIME READING DATA

1604 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00545	-0.00000
0.1	0.32	0.00760	-0.00215
0.3	0.50	0.00810	-0.00265
0.5	0.71	0.00865	-0.00320
1.0	1.00	0.00935	-0.00390
2.0	1.41	0.01025	-0.00480
4.0	2.00	0.01125	-0.00580
9.0	3.00	0.01220	-0.00675
16.0	4.00	0.01265	-0.00720
30.0	5.48	0.01305	-0.00760
60.0	7.75	0.01345	-0.00800
120.0	10.95	0.01385	-0.00840
256.0	16.00	0.01440	-0.00895
480.0	21.91	0.01475	-0.00930

3204 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01535	0.00000
0.1	0.32	0.01870	-0.00335
0.3	0.50	0.01980	-0.00445
0.5	0.71	0.02075	-0.00540
1.0	1.00	0.02220	-0.00685
2.0	1.41	0.02395	-0.00860
4.0	2.00	0.02565	-0.01030
9.0	3.00	0.02735	-0.01200
16.0	4.00	0.02820	-0.01285
30.0	5.48	0.02885	-0.01350
60.0	7.75	0.02955	-0.01420
120.0	10.95	0.03030	-0.01495
240.0	15.49	0.03130	-0.01595
480.0	21.91	0.03200	-0.01665

6377 psf Load

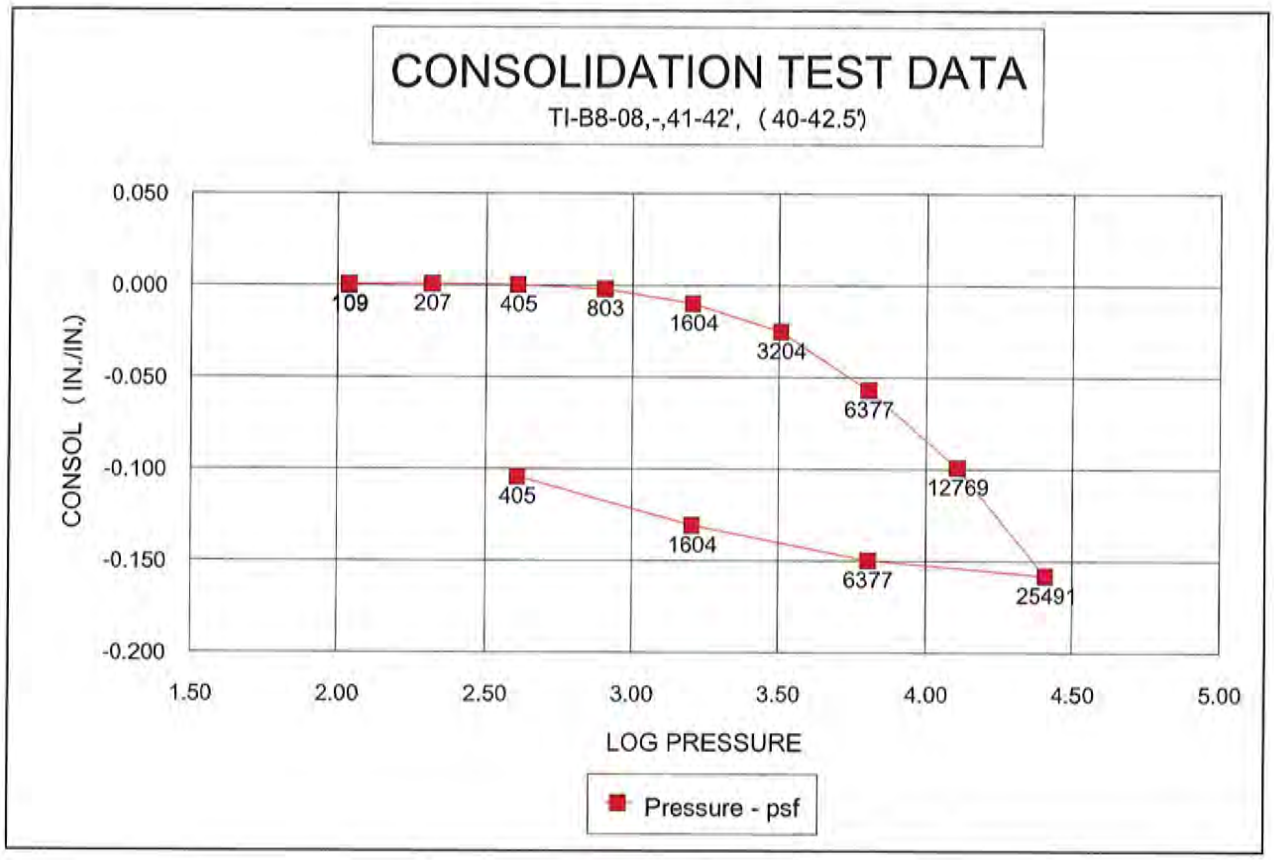
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.03305	0.00000
0.1	0.32	0.03720	-0.00415
0.3	0.50	0.03860	-0.00555
0.5	0.71	0.04060	-0.00755
1.0	1.00	0.04360	-0.01055
2.0	1.41	0.04750	-0.01445
4.0	2.00	0.05080	-0.01775
9.0	3.00	0.05460	-0.02155
16.0	4.00	0.05635	-0.02330
30.0	5.48	0.05770	-0.02465
60.0	7.75	0.05895	-0.02590
120.0	10.95	0.06015	-0.02710
240.0	15.49	0.06155	-0.02850
480.0	21.91	0.06270	-0.02965

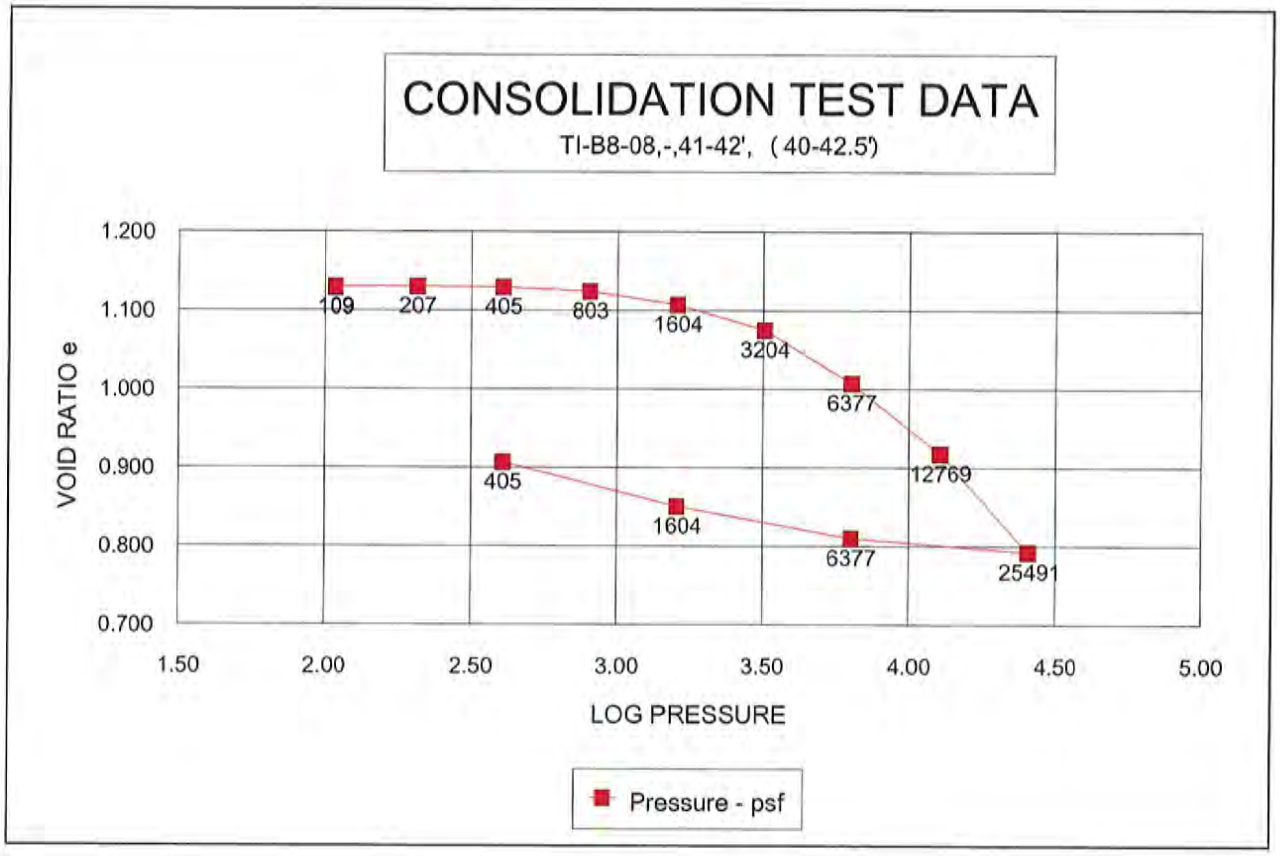
12769 psf Load

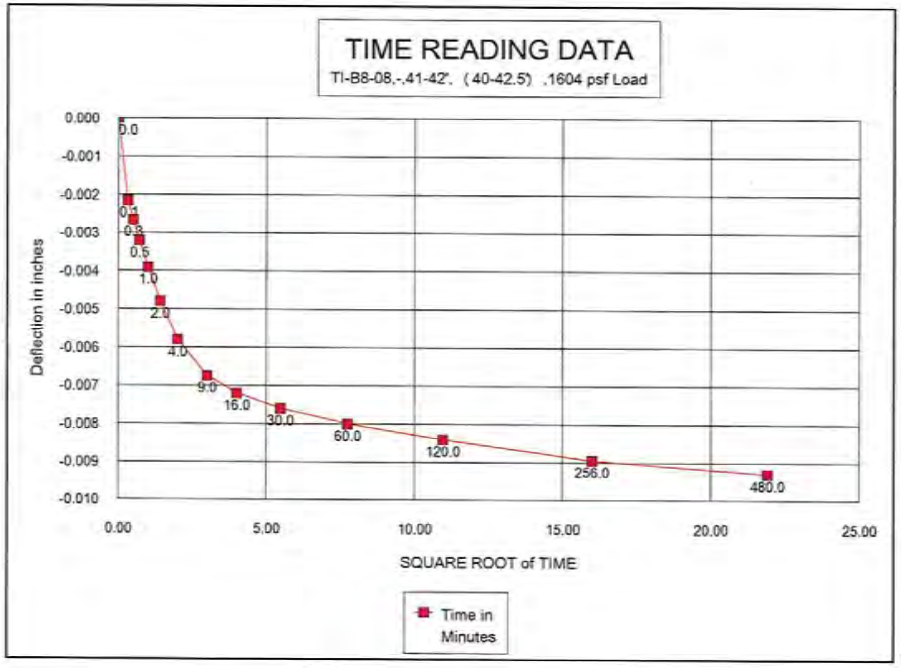
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.06655	0.00000
0.1	0.32	0.07130	-0.00475
0.3	0.50	0.07370	-0.00715
0.5	0.71	0.07640	-0.00985
1.0	1.00	0.07995	-0.01340
2.0	1.41	0.08445	-0.01790
4.0	2.00	0.08945	-0.02290
9.0	3.00	0.09440	-0.02785
16.0	4.00	0.09700	-0.03045
30.0	5.48	0.09925	-0.03270
60.0	7.75	0.10125	-0.03470
120.0	10.95	0.10310	-0.03655
240.0	15.49	0.10485	-0.03830
480.0	21.91	0.10690	-0.04035

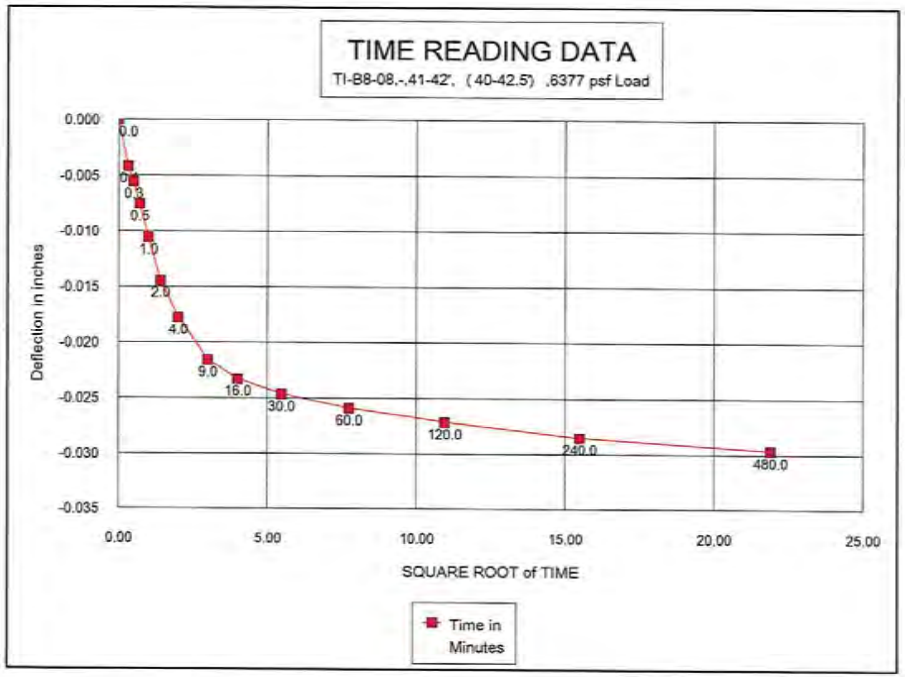
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC0B808

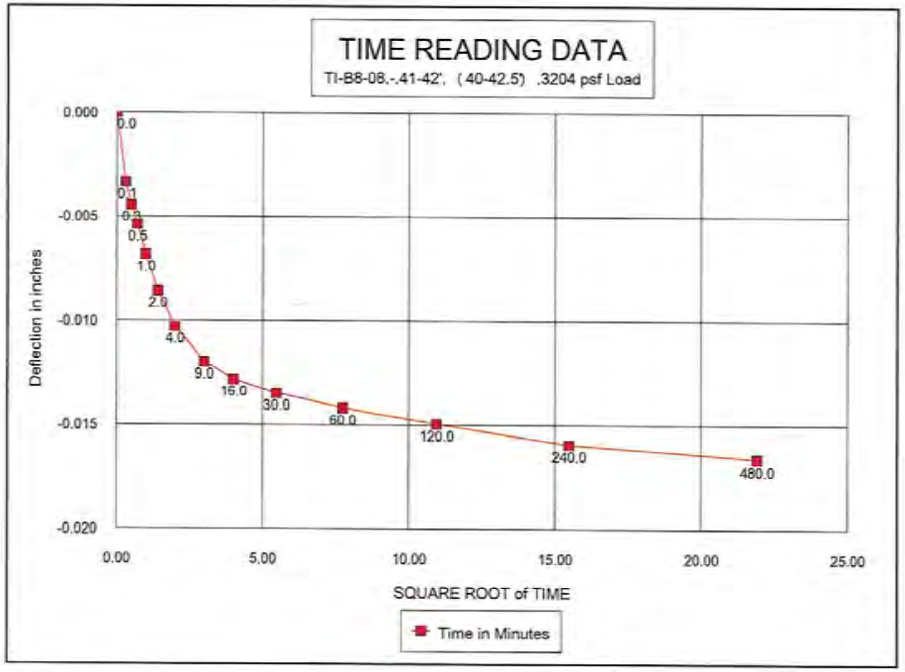
ADVANCED TERRA TESTING, INC. ATT

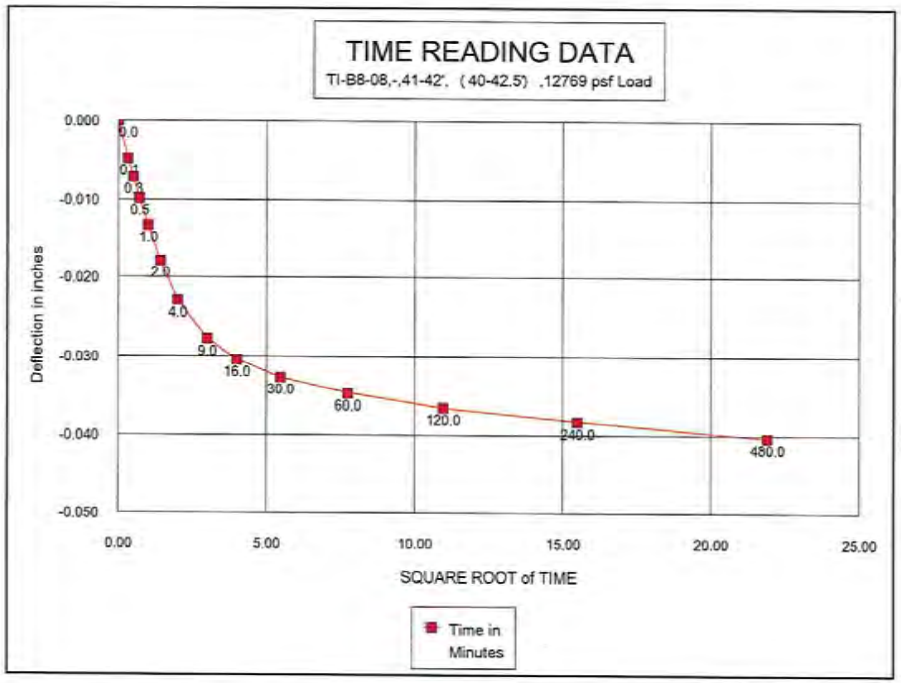

CONSOLIDATION TEST DATA
TI-B8-08,-,41-42', (40-42.5')
CONSOL (IN./IN.)
0.050
0.000
-0.050
-0.100
-0.150
-0.200
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
109
207
405
803
1604
3204
6377
12769
405
1604
6377
25491
Pressure - psf


CONSOLIDATION TEST DATA
TI-B8-08,-,41-42', (40-42.5')
VOID RATIO e
1.200
1.100
1.000
0.900
0.800
0.700
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
109
207
405
803
1604
3204
6377
12769
405
1604
6377
25491
Pressure - psf


TIME READING DATA
TI-B8-08,-,41-42', (40-42.5) ,1604 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B8-08,-,41-42', (40-42.5) ,6377 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B8-08,-,41-42', (40-42.5) ,3204 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B8-08,-,41-42', (40-42.5) ,12769 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B11-10	SAMPLED	12/02/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	01/21/14 DPM
SAMPLE NO.	-	TEST FINISHED	01/30/14 DPM
SOIL DESCR.	Silty Sand	CELL NUMBER	ATT-5
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	151.1	162.3
Wt. Ring (s) (g)	42.6	42.6
Wt. Soil (g)	108.4	119.6
Wet Density PCF	90.6	109.5
Wt. Wet Soil & Pan (g)	112.1	123.3
Wt. Dry Soil & Pan (g)	97.0	97.0
Wt. Lost Moisture (g)	15.1	26.3
Wt. of Pan Only (g)	3.7	3.7
Wt. of Dry Soil (g)	93.3	93.3
Moisture Content %	16.2	28.2
Dry Density PCF	77.9	85.4

LOAD (PSF)	CONSOL. (IN.)
99	0.00000
99	0.00565
199	0.01050
401	0.01780
813	0.02830
1648	0.04260
3249	0.05495
6487	0.06740
12943	0.08530
25617	0.10260
6487	0.09910
1648	0.09560
401	0.09130
99	0.08730

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	99	1.997	0.0000	0.0000	1.1631
Inundate	99	1.997	0.0057	-0.0057	1.1508
	199	2.299	0.0105	-0.0105	1.1404
	401	2.603	0.0178	-0.0178	1.1246
	813	2.910	0.0283	-0.0283	1.1018
	1648	3.217	0.0426	-0.0426	1.0709
	3249	3.512	0.0550	-0.0550	1.0442
	6487	3.812	0.0674	-0.0674	1.0173
	12943	4.112	0.0853	-0.0853	0.9786
	25617	4.409	0.1026	-0.1026	0.9411
	6487	3.812	0.0991	-0.0991	0.9487
	1648	3.217	0.0956	-0.0956	0.9563
	401	2.603	0.0913	-0.0913	0.9656
	99	1.997	0.0873	-0.0873	0.9742

% Saturation	37.6
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.174
Init. Ht. Voids (cm)	1.366
Init. Void Ratio	1.1631

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01110

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B11-10	SAMPLED	12/02/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	01/21/14 DPM
SAMPLE NO.	-	TEST FINISHED	01/30/14 DPM
SOIL DESCR.	Silty Sand	CELL NUMBER	ATT-5
LOCATION	Tailings Impoundment		

TIME READING DATA

400.9 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01110	-0.00000
0.1	0.32	0.01525	-0.00415
0.3	0.50	0.01565	-0.00455
0.5	0.71	0.01580	-0.00470
1.0	1.00	0.01620	-0.00510
2.0	1.41	0.01635	-0.00525
4.0	2.00	0.01660	-0.00550
9.0	3.00	0.01685	-0.00575
16.0	4.00	0.01705	-0.00595
30.0	5.48	0.01725	-0.00615
60.0	7.75	0.01755	-0.00645
120.0	10.95	0.01800	-0.00690
240.0	15.49	0.01840	-0.00730
480.0	21.91	0.01885	-0.00775

813.2 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01925	0.00000
0.1	0.32	0.02515	-0.00590
0.3	0.50	0.02560	-0.00635
0.5	0.71	0.02595	-0.00670
1.0	1.00	0.02640	-0.00715
2.0	1.41	0.02675	-0.00750
4.0	2.00	0.02700	-0.00775
9.0	3.00	0.02735	-0.00810
16.0	4.00	0.02765	-0.00840
30.0	5.48	0.02795	-0.00870
60.0	7.75	0.02840	-0.00915
120.0	10.95	0.02900	-0.00975
240.0	15.49	0.02980	-0.01055
480.0	21.91	0.03035	-0.01110

1648 psf Load

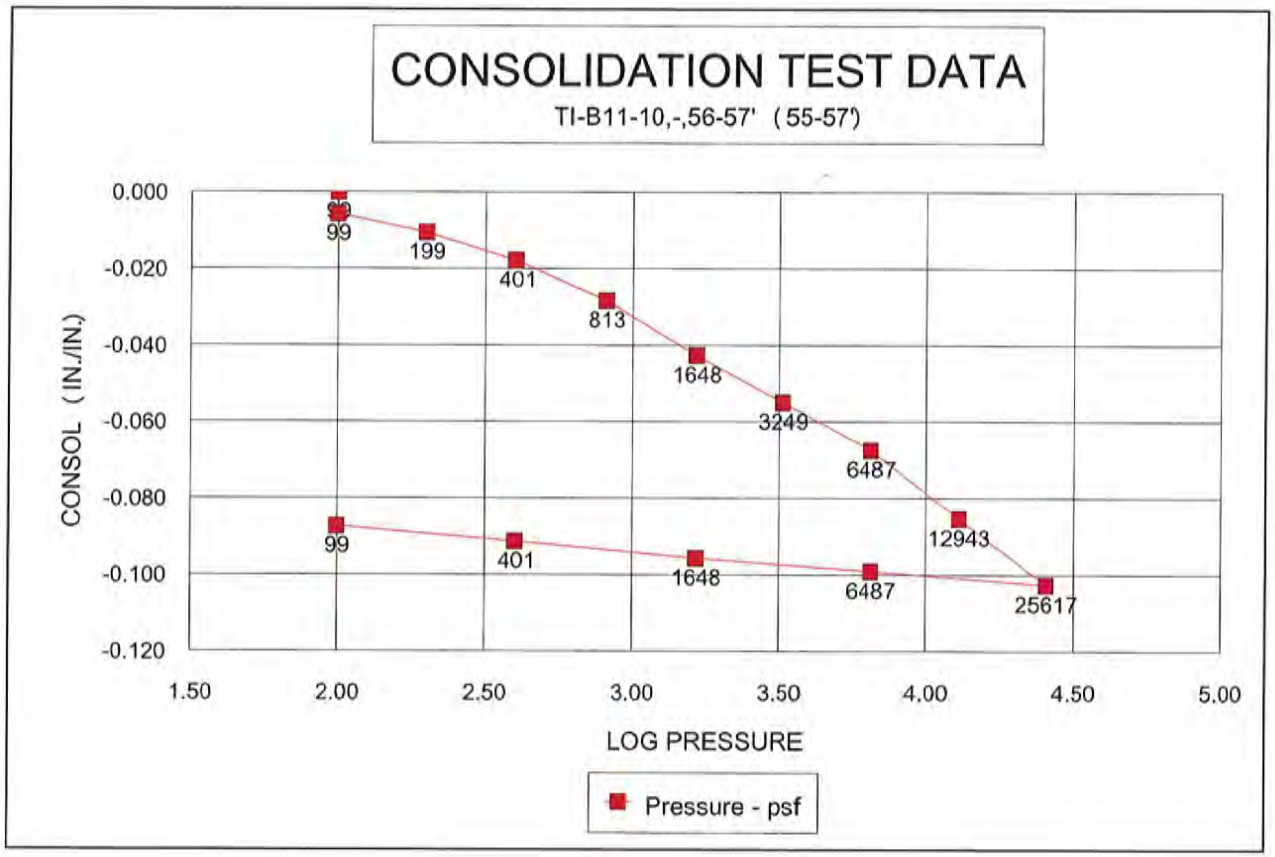
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00000	0.00000
0.1	0.32	0.00770	-0.00770
0.3	0.50	0.00830	-0.00830
0.5	0.71	0.00875	-0.00875
1.0	1.00	0.00915	-0.00915
2.0	1.41	0.00985	-0.00985
4.0	2.00	0.01015	-0.01015
9.0	3.00	0.01045	-0.01045
16.0	4.00	0.01070	-0.01070
30.0	5.48	0.01100	-0.01100
60.0	7.75	0.01150	-0.01150
120.0	10.95	0.01195	-0.01195
240.0	15.49	0.01265	-0.01265
480.0	21.91	0.01325	-0.01325

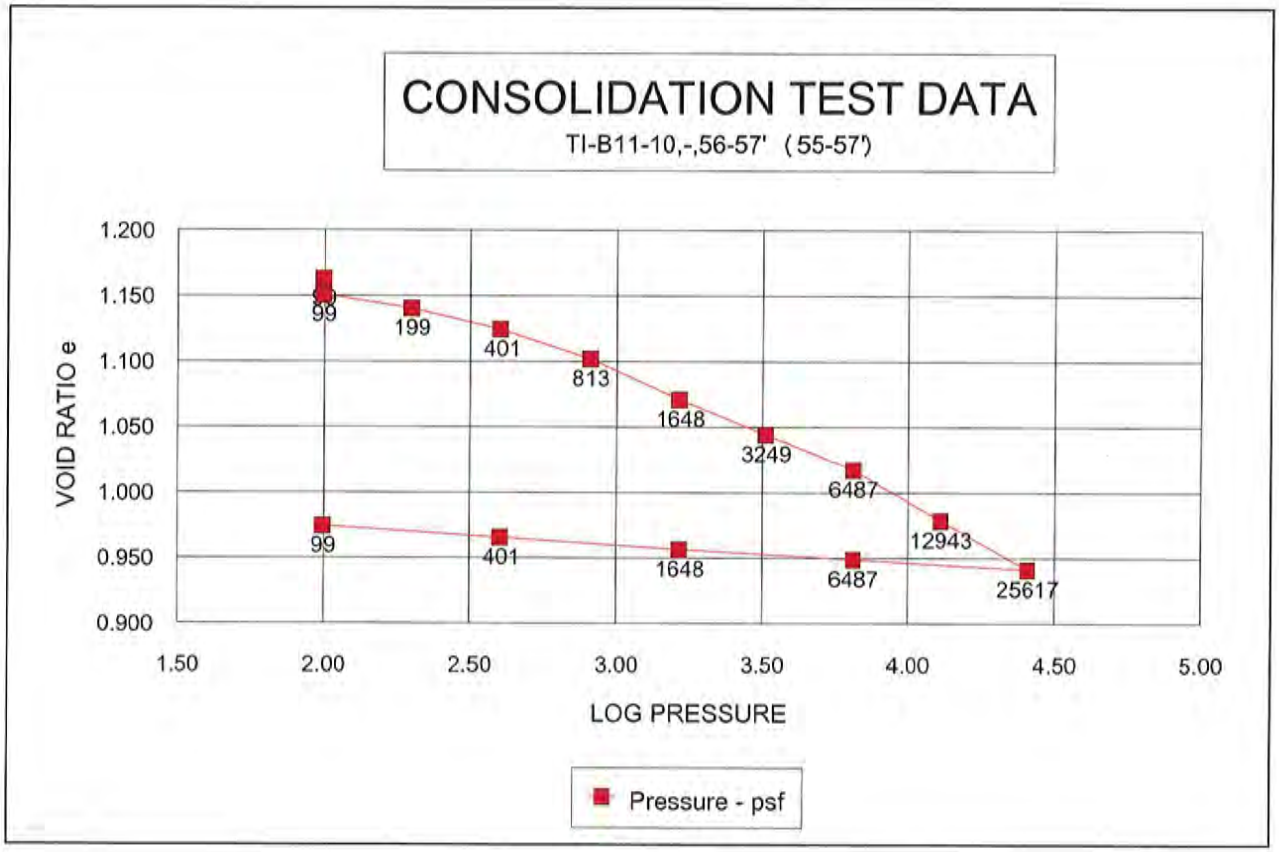
3249 psf Load

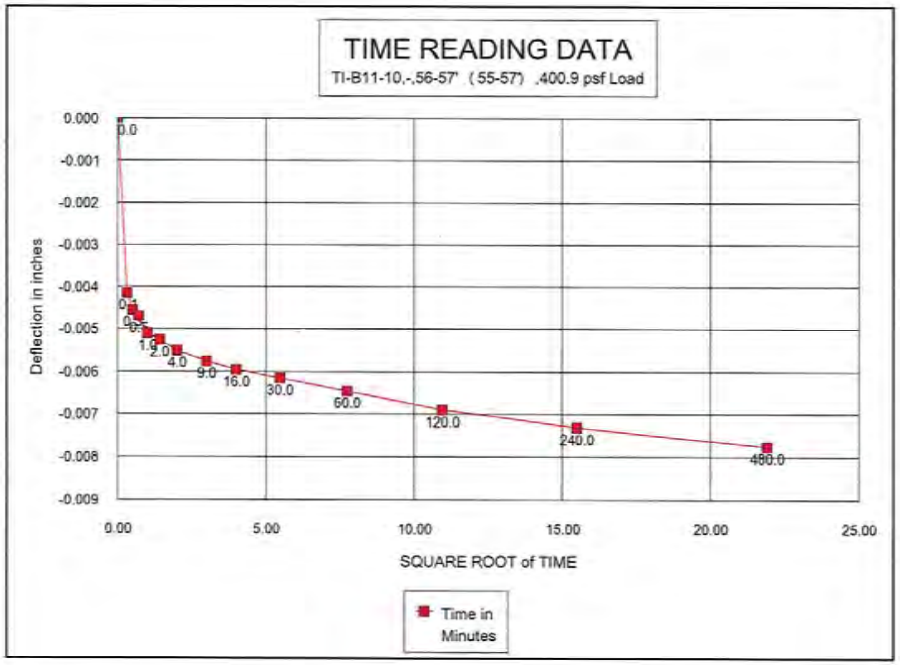
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01585	0.00000
0.1	0.32	0.02340	-0.00755
0.3	0.50	0.02410	-0.00825
0.5	0.71	0.02445	-0.00860
1.0	1.00	0.02480	-0.00895
2.0	1.41	0.02520	-0.00935
4.0	2.00	0.02555	-0.00970
9.0	3.00	0.02595	-0.01010
16.0	4.00	0.02620	-0.01035
30.0	5.48	0.02655	-0.01070
60.0	7.75	0.02690	-0.01105
120.0	10.95	0.02725	-0.01140
240.0	15.49	0.02770	-0.01185
480.0	21.91	0.02840	-0.01255

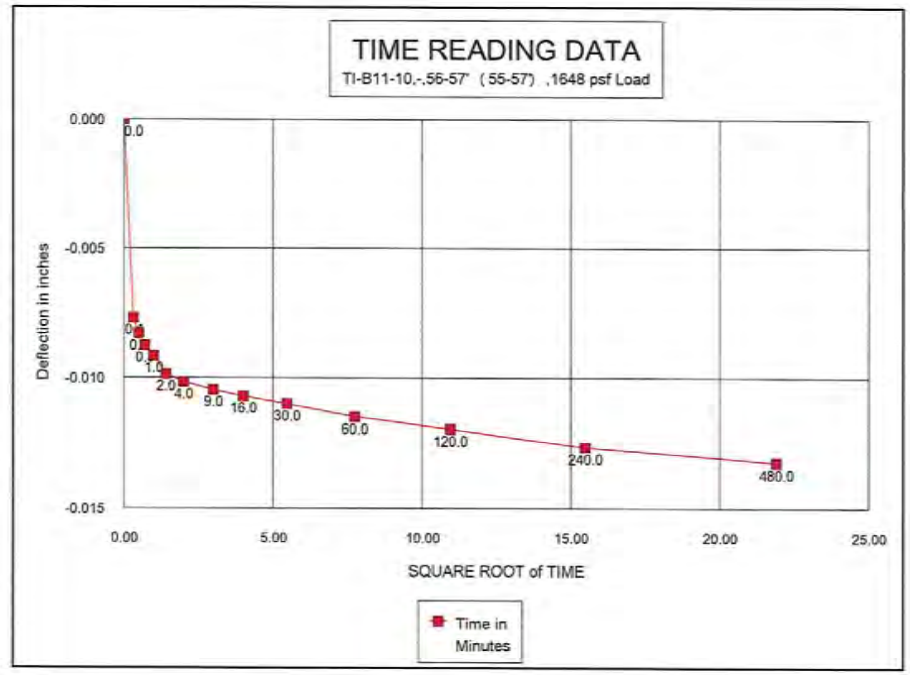
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/9/14
FileName: MWC01110

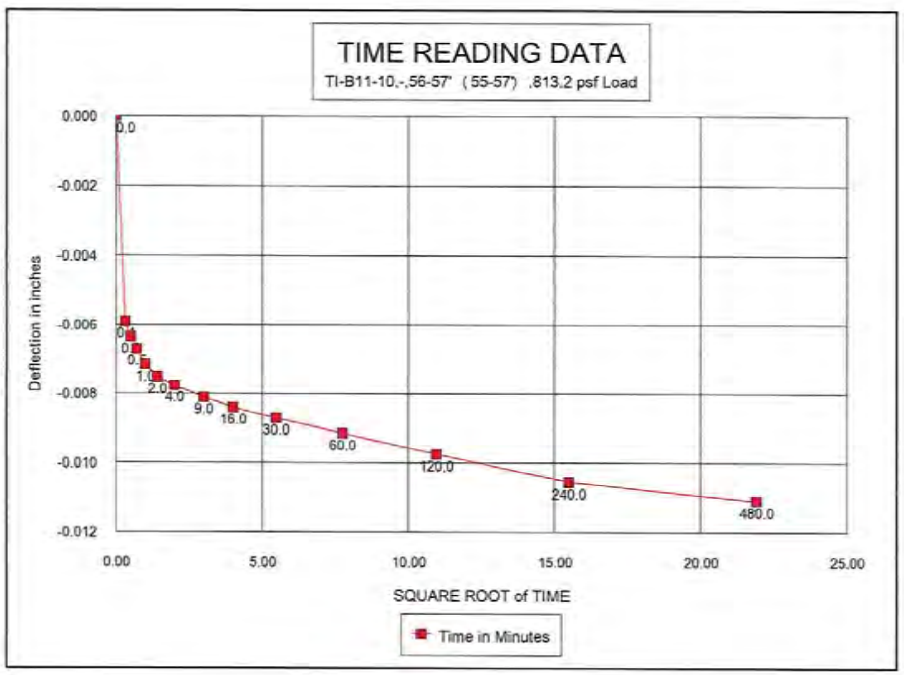
ADVANCED TERRA TESTING, INC. ATT

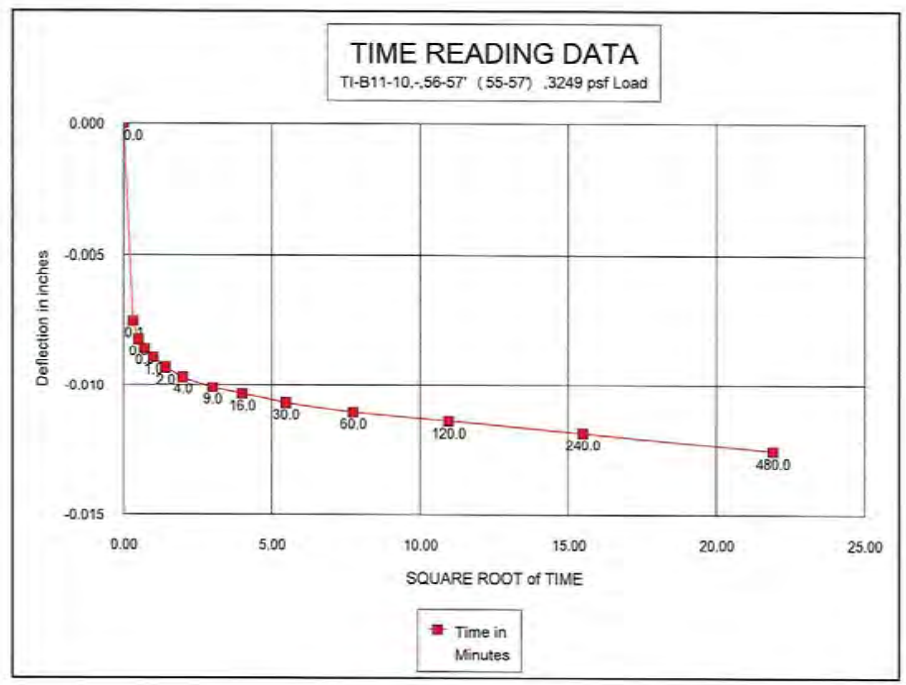

CONSOLIDATION TEST DATA
TI-B11-10,-,56-57' (55-57')
CONSOL (IN./IN.)
0.000
-0.020
-0.040
-0.060
-0.080
-0.100
-0.120
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
99
199
401
813
1648
3249
6487
12943
25617
Pressure - psf


CONSOLIDATION TEST DATA
TI-B11-10,-,56-57' (55-57')
VOID RATIO e
1.200
1.150
1.100
1.050
1.000
0.950
0.900
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
99
199
401
813
1648
3249
6487
12943
25617
Pressure - psf


TIME READING DATA
TI-B11-10,-,56-57' (55-57) ,400.9 psf Load
Deflection in inches
0.000
-0.001
-0.002
-0.003
-0.004
-0.005
-0.006
-0.007
-0.008
-0.009
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
0.0
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
Time in Minutes


TIME READING DATA
TI-B11-10,-,56-57' (55-57) ,1648 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
0.0
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
Time in Minutes


TIME READING DATA
TI-B11-10,-,56-57' (55-57) ,813.2 psf Load
Deflection in inches
0.000
-0.002
-0.004
-0.006
-0.008
-0.010
-0.012
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
0.0
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
Time in Minutes


TIME READING DATA
TI-B11-10,-,56-57' (55-57) ,3249 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
0.0
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B15-05	SAMPLED	12/05/13 MWH
DEPTH	15.5-16.0' (15-17.5')	TEST STARTED	03/19/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/28/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	165.8	171.2
Wt. Ring (s) (g)	42.1	42.1
Wt. Soil (g)	123.6	129.1
Wet Density PCF	103.2	120.1
Wt. Wet Soil & Pan (g)	127.4	132.9
Wt. Dry Soil & Pan (g)	112.1	112.1
Wt. Lost Moisture (g)	15.4	20.8
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	108.2	108.2
Moisture Content %	14.2	19.2
Dry Density PCF	90.4	100.7

LOAD (PSF)	CONSOL. (IN.)
108.9	0.00000
108.9	-0.00035
207.4	0.00220
405.0	0.00620
802.8	0.01525
1604	0.03025
3204	0.04995
6377	0.07070
12769	0.09425
25491	0.11755
6377	0.11520
1604	0.11095
405.0	0.10565
207.4	0.10260

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	109	2.037	0.0000	0.0000	0.8650
Inundate	109	2.037	-0.0004	0.0004	0.8656
	207	2.317	0.0022	-0.0022	0.8609
	405	2.607	0.0062	-0.0062	0.8534
	803	2.905	0.0153	-0.0153	0.8365
	1604	3.205	0.0303	-0.0303	0.8085
	3204	3.506	0.0500	-0.0500	0.7718
	6377	3.805	0.0707	-0.0707	0.7331
	12769	4.106	0.0943	-0.0943	0.6892
	25491	4.406	0.1176	-0.1176	0.6457
	6377	3.805	0.1152	-0.1152	0.6501
	1604	3.205	0.1110	-0.1110	0.6580
	405	2.607	0.1057	-0.1057	0.6679
	207	2.317	0.1026	-0.1026	0.6736

Note: The Facies changed within the requested testing interval. The Perm came from the clean Sand portion of the requested interval, and the consol came from the Silty, Clayey Sand portion of the requested interval.

% Saturation	44.4
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.362
Init. Ht. Voids (cm)	1.178
Init. Void Ratio	0.8650

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01505

ADVANCED TERRA TESTING, Inc. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B15-05	SAMPLED	12/05/13 MWH
DEPTH	15.5-16.0' (15-17.5')	TEST STARTED	03/19/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/28/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		

TIME READING DATA

405.0 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00285	-0.00000
0.1	0.32	0.00515	-0.00230
0.3	0.50	0.00550	-0.00265
0.5	0.71	0.00570	-0.00285
1.0	1.00	0.00595	-0.00310
2.0	1.41	0.00610	-0.00325
4.0	2.00	0.00630	-0.00345
9.0	3.00	0.00650	-0.00365
16.0	4.00	0.00665	-0.00380
30.0	5.48	0.00675	-0.00390
60.0	7.75	0.00690	-0.00405
120.0	10.95	0.00705	-0.00420
240.0	15.49	0.00725	-0.00440
480.0	21.91	0.00765	-0.00480

802.8 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00790	0.00000
0.1	0.32	0.01345	-0.00555
0.3	0.50	0.01415	-0.00625
0.5	0.71	0.01465	-0.00675
1.0	1.00	0.01510	-0.00720
2.0	1.41	0.01550	-0.00760
4.0	2.00	0.01580	-0.00790
9.0	3.00	0.01620	-0.00830
16.0	4.00	0.01640	-0.00850
30.0	5.48	0.01665	-0.00875
60.0	7.75	0.01690	-0.00900
120.0	10.95	0.01715	-0.00925
240.0	15.49	0.01755	-0.00965
480.0	21.91	0.01800	-0.01010

1604 psf Load

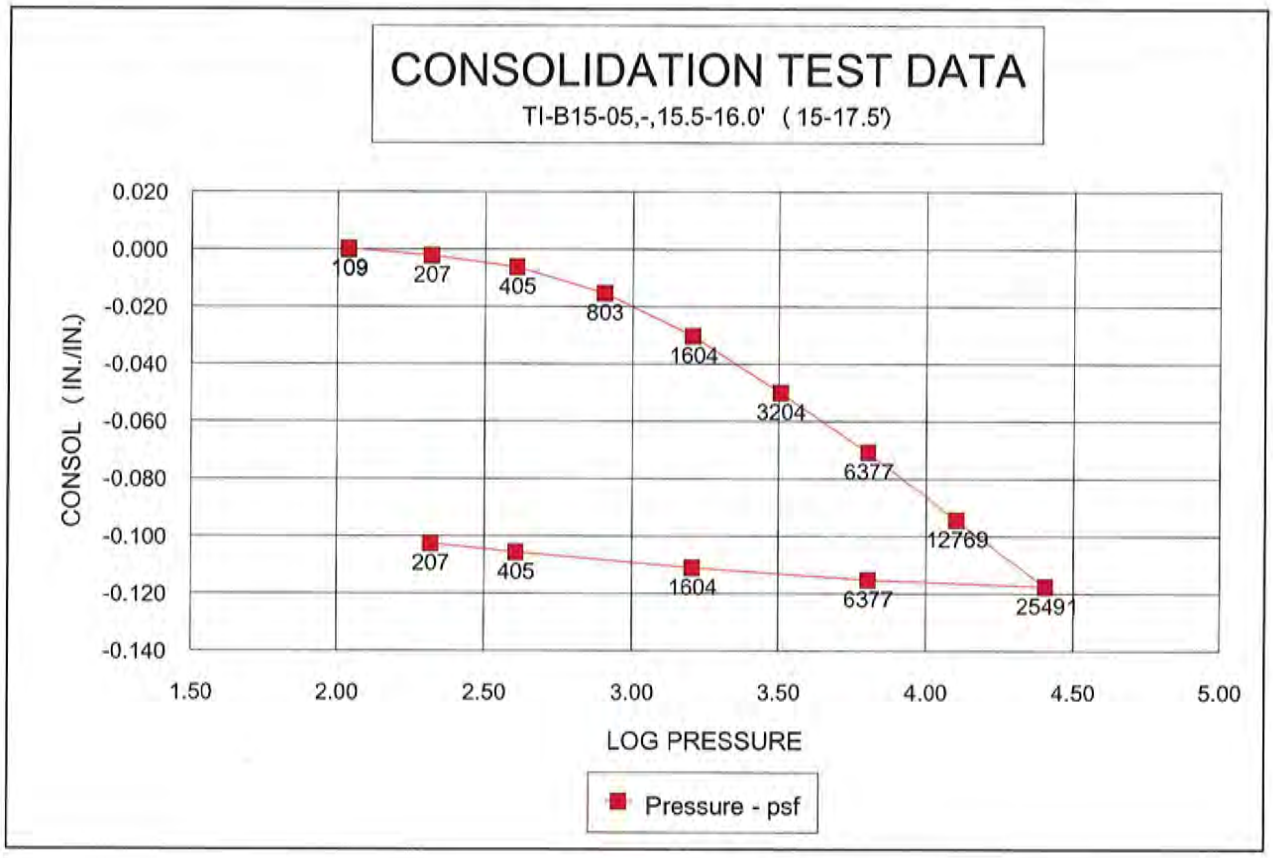
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01870	0.00000
0.1	0.32	0.02730	-0.00860
0.3	0.50	0.02850	-0.00980
0.5	0.71	0.02940	-0.01070
1.0	1.00	0.03015	-0.01145
2.0	1.41	0.03080	-0.01210
4.0	2.00	0.03135	-0.01265
9.0	3.00	0.03185	-0.01315
16.0	4.00	0.03225	-0.01355
30.0	5.48	0.03265	-0.01395
60.0	7.75	0.03305	-0.01435
120.0	10.95	0.03350	-0.01480
240.0	15.49	0.03410	-0.01540
480.0	21.91	0.03475	-0.01605

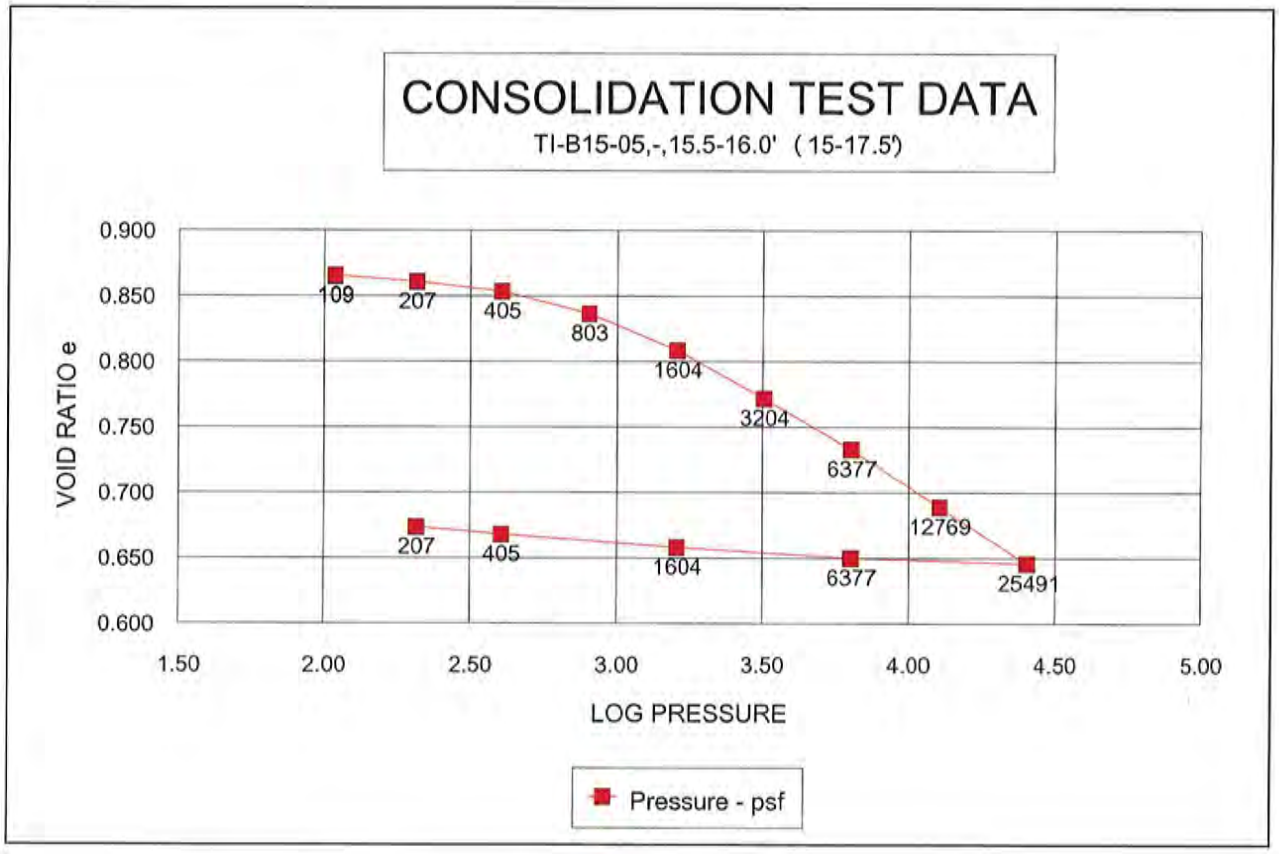
3204 psf Load

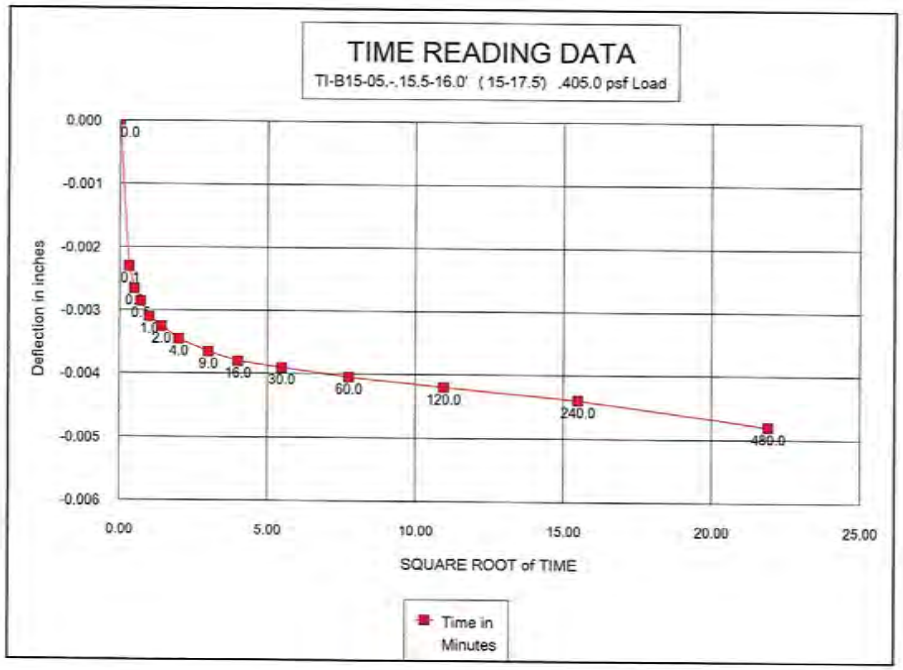
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.03565	0.00000
0.1	0.32	0.04875	-0.01310
0.3	0.50	0.05090	-0.01525
0.5	0.71	0.05155	-0.01590
1.0	1.00	0.05250	-0.01685
2.0	1.41	0.05320	-0.01755
4.0	2.00	0.05375	-0.01810
9.0	3.00	0.05445	-0.01880
16.0	4.00	0.05480	-0.01915
30.0	5.48	0.05525	-0.01960
60.0	7.75	0.05570	-0.02005
120.0	10.95	0.05620	-0.02055
240.0	15.49	0.05675	-0.02110
480.0	21.91	0.05725	-0.02160

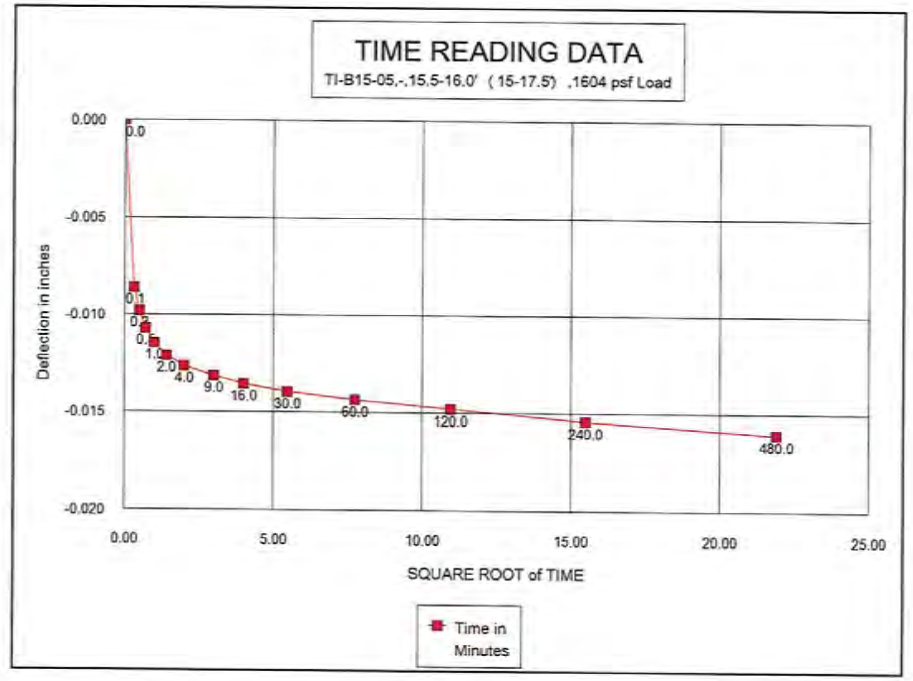
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01505

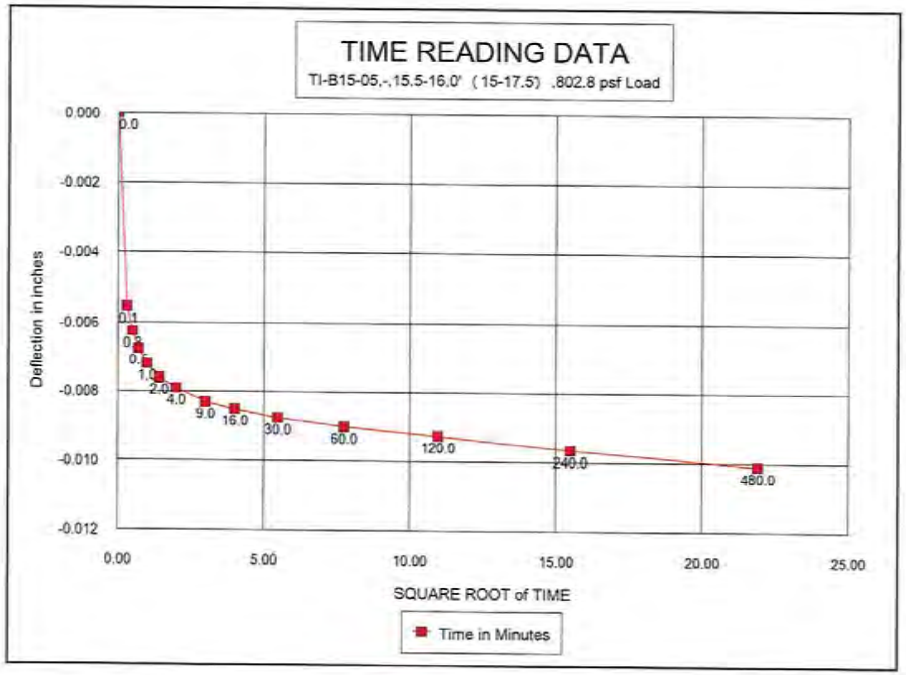
ADVANCED TERRA TESTING, INC. ATT

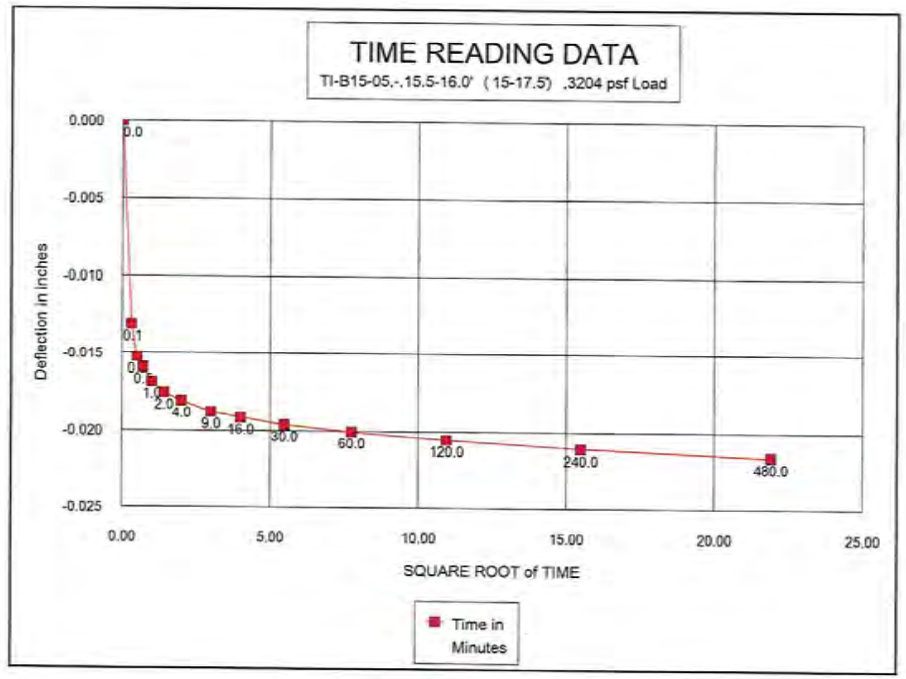

CONSOLIDATION TEST DATA
TI-B15-05,-,15.5-16.0' (15-17.5')
CONSOL (IN./IN.)
0.020
0.000
-0.020
-0.040
-0.060
-0.080
-0.100
-0.120
-0.140
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
109
207
405
803
1604
3204
6377
12769
25491
Pressure - psf


CONSOLIDATION TEST DATA
TI-B15-05,-,15.5-16.0' (15-17.5')
VOID RATIO e
0.900
0.850
0.800
0.750
0.700
0.650
0.600
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
109
207
405
803
1604
3204
6377
12769
25491
Pressure - psf


TIME READING DATA
TI-B15-05,-,15.5-16.0' (15-17.5) ,405.0 psf Load
Deflection in inches
0.000
-0.001
-0.002
-0.003
-0.004
-0.005
-0.006
0.0
0.1
0.2
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B15-05,-,15.5-16.0' (15-17.5) ,1604 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
-0.020
0.0
0.1
0.2
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B15-05,-,15.5-16.0' (15-17.5) ,802.8 psf Load
Deflection in inches
0.000
-0.002
-0.004
-0.006
-0.008
-0.010
-0.012
0.0
0.1
0.2
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B15-05,-,15.5-16.0' (15-17.5) ,3204 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
-0.020
-0.025
0.0
0.1
0.2
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B23-06	SAMPLED	12/06/13 MWH
DEPTH	26-27' (25-27.5')	TEST STARTED	03/20/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/29/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	ATT-05
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	190.1	190.1
Wt. Ring (s) (g)	41.9	41.9
Wt. Soil (g)	148.1	148.2
Wet Density PCF	123.7	128.4
Wt. Wet Soil & Pan (g)	152.0	152.0
Wt. Dry Soil & Pan (g)	125.6	125.6
Wt. Lost Moisture (g)	26.3	26.4
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	121.8	121.8
Moisture Content %	21.6	21.7
Dry Density PCF	101.7	105.5

LOAD (PSF)	CONSOL. (IN.)
99.4	0.00000
99.4	-0.00035
198.9	-0.00035
400.9	-0.00035
813.2	-0.00020
1648	0.00175
3249	0.00660
6487	0.01830
12943	0.03840
25617	0.06585
6487	0.05810
1648	0.04215
813.2	0.03595

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	99	1.997	0.0000	0.0000	0.6574
Inundate	99	1.997	-0.0004	0.0004	0.6580
	199	2.299	-0.0004	0.0004	0.6580
	401	2.603	-0.0004	0.0004	0.6580
	813	2.910	-0.0002	0.0002	0.6578
	1648	3.217	0.0018	-0.0018	0.6545
	3249	3.512	0.0066	-0.0066	0.6465
	6487	3.812	0.0183	-0.0183	0.6271
	12943	4.112	0.0384	-0.0384	0.5938
	25617	4.409	0.0659	-0.0659	0.5483
	6487	3.812	0.0581	-0.0581	0.5611
	1648	3.217	0.0422	-0.0422	0.5876
	813	2.910	0.0360	-0.0360	0.5979

% Saturation	88.8
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.532
Init. Ht. Voids (cm)	1.008
Init. Void Ratio	0.6574

Data entry by: DPM Date: 06/11/2014
Data checked by: MR Date: 6/11/14
FileName: MWC02306

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B23-06	SAMPLED	12/06/13 MWH
DEPTH	26-27' (25-27.5')	TEST STARTED	03/20/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/29/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	ATT-05
LOCATION	Tailings Impoundment		

TIME READING DATA

1648 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00250	-0.00000
0.1	0.32	0.00410	-0.00160
0.3	0.50	0.00420	-0.00170
0.5	0.71	0.00430	-0.00180
1.0	1.00	0.00440	-0.00190
2.0	1.41	0.00450	-0.00200
4.0	2.00	0.00460	-0.00210
9.0	3.00	0.00470	-0.00220
16.0	4.00	0.00480	-0.00230
30.0	5.48	0.00490	-0.00240
60.0	7.75	0.00500	-0.00250
120.0	10.95	0.00515	-0.00265
240.0	15.49	0.00540	-0.00290
480.0	21.91	0.00575	-0.00325

3249 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00600	0.00000
0.1	0.32	0.00850	-0.00250
0.3	0.50	0.00880	-0.00280
0.5	0.71	0.00895	-0.00295
1.0	1.00	0.00915	-0.00315
2.0	1.41	0.00935	-0.00335
4.0	2.00	0.00960	-0.00360
9.0	3.00	0.00985	-0.00385
16.0	4.00	0.01005	-0.00405
30.0	5.48	0.01030	-0.00430
60.0	7.75	0.01055	-0.00455
120.0	10.95	0.01090	-0.00490
240.0	15.49	0.01135	-0.00535
480.0	21.91	0.01180	-0.00580

6487 psf Load

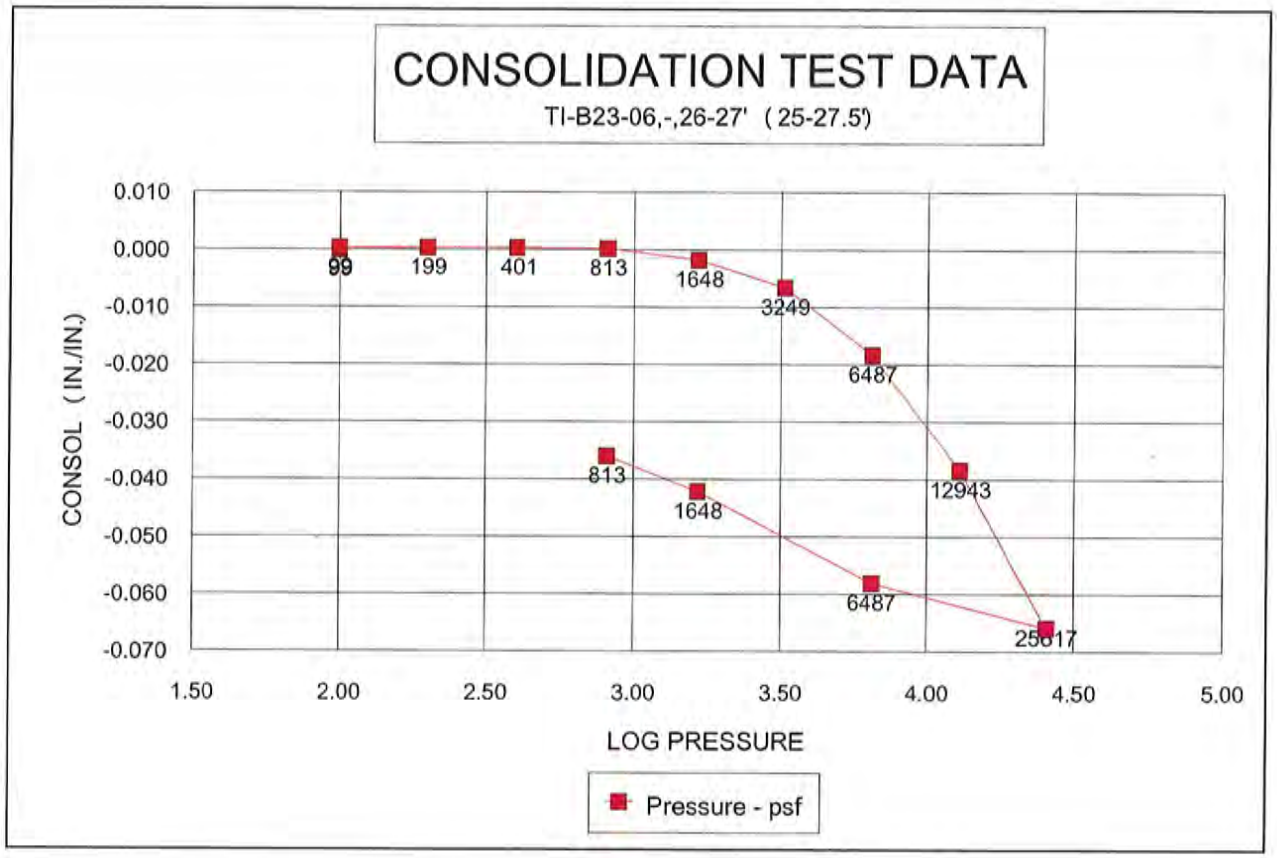
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01250	0.00000
0.1	0.32	0.01940	-0.00690
0.3	0.50	0.02020	-0.00770
0.5	0.71	0.02070	-0.00820
1.0	1.00	0.02115	-0.00865
2.0	1.41	0.02155	-0.00905
4.0	2.00	0.02205	-0.00955
9.0	3.00	0.02255	-0.01005
16.0	4.00	0.02290	-0.01040
30.0	5.48	0.02340	-0.01090
60.0	7.75	0.02390	-0.01140
120.0	10.95	0.02445	-0.01195
240.0	15.49	0.02505	-0.01255
480.0	21.91	0.02560	-0.01310

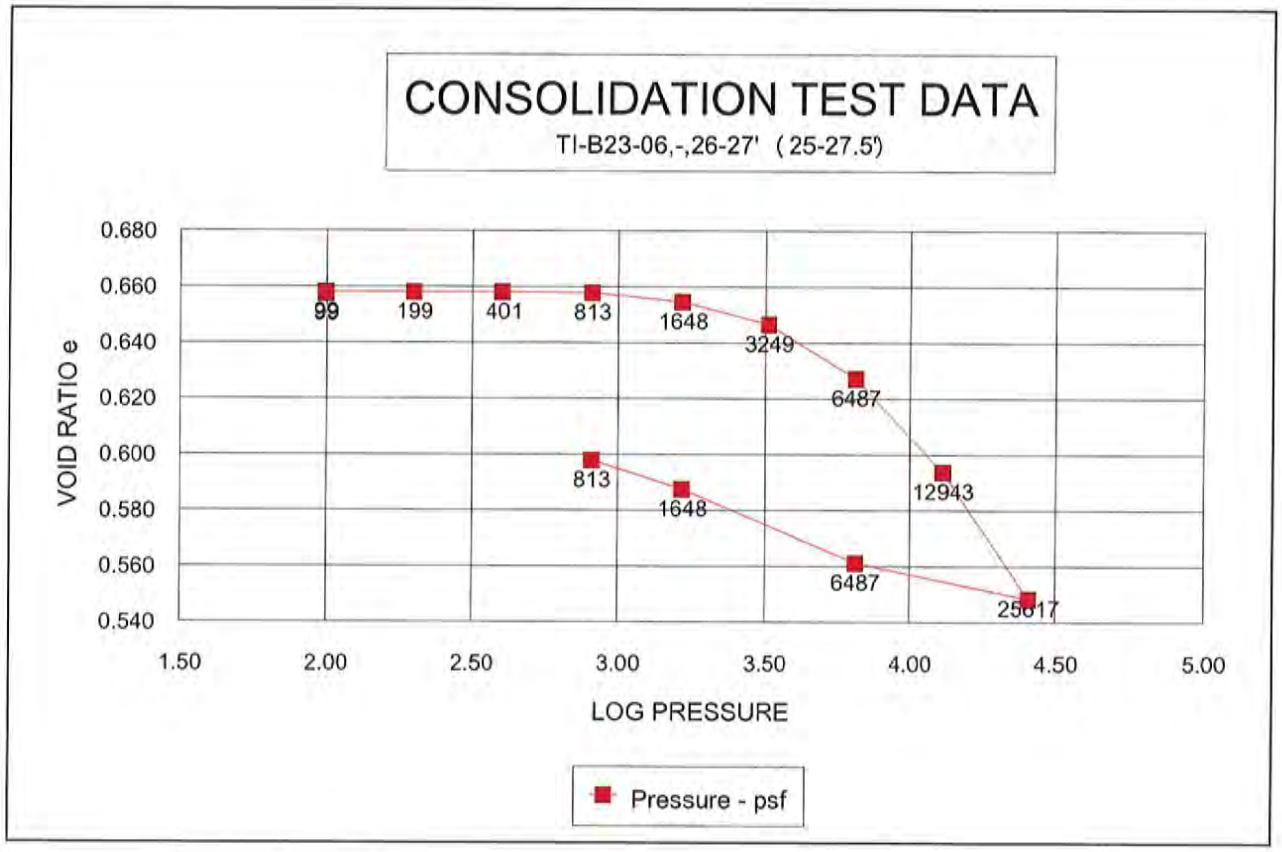
12943 psf Load

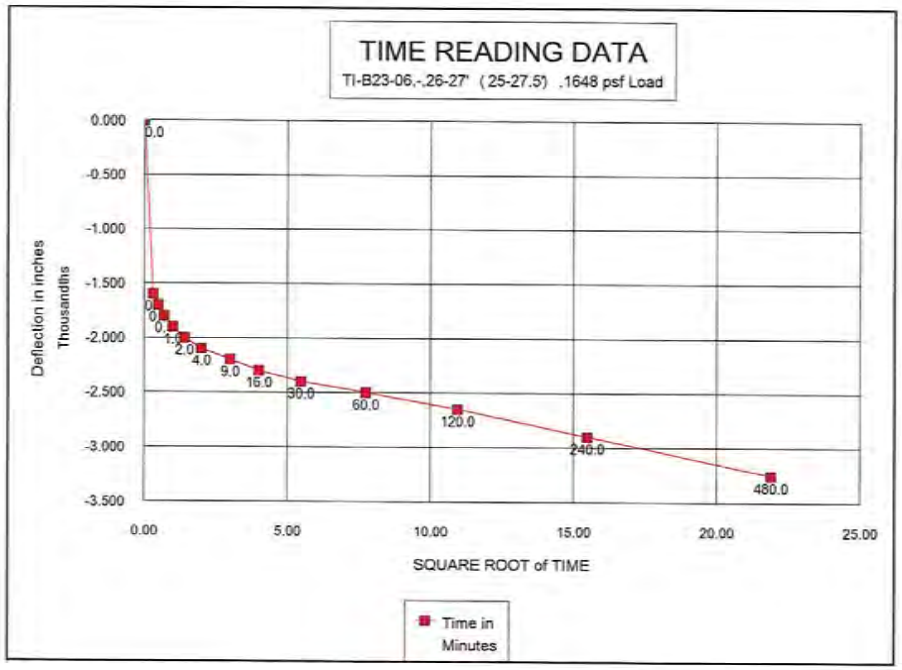
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02615	0.00000
0.1	0.32	0.03755	-0.01140
0.3	0.50	0.03875	-0.01260
0.5	0.71	0.03960	-0.01345
1.0	1.00	0.04035	-0.01420
2.0	1.41	0.04110	-0.01495
4.0	2.00	0.04185	-0.01570
9.0	3.00	0.04270	-0.01655
16.0	4.00	0.04330	-0.01715
30.0	5.48	0.04405	-0.01790
60.0	7.75	0.04495	-0.01880
120.0	10.95	0.04600	-0.01985
240.0	15.49	0.04665	-0.02050
480.0	21.91	0.04770	-0.02155

