

APPENDIX B1.2

GEOTECHNICAL TEST RESULTS

ADVANCED TERRA TESTING

IMPOUNDMENT GEOTECHNICAL TEST RESULTS

Moisture Content Determinations
ASTM D 2216

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock
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JOB NO. 2512-77

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:
Checked by:
File name:

CAL

KP

Date: 12/3/2013

Date: 12/5/13

2512-77-M&D-ASTMD-2216-2937-R0-AS3-P1.xls



Moisture Content Determinations
ASTM D 2216

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock

JOB 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:
Checked by:
File name:

CAL




2512-77-M&D-ASTMD-2216-2937-R0-7.xls

Date:

Date:

12/5/2013



Moisture Content Determinations
ASTM D 2216

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock
--

JOB NO.
LOCATION

2512-77
Tailings Impoundment

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:
Checked by:
File name:

KMR

DPM

2512-77-M&D-ASTMD-2216-2937-R0-8.xls

Date: 12/11/2013

Date: *12/10/13*



Moisture Content Determinations
ASTM D 2216

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

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:
Checked by:
File name:

DPM
DPM
2512-77- M&D-ASTMD-2216-2937-R0-10.xls

Date: 12/20/2013
Date: 12/20/13



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

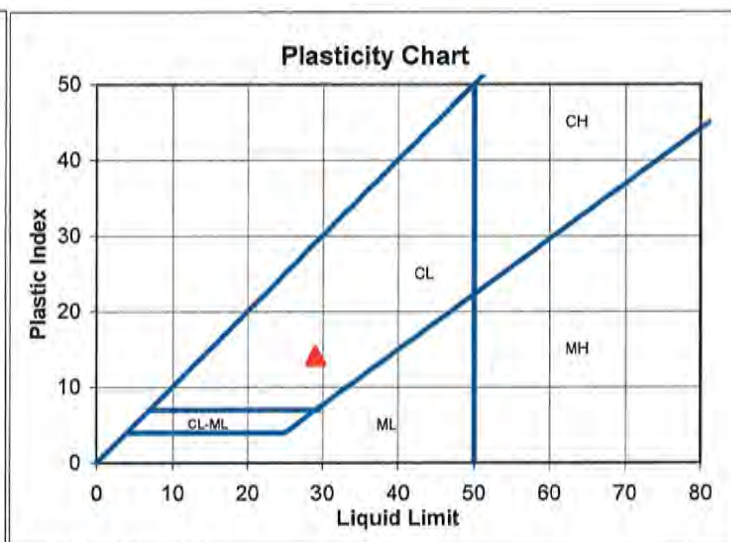
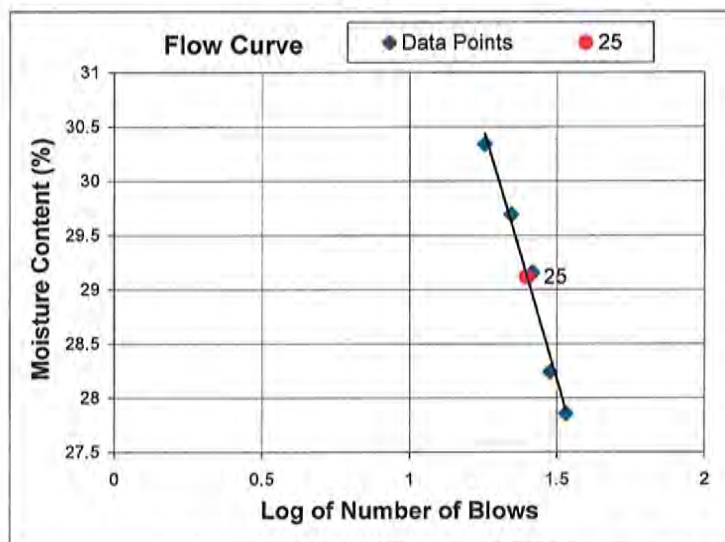
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	34	30	26	22	18
Weight of Wet Soil & Pan (g):	16.758	16.257	17.649	17.054	16.046
Weight of Dry Soil & Pan (g):	13.357	12.928	13.924	13.416	12.580
Weight of Water (g):	3.401	3.329	3.725	3.638	3.466
Weight of Pan (g):	1.148	1.140	1.147	1.162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



Data Entered By: SKL

Date: 12/27/2013

Data Checked By: MLM

File Name: atterberg-ASTM_4318-R6_1.xls

Date: 12/30/13

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

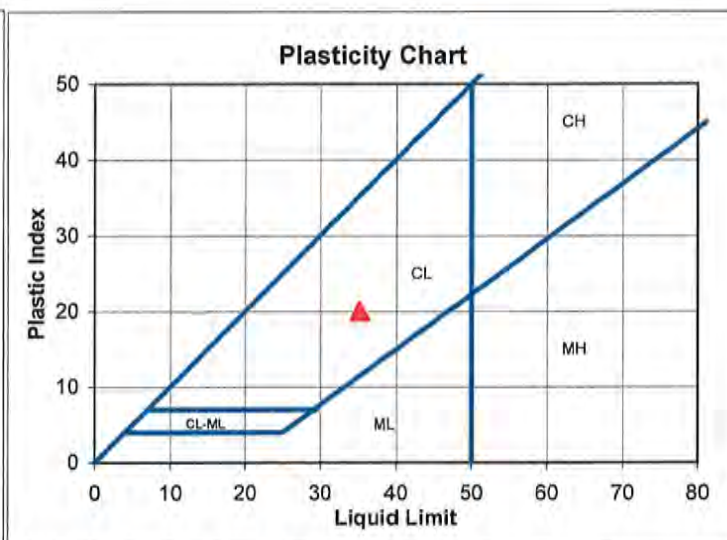
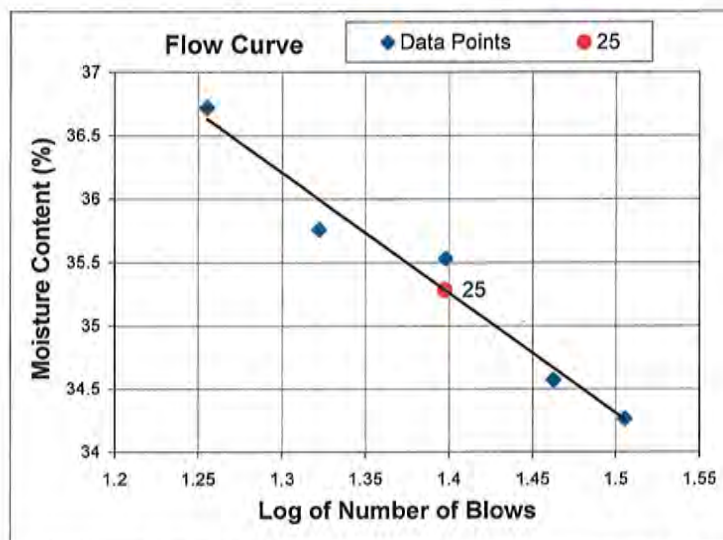
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	32	29	25	21	18
Weight of Wet Soil & Pan (g):	15.825	16.545	14.944	16.252	14.906
Weight of Dry Soil & Pan (g):	12.081	12.589	11.303	12.263	11.201
Weight of Water (g):	3.744	3.956	3.641	3.989	3.705
Weight of Pan (g):	1.153	1.145	1.054	1.107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



Data Entered By: SKL

Date: 12/27/2013

Data Checked By: MLM

File Name: atterberg-ASTM_4318-R6_0.xls

Date: 12/30/13

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

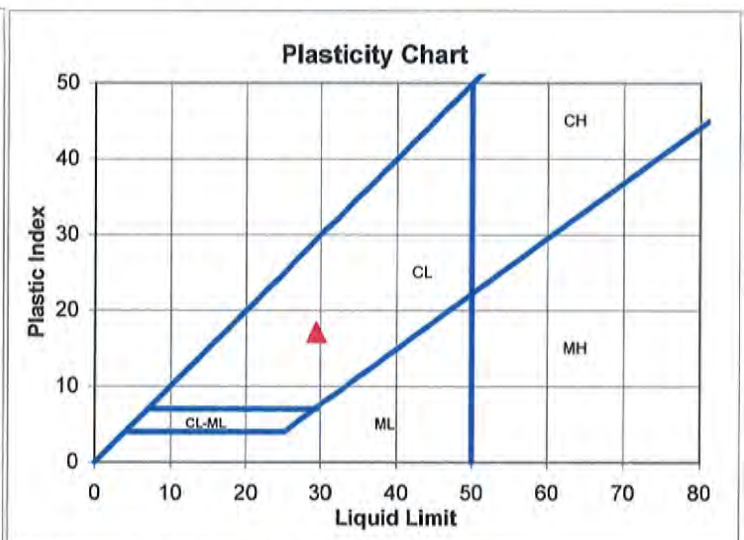
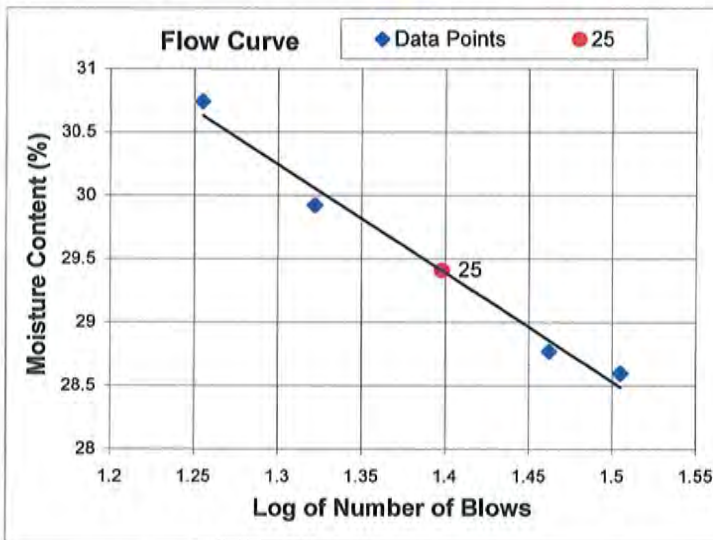
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	32	29	21	18
Weight of Wet Soil & Pan (g):	11.769	11.305	11.298	9.415
Weight of Dry Soil & Pan (g):	9.315	8.948	8.871	7.382
Weight of Water (g):	2.454	2.357	2.427	2.033
Weight of Pan (g):	0.733	0.755	0.760	0.769
Moisture Content (%):	28.6	28.8	29.9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

Plastic Limit: 12

Liquid Limit: 29

Plastic Index: 17

Atterberg Classification CL



Data Entered By: CAL

File Name: atterberg-ASTM_4318-R6_4.xls

Date: 12/4/2013

Data Checked By: KR

Date: 12/5/13

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

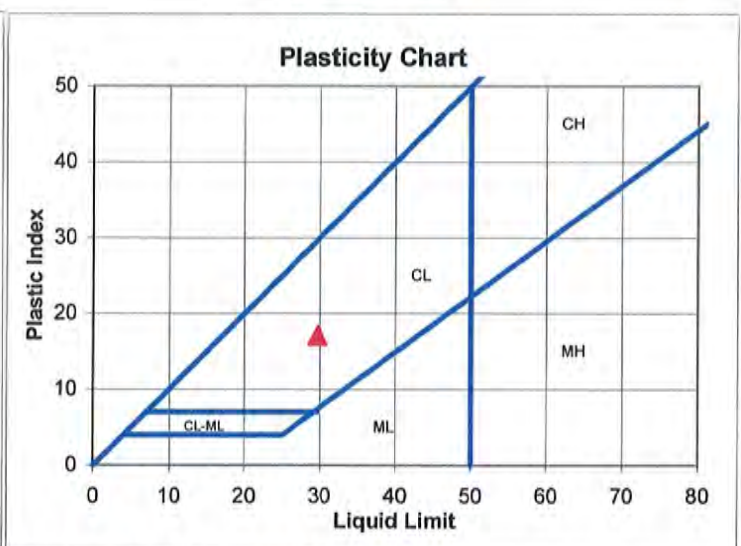
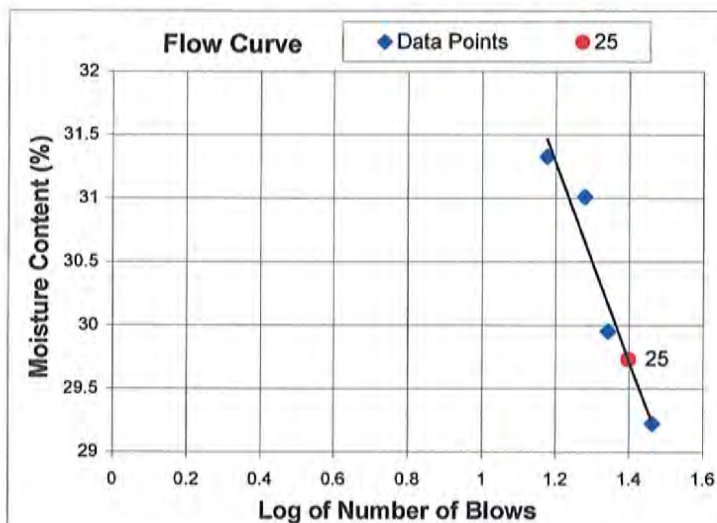
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	29	22	19	15
Weight of Wet Soil & Pan (g):	11.472	12.036	11.694	10.611
Weight of Dry Soil & Pan (g):	9.043	9.438	9.108	8.261
Weight of Water (g):	2.429	2.598	2.586	2.350
Weight of Pan (g):	0.731	0.764	0.769	0.760
Moisture Content (%):	29.2	30.0	31.0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