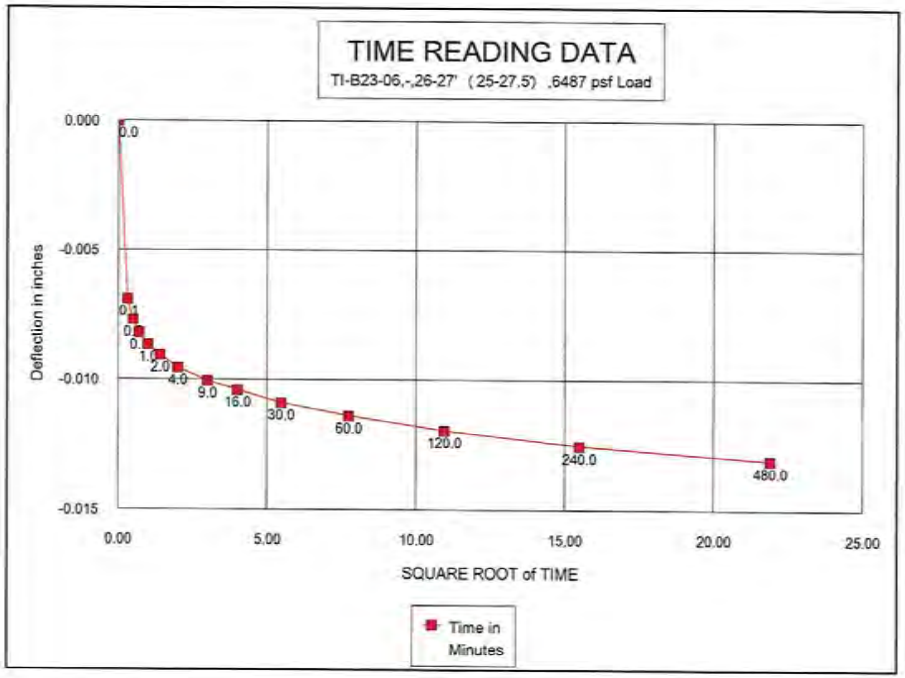
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC02306

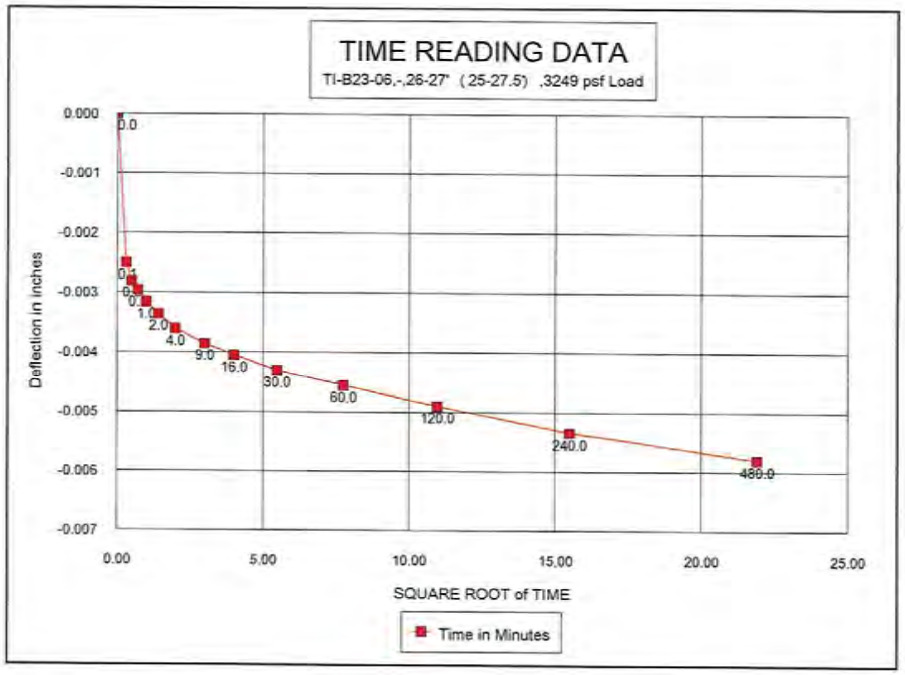
ADVANCED TERRA TESTING, INC. ATT

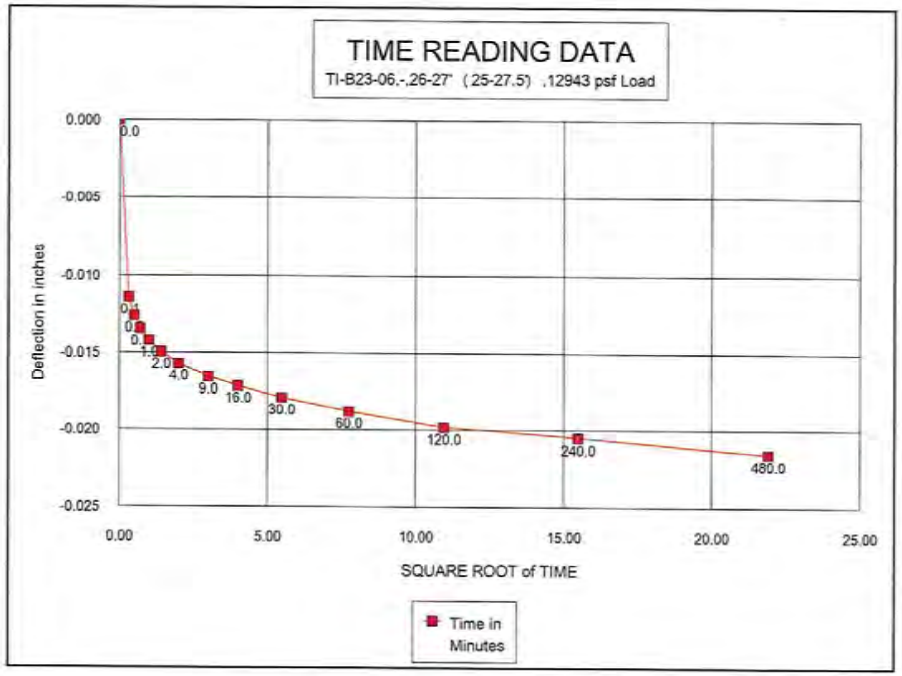

CONSOLIDATION TEST DATA
TI-B23-06,-,26-27' (25-27.5')
CONSOL (IN./IN.)
0.010
0.000
-0.010
-0.020
-0.030
-0.040
-0.050
-0.060
-0.070
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
99
199
401
813
1648
3249
6487
12943
25617
813
1648
6487
25617
Pressure - psf


CONSOLIDATION TEST DATA
TI-B23-06,-,26-27' (25-27.5')
VOID RATIO e
0.680
0.660
0.640
0.620
0.600
0.580
0.560
0.540
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
99
199
401
813
1648
3249
6487
12943
25617
813
1648
6487
25617
Pressure - psf


TIME READING DATA
TI-B23-06,-,26-27' (25-27.5) .1648 psf Load
Deflection in inches
Thousandths
0.000
-0.500
-1.000
-1.500
-2.000
-2.500
-3.000
-3.500
0.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B23-06,-,26-27' (25-27.5) .6487 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
0.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B23-06,-,26-27' (25-27.5) .3249 psf Load
Deflection in inches
0.000
-0.001
-0.002
-0.003
-0.004
-0.005
-0.006
-0.007
0.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B23-06,-,26-27' (25-27.5) .12943 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
-0.020
-0.025
0.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B11-03	SAMPLED	12/02/13 MWH
DEPTH	15-16'	TEST STARTED	03/03/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/14/14 DPM
SOIL DESCR.	Sand	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	175.6	185.1
Wt. Ring (s) (g)	41.9	41.9
Wt. Soil (g)	133.6	143.2
Wet Density PCF	111.6	133.7
Wt. Wet Soil & Pan (g)	137.5	147.0
Wt. Dry Soil & Pan (g)	128.9	128.9
Wt. Lost Moisture (g)	8.6	18.1
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	125.1	125.1
Moisture Content %	6.8	14.5
Dry Density PCF	104.5	116.8

LOAD (PSF)	CONSOL. (IN.)
104.5	0.00000
104.5	0.00320
206.8	0.00775
417.0	0.02475
833.7	0.04160
1489	0.05625
3128	0.07355
6392	0.08965
13179	0.10835
26075	0.12505
6392	0.12250
1489	0.11825
417.0	0.11215
104.5	0.10595

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	105	2.019	0.0000	0.0000	0.6136
Inundate	105	2.019	0.0032	-0.0032	0.6084
	207	2.316	0.0078	-0.0078	0.6011
	417	2.620	0.0248	-0.0248	0.5737
	834	2.921	0.0416	-0.0416	0.5465
	1489	3.173	0.0563	-0.0563	0.5228
	3128	3.495	0.0736	-0.0736	0.4949
	6392	3.806	0.0897	-0.0897	0.4689
	13179	4.120	0.1084	-0.1084	0.4388
	26075	4.416	0.1251	-0.1251	0.4118
	6392	3.806	0.1225	-0.1225	0.4159
	1489	3.173	0.1183	-0.1183	0.4228
	417	2.620	0.1122	-0.1122	0.4326
	105	2.019	0.1060	-0.1060	0.4426

% Saturation	30.1
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.574
Init. Ht. Voids (cm)	0.966
Init. Void Ratio	0.6136

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01103

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B11-03	SAMPLED	12/02/13 MWH
DEPTH	15-16'	TEST STARTED	03/03/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/14/14 DPM
SOIL DESCR.	Sand	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		

TIME READING DATA

417.0 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00840	-0.00000
0.1	0.32	0.01785	-0.00945
0.3	0.50	0.01980	-0.01140
0.5	0.71	0.02070	-0.01230
1.0	1.00	0.02150	-0.01310
2.0	1.41	0.02230	-0.01390
4.0	2.00	0.02315	-0.01475
9.0	3.00	0.02385	-0.01545
16.0	4.00	0.02425	-0.01585
30.0	5.48	0.02465	-0.01625
60.0	7.75	0.02500	-0.01660
120.0	10.95	0.02535	-0.01695
240.0	15.49	0.02565	-0.01725
480.0	21.91	0.02600	-0.01760

833.7 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02645	0.00000
0.1	0.32	0.03555	-0.00910
0.3	0.50	0.03680	-0.01035
0.5	0.71	0.03770	-0.01125
1.0	1.00	0.03845	-0.01200
2.0	1.41	0.03915	-0.01270
4.0	2.00	0.03985	-0.01340
9.0	3.00	0.04070	-0.01425
16.0	4.00	0.04155	-0.01510
30.0	5.48	0.04220	-0.01575
60.0	7.75	0.04270	-0.01625
120.0	10.95	0.04325	-0.01680
240.0	15.49	0.04380	-0.01735
480.0	21.91	0.04435	-0.01790

1484 psf Load

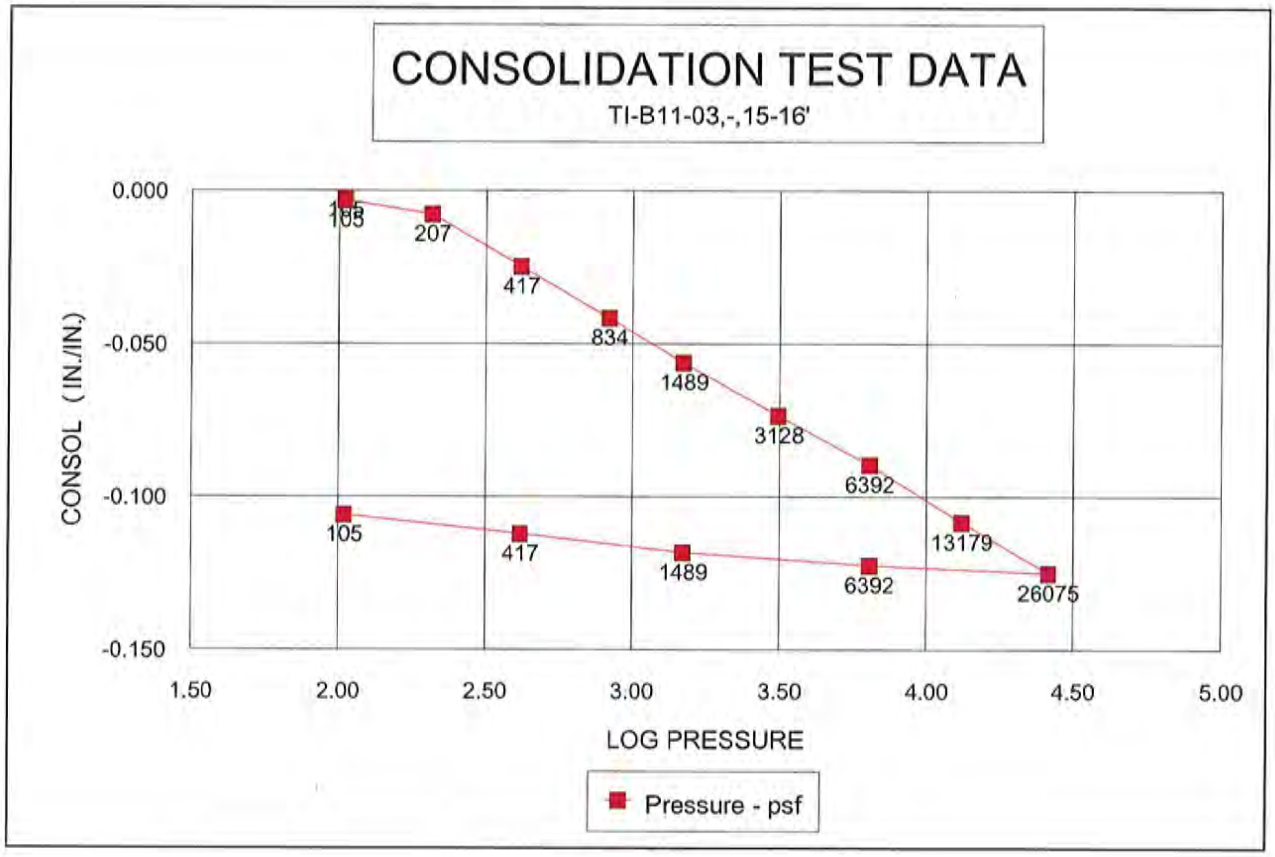
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.04480	0.00000
0.1	0.32	0.05140	-0.00660
0.3	0.50	0.05275	-0.00795
0.5	0.71	0.05350	-0.00870
1.0	1.00	0.05430	-0.00950
2.0	1.41	0.05500	-0.01020
4.0	2.00	0.05570	-0.01090
9.0	3.00	0.05650	-0.01170
16.0	4.00	0.05695	-0.01215
30.0	5.48	0.05740	-0.01260
60.0	7.75	0.05795	-0.01315
120.0	10.95	0.05835	-0.01355
240.0	15.49	0.05880	-0.01400
480.0	21.91	0.05925	-0.01445

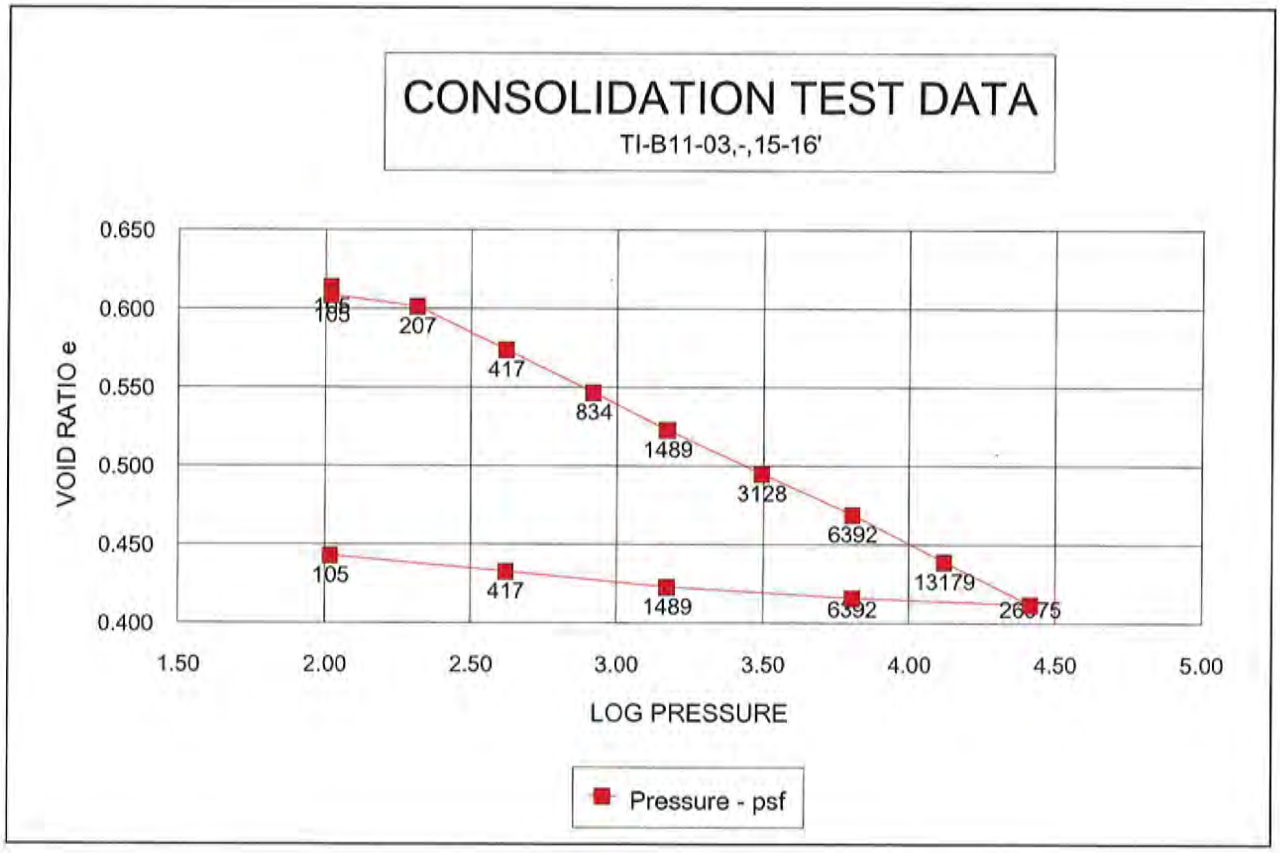
3128 psf Load

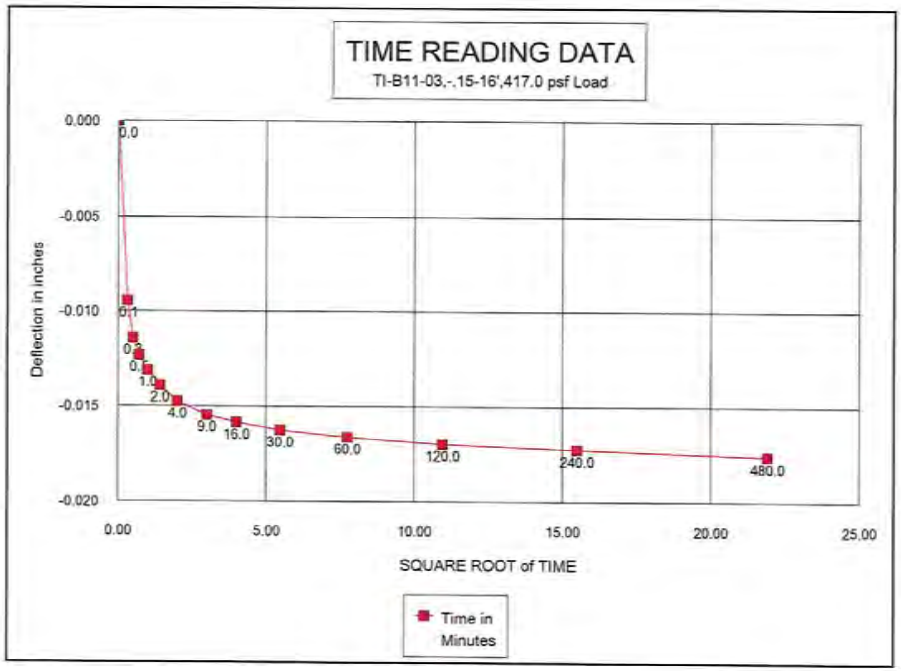
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.06065	0.00000
0.1	0.32	0.07065	-0.01000
0.3	0.50	0.07180	-0.01115
0.5	0.71	0.07285	-0.01220
1.0	1.00	0.07380	-0.01315
2.0	1.41	0.07455	-0.01390
4.0	2.00	0.07520	-0.01455
9.0	3.00	0.07590	-0.01525
16.0	4.00	0.07640	-0.01575
30.0	5.48	0.07685	-0.01620
60.0	7.75	0.07740	-0.01675
120.0	10.95	0.07790	-0.01725
240.0	15.49	0.07835	-0.01770
480.0	21.91	0.07880	-0.01815

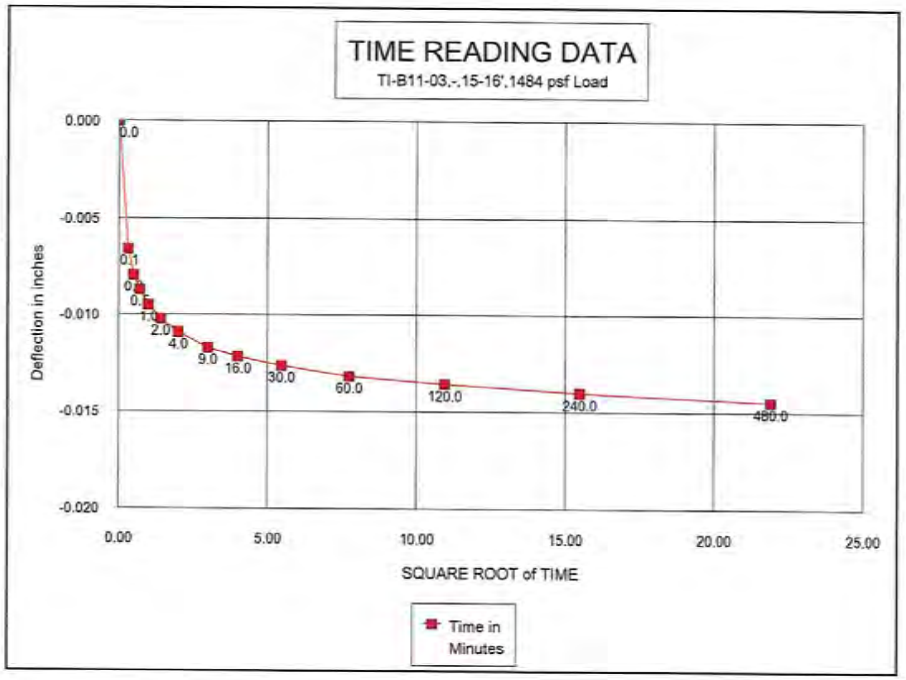
Data entry by: DPM Date: 06/11/2014
Data checked by: KL Date: 6/11/14
FileName: MWC01103

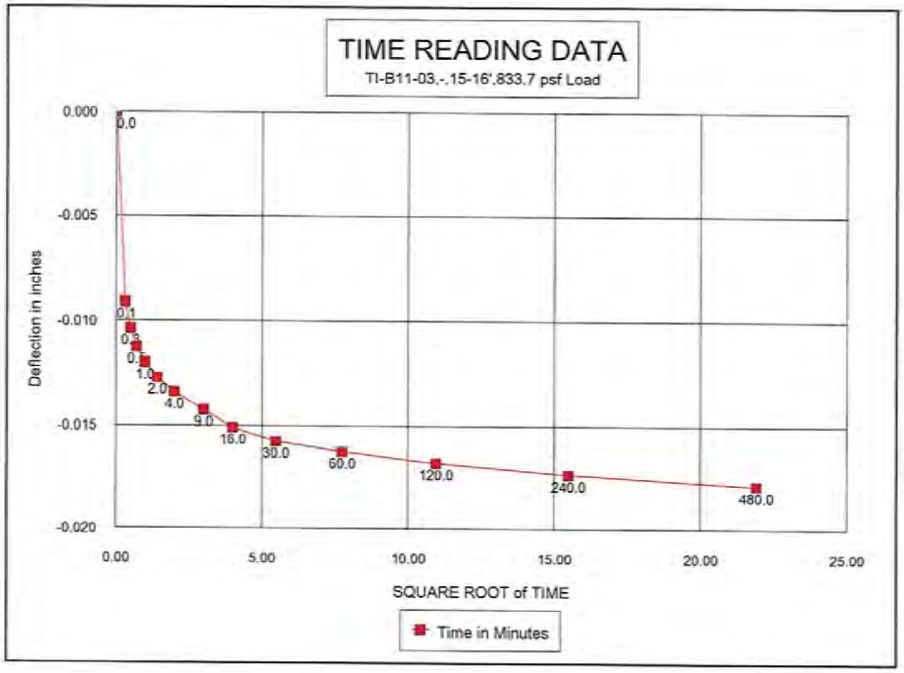
ADVANCED TERRA TESTING, INC. ATT

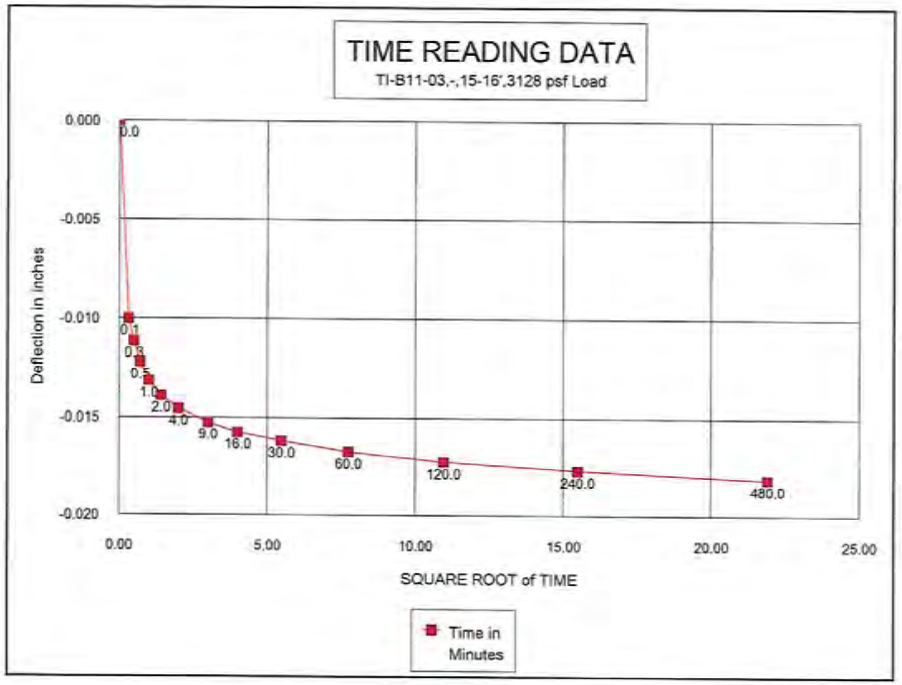

CONSOLIDATION TEST DATA
TI-B11-03,-,15-16'
CONSOL (IN./IN.)
0.000
-0.050
-0.100
-0.150
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
105
207
417
834
1489
3128
6392
13179
26075
Pressure - psf


CONSOLIDATION TEST DATA
TI-B11-03,-,15-16'
VOID RATIO e
0.650
0.600
0.550
0.500
0.450
0.400
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
105
207
417
834
1489
3128
6392
13179
26075
Pressure - psf


TIME READING DATA
TI-B11-03,-,15-16',417.0 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B11-03,-,15-16',1484 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B11-03,-,15-16',833.7 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B11-03,-,15-16',3128 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B8-04	SAMPLED	12/03/13 MWH
DEPTH	30.0-31.0' (30-32')	TEST STARTED	03/06/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/20/14 DPM
SOIL DESCR.	Clayey Silt	CELL NUMBER	ATT-05
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	164.2	150.2
Wt. Ring (s) (g)	42.6	42.6
Wt. Soil (g)	121.5	107.5
Wet Density PCF	101.5	109.6
Wt. Wet Soil & Pan (g)	125.4	111.4
Wt. Dry Soil & Pan (g)	77.5	77.5
Wt. Lost Moisture (g)	47.9	33.9
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	73.6	73.6
Moisture Content %	65.1	46.1
Dry Density PCF	61.5	75.0

LOAD (PSF)	CONSOL. (IN.)
99.4	0.00000
99.4	-0.00030
198.9	-0.00045
400.9	0.00130
813.2	0.01095
1648	0.03900
3249	0.07960
6487	0.12625
12943	0.18410
25617	0.24845
6487	0.23925
1648	0.21315
400.9	0.18065

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	99	1.997	0.0000	0.0000	1.7418
Inundate	99	1.997	-0.0003	0.0003	1.7426
	199	2.299	-0.0005	0.0005	1.7430
	401	2.603	0.0013	-0.0013	1.7382
	813	2.910	0.0110	-0.0110	1.7118
	1648	3.217	0.0390	-0.0390	1.6349
	3249	3.512	0.0796	-0.0796	1.5236
	6487	3.812	0.1263	-0.1263	1.3957
	12943	4.112	0.1841	-0.1841	1.2370
	25617	4.409	0.2485	-0.2485	1.0606
	6487	3.812	0.2393	-0.2393	1.0858
	1648	3.217	0.2132	-0.2132	1.1574
	401	2.603	0.1807	-0.1807	1.2465

% Saturation	100.9
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	0.926
Init. Ht. Voids (cm)	1.614
Init. Void Ratio	1.7418

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC0B804

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B8-04	SAMPLED	12/03/13 MWH
DEPTH	30.0-31.0' (30-32')	TEST STARTED	03/06/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/20/14 DPM
SOIL DESCR.	Clayey Silt	CELL NUMBER	ATT-05
LOCATION	Tailings Impoundment		

TIME READING DATA

813.2 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00275	-0.00000
0.1	0.32	0.00470	-0.00195
0.3	0.50	0.00515	-0.00240
0.5	0.71	0.00555	-0.00280
1.0	1.00	0.00590	-0.00315
2.0	1.41	0.00640	-0.00365
4.0	2.00	0.00685	-0.00410
9.0	3.00	0.00750	-0.00475
16.0	4.00	0.00795	-0.00520
30.0	5.48	0.00840	-0.00565
60.0	7.75	0.00885	-0.00610
120.0	10.95	0.00925	-0.00650
240.0	15.49	0.00975	-0.00700
480.0	21.91	0.01055	-0.00780

1648 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01365	0.00000
0.1	0.32	0.01875	-0.00510
0.3	0.50	0.01990	-0.00625
0.5	0.71	0.02110	-0.00745
1.0	1.00	0.02250	-0.00885
2.0	1.41	0.02420	-0.01055
4.0	2.00	0.02645	-0.01280
9.0	3.00	0.02910	-0.01545
16.0	4.00	0.03075	-0.01710
30.0	5.48	0.03215	-0.01850
60.0	7.75	0.03335	-0.01970
120.0	10.95	0.03435	-0.02070
240.0	15.49	0.03530	-0.02165
480.0	21.91	0.03650	-0.02285

3249 psf Load

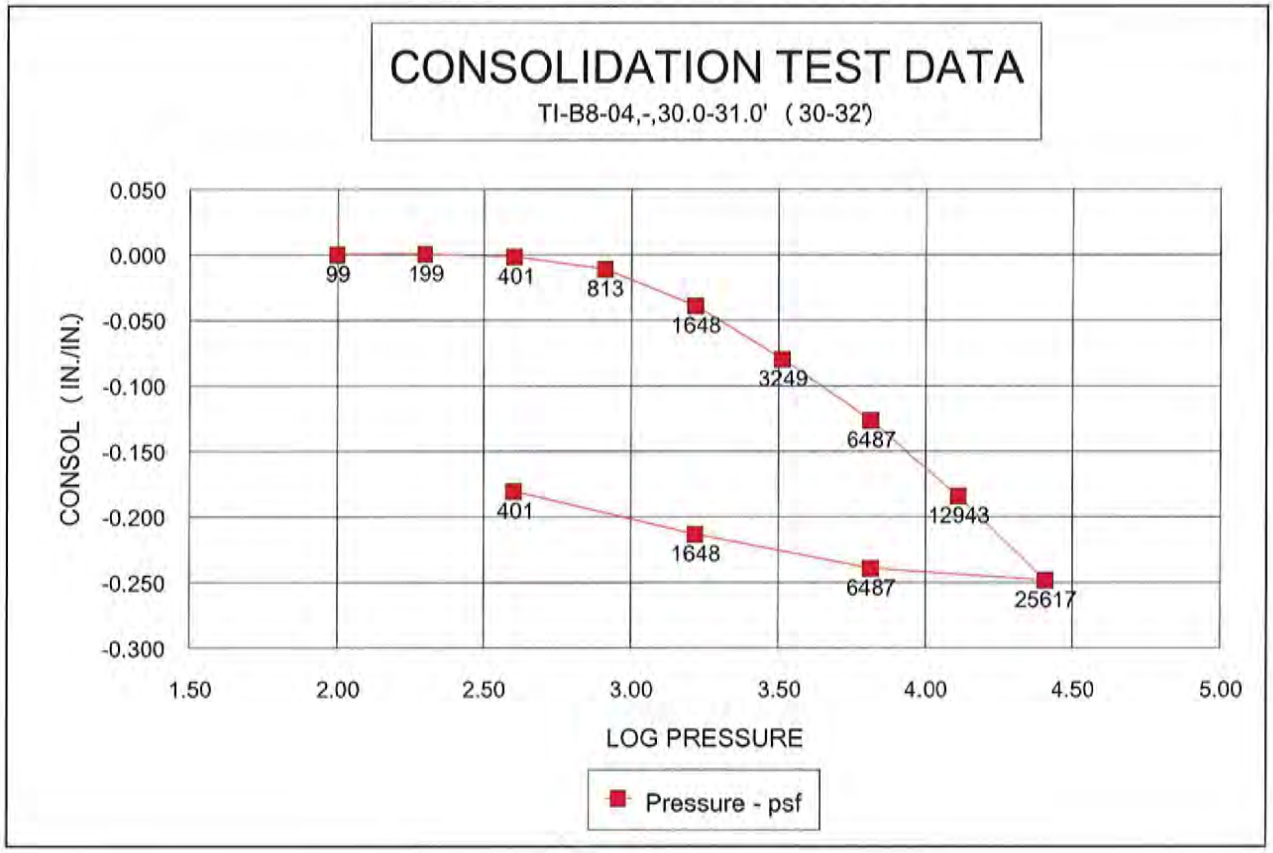
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.04325	0.00000
0.1	0.32	0.05020	-0.00695
0.3	0.50	0.05200	-0.00875
0.5	0.71	0.05390	-0.01065
1.0	1.00	0.05620	-0.01295
2.0	1.41	0.05880	-0.01555
4.0	2.00	0.06195	-0.01870
9.0	3.00	0.06640	-0.02315
16.0	4.00	0.06950	-0.02625
30.0	5.48	0.07240	-0.02915
60.0	7.75	0.07470	-0.03145
120.0	10.95	0.07675	-0.03350
240.0	15.49	0.07905	-0.03580
480.0	21.91	0.08150	-0.03825

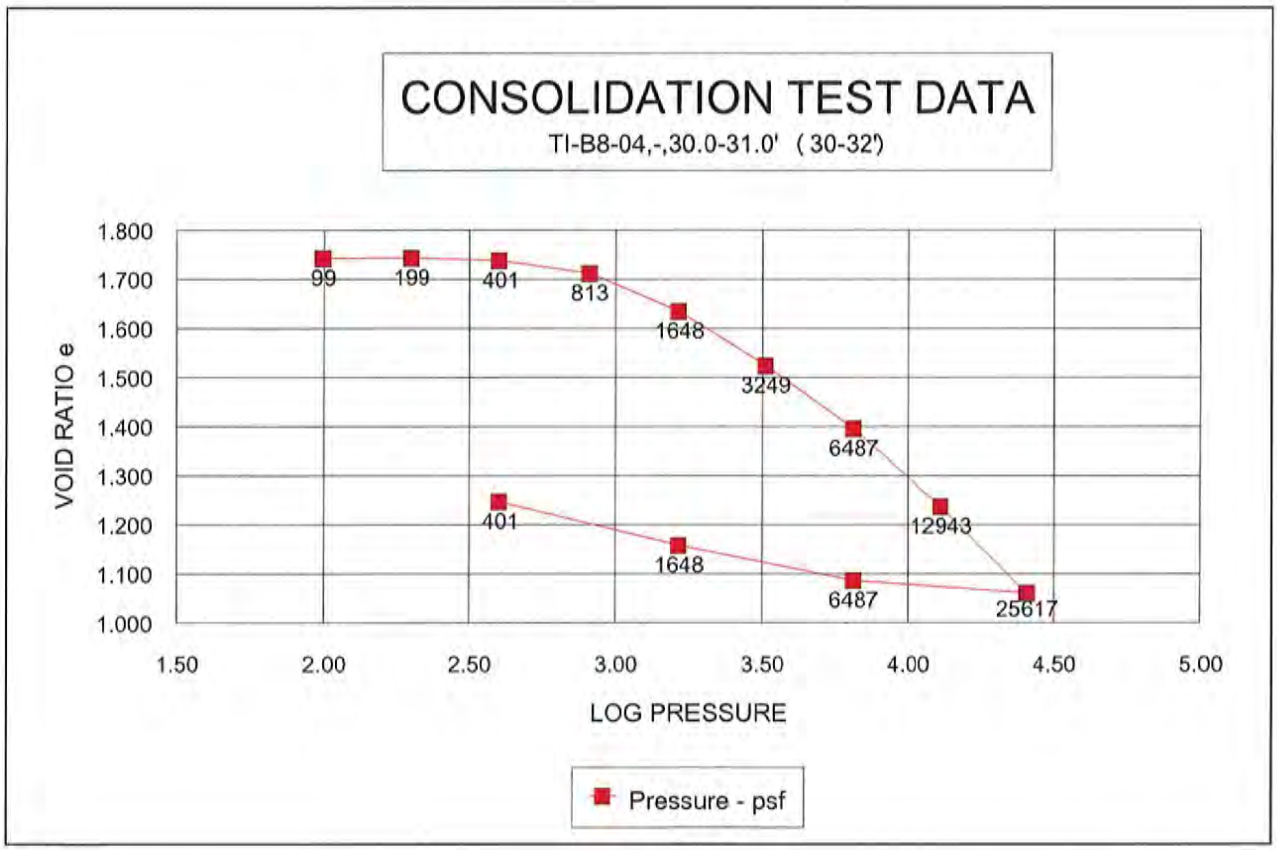
6487 psf Load

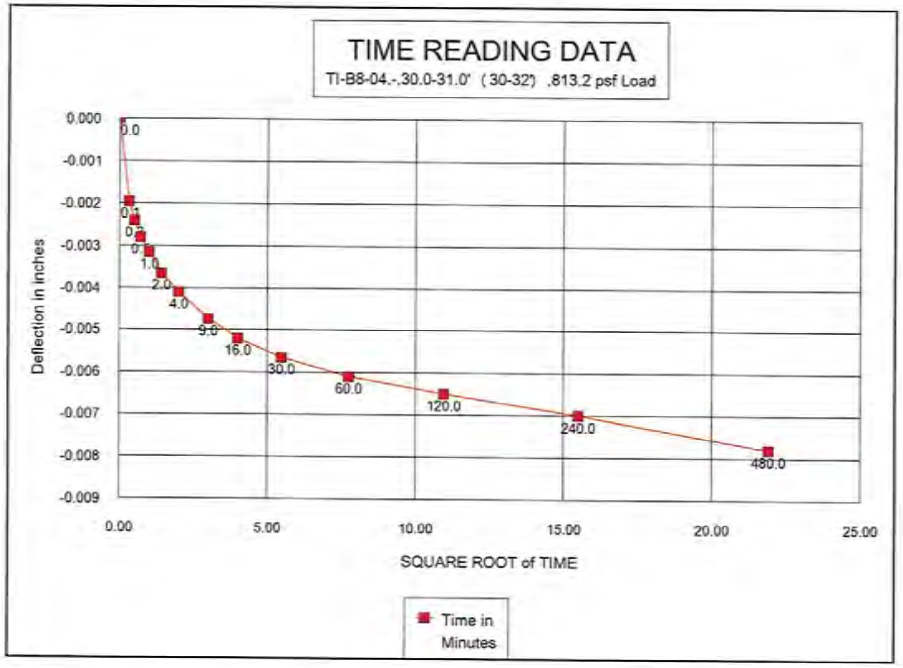
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.08550	0.00000
0.1	0.32	0.09315	-0.00765
0.3	0.50	0.09585	-0.01035
0.5	0.71	0.09840	-0.01290
1.0	1.00	0.10160	-0.01610
2.0	1.41	0.10520	-0.01970
4.0	2.00	0.10915	-0.02365
9.0	3.00	0.11435	-0.02885
16.0	4.00	0.11770	-0.03220
30.0	5.48	0.12060	-0.03510
60.0	7.75	0.12280	-0.03730
120.0	10.95	0.12470	-0.03920
248.0	15.75	0.12675	-0.04125
480.0	21.91	0.12885	-0.04335

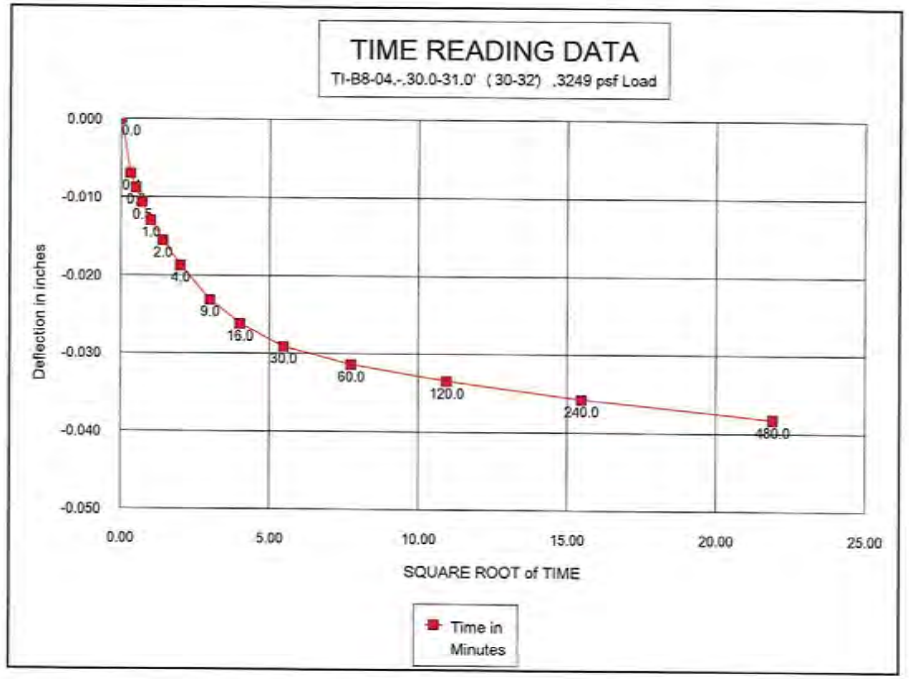
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC0B804

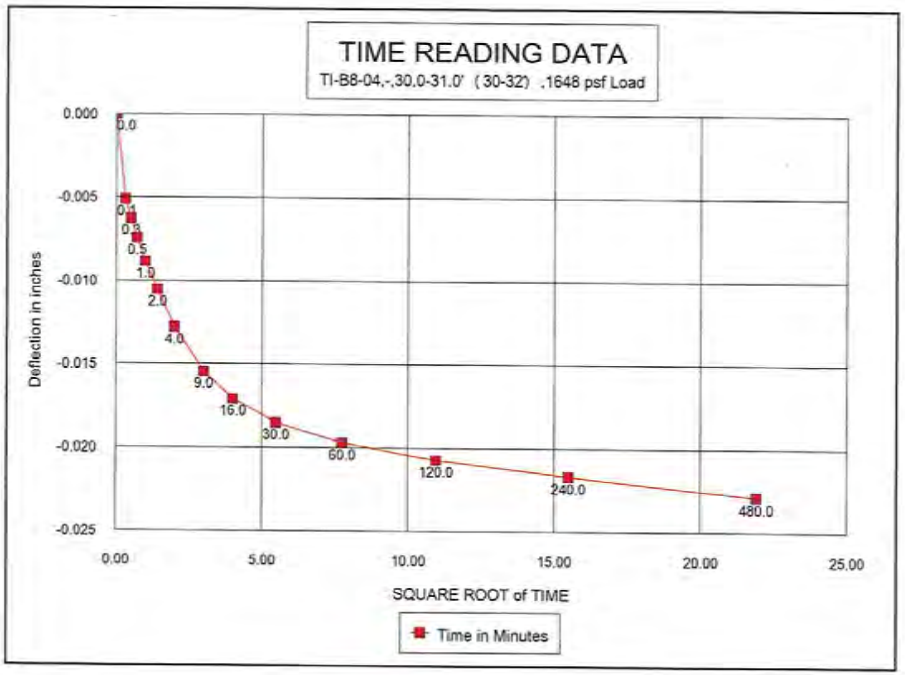
ADVANCED TERRA TESTING, Inc. ATT

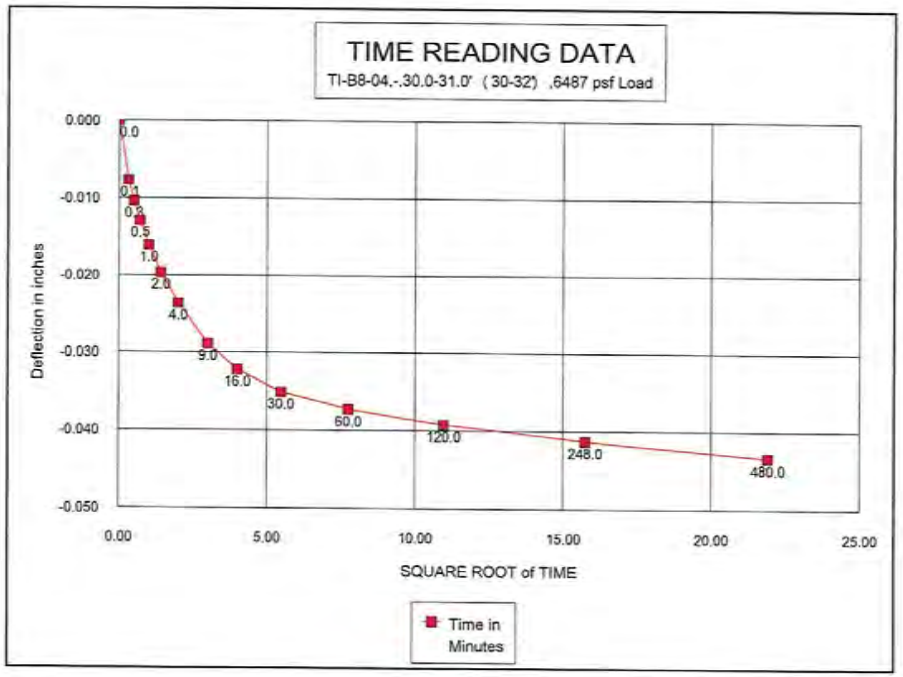

CONSOLIDATION TEST DATA
TI-B8-04,-,30.0-31.0' (30-32')
CONSOL (IN./IN.)
0.050
0.000
-0.050
-0.100
-0.150
-0.200
-0.250
-0.300
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
99
199
401
813
1648
3249
6487
12943
25617
401
1648
6487
Pressure - psf


CONSOLIDATION TEST DATA
TI-B8-04,-,30.0-31.0' (30-32')
VOID RATIO e
1.800
1.700
1.600
1.500
1.400
1.300
1.200
1.100
1.000
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
99
199
401
813
1648
3249
6487
12943
25617
401
1648
6487
Pressure - psf


TIME READING DATA
TI-B8-04.-,30.0-31.0' (30-32) ,813.2 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B8-04.-,30.0-31.0' (30-32) ,3249 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B8-04,-,30.0-31.0' (30-32) ,1648 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B8-04.-,30.0-31.0' (30-32) ,6487 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B11-06	SAMPLED	12/02/13 MWH
DEPTH	30.5-31.5' (30-31.7')	TEST STARTED	03/18/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/27/14 DPM
SOIL DESCR.	Sandy Clay	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	196.8	198.2
Wt. Ring (s) (g)	42.0	42.0
Wt. Soil (g)	154.8	156.2
Wet Density PCF	129.3	136.4
Wt. Wet Soil & Pan (g)	158.4	159.8
Wt. Dry Soil & Pan (g)	140.2	140.2
Wt. Lost Moisture (g)	18.2	19.6
Wt. of Pan Only (g)	3.6	3.6
Wt. of Dry Soil (g)	136.6	136.6
Moisture Content %	13.3	14.4
Dry Density PCF	114.1	119.3

LOAD (PSF)	CONSOL. (IN.)
104.5	0.00000
104.5	-0.00030
206.8	-0.00030
417.0	0.00165
833.7	0.00495
1489	0.00975
3128	0.01790
6392	0.02885
13179	0.04280
26075	0.05965
6392	0.05650
1489	0.05030
417.0	0.04370

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	105	2.019	0.0000	0.0000	0.4779
Inundate	105	2.019	-0.0003	0.0003	0.4783
	207	2.316	-0.0003	0.0003	0.4783
	417	2.620	0.0017	-0.0017	0.4754
	834	2.921	0.0050	-0.0050	0.4705
	1489	3.173	0.0098	-0.0098	0.4634
	3128	3.495	0.0179	-0.0179	0.4514
	6392	3.806	0.0289	-0.0289	0.4352
	13179	4.120	0.0428	-0.0428	0.4146
	26075	4.416	0.0597	-0.0597	0.3897
	6392	3.806	0.0565	-0.0565	0.3944
	1489	3.173	0.0503	-0.0503	0.4035
	417	2.620	0.0437	-0.0437	0.4133

% Saturation	75.3
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.719
Init. Ht. Voids (cm)	0.821
Init. Void Ratio	0.4779

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01106

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B11-06	SAMPLED	12/02/13 MWH
DEPTH	30.5-31.5' (30-31.7')	TEST STARTED	03/18/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/27/14 DPM
SOIL DESCR.	Sandy Clay	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		

TIME READING DATA

833.7 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00335	-0.00000
0.1	0.32	0.00585	-0.00250
0.3	0.50	0.00605	-0.00270
0.5	0.71	0.00620	-0.00285
1.0	1.00	0.00635	-0.00300
2.0	1.41	0.00650	-0.00315
4.0	2.00	0.00665	-0.00330
9.0	3.00	0.00685	-0.00350
16.0	4.00	0.00695	-0.00360
30.0	5.48	0.00705	-0.00370
60.0	7.75	0.00720	-0.00385
120.0	10.95	0.00740	-0.00405
240.0	15.49	0.00760	-0.00425
480.0	21.91	0.00785	-0.00450

1489 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00815	0.00000
0.1	0.32	0.01110	-0.00295
0.3	0.50	0.01140	-0.00325
0.5	0.71	0.01160	-0.00345
1.0	1.00	0.01180	-0.00365
2.0	1.41	0.01200	-0.00385
4.0	2.00	0.01225	-0.00410
9.0	3.00	0.01250	-0.00435
16.0	4.00	0.01265	-0.00450
30.0	5.48	0.01280	-0.00465
60.0	7.75	0.01295	-0.00480
120.0	10.95	0.01315	-0.00500
240.0	15.49	0.01340	-0.00525
480.0	21.91	0.01380	-0.00565

3128 psf Load

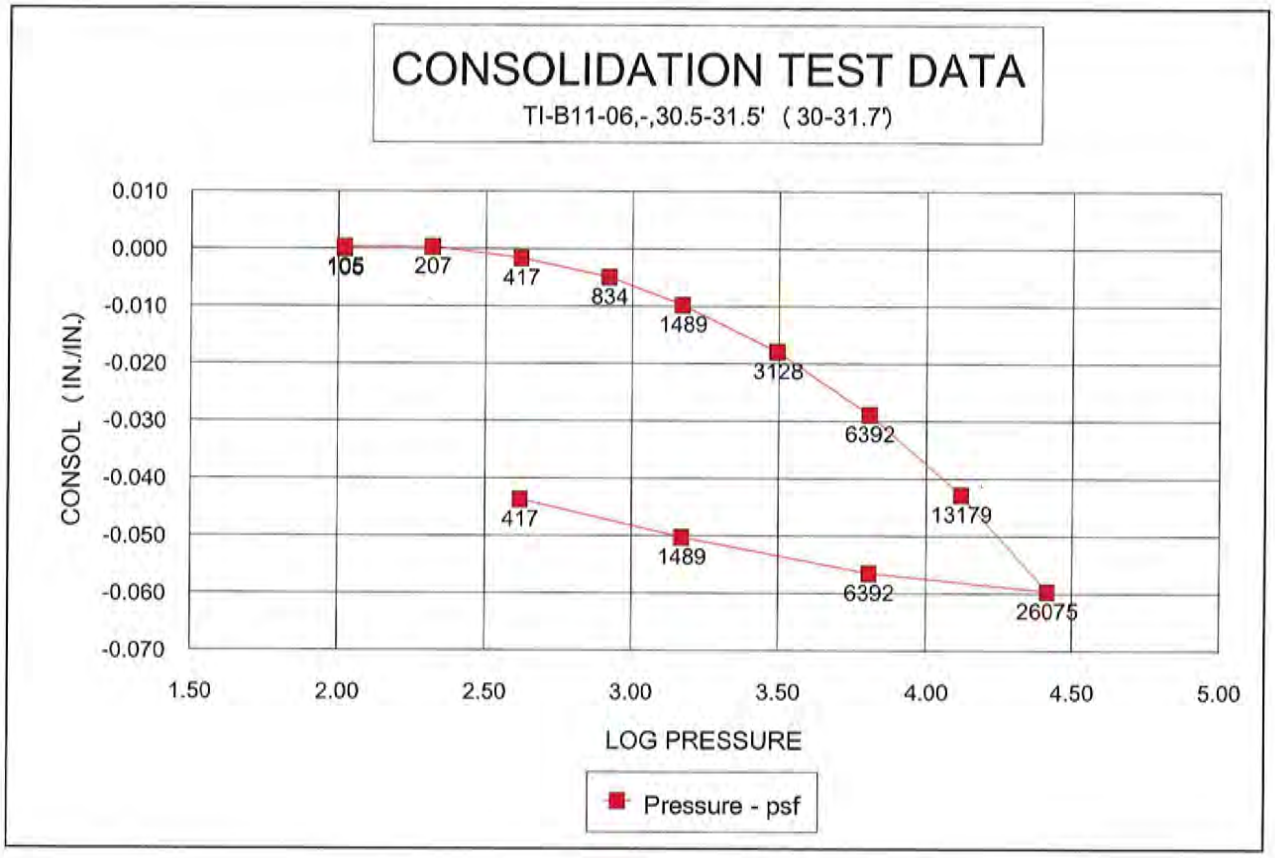
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01415	0.00000
0.1	0.32	0.01955	-0.00540
0.3	0.50	0.02005	-0.00590
0.5	0.71	0.02040	-0.00625
1.0	1.00	0.02075	-0.00660
2.0	1.41	0.02110	-0.00695
4.0	2.00	0.02145	-0.00730
9.0	3.00	0.02180	-0.00765
16.0	4.00	0.02200	-0.00785
30.0	5.48	0.02225	-0.00810
60.0	7.75	0.02250	-0.00835
120.0	10.95	0.02280	-0.00865
240.0	15.49	0.02305	-0.00890
480.0	21.91	0.02340	-0.00925

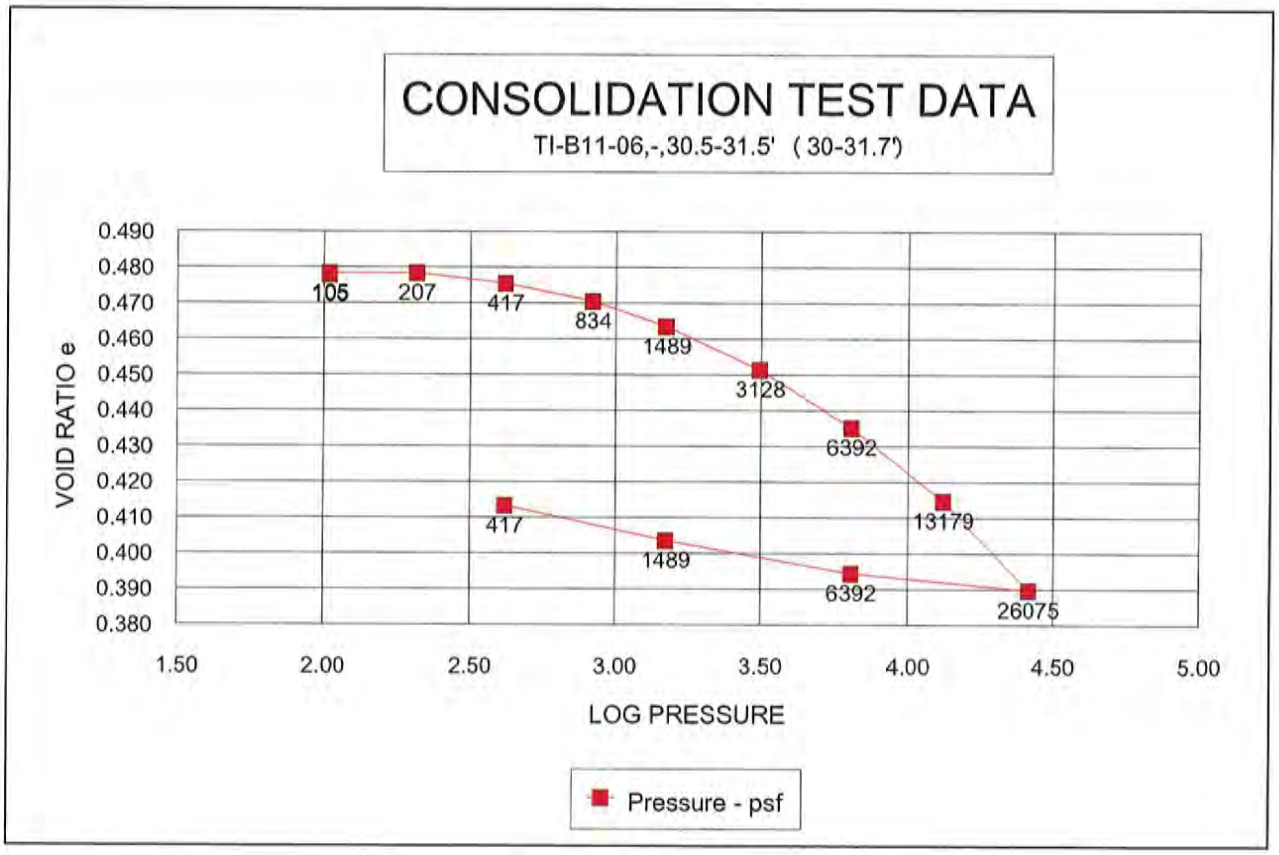
6392 psf Load

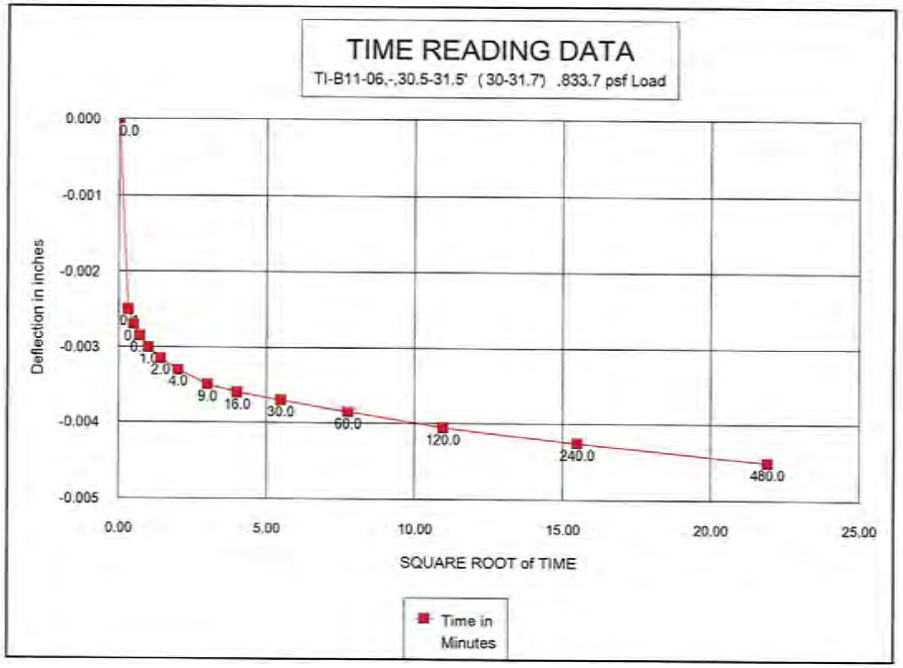
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02390	0.00000
0.1	0.32	0.03035	-0.00645
0.3	0.50	0.03105	-0.00715
0.5	0.71	0.03155	-0.00765
1.0	1.00	0.03205	-0.00815
2.0	1.41	0.03250	-0.00860
4.0	2.00	0.03300	-0.00910
9.0	3.00	0.03345	-0.00955
16.0	4.00	0.03375	-0.00985
30.0	5.48	0.03415	-0.01025
60.0	7.75	0.03450	-0.01060
120.0	10.95	0.03490	-0.01100
240.0	15.49	0.03540	-0.01150
480.0	21.91	0.03590	-0.01200

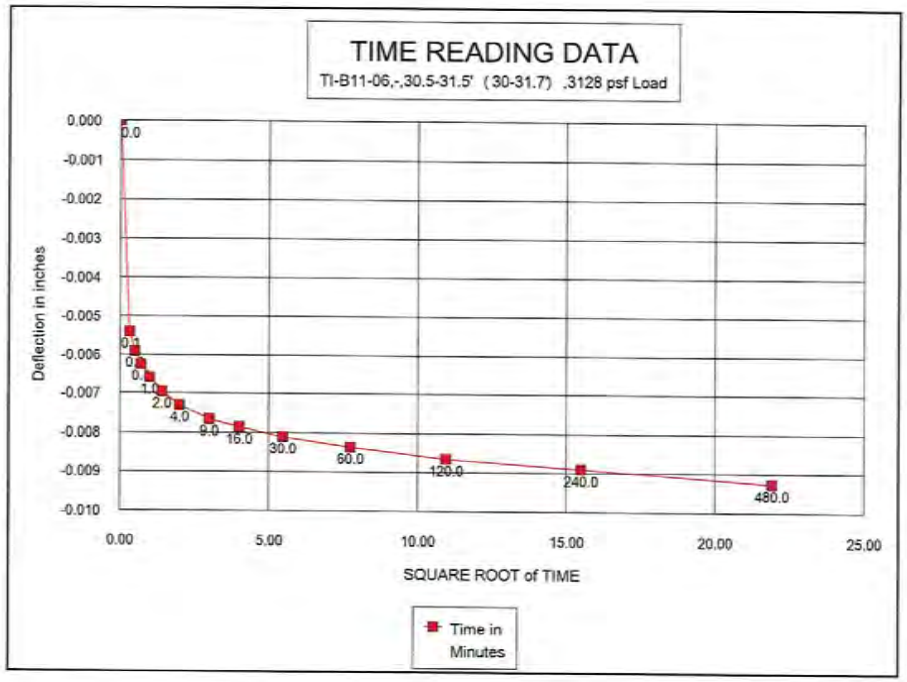
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01106

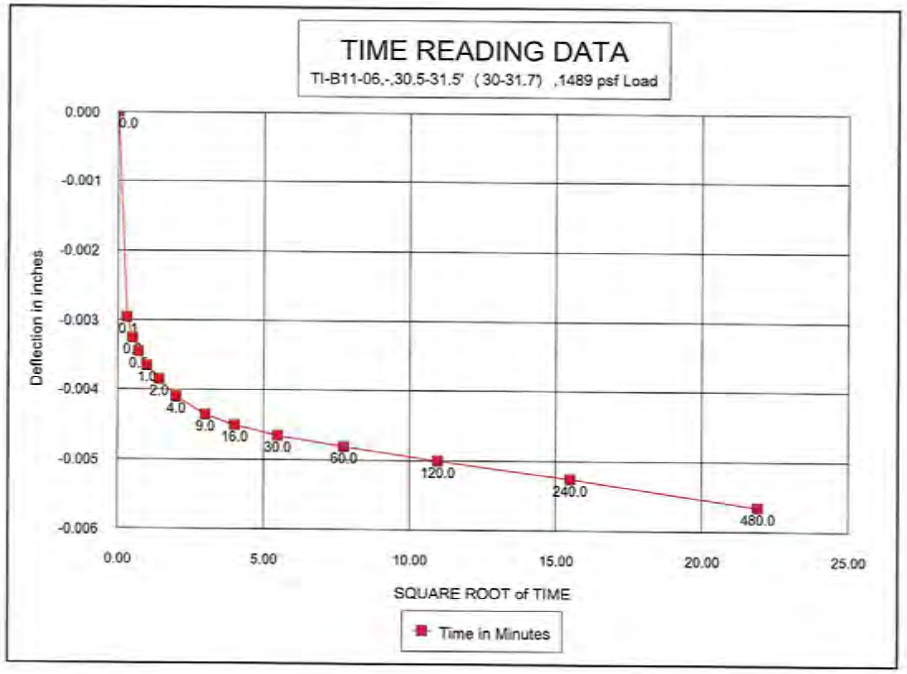
ADVANCED TERRA TESTING, Inc. ATT

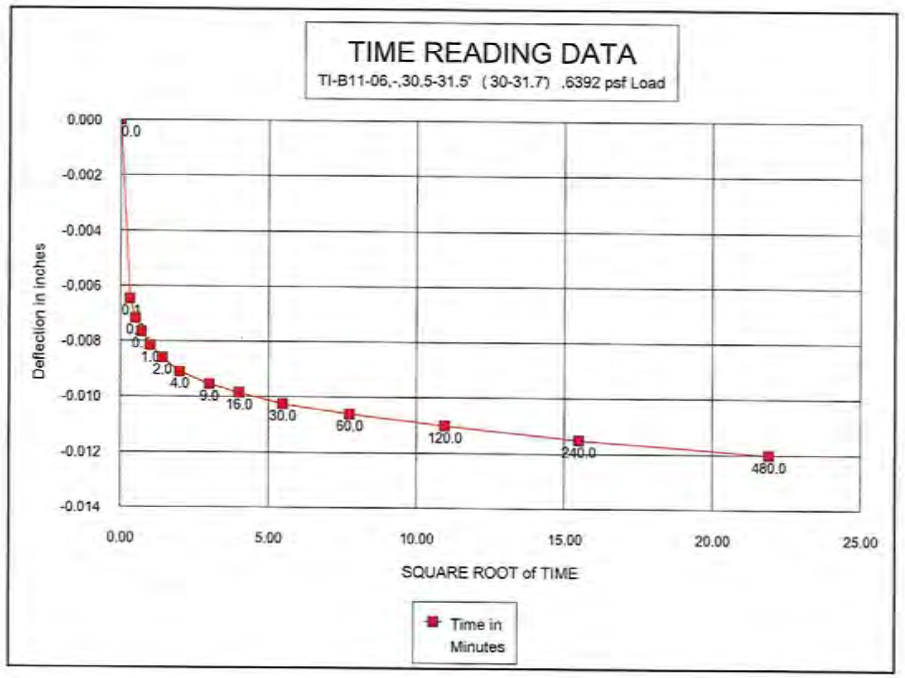

CONSOLIDATION TEST DATA
TI-B11-06,-,30.5-31.5' (30-31.7')
CONSOL (IN./IN.)
0.010
0.000
-0.010
-0.020
-0.030
-0.040
-0.050
-0.060
-0.070
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
105
207
417
834
1489
3128
6392
13179
26075
417
1489
6392
Pressure - psf


CONSOLIDATION TEST DATA
TI-B11-06,-,30.5-31.5' (30-31.7')
VOID RATIO e
0.490
0.480
0.470
0.460
0.450
0.440
0.430
0.420
0.410
0.400
0.390
0.380
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
105
207
417
834
1489
3128
6392
13179
26075
417
1489
6392
Pressure - psf


TIME READING DATA
TI-B11-06,-,30.5-31.5' (30-31.7) ,833.7 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B11-06,-,30.5-31.5' (30-31.7) ,3128 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B11-06,-,30.5-31.5' (30-31.7) ,1489 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B11-06,-,30.5-31.5' (30-31.7) ,6392 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-07A	SAMPLED	11/21/13 MWH
DEPTH	21.0-21.5'	TEST STARTED	02/04/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/13/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	1.938	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	337.8	344.0
Wt. Ring (s) (g)	249.9	249.9
Wt. Soil (g)	87.9	94.1
Wet Density PCF	113.5	124.9
Wt. Wet Soil & Pan (g)	91.4	97.6
Wt. Dry Soil & Pan (g)	85.3	85.3
Wt. Lost Moisture (g)	6.2	12.4
Wt. of Pan Only (g)	3.6	3.6
Wt. of Dry Soil (g)	81.7	81.7
Moisture Content %	7.5	15.1
Dry Density PCF	105.5	108.5

LOAD (PSF)	CONSOL. (IN.)
162	0.00000
162	0.00070
320	0.00260
645	0.00545
1289	0.00885
2303	0.01300
4837	0.01785
9885	0.02315
20380	0.02925
40322	0.03730
9885	0.03560
2303	0.03295
645	0.03015
162	0.02715

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	162	2.208	0.0000	0.0000	0.5971
Inundate	162	2.208	0.0007	-0.0007	0.5960
	320	2.505	0.0026	-0.0026	0.5930
	645	2.809	0.0055	-0.0055	0.5884
	1289	3.110	0.0089	-0.0089	0.5830
	2303	3.362	0.0130	-0.0130	0.5764
	4837	3.685	0.0179	-0.0179	0.5686
	9885	3.995	0.0232	-0.0232	0.5602
	20380	4.309	0.0293	-0.0293	0.5504
	40322	4.606	0.0373	-0.0373	0.5376
	9885	3.995	0.0356	-0.0356	0.5403
	2303	3.362	0.0330	-0.0330	0.5445
	645	2.809	0.0302	-0.0302	0.5490
	162	2.208	0.0272	-0.0272	0.5538

% Saturation	34.1
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.590
Init. Ht. Voids (cm)	0.950
Init. Void Ratio	0.5971

Data entry by: DPM Date: 06/11/2014
Data checked by: FR Date: 6/11/14
FileName: MWC0107A

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B1-07A	SAMPLED	11/21/13 MWH
DEPTH	21.0-21.5'	TEST STARTED	02/04/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/13/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		

TIME READING DATA

644.8 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00325	-0.00000
0.1	0.32	0.00535	-0.00210
0.3	0.50	0.00545	-0.00220
0.5	0.71	0.00555	-0.00230
1.0	1.00	0.00565	-0.00240
2.0	1.41	0.00575	-0.00250
4.0	2.00	0.00590	-0.00265
9.0	3.00	0.00605	-0.00280
16.0	4.00	0.00610	-0.00285
30.0	5.48	0.00625	-0.00300
60.0	7.75	0.00635	-0.00310
120.0	10.95	0.00650	-0.00325
240.0	15.49	0.00665	-0.00340
480.0	21.91	0.00695	-0.00370

1289 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00715	0.00000
0.1	0.32	0.00985	-0.00270
0.3	0.50	0.01005	-0.00290
0.5	0.71	0.01020	-0.00305
1.0	1.00	0.01035	-0.00320
2.0	1.41	0.01045	-0.00330
4.0	2.00	0.01065	-0.00350
9.0	3.00	0.01080	-0.00365
16.0	4.00	0.01095	-0.00380
30.0	5.48	0.01110	-0.00395
60.0	7.75	0.01120	-0.00405
120.0	10.95	0.01135	-0.00420
240.0	15.49	0.01150	-0.00435
480.0	21.91	0.01170	-0.00455

2303 psf Load

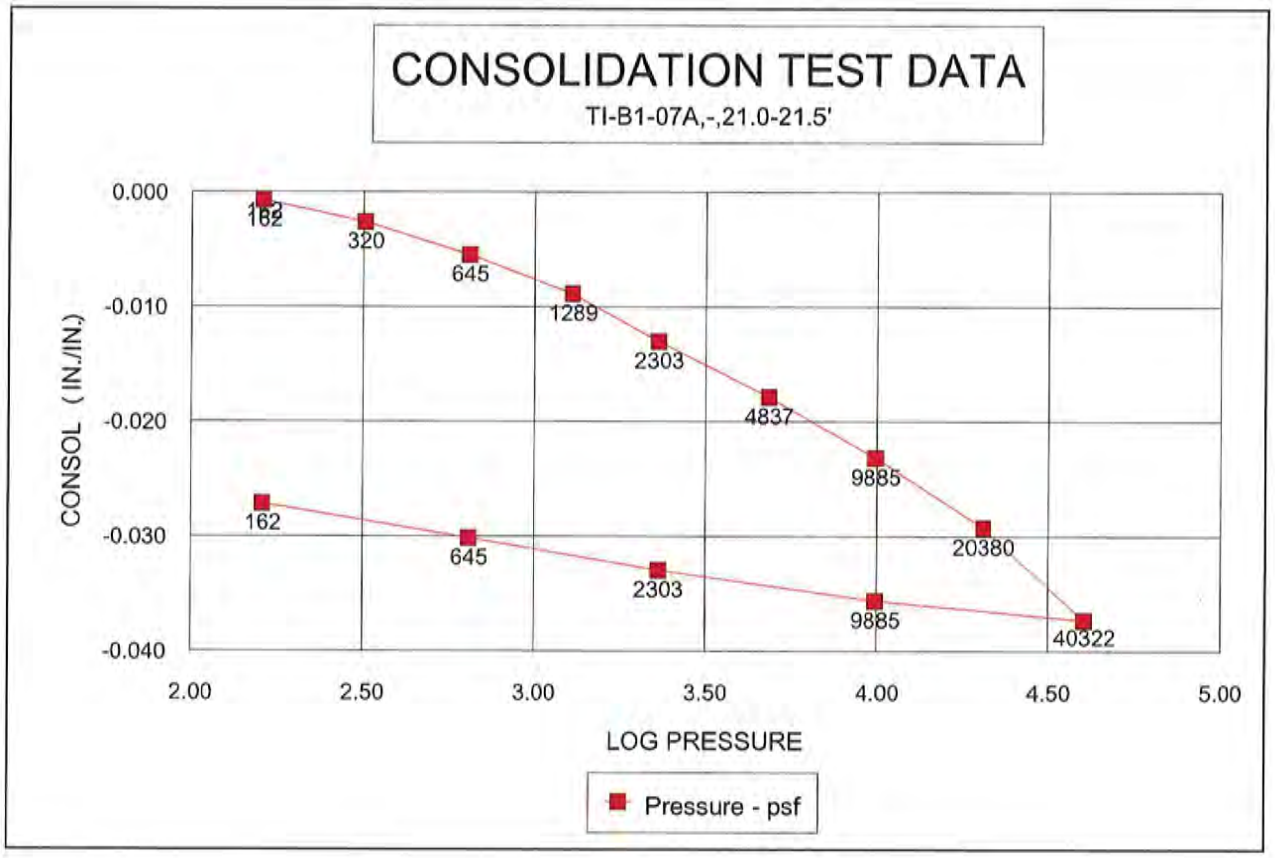
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01205	0.00000
0.1	0.32	0.01435	-0.00230
0.3	0.50	0.01460	-0.00255
0.5	0.71	0.01475	-0.00270
1.0	1.00	0.01490	-0.00285
2.0	1.41	0.01510	-0.00305
4.0	2.00	0.01525	-0.00320
9.0	3.00	0.01545	-0.00340
16.0	4.00	0.01560	-0.00355
30.0	5.48	0.01575	-0.00370
60.0	7.75	0.01590	-0.00385
120.0	10.95	0.01605	-0.00400
240.0	15.49	0.01620	-0.00415
480.0	21.91	0.01640	-0.00435

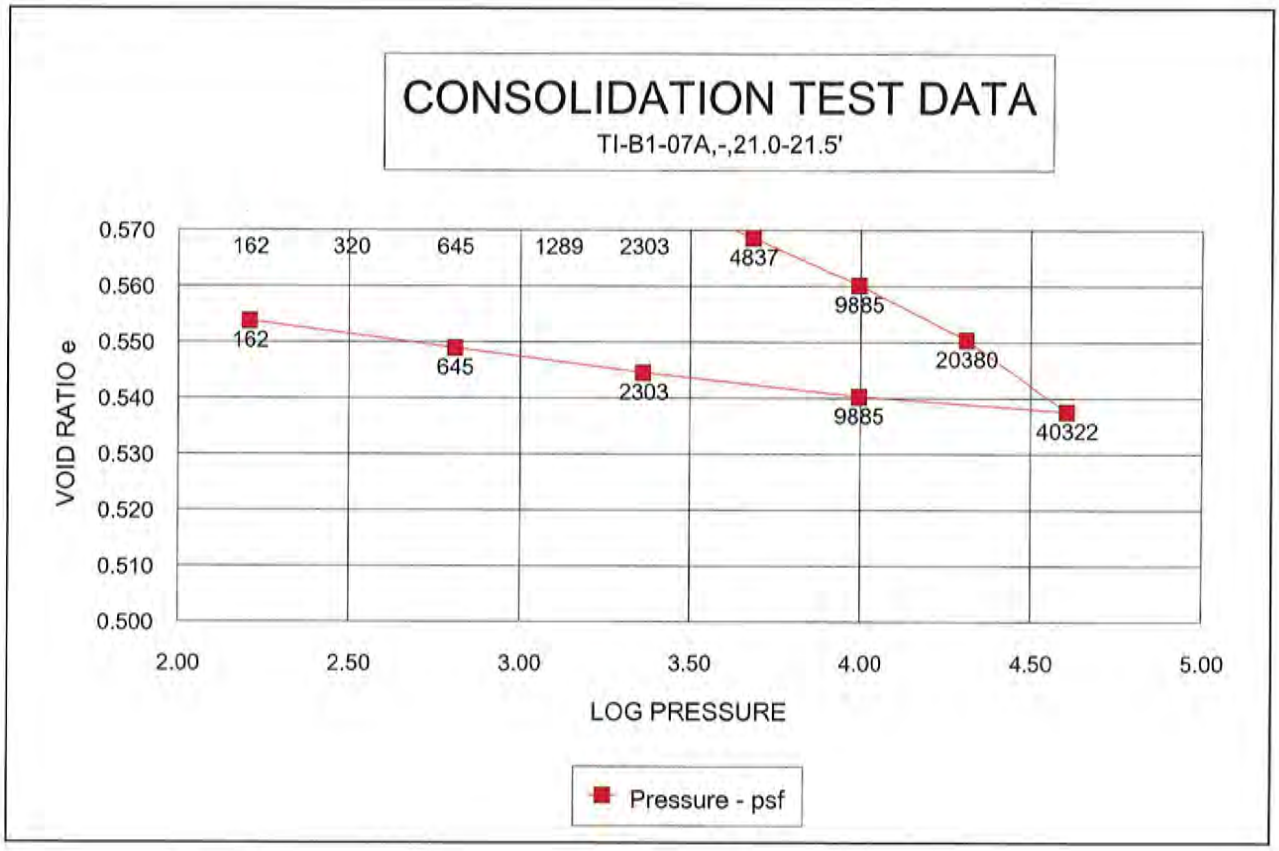
4837 psf Load

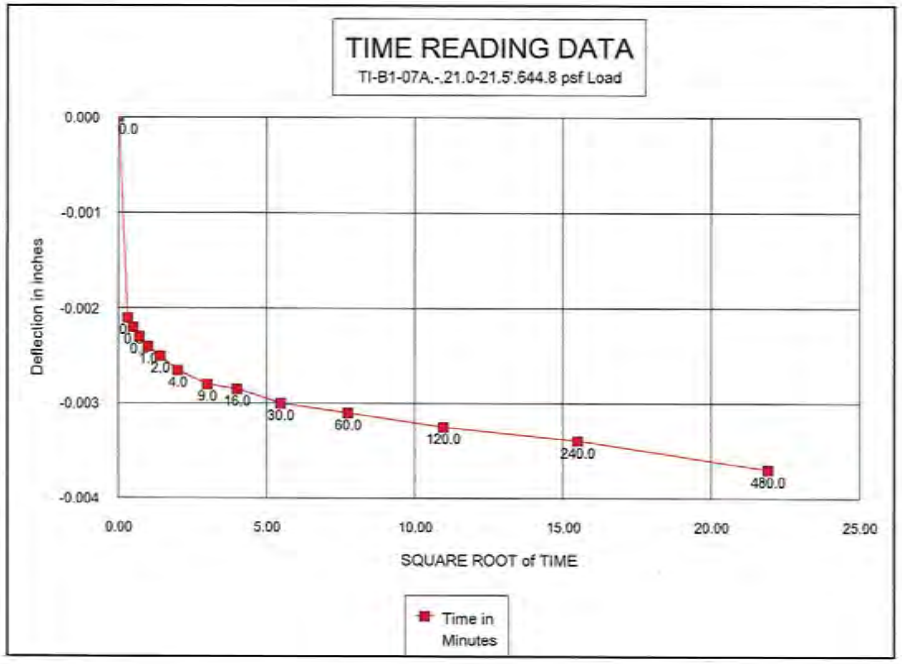
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01740	0.00000
0.1	0.32	0.02135	-0.00395
0.3	0.50	0.02155	-0.00415
0.5	0.71	0.02175	-0.00435
1.0	1.00	0.02195	-0.00455
2.0	1.41	0.02215	-0.00475
4.0	2.00	0.02230	-0.00490
9.0	3.00	0.02255	-0.00515
16.0	4.00	0.02270	-0.00530
30.0	5.48	0.02285	-0.00545
60.0	7.75	0.02300	-0.00560
120.0	10.95	0.02315	-0.00575
240.0	15.49	0.02330	-0.00590
493.0	22.20	0.02350	-0.00610

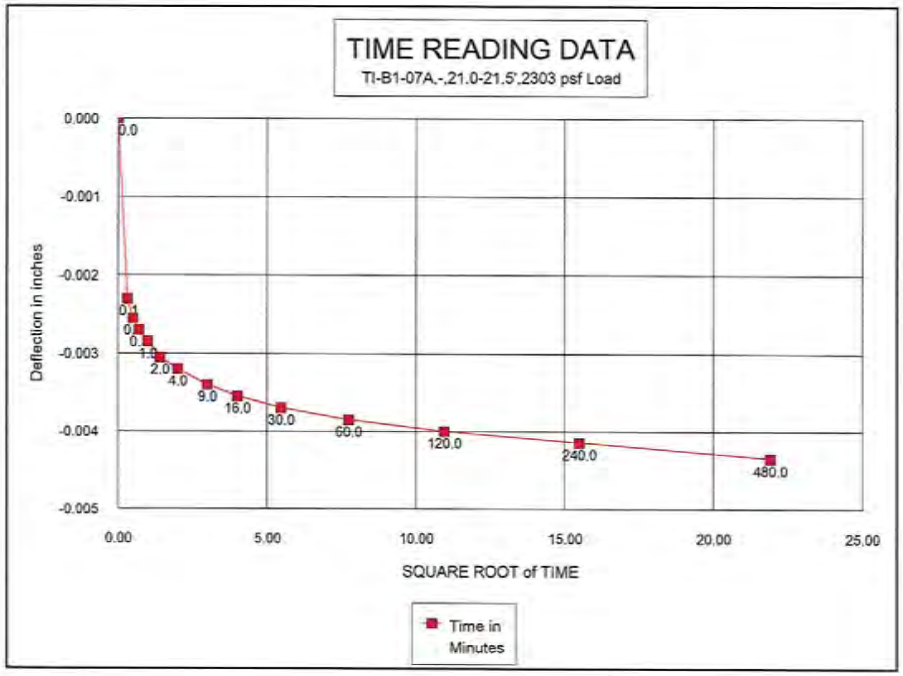
Data entry by: DPM Date: 06/11/2014
Data checked by: KL Date: 6/11/14
FileName: MWC0107A

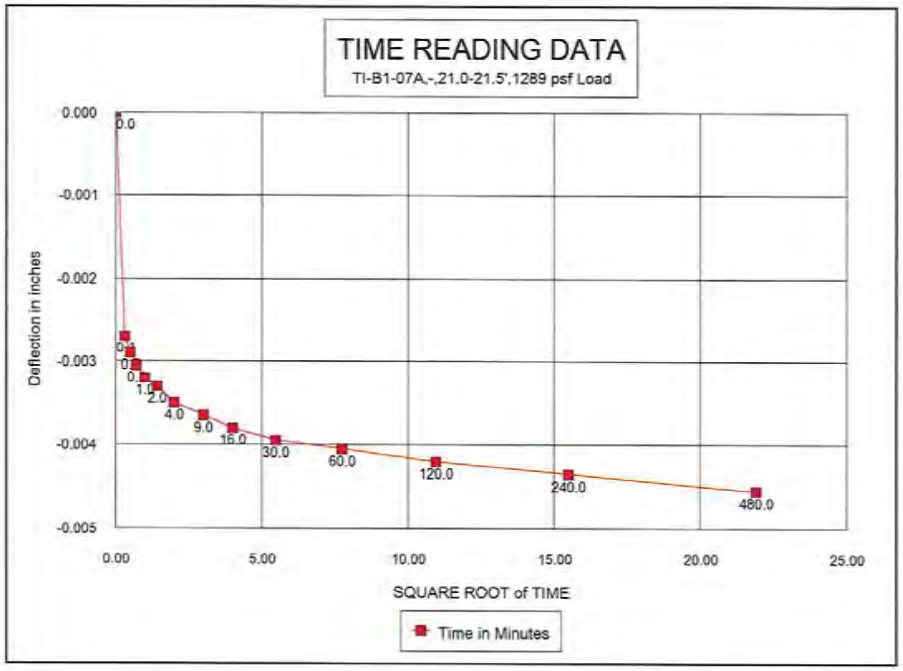
ADVANCED TERRA TESTING, INC. ATT

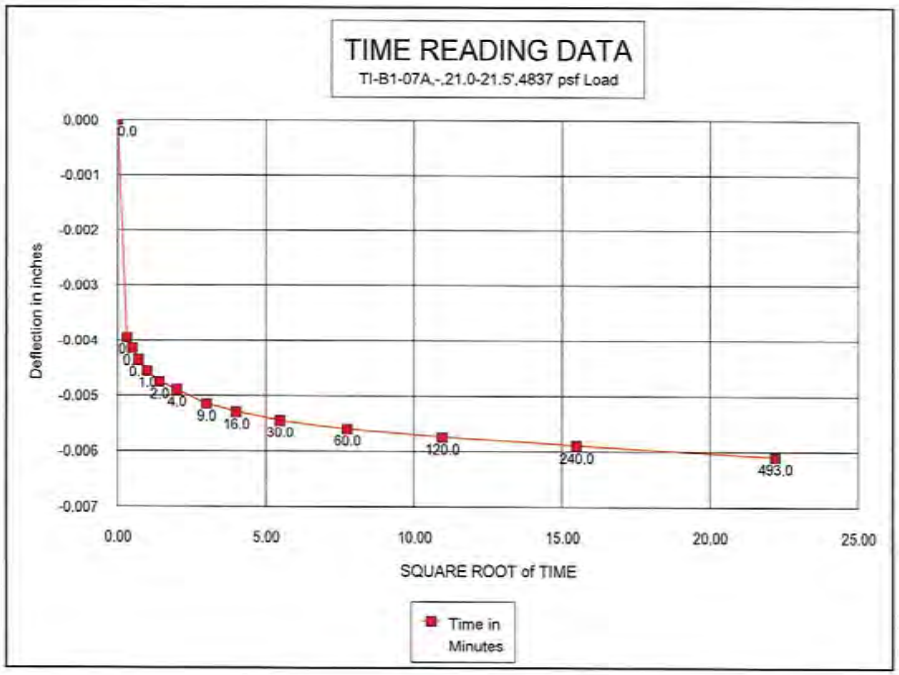

CONSOLIDATION TEST DATA
TI-B1-07A,-,21.0-21.5'
0.000
-0.010
-0.020
-0.030
-0.040
CONSOL (IN./IN.)
162
320
645
1289
2303
4837
9885
20380
40322
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


CONSOLIDATION TEST DATA
TI-B1-07A,-,21.0-21.5'
0.570
0.560
0.550
0.540
0.530
0.520
0.510
0.500
VOID RATIO e
162
320
645
1289
2303
4837
9885
20380
40322
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


TIME READING DATA
TI-B1-07A,-,21.0-21.5',644.8 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-07A,-,21.0-21.5',2303 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-07A,-,21.0-21.5',1289 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-07A,-,21.0-21.5',4837 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-11B	SAMPLED	11/21/13 MWH
DEPTH	30.5-31'	TEST STARTED	02/04/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/13/14 DPM
SOIL DESCR.	Sand Tailings (V. Fine)	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	1.938	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	329.3	335.0
Wt. Ring (s) (g)	248.0	248.0
Wt. Soil (g)	81.3	87.0
Wet Density PCF	105.0	120.7
Wt. Wet Soil & Pan (g)	84.4	90.1
Wt. Dry Soil & Pan (g)	74.0	74.0
Wt. Lost Moisture (g)	10.3	16.1
Wt. of Pan Only (g)	3.1	3.1
Wt. of Dry Soil (g)	70.9	70.9
Moisture Content %	14.6	22.7
Dry Density PCF	91.6	98.4

LOAD (PSF)	CONSOL. (IN.)
168	0.00000
168	-0.00050
321	0.00095
626	0.00405
1241	0.00915
2480	0.01850
4955	0.03315
9861	0.04855
19746	0.06575
39419	0.08765
9861	0.08480
2480	0.07995
626	0.07285
321	0.06920

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	168	2.226	0.0000	0.0000	0.8399
Inundate	168	2.226	-0.0005	0.0005	0.8408
	321	2.506	0.0010	-0.0010	0.8382
	626	2.797	0.0041	-0.0041	0.8325
	1241	3.094	0.0092	-0.0092	0.8231
	2480	3.394	0.0185	-0.0185	0.8059
	4955	3.695	0.0332	-0.0332	0.7789
	9861	3.994	0.0486	-0.0486	0.7506
	19746	4.295	0.0658	-0.0658	0.7189
	39419	4.596	0.0877	-0.0877	0.6786
	9861	3.994	0.0848	-0.0848	0.6839
	2480	3.394	0.0800	-0.0800	0.6928
	626	2.797	0.0729	-0.0729	0.7059
	321	2.506	0.0692	-0.0692	0.7126

% Saturation	46.9
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.380
Init. Ht. Voids (cm)	1.160
Init. Void Ratio	0.8399

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC0111B

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B1-11B	SAMPLED	11/21/13 MWH
DEPTH	30.5-31'	TEST STARTED	02/04/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/13/14 DPM
SOIL DESCR.	Sand Tailings (V. Fine)	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		

TIME READING DATA

1241 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00575	-0.00000
0.1	0.32	0.00920	-0.00345
0.3	0.50	0.00950	-0.00375
0.5	0.71	0.00970	-0.00395
1.0	1.00	0.00995	-0.00420
2.0	1.41	0.01010	-0.00435
4.0	2.00	0.01035	-0.00460
9.0	3.00	0.01055	-0.00480
16.0	4.00	0.01080	-0.00505
30.0	5.48	0.01095	-0.00520
60.0	7.75	0.01110	-0.00535
120.0	10.95	0.01145	-0.00570
240.0	15.49	0.01175	-0.00600
480.0	21.91	0.01210	-0.00635

2480 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01260	0.00000
0.1	0.32	0.01840	-0.00580
0.3	0.50	0.01900	-0.00640
0.5	0.71	0.01935	-0.00675
1.0	1.00	0.01975	-0.00715
2.0	1.41	0.02010	-0.00750
4.0	2.00	0.02045	-0.00785
9.0	3.00	0.02090	-0.00830
16.0	4.00	0.02120	-0.00860
30.0	5.48	0.02150	-0.00890
60.0	7.75	0.02195	-0.00935
120.0	10.95	0.02225	-0.00965
240.0	15.49	0.02260	-0.01000
480.0	21.91	0.02310	-0.01050

4955 psf Load

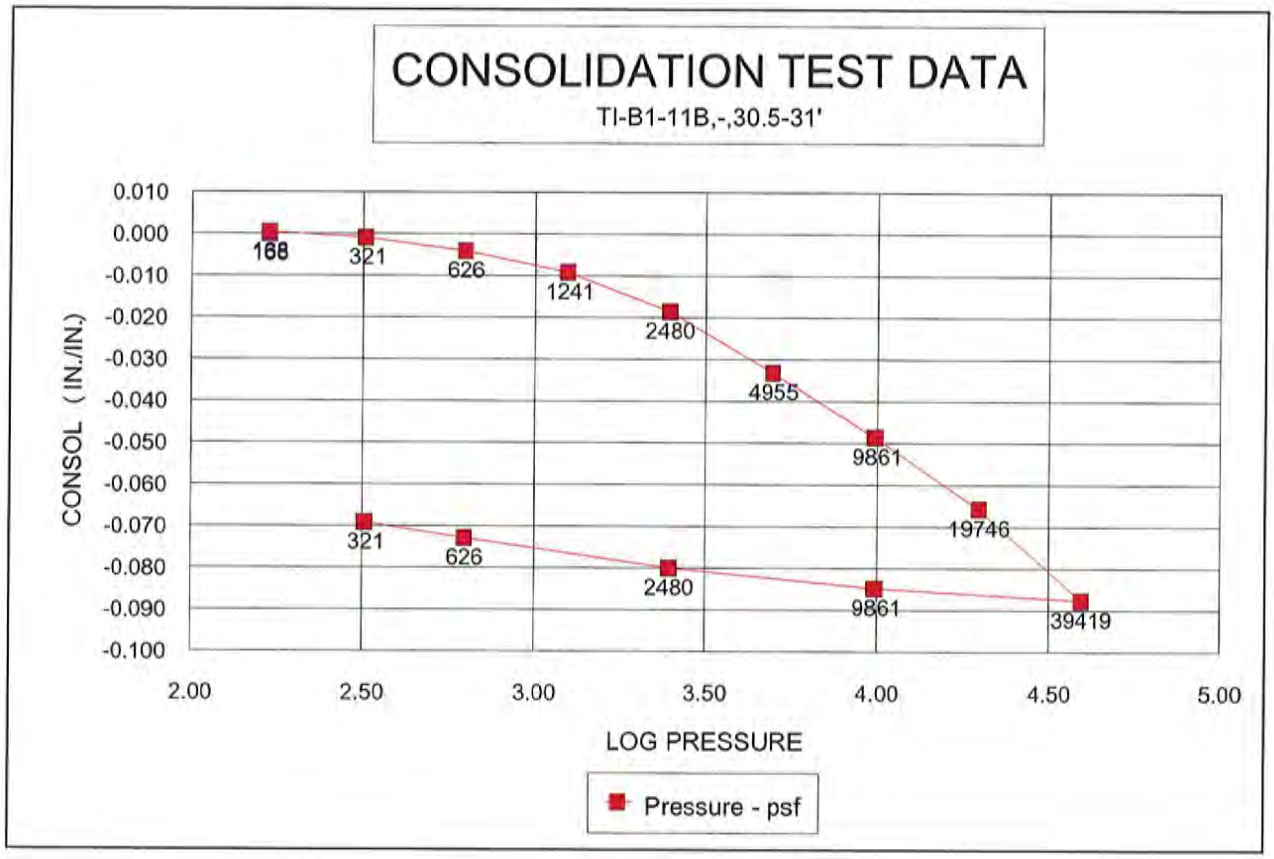
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02390	0.00000
0.1	0.32	0.03255	-0.00865
0.3	0.50	0.03340	-0.00950
0.5	0.71	0.03390	-0.01000
1.0	1.00	0.03445	-0.01055
2.0	1.41	0.03449	-0.01059
4.0	2.00	0.03540	-0.01150
9.0	3.00	0.03595	-0.01205
16.0	4.00	0.03640	-0.01250
30.0	5.48	0.03680	-0.01290
60.0	7.75	0.03725	-0.01335
120.0	10.95	0.03780	-0.01390
240.0	15.49	0.03825	-0.01435
480.0	21.91	0.03875	-0.01485

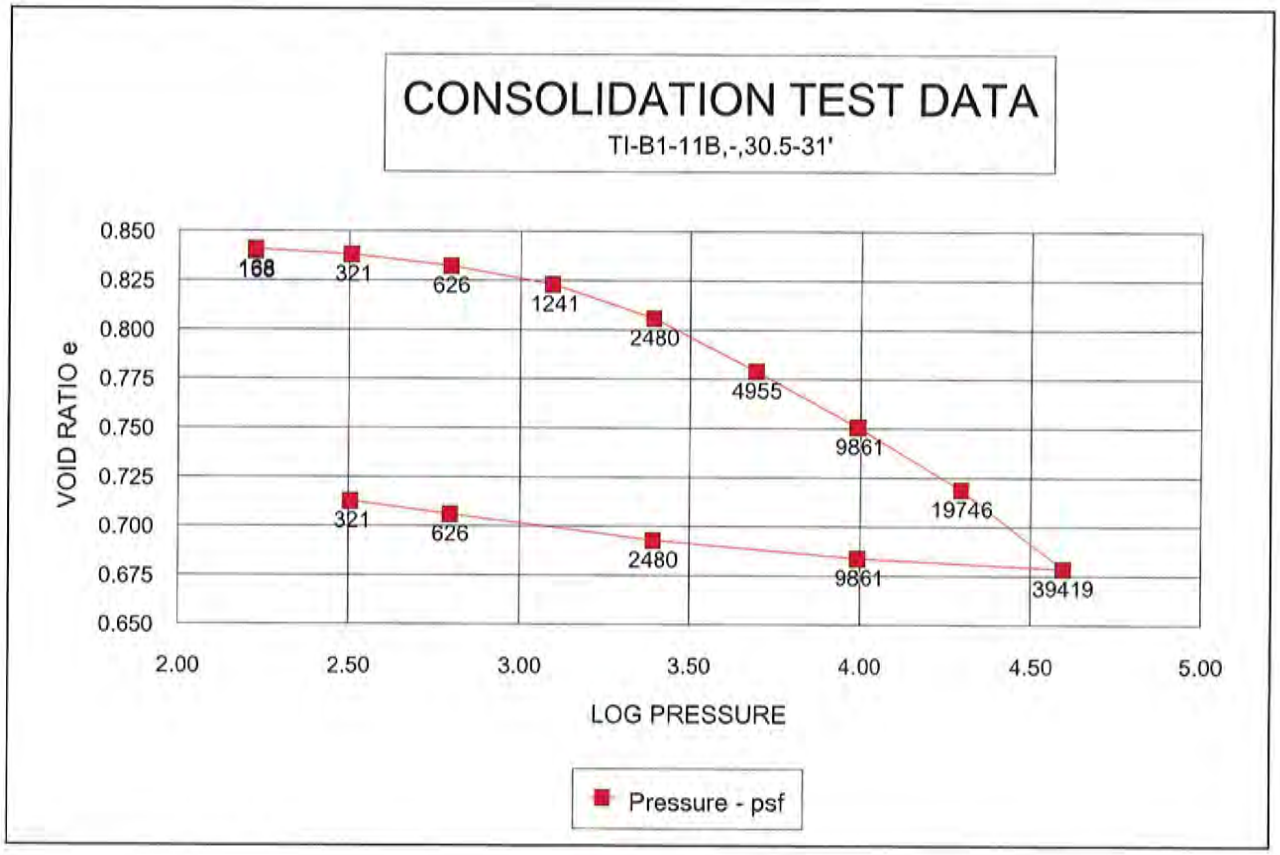
9861 psf Load

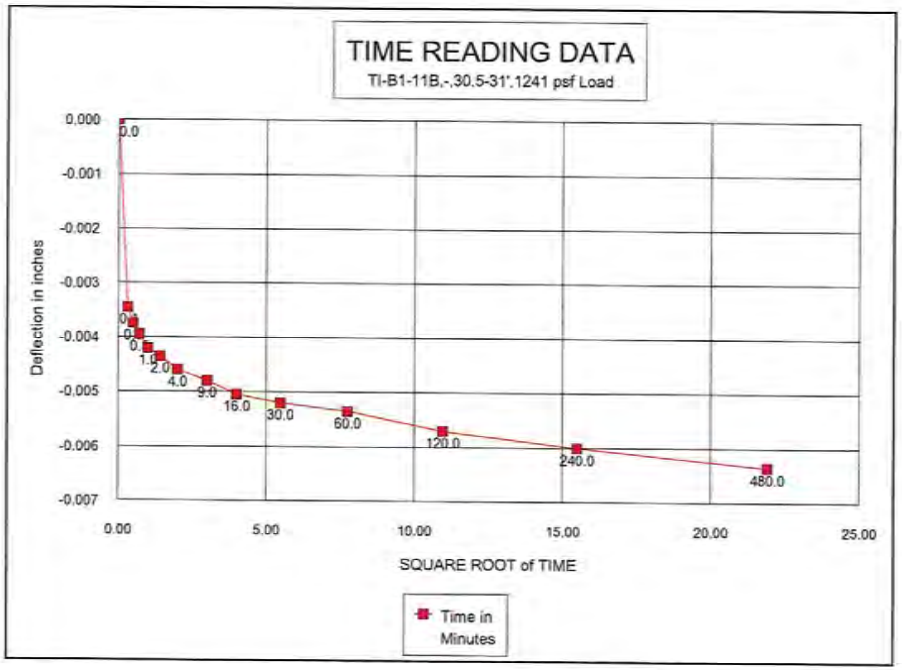
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.04100	0.00000
0.1	0.32	0.05030	-0.00930
0.3	0.50	0.05120	-0.01020
0.5	0.71	0.05180	-0.01080
1.0	1.00	0.05235	-0.01135
2.0	1.41	0.05295	-0.01195
4.0	2.00	0.05350	-0.01250
9.0	3.00	0.05405	-0.01305
16.0	4.00	0.05455	-0.01355
30.0	5.48	0.05500	-0.01400
60.0	7.75	0.05555	-0.01455
120.0	10.95	0.05610	-0.01510
240.0	15.49	0.05665	-0.01565
480.0	21.91	0.05720	-0.01620

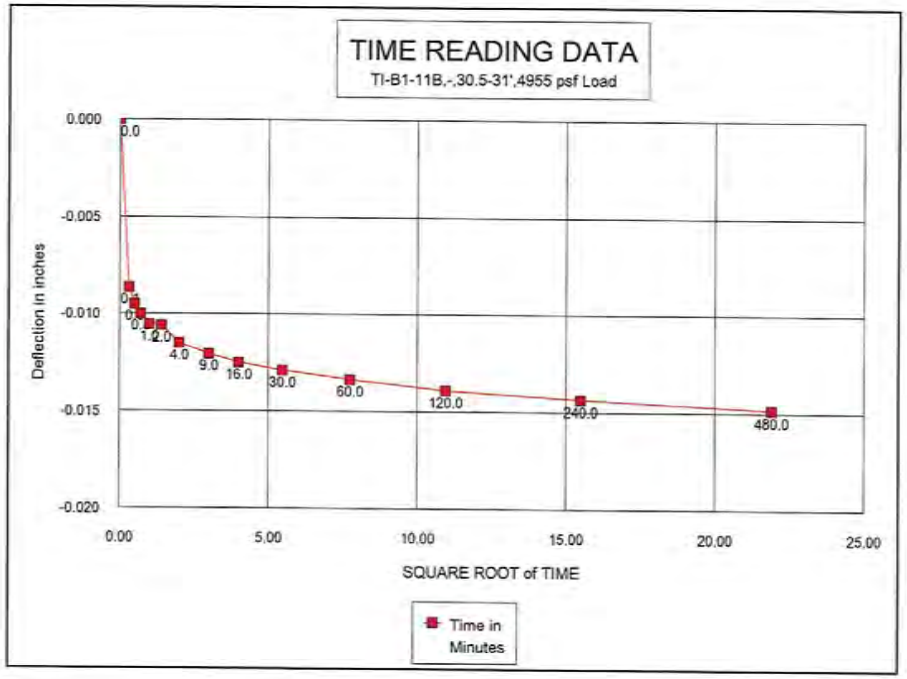
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC0111B

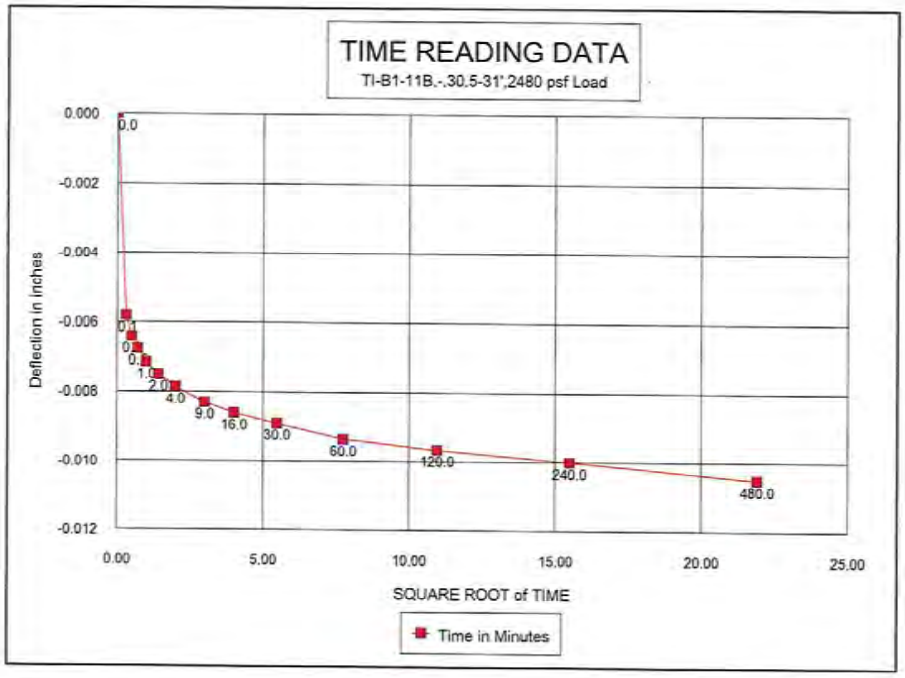
ADVANCED TERRA TESTING, INC. ATT

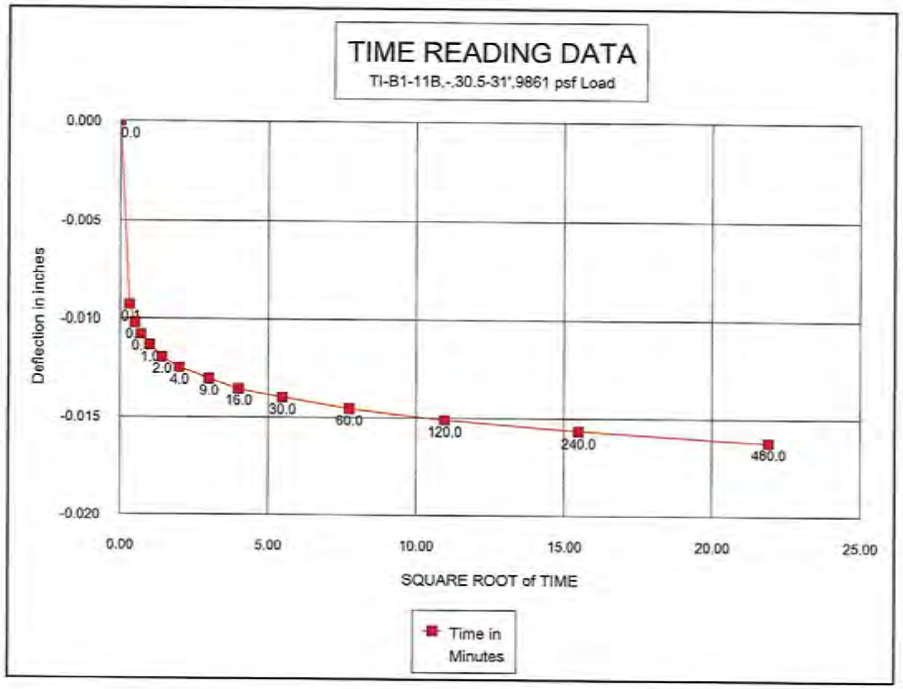

CONSOLIDATION TEST DATA
TI-B1-11B,-,30.5-31'
CONSOL (IN./IN.)
0.010
0.000
-0.010
-0.020
-0.030
-0.040
-0.050
-0.060
-0.070
-0.080
-0.090
-0.100
168
321
626
1241
2480
4955
9861
19746
39419
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


CONSOLIDATION TEST DATA
TI-B1-11B,-,30.5-31'
VOID RATIO e
0.850
0.825
0.800
0.775
0.750
0.725
0.700
0.675
0.650
168
321
626
1241
2480
4955
9861
19746
39419
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


TIME READING DATA
TI-B1-11B,-,30.5-31',1241 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-11B,-,30.5-31',4955 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-11B,-,30.5-31',2480 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-11B,-,30.5-31',9861 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-13A	SAMPLED	11/21/13 MWH
DEPTH	36.0-36.5'	TEST STARTED	02/09/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/20/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	ATT-05
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	1.938	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	334.5	335.2
Wt. Ring (s) (g)	243.3	243.3
Wt. Soil (g)	91.2	91.9
Wet Density PCF	117.8	128.4
Wt. Wet Soil & Pan (g)	95.0	95.7
Wt. Dry Soil & Pan (g)	79.2	79.2
Wt. Lost Moisture (g)	15.8	16.5
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	75.3	75.3
Moisture Content %	21.0	21.9
Dry Density PCF	97.3	105.3

LOAD (PSF)	CONSOL. (IN.)
154	0.00000
154	0.00050
308	0.00400
620	0.00815
1258	0.01380
2548	0.02505
5024	0.03385
10031	0.04550
20015	0.06565
39614	0.08745
10031	0.08575
2548	0.08225
620	0.07735
154	0.07595

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	154	2.187	0.0000	0.0000	0.7323
Inundate	154	2.187	0.0005	-0.0005	0.7315
	308	2.488	0.0040	-0.0040	0.7254
	620	2.792	0.0082	-0.0082	0.7182
	1258	3.100	0.0138	-0.0138	0.7084
	2548	3.406	0.0251	-0.0251	0.6889
	5024	3.701	0.0339	-0.0339	0.6737
	10031	4.001	0.0455	-0.0455	0.6535
	20015	4.301	0.0657	-0.0657	0.6186
	39614	4.598	0.0875	-0.0875	0.5808
	10031	4.001	0.0858	-0.0858	0.5838
	2548	3.406	0.0823	-0.0823	0.5898
	620	2.792	0.0774	-0.0774	0.5983
	154	2.187	0.0760	-0.0760	0.6008

% Saturation	77.5
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.466
Init. Ht. Voids (cm)	1.074
Init. Void Ratio	0.7323

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC0113A

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B1-13A	SAMPLED	11/21/13 MWH
DEPTH	36.0-36.5'	TEST STARTED	02/09/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/20/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	ATT-05
LOCATION	Tailings Impoundment		

TIME READING DATA

620 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00680	-0.00000
0.1	0.32	0.00845	-0.00165
0.3	0.50	0.00865	-0.00185
0.5	0.71	0.00880	-0.00200
1.0	1.00	0.00900	-0.00220
2.0	1.41	0.00915	-0.00235
4.0	2.00	0.00945	-0.00265
9.0	3.00	0.00965	-0.00285
16.0	4.00	0.00980	-0.00300
30.0	5.48	0.01000	-0.00320
60.0	7.75	0.01020	-0.00340
120.0	10.95	0.01035	-0.00355
240.0	15.49	0.01095	-0.00415
480.0	21.91	0.01135	-0.00455

1258 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01180	0.00000
0.1	0.32	0.01400	-0.00220
0.3	0.50	0.01430	-0.00250
0.5	0.71	0.01460	-0.00280
1.0	1.00	0.01490	-0.00310
2.0	1.41	0.01520	-0.00340
4.0	2.00	0.01550	-0.00370
9.0	3.00	0.01595	-0.00415
16.0	4.00	0.01620	-0.00440
30.0	5.48	0.01640	-0.00460
60.0	7.75	0.01670	-0.00490
120.0	10.95	0.01705	-0.00525
240.0	15.49	0.01745	-0.00565
480.0	21.91	0.01810	-0.00630

22548 psf Load

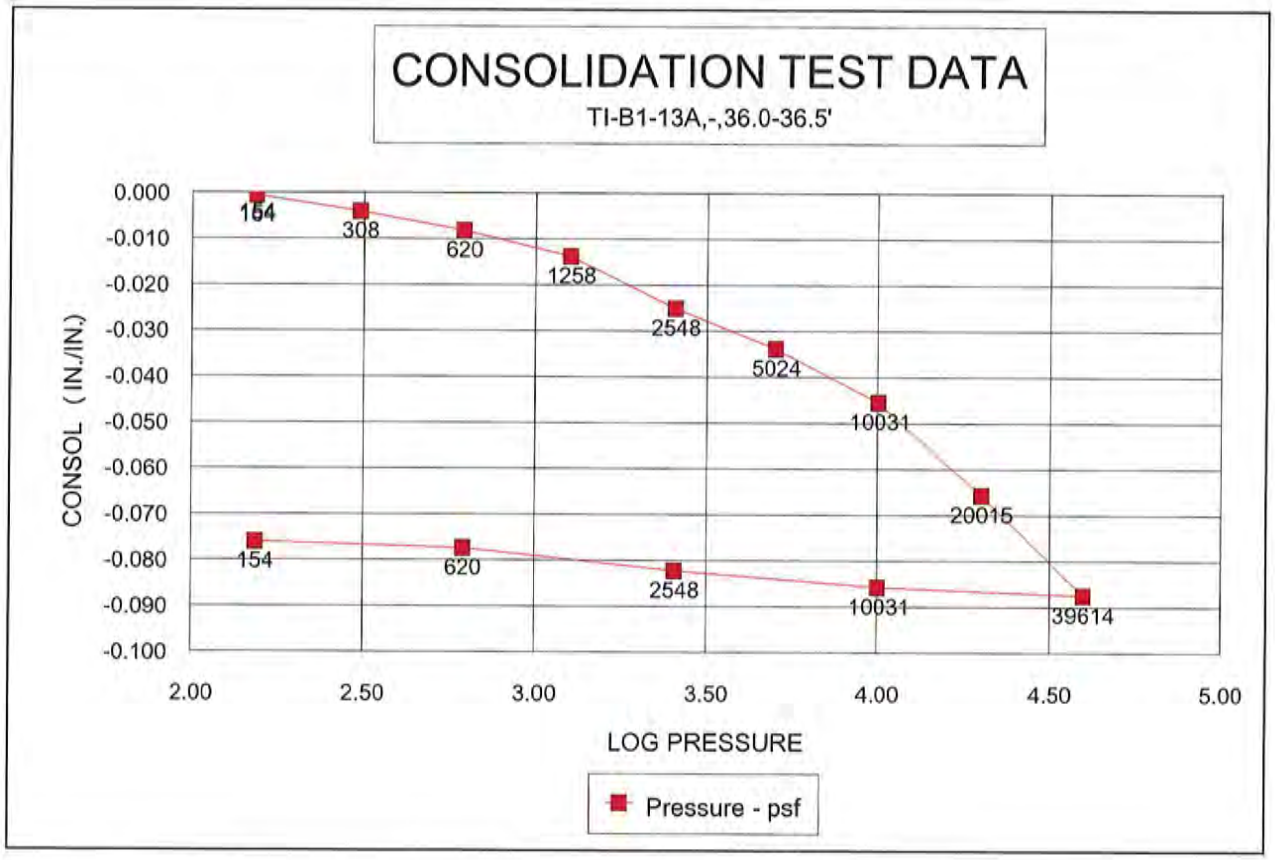
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01870	0.00000
0.1	0.32	0.02235	-0.00365
0.3	0.50	0.02295	-0.00425
0.5	0.71	0.02335	-0.00465
1.0	1.00	0.02395	-0.00525
2.0	1.41	0.02440	-0.00570
4.0	2.00	0.02490	-0.00620
9.0	3.00	0.02545	-0.00675
16.0	4.00	0.02585	-0.00715
30.0	5.48	0.02625	-0.00755
60.0	7.75	0.02670	-0.00800
120.0	10.95	0.02715	-0.00845
240.0	15.49	0.02765	-0.00895
480.0	21.91	0.02840	-0.00970

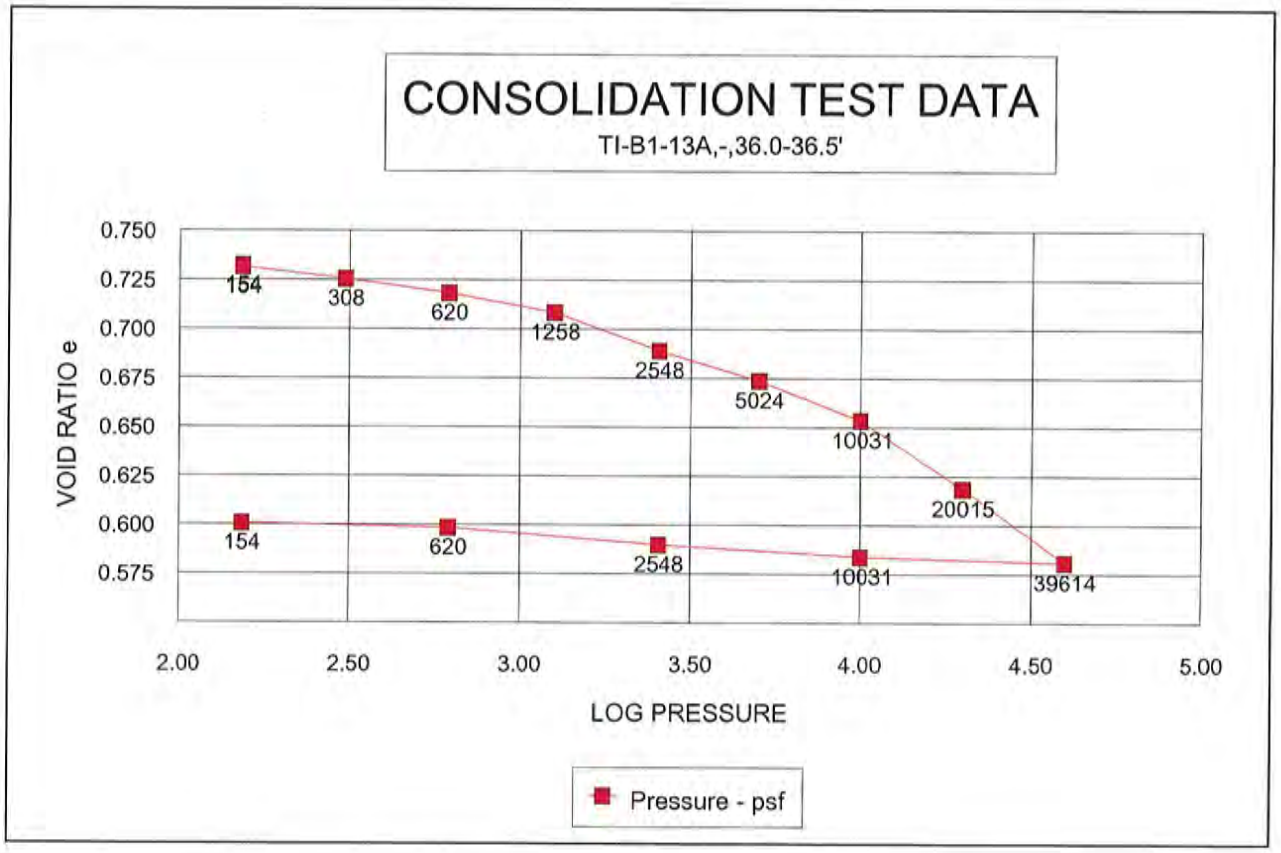
5024 psf Load

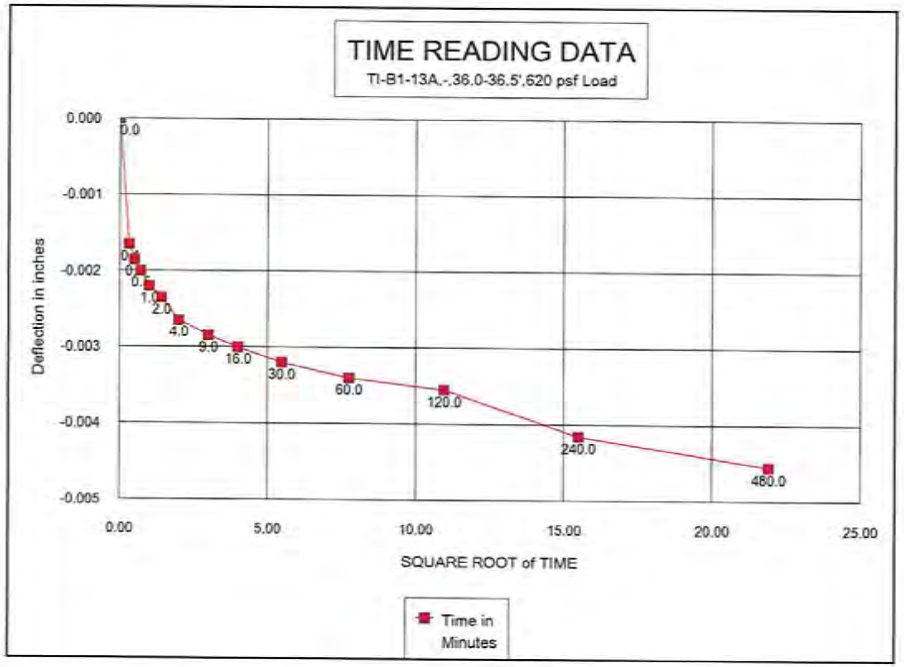
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.03150	0.00000
0.1	0.32	0.03245	-0.00095
0.3	0.50	0.03475	-0.00325
0.5	0.71	0.03520	-0.00370
1.0	1.00	0.03570	-0.00420
2.0	1.41	0.03620	-0.00470
4.0	2.00	0.03680	-0.00530
9.0	3.00	0.03740	-0.00590
16.0	4.00	0.03780	-0.00630
30.0	5.48	0.03830	-0.00680
60.0	7.75	0.03895	-0.00745
120.0	10.95	0.03965	-0.00815
240.0	15.49	0.04040	-0.00890
493.0	22.20	0.04115	-0.00965

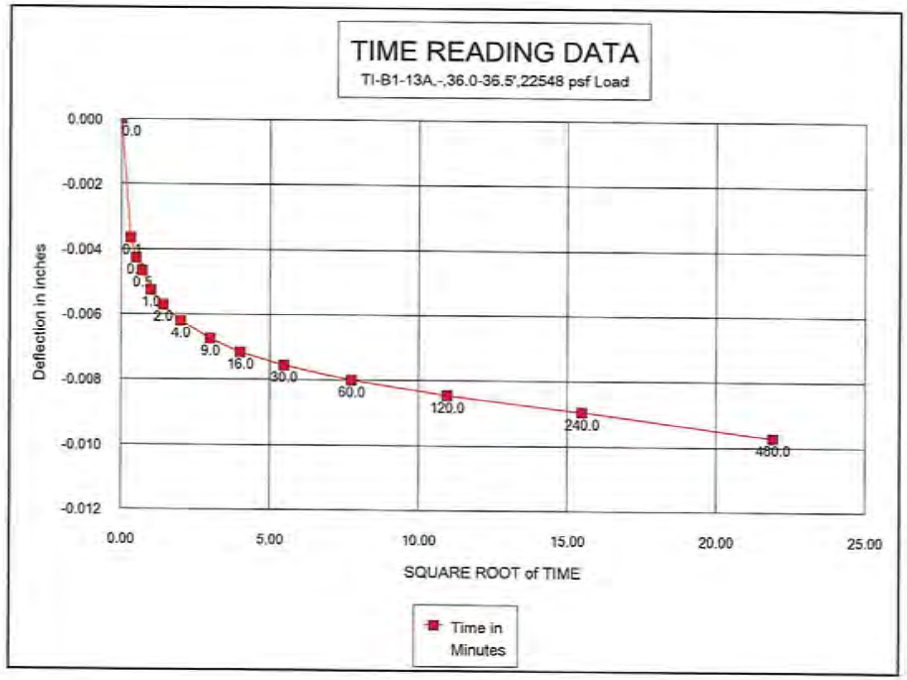
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC0113A

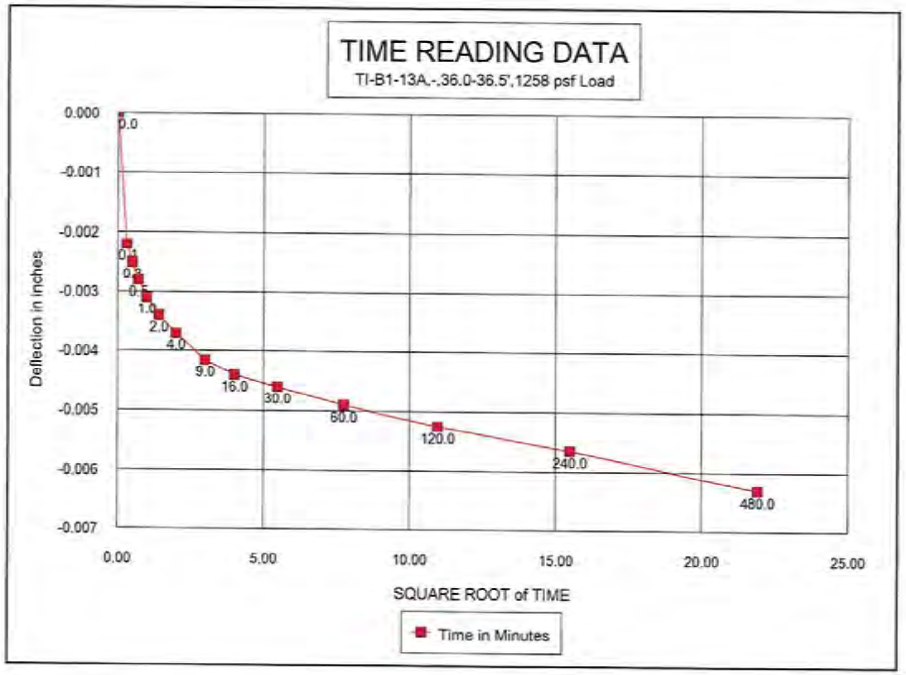
ADVANCED TERRA TESTING, Inc. ATT

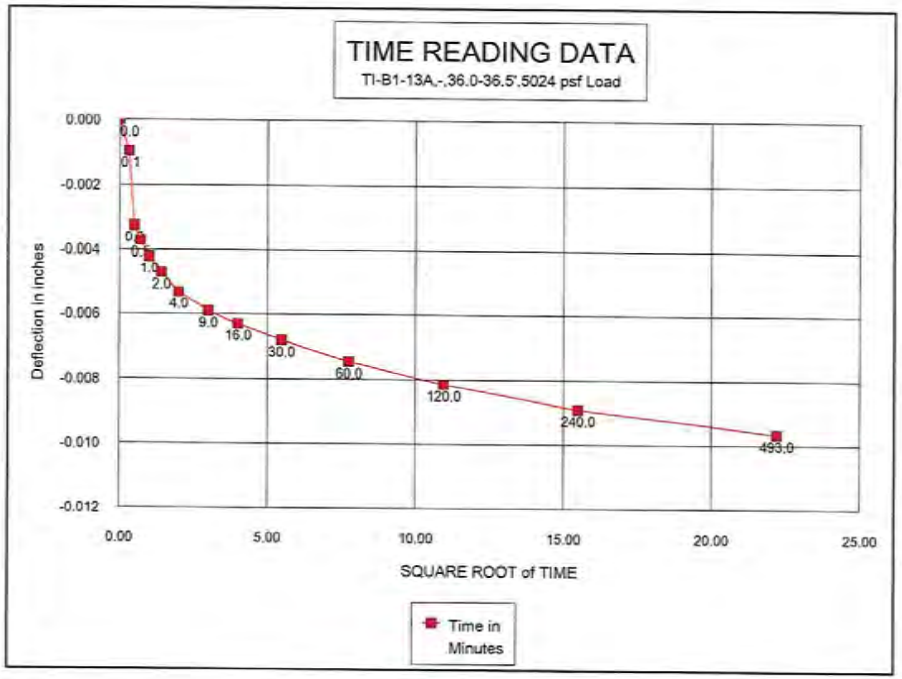

CONSOLIDATION TEST DATA
TI-B1-13A,-,36.0-36.5'
CONSOL (IN./IN.)
0.000
-0.010
-0.020
-0.030
-0.040
-0.050
-0.060
-0.070
-0.080
-0.090
-0.100
154
308
620
1258
2548
5024
10031
20015
154
620
2548
10031
39614
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


CONSOLIDATION TEST DATA
TI-B1-13A,-,36.0-36.5'
VOID RATIO e
0.750
0.725
0.700
0.675
0.650
0.625
0.600
0.575
154
308
620
1258
2548
5024
10031
20015
154
620
2548
10031
39614
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


TIME READING DATA
TI-B1-13A,-,36.0-36.5',620 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-13A,-,36.0-36.5',22548 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-13A,-,36.0-36.5',1258 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-13A,-,36.0-36.5',5024 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B10-02	SAMPLED	11/26/13 MWH
DEPTH	10-11' (10-12.5')	TEST STARTED	02/20/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/01/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	169.1	176.9
Wt. Ring (s) (g)	42.7	42.7
Wt. Soil (g)	126.4	134.2
Wet Density PCF	105.6	127.8
Wt. Wet Soil & Pan (g)	130.2	138.0
Wt. Dry Soil & Pan (g)	119.8	119.8
Wt. Lost Moisture (g)	10.5	18.3
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	116.0	116.0
Moisture Content %	9.0	15.7
Dry Density PCF	96.8	110.4

LOAD (PSF)	CONSOL. (IN.)
104.5	0.00000
104.5	0.00815
206.8	0.02340
417.0	0.04155
833.7	0.05935
1489	0.07405
3128	0.09205
6392	0.10690
13179	0.12195
26075	0.13870
6392	0.13650
1489	0.13305
417.0	0.12845
104.5	0.12325

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	105	2.019	0.0000	0.0000	0.7408
Inundate	105	2.019	0.0082	-0.0082	0.7266
	207	2.316	0.0234	-0.0234	0.7001
	417	2.620	0.0416	-0.0416	0.6685
	834	2.921	0.0594	-0.0594	0.6375
	1489	3.173	0.0741	-0.0741	0.6119
	3128	3.495	0.0921	-0.0921	0.5805
	6392	3.806	0.1069	-0.1069	0.5547
	13179	4.120	0.1220	-0.1220	0.5285
	26075	4.416	0.1387	-0.1387	0.4993
	6392	3.806	0.1365	-0.1365	0.5032
	1489	3.173	0.1331	-0.1331	0.5092
	417	2.620	0.1285	-0.1285	0.5172
	105	2.019	0.1233	-0.1233	0.5262

% Saturation	32.9
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.459
Init. Ht. Voids (cm)	1.081
Init. Void Ratio	0.7408

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01002

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B10-02	SAMPLED	11/26/13 MWH
DEPTH	10-11' (10-12.5')	TEST STARTED	02/20/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/01/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		

TIME READING DATA

417 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02405	-0.00000
0.1	0.32	0.03170	-0.00765
0.3	0.50	0.03330	-0.00925
0.5	0.71	0.03430	-0.01025
1.0	1.00	0.03530	-0.01125
2.0	1.41	0.03610	-0.01205
4.0	2.00	0.03695	-0.01290
9.0	3.00	0.03785	-0.01380
16.0	4.00	0.03845	-0.01440
30.0	5.48	0.03905	-0.01500
60.0	7.75	0.03970	-0.01565
120.0	10.95	0.04030	-0.01625
240.0	15.49	0.04085	-0.01680
480.0	21.91	0.04150	-0.01745

833.7 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.04325	0.00000
0.1	0.32	0.05250	-0.00925
0.3	0.50	0.05360	-0.01035
0.5	0.71	0.05460	-0.01135
1.0	1.00	0.05540	-0.01215
2.0	1.41	0.05630	-0.01305
4.0	2.00	0.05710	-0.01385
9.0	3.00	0.05805	-0.01480
16.0	4.00	0.05860	-0.01535
30.0	5.48	0.05920	-0.01595
60.0	7.75	0.05985	-0.01660
120.0	10.95	0.06045	-0.01720
240.0	15.49	0.06105	-0.01780
480.0	21.91	0.06175	-0.01850

1489 psf Load

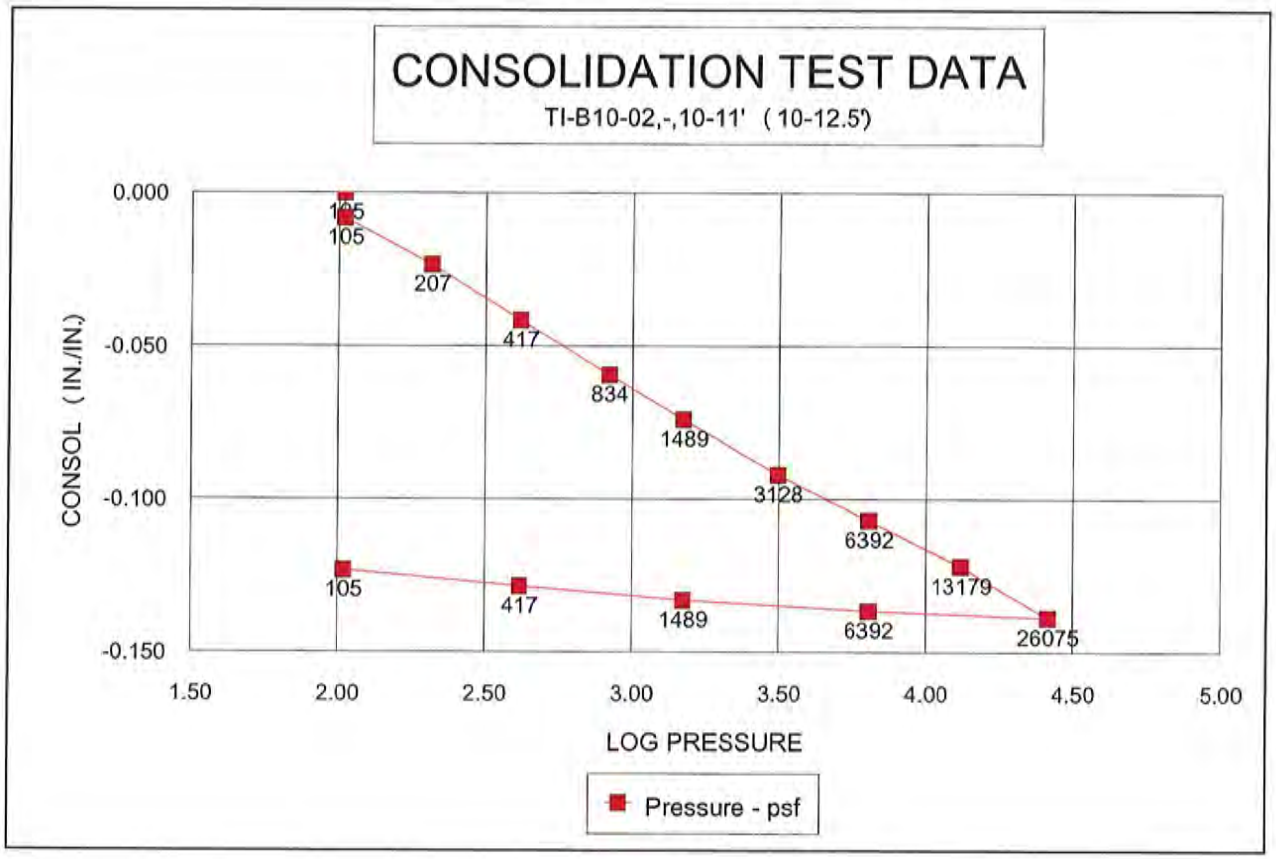
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.06255	0.00000
0.1	0.32	0.06935	-0.00680
0.3	0.50	0.07035	-0.00780
0.5	0.71	0.07115	-0.00860
1.0	1.00	0.07190	-0.00935
2.0	1.41	0.07260	-0.01005
4.0	2.00	0.07335	-0.01080
9.0	3.00	0.07410	-0.01155
16.0	4.00	0.07465	-0.01210
30.0	5.48	0.07520	-0.01265
60.0	7.75	0.07580	-0.01325
120.0	10.95	0.07635	-0.01380
240.0	15.49	0.07695	-0.01440
480.0	21.91	0.07760	-0.01505

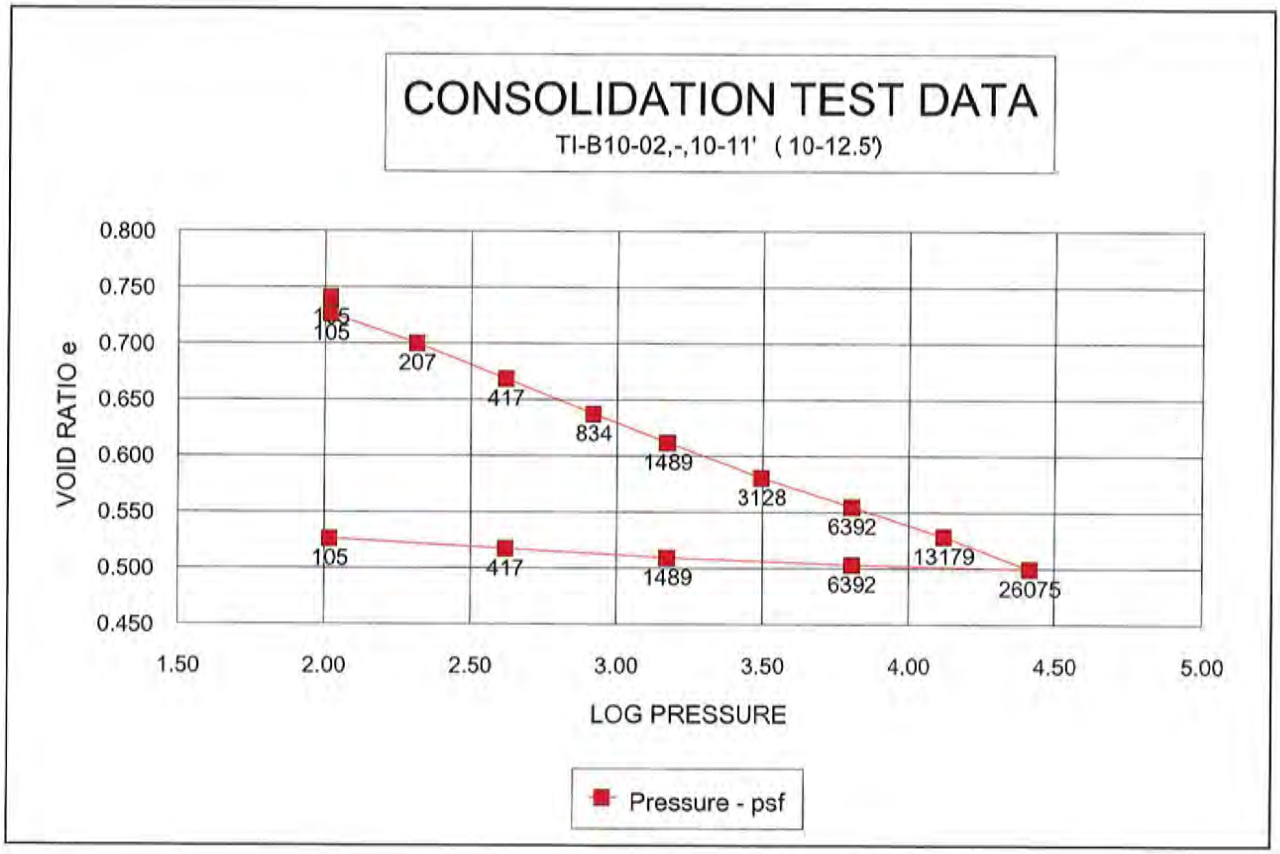
3128 psf Load

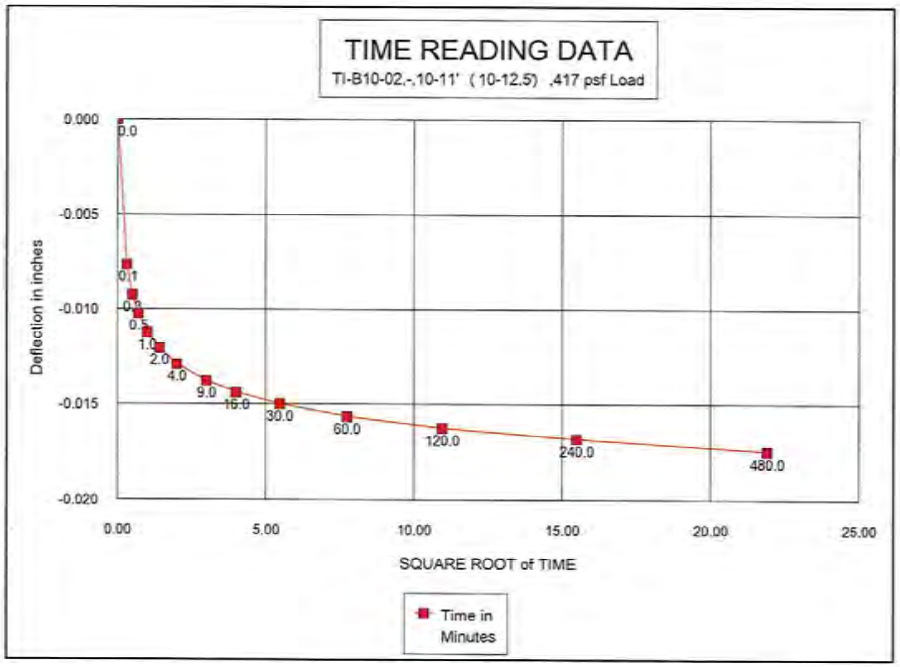
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.07845	0.00000
0.1	0.32	0.08990	-0.01145
0.3	0.50	0.09100	-0.01255
0.5	0.71	0.09165	-0.01320
1.0	1.00	0.09240	-0.01395
2.0	1.41	0.09305	-0.01460
4.0	2.00	0.09360	-0.01515
9.0	3.00	0.09425	-0.01580
16.0	4.00	0.09470	-0.01625
30.0	5.48	0.09520	-0.01675
60.0	7.75	0.09575	-0.01730
120.0	10.95	0.09625	-0.01780
240.0	15.49	0.09670	-0.01825
480.0	21.91	0.09730	-0.01885

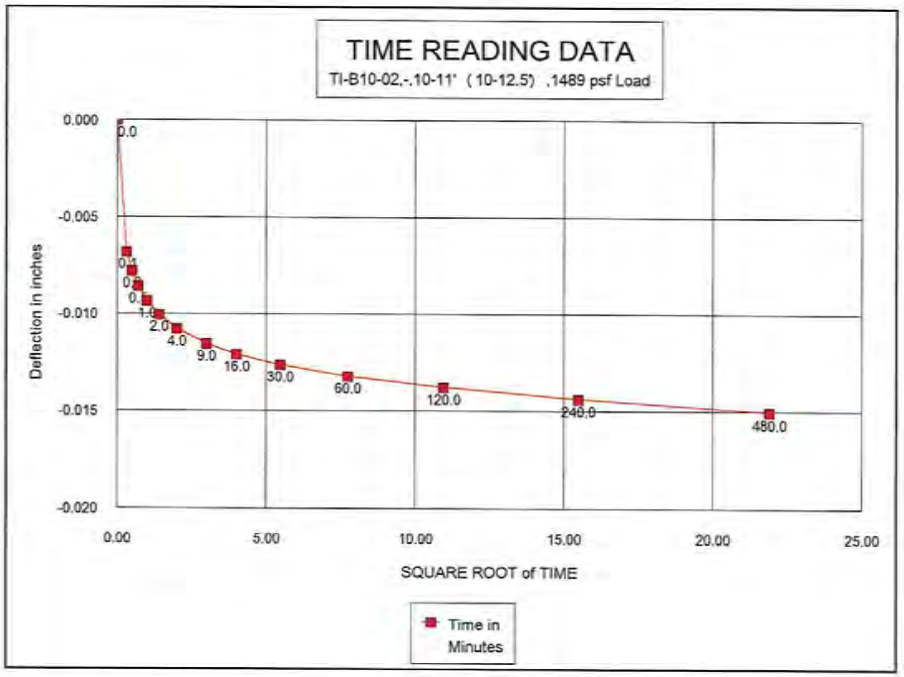
Data entry by: DPM Date: 06/11/2014
Data checked by: KL Date: 6/11/14
FileName: MWC01002