Plastic Limit: 13

Liquid Limit: 30

Plastic Index: 17

Atterberg Classification CL



Data Entered By: CAL

File Name: atterberg-ASTM_4318-R6_5.xls

Date: 12/4/2013

Data Checked By: KR

Date: 12/5/13

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

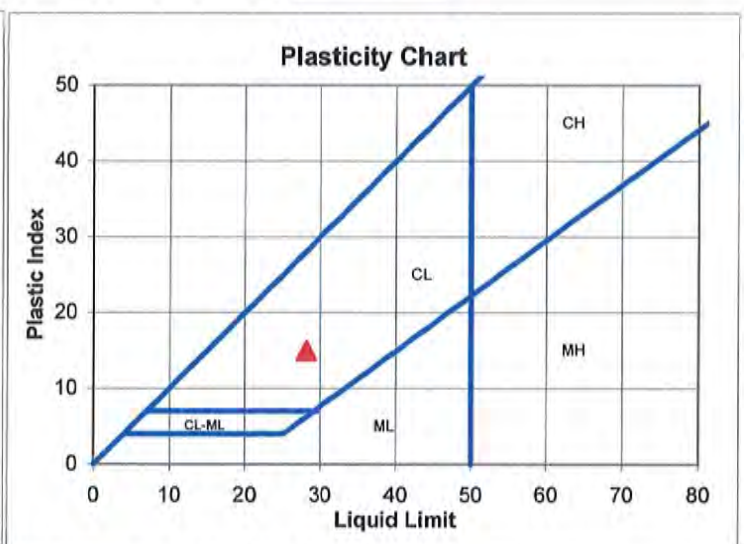
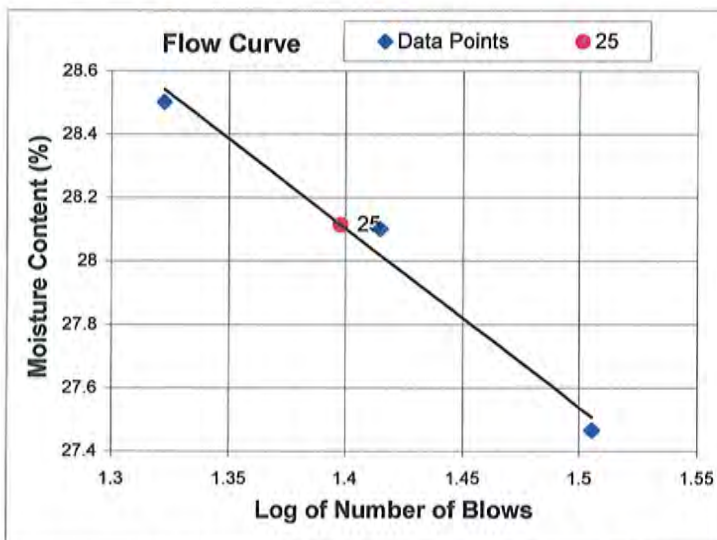
	Sample 1	Sample 2	Sample 3
Number of Blows:	32	21	26
Weight of Wet Soil & Pan (g):	11.095	10.501	13.216
Weight of Dry Soil & Pan (g):	8.870	8.342	10.484
Weight of Water (g):	2.225	2.159	2.732
Weight of Pan (g):	0.769	0.767	0.762
Moisture Content (%):	27.5	28.5	28.1

Plastic Limit: 13

Liquid Limit: 28

Plastic Index: 15

Atterberg Classification CL



Data Entered By: KR

File Name: atterberg-ASTM_4318-R6_0.xls

Date: 12/3/2013

Data Checked By: cm

Date: 12/3/13

**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

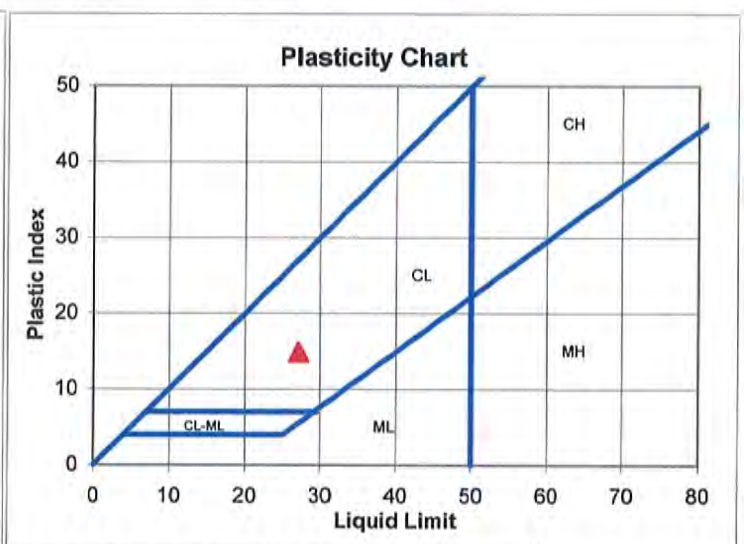
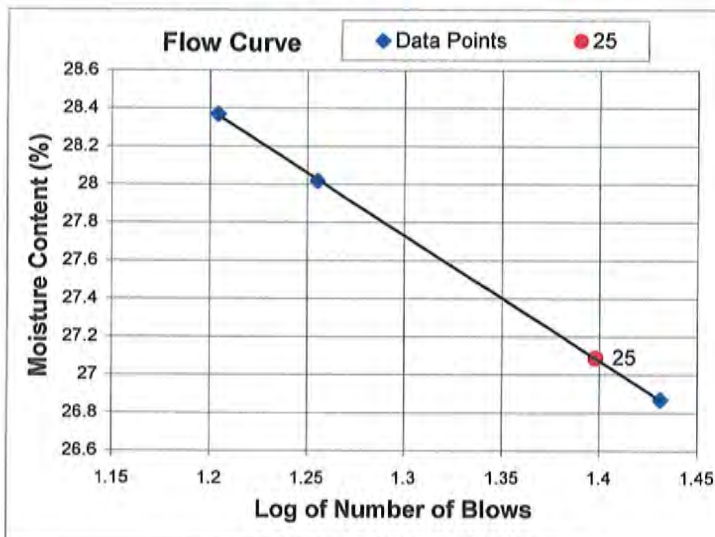
	Sample 1	Sample 2	Sample 3
Number of Blows:	16	18	27
Weight of Wet Soil & Pan (g):	11.528	9.880	9.560
Weight of Dry Soil & Pan (g):	9.147	7.883	7.691
Weight of Water (g):	2.381	1.997	1.869
Weight of Pan (g):	0.754	0.755	0.735
Moisture Content (%):	28.4	28.0	26.9

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

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

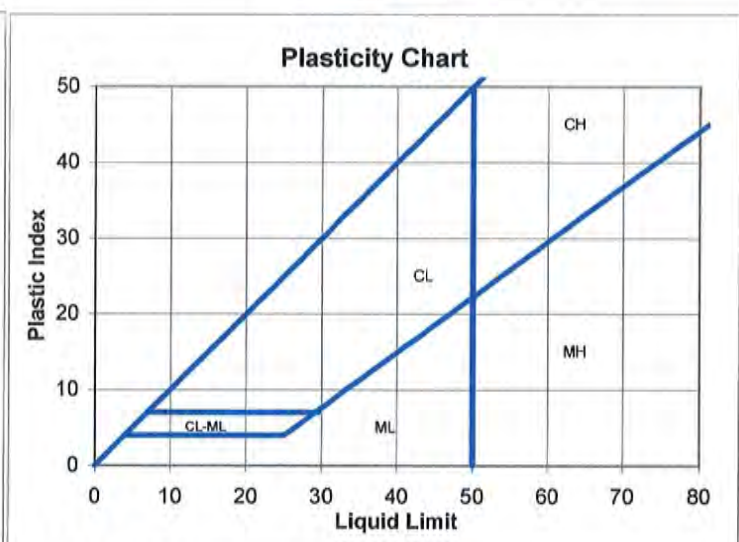
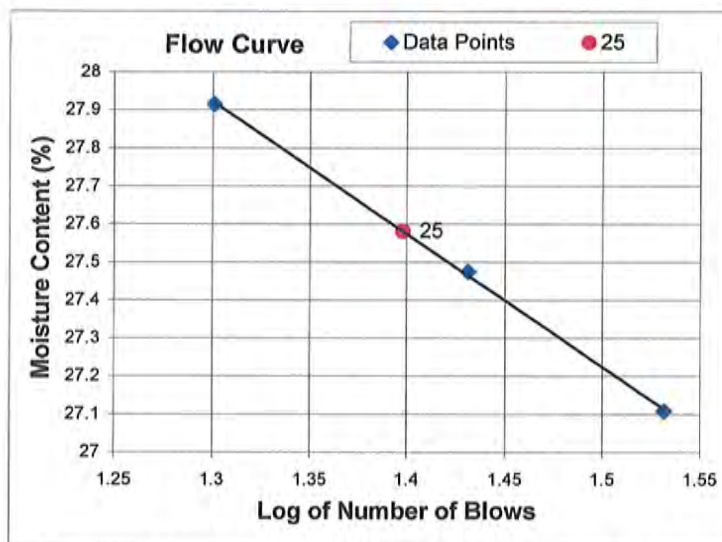
	Sample 1	Sample 2	Sample 3
Number of Blows:	20	27	34
Weight of Wet Soil & Pan (g):	9.990	9.271	11.723
Weight of Dry Soil & Pan (g):	7.974	7.436	9.386
Weight of Water (g):	2.016	1.835	2.337
Weight of Pan (g):	0.752	0.757	0.765
Moisture Content (%):	27.9	27.5	27.1