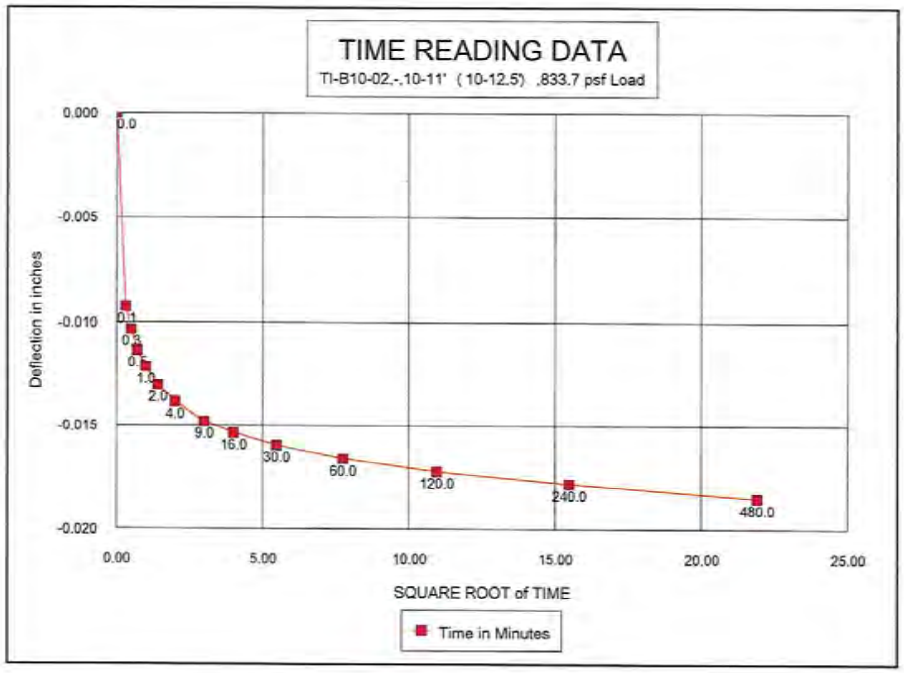
ADVANCED TERRA TESTING, INC. ATT

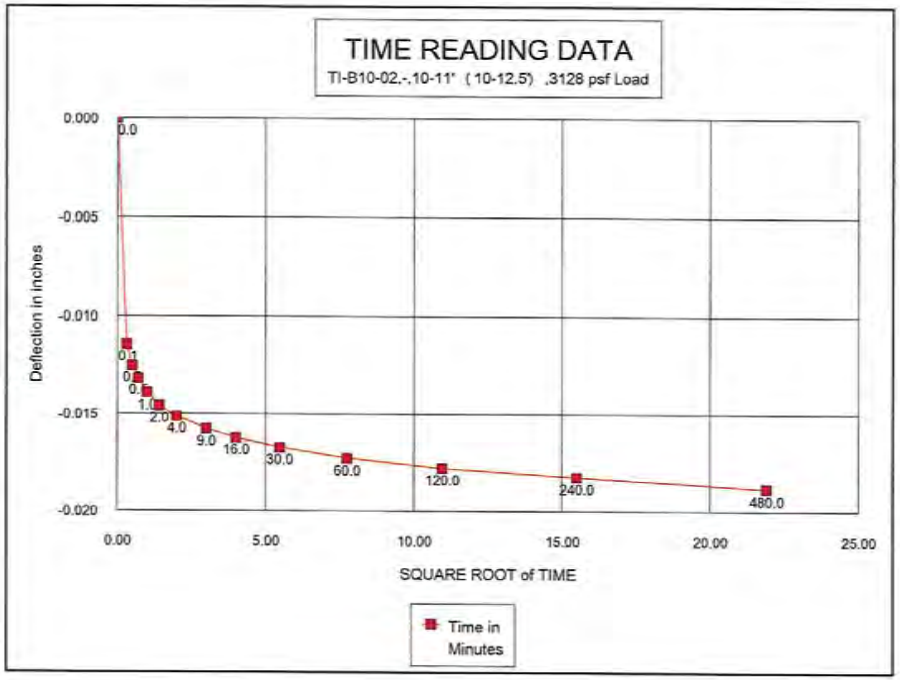

CONSOLIDATION TEST DATA
TI-B10-02,-,10-11' (10-12.5')
CONSOL (IN./IN.)
0.000
-0.050
-0.100
-0.150
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
105
207
417
834
1489
3128
6392
13179
26075
Pressure - psf


CONSOLIDATION TEST DATA
TI-B10-02,-,10-11' (10-12.5')
VOID RATIO e
0.800
0.750
0.700
0.650
0.600
0.550
0.500
0.450
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
105
207
417
834
1489
3128
6392
13179
26075
Pressure - psf


TIME READING DATA
TI-B10-02,-,10-11' (10-12.5) ,417 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
-0.020
0.0
0.1
0.3
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-02,-,10-11' (10-12.5) ,1489 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
-0.020
0.0
0.1
0.3
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-02,-,10-11' (10-12.5) ,833.7 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
-0.020
0.0
0.1
0.3
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-02,-,10-11' (10-12.5) ,3128 psf Load
Deflection in inches
0.000
-0.005
-0.010
-0.015
-0.020
0.0
0.1
0.3
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B10-14	SAMPLED	11/26/13 MWH
DEPTH	40.0-41.0' (40-42.5')	TEST STARTED	02/20/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/03/14 DPM
SOIL DESCR.	Clayey Silt Tailings	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	174.4	164.5	108.9	0.00000
Wt. Ring (s) (g)	43.1	43.1	108.9	-0.00090
Wt. Soil (g)	131.3	121.4	207.4	-0.00145
Wet Density PCF	109.7	115.9	405.0	-0.00160
			802.8	0.00110
Wt. Wet Soil & Pan (g)	135.2	125.2	1604	0.00975
Wt. Dry Soil & Pan (g)	91.6	91.6	3204	0.02755
Wt. Lost Moisture (g)	43.6	33.7	6377	0.04930
Wt. of Pan Only (g)	3.8	3.8	12796	0.10995
Wt. of Dry Soil (g)	87.7	87.7	25491	0.18255
Moisture Content %	49.7	38.4	6377	0.17045
Dry Density PCF	73.3	83.8	1604	0.14115
			802.8	0.12540

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	109	2.037	0.0000	0.0000	1.3009
Inundate	109	2.037	-0.0009	0.0009	1.3030
	207	2.317	-0.0015	0.0015	1.3042
	405	2.607	-0.0016	0.0016	1.3046
	803	2.905	0.0011	-0.0011	1.2984
	1604	3.205	0.0098	-0.0098	1.2785
	3204	3.506	0.0276	-0.0276	1.2375
	6377	3.805	0.0493	-0.0493	1.1875
	12796	4.107	0.1100	-0.1100	1.0479
	25491	4.406	0.1826	-0.1826	0.8809
	6377	3.805	0.1705	-0.1705	0.9087
	1604	3.205	0.1412	-0.1412	0.9761
	803	2.905	0.1254	-0.1254	1.0124

% Saturation	103.1
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.104
Init. Ht. Voids (cm)	1.436
Init. Void Ratio	1.3009

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01014

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B10-14	SAMPLED	11/26/13 MWH
DEPTH	40.0-41.0' (40-42.5')	TEST STARTED	02/20/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/03/14 DPM
SOIL DESCR.	Clayey Silt Tailings	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		

TIME READING DATA

1604 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00455	-0.00000
0.1	0.32	0.00655	-0.00200
0.3	0.50	0.00700	-0.00245
0.5	0.71	0.00745	-0.00290
1.0	1.00	0.00800	-0.00345
2.0	1.41	0.00880	-0.00425
4.0	2.00	0.00965	-0.00510
9.0	3.00	0.01065	-0.00610
16.0	4.00	0.01135	-0.00680
30.0	5.48	0.01180	-0.00725
60.0	7.75	0.01235	-0.00780
120.0	10.95	0.01280	-0.00825
240.0	15.49	0.01315	-0.00860
480.0	21.91	0.01380	-0.00925

3204 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01515	0.00000
0.1	0.32	0.01760	-0.00245
0.3	0.50	0.01850	-0.00335
0.5	0.71	0.01950	-0.00435
1.0	1.00	0.02090	-0.00575
2.0	1.41	0.02280	-0.00765
4.0	2.00	0.02520	-0.01005
9.0	3.00	0.02830	-0.01315
16.0	4.00	0.02990	-0.01475
30.0	5.48	0.03100	-0.01585
60.0	7.75	0.03190	-0.01675
120.0	10.95	0.03255	-0.01740
240.0	15.49	0.03320	-0.01805
480.0	21.91	0.03410	-0.01895

6377 psf Load

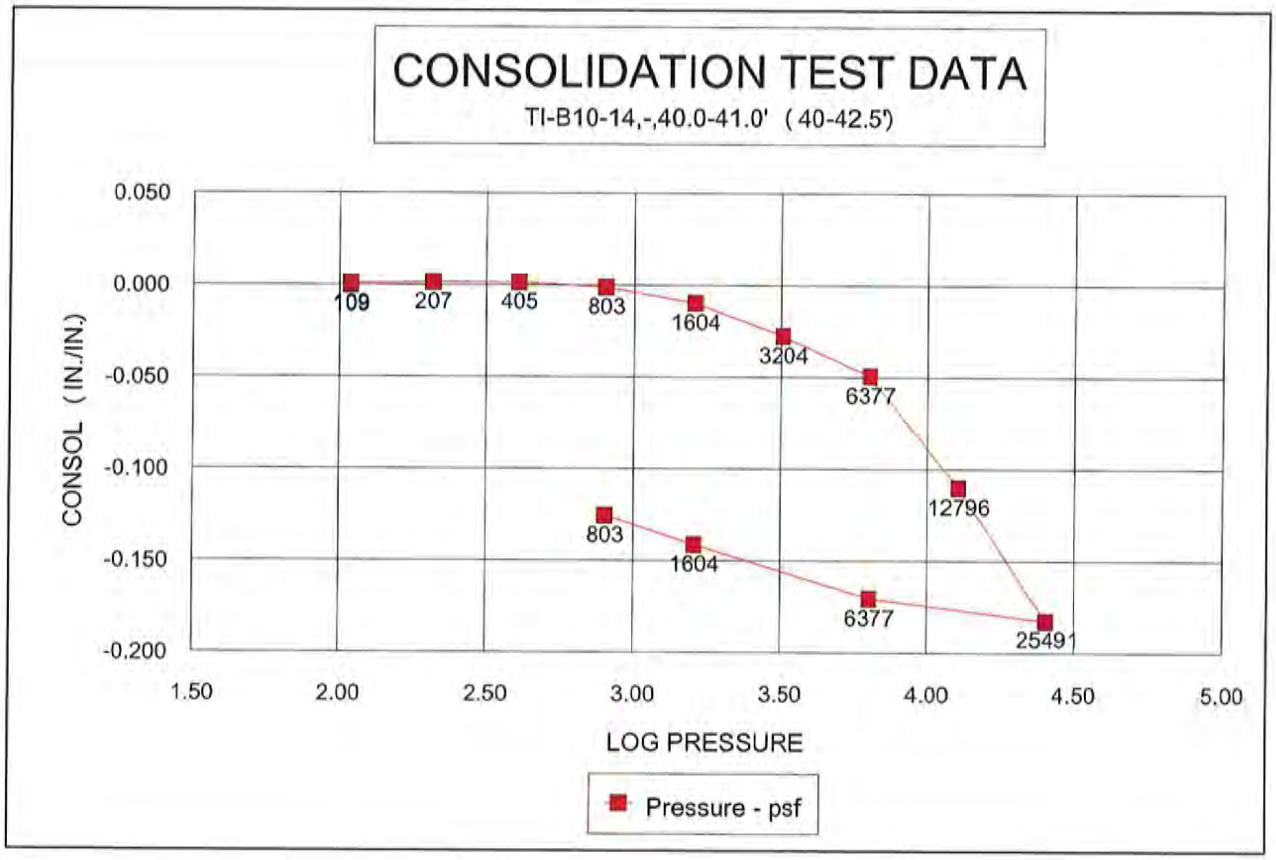
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.03540	0.00000
0.1	0.32	0.03860	-0.00320
0.3	0.50	0.03985	-0.00445
0.5	0.71	0.04125	-0.00585
1.0	1.00	0.04295	-0.00755
2.0	1.41	0.04535	-0.00995
4.0	2.00	0.04800	-0.01260
9.0	3.00	0.05080	-0.01540
16.0	4.00	0.05215	-0.01675
30.0	5.48	0.05320	-0.01780
60.0	7.75	0.05415	-0.01875
120.0	10.95	0.05501	-0.01961
240.0	15.49	0.05610	-0.02070
480.0	21.91	0.05740	-0.02200

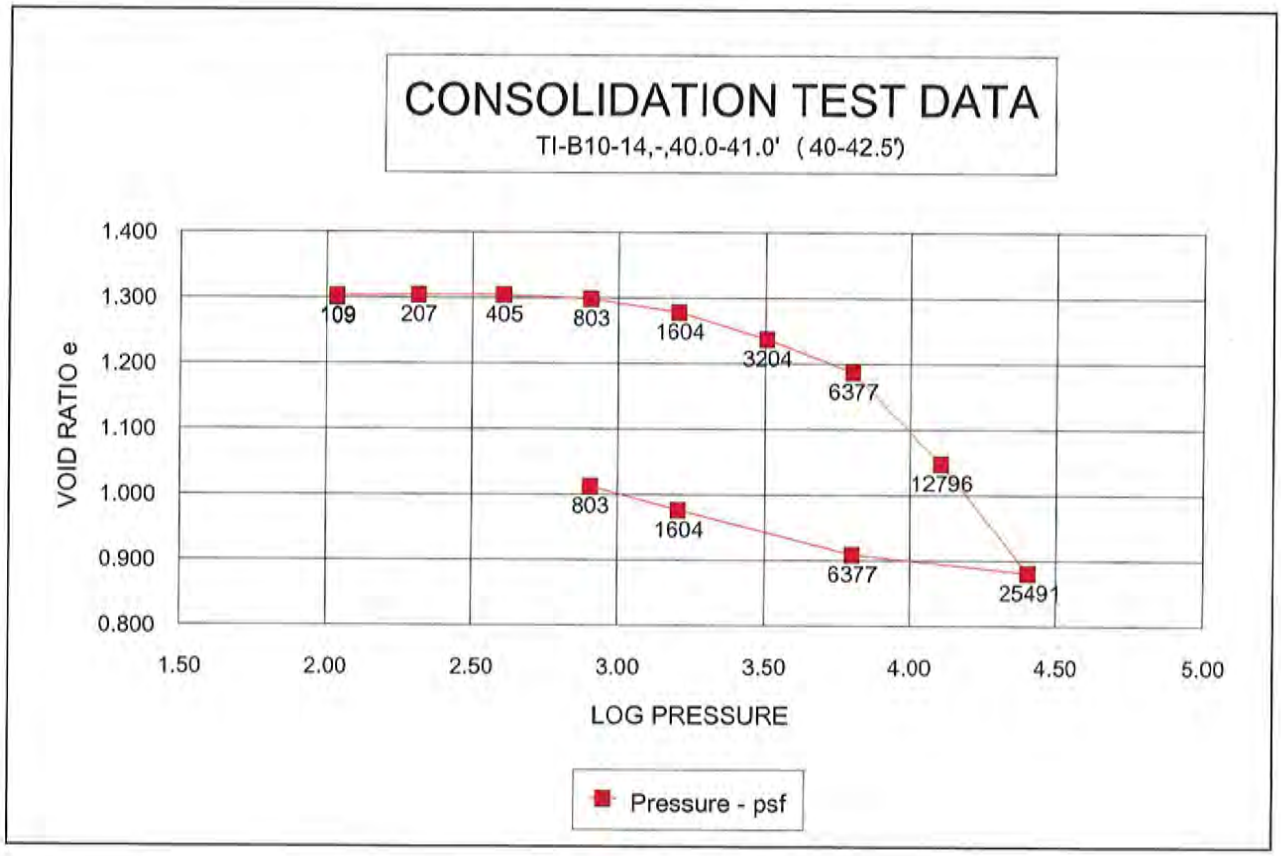
12769 psf Load

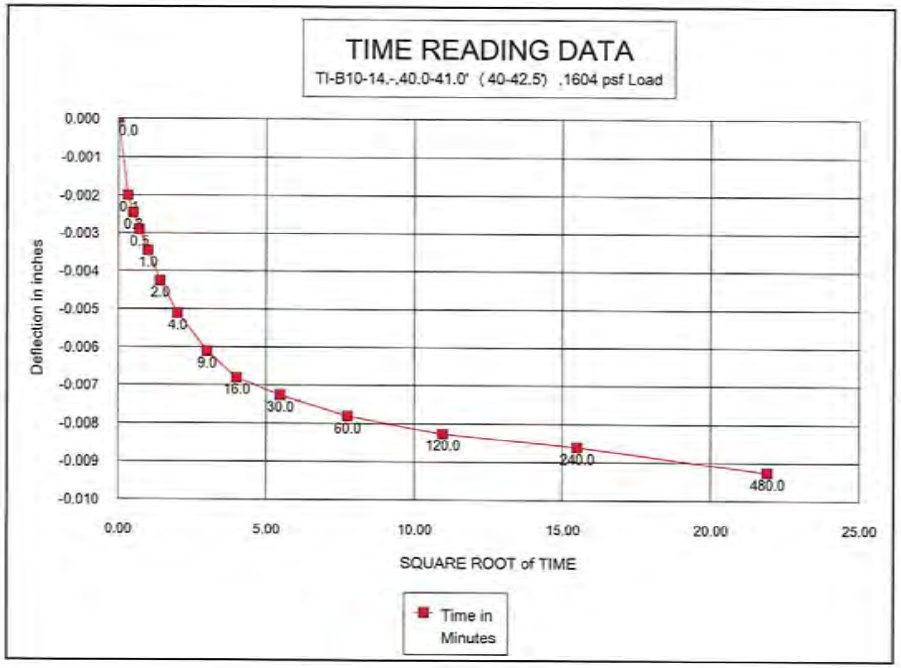
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.05895	0.00000
0.1	0.32	0.06405	-0.00510
0.3	0.50	0.06615	-0.00720
0.5	0.71	0.06840	-0.00945
1.0	1.00	0.07195	-0.01300
2.0	1.41	0.07695	-0.01800
4.0	2.00	0.08380	-0.02485
9.0	3.00	0.09495	-0.03600
16.0	4.00	0.10035	-0.04140
30.0	5.48	0.10520	-0.04625
60.0	7.75	0.10960	-0.05065
120.0	10.95	0.11240	-0.05345
240.0	15.49	0.11435	-0.05540
480.0	21.91	0.11695	-0.05800

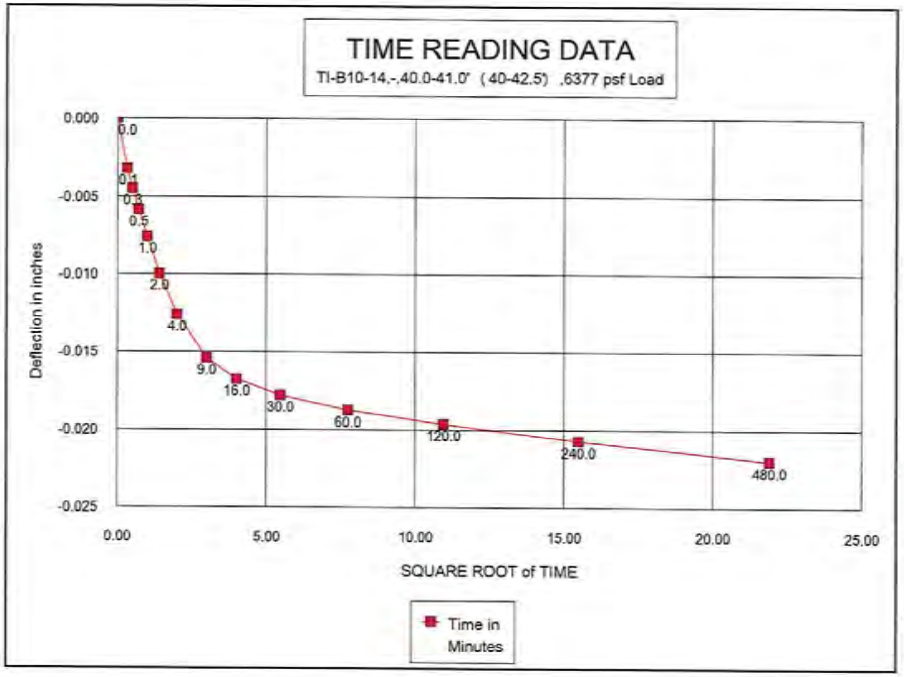
Data entry by: DPM Date: 06/11/2014
Data checked by: KA Date: 6/11/14
FileName: MWC01014

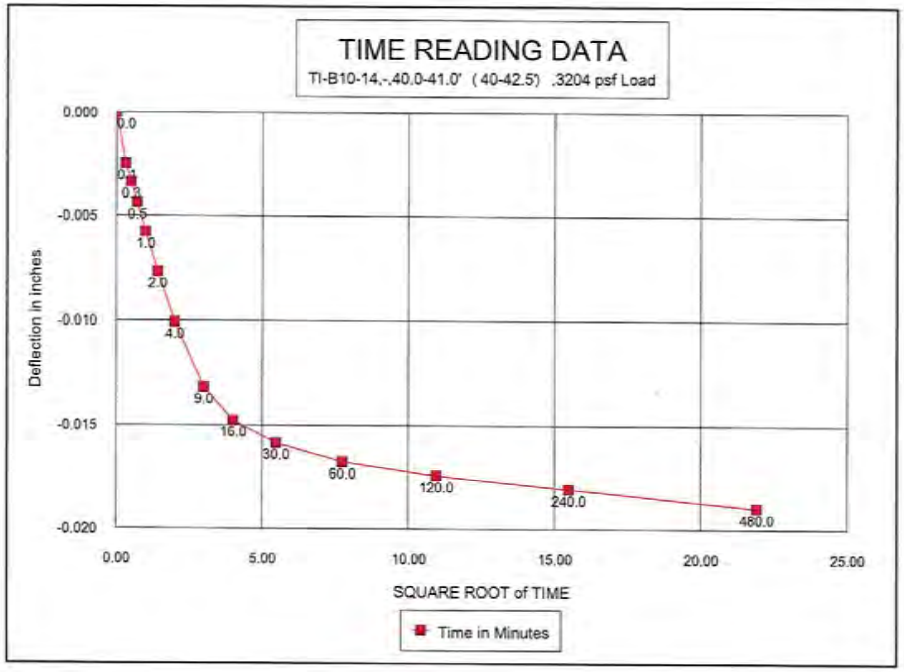
ADVANCED TERRA TESTING, Inc. ATT

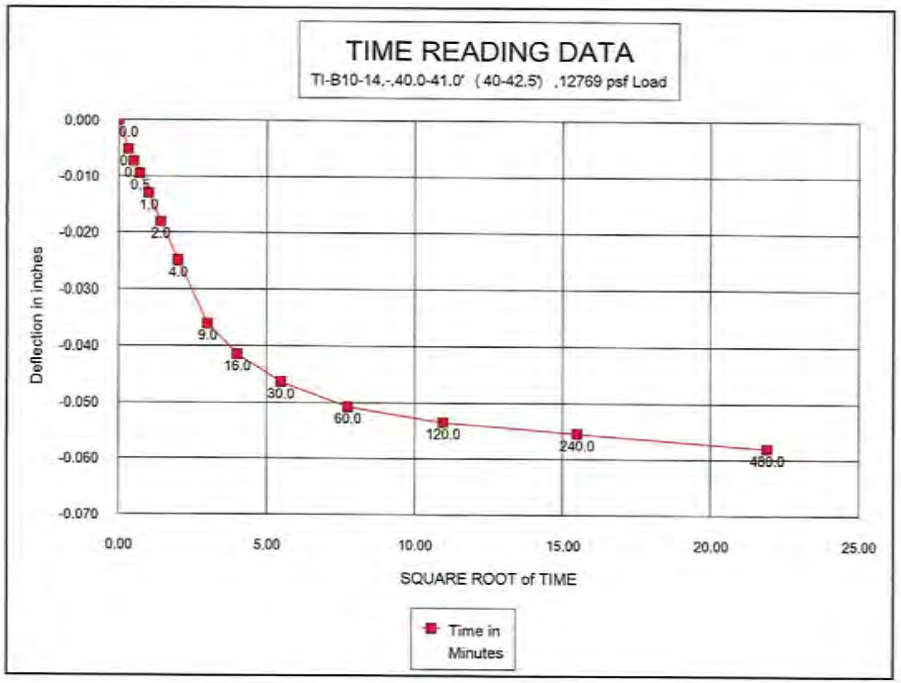

CONSOLIDATION TEST DATA
TI-B10-14,-,40.0-41.0' (40-42.5')
CONSOL (IN./IN.)
0.050
0.000
-0.050
-0.100
-0.150
-0.200
109
207
405
803
1604
3204
6377
12796
803
1604
6377
25491
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


CONSOLIDATION TEST DATA
TI-B10-14,-,40.0-41.0' (40-42.5')
VOID RATIO e
1.400
1.300
1.200
1.100
1.000
0.900
0.800
109
207
405
803
1604
3204
6377
12796
803
1604
6377
25491
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


TIME READING DATA
TI-B10-14,-,40.0-41.0' (40-42.5) ,1604 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-14,-,40.0-41.0' (40-42.5) ,6377 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-14,-,40.0-41.0' (40-42.5) ,3204 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-14,-,40.0-41.0' (40-42.5) ,12769 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B10-18	SAMPLED	11/26/13 MWH
DEPTH	55-56' (55-56.5')	TEST STARTED	02/24/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/05/14 DPM
SOIL DESCR.	Silty Sand	CELL NUMBER	ATT-05
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	180.9	185.3
Wt. Ring (s) (g)	43.2	43.2
Wt. Soil (g)	137.7	142.1
Wet Density PCF	115.0	130.9
Wt. Wet Soil & Pan (g)	141.5	145.9
Wt. Dry Soil & Pan (g)	124.5	124.5
Wt. Lost Moisture (g)	17.0	21.4
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	120.7	120.7
Moisture Content %	14.1	17.7
Dry Density PCF	100.8	111.2

LOAD (PSF)	CONSOL. (IN.)
99.4	0.00000
99.4	-0.00040
198.9	0.00035
400.9	0.00245
813.2	0.00685
1648	0.01520
3249	0.03065
6487	0.05470
12943	0.08075
25617	0.10300
6487	0.10115
1648	0.09900
400.9	0.09515
198.9	0.09320

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	99	1.997	0.0000	0.0000	0.6719
Inundate	99	1.997	-0.0004	0.0004	0.6725
	199	2.299	0.0004	-0.0004	0.6713
	401	2.603	0.0025	-0.0025	0.6678
	813	2.910	0.0069	-0.0069	0.6604
	1648	3.217	0.0152	-0.0152	0.6465
	3249	3.512	0.0307	-0.0307	0.6206
	6487	3.812	0.0547	-0.0547	0.5804
	12943	4.112	0.0808	-0.0808	0.5369
	25617	4.409	0.1030	-0.1030	0.4997
	6487	3.812	0.1012	-0.1012	0.5028
	1648	3.217	0.0990	-0.0990	0.5064
	401	2.603	0.0952	-0.0952	0.5128
	199	2.299	0.0932	-0.0932	0.5161

% Saturation	56.5
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.519
Init. Ht. Voids (cm)	1.021
Init. Void Ratio	0.6719

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01018

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B10-18	SAMPLED	11/26/13 MWH
DEPTH	55-56' (55-56.5')	TEST STARTED	02/24/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/05/14 DPM
SOIL DESCR.	Silty Sand	CELL NUMBER	ATT-05
LOCATION	Tailings Impoundment		

TIME READING DATA

813.2 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00390	-0.0000
0.1	0.32	0.00605	-0.0022
0.3	0.50	0.00625	-0.0024
0.5	0.71	0.00640	-0.0025
1.0	1.00	0.00655	-0.0027
2.0	1.41	0.00675	-0.0029
4.0	2.00	0.00695	-0.0031
9.0	3.00	0.00715	-0.0033
16.0	4.00	0.00730	-0.0034
30.0	5.48	0.00750	-0.0036
60.0	7.75	0.00775	-0.0039
120.0	10.95	0.00805	-0.0042
240.0	15.49	0.00840	-0.0045
480.0	21.91	0.00900	-0.0051

1648 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00955	0.0000
0.1	0.32	0.01360	-0.0041
0.3	0.50	0.01410	-0.0046
0.5	0.71	0.01445	-0.0049
1.0	1.00	0.01485	-0.0053
2.0	1.41	0.01515	-0.0056
4.0	2.00	0.01550	-0.0060
9.0	3.00	0.01590	-0.0064
16.0	4.00	0.01620	-0.0067
30.0	5.48	0.01655	-0.0070
60.0	7.75	0.01685	-0.0073
132.0	11.49	0.01740	-0.0079
240.0	15.49	0.01785	-0.0083
480.0	21.91	0.01845	-0.0089

3248 psf Load

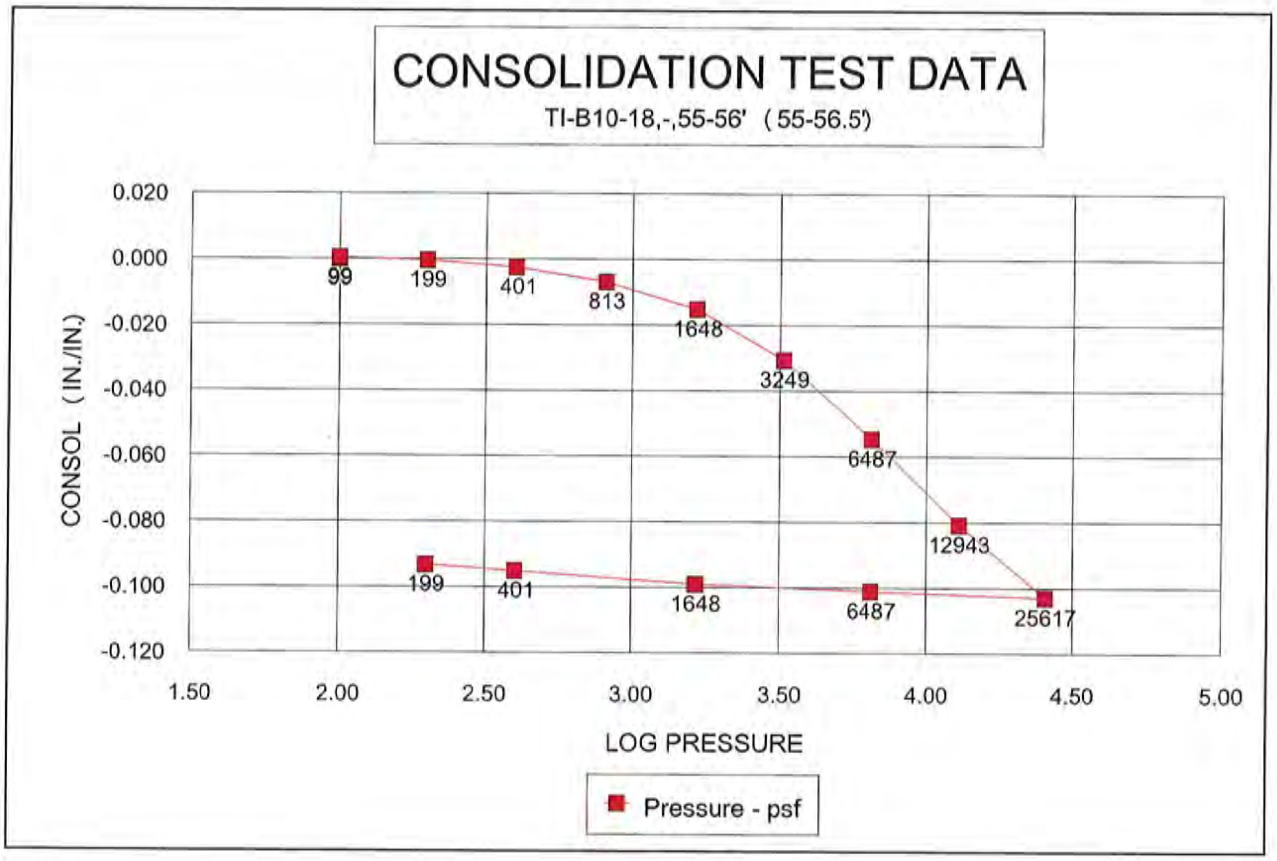
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01945	0.0000
0.1	0.32	0.02750	-0.0081
0.3	0.50	0.02855	-0.0091
0.5	0.71	0.02930	-0.0099
1.0	1.00	0.02990	-0.0105
2.0	1.41	0.03050	-0.0111
4.0	2.00	0.03110	-0.0117
9.0	3.00	0.03165	-0.0122
16.0	4.00	0.03210	-0.0127
30.0	5.48	0.03260	-0.0132
60.0	7.75	0.03310	-0.0137
120.0	10.95	0.03375	-0.0143
240.0	15.49	0.03445	-0.0150
480.0	21.91	0.03530	-0.0159

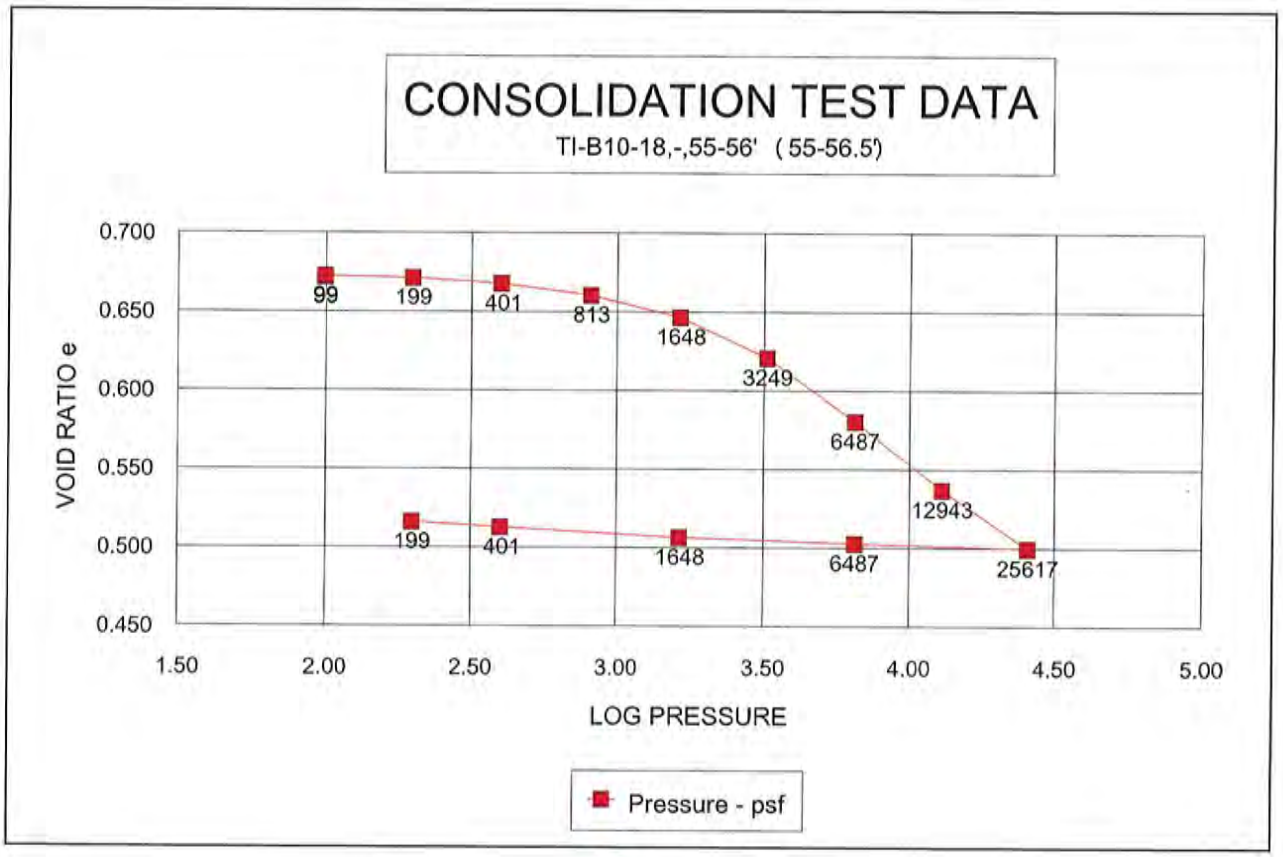
6487 psf Load

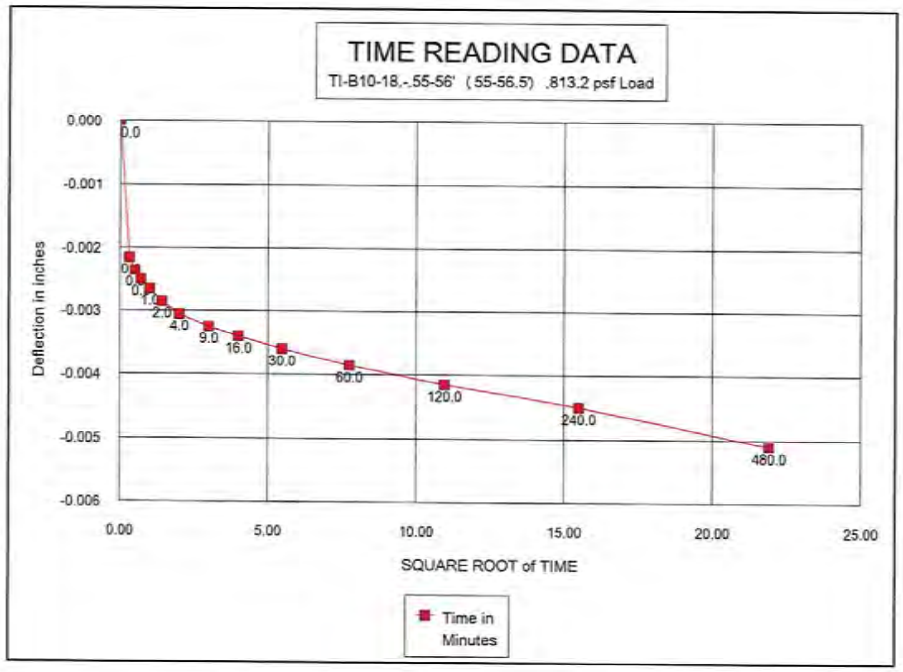
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.03655	0.0000
0.1	0.32	0.05055	-0.0140
0.3	0.50	0.05190	-0.0154
0.5	0.71	0.05295	-0.0164
1.0	1.00	0.05375	-0.0172
2.0	1.41	0.05445	-0.0179
4.0	2.00	0.05515	-0.0186
9.0	3.00	0.05590	-0.0194
16.0	4.00	0.05645	-0.0199
30.0	5.48	0.05715	-0.0206
60.0	7.75	0.05780	-0.0213
120.0	10.95	0.05860	-0.0221
240.0	15.49	0.05945	-0.0229
480.0	21.91	0.06060	-0.0241

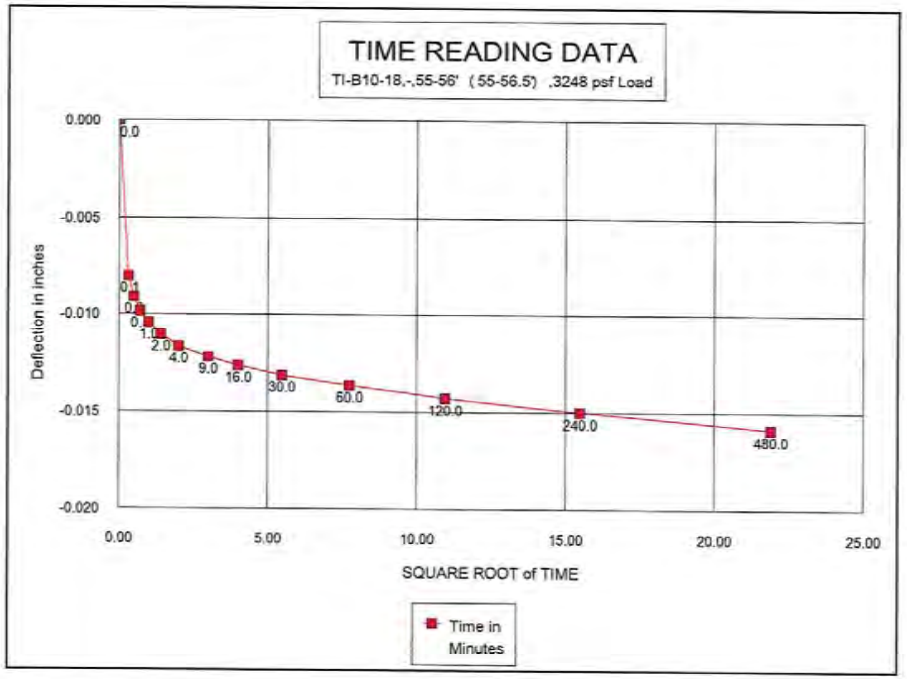
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01018

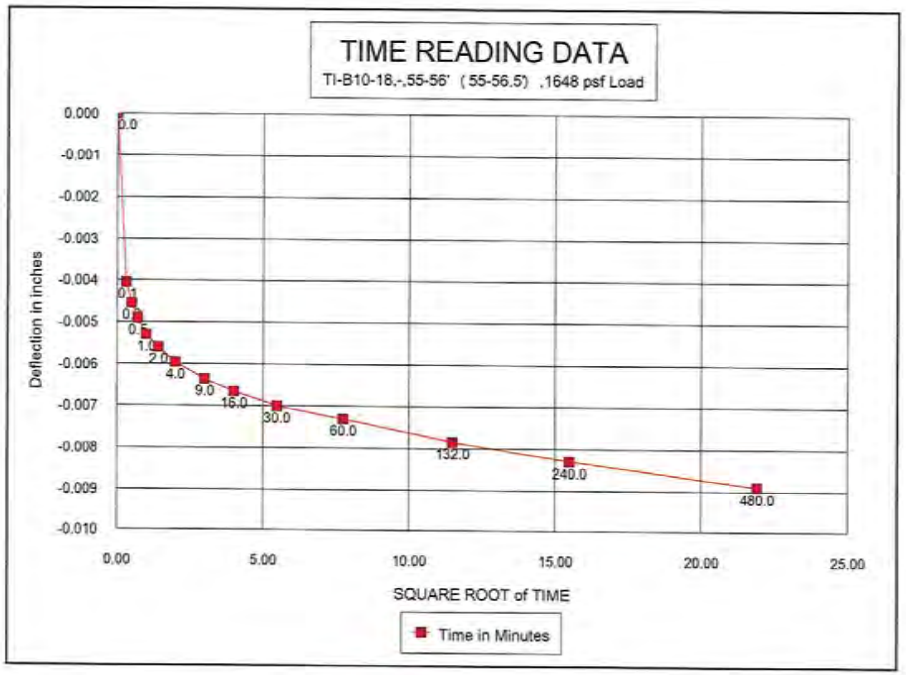
ADVANCED TERRA TESTING, INC. ATT

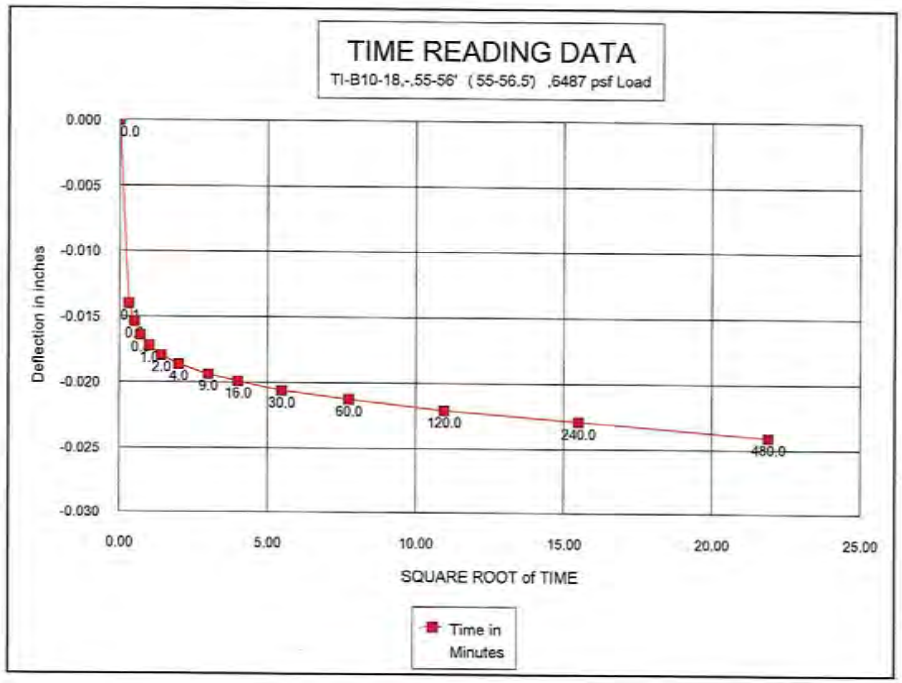

CONSOLIDATION TEST DATA
TI-B10-18,-,55-56' (55-56.5')
CONSOL (IN./IN.)
0.020
0.000
-0.020
-0.040
-0.060
-0.080
-0.100
-0.120
99
199
401
813
1648
3249
6487
12943
25617
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


CONSOLIDATION TEST DATA
TI-B10-18,-,55-56' (55-56.5')
VOID RATIO e
0.700
0.650
0.600
0.550
0.500
0.450
99
199
401
813
1648
3249
6487
12943
25617
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
Pressure - psf


TIME READING DATA
TI-B10-18,-,55-56' (55-56.5') ,813.2 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-18,-,55-56' (55-56.5') ,3248 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-18,-,55-56' (55-56.5') ,1648 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-18,-,55-56' (55-56.5') ,6487 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-17	SAMPLED	11/21/13 MWH
DEPTH	45-46' (45-47.5')	TEST STARTED	04/11/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/19/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	191.2	188.6
Wt. Ring (s) (g)	39.5	39.5
Wt. Soil (g)	151.8	149.2
Wet Density PCF	126.7	130.8
Wt. Wet Soil & Pan (g)	155.3	152.7
Wt. Dry Soil & Pan (g)	130.4	130.4
Wt. Lost Moisture (g)	24.9	22.3
Wt. of Pan Only (g)	3.6	3.6
Wt. of Dry Soil (g)	126.9	126.9
Moisture Content %	19.6	17.5
Dry Density PCF	106.0	111.3

LOAD (PSF)	CONSOL. (IN.)
108.9	0.00000
108.9	-0.00035
207.4	0.00045
405.0	0.00390
802.8	0.00805
1604	0.01560
3204	0.02455
6377	0.03530
12769	0.04650
25491	0.06170
6377	0.05870
1604	0.05515
405.0	0.05100
207.4	0.04805

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	109	2.037	0.0000	0.0000	0.5907
Inundate	109	2.037	-0.0004	0.0004	0.5913
	207	2.317	0.0005	-0.0005	0.5900
	405	2.607	0.0039	-0.0039	0.5845
	803	2.905	0.0081	-0.0081	0.5779
	1604	3.205	0.0156	-0.0156	0.5659
	3204	3.506	0.0246	-0.0246	0.5517
	6377	3.805	0.0353	-0.0353	0.5346
	12769	4.106	0.0465	-0.0465	0.5168
	25491	4.406	0.0617	-0.0617	0.4926
	6377	3.805	0.0587	-0.0587	0.4973
	1604	3.205	0.0552	-0.0552	0.5030
	405	2.607	0.0510	-0.0510	0.5096
	207	2.317	0.0481	-0.0481	0.5143

% Saturation	89.6
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.597
Init. Ht. Voids (cm)	0.943
Init. Void Ratio	0.5907

Data entry by: DPM Date: 06/11/2014
Data checked by: KA Date: 6/11/14
FileName: MWC0B117

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B1-17	SAMPLED	11/21/13 MWH
DEPTH	45-46' (45-47.5')	TEST STARTED	04/11/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/19/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	ATT-04
LOCATION	Tailings Impoundment		

TIME READING DATA

802.8 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00560	-0.00000
0.1	0.32	0.00750	-0.00190
0.3	0.50	0.00830	-0.00270
0.5	0.71	0.00860	-0.00300
1.0	1.00	0.00895	-0.00335
2.0	1.41	0.00930	-0.00370
4.0	2.00	0.00960	-0.00400
9.0	3.00	0.00990	-0.00430
16.0	4.00	0.01010	-0.00450
30.0	5.48	0.01030	-0.00470
60.0	7.75	0.01055	-0.00495
120.0	10.95	0.01080	-0.00520
240.0	15.49	0.01100	-0.00540
480.0	21.91	0.01120	-0.00560

1604 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01150	0.00000
0.1	0.32	0.01540	-0.00390
0.3	0.50	0.01600	-0.00450
0.5	0.71	0.01650	-0.00500
1.0	1.00	0.01700	-0.00550
2.0	1.41	0.01745	-0.00595
4.0	2.00	0.01785	-0.00635
9.0	3.00	0.01825	-0.00675
16.0	4.00	0.01850	-0.00700
30.0	5.48	0.01880	-0.00730
60.0	7.75	0.01905	-0.00755
120.0	10.95	0.01935	-0.00785
240.0	15.49	0.01975	-0.00825
480.0	21.91	0.02030	-0.00880

3204 psf Load

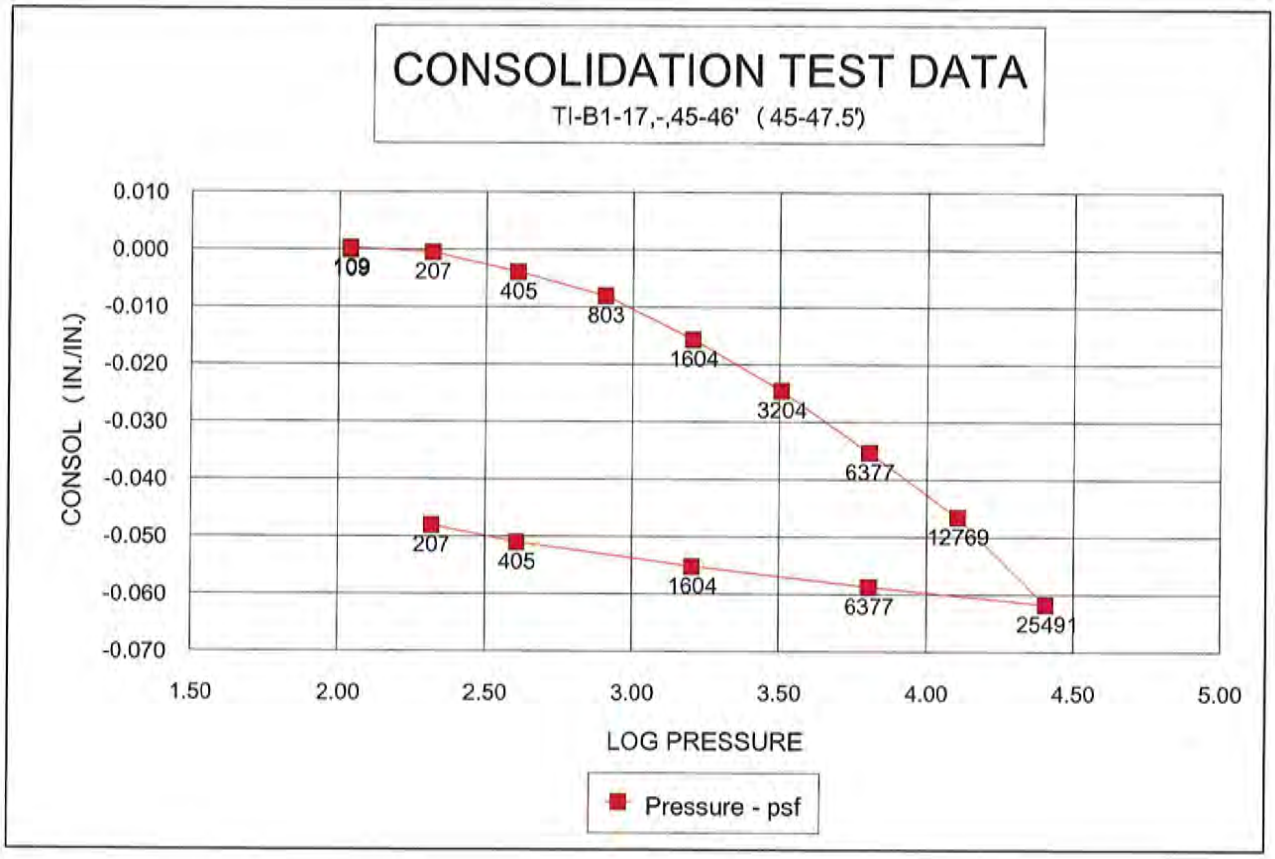
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02100	0.00000
0.1	0.32	0.02600	-0.00500
0.3	0.50	0.02675	-0.00575
0.5	0.71	0.02735	-0.00635
1.0	1.00	0.02790	-0.00690
2.0	1.41	0.02845	-0.00745
4.0	2.00	0.02890	-0.00790
9.0	3.00	0.02935	-0.00835
16.0	4.00	0.02965	-0.00865
30.0	5.48	0.03000	-0.00900
60.0	7.75	0.03030	-0.00930
120.0	10.95	0.03065	-0.00965
240.0	15.49	0.03110	-0.01010
480.0	21.91	0.03175	-0.01075

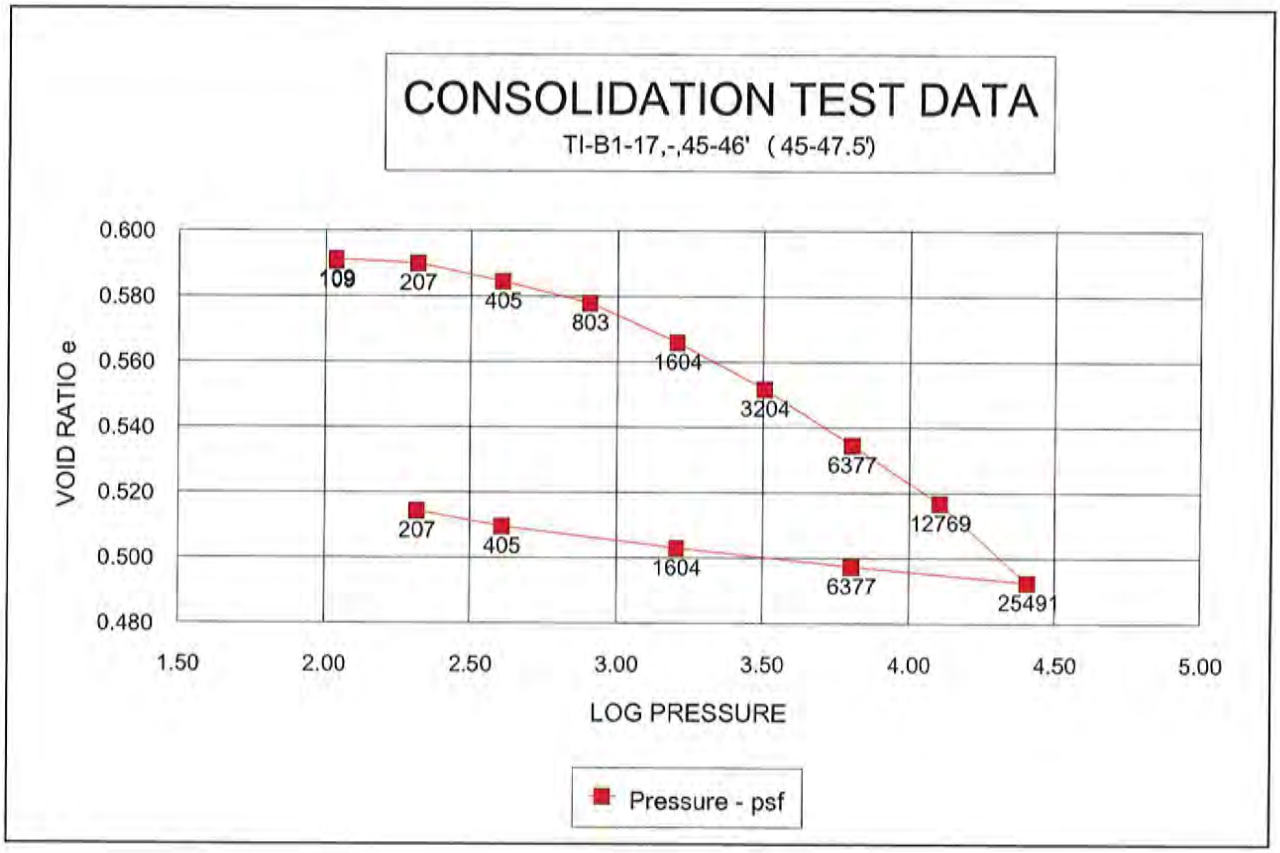
6377 psf Load

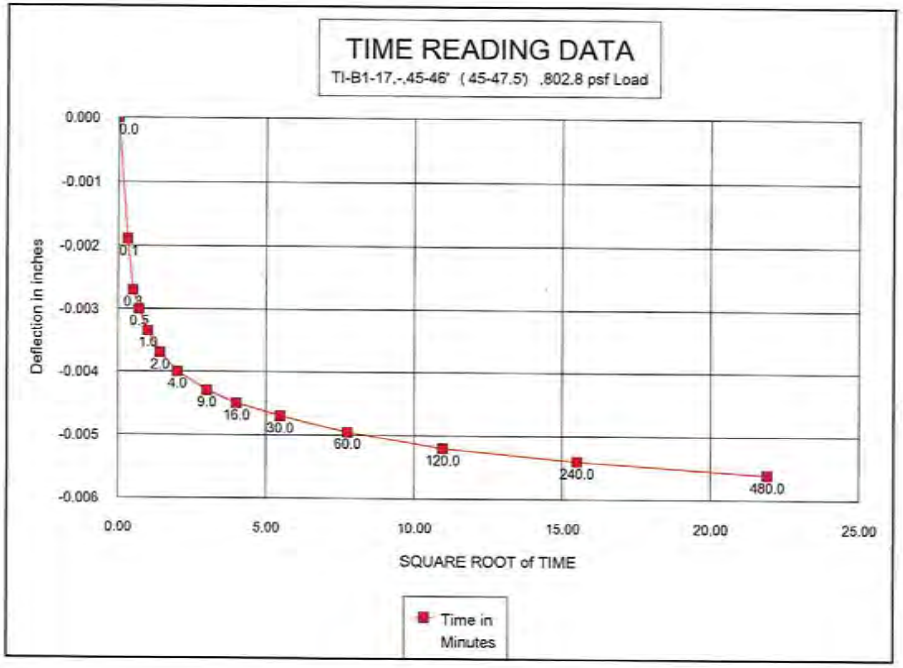
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.03240	0.00000
0.1	0.32	0.03875	-0.00635
0.3	0.50	0.03955	-0.00715
0.5	0.71	0.04020	-0.00780
1.0	1.00	0.04075	-0.00835
2.0	1.41	0.04130	-0.00890
4.0	2.00	0.04175	-0.00935
9.0	3.00	0.04220	-0.00980
16.0	4.00	0.04255	-0.01015
30.0	5.48	0.04285	-0.01045
60.0	7.75	0.04325	-0.01085
120.0	10.95	0.04360	-0.01120
240.0	15.49	0.04405	-0.01165
480.0	21.91	0.04445	-0.01205

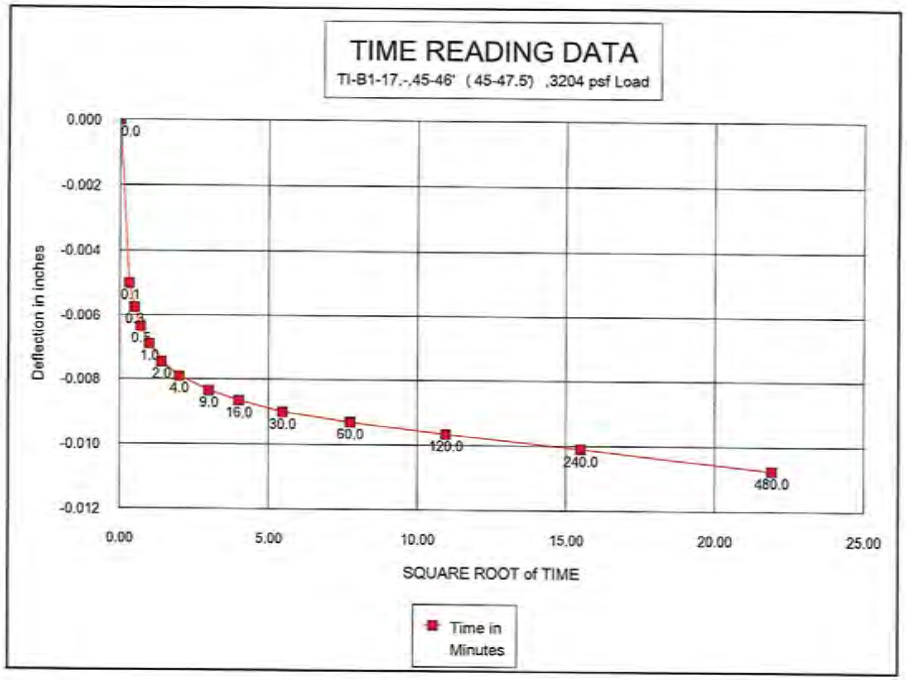
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC0B117

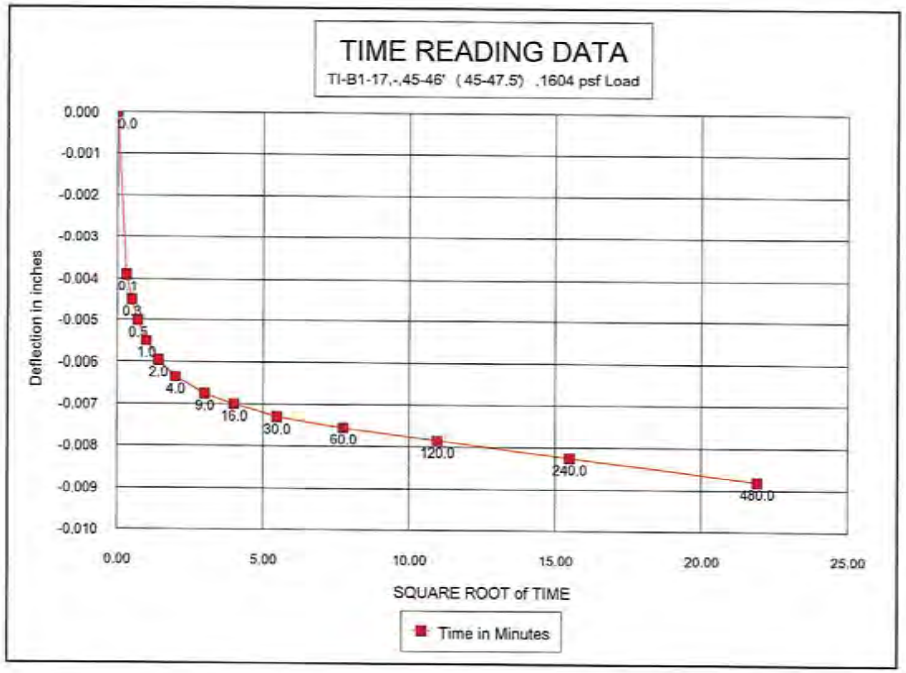
ADVANCED TERRA TESTING, INC. ATT

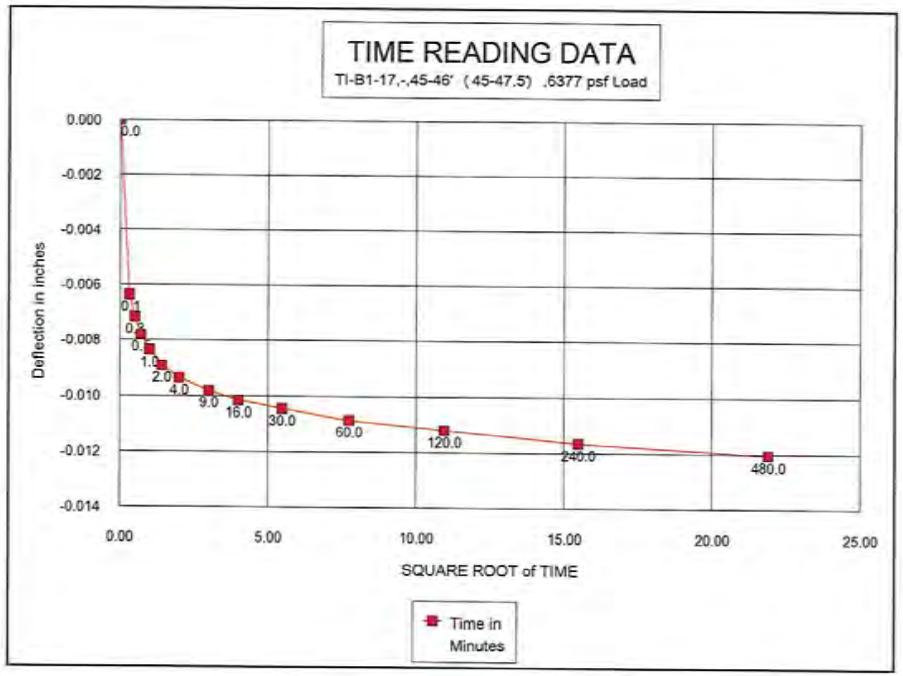

CONSOLIDATION TEST DATA
TI-B1-17,-,45-46' (45-47.5')
CONSOL (IN./IN.)
0.010
0.000
-0.010
-0.020
-0.030
-0.040
-0.050
-0.060
-0.070
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
109
207
405
803
1604
3204
6377
12769
207
405
1604
6377
25491
Pressure - psf


CONSOLIDATION TEST DATA
TI-B1-17,-,45-46' (45-47.5')
VOID RATIO e
0.600
0.580
0.560
0.540
0.520
0.500
0.480
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
109
207
405
803
1604
3204
6377
12769
207
405
1604
6377
25491
Pressure - psf


TIME READING DATA
TI-B1-17,-,45-46' (45-47.5) ,802.8 psf Load
Deflection in inches
0.000
-0.001
-0.002
-0.003
-0.004
-0.005
-0.006
0.0
0.1
0.2
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-17,-,45-46' (45-47.5) ,3204 psf Load
Deflection in inches
0.000
-0.002
-0.004
-0.006
-0.008
-0.010
-0.012
0.0
0.1
0.2
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-17,-,45-46' (45-47.5) ,1604 psf Load
Deflection in inches
0.000
-0.001
-0.002
-0.003
-0.004
-0.005
-0.006
-0.007
-0.008
-0.009
-0.010
0.0
0.1
0.2
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B1-17,-,45-46' (45-47.5) ,6377 psf Load
Deflection in inches
0.000
-0.002
-0.004
-0.006
-0.008
-0.010
-0.012
-0.014
0.0
0.1
0.2
0.5
1.0
2.0
4.0
9.0
16.0
30.0
60.0
120.0
240.0
480.0
0.00
5.00
10.00
15.00
20.00
25.00
SQUARE ROOT of TIME
Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B10-06	SAMPLED	11/26/13 MWH
DEPTH	21.5-22.5 (20.0-22.5')	TEST STARTED	01/22/14 DPM
SAMPLE NO.	-	TEST FINISHED	01/30/14 DPM
SOIL DESCR.	Clayey Silt Tailings	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		
SAMPLE DIA. (in)	2.410	INITIAL HT. (in)	1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil & Ring (s) (g)	184.1	179.0
Wt. Ring (s) (g)	43.2	43.2
Wt. Soil (g)	141.0	135.8
Wet Density PCF	117.7	125.7
Wt. Wet Soil & Pan (g)	144.8	139.6
Wt. Dry Soil & Pan (g)	113.8	113.8
Wt. Lost Moisture (g)	31.0	25.8
Wt. of Pan Only (g)	3.8	3.8
Wt. of Dry Soil (g)	110.0	110.0
Moisture Content %	28.1	23.4
Dry Density PCF	91.9	101.8

LOAD (PSF)	CONSOL. (IN.)
105	0.00000
105	-0.00050
207	-0.00025
417	0.00220
834	0.00775
1489	0.01720
3128	0.03300
6392	0.05555
13179	0.08250
26075	0.12010
6392	0.11605
1489	0.10875
417	0.09770

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
	105	2.019	0.0000	0.0000	0.8342
Inundate	105	2.019	-0.0005	0.0005	0.8351
	207	2.316	-0.0003	0.0003	0.8347
	417	2.620	0.0022	-0.0022	0.8302
	834	2.921	0.0078	-0.0078	0.8200
	1489	3.173	0.0172	-0.0172	0.8027
	3128	3.495	0.0330	-0.0330	0.7737
	6392	3.806	0.0556	-0.0556	0.7323
	13179	4.120	0.0825	-0.0825	0.6829
	26075	4.416	0.1201	-0.1201	0.6139
	6392	3.806	0.1161	-0.1161	0.6214
	1489	3.173	0.1088	-0.1088	0.6348
	417	2.620	0.0977	-0.0977	0.6550

% Saturation	91.0
Sp. Gr. (g/cc)	2.700
Init. Ht. Solids (cm)	1.385
Init. Ht. Voids (cm)	1.155
Init. Void Ratio	0.8342

Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01006

ADVANCED TERRA TESTING, INC. ATT

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B10-06	SAMPLED	11/26/13 MWH
DEPTH	21.5-22.5 (20.0-22.5')	TEST STARTED	01/22/14 DPM
SAMPLE NO.	-	TEST FINISHED	01/30/14 DPM
SOIL DESCR.	Clayey Silt Tailings	CELL NUMBER	ATT-02
LOCATION	Tailings Impoundment		

TIME READING DATA

834 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.00390	-0.00000
0.1	0.32	0.00700	-0.00310
0.3	0.50	0.00730	-0.00340
0.5	0.71	0.00760	-0.00370
1.0	1.00	0.00785	-0.00395
2.0	1.41	0.00820	-0.00430
4.0	2.00	0.00850	-0.00460
9.0	3.00	0.00890	-0.00500
16.0	4.00	0.00905	-0.00515
30.0	5.48	0.00930	-0.00540
60.0	7.75	0.00955	-0.00565
120.0	10.95	0.00990	-0.00600
240.0	15.49	0.01030	-0.00640
480.0	21.91	0.01055	-0.00665

1489 psf Load

Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01095	0.00000
0.1	0.32	0.01500	-0.00405
0.3	0.50	0.01555	-0.00460
0.5	0.71	0.01600	-0.00505
1.0	1.00	0.01650	-0.00555
2.0	1.41	0.01700	-0.00605
4.0	2.00	0.01745	-0.00650
9.0	3.00	0.01795	-0.00700
16.0	4.00	0.01825	-0.00730
30.0	5.48	0.01855	-0.00760
60.0	7.75	0.01890	-0.00795
120.0	10.95	0.01925	-0.00830
240.0	15.49	0.01970	-0.00875
480.0	21.91	0.02005	-0.00910