Plastic Limit: -880

Liquid Limit: 28

Plastic Index: 908

Atterberg Classification CL



Data Entered By: KR

File Name: atterberg-ASTM_4318-R6_3.xls

Date: 12/4/2013

Data Checked By: CAL

Date: 12/4/13

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

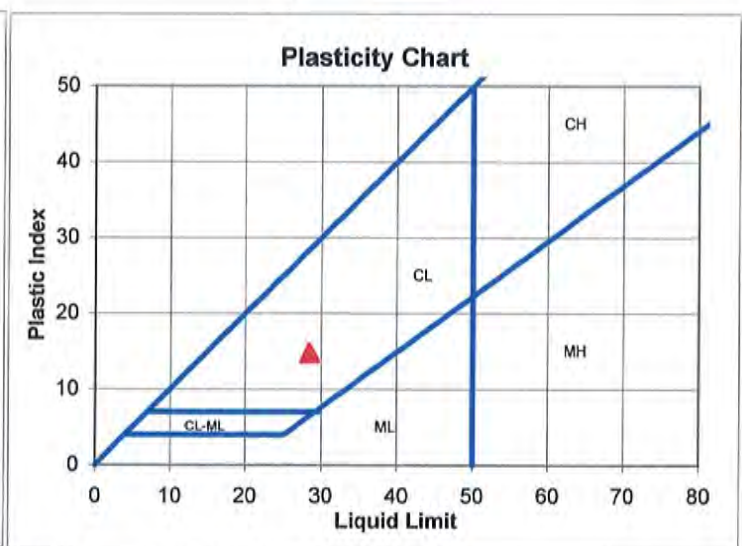
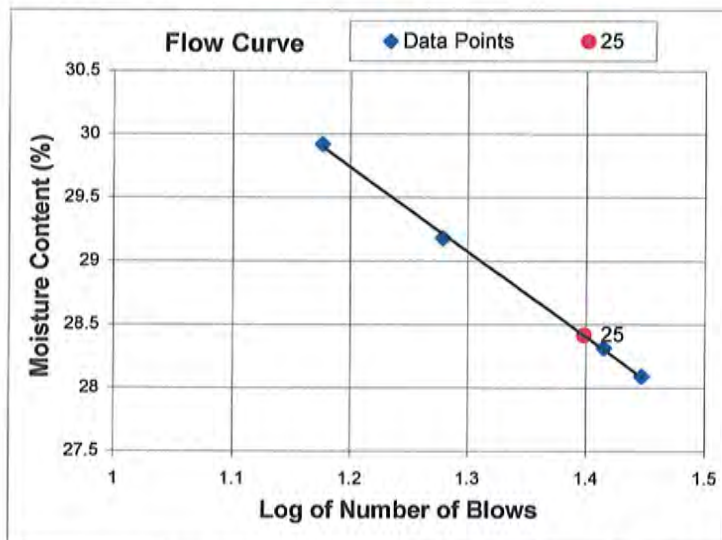
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	28	26	19	15
Weight of Wet Soil & Pan (g):	11.741	12.307	14.543	12.590
Weight of Dry Soil & Pan (g):	9.334	9.756	11.432	9.870
Weight of Water (g):	2.407	2.551	3.111	2.720
Weight of Pan (g):	0.765	0.746	0.770	0.779
Moisture Content (%):	28.1	28.3	29.2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

File Name: atterberg-ASTM_4318-R6_7.xls

Date: *12/13/13*

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

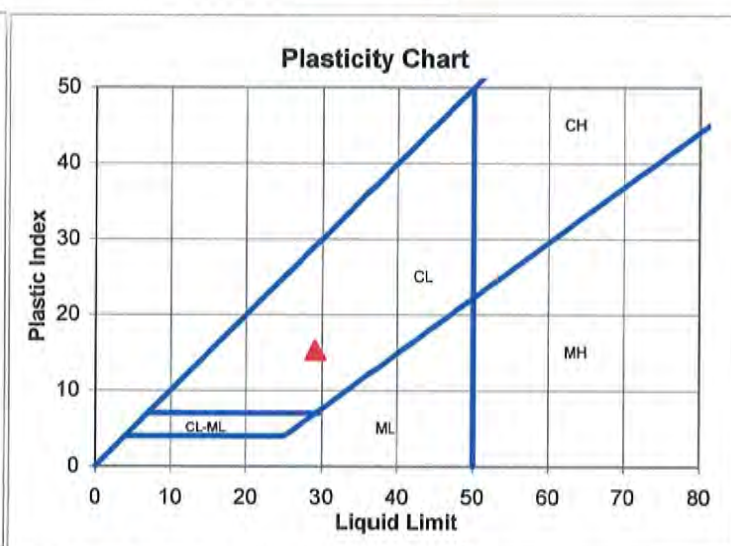
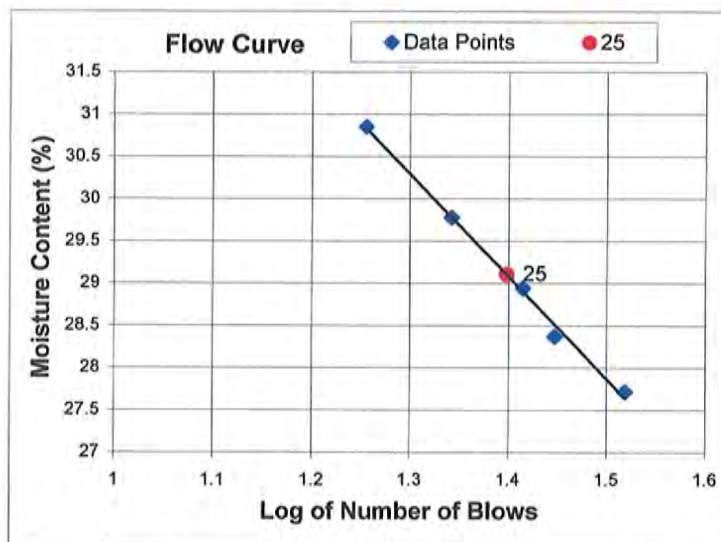
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	33	28	26	22	18
Weight of Wet Soil & Pan (g):	14.400	15.122	13.908	18.819	15.267
Weight of Dry Soil & Pan (g):	11.441	11.951	10.958	14.677	11.845
Weight of Water (g):	2.959	3.171	2.950	4.142	3.422
Weight of Pan (g):	0.765	0.773	0.764	0.766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

File Name: atterberg-ASTM_4318-R6_9.xls

Date: *12/13/13*

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

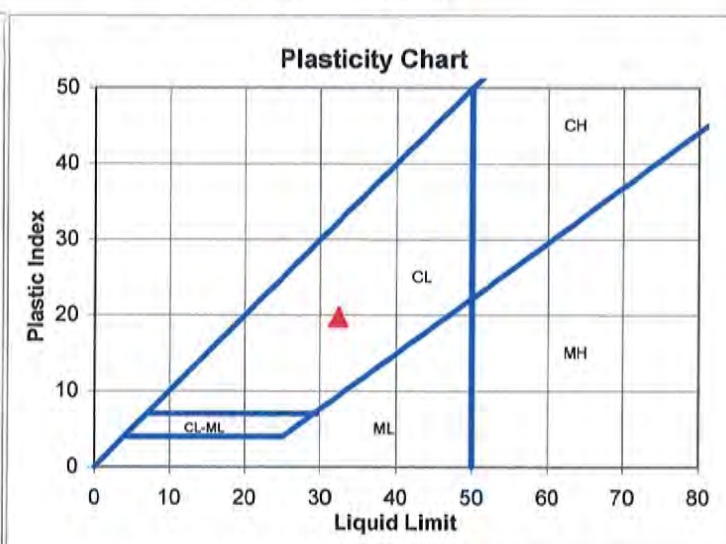
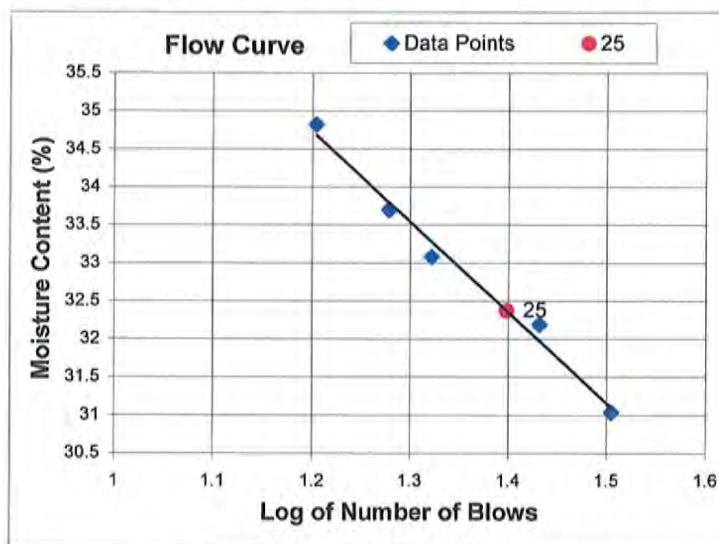
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	32	27	21	19	16
Weight of Wet Soil & Pan (g):	10.899	10.245	9.851	10.238	8.958
Weight of Dry Soil & Pan (g):	8.501	7.936	7.590	7.843	6.844
Weight of Water (g):	2.398	2.309	2.261	2.395	2.114
Weight of Pan (g):	0.775	0.763	0.755	0.735	0.773
Moisture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

File Name: atterberg-ASTM_4318-R6_6.xls

Date: 12/09/13

**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

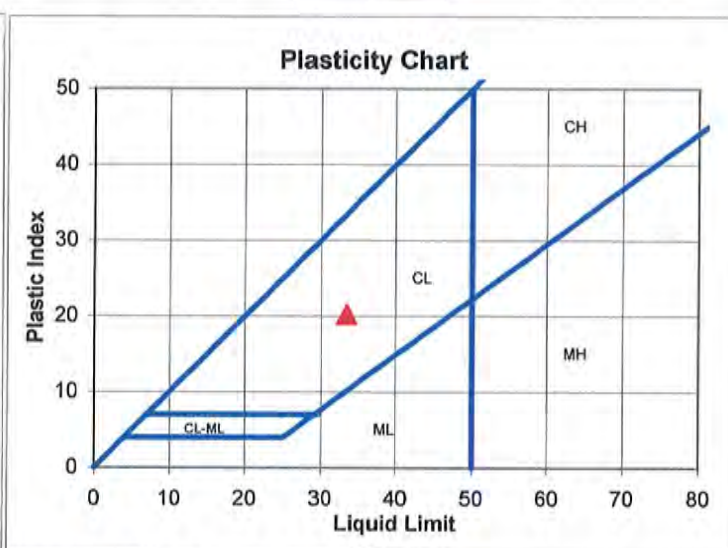
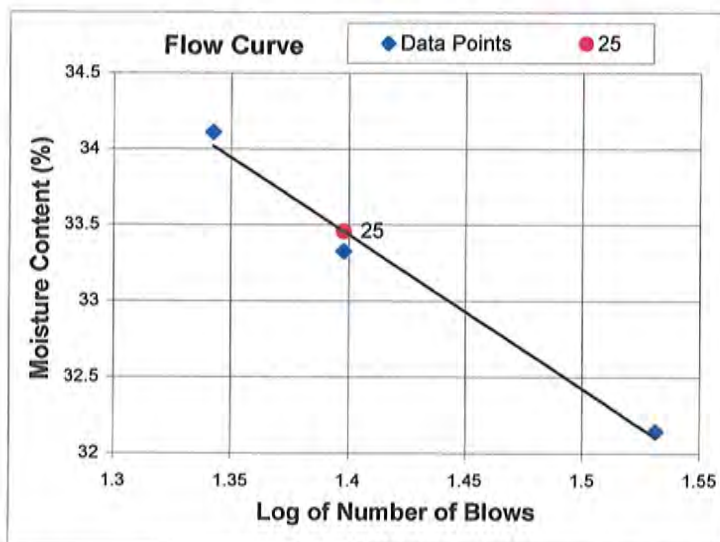
	Sample 1	Sample 2	Sample 3
Number of Blows:	34	25	22
Weight of Wet Soil & Pan (g):	14.697	12.843	15.671
Weight of Dry Soil & Pan (g):	11.301	9.819	11.877
Weight of Water (g):	3.396	3.024	3.794
Weight of Pan (g):	0.736	0.745	0.754
Moisture Content (%):	32.1	33.3	34.1