3228 psf Load

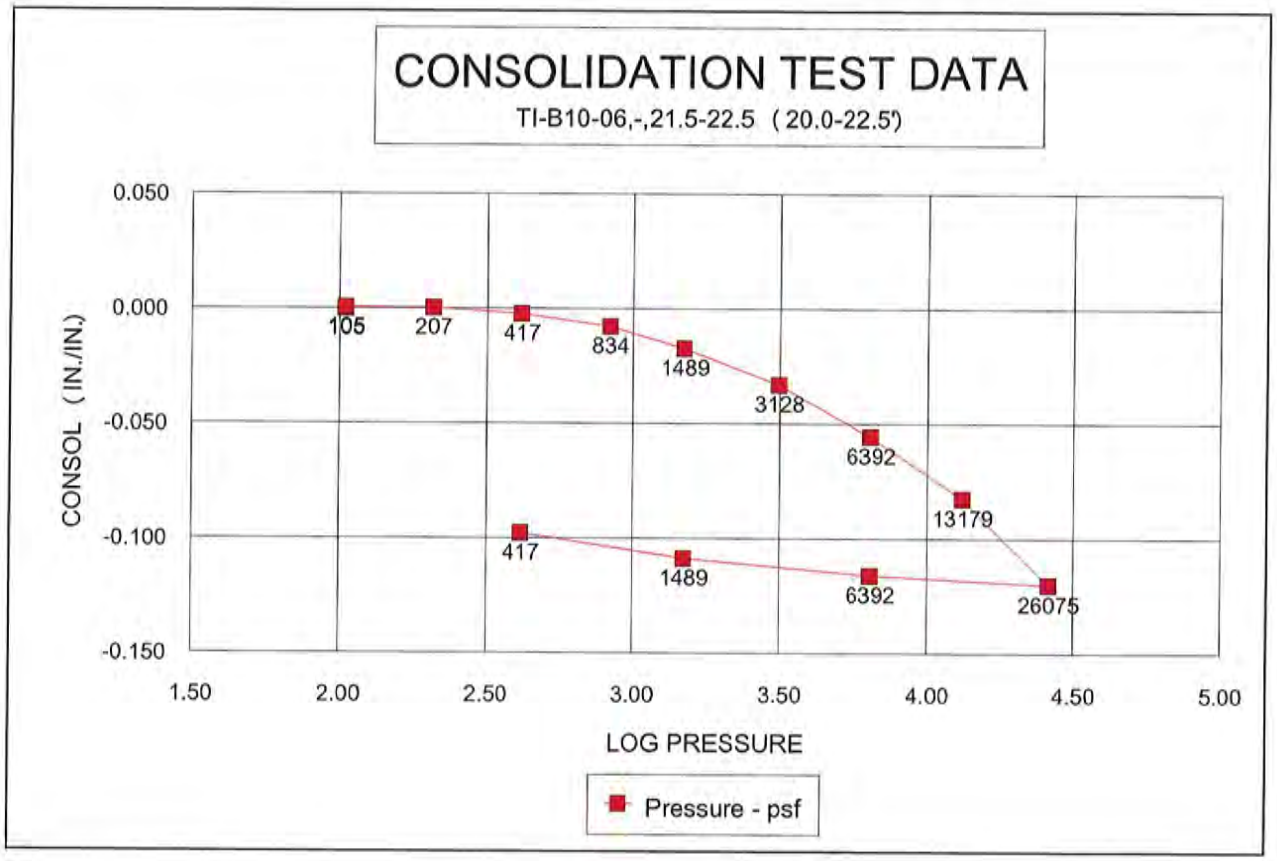
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02160	0.00000
0.1	0.32	0.02950	-0.00790
0.3	0.50	0.03060	-0.00900
0.5	0.71	0.03155	-0.00995
1.0	1.00	0.03245	-0.01085
2.0	1.41	0.03335	-0.01175
4.0	2.00	0.03420	-0.01260
9.0	3.00	0.03505	-0.01345
16.0	4.00	0.03550	-0.01390
30.0	5.48	0.03600	-0.01440
60.0	7.75	0.03650	-0.01490
120.0	10.95	0.03695	-0.01535
240.0	15.49	0.03740	-0.01580
480.0	21.91	0.03800	-0.01640

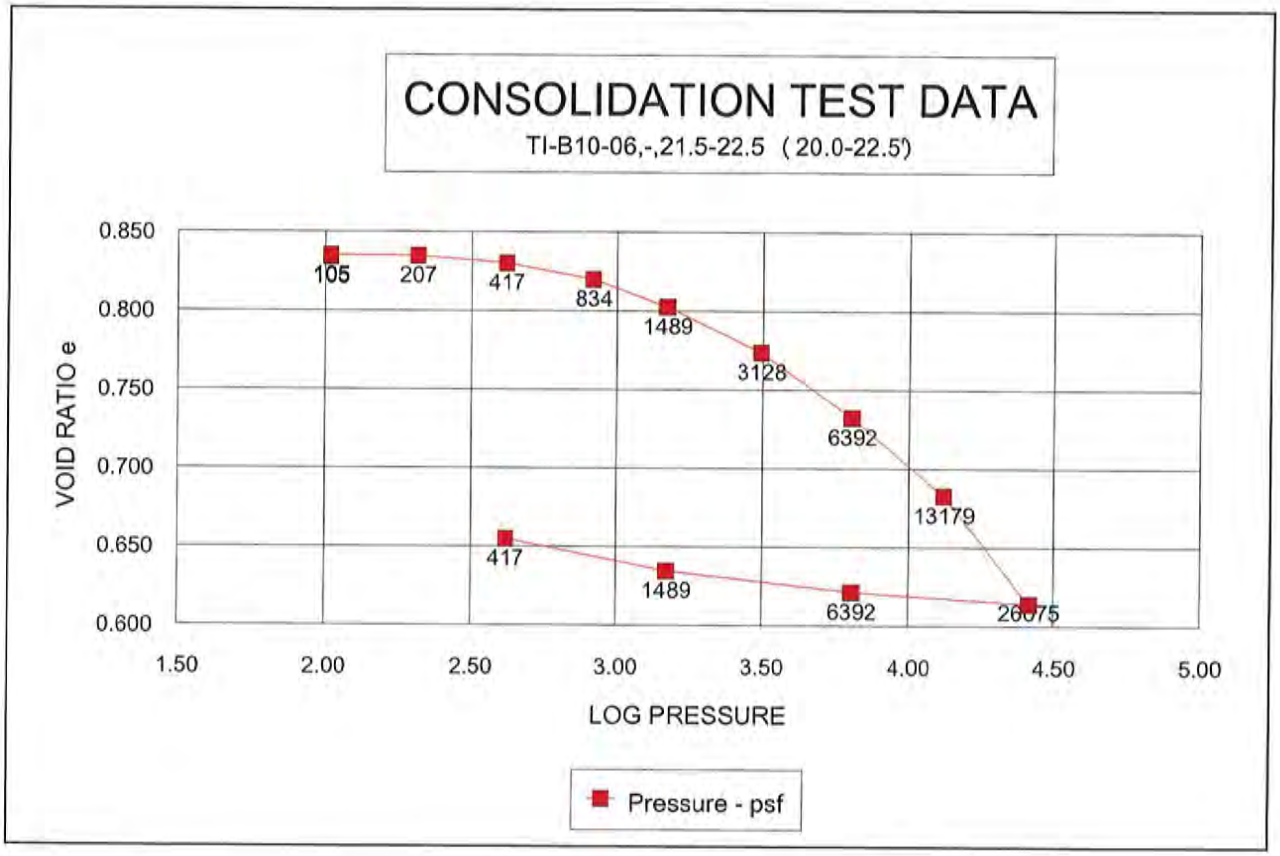
6392 psf Load

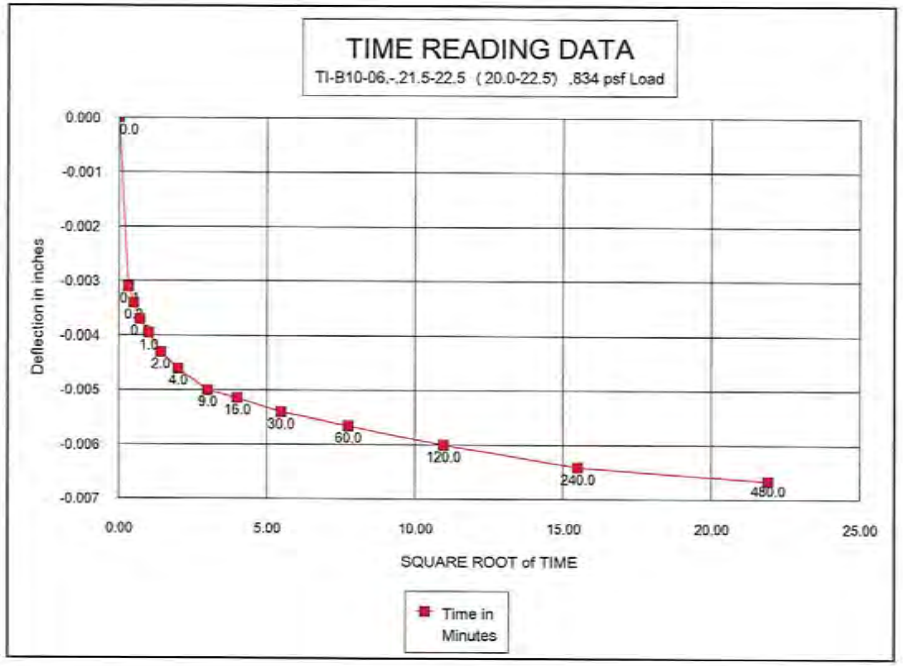
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.03900	0.00000
0.1	0.32	0.05040	-0.01140
0.3	0.50	0.05195	-0.01295
0.5	0.71	0.05335	-0.01435
1.0	1.00	0.05465	-0.01565
2.0	1.41	0.05600	-0.01700
4.0	2.00	0.05715	-0.01815
9.0	3.00	0.05830	-0.01930
16.0	4.00	0.05895	-0.01995
30.0	5.48	0.05965	-0.02065
60.0	7.75	0.06030	-0.02130
144.0	12.00	0.06105	-0.02205
240.0	15.49	0.06150	-0.02250
480.0	21.91	0.06220	-0.02320

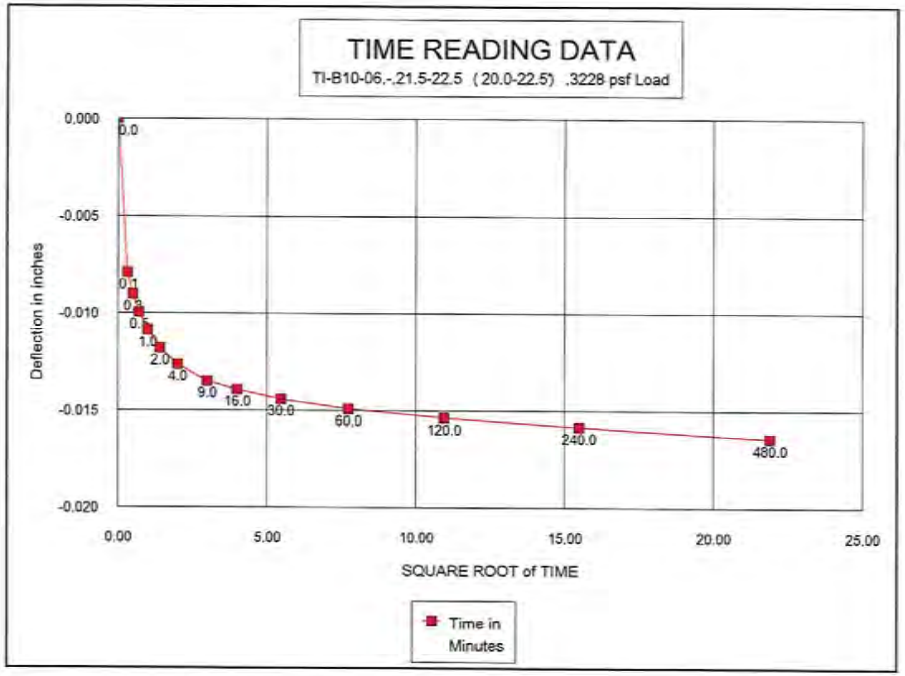
Data entry by: DPM Date: 06/11/2014
Data checked by: KR Date: 6/11/14
FileName: MWC01006

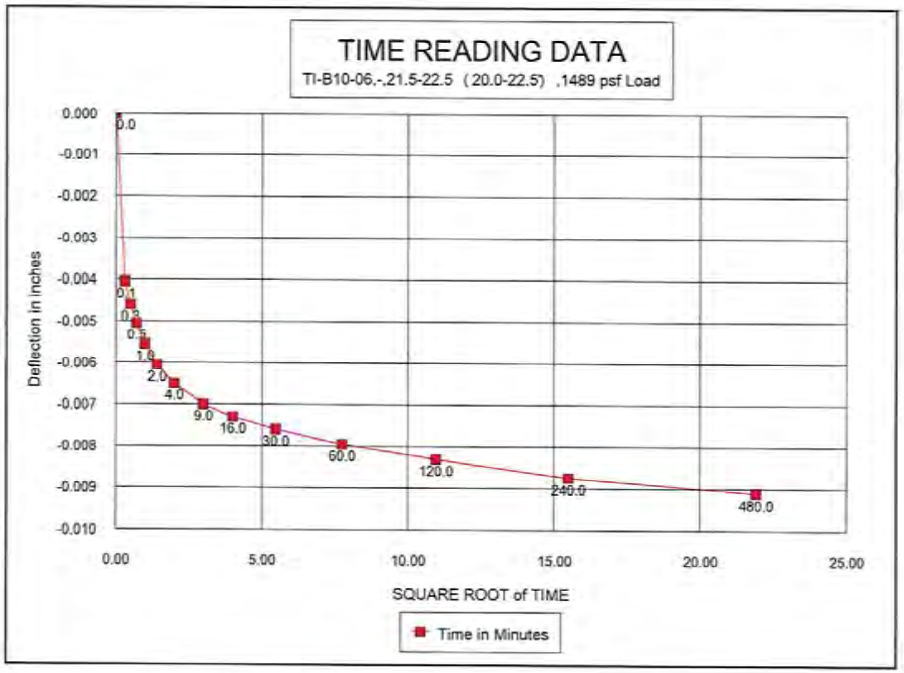
ADVANCED TERRA TESTING, Inc. ATT

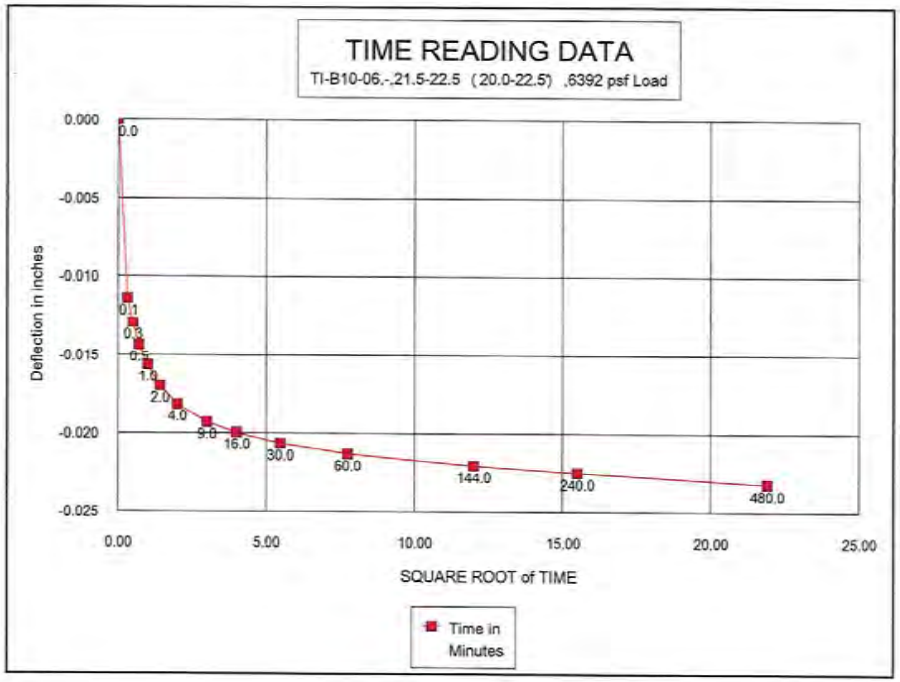

CONSOLIDATION TEST DATA
TI-B10-06,-,21.5-22.5 (20.0-22.5')
CONSOL (IN./IN.)
0.050
0.000
-0.050
-0.100
-0.150
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
105
207
417
834
1489
3128
6392
13179
26075
Pressure - psf


CONSOLIDATION TEST DATA
TI-B10-06,-,21.5-22.5 (20.0-22.5')
VOID RATIO e
0.850
0.800
0.750
0.700
0.650
0.600
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
LOG PRESSURE
105
207
417
834
1489
3128
6392
13179
26075
Pressure - psf


TIME READING DATA
TI-B10-06,-,21.5-22.5 (20.0-22.5) ,834 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-06,-,21.5-22.5 (20.0-22.5) ,3228 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-06,-,21.5-22.5 (20.0-22.5) ,1489 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes


TIME READING DATA
TI-B10-06,-,21.5-22.5 (20.0-22.5) ,6392 psf Load
Deflection in inches
SQUARE ROOT of TIME
Time in Minutes

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE	-	TEST STARTED	12/20/13 DPM
SOIL DESCR.	Church Rock	TEST FINISHED	03/11/14 DPM
LOCATION	Tailings Impoundment		

MASS DATA

Sample Description	Ring Mass g	As Rec. Mass g	Sat. Mass g	0.1 Bar Mass g	0.2 Bar Mass g	0.33 Bar Mass g	0.5 Bar Mass g	1 Bar Mass g	3 Bar Mass g	5 Bar Mass g	15 Bar Mass g	Dry Mass Filter, Ring, & Dish (g)	Dish Wt. g
Filter Mass g		0.200	0.692	0.461	0.434	0.399	0.357	0.352	0.315	0.314	0.291		
TI-B10-14, 40-41'	10.362	44.264	45.491	44.734	44.471	44.004	43.720	43.303	42.682	42.042	40.264	36.236	2.357
TI-B10-14, 40-41' - R	10.702	43.076	44.160	43.507	43.286	42.832	42.598	42.169	41.357	40.826	38.783	34.316	2.372
TI-B10-18, 55-56'	10.313	45.185	49.134	46.066	45.666	45.217	44.953	44.770	44.438	44.186	43.603	43.226	2.377
TI-B10-18, 55-56' - R	10.752	46.396	50.072	47.000	46.775	46.359	46.168	45.964	45.562	45.320	44.673	44.250	2.357
TI-B11-03, 15-16'	10.654	52.730	53.633	53.169	53.073	52.832	52.757	52.553	52.198	52.014	51.524	49.650	2.326
TI-B11-03, 15-16' -R	10.496	51.645	53.183	52.501	52.411	52.144	52.040	51.838	51.528	51.341	50.852	49.088	2.285
TI-B11-10, 56-57'	10.614	42.246	48.073	43.813	43.015	42.476	42.146	41.871	41.410	41.202	40.775	41.264	2.373
TI-B11-10, 56-57' -R	10.593	42.992	48.859	44.348	43.656	43.136	42.816	42.547	42.082	41.873	41.407	41.812	2.291

Data Entered By: DPM Date: 03/18/2014
Data Checked By: KR Date: 3/18/14
Filename: CMRSETB

ADVANCED TERRA TESTING, INC. ATT

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE	-	TEST STARTED	12/20/13 DPM
SOIL DESCR.	Church Rock	TEST FINISHED	03/11/14 DPM
LOCATION	Tailings Impoundment		

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	Sample Conditions						0.1 Bar			0.2 Bar		
	Dry Mass (g)	Unit Wt. (g/cc)	Sat. Mass (g)	Total H2O (g)	Sat. M.C. % D.M.	Sat. M.C. % Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
TI-B10-14, 40-41'	23.317	1.206	34.437	11.120	47.69	57.51	10.594	45.43	54.79	10.358	44.42	53.57
TI-B10-14, 40-41' - R	21.042	1.088	32.766	11.724	55.72	60.63	11.302	53.71	58.45	11.108	52.79	57.45
TI-B10-18, 55-56'	30.336	1.569	38.129	7.793	25.69	40.30	4.956	16.34	25.63	4.583	15.11	23.70
TI-B10-18, 55-56' - R	30.941	1.600	38.628	7.687	24.84	39.75	4.846	15.66	25.06	4.648	15.02	24.04
TI-B11-03, 15-16'	36.470	1.886	42.287	5.817	15.95	30.08	5.584	15.31	28.88	5.515	15.12	28.52
TI-B11-03, 15-16' -R	36.107	1.867	41.995	5.888	16.31	30.45	5.437	15.06	28.12	5.374	14.88	27.79
TI-B11-10, 56-57'	28.077	1.452	36.767	8.690	30.95	44.94	4.661	16.60	24.11	3.890	13.85	20.12
TI-B11-10, 56-57' -R	28.728	1.486	37.574	8.846	30.79	45.75	4.566	15.89	23.61	3.901	13.58	20.17

Data Entered By: DPM Date: 03/18/2014
Data Checked By: KK Date: 3/18/14
Filename: CMRSETB

ADVANCED TERRA TESTING, INC. ATT

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT MWH

JOB NO. 2512-77

SAMPLE DATE -
SOIL DESCR. Church Rock
LOCATION Tailings Impoundment

TEST STARTED 12/20/13 DPM
TEST FINISHED 03/11/14 DPM

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	0.33 Bar			0.5 Bar			1 Bar			3 Bar		
	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
TI-B10-14, 40-41'	9.926	42.57	51.33	9.684	41.53	50.08	9.272	39.76	47.95	8.688	37.26	44.93
TI-B10-14, 40-41' - R	10.689	50.80	55.28	10.497	49.89	54.29	10.073	47.87	52.09	9.298	44.19	48.09
TI-B10-18, 55-56'	4.169	13.74	21.56	3.947	13.01	20.41	3.769	12.42	19.49	3.474	11.45	17.97
TI-B10-18, 55-56' - R	4.267	13.79	22.07	4.118	13.31	21.30	3.919	12.67	20.27	3.554	11.49	18.38
TI-B11-03, 15-16'	5.309	14.56	27.46	5.276	14.47	27.29	5.077	13.92	26.26	4.759	13.05	24.61
TI-B11-03, 15-16' -R	5.142	14.24	26.59	5.080	14.07	26.27	4.883	13.52	25.25	4.610	12.77	23.84
TI-B11-10, 56-57'	3.386	12.06	17.51	3.098	11.03	16.02	2.828	10.07	14.63	2.404	8.56	12.43
TI-B11-10, 56-57' -R	3.416	11.89	17.67	3.138	10.92	16.23	2.874	10.00	14.86	2.446	8.51	12.65

Data Entered By: DPM Date: 03/18/2014
Data Checked By: KR Date: 3/18/14
Filename: CMRSETB

ADVANCED TERRA TESTING, INC. ATT

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE	-	TEST STARTED	12/20/13 DPM
SOIL DESCR.	Church Rock	TEST FINISHED	03/11/14 DPM
LOCATION	Tailings Impoundment		

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	5 Bar			15 Bar		
	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
TI-B10-14, 40-41'	8.049	34.52	41.63	6.294	26.99	32.55
TI-B10-14, 40-41' - R	8.768	41.67	45.35	6.748	32.07	34.90
TI-B10-18, 55-56'	3.223	10.62	16.67	2.663	8.78	13.77
TI-B10-18, 55-56' - R	3.313	10.71	17.13	2.689	8.69	13.91
TI-B11-03, 15-16'	4.576	12.55	23.67	4.109	11.27	21.25
TI-B11-03, 15-16' -R	4.424	12.25	22.88	3.958	10.96	20.47
TI-B11-10, 56-57'	2.197	7.82	11.36	1.793	6.39	9.27
TI-B11-10, 56-57' -R	2.238	7.79	11.57	1.795	6.25	9.28

Data Entered By: DPM Date: 03/18/2014
Data Checked By: KR Date: 3/18/14
Filename: CMRSETB

ADVANCED TERRA TESTING, INC. ATT

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT MWH

JOB NO. 2512-77

SAMPLE DATE -
SOIL DESCR. Church Rock
LOCATION Tailings Impoundment

TEST STARTED 12/20/13 DPM
TEST FINISHED 03/11/14 DPM

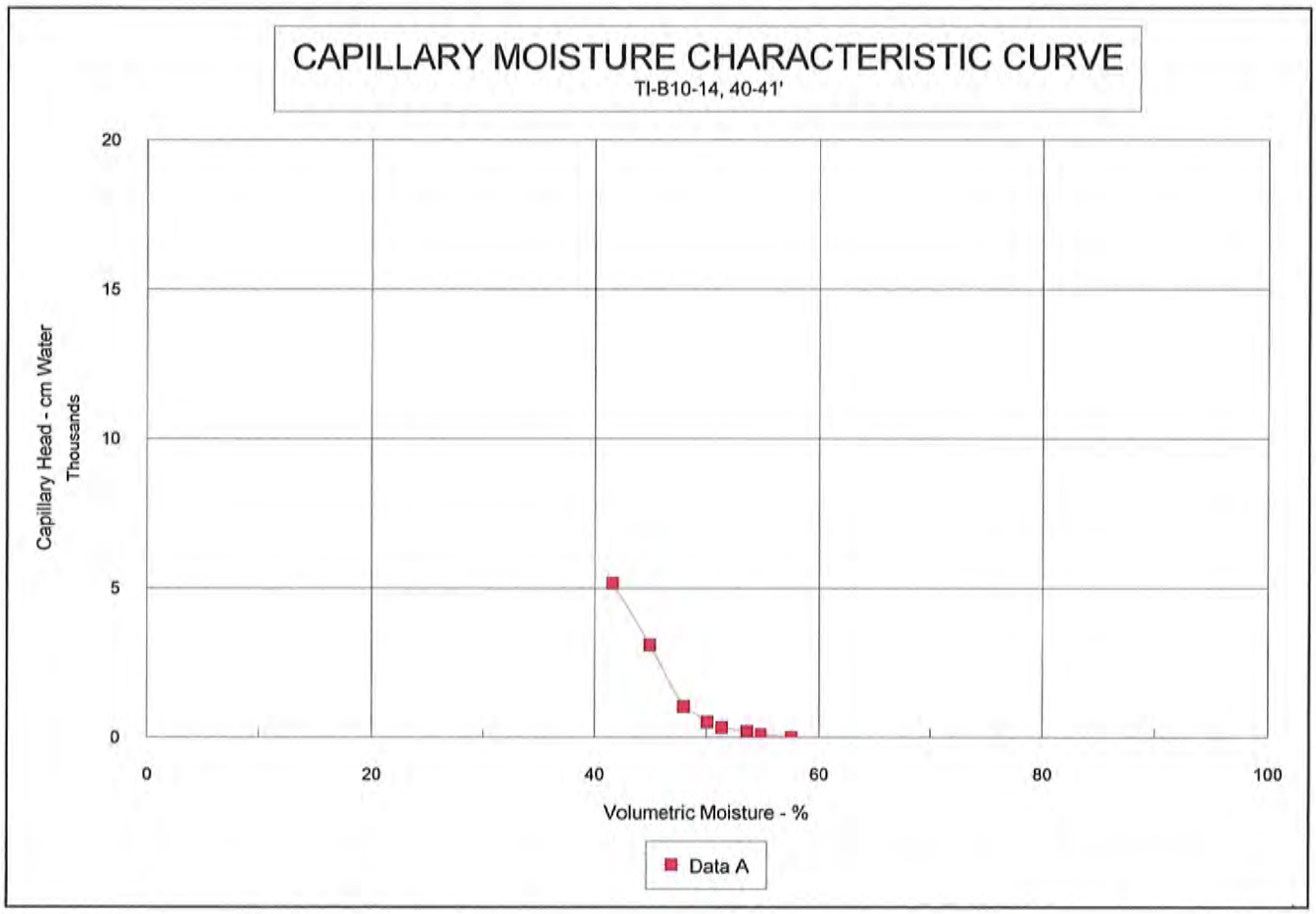
	Vol. MC % Sat.	Vol. MC % 0.1 Bar	Vol. MC % 0.2 Bar	Vol. MC % 0.33 Bar	Vol. MC % 0.5 Bar	Vol. MC % 1 Bar	Vol. MC % 3 Bar	Vol. MC % 5 Bar	Vol. MC % 15 Bar
TI-B10-14, 40-41'	57.51	54.79	53.57	51.33	50.08	47.95	44.93	41.63	32.55
TI-B10-14, 40-41' - R	60.63	58.45	57.45	55.28	54.29	52.09	48.09	45.35	34.90
TI-B10-18, 55-56'	40.30	25.63	23.70	21.56	20.41	19.49	17.97	16.67	13.77
TI-B10-18, 55-56' - R	39.75	25.06	24.04	22.07	21.30	20.27	18.38	17.13	13.91
TI-B11-03, 15-16'	30.08	28.88	28.52	27.46	27.29	26.26	24.61	23.67	21.25
TI-B11-03, 15-16' -R	30.45	28.12	27.79	26.59	26.27	25.25	23.84	22.88	20.47
TI-B11-10, 56-57'	44.94	24.11	20.12	17.51	16.02	14.63	12.43	11.36	9.27
TI-B11-10, 56-57' -R	45.75	23.61	20.17	17.67	16.23	14.86	12.65	11.57	9.28

% Saturation

	Sat.	0.1 Bar	0.2 Bar	0.33 Bar	0.5 Bar	1 Bar	3 Bar	5 Bar	15 Bar
TI-B10-14, 40-41'	100.00	95.27	93.15	89.26	87.09	83.38	78.13	72.38	56.60
TI-B10-14, 40-41' - R	100.00	96.40	94.75	91.17	89.53	85.92	79.31	74.79	57.56
TI-B10-18, 55-56'	100.00	63.60	58.81	53.50	50.65	48.36	44.58	41.36	34.17
TI-B10-18, 55-56' - R	100.00	63.04	60.47	55.51	53.57	50.98	46.23	43.10	34.98
TI-B11-03, 15-16'	100.00	95.99	94.81	91.27	90.70	87.28	81.81	78.67	70.64
TI-B11-03, 15-16' -R	100.00	92.34	91.27	87.33	86.28	82.93	78.29	75.14	67.22
TI-B11-10, 56-57'	100.00	53.64	44.76	38.96	35.65	32.54	27.66	25.28	20.63
TI-B11-10, 56-57' -R	100.00	51.62	44.10	38.62	35.47	32.49	27.65	25.30	20.29

Data Entered By: DPM Date: 03/18/2014
Data Checked By: KR Date: 3/18/14
Filename: CMRSETB

ADVANCED TERRA TESTING, INC. ATT


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B10-14, 40-41'
Capillary Head - cm Water
Thousands
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10
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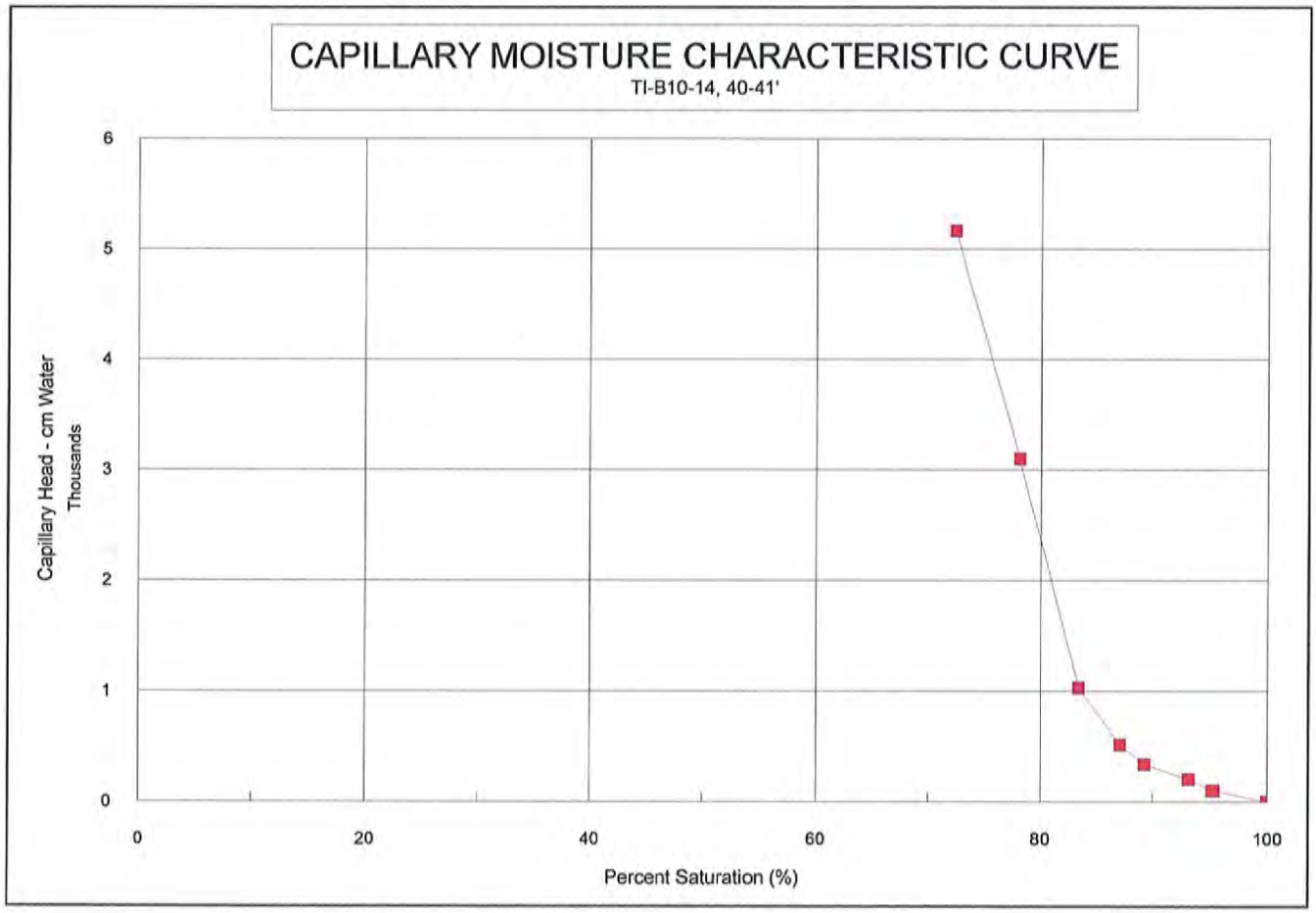
40
60
80
100
Volumetric Moisture - %
Data A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TI-B10-14, 40-41'
Capillary Head - cm Water
Thousands
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40
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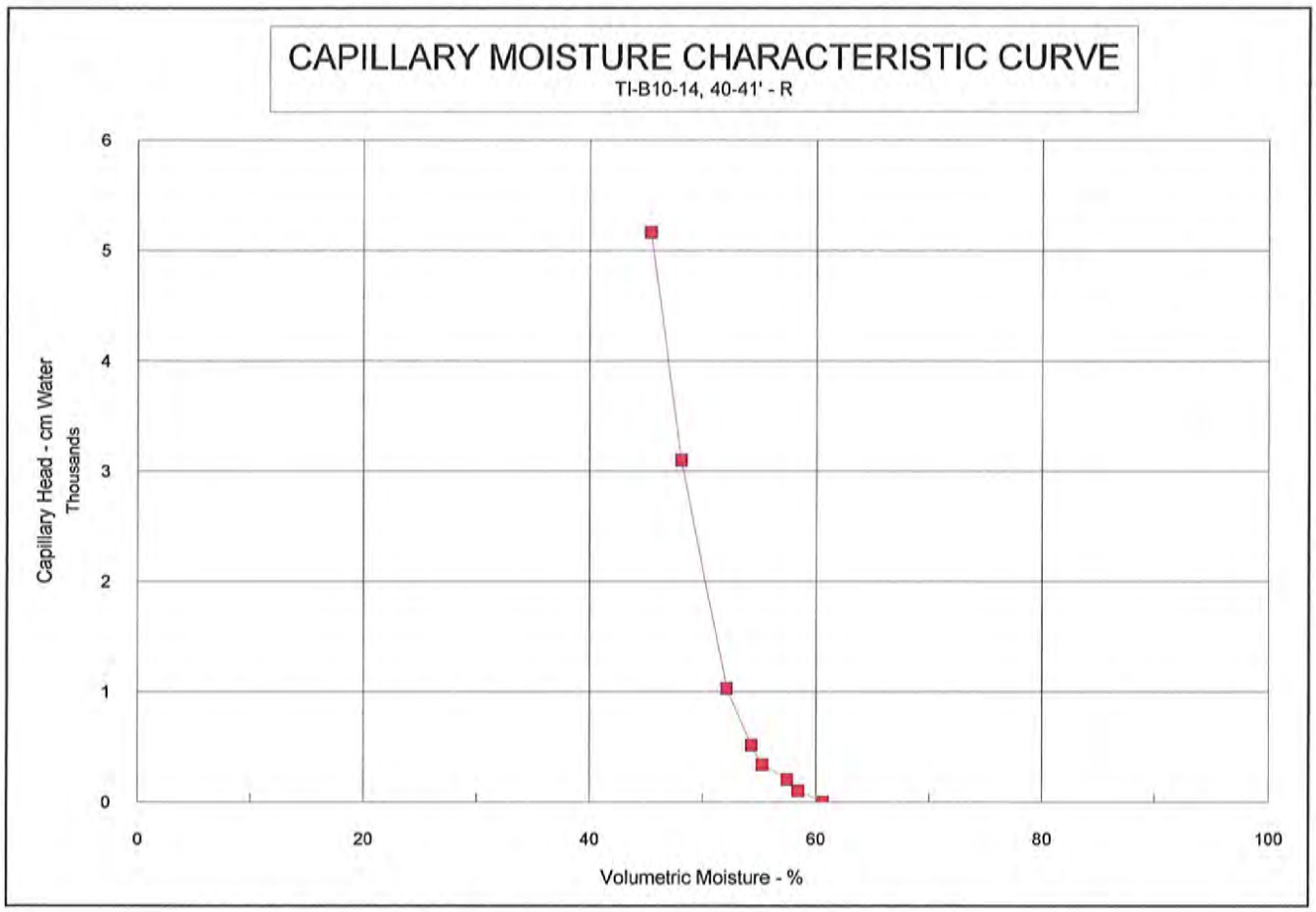
80
100
Percent Saturation (%)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TI-B10-14, 40-41' - R
Capillary Head - cm Water
Thousands
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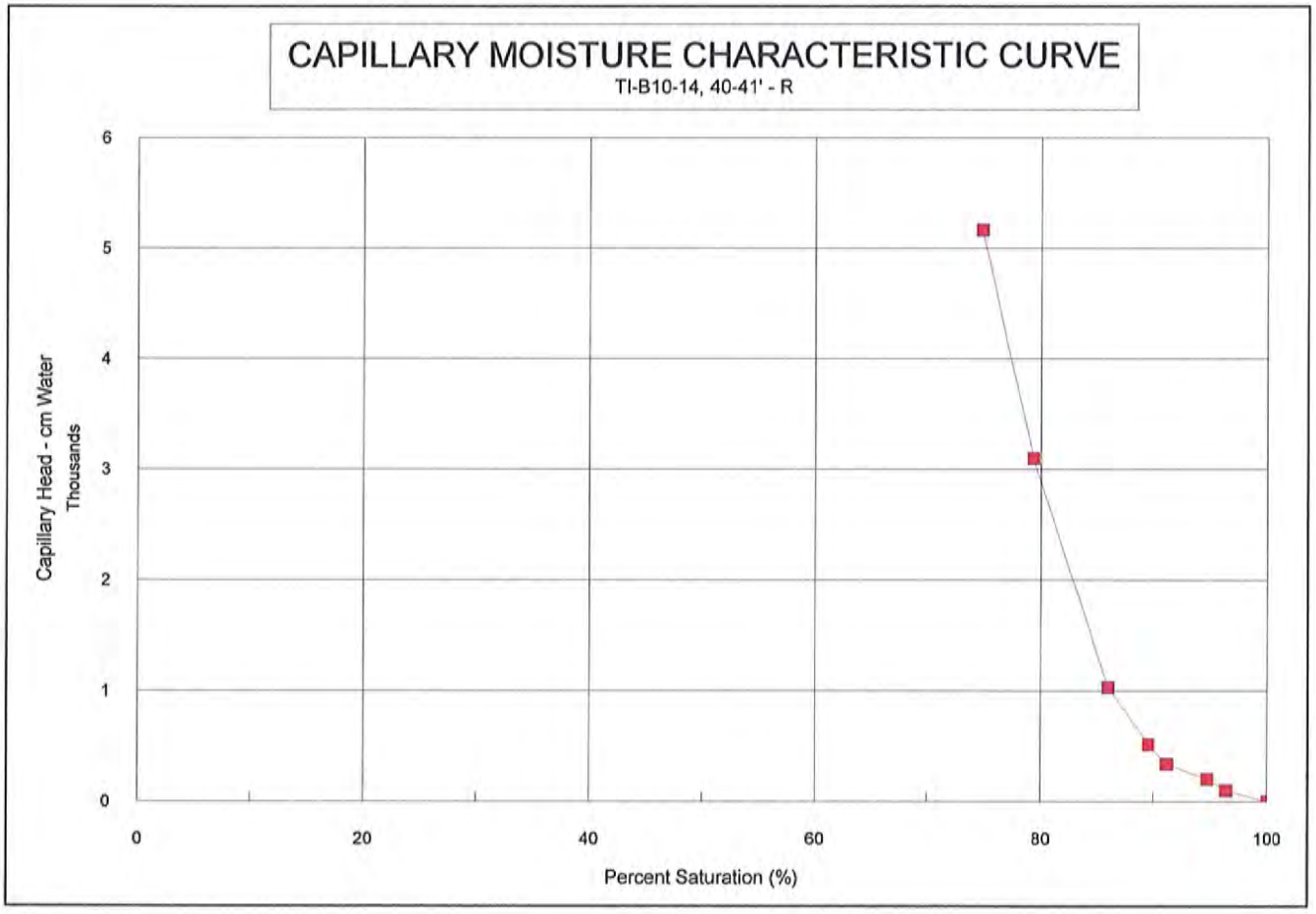
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B10-14, 40-41' - R
Capillary Head - cm Water
Thousands
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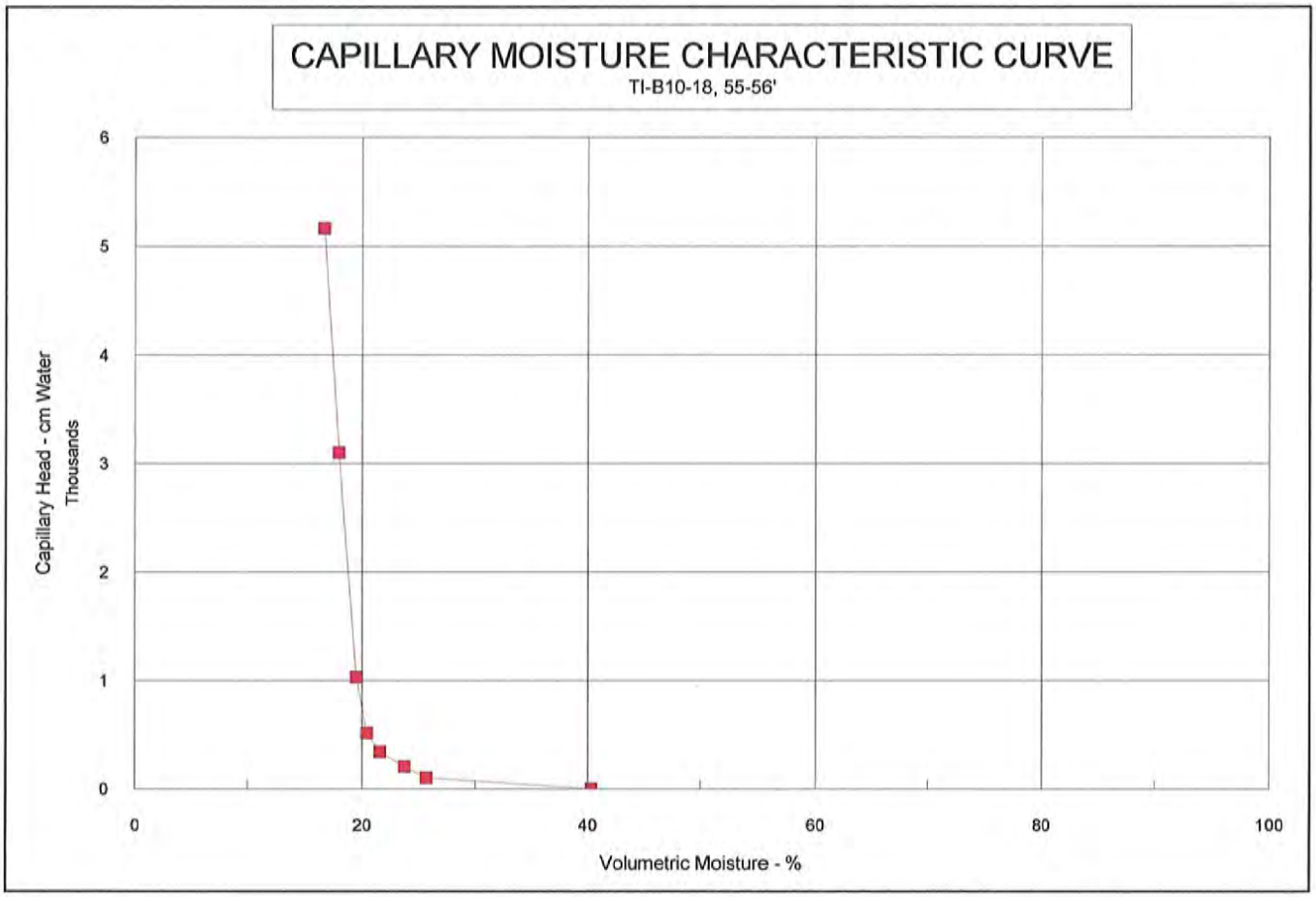
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)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TI-B10-18, 55-56'
Capillary Head - cm Water
Thousands
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2
3
4
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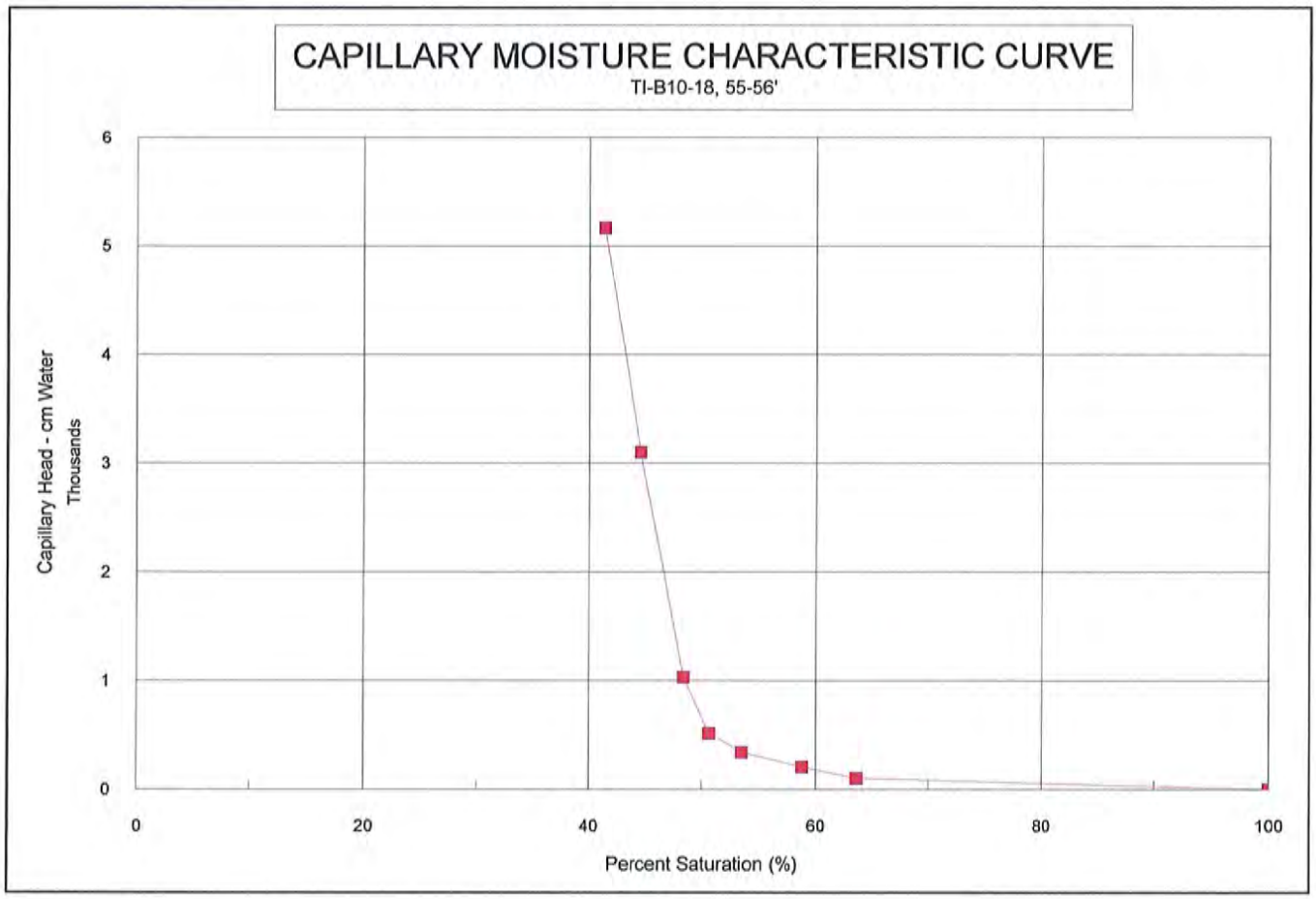
6
0
20
40
60
80
100
Volumetric Moisture - %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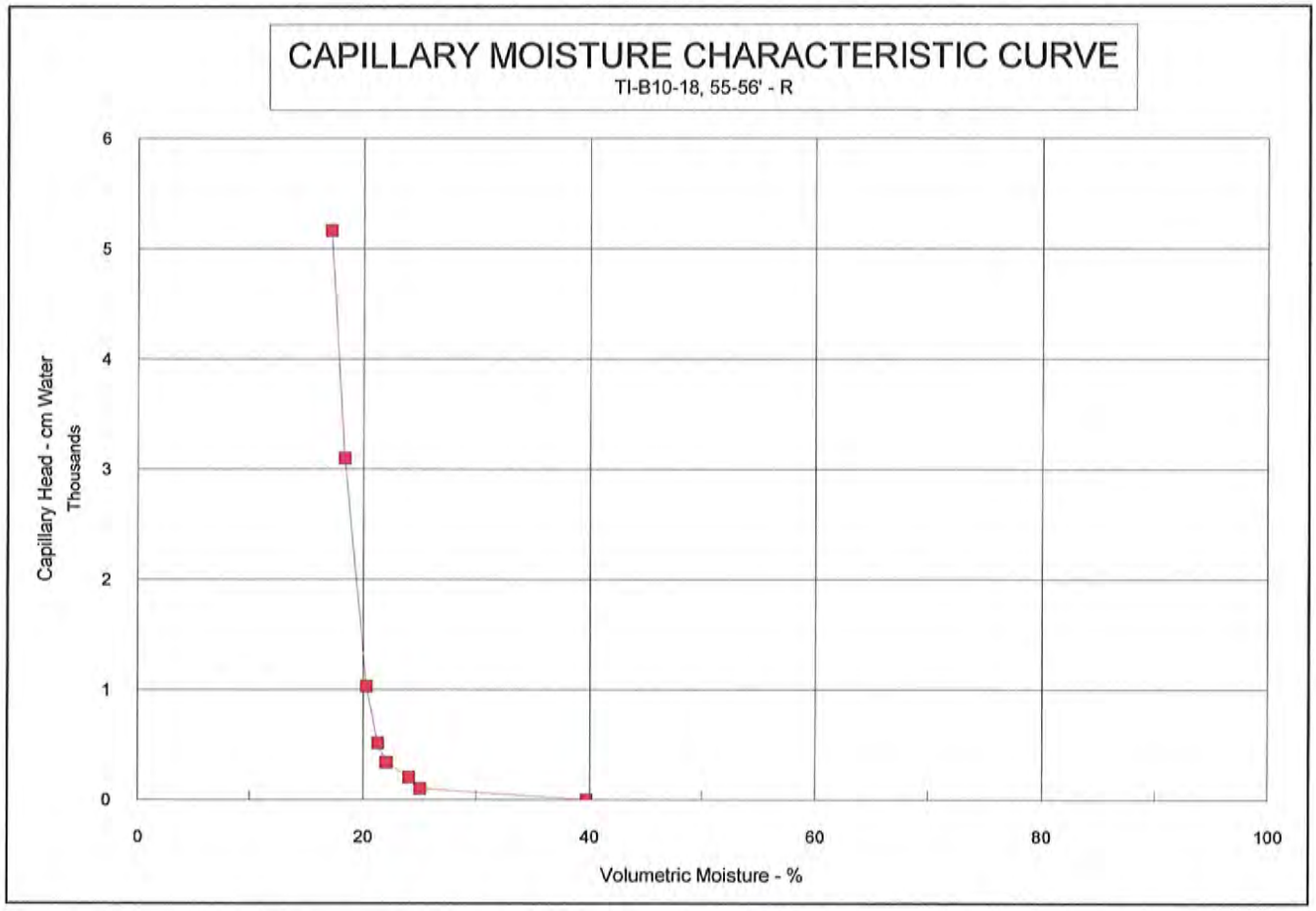
TI-B10-18, 55-56'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)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TI-B10-18, 55-56' - R
Capillary Head - cm Water
Thousands
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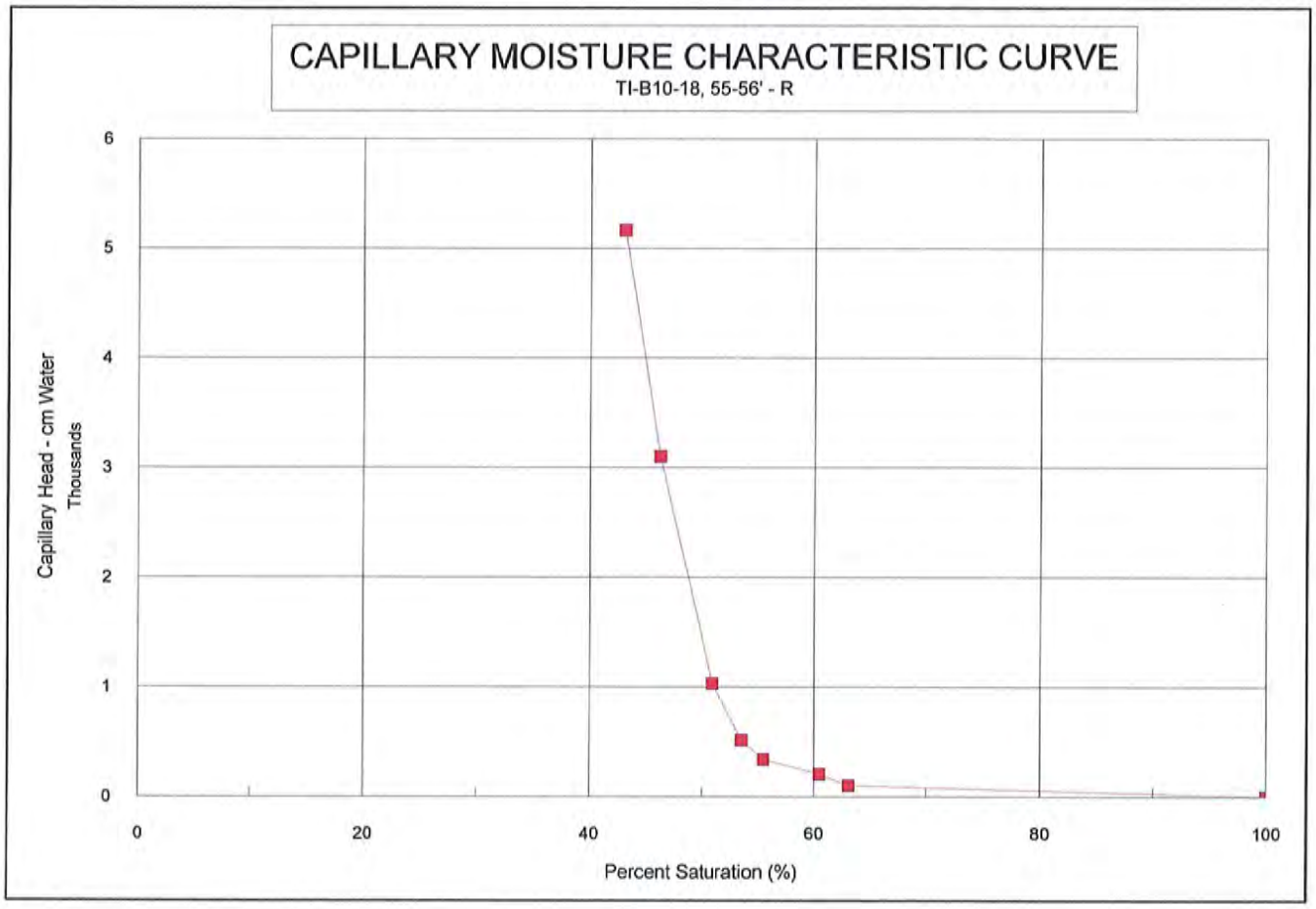
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B10-18, 55-56' - R
Capillary Head - cm Water
Thousands
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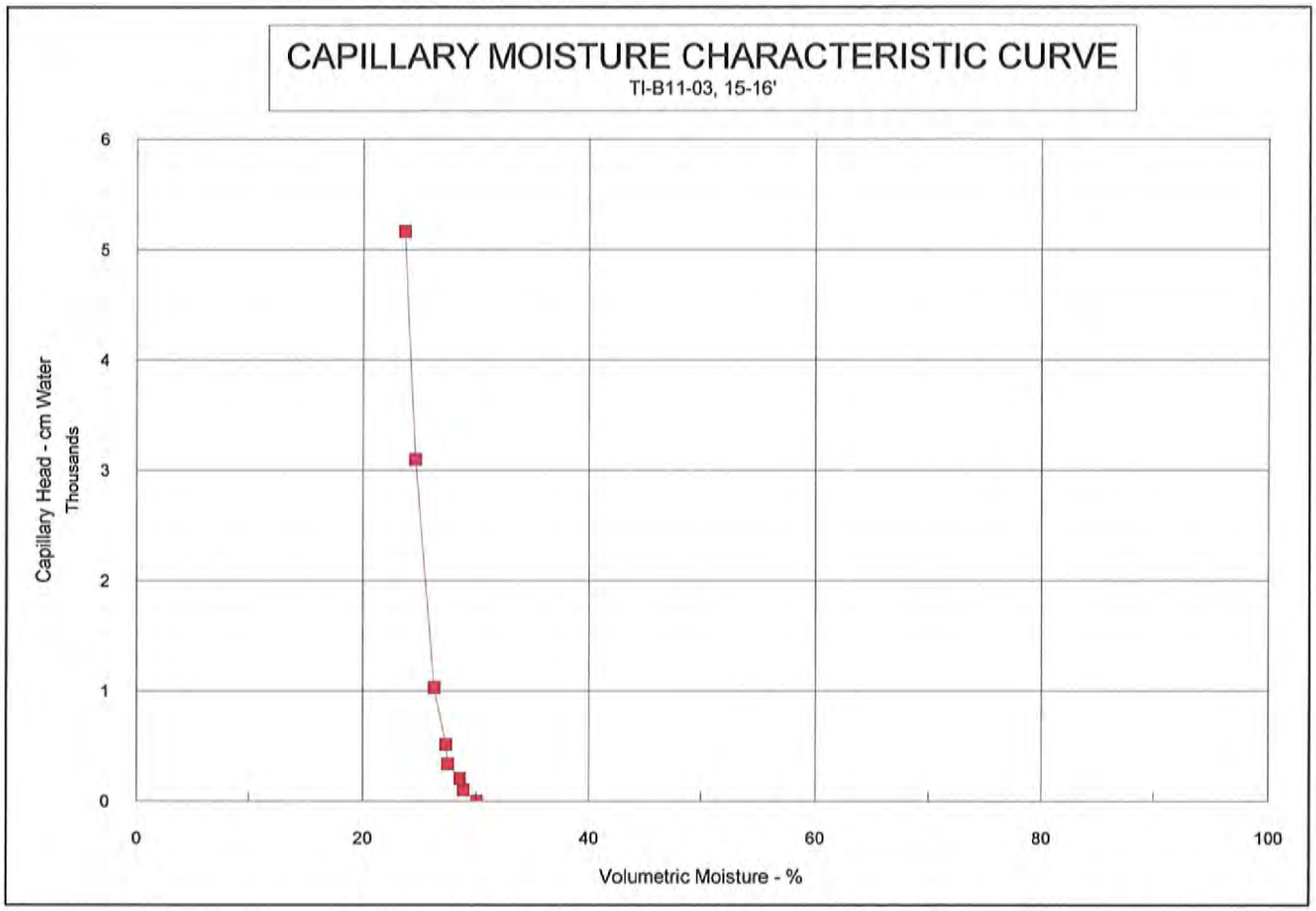
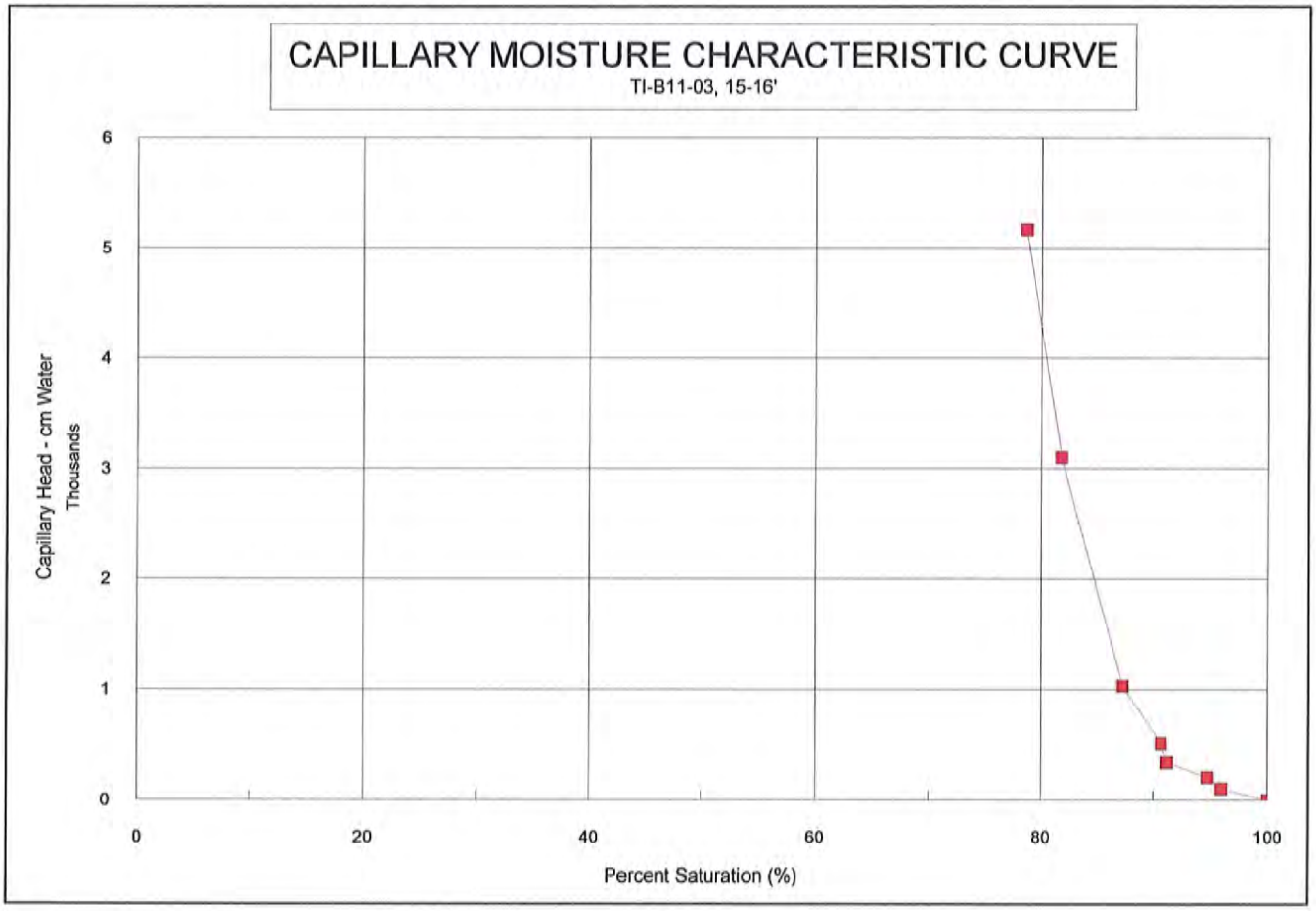
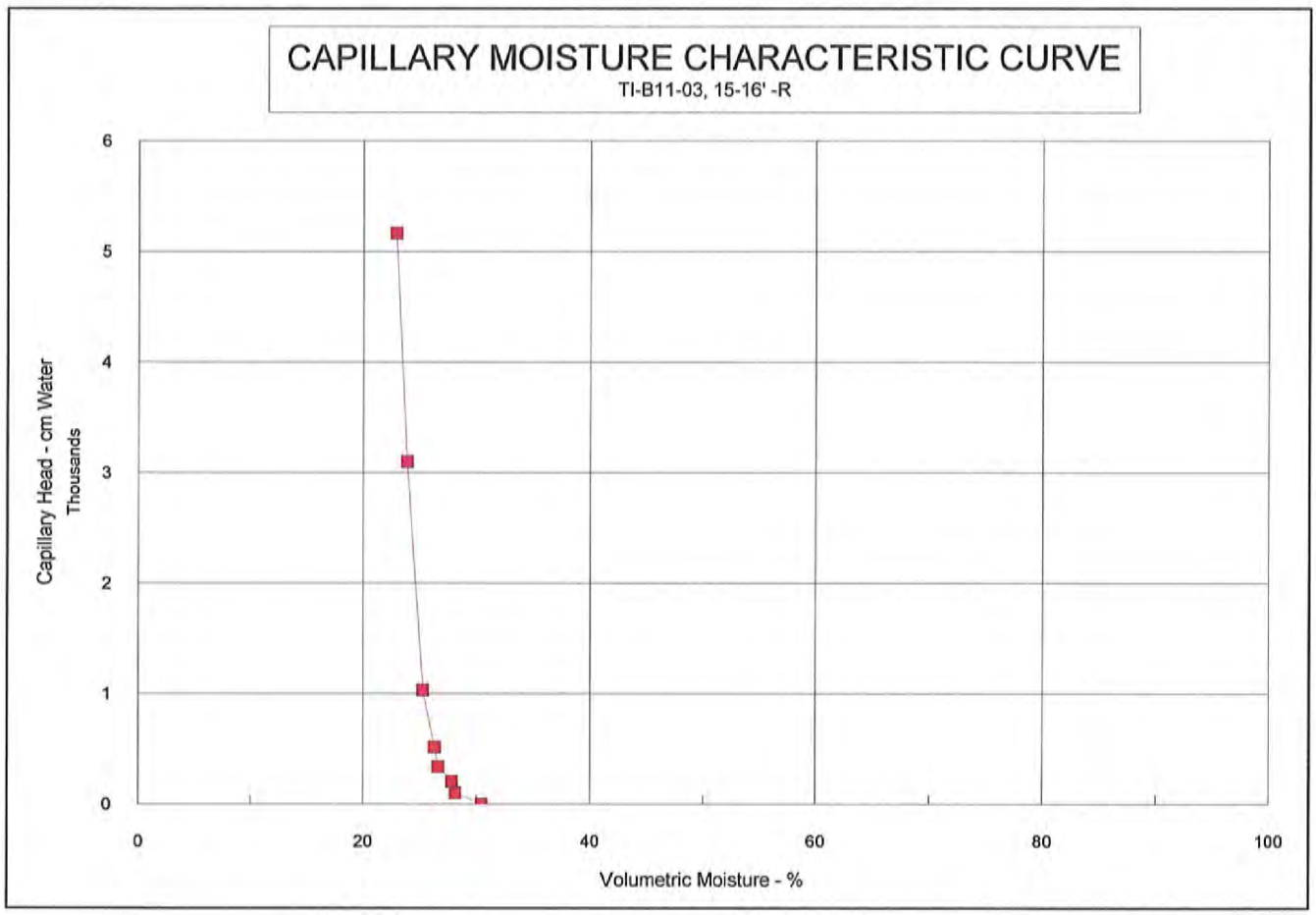
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B11-03, 15-16'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B11-03, 15-16'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B11-03, 15-16' -R
Capillary Head - cm Water
Thousands
0
1
2
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4
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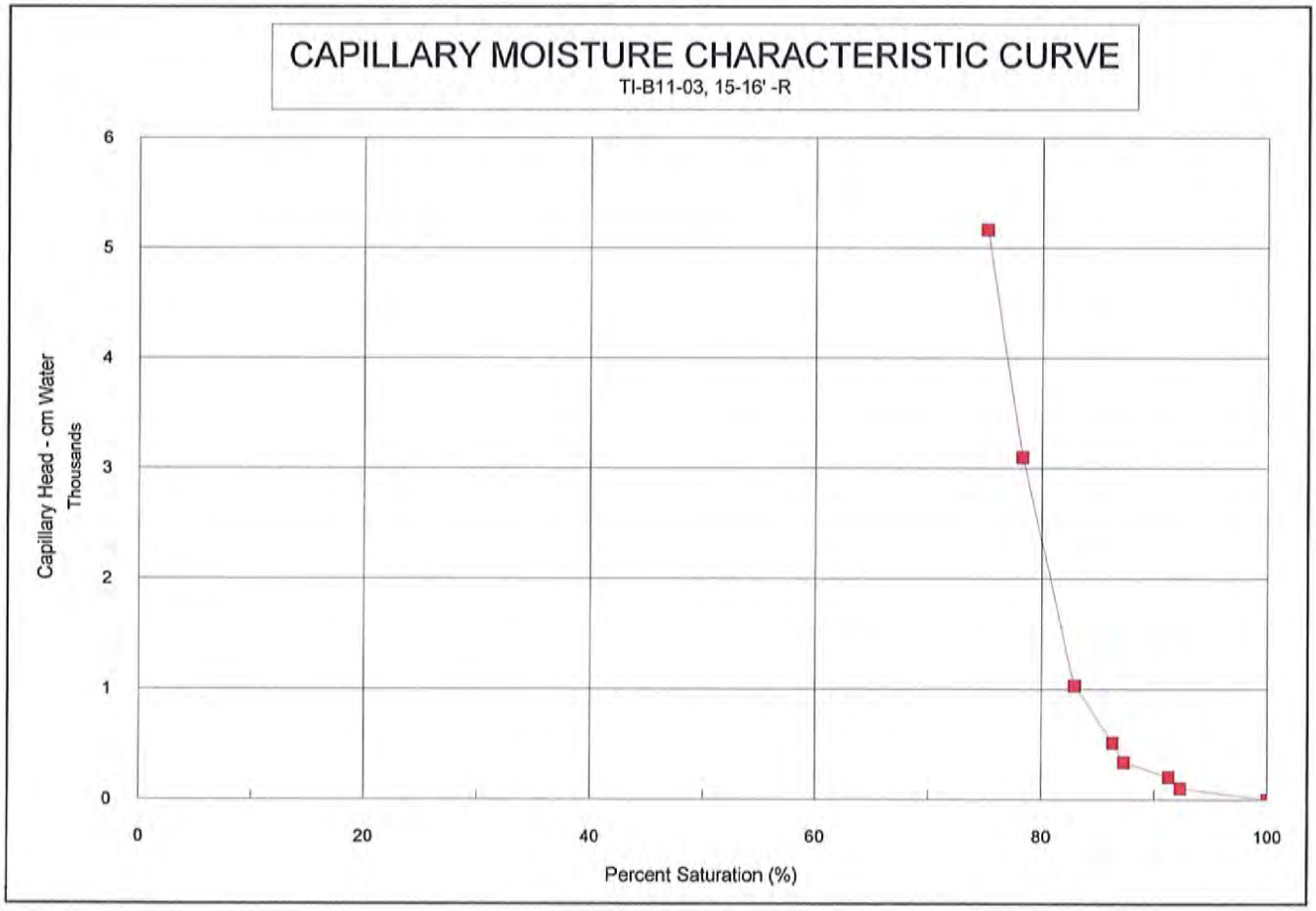
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B11-03, 15-16' -R
Capillary Head - cm Water
Thousands
0
1
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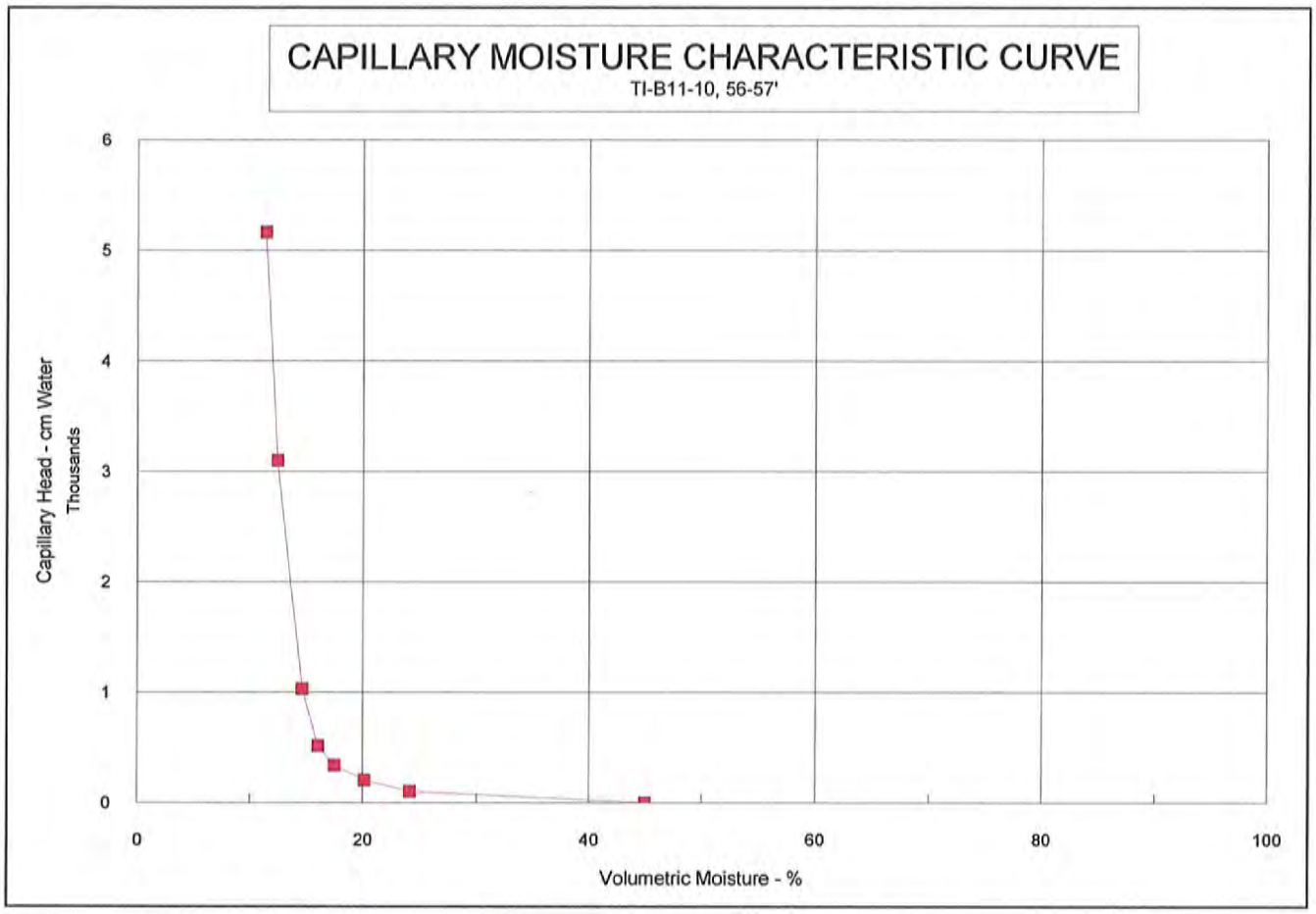
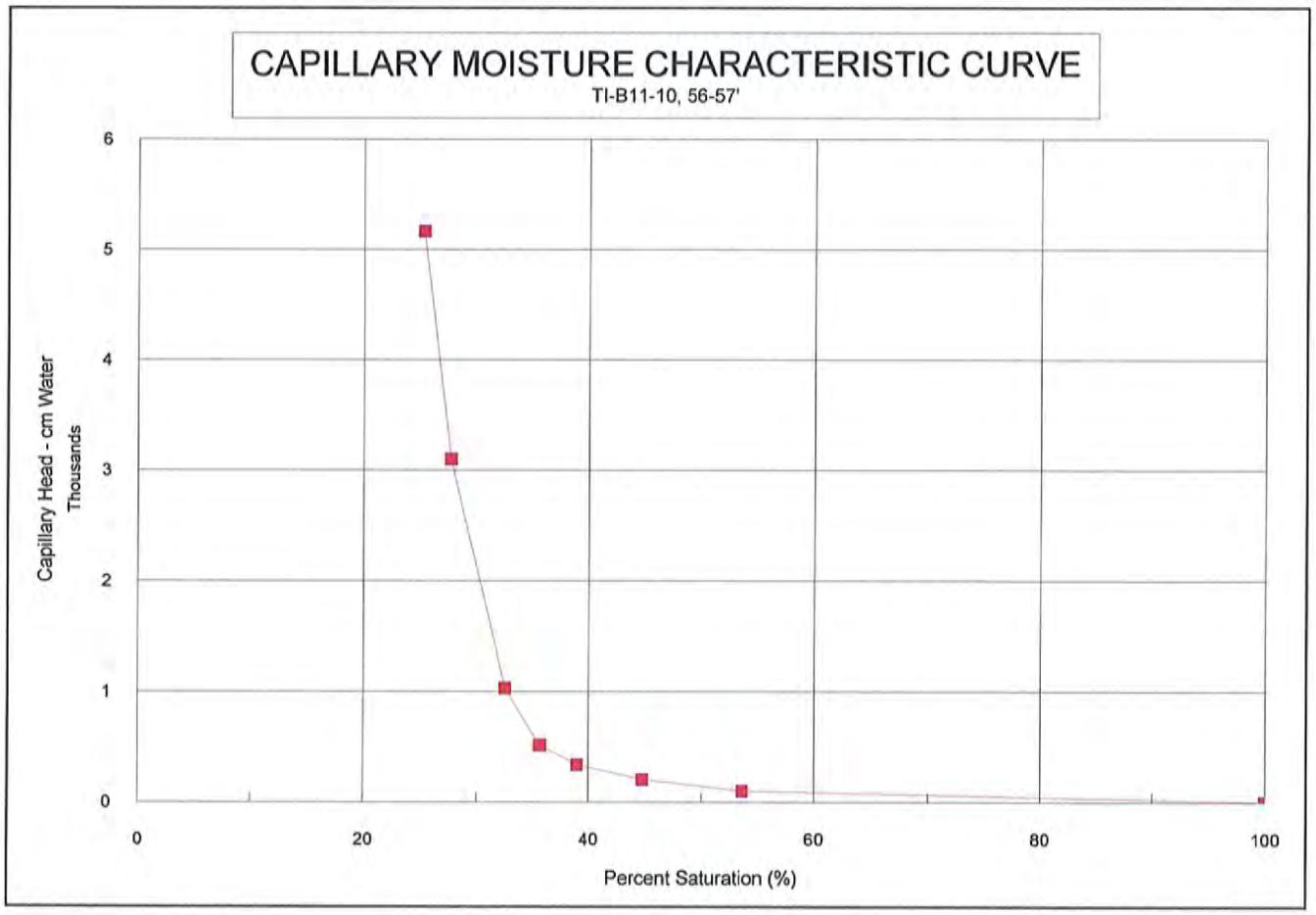
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B11-10, 56-57'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B11-10, 56-57'
Capillary Head - cm Water
Thousands
0
1
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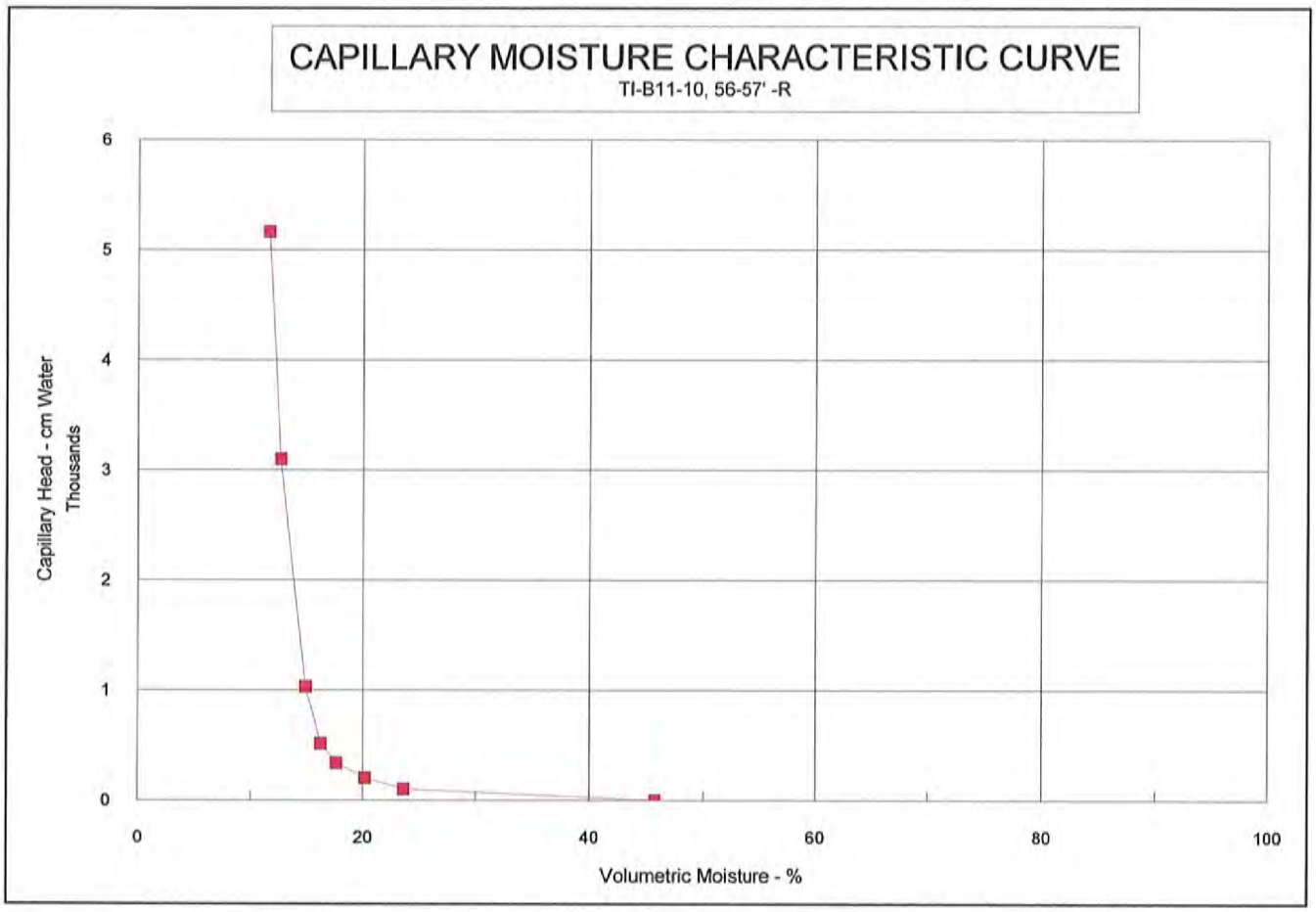
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B11-10, 56-57' -R
Capillary Head - cm Water
Thousands
0
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2
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6
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20
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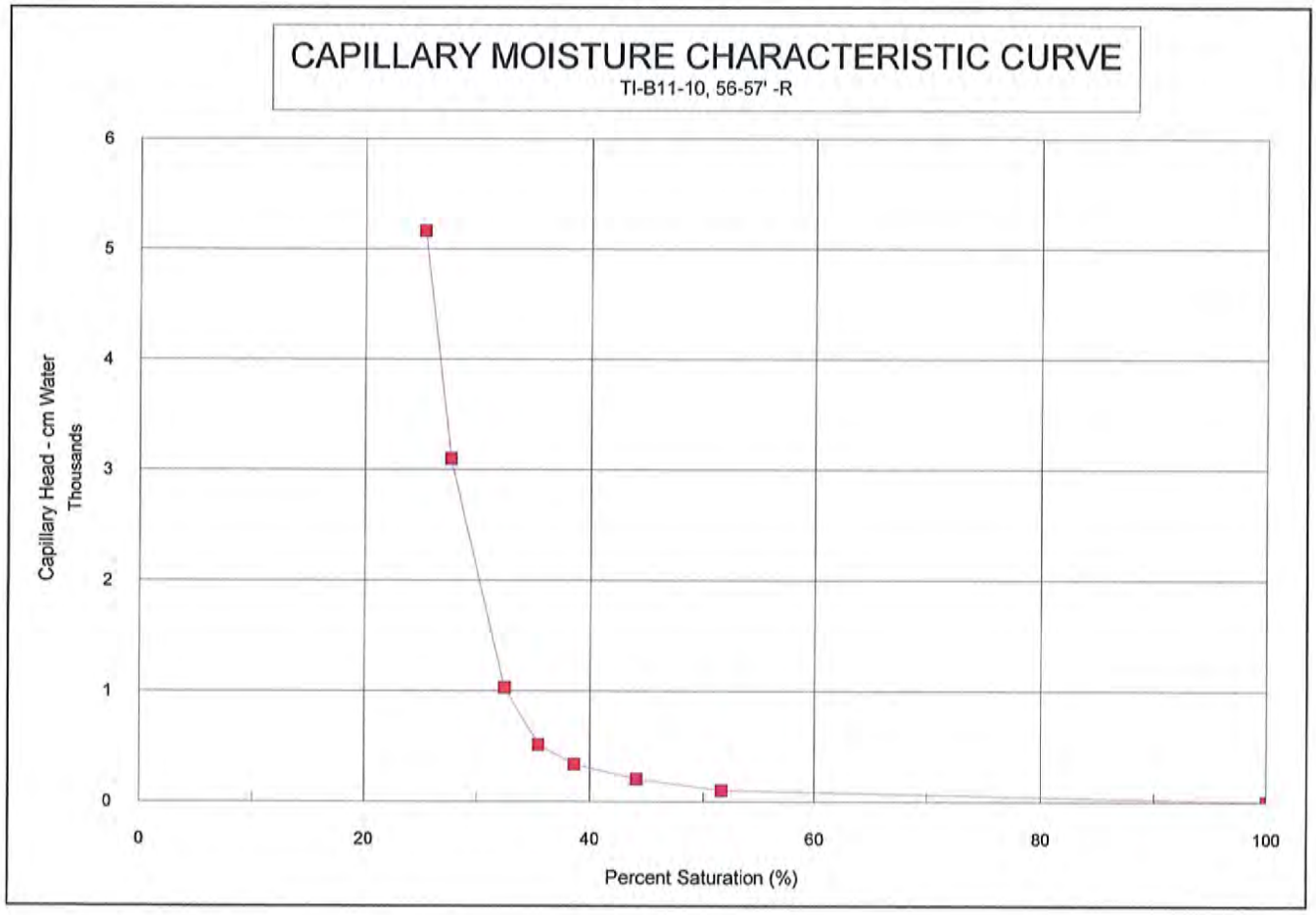
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B11-10, 56-57' -R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE	-	TEST STARTED	12/20/13 DPM
SOIL DESCR.	Church Rock	TEST FINISHED	03/11/14 DPM
LOCATION	Tailings Impoundment		