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*

**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

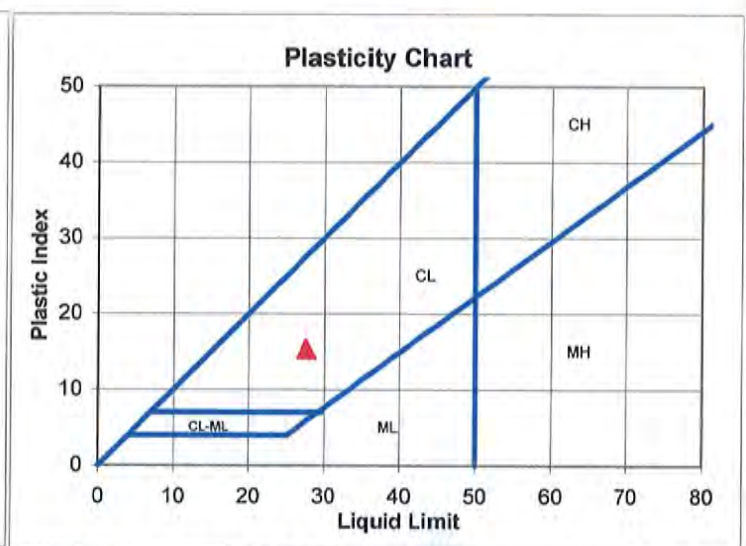
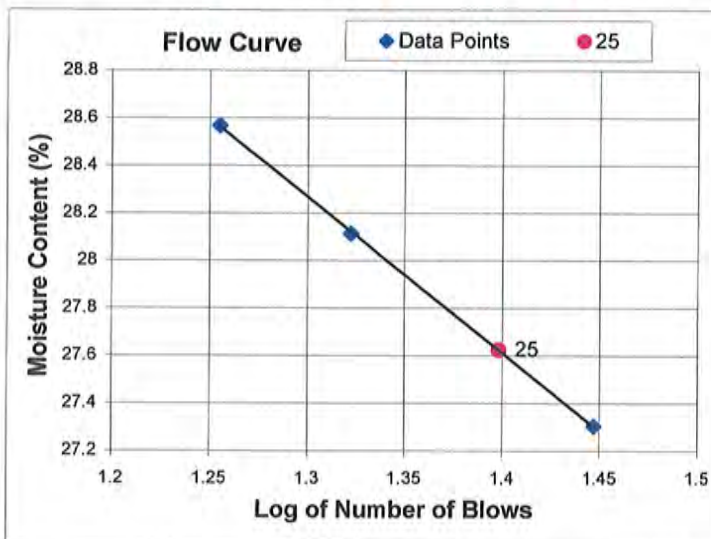
	Sample 1	Sample 2	Sample 3
Number of Blows:	28	18	21
Weight of Wet Soil & Pan (g):	14.596	14.925	14.115
Weight of Dry Soil & Pan (g):	11.625	11.772	11.180
Weight of Water (g):	2.971	3.153	2.935
Weight of Pan (g):	0.744	0.735	0.740
Moisture Content (%):	27.3	28.6	28.1

Plastic Limit: 12

Liquid Limit: 28

Plastic Index: 15

Atterberg Classification CL



Data Entered By: DPM

Date: 12/17/2013

Data Checked By: DJ

File Name: atterberg-ASTM_4318-R6_10.xls

Date: 12/17/2013

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

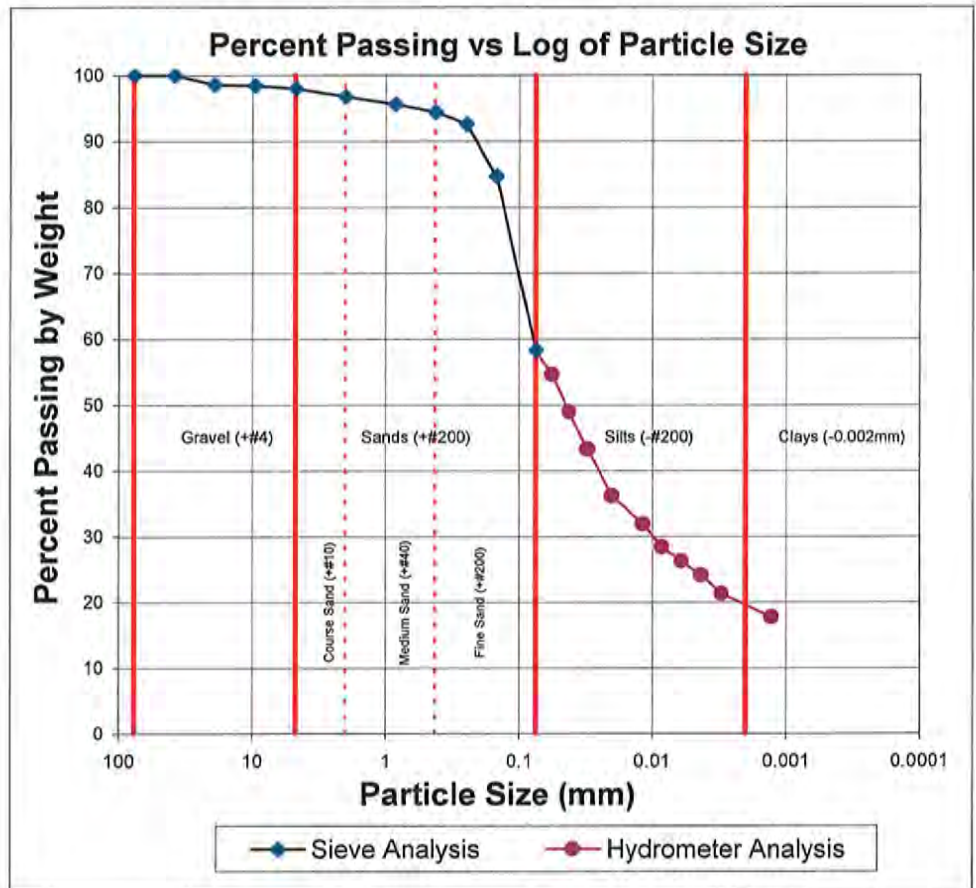
Plus Split Data

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

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: 12/19/2013
Sampled By: MWH
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

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
Test Date: 12/20/2013
Sampled By: MWH
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

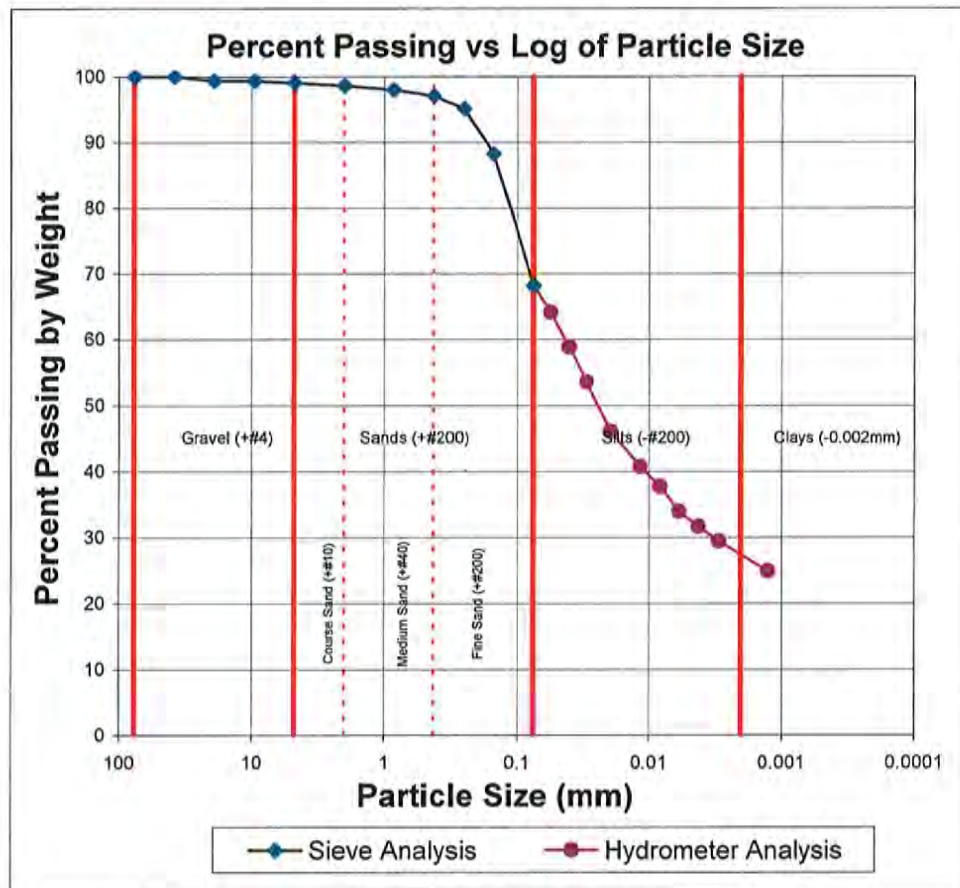
Plus Split Data

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: CAL

Date: 12/27/13

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
Test Date: 12/19/2013
Sampled By: MWH
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: _____

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

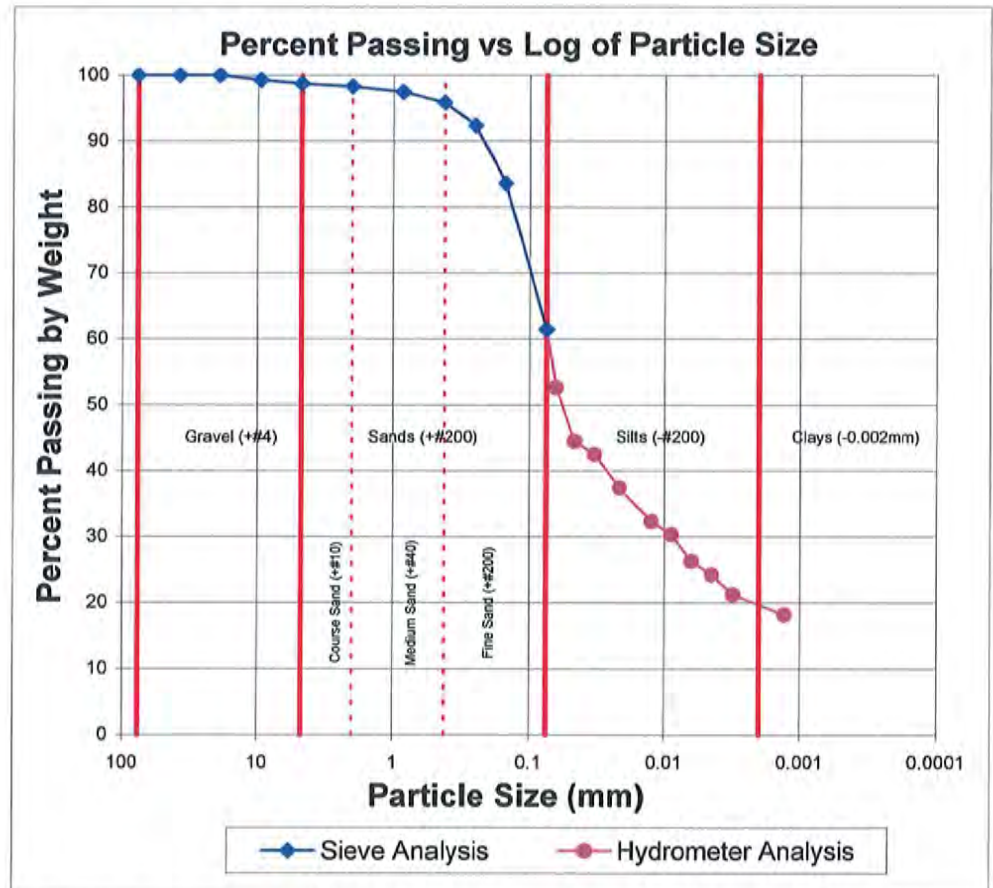
Plus Split Data

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: *VR*

Date: *12/5/13*

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

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

Specific Gravity Correction Factor - α : 1.00

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

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

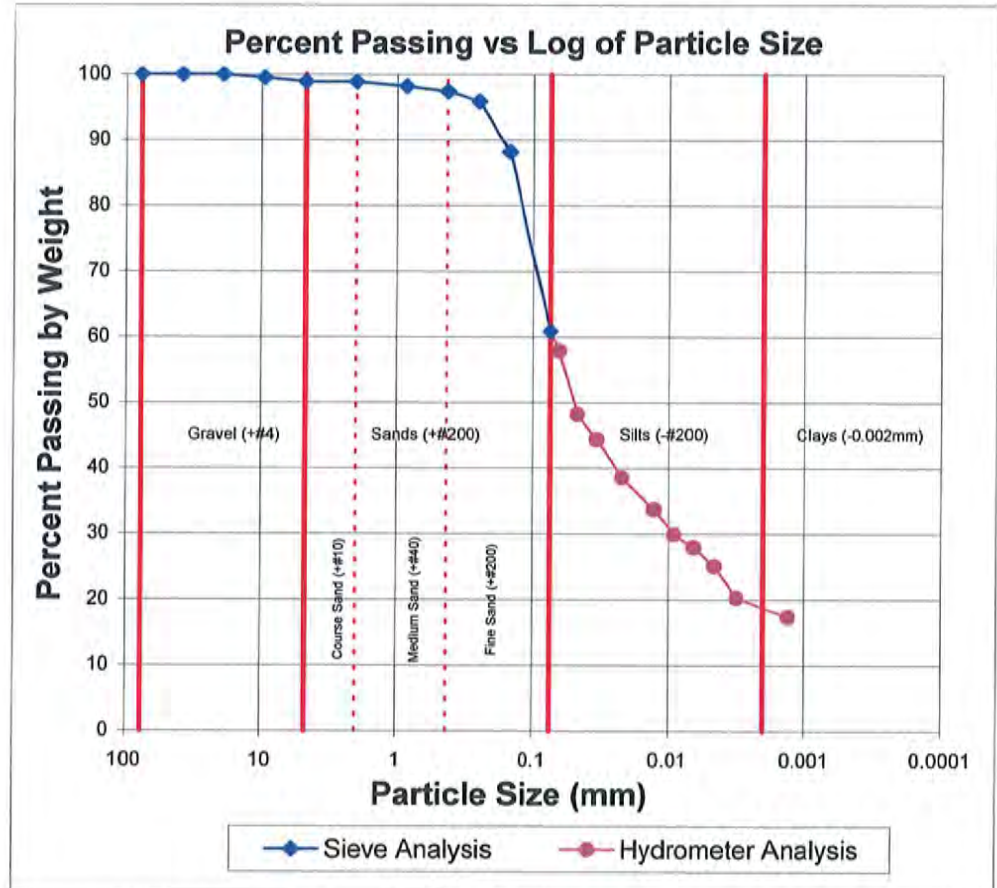
Plus Split Data

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: KC
Date: 12/5/13

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

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

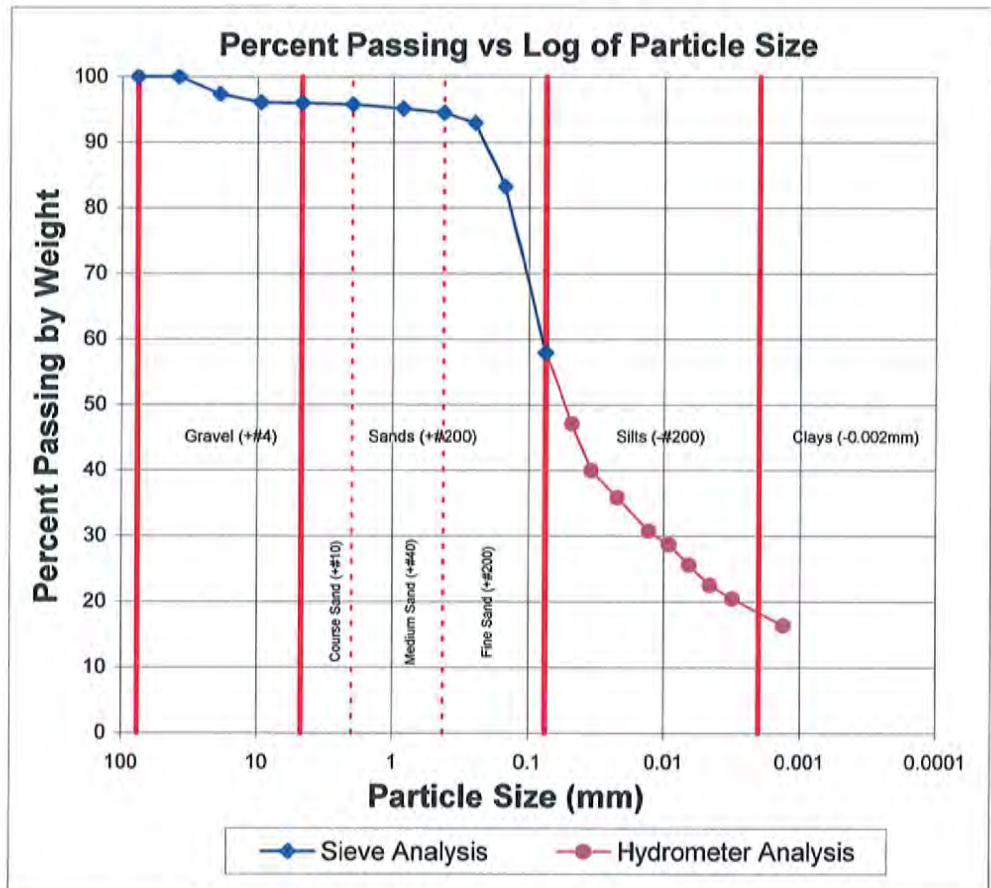
Plus Split Data

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: KL

Date: 12/5/13

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

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

Specific Gravity Correction Factor - α : 1.00

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

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

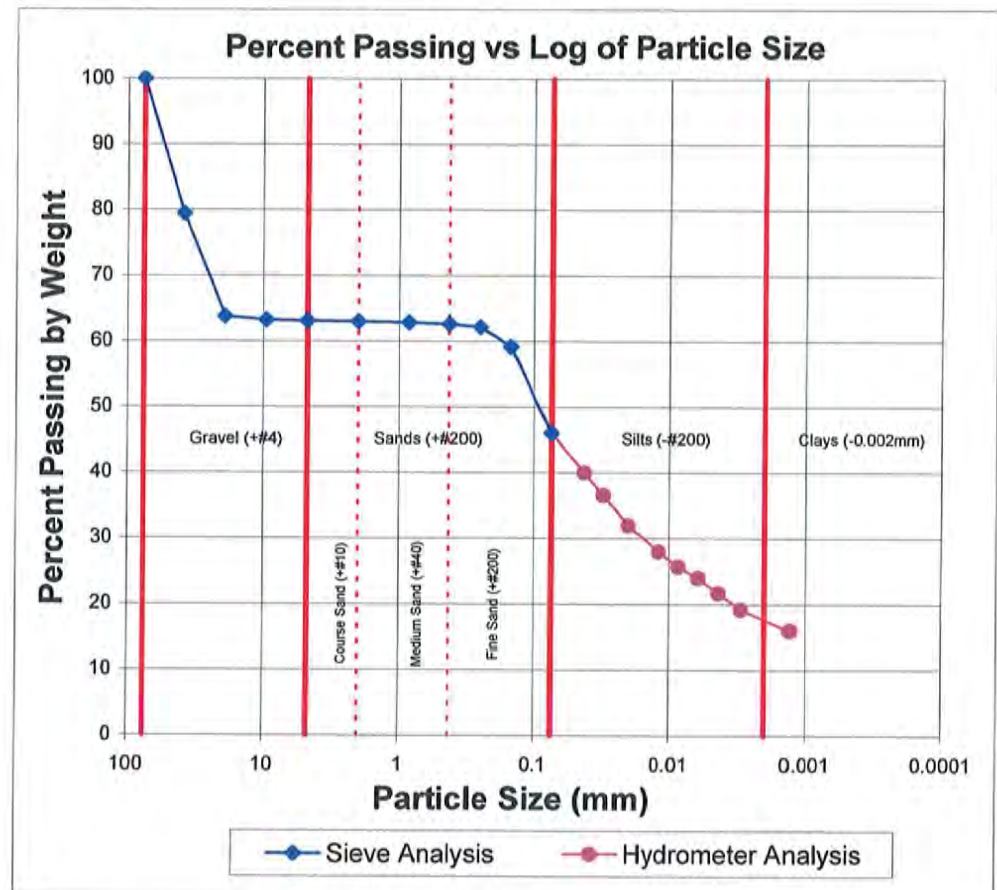
Plus Split Data

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*

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

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

Specific Gravity Correction Factor - α : 1.00

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: *DPW*

Date: *12/13/13*

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

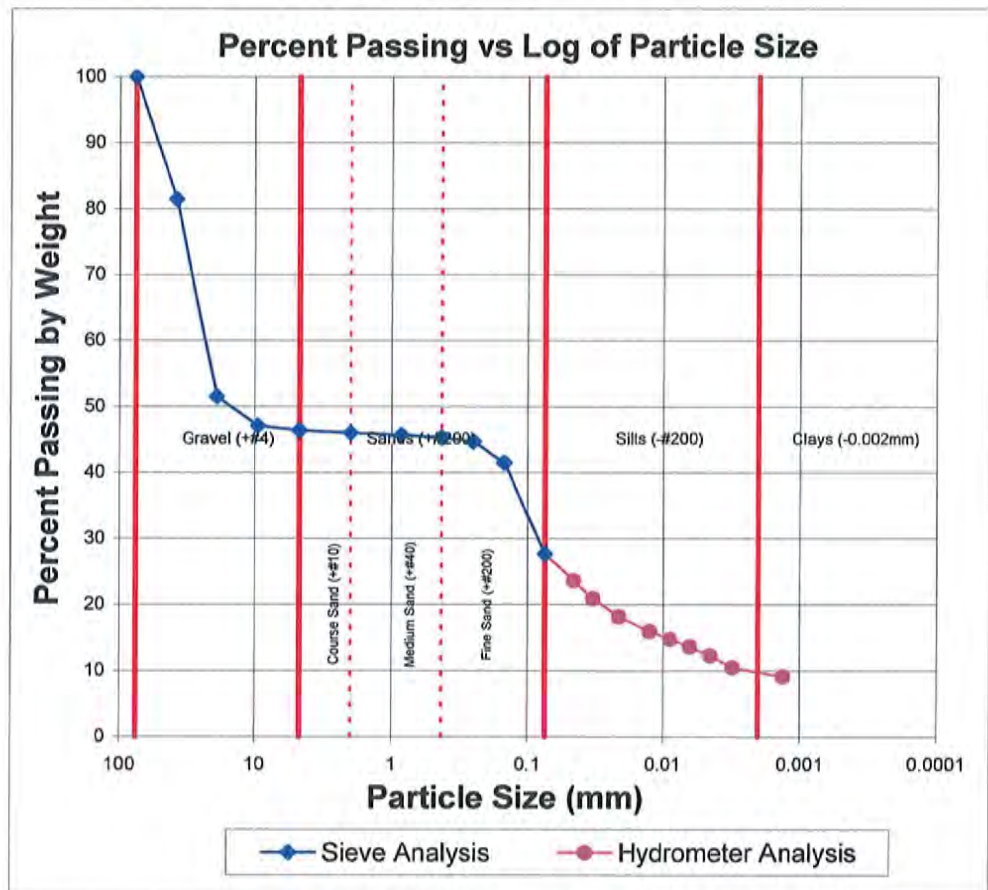
Plus Split Data

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