MASS DATA

Sample Description	Ring Mass g	As Rec. Mass g	Sat. Mass g	0.1 Bar Mass g	0.2 Bar Mass g	0.33 Bar Mass g	0.5 Bar Mass g	1 Bar Mass g	3 Bar Mass g	5 Bar Mass g	15 Bar Mass g	Dry Mass Filter, Ring, & Dish (g)	Dish Wt. g
Filter Mass g		0.200	0.692	0.461	0.434	0.399	0.357	0.352	0.315	0.314	0.291		
TI-B10-03, 12.5-14.0'	10.716	39.425	45.942	40.768	40.407	40.063	39.906	39.693	39.319	39.089	38.690	39.592	2.366
TI-B10-03, 12.5-14.0' -R	10.706	39.395	45.974	40.893	40.505	40.170	39.967	39.712	39.324	39.108	38.712	39.520	2.299
TI-B1-07A, 21-21.5'	10.736	42.846	47.865	42.936	42.634	42.381	42.292	42.151	41.847	41.740	41.478	43.197	2.364
TI-B1-07A, 21-21.5' -R	10.556	43.721	48.234	43.768	43.507	43.236	43.217	43.064	42.725	42.590	42.332	43.985	2.367
TI-B1-11B, 30.5-31'	10.572	39.351	45.053	39.514	38.908	38.496	38.242	38.175	37.800	37.683	37.485	39.210	2.372
TI-B1-11B, 30.5-31' -R	10.473	41.338	45.823	41.582	41.081	40.628	40.260	39.988	39.406	38.962	38.121	38.896	2.327
TI-B1-13A, 36-36.5'	10.701	41.839	47.366	42.417	41.838	41.425	41.062	40.844	40.248	40.005	39.593	39.602	2.302
TI-B1-13A, 36-36.5' - R	10.774	42.600	47.778	43.029	42.514	42.067	41.855	41.625	41.090	40.872	40.446	40.524	2.288
TI-B10-02, 10-11'	10.624	45.439	49.685	46.418	46.072	45.752	45.540	45.374	45.006	44.798	44.369	44.950	2.339
TI-B10-02, 10-11' - R	10.688	45.298	49.464	46.272	45.938	45.609	45.416	45.206	44.827	44.595	44.140	44.614	2.373

Data Entered By: DPM Date: 03/18/2014
Data Checked By: [illegible] Date: 3/18/14
Filename: CMRSETC

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE	-	TEST STARTED	12/20/13 DPM
SOIL DESCR.	Church Rock	TEST FINISHED	03/11/14 DPM
LOCATION	Tailings Impoundment		

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	Sample Conditions						0.1 Bar			0.2 Bar		
	Dry Mass (g)	Unit Wt. (g/cc)	Sat. Mass (g)	Total H2O (g)	Sat. M.C. % D.M.	Sat. M.C. % Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
TI-B10-03, 12.5-14.0'	26.310	1.361	34.534	8.224	31.26	42.53	3.281	12.47	16.97	2.947	11.20	15.24
TI-B10-03, 12.5-14.0' -R	26.315	1.361	34.576	8.261	31.39	42.72	3.411	12.96	17.64	3.050	11.59	15.77
TI-B1-07A, 21-21.5'	29.897	1.546	36.437	6.540	21.88	33.82	1.842	6.16	9.53	1.567	5.24	8.10
TI-B1-07A, 21-21.5' -R	30.862	1.596	36.986	6.124	19.84	31.67	1.889	6.12	9.77	1.655	5.36	8.56
TI-B1-11B, 30.5-31'	26.066	1.348	33.789	7.723	29.63	39.94	2.415	9.26	12.49	1.836	7.04	9.50
TI-B1-11B, 30.5-31' -R	25.896	1.339	34.658	8.762	33.84	45.31	4.752	18.35	24.58	4.278	16.52	22.12
TI-B1-13A, 36-36.5'	26.399	1.365	35.973	9.574	36.27	49.51	4.856	18.39	25.11	4.304	16.30	22.26
TI-B1-13A, 36-36.5' - R	27.262	1.410	36.312	9.050	33.20	46.80	4.532	16.62	23.44	4.044	14.83	20.91
TI-B10-02, 10-11'	31.787	1.644	38.369	6.582	20.71	34.04	3.546	11.16	18.34	3.227	10.15	16.69
TI-B10-02, 10-11' - R	31.353	1.621	38.084	6.731	21.47	34.81	3.770	12.02	19.50	3.463	11.05	17.91

Data Entered By: DPM Date: 03/18/2014
Data Checked By: KR Date: 3/18/14
Filename: CMRSETC

ADVANCED TERRA TESTING, INC. ATT

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE	-	TEST STARTED	12/20/13 DPM
SOIL DESCR.	Church Rock	TEST FINISHED	03/11/14 DPM
LOCATION	Tailings Impoundment		

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	0.33 Bar			0.5 Bar			1 Bar			3 Bar		
	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
TI-B10-03, 12.5-14.0'	2.638	10.03	13.64	2.523	9.59	13.05	2.315	8.80	11.97	1.978	7.52	10.23
TI-B10-03, 12.5-14.0' -R	2.750	10.45	14.22	2.589	9.84	13.39	2.339	8.89	12.10	1.988	7.55	10.28
TI-B1-07A, 21-21.5'	1.349	4.51	6.98	1.302	4.35	6.73	1.166	3.90	6.03	0.899	3.01	4.65
TI-B1-07A, 21-21.5' -R	1.419	4.60	7.34	1.442	4.67	7.46	1.294	4.19	6.69	0.992	3.21	5.13
TI-B1-11B, 30.5-31'	1.459	5.60	7.55	1.247	4.78	6.45	1.185	4.55	6.13	0.847	3.25	4.38
TI-B1-11B, 30.5-31' -R	3.860	14.91	19.96	3.534	13.65	18.28	3.267	12.62	16.90	2.722	10.51	14.08
TI-B1-13A, 36-36.5'	3.926	14.87	20.30	3.605	13.66	18.64	3.392	12.85	17.54	2.833	10.73	14.65
TI-B1-13A, 36-36.5' - R	3.632	13.32	18.78	3.462	12.70	17.90	3.237	11.87	16.74	2.739	10.05	14.17
TI-B10-02, 10-11'	2.942	9.26	15.22	2.772	8.72	14.34	2.611	8.21	13.50	2.280	7.17	11.79
TI-B10-02, 10-11' - R	3.169	10.11	16.39	3.018	9.63	15.61	2.813	8.97	14.55	2.471	7.88	12.78

Data Entered By: DPM Date: **********
Data Checked By: KR Date: 3/18/14
Filename: CMRSETC

ADVANCED TERRA TESTING, INC. ATT

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE	-	TEST STARTED	12/20/13 DPM
SOIL DESCR.	Church Rock	TEST FINISHED	03/11/14 DPM
LOCATION	Tailings Impoundment		

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	5 Bar			15 Bar		
	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
TI-B10-03, 12.5-14.0'	1.749	6.65	9.05	1.373	5.22	7.10
TI-B10-03, 12.5-14.0' -R	1.773	6.74	9.17	1.400	5.32	7.24
TI-B1-07A, 21-21.5'	0.793	2.65	4.10	0.554	1.85	2.87
TI-B1-07A, 21-21.5' -R	0.858	2.78	4.44	0.623	2.02	3.22
TI-B1-11B, 30.5-31'	0.731	2.80	3.78	0.556	2.13	2.88
TI-B1-11B, 30.5-31' -R	2.279	8.80	11.79	1.461	5.64	7.56
TI-B1-13A, 36-36.5'	2.591	9.81	13.40	2.202	8.34	11.39
TI-B1-13A, 36-36.5' - R	2.522	9.25	13.04	2.119	7.77	10.96
TI-B10-02, 10-11'	2.073	6.52	10.72	1.667	5.24	8.62
TI-B10-02, 10-11' - R	2.240	7.14	11.58	1.808	5.77	9.35

Data Entered By: DPM Date: **********
Data Checked By: [illegible] Date: 3/18/14
Filename: CMRSETC

ADVANCED TERRA TESTING, INC. ATT

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT MWH

JOB NO. 2512-77

SAMPLE DATE -
SOIL DESCR. Church Rock
LOCATION Tailings Impoundment

TEST STARTED 12/20/13 DPM
TEST FINISHED 03/11/14 DPM

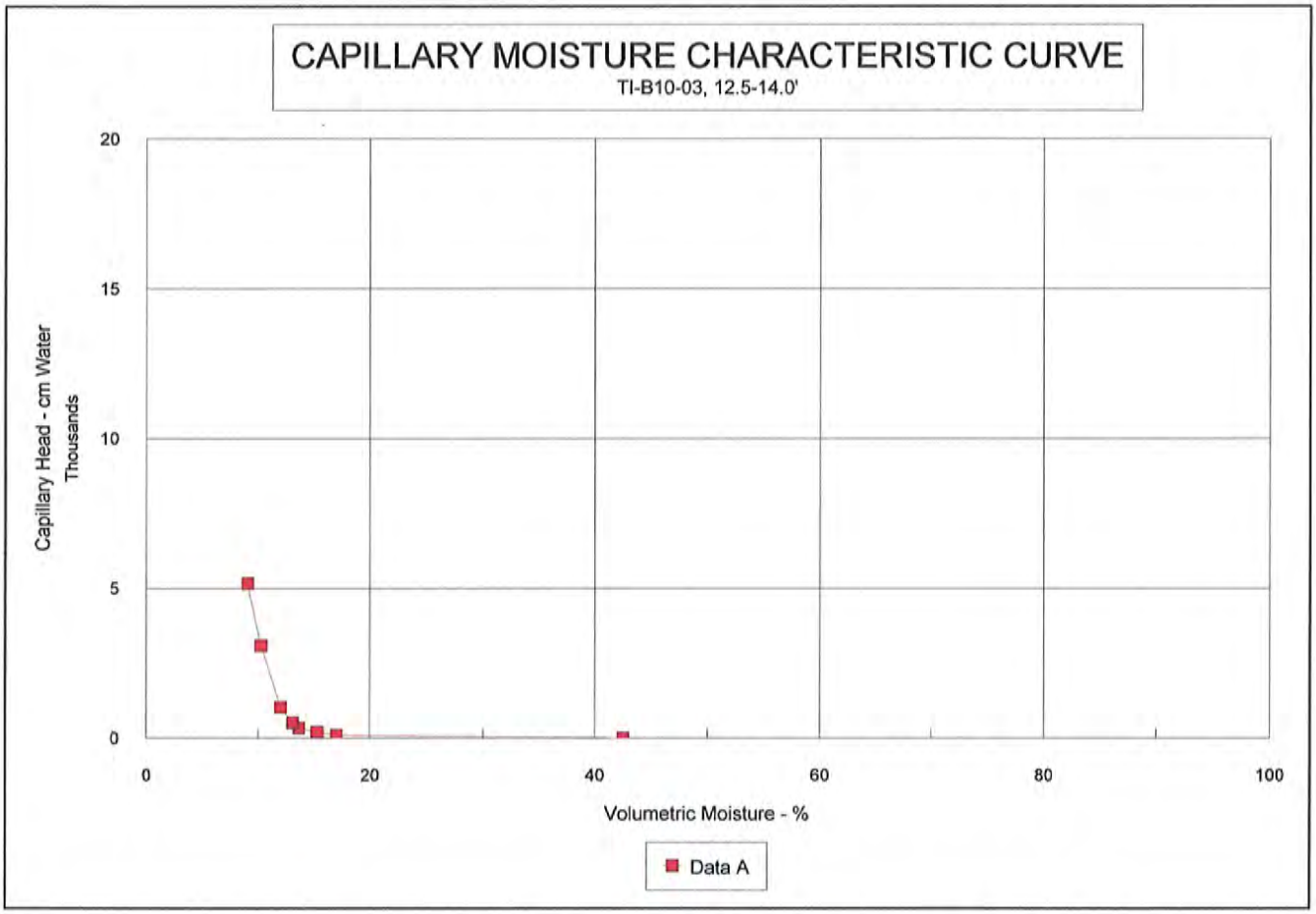
	Vol. MC % Sat.	Vol. MC % 0.1 Bar	Vol. MC % 0.2 Bar	Vol. MC % 0.33 Bar	Vol. MC % 0.5 Bar	Vol. MC % 1 Bar	Vol. MC % 3 Bar	Vol. MC % 5 Bar	Vol. MC % 15 Bar
TI-B10-03, 12.5-14.0'	42.53	16.97	15.24	13.64	13.05	11.97	10.23	9.05	7.10
TI-B10-03, 12.5-14.0' -R	42.72	17.64	15.77	14.22	13.39	12.10	10.28	9.17	7.24
TI-B1-07A, 21-21.5'	33.82	9.53	8.10	6.98	6.73	6.03	4.65	4.10	2.87
TI-B1-07A, 21-21.5' -R	31.67	9.77	8.56	7.34	7.46	6.69	5.13	4.44	3.22
TI-B1-11B, 30.5-31'	39.94	12.49	9.50	7.55	6.45	6.13	4.38	3.78	2.88
TI-B1-11B, 30.5-31' -R	45.31	24.58	22.12	19.96	18.28	16.90	14.08	11.79	7.56
TI-B1-13A, 36-36.5'	49.51	25.11	22.26	20.30	18.64	17.54	14.65	13.40	11.39
TI-B1-13A, 36-36.5' - R	46.80	23.44	20.91	18.78	17.90	16.74	14.17	13.04	10.96
TI-B10-02, 10-11'	34.04	18.34	16.69	15.22	14.34	13.50	11.79	10.72	8.62
TI-B10-02, 10-11' - R	34.81	19.50	17.91	16.39	15.61	14.55	12.78	11.58	9.35

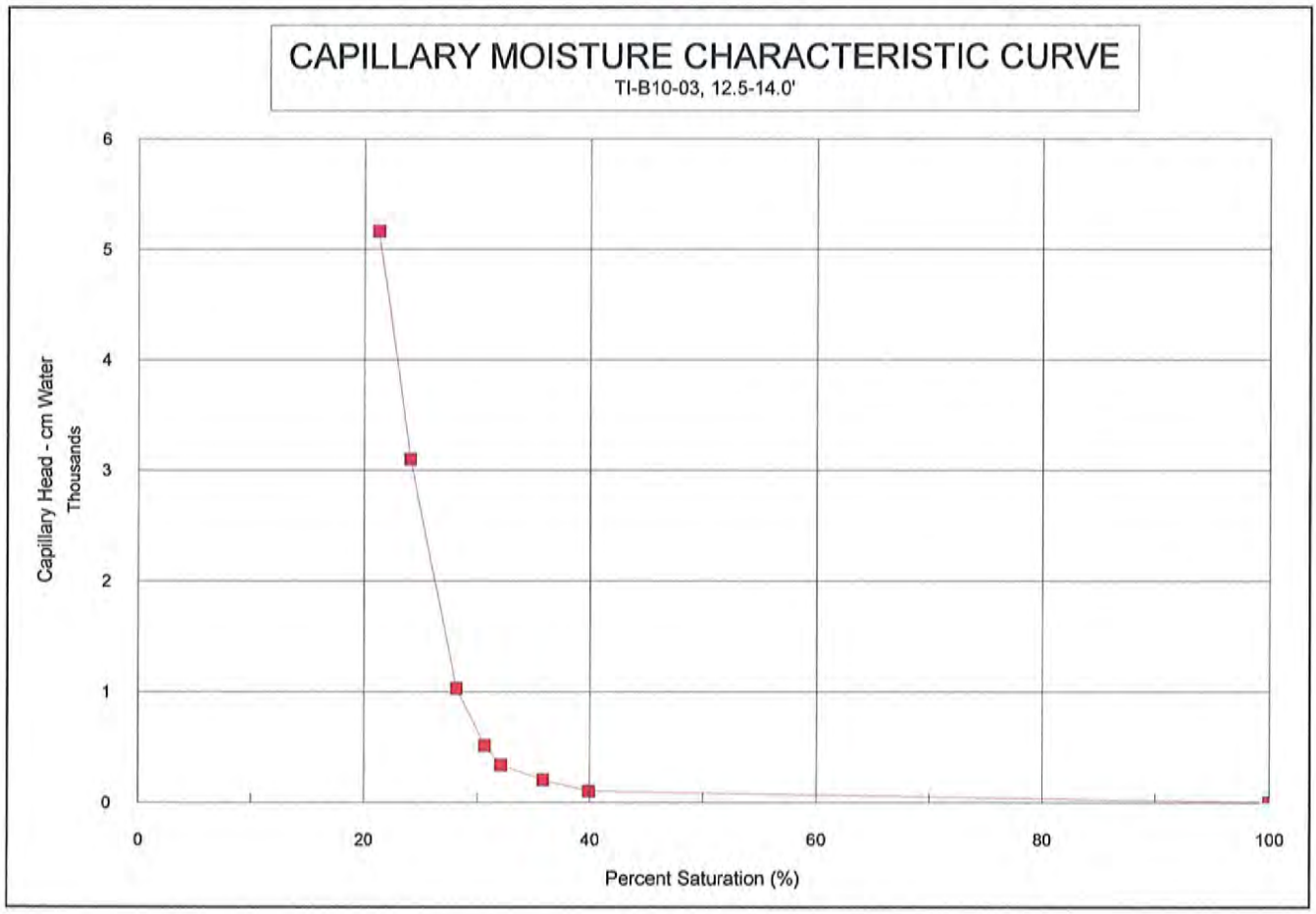
% Saturation

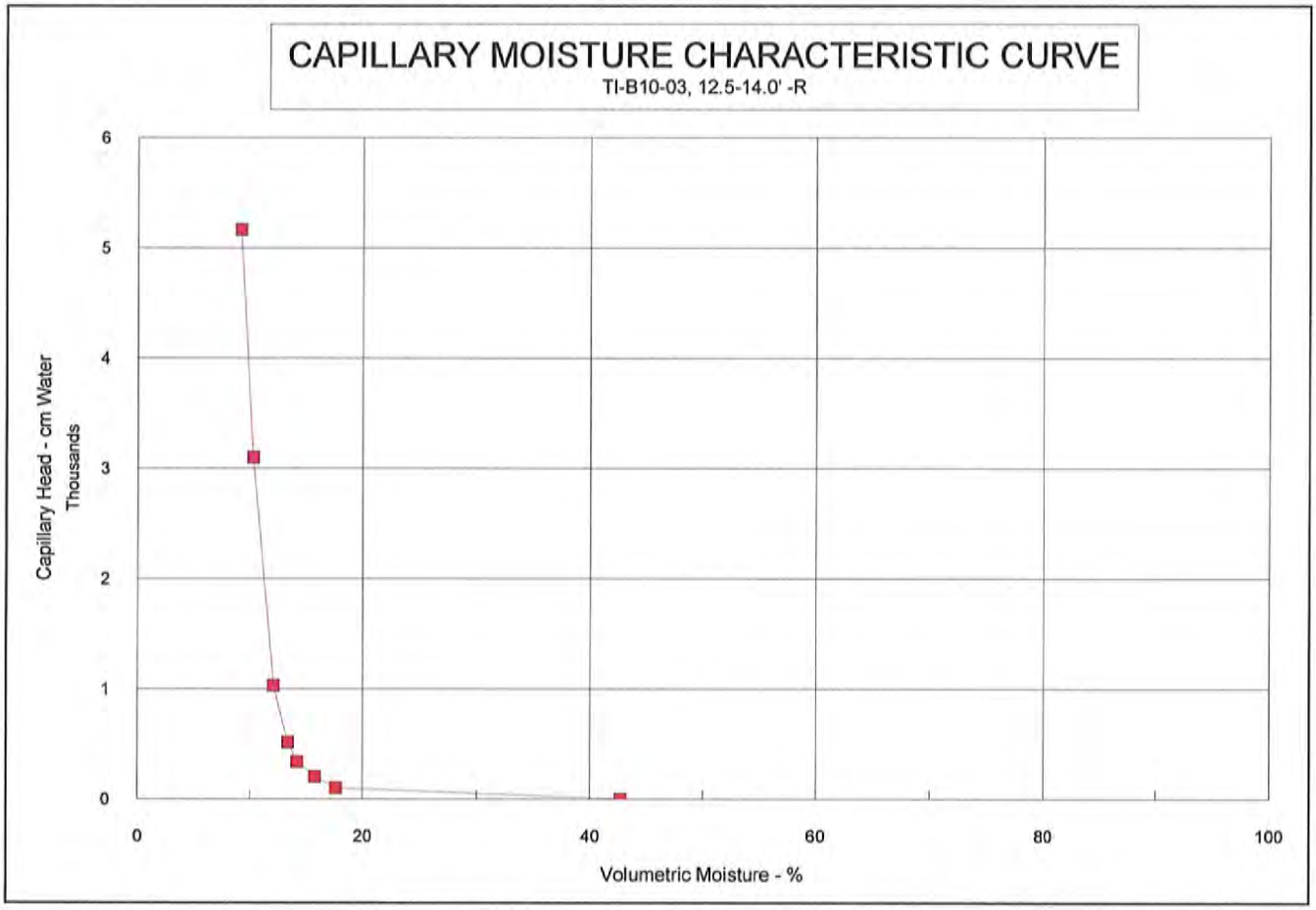
	Sat.	0.1 Bar	0.2 Bar	0.33 Bar	0.5 Bar	1 Bar	3 Bar	5 Bar	15 Bar
TI-B10-03, 12.5-14.0'	100.00	39.90	35.83	32.08	30.68	28.15	24.05	21.27	16.70
TI-B10-03, 12.5-14.0' -R	100.00	41.29	36.92	33.29	31.34	28.31	24.06	21.46	16.95
TI-B1-07A, 21-21.5'	100.00	28.17	23.96	20.63	19.91	17.83	13.75	12.13	8.47
TI-B1-07A, 21-21.5' -R	100.00	30.85	27.02	23.17	23.55	21.13	16.20	14.01	10.17
TI-B1-11B, 30.5-31'	100.00	31.27	23.77	18.89	16.15	15.34	10.97	9.47	7.20
TI-B1-11B, 30.5-31' -R	100.00	54.23	48.82	44.05	40.33	37.29	31.07	26.01	16.67
TI-B1-13A, 36-36.5'	100.00	50.72	44.96	41.01	37.65	35.43	29.59	27.06	23.00
TI-B1-13A, 36-36.5' - R	100.00	50.08	44.69	40.13	38.25	35.77	30.27	27.87	23.41
TI-B10-02, 10-11'	100.00	53.87	49.03	44.70	42.11	39.67	34.64	31.49	25.33
TI-B10-02, 10-11' - R	100.00	56.01	51.45	47.08	44.84	41.79	36.71	33.28	26.86

Data Entered By: DPM Date: 03/18/2014
Data Checked By: KR Date: 3/18/14
Filename: CMRSETC

ADVANCED TERRA TESTING, INC. ATT


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B10-03, 12.5-14.0'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Volumetric Moisture - %
Data A


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B10-03, 12.5-14.0'
Capillary Head - cm Water
Thousands
6
5
4
3
2
1
0
0
20
40
60
80
100
Percent Saturation (%)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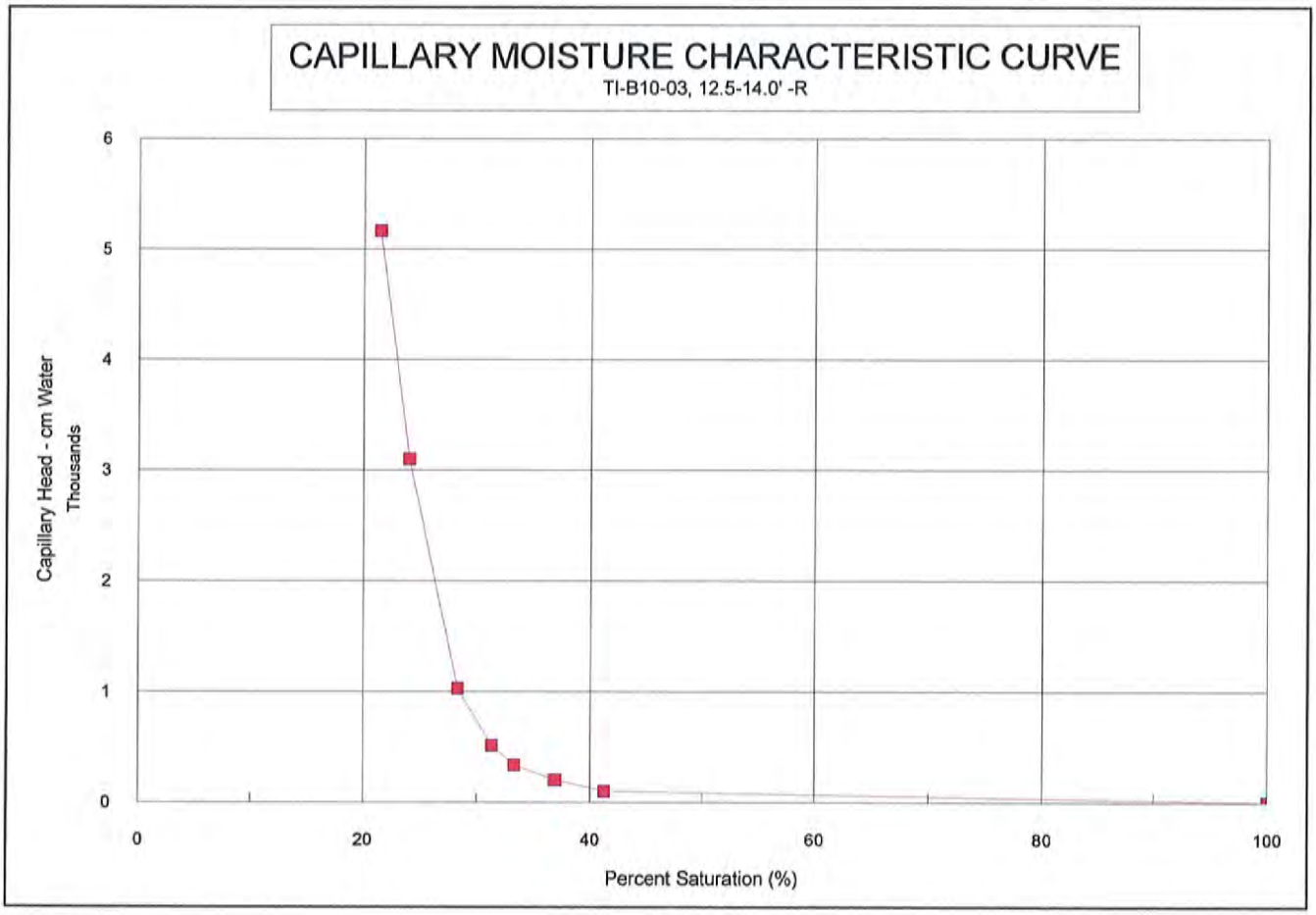
TI-B10-03, 12.5-14.0' -R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %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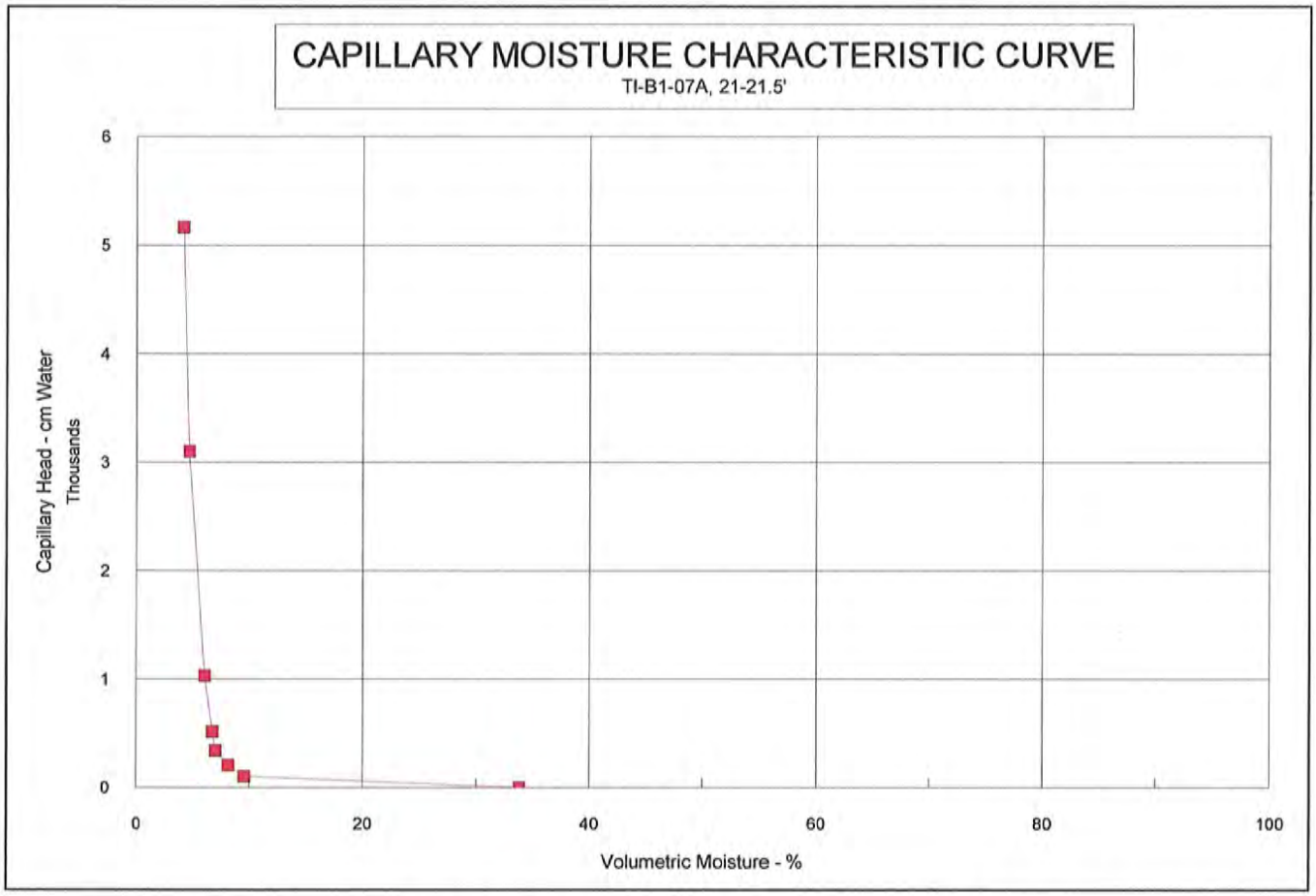
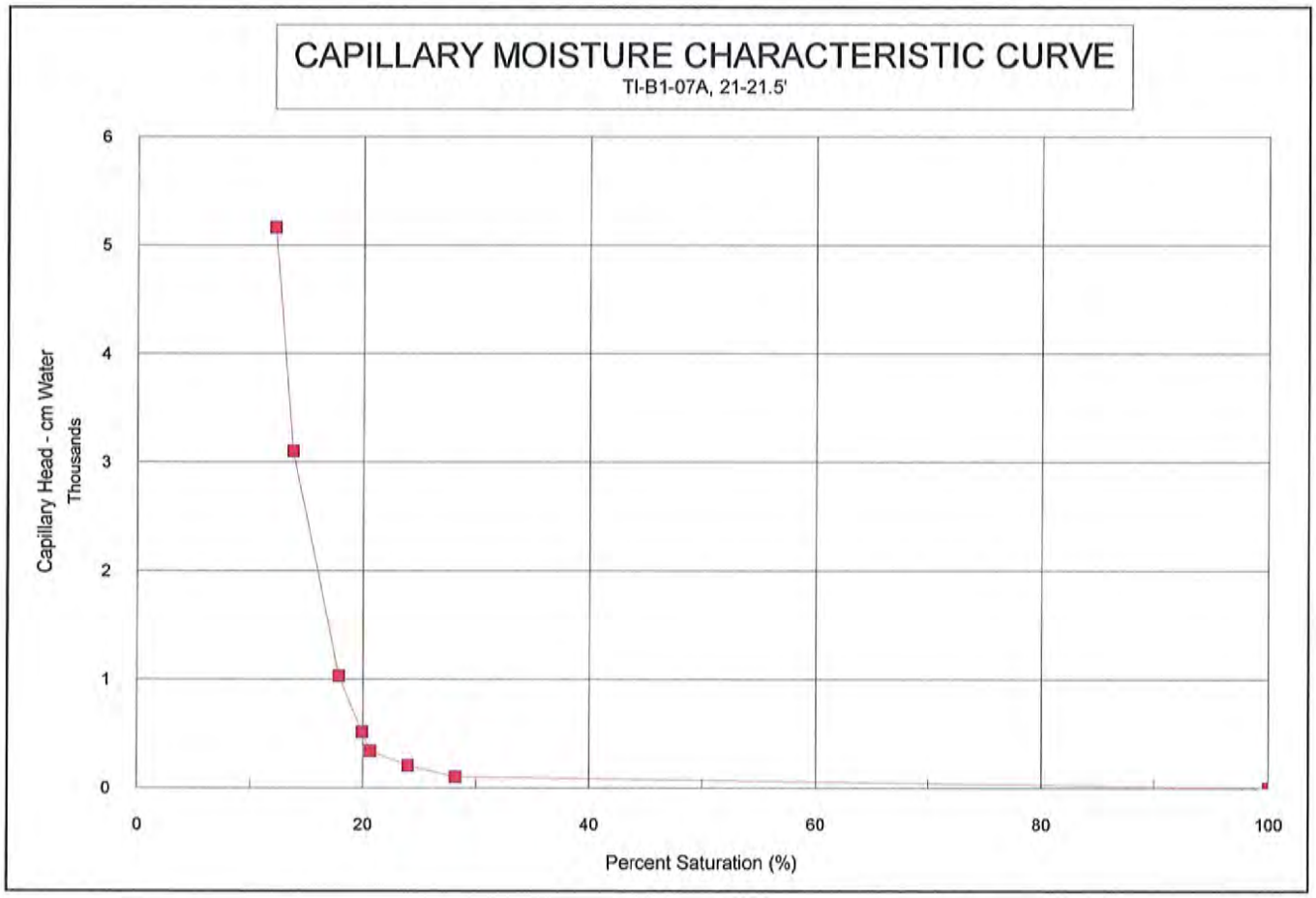
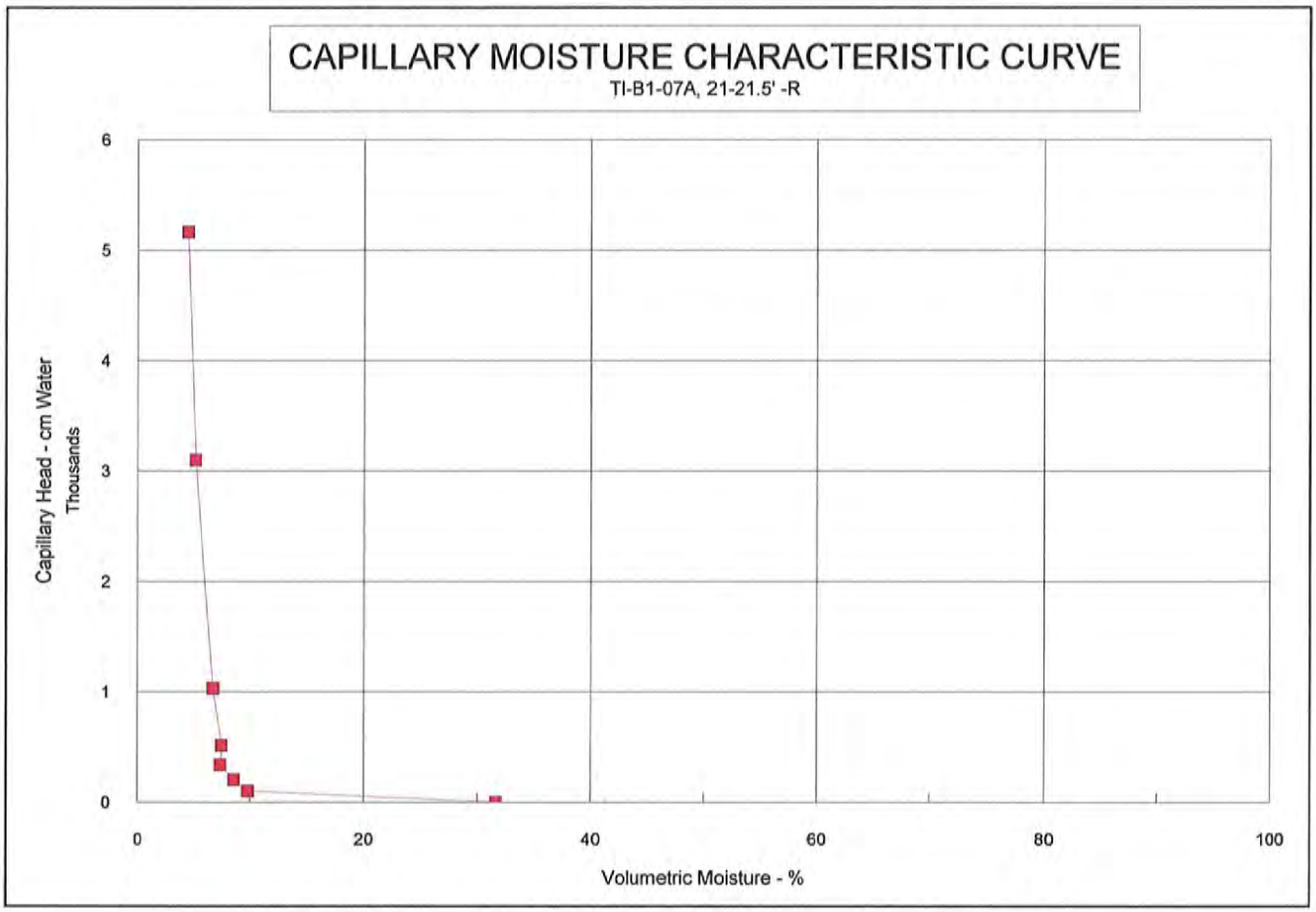
TI-B10-03, 12.5-14.0' -R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-07A, 21-21.5'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-07A, 21-21.5'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)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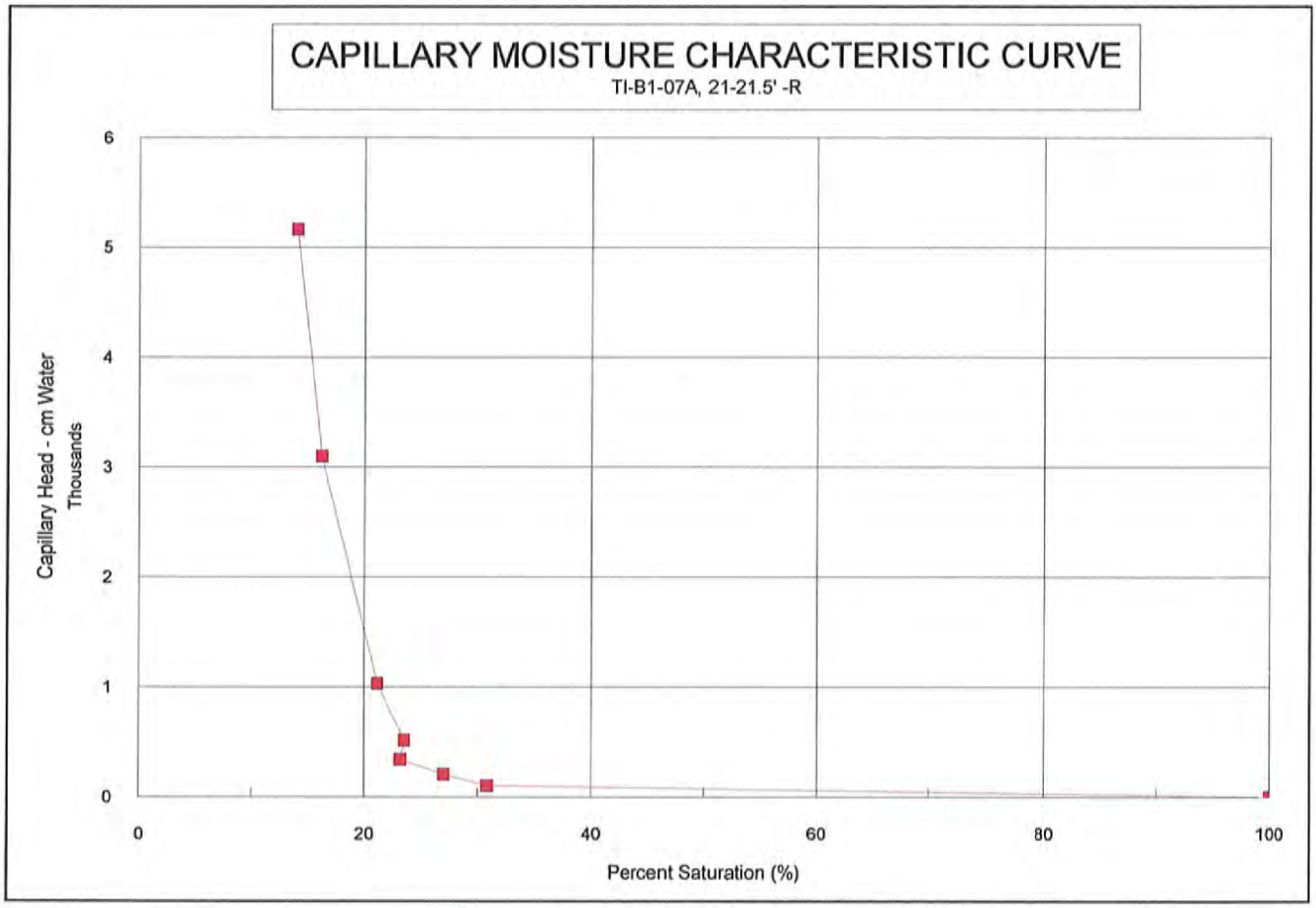
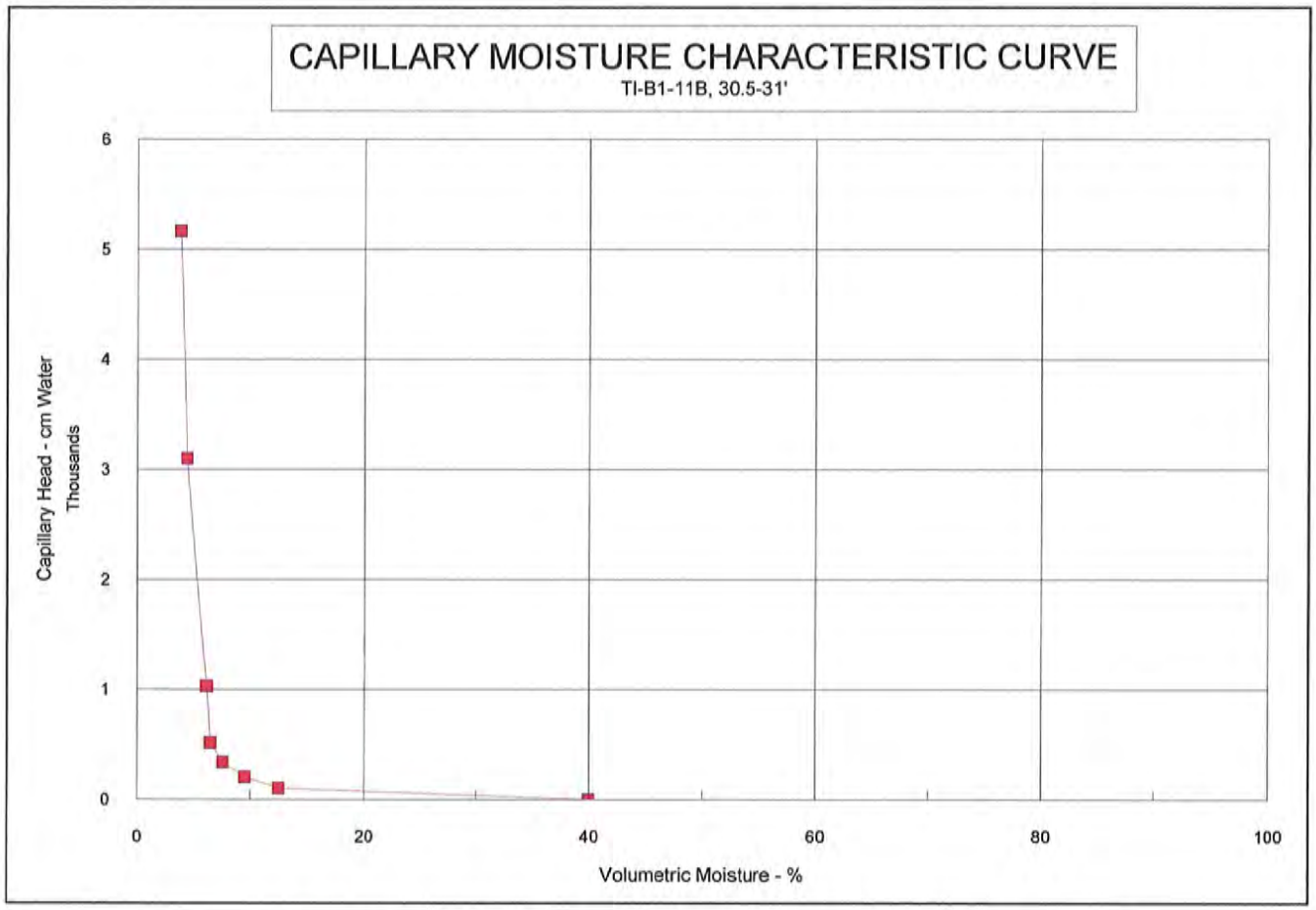
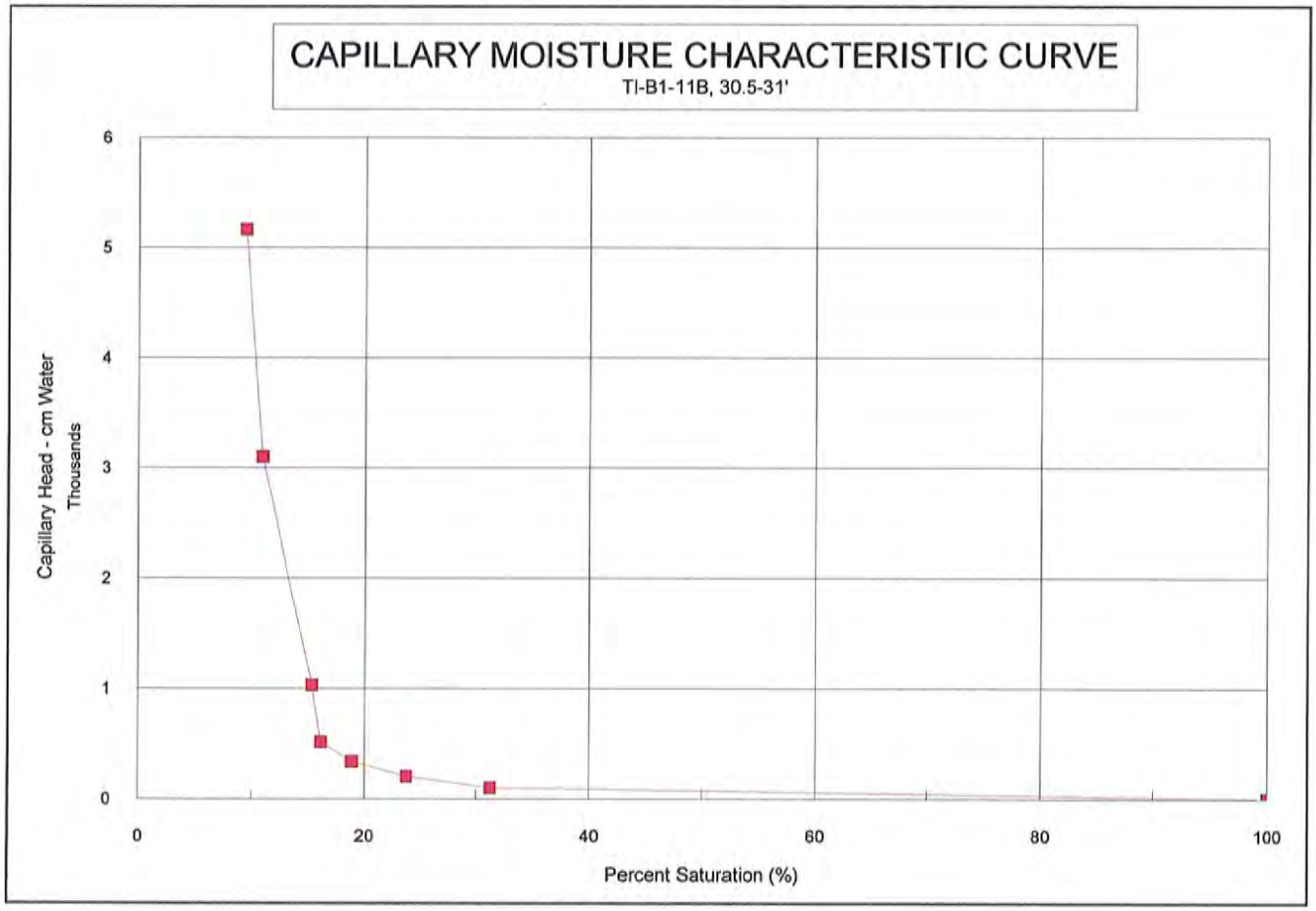
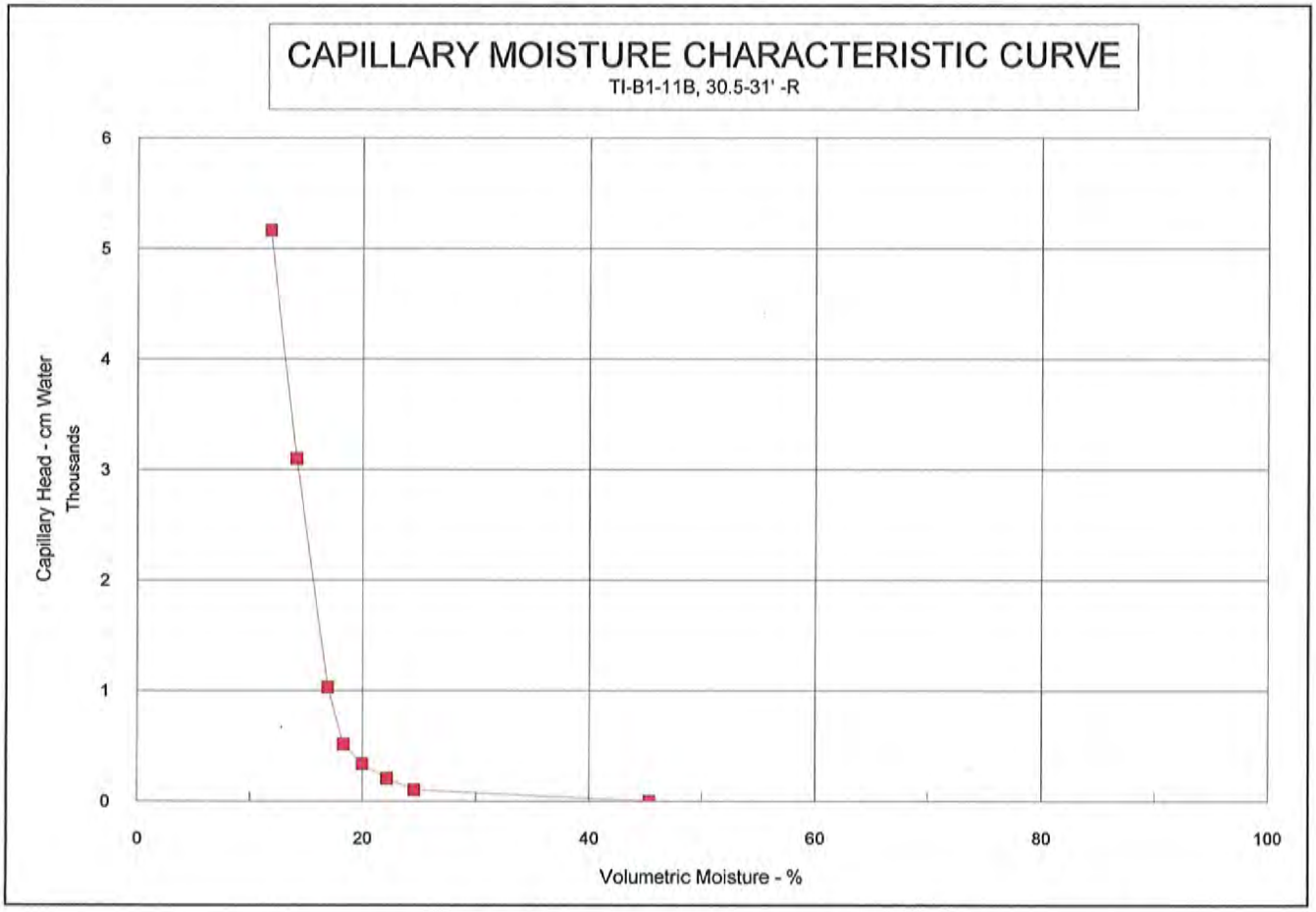
TI-B1-07A, 21-21.5' -R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-07A, 21-21.5' -R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-11B, 30.5-31'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-11B, 30.5-31'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)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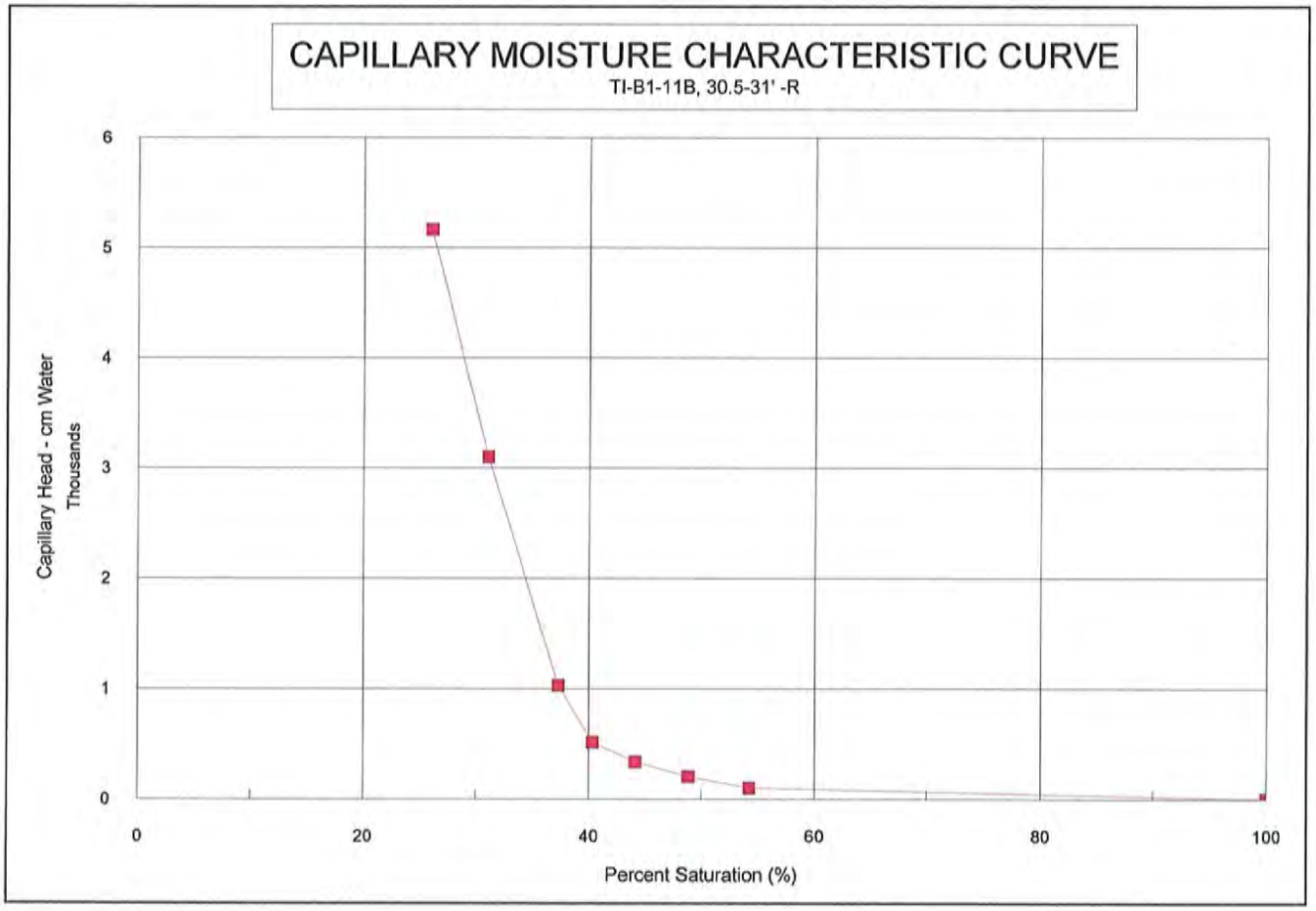
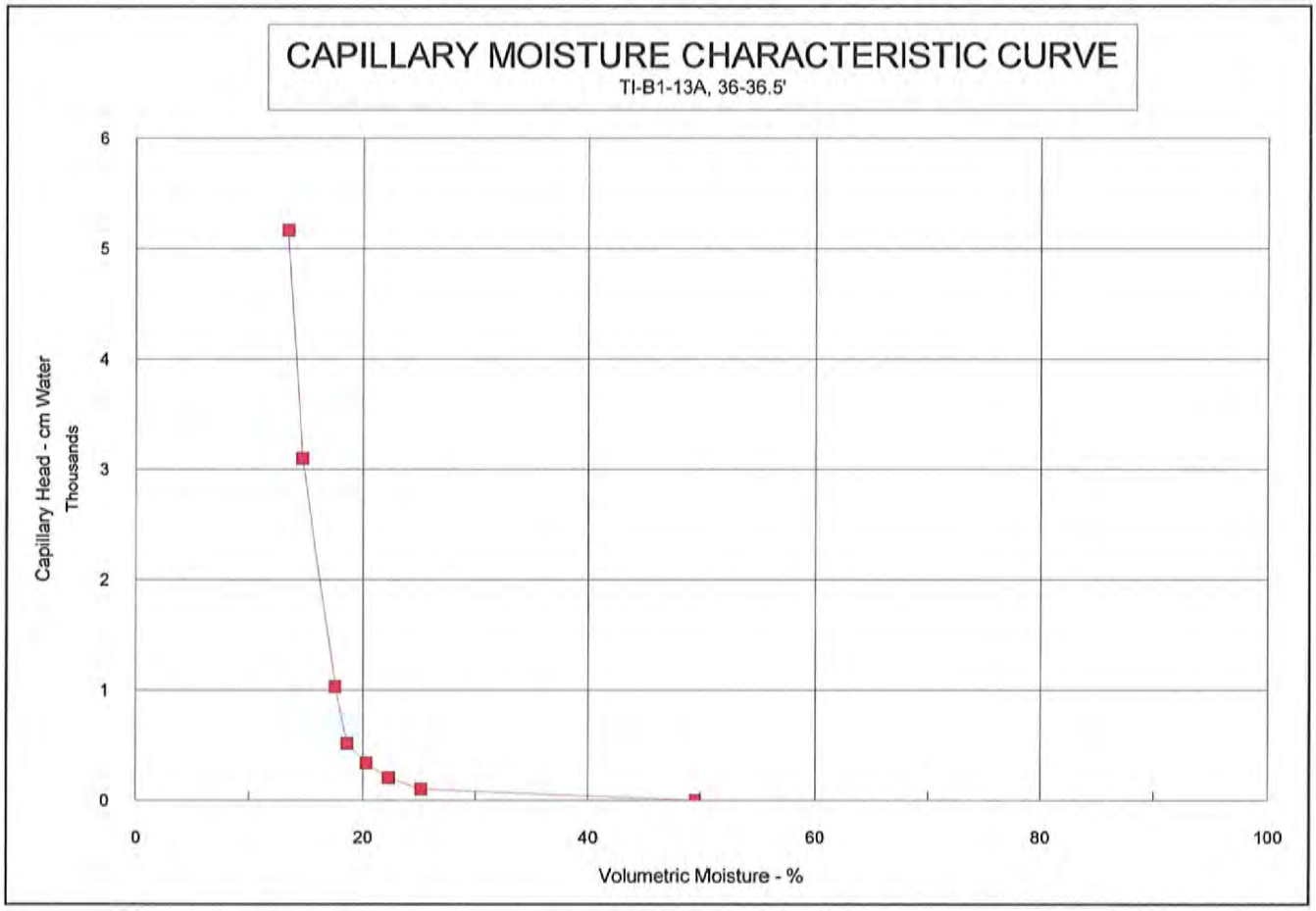
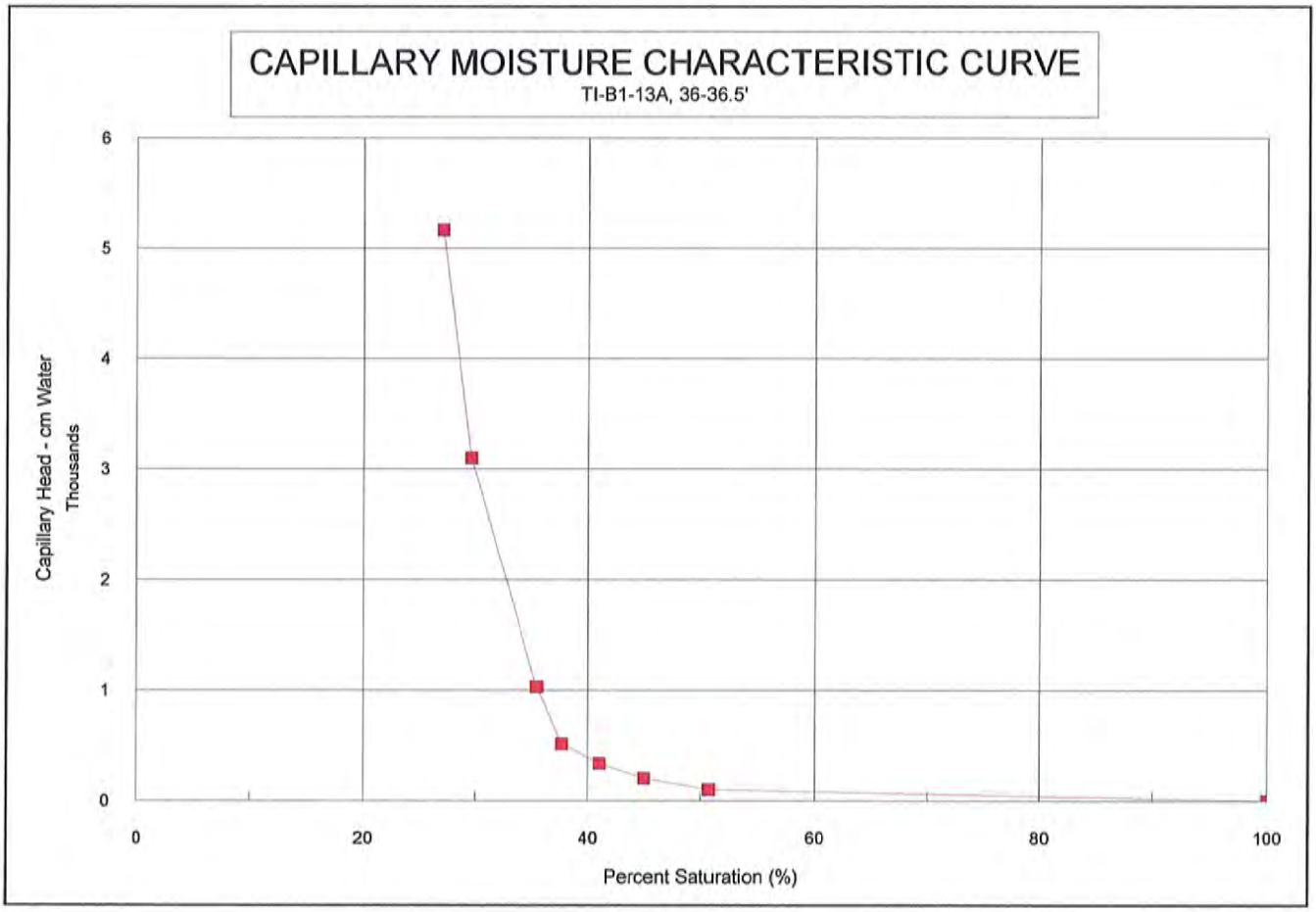
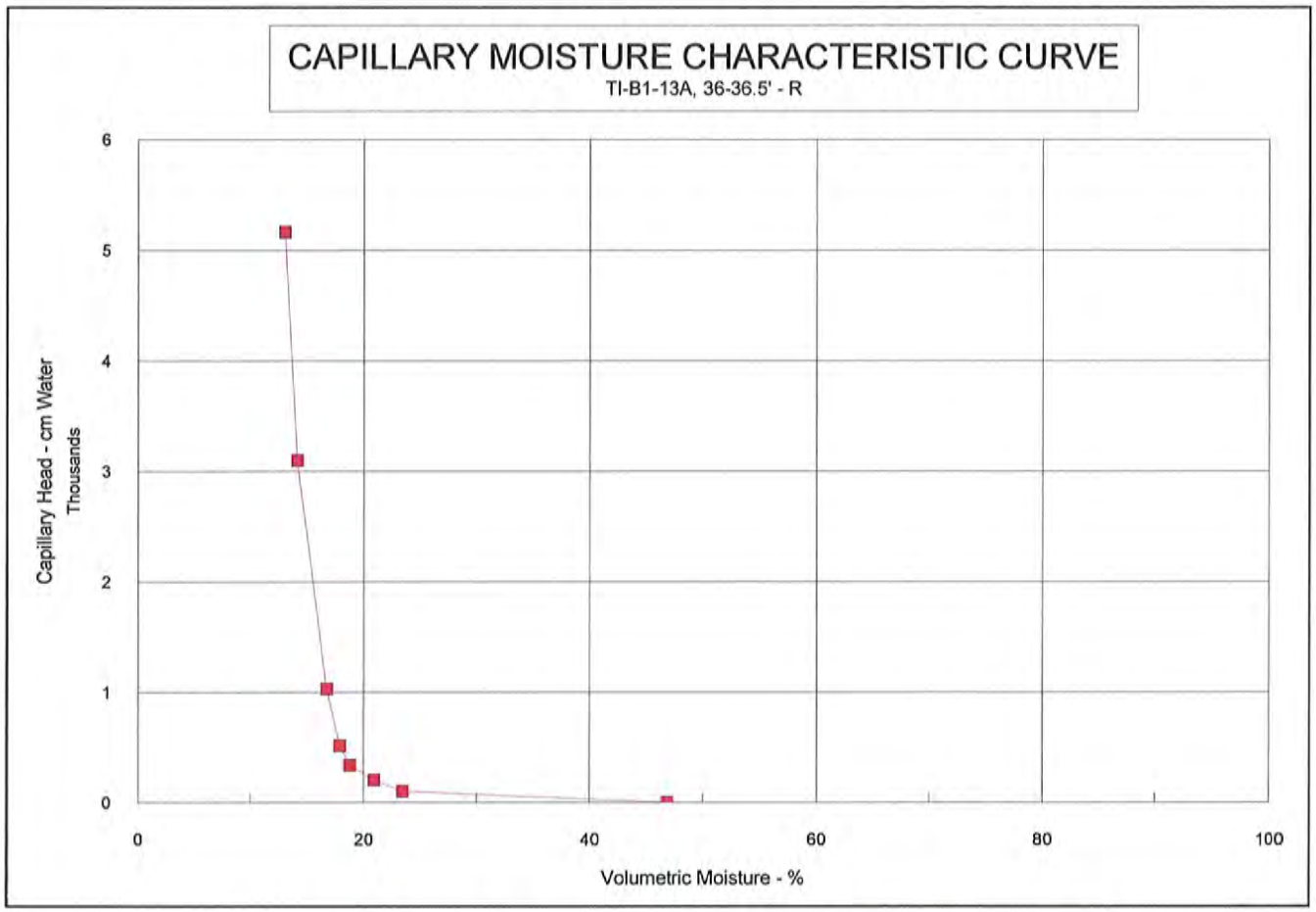
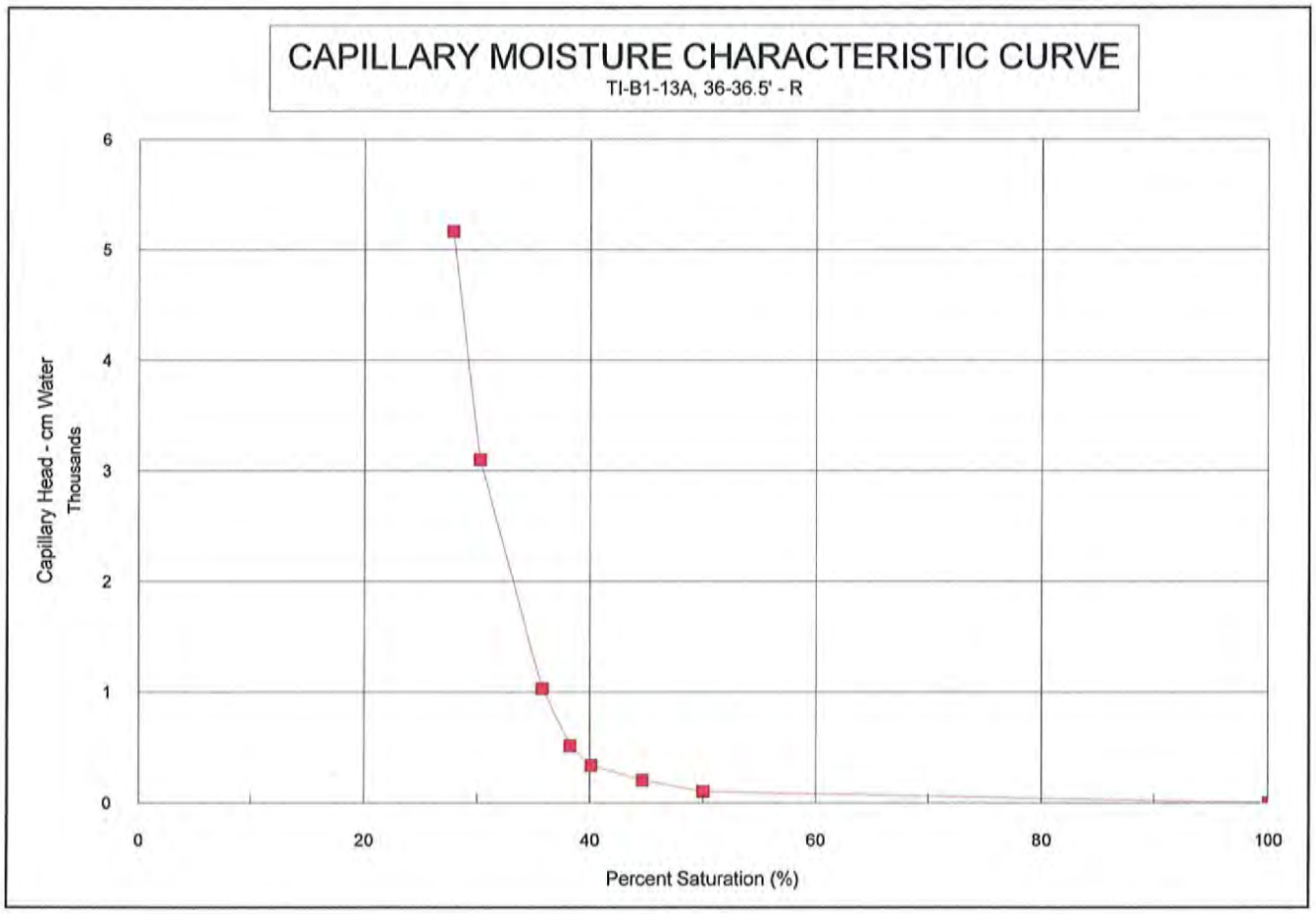
TI-B1-11B, 30.5-31' -R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %