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

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

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

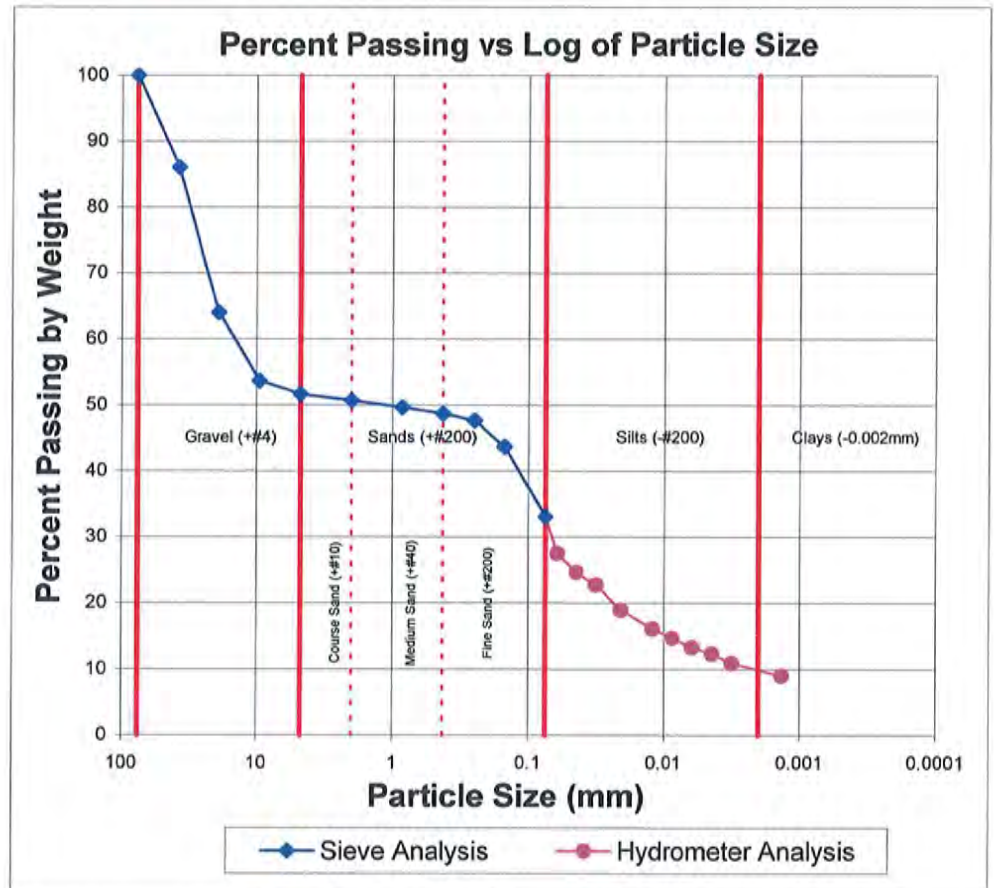
Plus Split Data

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

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



Data Entered By: KMR

Date: 12/11/2013

File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_6.xls

Checked By: DDM

Date: 12/11/13

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

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

Specific Gravity Correction Factor - α : 1.00

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: AKM
Date: 12/11/13

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

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

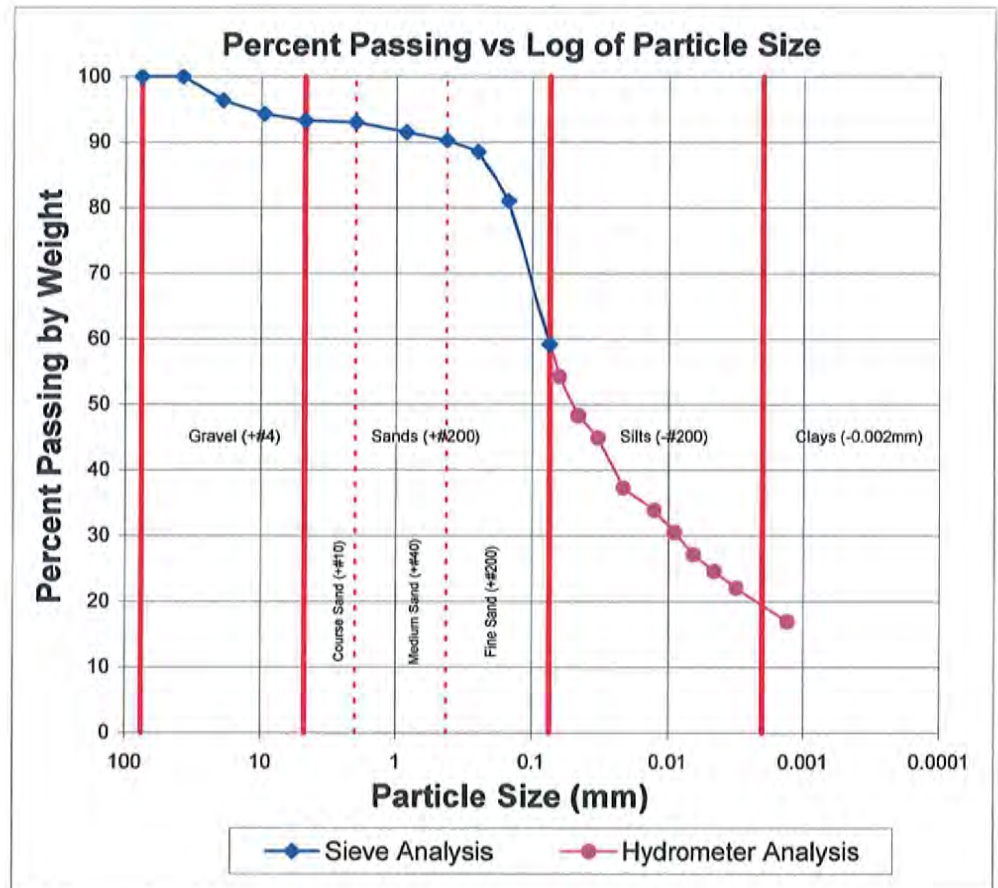
Plus Split Data

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

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



Data Entered By: KMR

Date: 12/6/2013

File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_0.xls

Checked By: DM

Date: 11/14/13

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

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

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

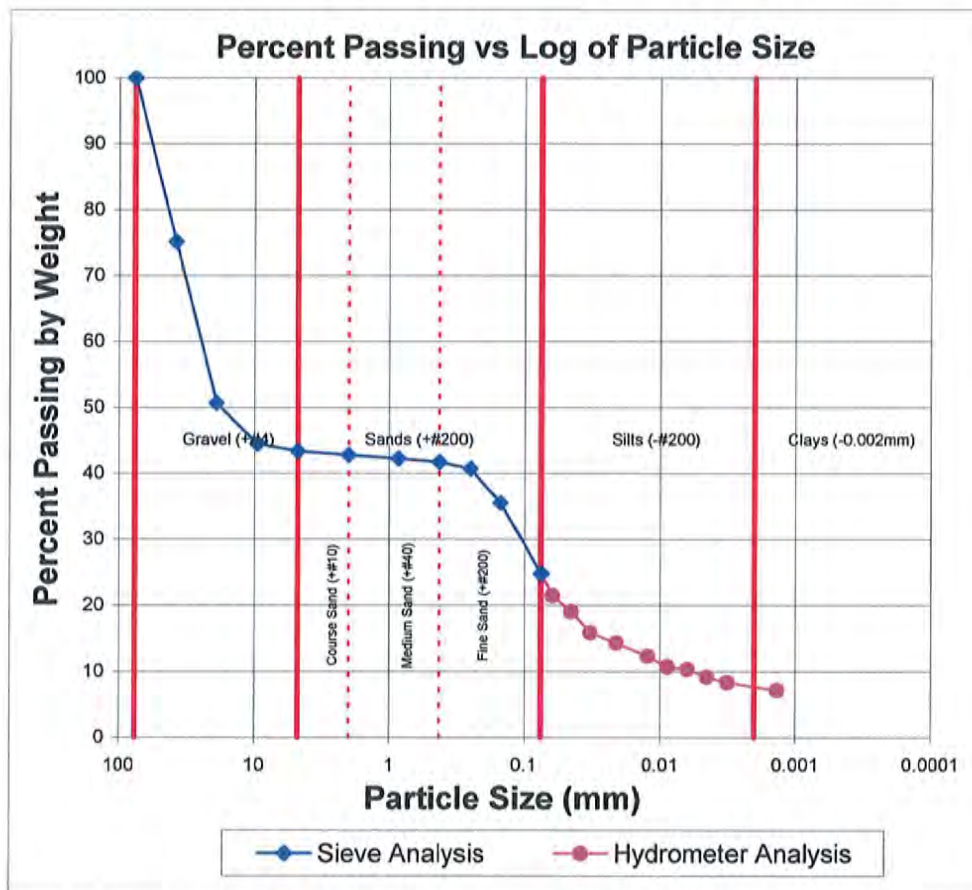
Plus Split Data

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

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



Data Entered By: KMR

Date: 12/11/2013

File Name: 2512_77_hydrometer-ASTM-D422-R0.xls_5.xls

Checked By: DM
Date: 12/11/13

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: OPW