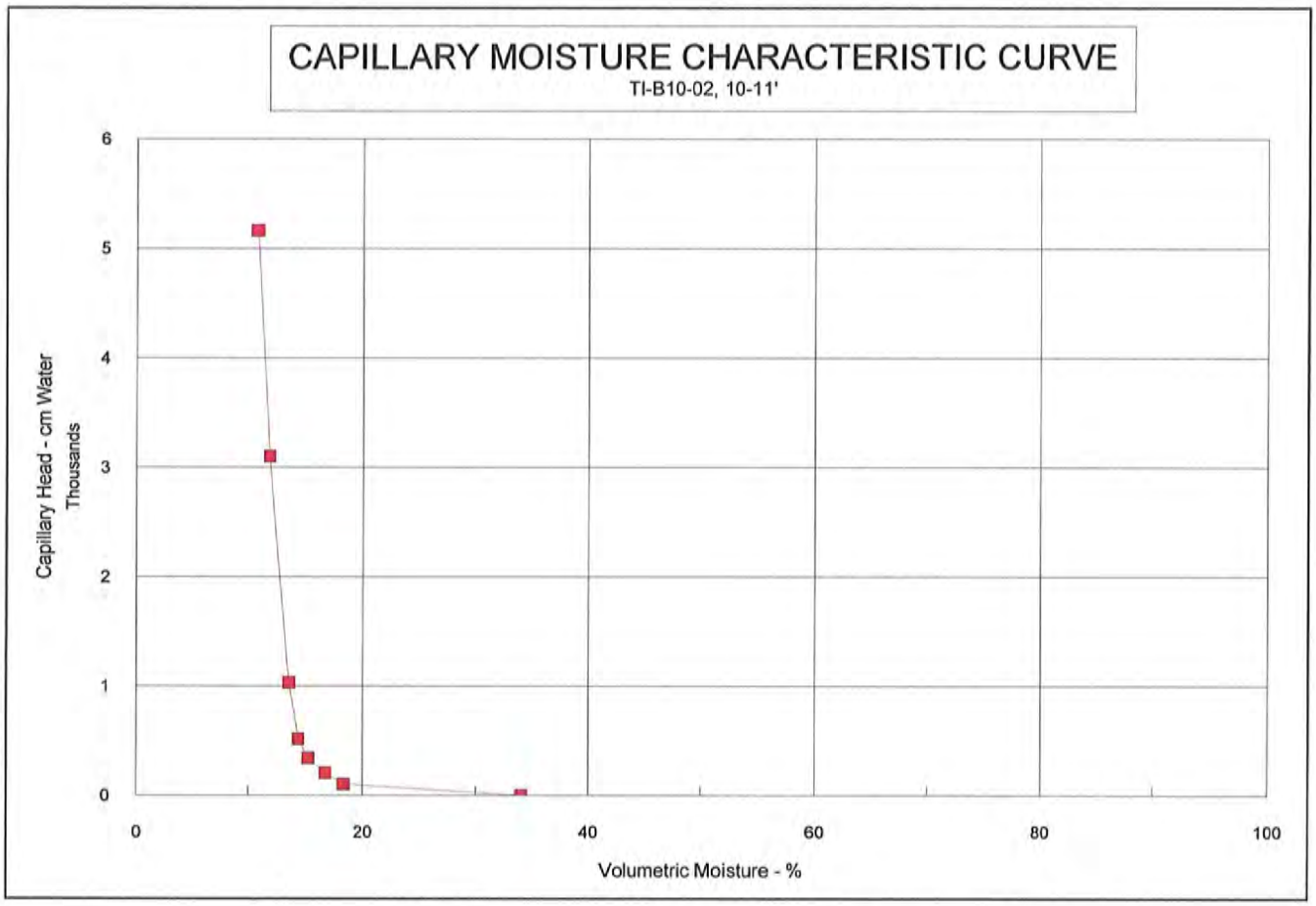

CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-11B, 30.5-31' -R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)

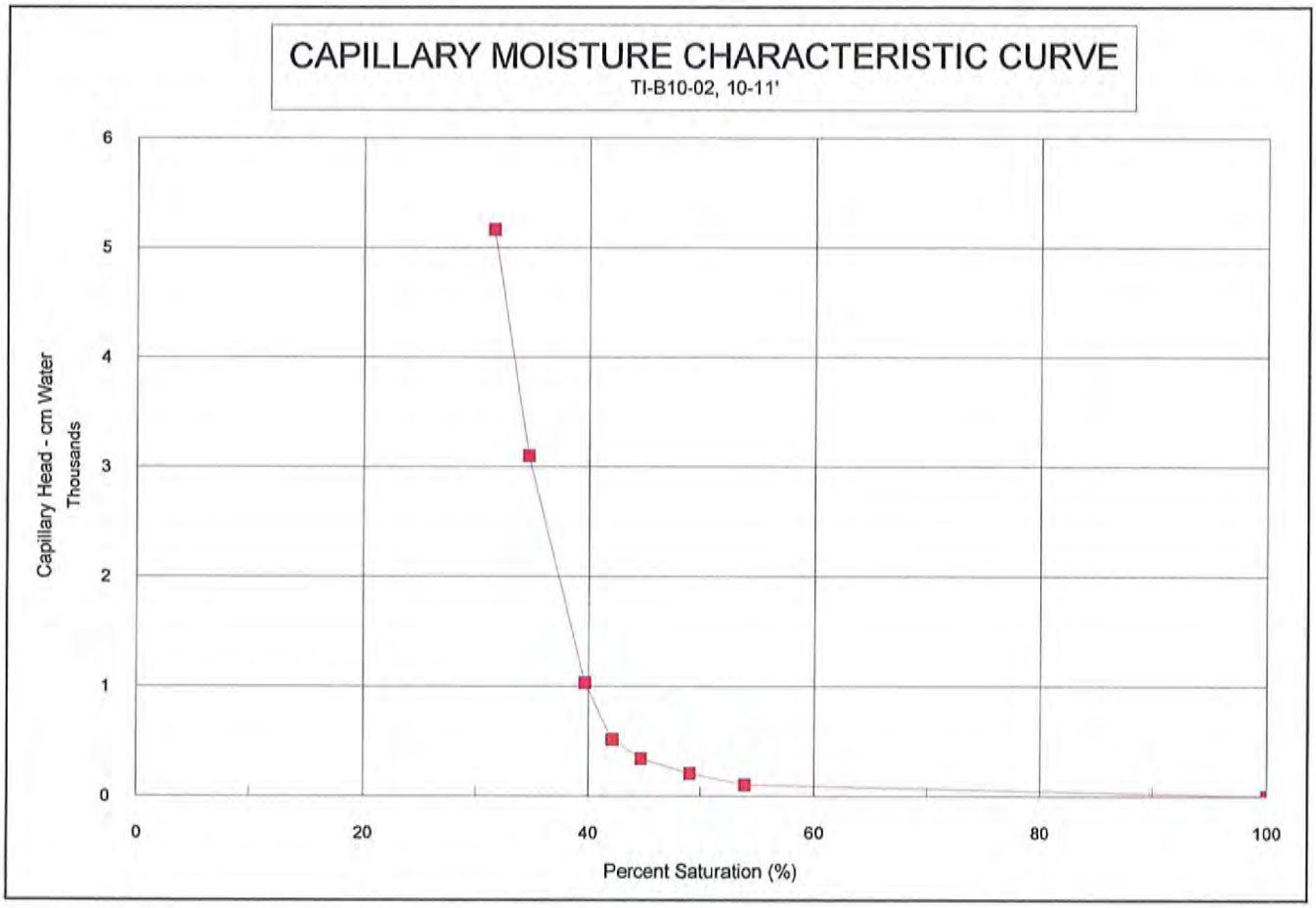

CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-13A, 36-36.5'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %

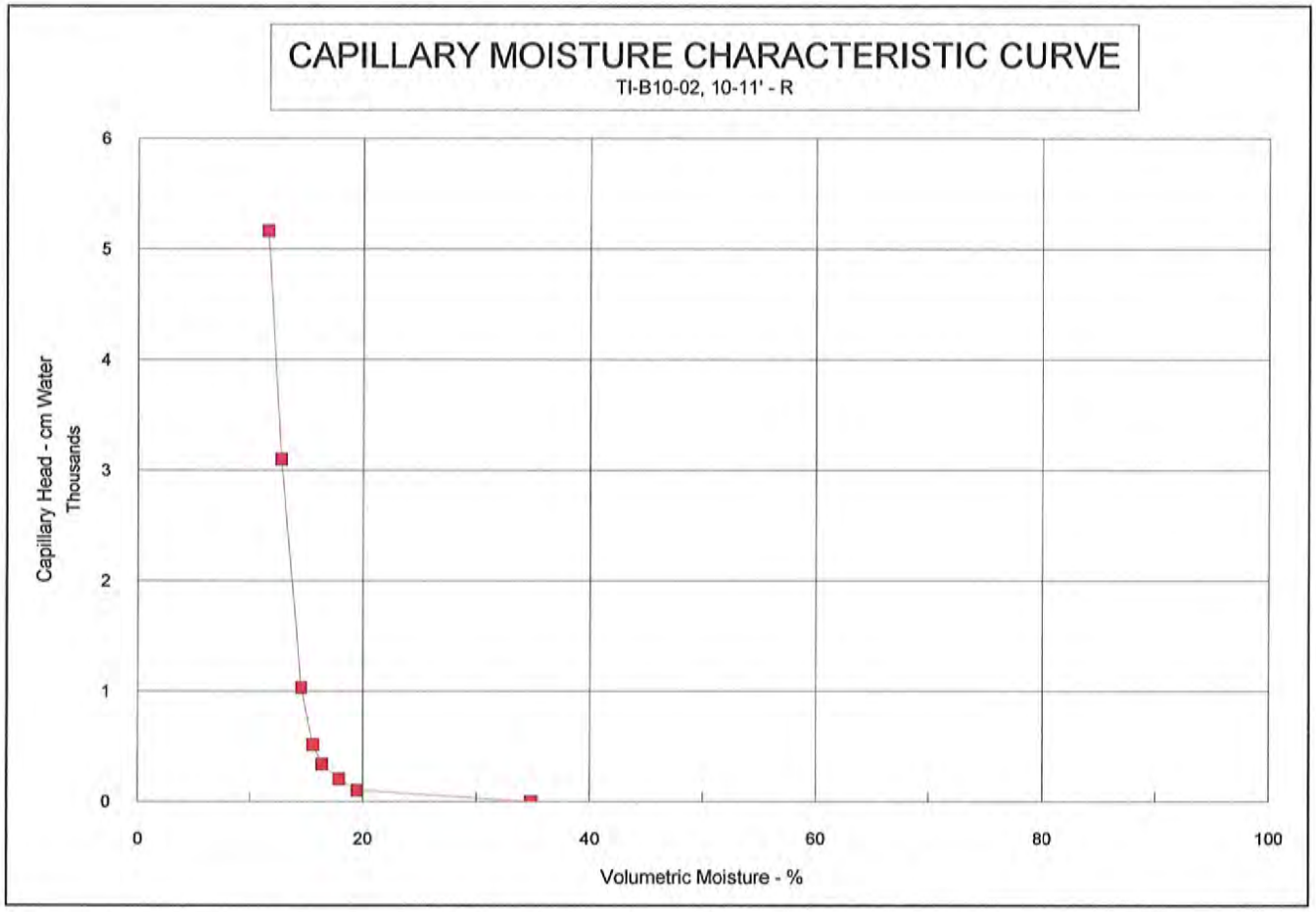

CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-13A, 36-36.5'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)

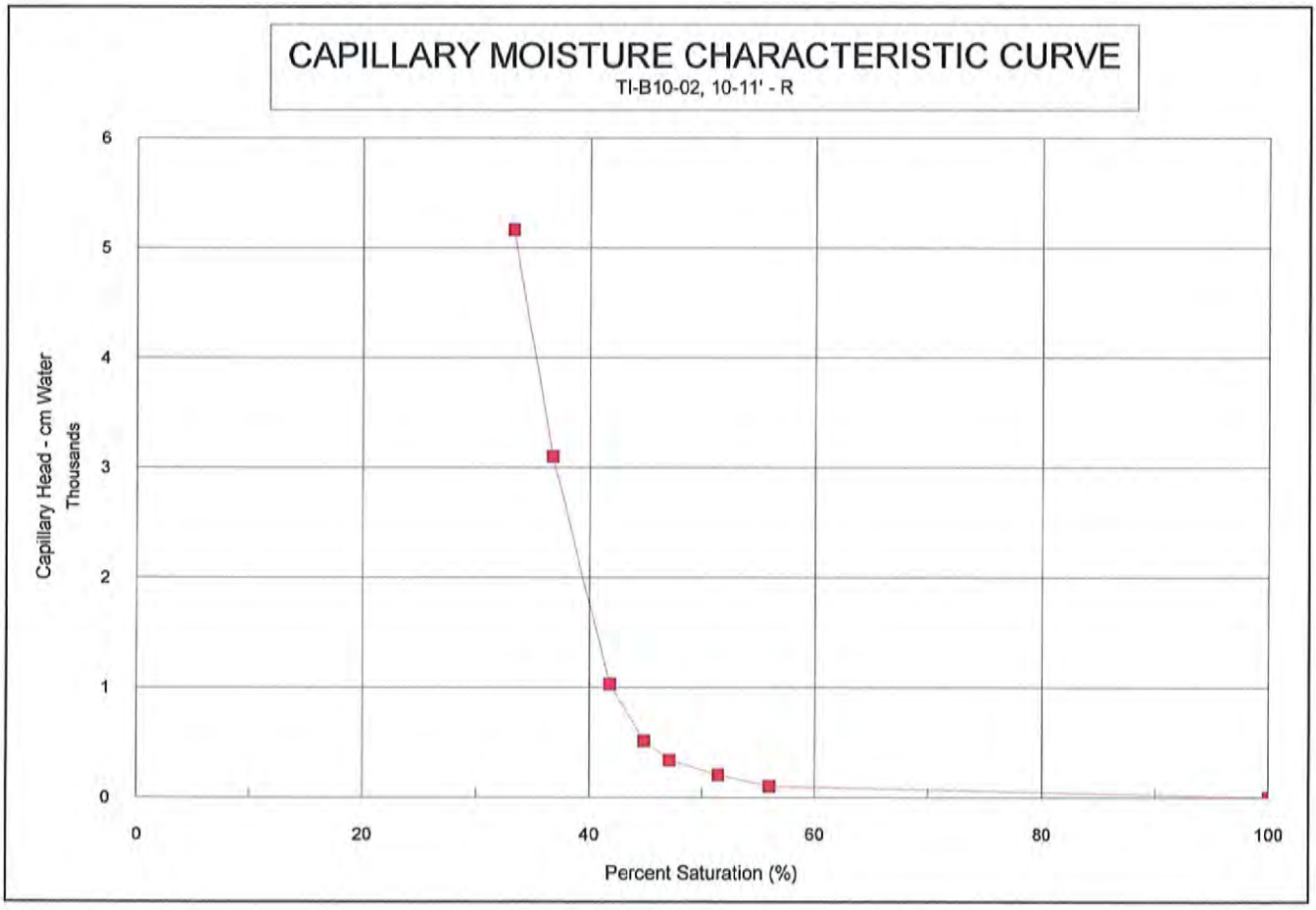

CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-13A, 36-36.5' - R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B1-13A, 36-36.5' - R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B10-02, 10-11'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B10-02, 10-11'
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B10-02, 10-11' - R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-B10-02, 10-11' - R
Capillary Head - cm Water
Thousands
0
1
2
3
4
5
6
0
20
40
60
80
100
Percent Saturation (%)

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT MWH

JOB NO. 2512-77

SAMPLE DATE --
SOIL DESCR. Remolded -10
LOCATION --

TEST STARTED 04/09/14 SKL
TEST FINISHED 06/20/14 DPM

MASS DATA

Sample Description	Ring Mass g	As Rec. Mass g	Sat. Mass g	0.1 Bar Mass g	0.2 Bar Mass g	0.33 Bar Mass g	0.5 Bar Mass g	1 Bar Mass g	3 Bar Mass g	5 Bar Mass g		Dry Mass Filter, Ring, & Dish (g)	Dish Wt. g
Filter Mass g		0.205	0.724	0.551	0.499	0.438	0.381	0.339	0.275	0.270			
SB-B1-04, 0-25'	10.805	43.877	51.583	48.518	47.971	47.260	46.722	46.118	43.630	43.384		43.747	2.362
SB-B1-04, 0-25'-R	10.638	43.675	50.849	48.536	47.962	47.217	46.667	45.949	43.300	43.002		43.509	2.350
SB-B4-01, 0-15'	10.590	44.322	50.243	47.745	47.263	46.638	46.307	45.644	44.741	43.620		43.201	2.372
SB-B4-01, 0-15'-R	10.731	44.466	51.609	48.252	47.688	46.971	46.709	45.834	44.676	43.668		43.399	2.377
TI-CS01-04A, 11-24"	10.542	50.295	53.522	51.671	51.424	51.154	50.936	50.650	49.441	48.502		47.751	2.294
TI-CS01-04A, 11-24"-R	10.685	50.424	52.535	51.382	51.244	51.042	50.860	50.659	50.081	48.850		47.827	2.364
WB-B1-06, 5-10'	10.679	42.760	49.960	56.073	45.422	44.529	44.110	43.575	42.808	42.176		42.484	2.313
WB-B1-06, 5-10'-R	10.651	42.744	50.498	46.576	45.659	44.694	44.295	43.778	42.666	42.294		42.773	2.367
WB-B2-05,10-20'	10.341	42.207	49.817	47.014	46.322	45.181	44.642	43.986	42.812	42.119		42.527	2.369
WB-B2-05,10-20'-R	10.679	42.457	50.587	46.743	45.977	45.116	44.659	44.035	42.954	42.205		42.505	2.316

Data Entered By: DAW Date: 06/26/2014
Data Checked By: DPM Date: 6/26/14
Filename: CMRSETS.WK4

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT: MWH

JOB NO.: 2512-77

SAMPLE DATE: --

SOIL DESCR.: Remolded -10

LOCATION: --

TEST STARTED: 04/09/14 SKL

TEST FINISHED: 06/20/14 DPM

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	Sample Conditions						0.1 Bar			0.2 Bar		
	Dry Mass (g)	Unit Wt. (g/cc)	Sat. Mass (g)	Total H2O (g)	Sat. M.C. % D.M.	Sat. M.C. % Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
SB-B1-04, 0-25'	30.375	1.571	40.054	9.679	31.87	50.06	6.787	22.34	35.10	6.292	20.71	32.54
SB-B1-04, 0-25'-R	30.316	1.568	39.487	9.171	30.25	47.43	7.031	23.19	36.36	6.509	21.47	33.66
SB-B4-01, 0-15'	30.034	1.553	38.929	8.895	29.62	46.00	6.570	21.88	33.98	6.140	20.44	31.75
SB-B4-01, 0-15'-R	30.086	1.556	40.154	10.068	33.46	52.07	6.884	22.88	35.60	6.372	21.18	32.95
TI-CS01-04A, 11-24"	34.710	1.795	42.256	7.546	21.74	39.03	5.868	16.91	30.35	5.673	16.34	29.34
TI-CS01-04A, 11-24"-R	34.573	1.788	41.126	6.553	18.95	33.89	5.573	16.12	28.82	5.487	15.87	28.38
WB-B1-06, 5-10'	29.287	1.515	38.557	9.270	31.65	47.94	15.556	53.12	80.45	4.957	16.93	25.64
WB-B1-06, 5-10'-R	29.550	1.528	39.123	9.573	32.40	49.51	5.824	19.71	30.12	4.959	16.78	25.65
WB-B2-05,10-20'	29.612	1.531	38.752	9.140	30.87	47.27	6.510	21.98	33.67	5.870	19.82	30.36
WB-B2-05,10-20'-R	29.305	1.516	39.184	9.879	33.71	51.09	6.208	21.18	32.11	5.494	18.75	28.41

Data Entered By: DAW Date: 06/26/2014

Data Checked By: DPM Date: 6/26/14

Filename: CMRSETS.WK4

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT MWH

JOB NO. 2512-77

SAMPLE DATE --
SOIL DESCR. Remolded -10
LOCATION --

TEST STARTED 04/09/14 SKL
TEST FINISHED 06/20/14 DPM

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	0.33 Bar			0.5 Bar			1 Bar			3 Bar		
	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
SB-B1-04, 0-25'	5.642	18.57	29.18	5.161	16.99	26.69	4.599	15.14	23.78	2.175	7.16	11.25
SB-B1-04, 0-25'-R	5.825	19.21	30.13	5.332	17.59	27.58	4.656	15.36	24.08	2.071	6.83	10.71
SB-B4-01, 0-15'	5.576	18.57	28.84	5.302	17.65	27.42	4.681	15.59	24.21	3.842	12.79	19.87
SB-B4-01, 0-15'-R	5.716	19.00	29.56	5.511	18.32	28.50	4.678	15.55	24.19	3.584	11.91	18.54
TI-CS01-04A, 11-24"	5.464	15.74	28.26	5.303	15.28	27.43	5.059	14.58	26.16	3.914	11.28	20.24
TI-CS01-04A, 11-24"-R	5.346	15.46	27.65	5.221	15.10	27.00	5.062	14.64	26.18	4.548	13.15	23.52
WB-B1-06, 5-10'	4.125	14.08	21.33	3.763	12.85	19.46	3.270	11.17	16.91	2.567	8.76	13.28
WB-B1-06, 5-10'-R	4.055	13.72	20.97	3.713	12.57	19.20	3.238	10.96	16.75	2.190	7.41	11.33
WB-B2-05,10-20'	4.790	16.18	24.77	4.308	14.55	22.28	3.694	12.47	19.10	2.584	8.73	13.36
WB-B2-05,10-20'-R	4.694	16.02	24.28	4.294	14.65	22.21	3.712	12.67	19.20	2.695	9.20	13.94

Data Entered By: DAW Date: 06/26/2014
Data Checked By: DPM Date: 6/26/14
Filename: CMRSETS.WK4

ADVANCED TERRA TESTING, INC. ATT

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT MWH

JOB NO. 2512-77

SAMPLE DATE --
SOIL DESCR. Remolded -10
LOCATION --

TEST STARTED 04/09/14 SKL
TEST FINISHED 06/20/14 DPM

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	5 Bar		
	Retained H2O	% DM	% Vol.
SB-B1-04, 0-25'	1.934	6.37	10.00
SB-B1-04, 0-25'-R	1.778	5.86	9.20
SB-B4-01, 0-15'	2.726	9.08	14.10
SB-B4-01, 0-15'-R	2.581	8.58	13.35
TI-CS01-04A, 11-24"	2.980	8.59	15.41
TI-CS01-04A, 11-24"-R	3.322	9.61	17.18
WB-B1-06, 5-10'	1.940	6.62	10.03
WB-B1-06, 5-10'-R	1.823	6.17	9.43
WB-B2-05,10-20'	1.896	6.40	9.81
WB-B2-05,10-20'-R	1.951	6.66	10.09

Data Entered By: DAW Date: 06/26/2014
Data Checked By: DPM Date: 6/26/14
Filename: CMRSETS.WK4

ADVANCED TERRA TESTING, INC. ATT

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT MWH

JOB NO. 2512-77

SAMPLE DATE --
SOIL DESCR. Remolded -10
LOCATION --

TEST STARTED 04/09/14 SKL
TEST FINISHED 06/20/14 DPM

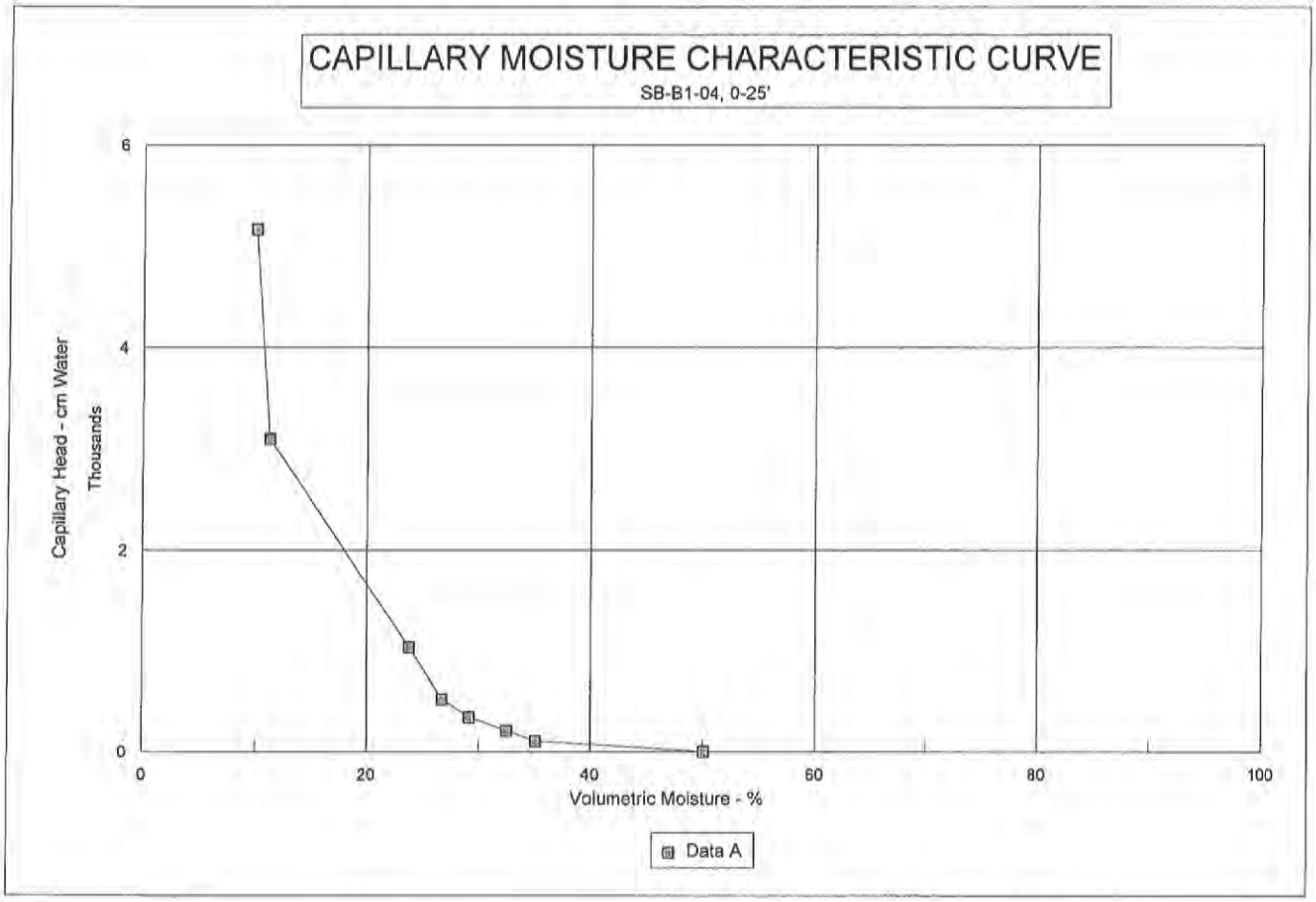
	Vol. MC % Sat.	Vol. MC % 0.1 Bar	Vol. MC % 0.2 Bar	Vol. MC % 0.33 Bar	Vol. MC % 0.5 Bar	Vol. MC % 1 Bar	Vol. MC % 3 Bar	Vol. MC % 5 Bar
SB-B1-04, 0-25'	50.06	35.10	32.54	29.18	26.69	23.78	11.25	10.00
SB-B1-04, 0-25'-R	47.43	36.36	33.66	30.13	27.58	24.08	10.71	9.20
SB-B4-01, 0-15'	46.00	33.98	31.75	28.84	27.42	24.21	19.87	14.10
SB-B4-01, 0-15'-R	52.07	35.60	32.95	29.56	28.50	24.19	18.54	13.35
TI-CS01-04A, 11-24"	39.03	30.35	29.34	28.26	27.43	26.16	20.24	15.41
TI-CS01-04A, 11-24"-R	33.89	28.82	28.38	27.65	27.00	26.18	23.52	17.18
WB-B1-06, 5-10'	47.94	80.45	25.64	21.33	19.46	16.91	13.28	10.03
WB-B1-06, 5-10'-R	49.51	30.12	25.65	20.97	19.20	16.75	11.33	9.43
WB-B2-05,10-20'	47.27	33.67	30.36	24.77	22.28	19.10	13.36	9.81
WB-B2-05,10-20'-R	51.09	32.11	28.41	24.28	22.21	19.20	13.94	10.09

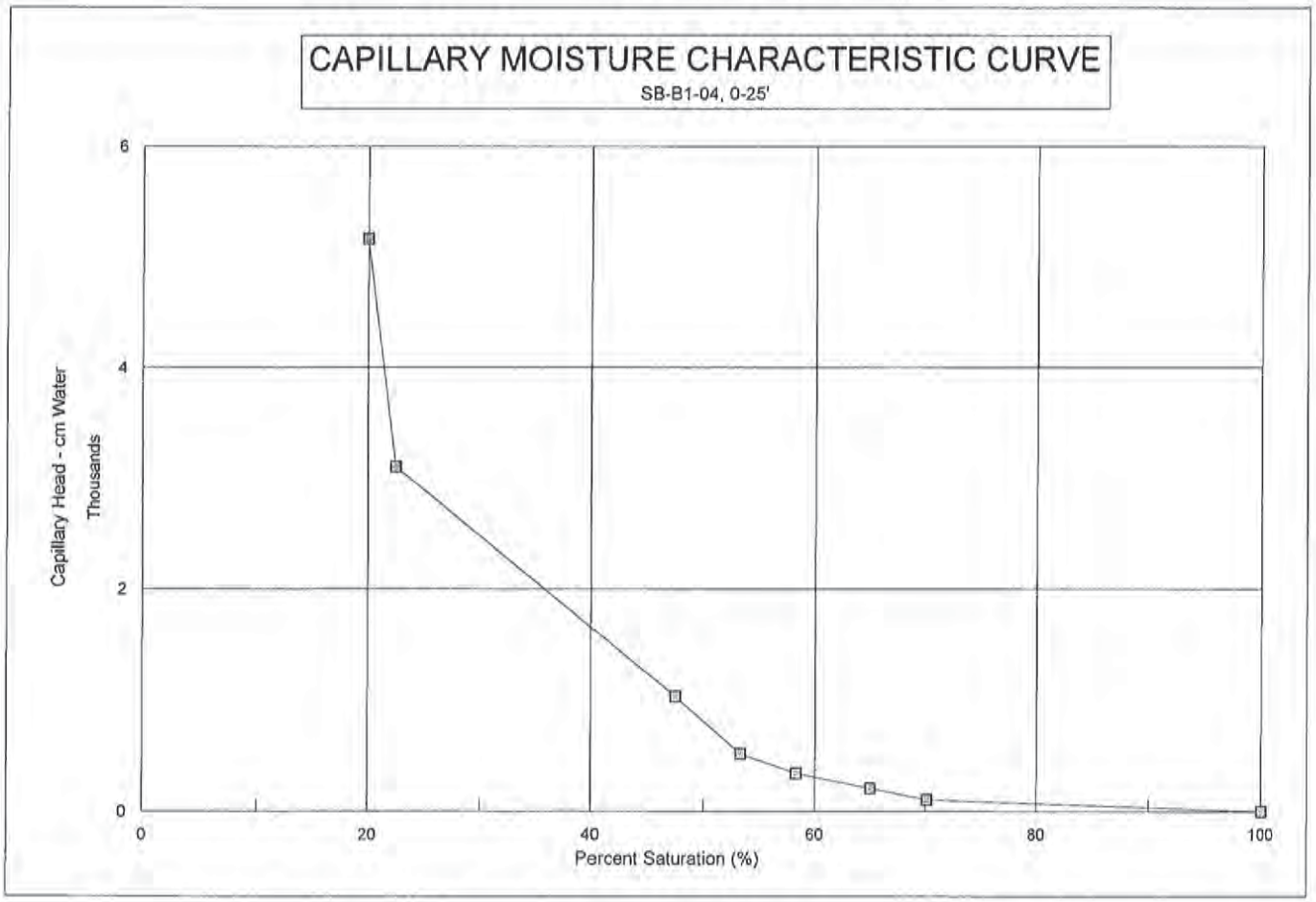
% Saturation

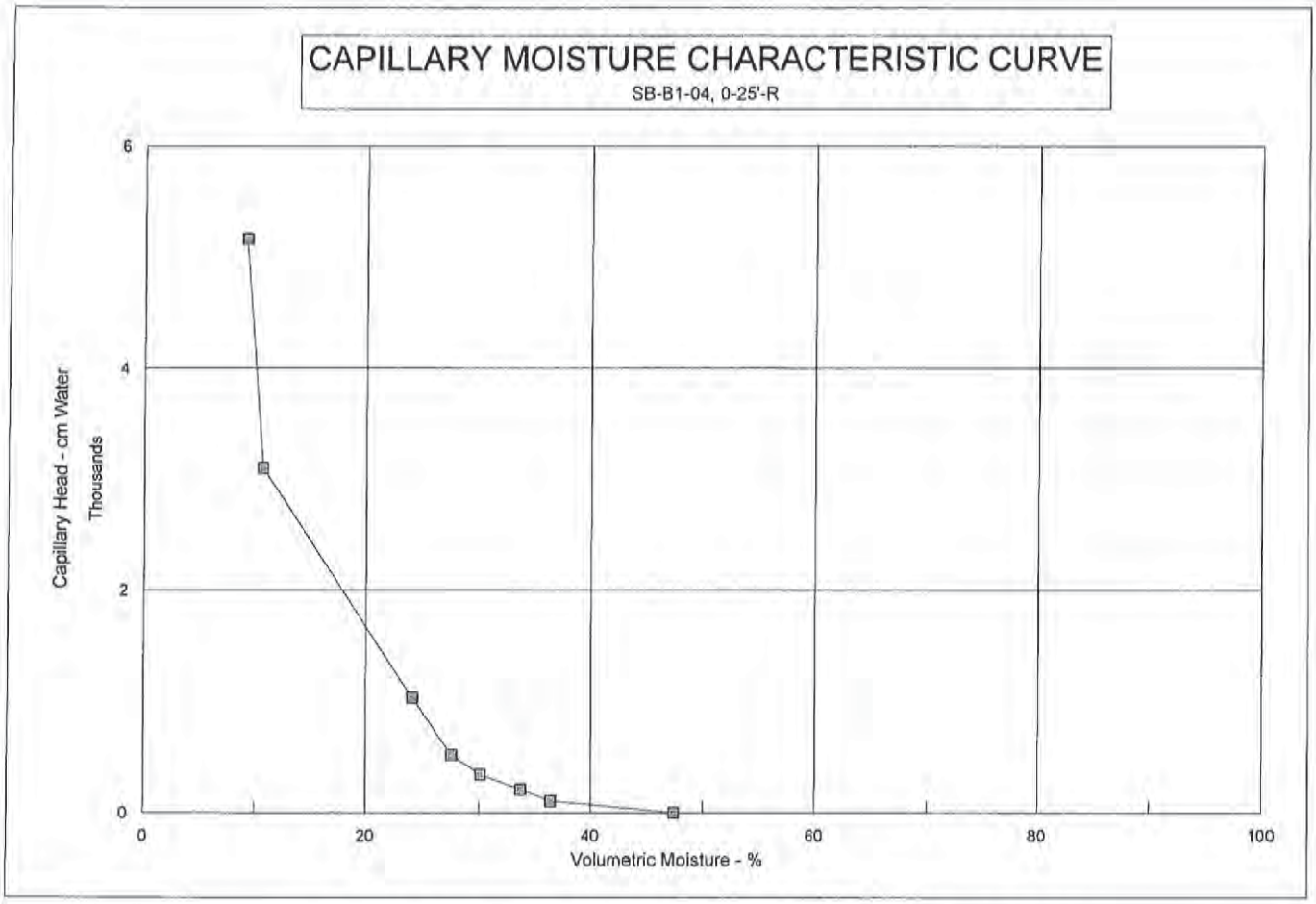
	Sat.	0.1 Bar	0.2 Bar	0.33 Bar	0.5 Bar	1 Bar	3 Bar	5 Bar
SB-B1-04, 0-25'	100.00	70.12	65.01	58.29	53.32	47.52	22.47	19.98
SB-B1-04, 0-25'-R	100.00	76.67	70.97	63.52	58.14	50.77	22.58	19.39
SB-B4-01, 0-15'	100.00	73.86	69.03	62.69	59.61	52.63	43.19	30.65
SB-B4-01, 0-15'-R	100.00	68.38	63.29	56.77	54.74	46.46	35.60	25.64
TI-CS01-04A, 11-24"	100.00	77.76	75.18	72.41	70.28	67.04	51.87	39.49
TI-CS01-04A, 11-24"-R	100.00	85.05	83.73	81.58	79.67	77.25	69.40	50.69
WB-B1-06, 5-10'	100.00	167.81	53.47	44.50	40.59	35.28	27.69	20.93
WB-B1-06, 5-10'-R	100.00	60.84	51.80	42.36	38.79	33.82	22.88	19.04
WB-B2-05,10-20'	100.00	71.23	64.22	52.41	47.13	40.42	28.27	20.74
WB-B2-05,10-20'-R	100.00	62.84	55.61	47.51	43.47	37.57	27.28	19.75

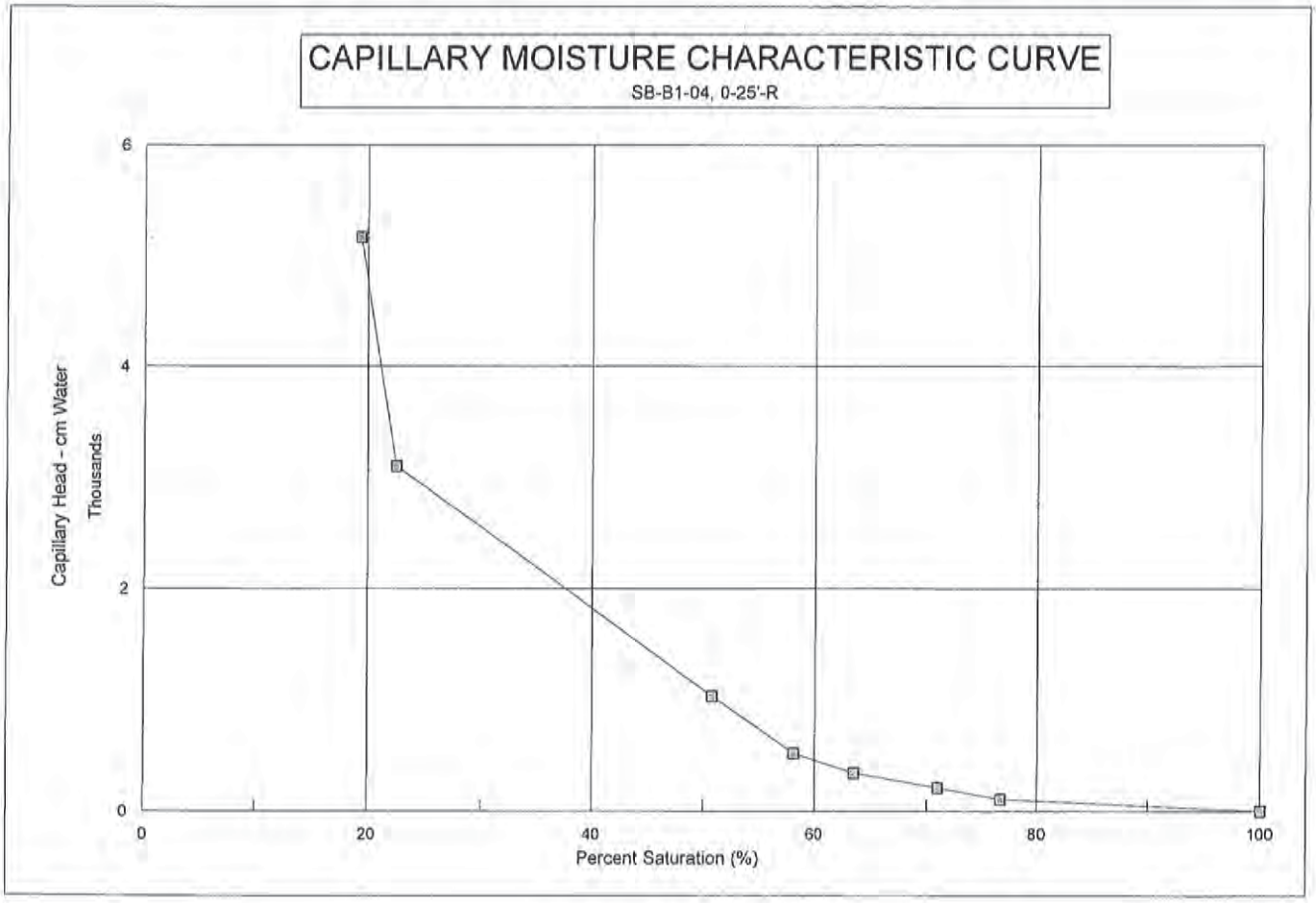
Data Entered By: DAW Date: 06/26/2014
Data Checked By: DPM Date: 6/26/14
Filename: CMRSETS.WK4

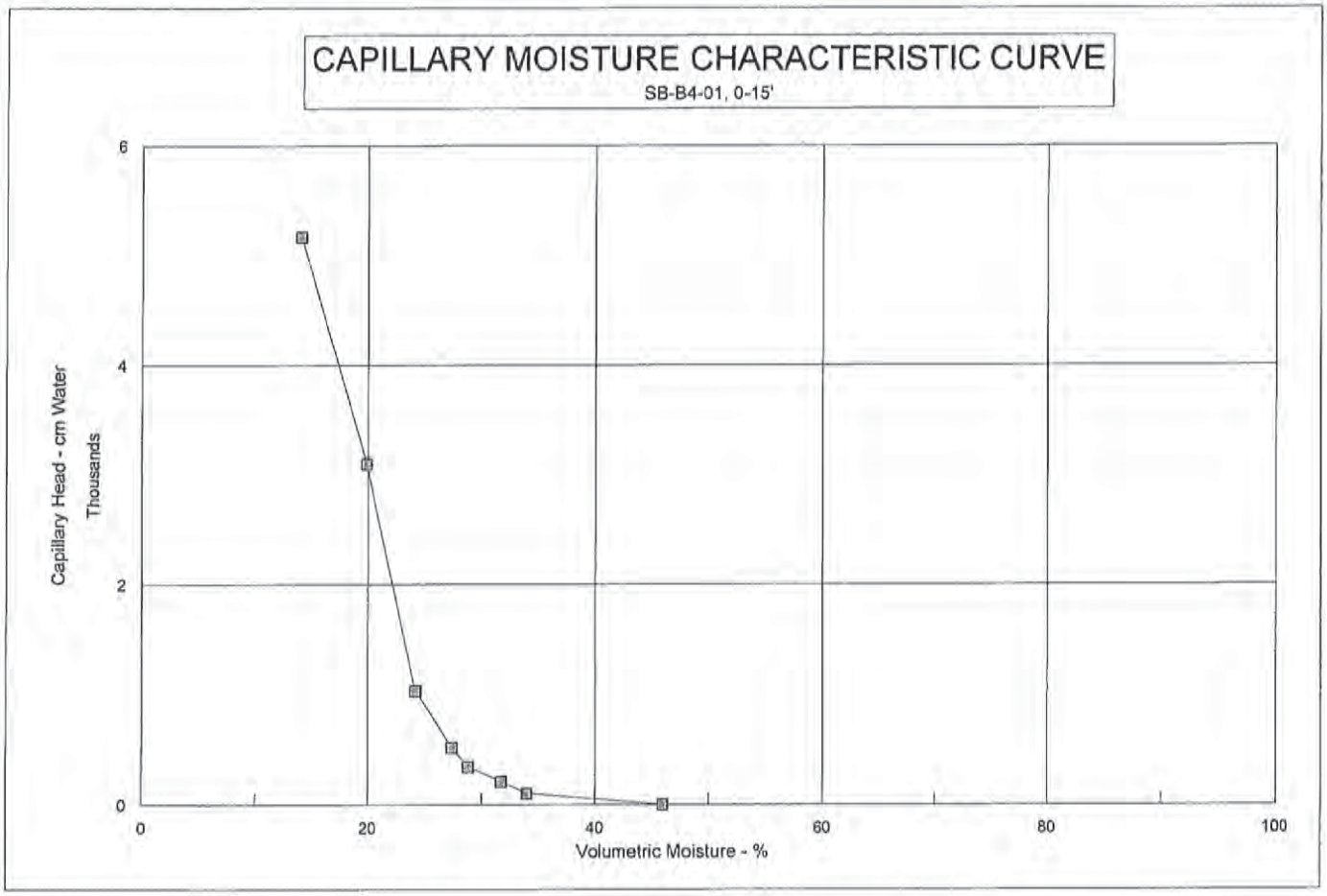
ADVANCED TERRA TESTING, INC. ATT

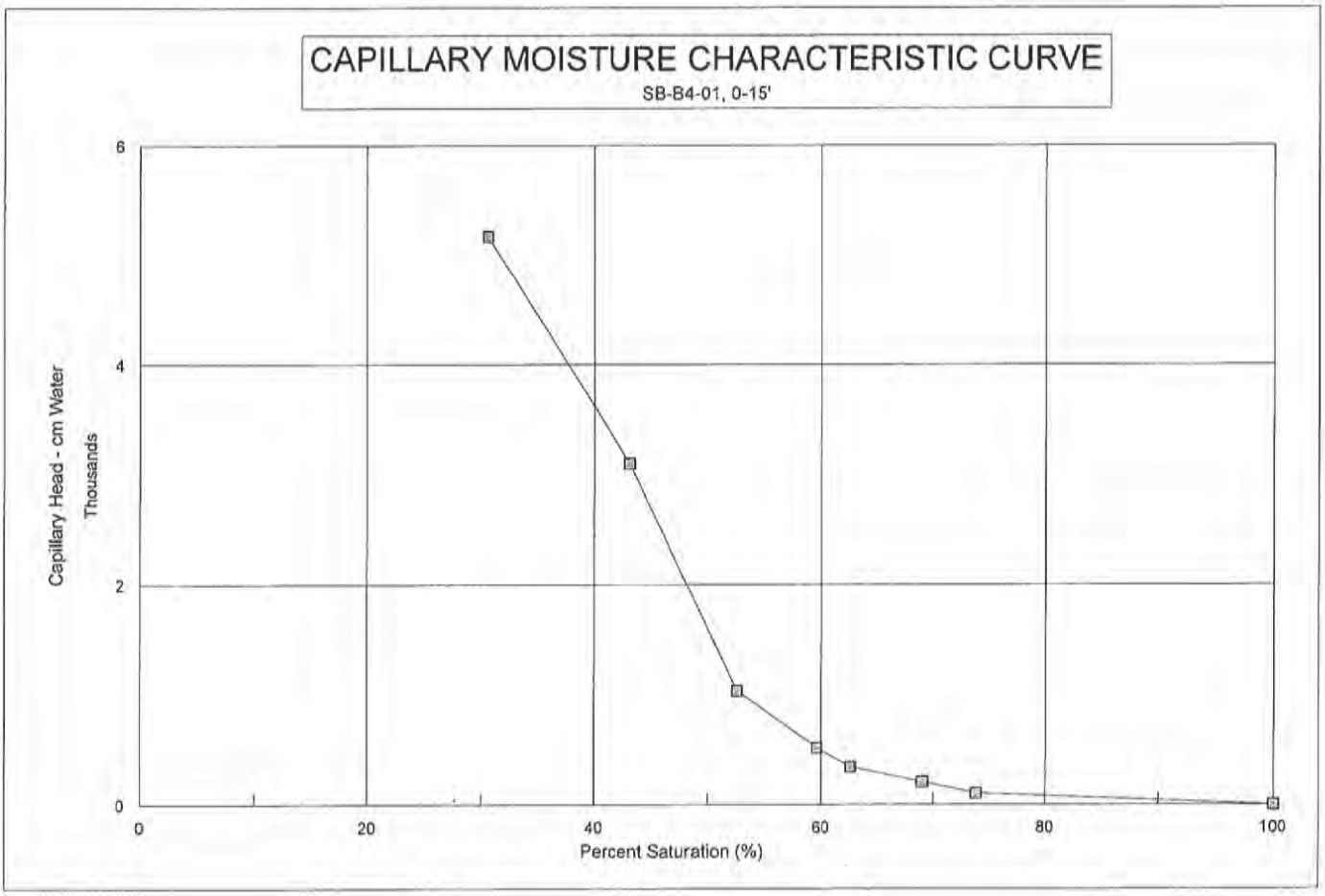

CAPILLARY MOISTURE CHARACTERISTIC CURVE
SB-B1-04, 0-25'
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %
Data A

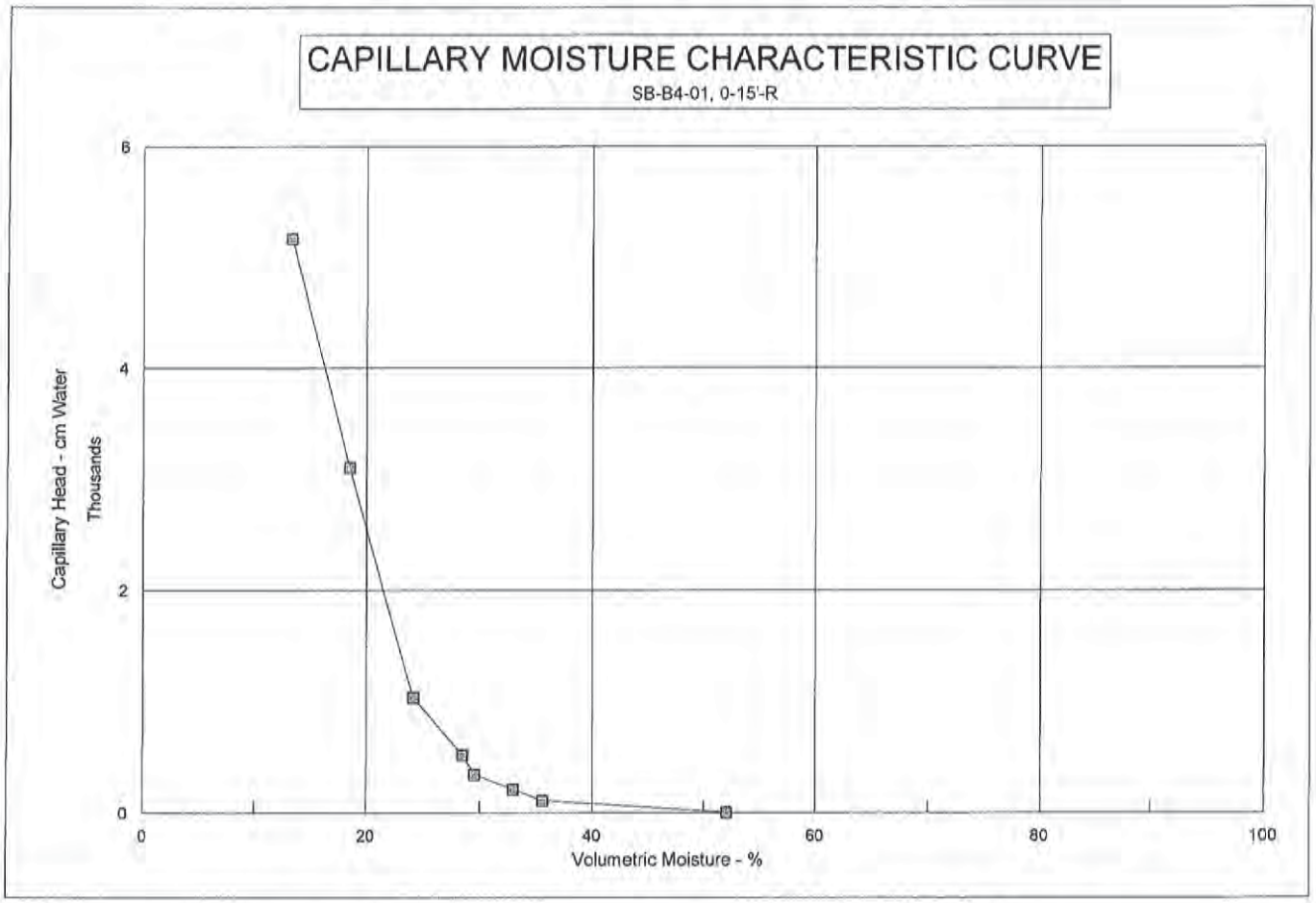

CAPILLARY MOISTURE CHARACTERISTIC CURVE
SB-B1-04, 0-25'
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)

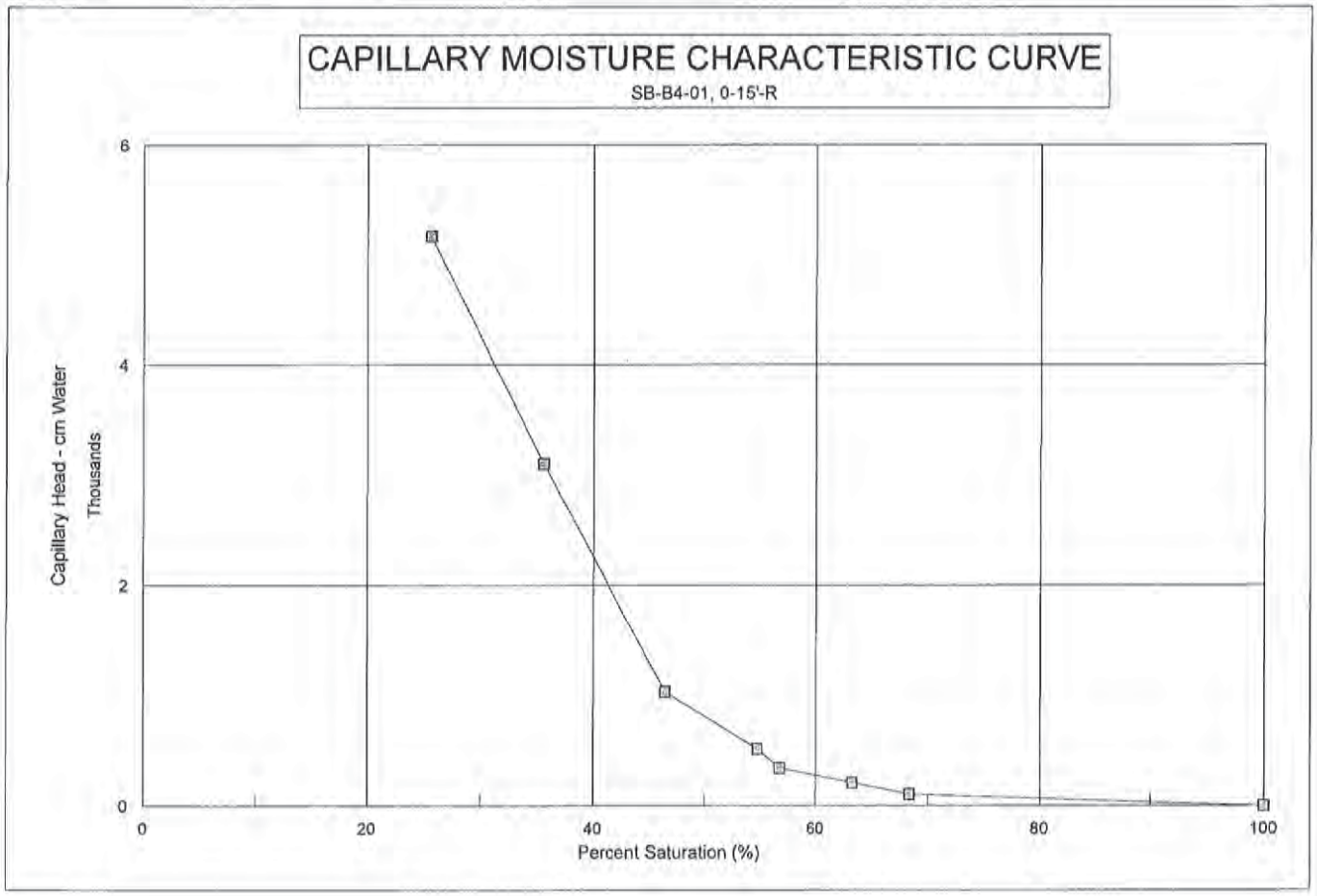

CAPILLARY MOISTURE CHARACTERISTIC CURVE
SB-B1-04, 0-25'-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %

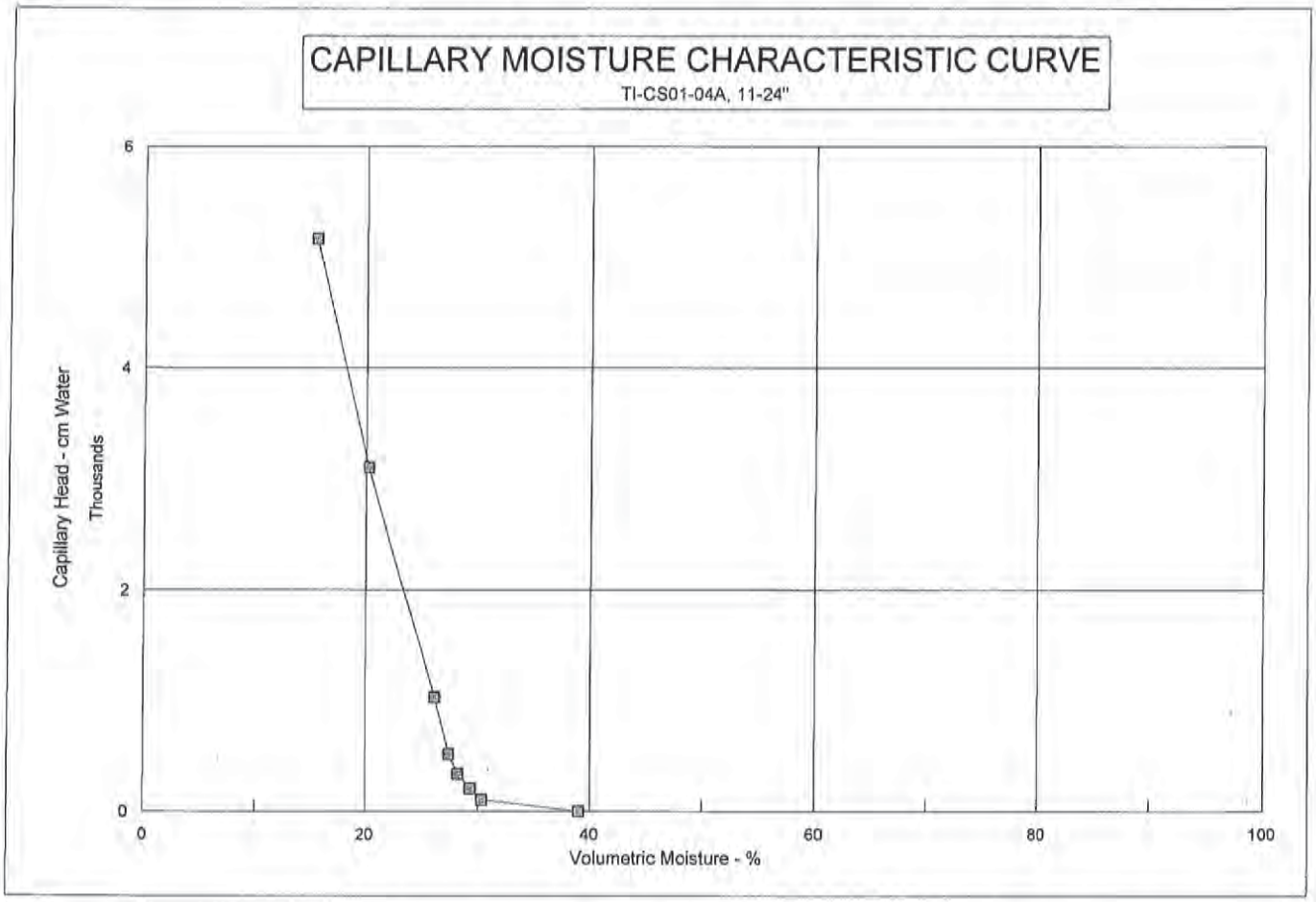

CAPILLARY MOISTURE CHARACTERISTIC CURVE
SB-B1-04, 0-25'-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)