Date: 12/11/13

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

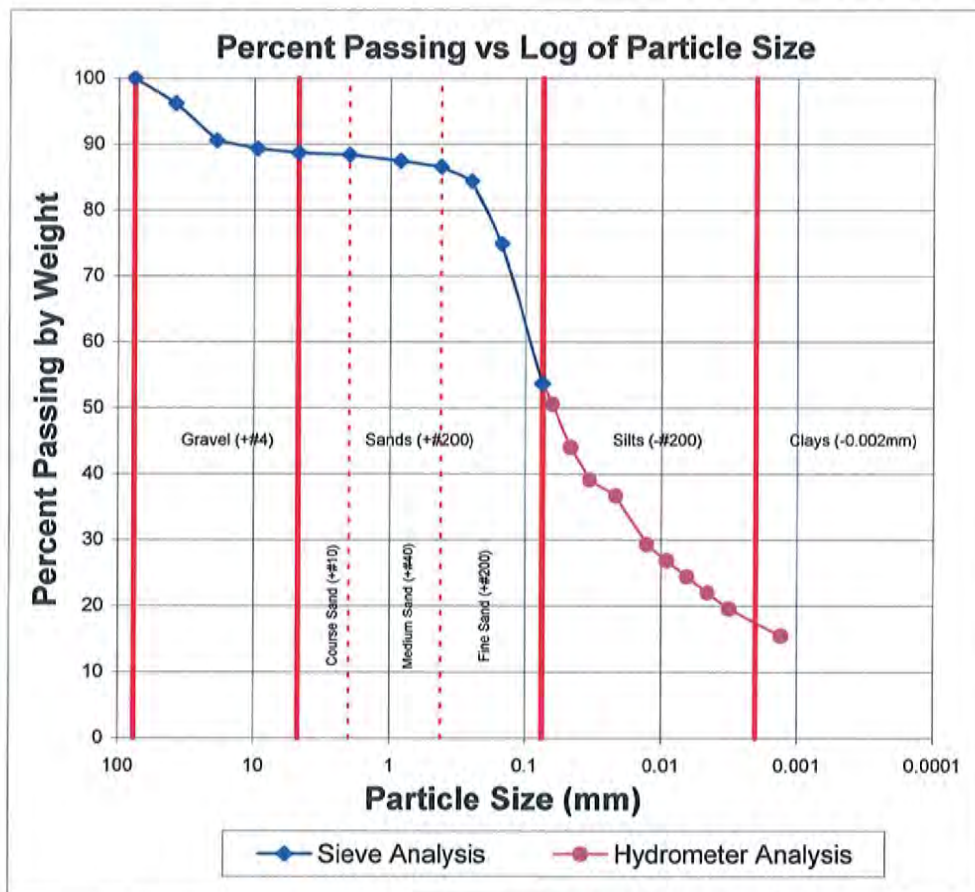
Plus Split Data

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

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: DBM

Date: 12/09/13

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

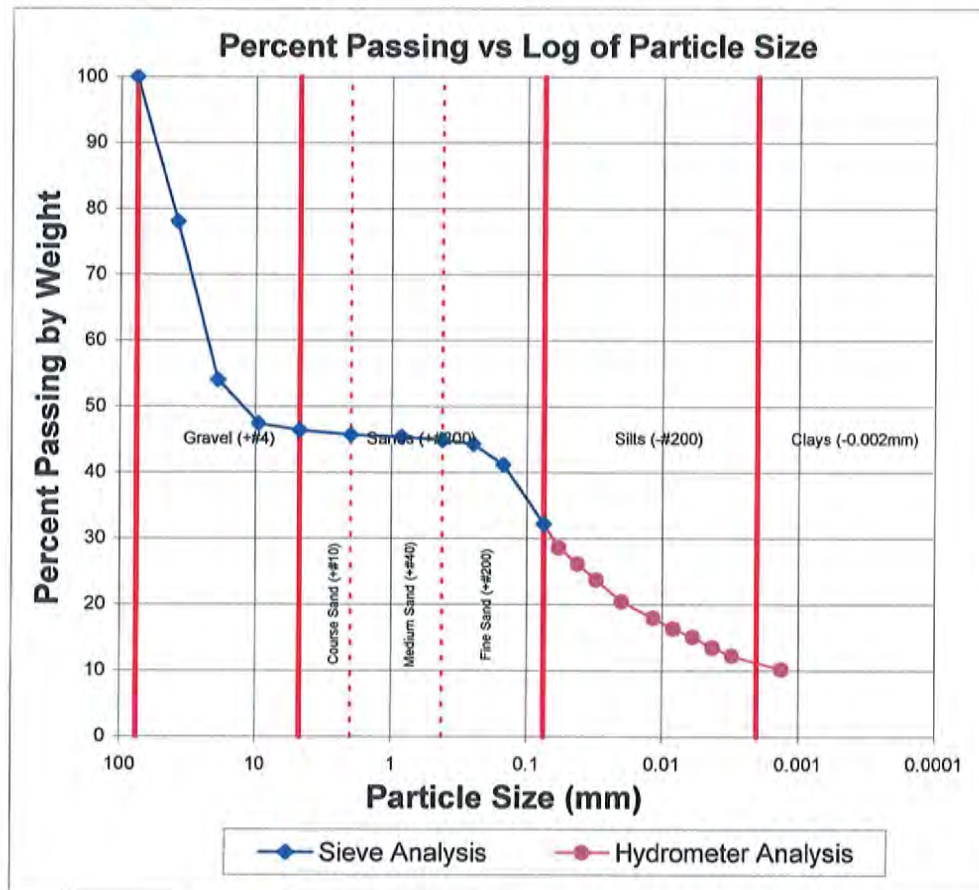
Plus Split Data

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: DAW

Date: 12/11/13

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

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

Specific Gravity Correction Factor - α : 1.00

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: ppm

Date: 12/11/13

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

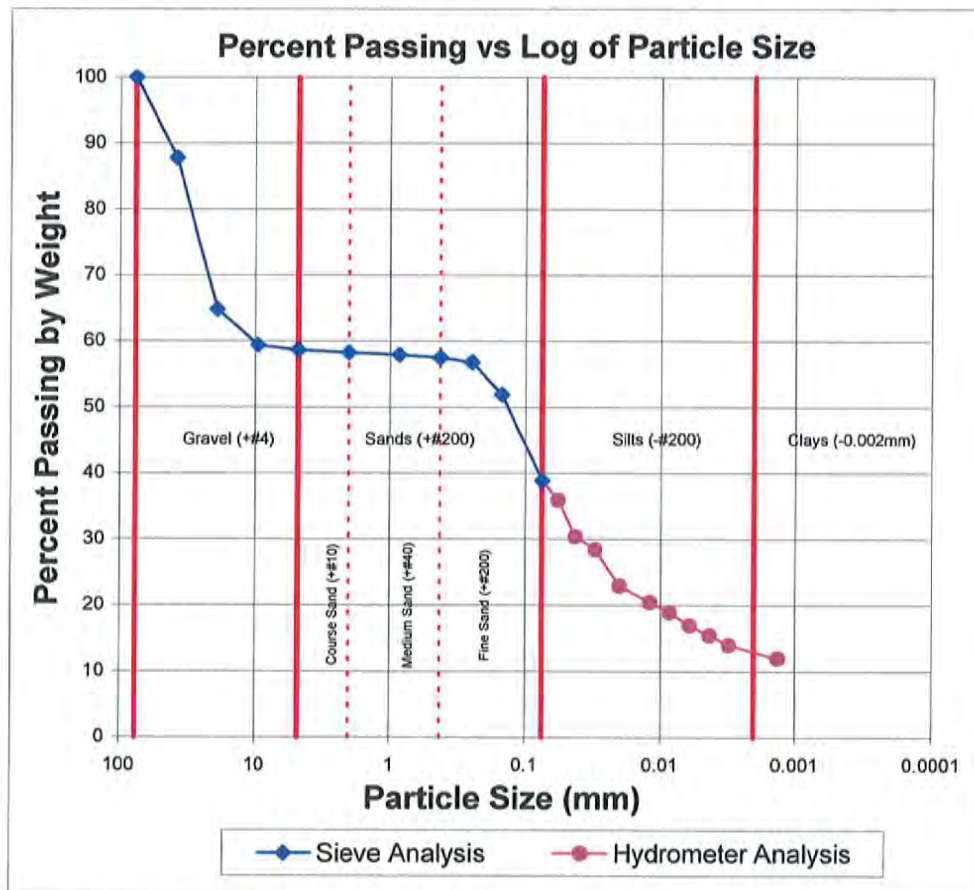
Plus Split Data

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: *[Signature]*

Date: 12/11/13

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

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

Specific Gravity Correction Factor - α : 1.00

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: *DPW*

Date: *12/11/13*

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

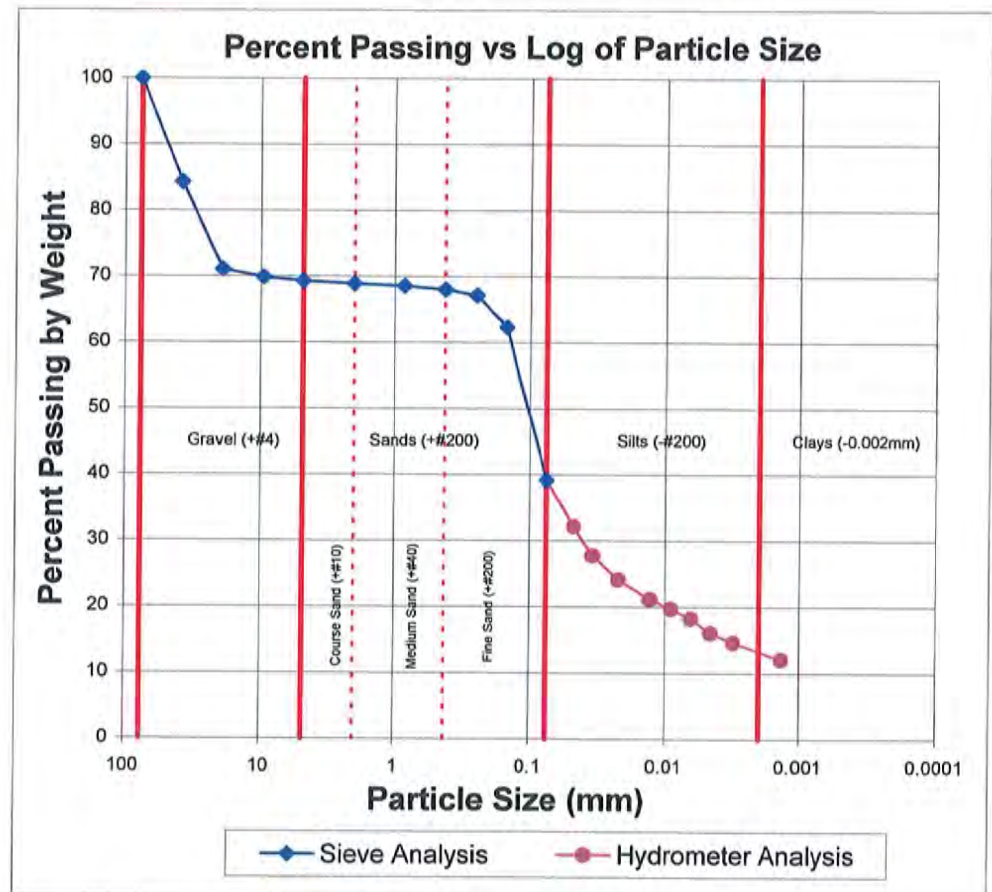
Plus Split Data

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*

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*

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

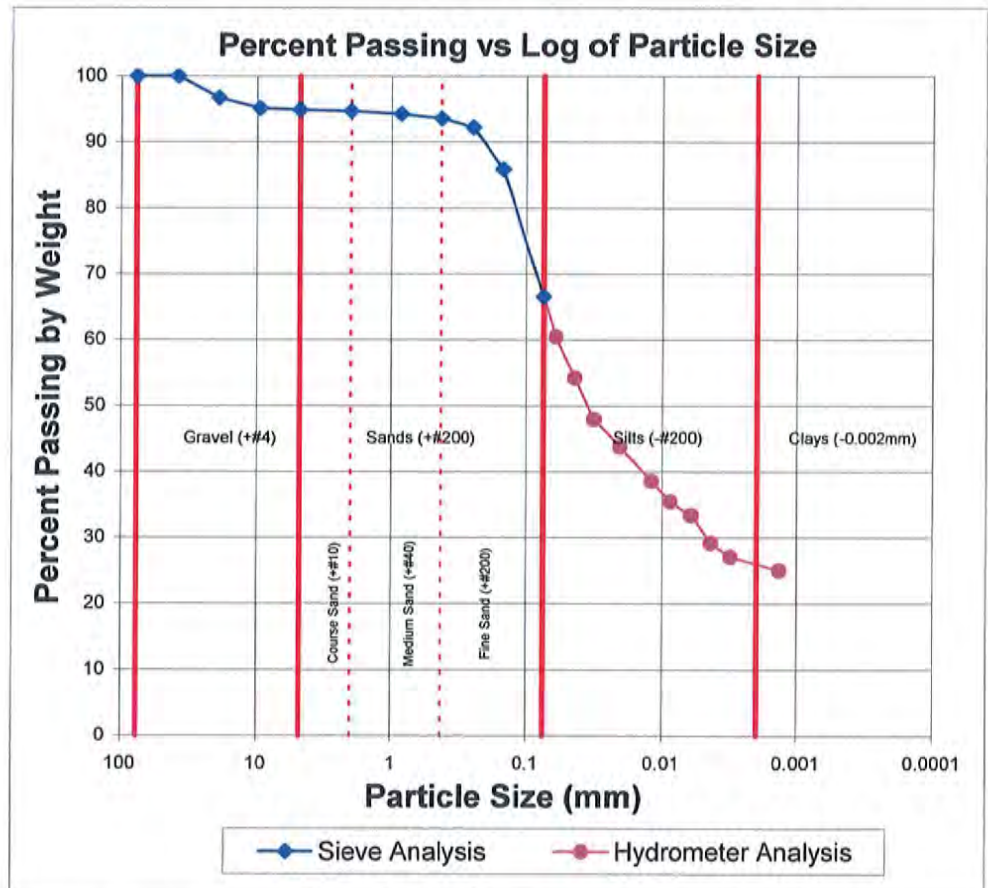
Plus Split Data

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



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: *OPM*

Date: *12/11/13*

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