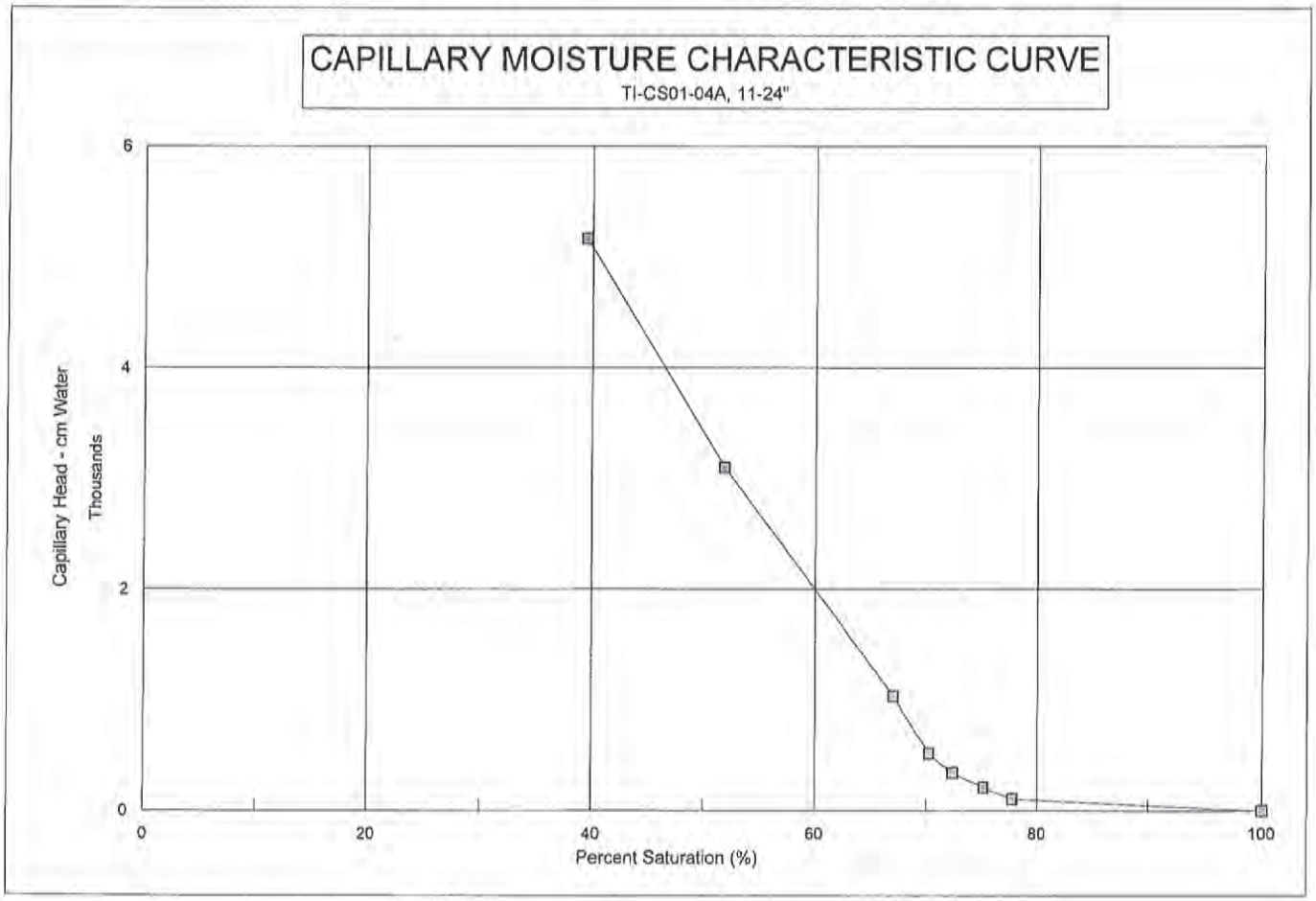

CAPILLARY MOISTURE CHARACTERISTIC CURVE
SB-B4-01, 0-15'
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %

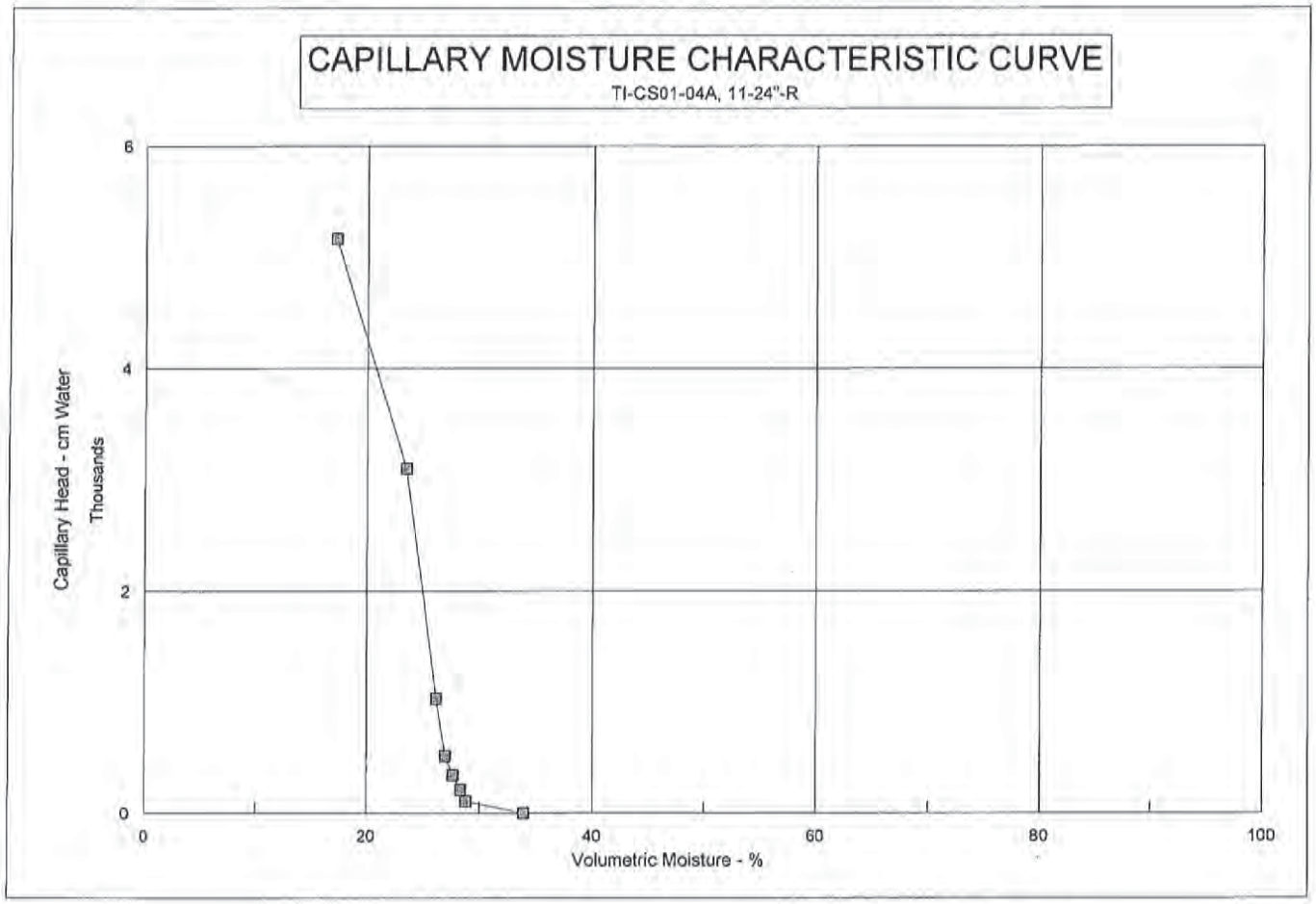

CAPILLARY MOISTURE CHARACTERISTIC CURVE
SB-B4-01, 0-15'
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)

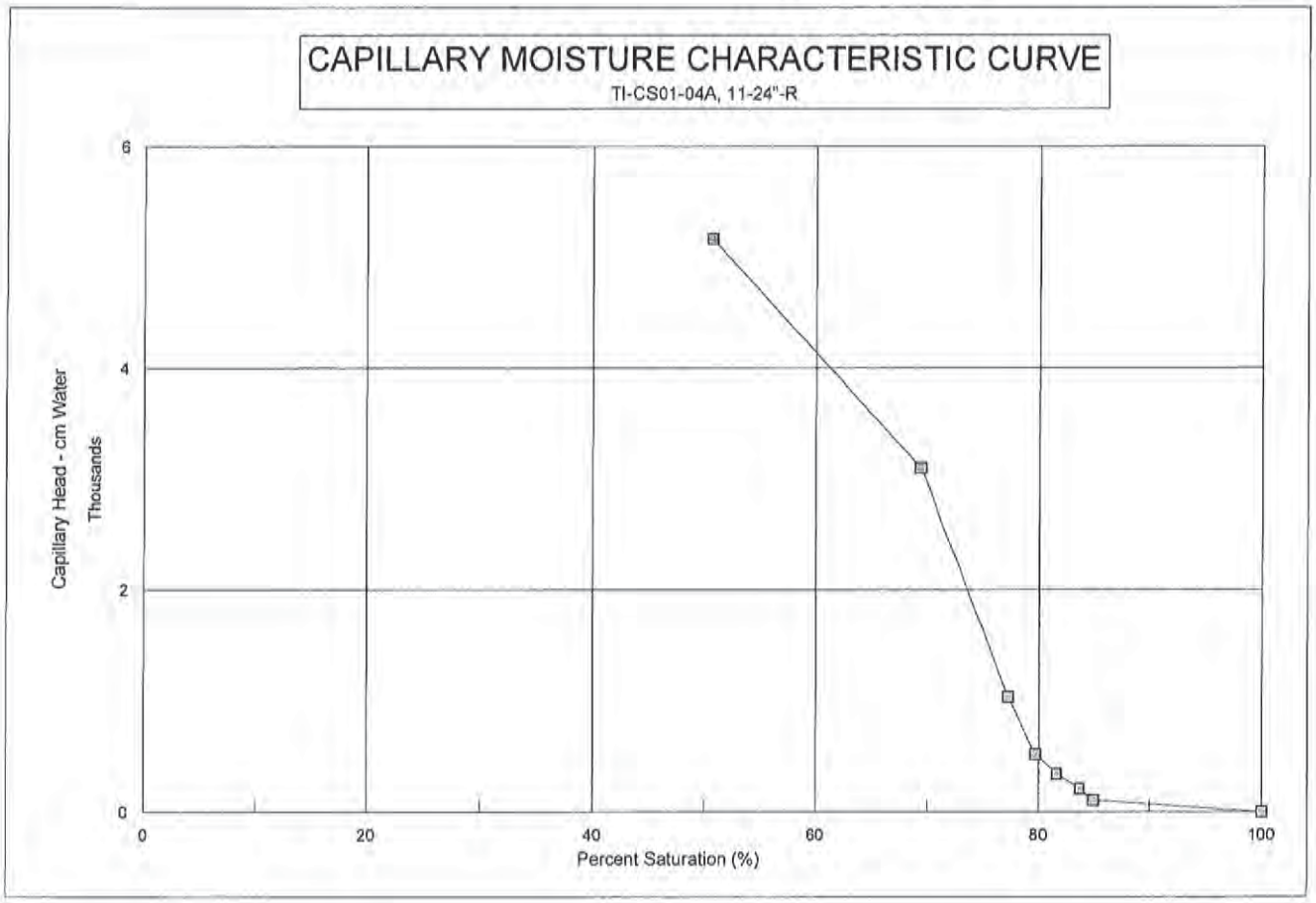

CAPILLARY MOISTURE CHARACTERISTIC CURVE
SB-B4-01, 0-15'-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %

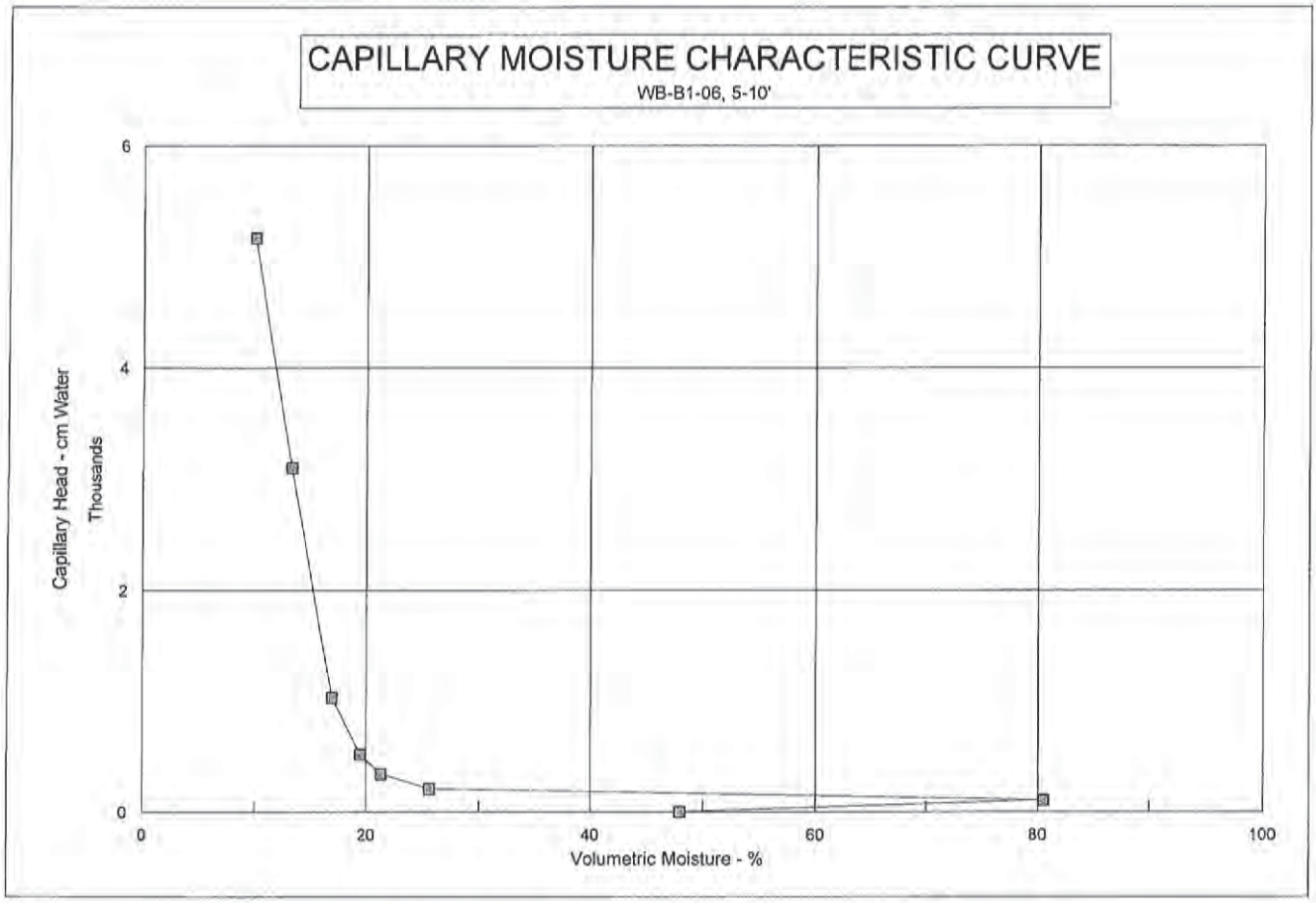

CAPILLARY MOISTURE CHARACTERISTIC CURVE
SB-B4-01, 0-15'-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)

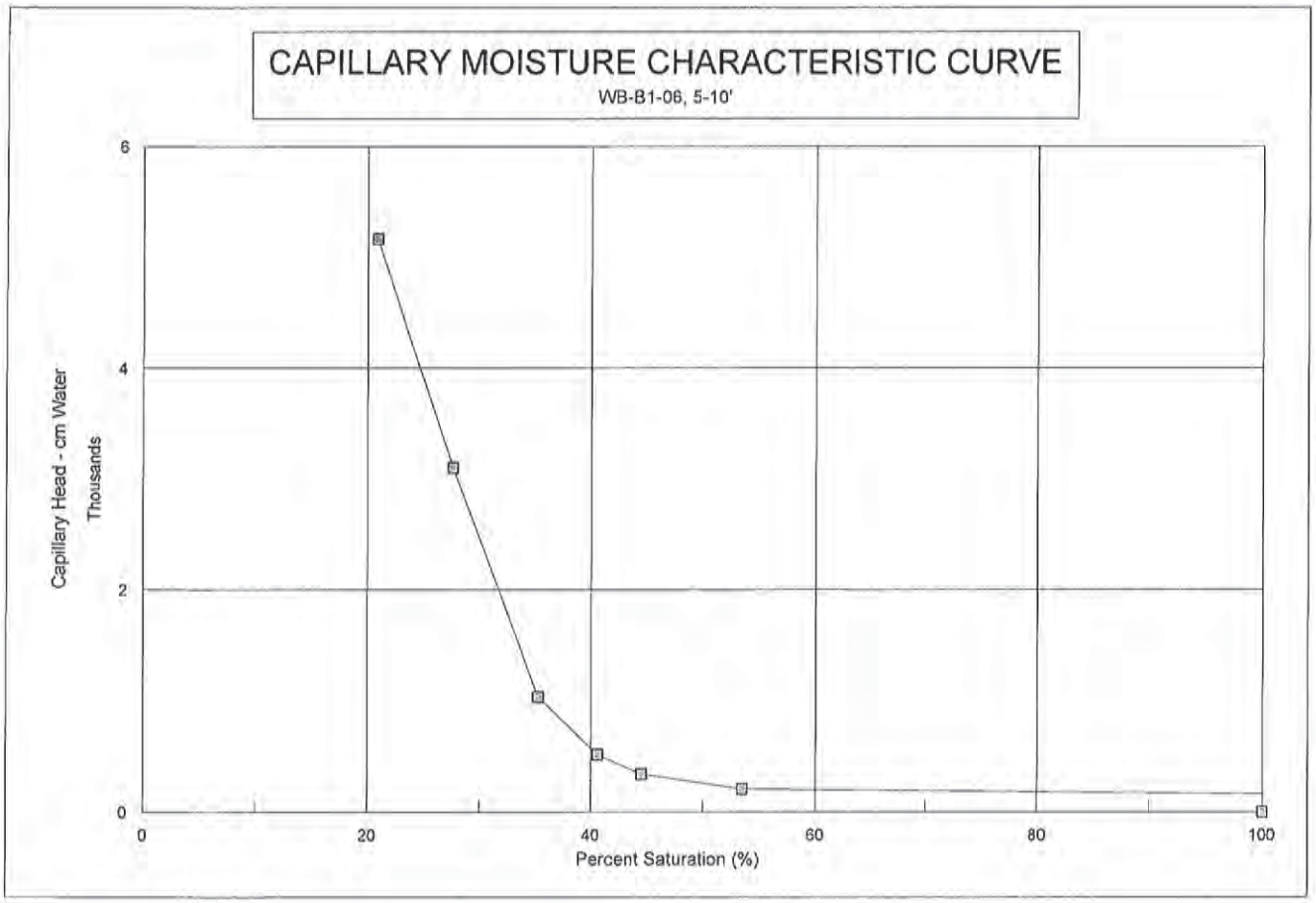

CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-CS01-04A, 11-24"
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %

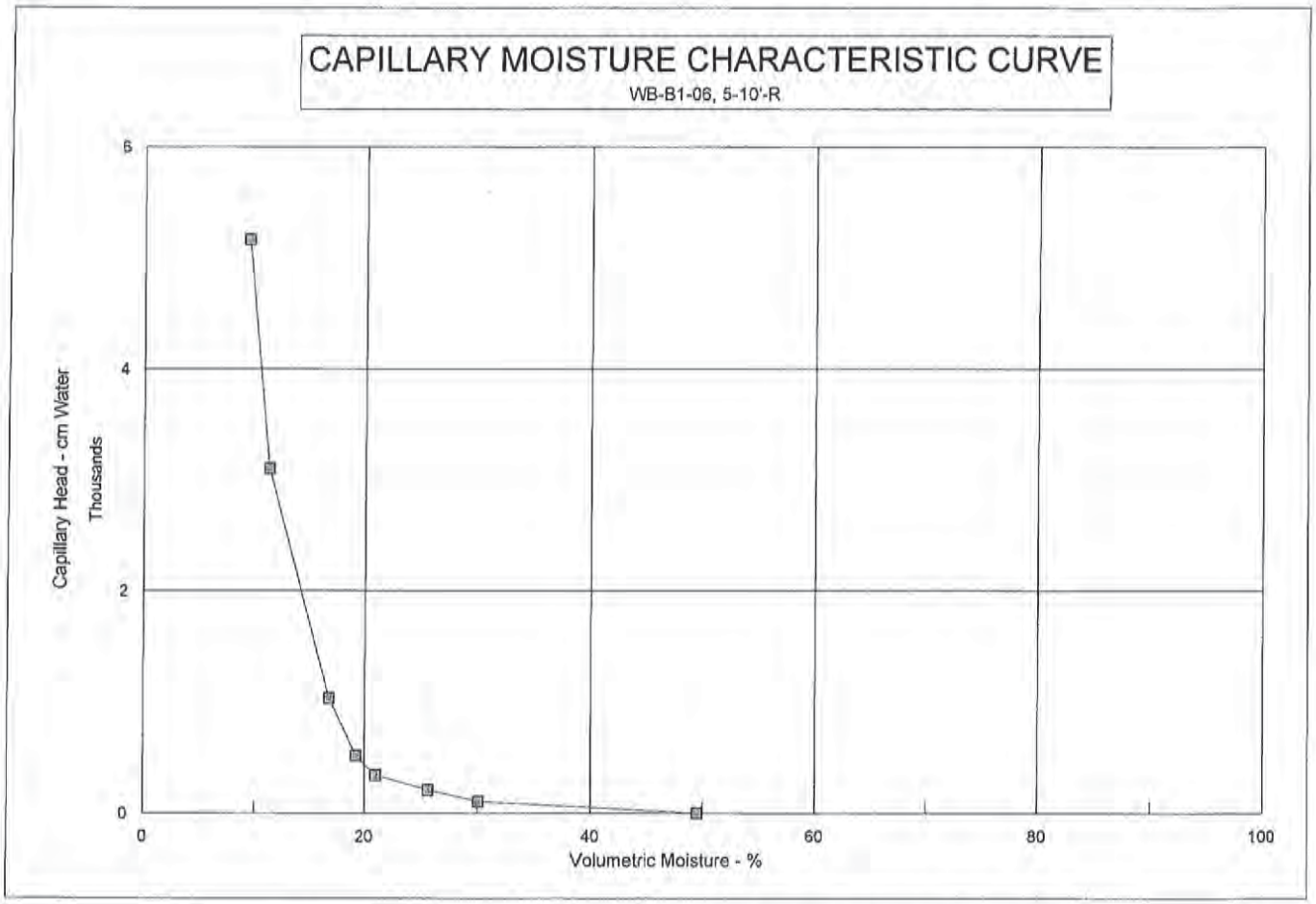

CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-CS01-04A, 11-24"
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)

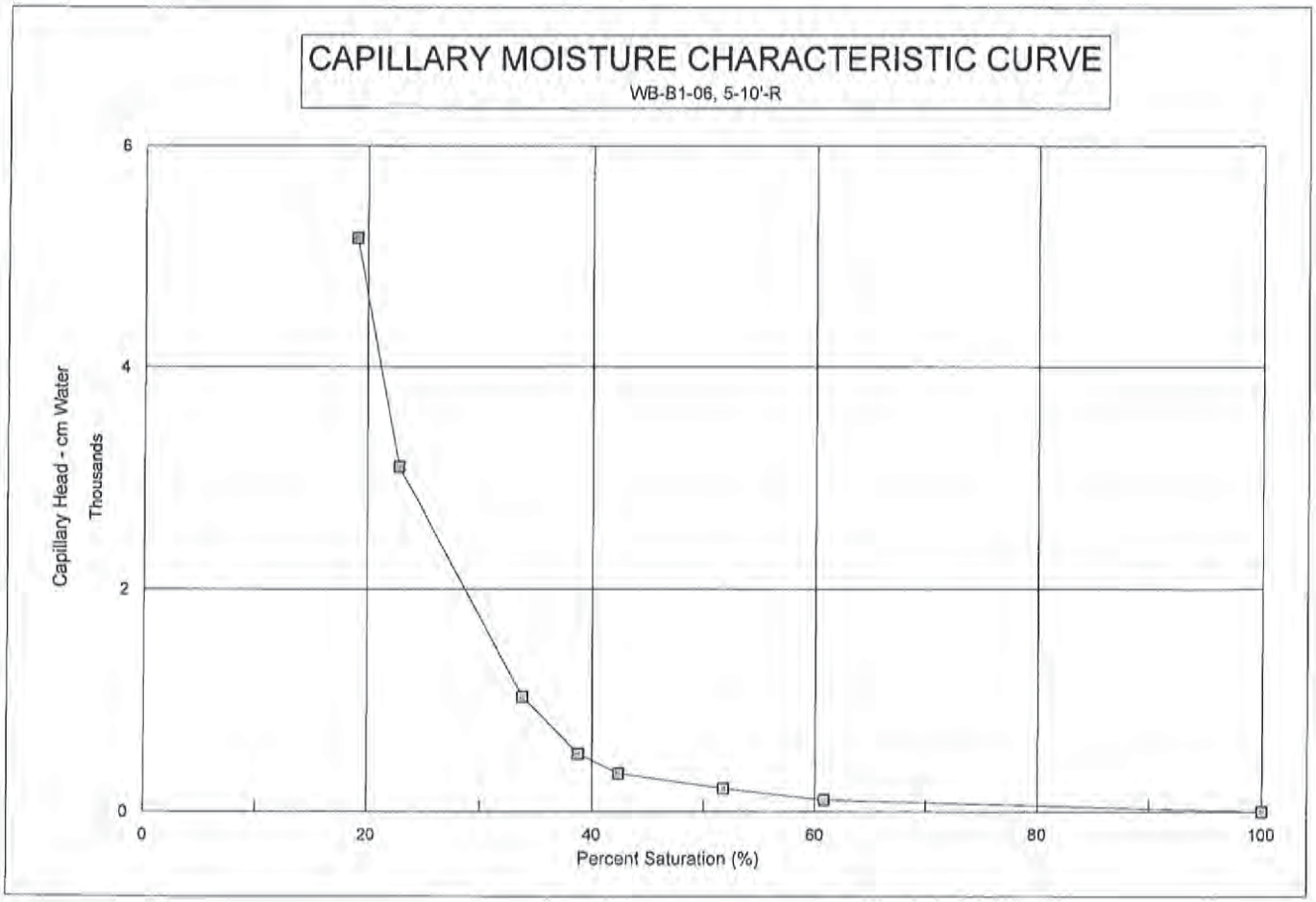

CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-CS01-04A, 11-24"-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %

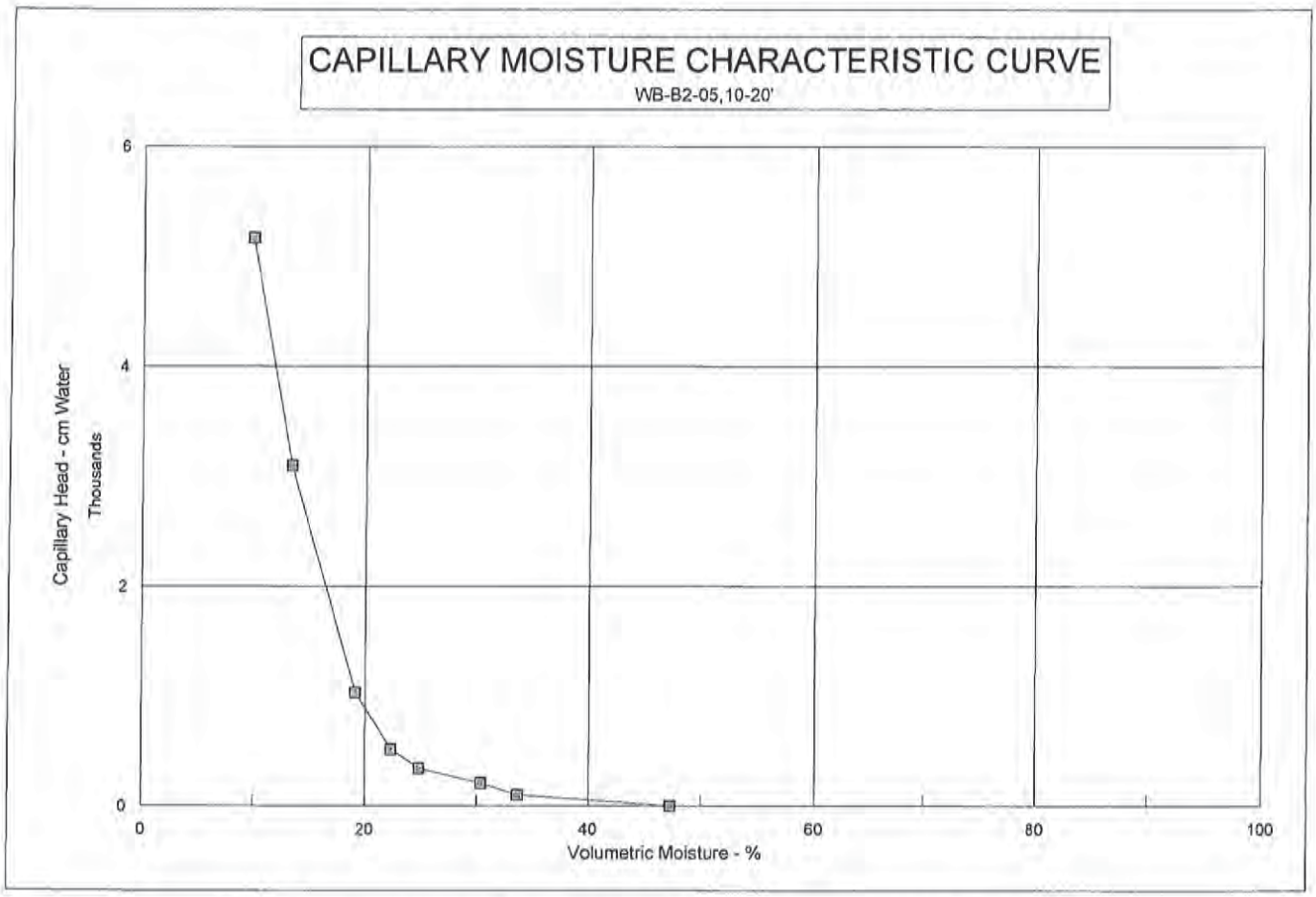

CAPILLARY MOISTURE CHARACTERISTIC CURVE
TI-CS01-04A, 11-24"-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)

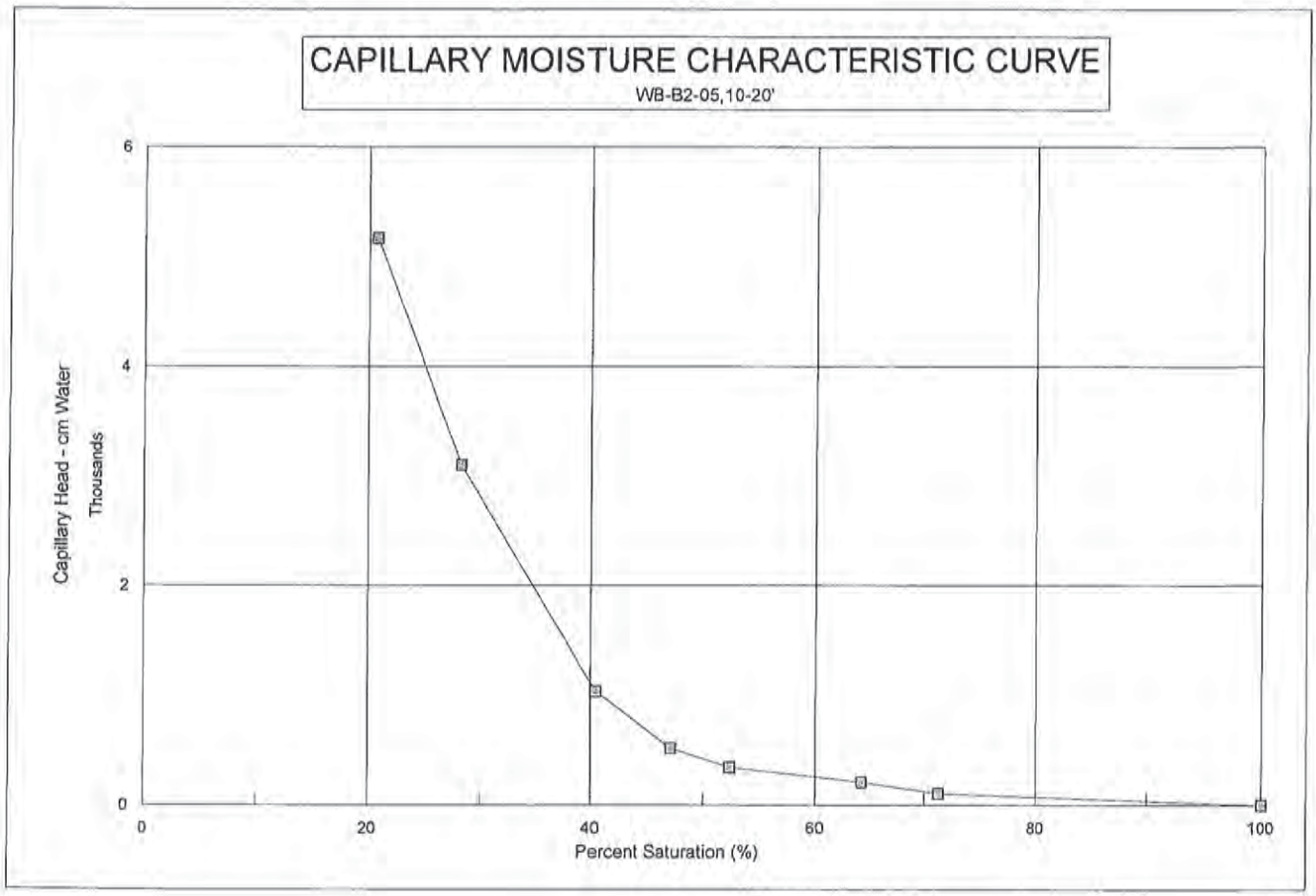

CAPILLARY MOISTURE CHARACTERISTIC CURVE
WB-B1-06, 5-10'
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %

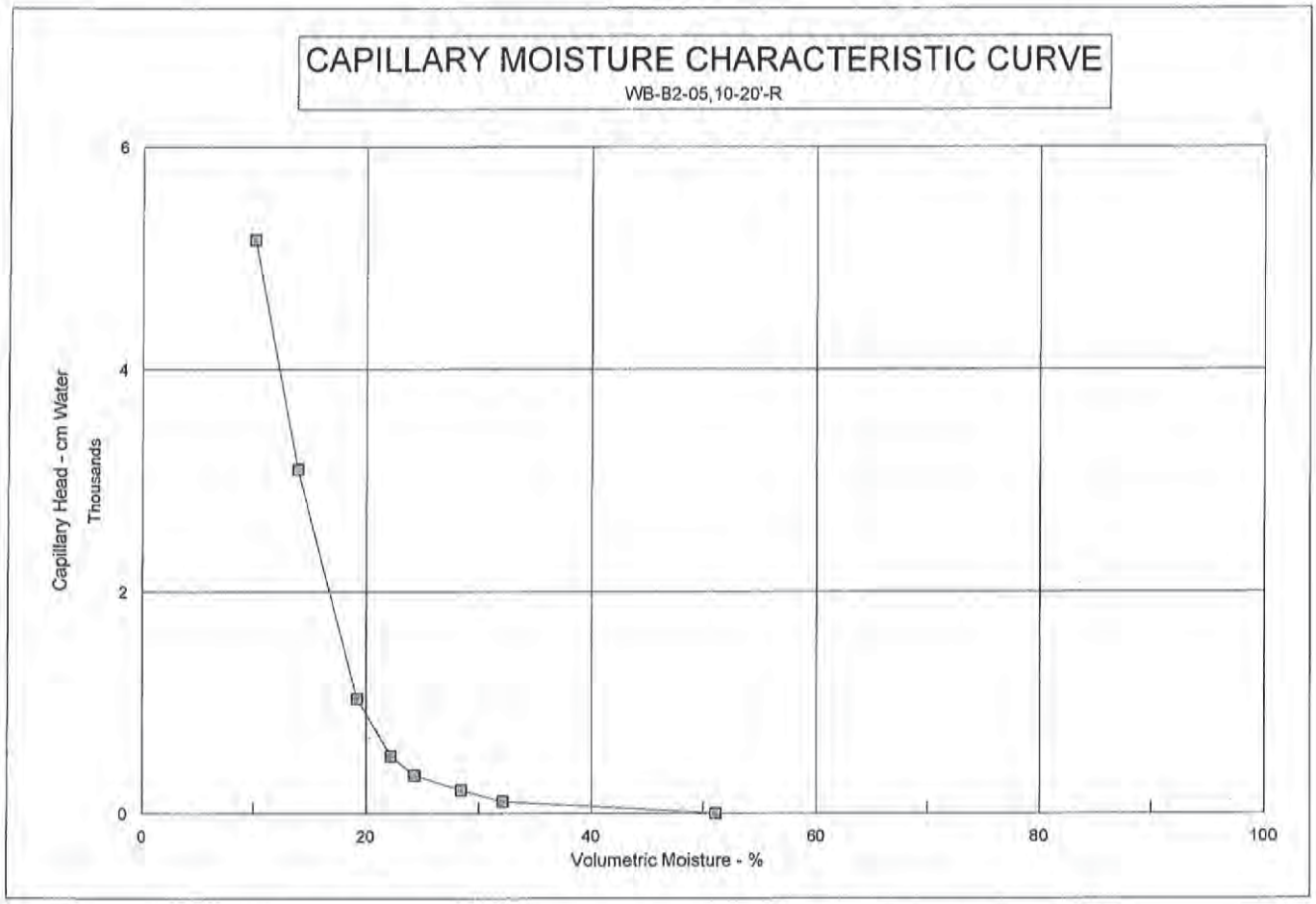

CAPILLARY MOISTURE CHARACTERISTIC CURVE
WB-B1-06, 5-10'
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)

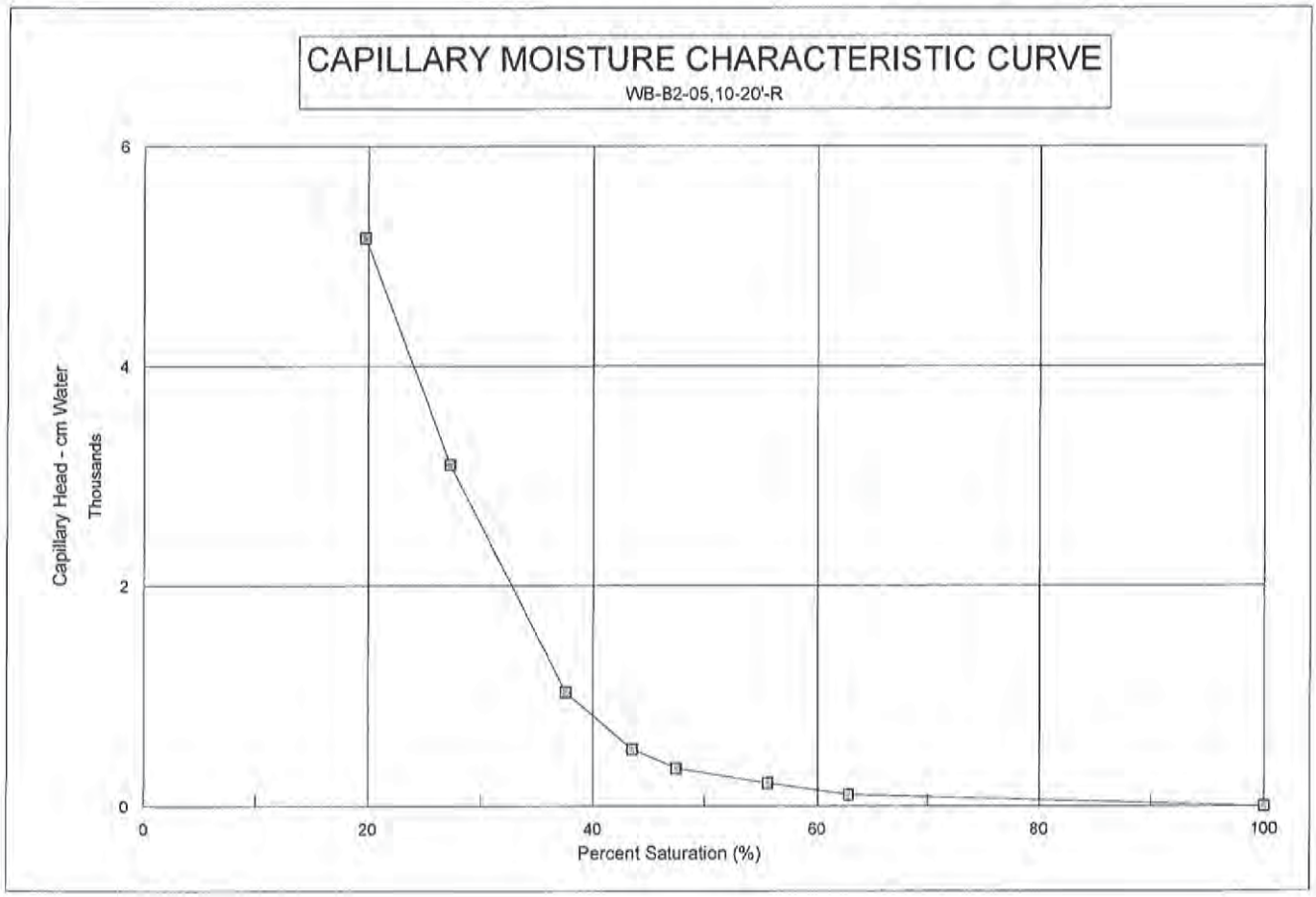

CAPILLARY MOISTURE CHARACTERISTIC CURVE
WB-B1-06, 5-10'-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
WB-B1-06, 5-10'-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
WB-B2-05,10-20'
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
WB-B2-05,10-20'
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
WB-B2-05,10-20'-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
WB-B2-05,10-20'-R
Capillary Head - cm Water
Thousands
0
2
4
6
0
20
40
60
80
100
Percent Saturation (%)

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B1-07A	SAMPLED	11/21/13 MWH
DEPTH	21.0-21.5'	TEST STARTED	01/31/14 DPM ,
SAMPLE NO.	-	TEST FINISHED	02/08/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	2592	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	358.8	415.7
Wt. Wet Soil & Pan (g)	365.3	422.2
Wt. Dry Soil & Pan (g)	344.1	344.1
Wt. Lost Moisture (g)	21.2	78.1
Wt. of Pan Only (g)	6.6	6.6
Wt. of Dry Soil (g)	337.6	337.6
Moisture Content %	6.3	23.1
Wet Density PCF	112.2	129.9
Dry Density PCF	105.5	105.5

Init. Diameter (in)	1.924	(cm)	4.887
Init. Area (sq in)	2.907	(sq cm)	18.758
Init. Height (in)	4.191	(cm)	10.645
Vol. Bef. Consol. (cu ft)	0.00705		
Vol. After Consol. (cu ft)	0.00706		
Porosity %	39.09		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Permeability k cm/sec
21.0	1260	48.1	28.2	23.8	7.6E-05
6.0	360	47.0	26.0	25.6	2.8E-04
6.0	360	47.4	26.2	25.3	2.9E-04
6.0	360	47.8	28.4	23.9	2.6E-04
6.0	360	47.8	29.1	23.5	2.5E-04
5.0	300	46.7	22.6	27.6	4.0E-04
5.0	300	47.0	24.2	26.6	3.7E-04
5.0	300	47.2	25.5	25.8	3.5E-04
5.0	300	46.7	24.1	26.8	3.7E-04

Average Temperature 19.2

Data entry by: DPM Date: 04/04/2014
Checked by: KK Date: 4/6/14
FileName: PBCH107A

ADVANCED TERRA TESTING, INC. ATT

RIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-07A	SAMPLED	11/21/13 MWH
DEPTH	21.0-21.5'	TEST STARTED	01/31/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/08/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	2592	TEST TYPE	TX/Pbp/Tap Water

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.4	8.8				
50.0	48.0	10.0	10.7	38.3	46.4	8.1	0.81
60.0	58.0	10.8	11.6	48.1	57.1	9.0	0.90
70.0	68.0	11.4	12.3	58.2	67.6	9.4	0.94
80.0		12.5	12.6	68.0	77.8	9.8	0.98

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	12.60	0.00
0.25	0.50	15.30	-2.70
0.5	0.71	15.35	-2.75
1	1.00	15.40	-2.80
2	1.41	15.45	-2.85
4	2.00	15.50	-2.90
9	3.00	15.55	-2.95
16	4.00	15.60	-3.00
30	5.48	15.65	-3.05
60	7.75	15.75	-3.15
120	10.95	15.90	-3.30
240	15.49	16.10	-3.50
360	18.97	16.20	-3.60

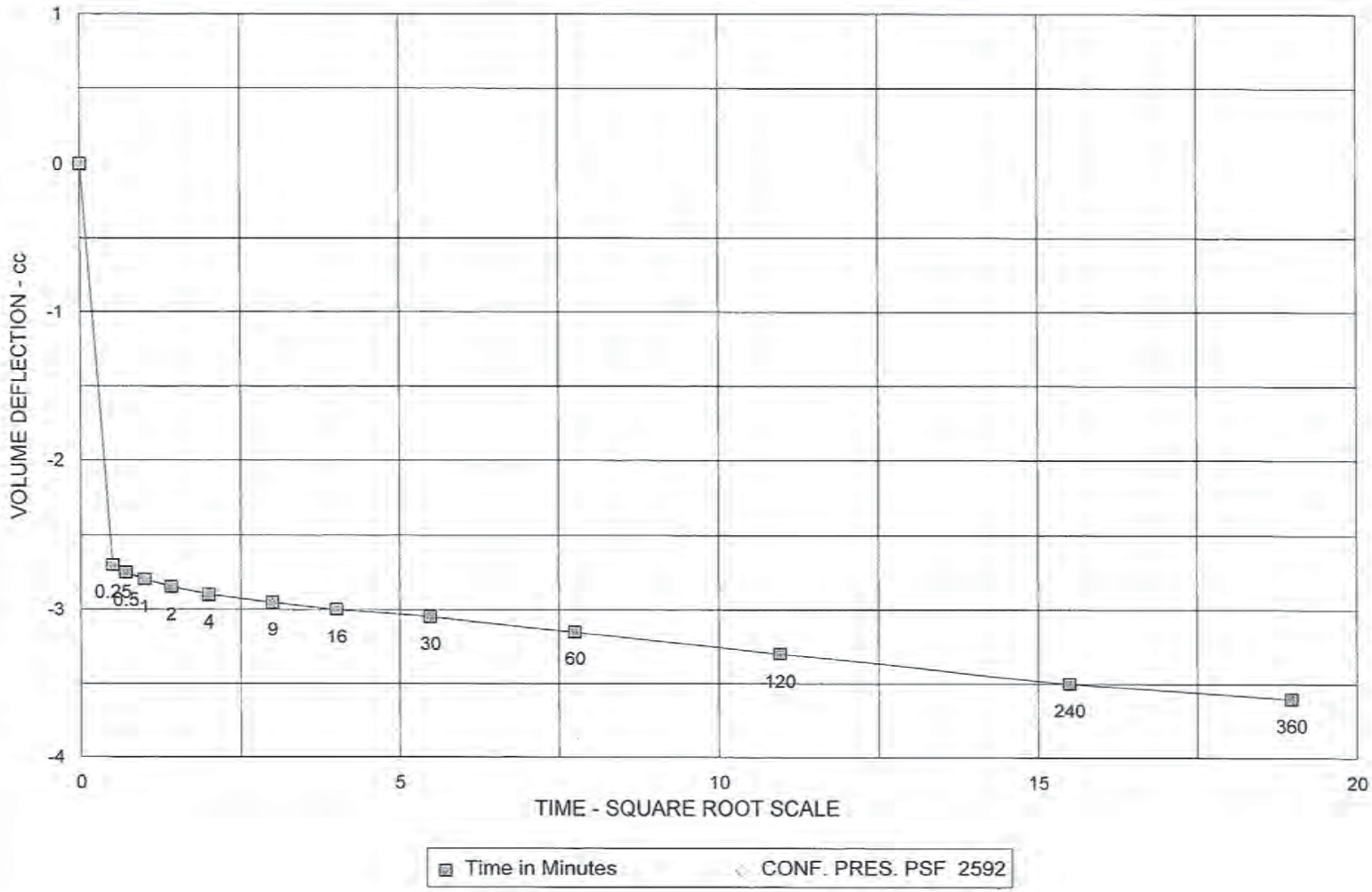
Initial Height (in)	4.191	Init. Vol. (CC)	199.71
Height Change (in)	0.023	Vol. Change (CC)	16.10
Ht. After Cons. (in)	4.168	Cell Exp. (CC)	16.20
Initial Area (sq in)	2.907	Net Change (CC)	-0.10
Area After Cons. (sq in)	2.925	Cons. Vol. (CC)	199.81

Data entry by: DPM Date: 04/04/2014
Checked by: KR Date: 4/6/14
FileName: PBCH107A

ADVANCED TERRA TESTING, Inc. ATT

CONSOLIDATION DATA

TI-B1-07A, 21.0-21.5', -



PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-12
BORING NO.	TI-B10-18	SAMPLED	11/26/13 MWH
DEPTH	55-56' (55-56.5')	TEST STARTED	02/22/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/27/14 DPM
SOIL DESCR.	Silty Sand	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	10368	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	594.1	619.6
Wt. Wet Soil & Pan (g)	609.9	635.4
Wt. Dry Soil & Pan (g)	536.1	536.1
Wt. Lost Moisture (g)	73.8	99.3
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	520.2	520.2
Moisture Content %	14.2	19.1
Wet Density PCF	121.3	134.7
Dry Density PCF	106.2	113.1

Init. Diameter (in)	2.835	(cm)	7.201
Init. Area (sq in)	6.312	(sq cm)	40.728
Init. Height (in)	2.955	(cm)	7.506
Vol. Bef. Consol. (cu ft)	0.01079		
Vol. After Consol. (cu ft)	0.01014		
Porosity %	34.58		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Permeability k cm/sec
20.0	1200	46.7	32.3	22.3	1.9E-05
20.0	1200	47.0	30.7	23.1	2.1E-05
20.0	1200	45.6	29.1	24.7	2.2E-05
20.0	1200	46.6	29.5	23.9	2.2E-05
20.0	1200	47.3	29.4	23.6	2.3E-05
20.0	1200	45.7	27.8	25.3	2.4E-05

Average Temperature 20.7

Data entry by: DPM Date: 04/04/2014
Checked by: KR Date: 4/7/14
FileName: PBCH1018

ADVANCED TERRA TESTING, INC. ATT

RIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-12
BORING NO.	TI-B10-18	SAMPLED	11/26/13 MWH
DEPTH	55-56' (55-56.5')	TEST STARTED	02/22/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/27/14 DPM
SOIL DESCR.	Silty Sand	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	10368	TEST TYPE	TX/Pbp/Tap Water

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	5.5	19.2				
50.0	48.0	21.7	22.6	38.1	46.3	8.2	0.82
60.0	58.0	22.7	23.5	47.8	56.6	8.8	0.88
70.0	68.0	23.2	24.2	57.8	66.9	9.1	0.91
80.0		24.9	25.2	67.8	77.4	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	0.60	0.00
0.25	0.50	20.90	-20.30
0.5	0.71	21.60	-21.00
1	1.00	22.10	-21.50
2	1.41	22.40	-21.80
4	2.00	22.75	-22.15
9	3.00	23.10	-22.50
16	4.00	23.40	-22.80
30	5.48	23.70	-23.10
60	7.75	24.00	-23.40
120	10.95	24.30	-23.70
240	15.49	24.70	-24.10
360	18.97	24.80	-24.20

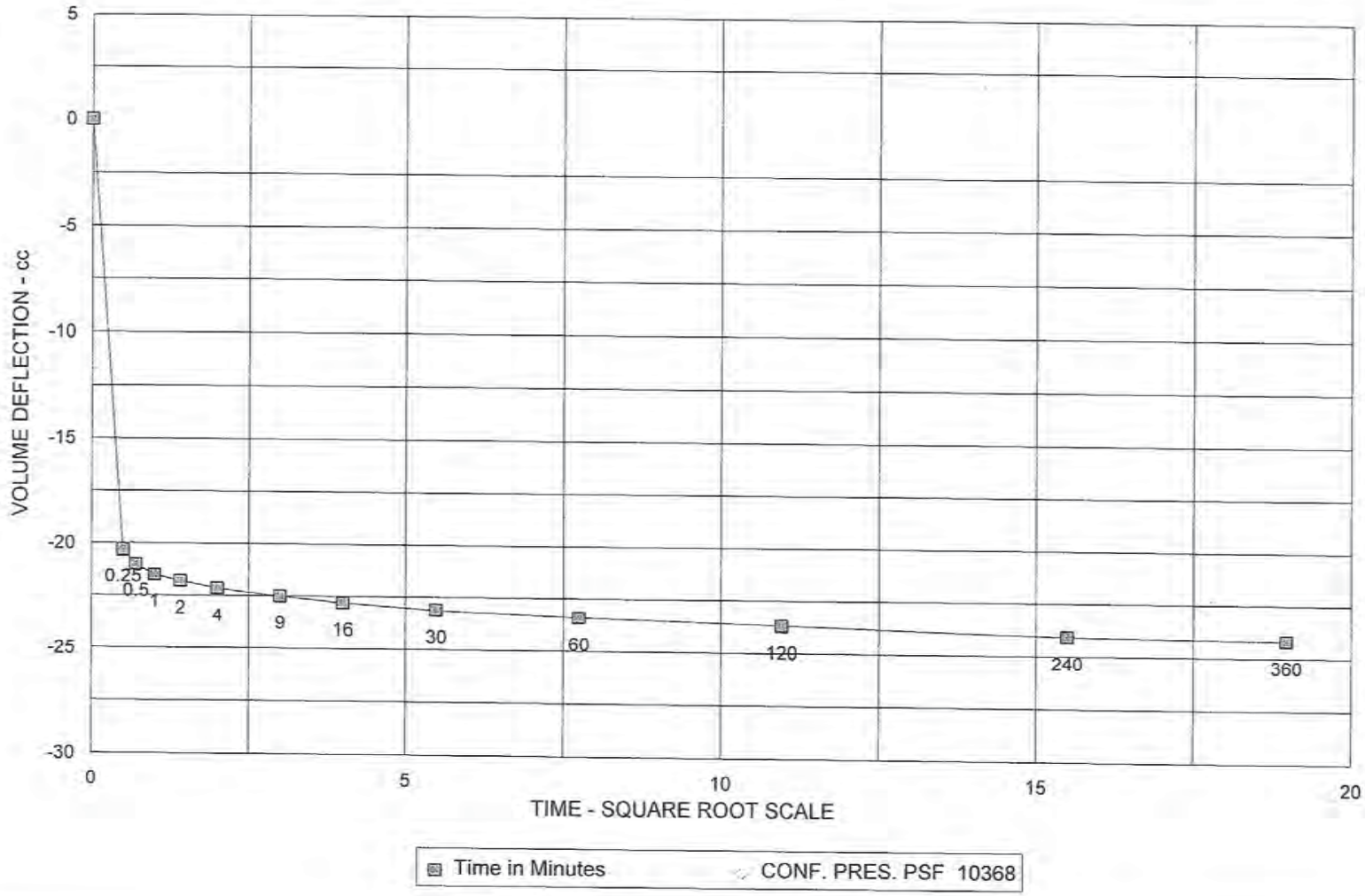
Initial Height (in)	2.955	Init. Vol. (CC)	305.73
Height Change (in)	0.096	Vol. Change (CC)	45.00
Ht. After Cons. (in)	2.859	Cell Exp. (CC)	26.48
Initial Area (sq in)	6.312	Net Change (CC)	18.52
Area After Cons. (sq in)	6.129	Cons. Vol. (CC)	287.20

Data entry by: DPM Date: 04/07/2014
Checked by: HR Date: 4/7/14
FileName: PBCH1018

ADVANCED TERRA TESTING, INC. ATT

CONSOLIDATION DATA

TI-B10-18, 55-56' (55-56.5'), -



PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B10-03	SAMPLED	-
DEPTH	12.5-14.0'	TEST STARTED	03/11/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/15/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	5184	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	391.0	432.7
Wt. Wet Soil & Pan (g)	406.8	448.5
Wt. Dry Soil & Pan (g)	379.4	379.4
Wt. Lost Moisture (g)	27.4	69.1
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	363.6	363.6
Moisture Content %	7.5	19.0
Wet Density PCF	106.6	129.4
Dry Density PCF	99.1	108.7

Init. Diameter	(in)	2.393	(cm)	6.078
Init. Area	(sq in)	4.498	(sq cm)	29.018
Init. Height	(in)	3.107	(cm)	7.892
Vol. Bef. Consol.	(cu ft)	0.00809		
Vol. After Consol.	(cu ft)	0.00737		
Porosity %		33.07		
Constant Head	(PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Permeability k cm/sec
10.0	600	48.3	28.5	23.5	7.9E-05
17.0	1020	47.1	21.0	28.3	6.4E-05
10.0	600	47.2	30.5	23.1	6.6E-05
10.0	600	47.2	30.9	22.8	6.5E-05
11.0	660	46.9	28.6	24.3	6.7E-05

Note: Could not achieve target density. The sample was too loose to hold together to assemble in the triax cell.

Average Temperature 21.3

Data entry by: DPM Date: 04/07/2014
Checked by: KA Date: 4/7/14
FileName: PBCH1003

ADVANCED TERRA TESTING, INC. ATT

RIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B10-03	SAMPLED	-
DEPTH	12.5-14.0'	TEST STARTED	03/11/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/15/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	5184	TEST TYPE	TX/Pbp/Tap Water

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	3.1	18.4				
50.0	48.0	19.5	21.1	38.1	46.0	7.9	0.79
60.0	58.0	21.8	22.7	48.1	56.9	8.8	0.88
70.0		23.0	23.9	58.2	67.7	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	3.30	0.00
0.25	0.50	20.20	-16.90
0.5	0.71	20.90	-17.60
1	1.00	21.10	-17.80
2	1.41	21.50	-18.20
4	2.00	21.70	-18.40
9	3.00	21.90	-18.60
16	4.00	22.00	-18.70
30	5.48	22.20	-18.90
60	7.75	22.40	-19.10
120	10.95	22.70	-19.40
240	15.49	23.00	-19.70
360	18.97	23.20	-19.90

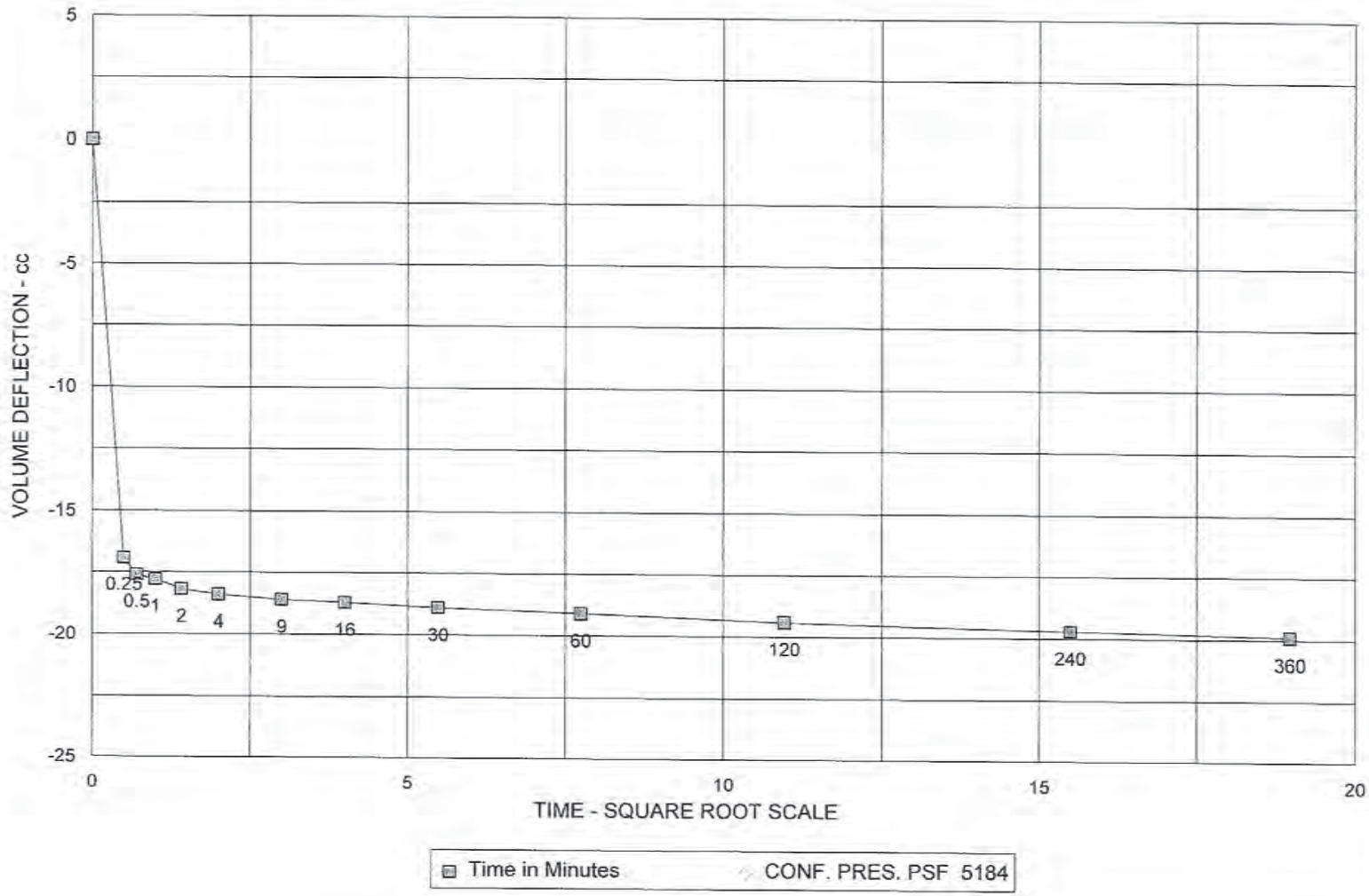
Initial Height (in)	3.107	Init. Vol. (CC)	229.03
Height Change (in)	0.093	Vol. Change (CC)	41.50
Ht. After Cons. (in)	3.014	Cell Exp. (CC)	21.30
Initial Area (sq in)	4.498	Net Change (CC)	20.20
Area After Cons. (sq in)	4.227	Cons. Vol. (CC)	208.83

Data entry by: DPM Date: 04/04/2014
Checked by: KR Date: 4/7/14
FileName: PBCH1003

ADVANCED TERRA TESTING, INC. ATT

CONSOLIDATION DATA

TI-B10-03, 12.5-14.0', -



PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B10-02	SAMPLED	11/26/13 MWH
DEPTH	10-11' (10-12.5')	TEST STARTED	02/20/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/22/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	4896	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	565.9	613.1
Wt. Wet Soil & Pan (g)	581.7	628.9
Wt. Dry Soil & Pan (g)	531.1	531.1
Wt. Lost Moisture (g)	50.5	97.8
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	515.3	515.3
Moisture Content %	9.8	19.0
Wet Density PCF	112.8	131.6
Dry Density PCF	102.7	110.6

Init. Diameter (in)	2.827	(cm)	7.181
Init. Area (sq in)	6.277	(sq cm)	40.498
Init. Height (in)	3.044	(cm)	7.732
Vol. Bef. Consol. (cu ft)	0.01106		
Vol. After Consol. (cu ft)	0.01027		
Porosity %	33.62		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Permeability k cm/sec
1.0	60	46.8	31.5	22.7	4.1E-04
1.0	60	46.5	31.2	23.1	4.1E-04
1.0	60	48.5	34.0	20.4	3.8E-04
1.0	60	47.6	33.6	21.1	3.7E-04
1.0	60	45.1	29.2	24.9	4.3E-04

Average Temperature 19.6

Data entry by: DPM Date: 04/04/2014
Checked by: KR Date: 4/5/14
FileName: PBCH1002

ADVANCED TERRA TESTING, INC. ATT

RIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B10-02	SAMPLED	11/26/13 MWH
DEPTH	10-11' (10-12.5')	TEST STARTED	02/20/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/22/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	4896	TEST TYPE	TX/Pbp/Tap Water

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	6.2	22.3				
50.0		24.9	25.0	38.2	47.7	9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	0.50	0.00
0.25	0.50	18.60	-18.10
0.5	0.71	19.10	-18.60
1	1.00	19.90	-19.40
2	1.41	20.20	-19.70
4	2.00	20.45	-19.95
9	3.00	20.70	-20.20
16	4.00	20.90	-20.40
30	5.48	21.10	-20.60
60	7.75	21.40	-20.90
120	10.95	21.60	-21.10
240	15.49	21.80	-21.30
360	18.97	21.90	-21.40

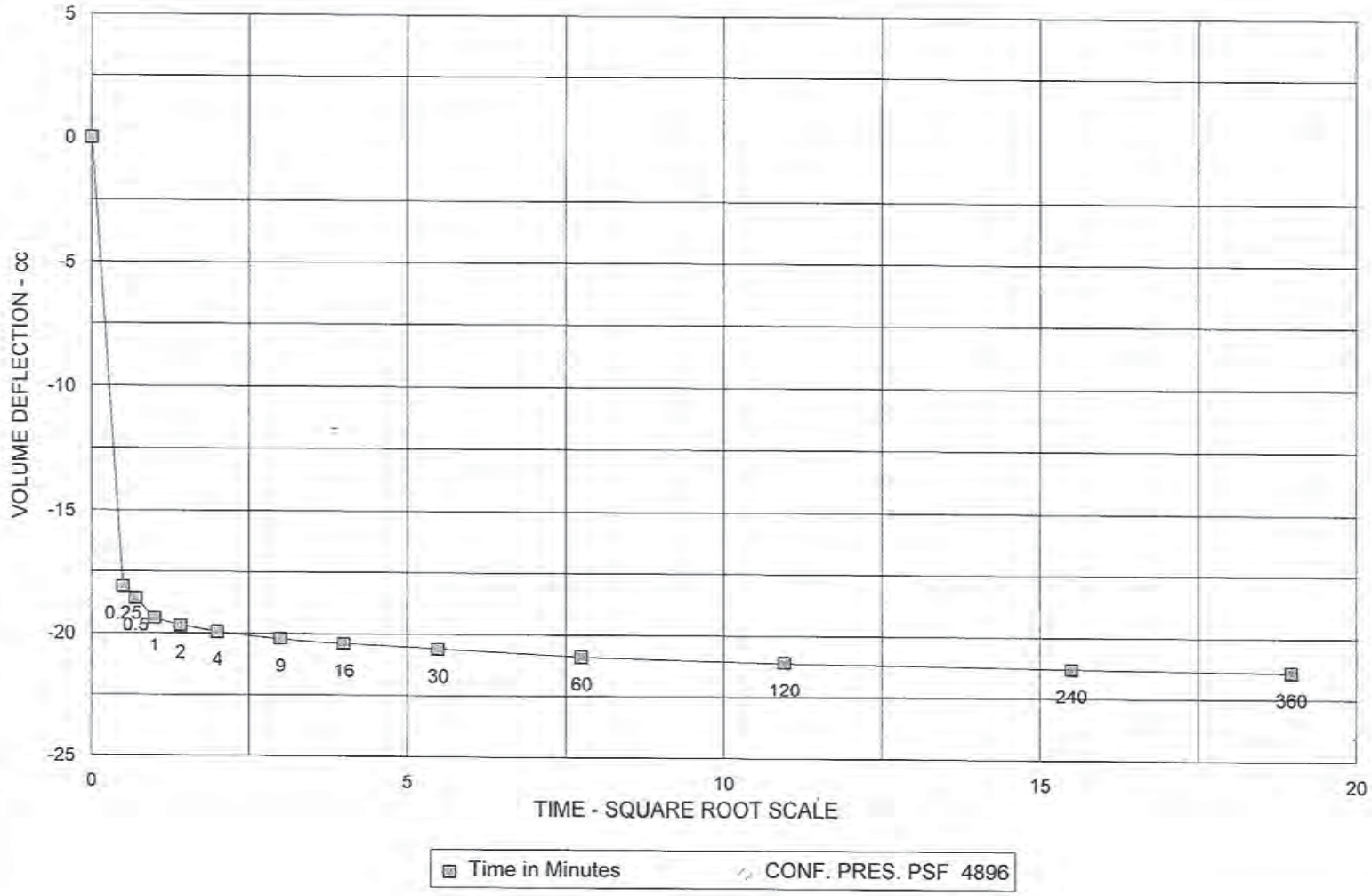
Initial Height (in)	3.044	Init. Vol. (CC)	313.16
Height Change (in)	0.132	Vol. Change (CC)	41.20
Ht. After Cons. (in)	2.912	Cell Exp. (CC)	18.82
Initial Area (sq in)	6.277	Net Change (CC)	22.38
Area After Cons. (sq in)	6.092	Cons. Vol. (CC)	290.78

Data entry by: DPM Date: 04/04/2014
Checked by: KR Date: 4/5/14
FileName: PBCH1002

ADVANCED TERRA TESTING, INC. ATT

CONSOLIDATION DATA

TI-B10-02, 10-11' (10-12.5'), -



PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-15A	SAMPLED	11/21/13 MWH
DEPTH	41.0-41.5'	TEST STARTED	02/09/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/19/14 DPM
SOIL DESCR.	Sandy Clay	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	5040	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	282.8	271.7
Wt. Wet Soil & Pan (g)	298.5	287.5
Wt. Dry Soil & Pan (g)	239.0	239.0
Wt. Lost Moisture (g)	59.5	48.5
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	223.2	223.2
Moisture Content %	26.7	21.7
Wet Density PCF	124.8	127.8
Dry Density PCF	98.6	105.0

Init. Diameter (in)	1.927	(cm)	4.893
Init. Area (sq in)	2.915	(sq cm)	18.807
Init. Height (in)	2.960	(cm)	7.518
Vol. Bef. Consol. (cu ft)	0.00499		
Vol. After Consol. (cu ft)	0.00469		
Porosity %	36.51		
Constant Head (PSI)	2.00	(cm)	140.79

Time Min	Time Sec	Init. Burette CC	Final Burette CC	Head Corr. CM	Permeability k cm/sec
1440.0	86400	45.3	42.2	17.7	1.2E-07
1440.0	86400	42.2	39.2	21.0	1.2E-07
7320.0	439200	39.2	25.5	30.1	1.1E-07
1380.0	82800	46.5	43.5	16.4	1.2E-07

Average Temperature 20.6

Data entry by: DPM Date: 04/04/2014
Checked by: KR Date: 4/5/14
FileName: PBCH115A

ADVANCED TERRA TESTING, INC. ATT