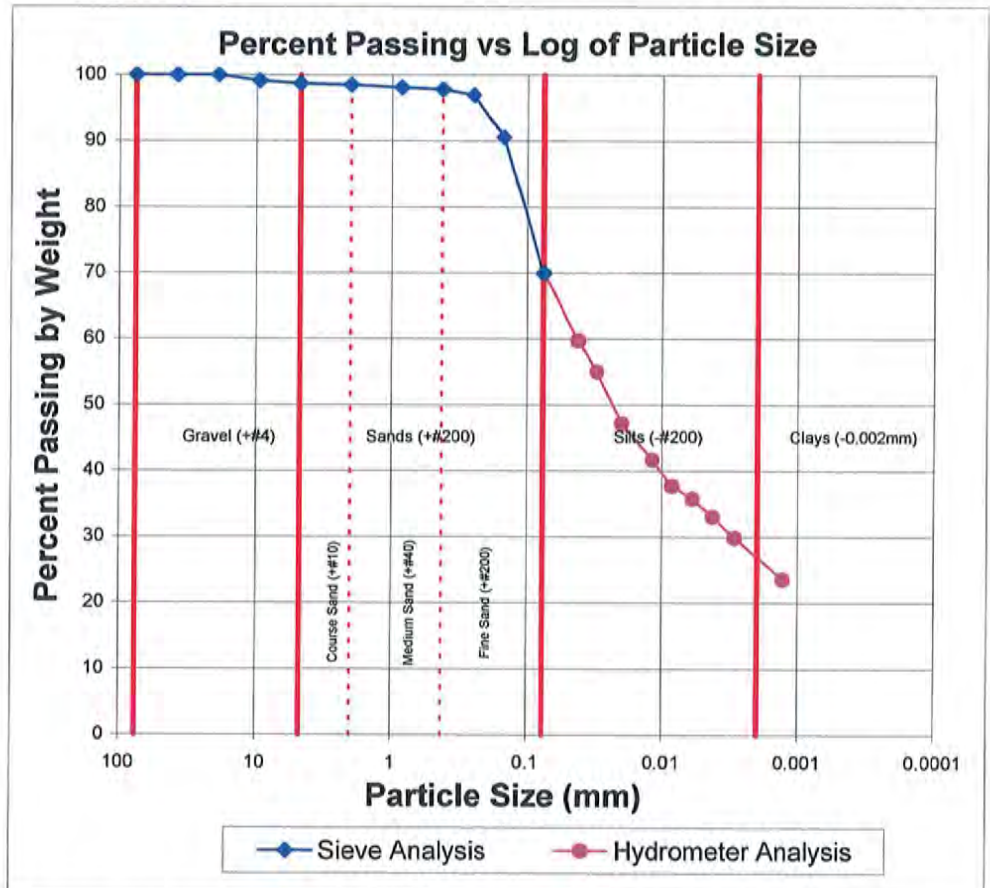
Plus Split Data

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: *[Signature]*

Date: 12/13/13

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: DPM
Date: 12/13/13

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

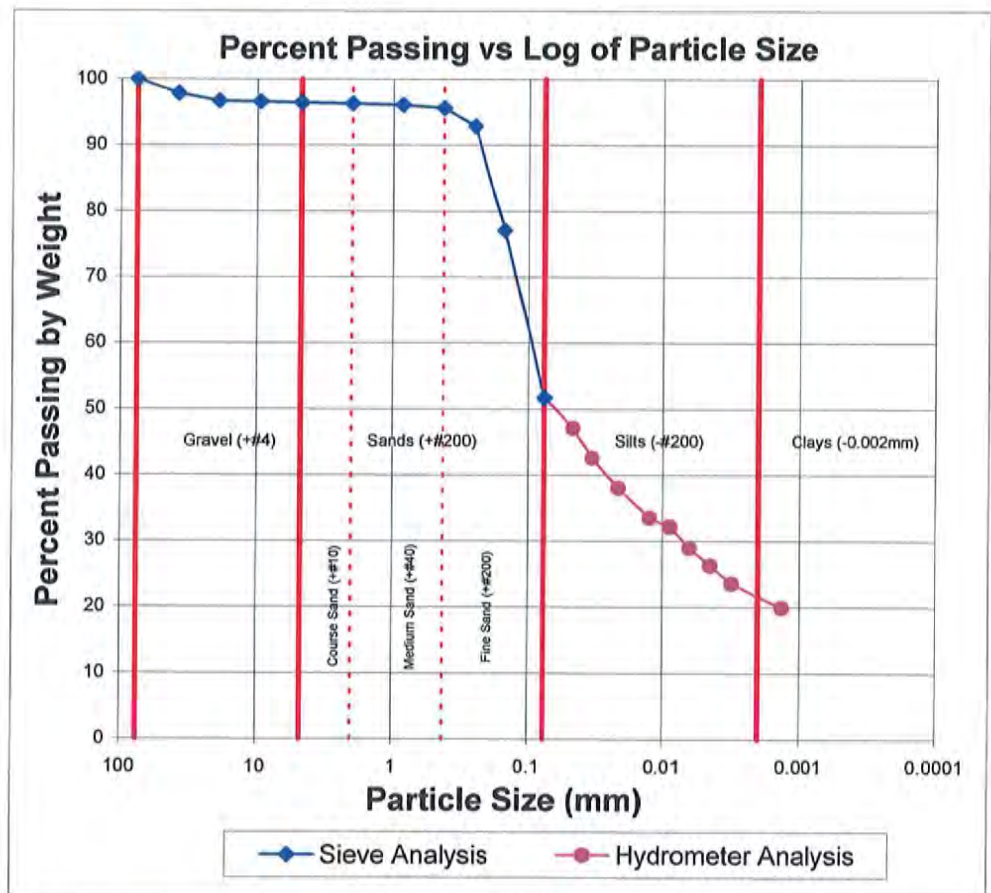
Plus Split Data

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: CD
Date: 12/18/2013

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

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

Specific Gravity Correction Factor - α : 1.00

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: W

Date: 12/18/2013

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

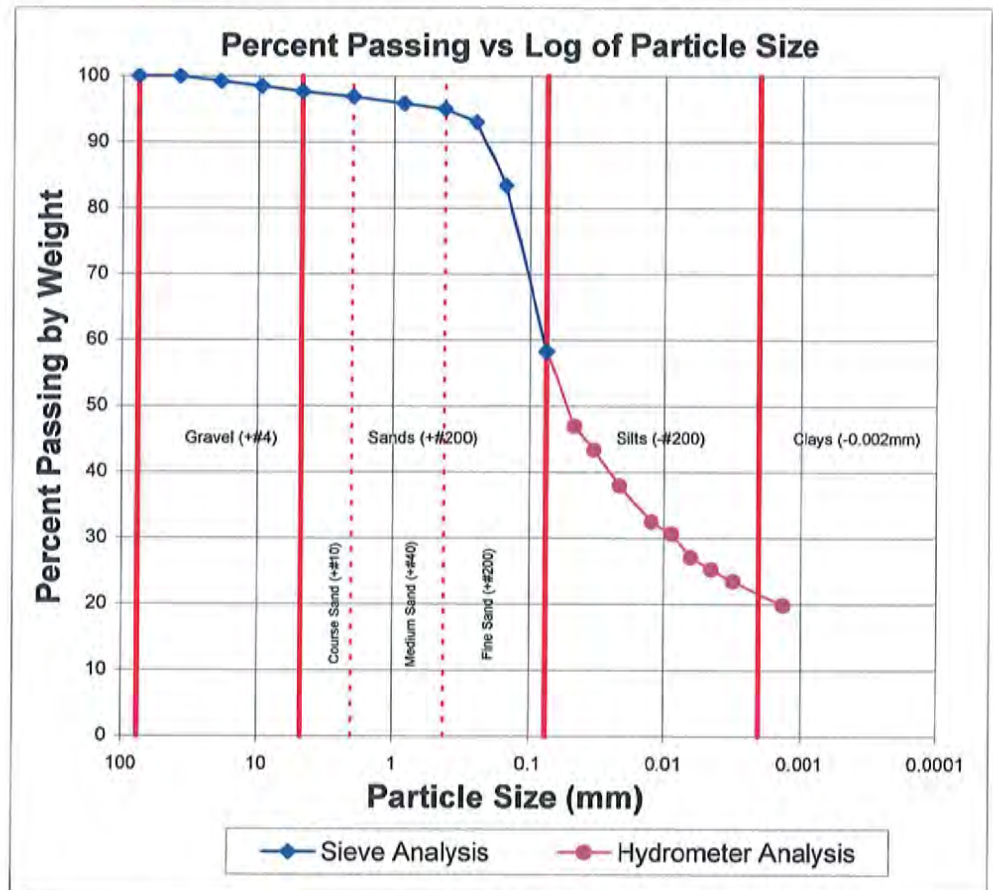
Plus Split Data

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: 12/16/2013

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: QJ
Date: 12/18/2013

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

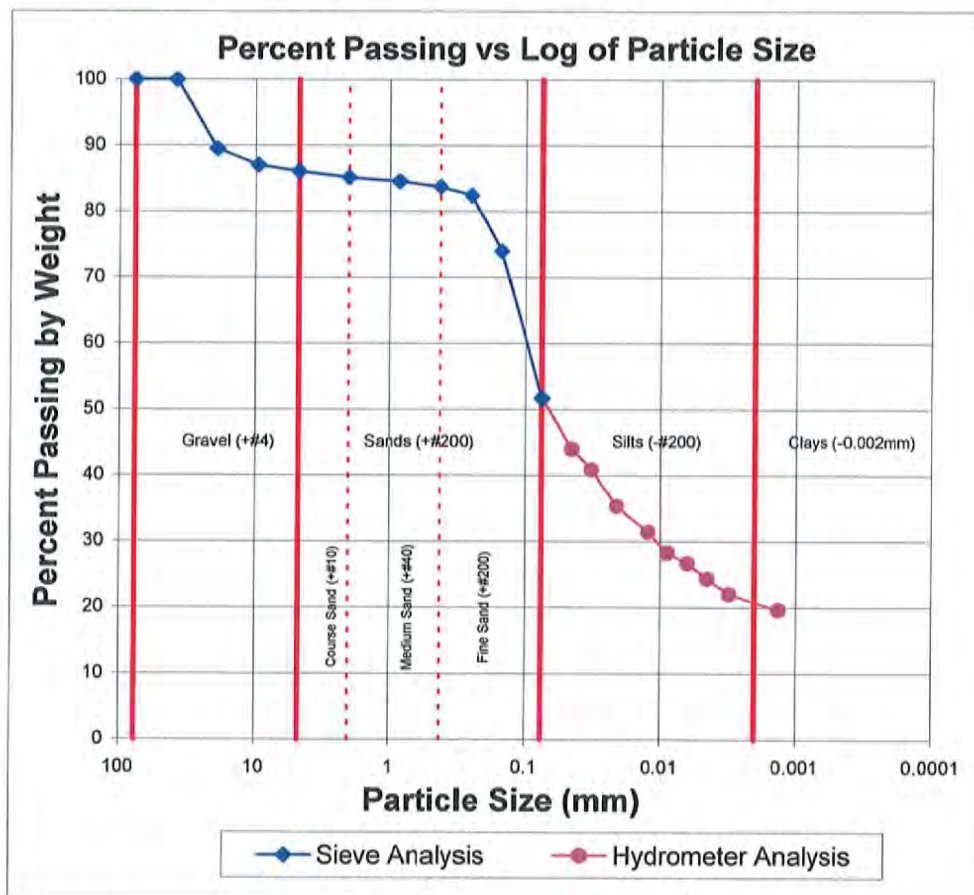
Plus Split Data

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: GJ

Date: 12/18/2013

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

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

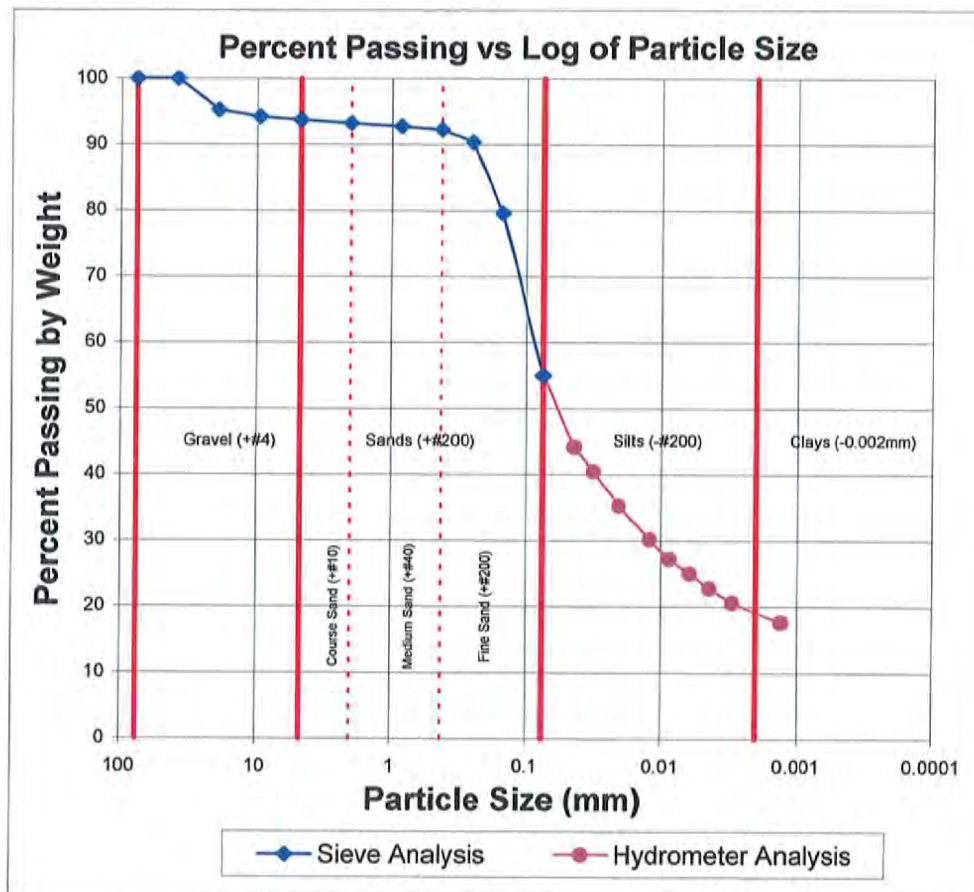
Plus Split Data

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: CD

Date: 12/16/2013

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

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

Specific Gravity Correction Factor - α : 1.00

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: 61
Date: 12/16/2013

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

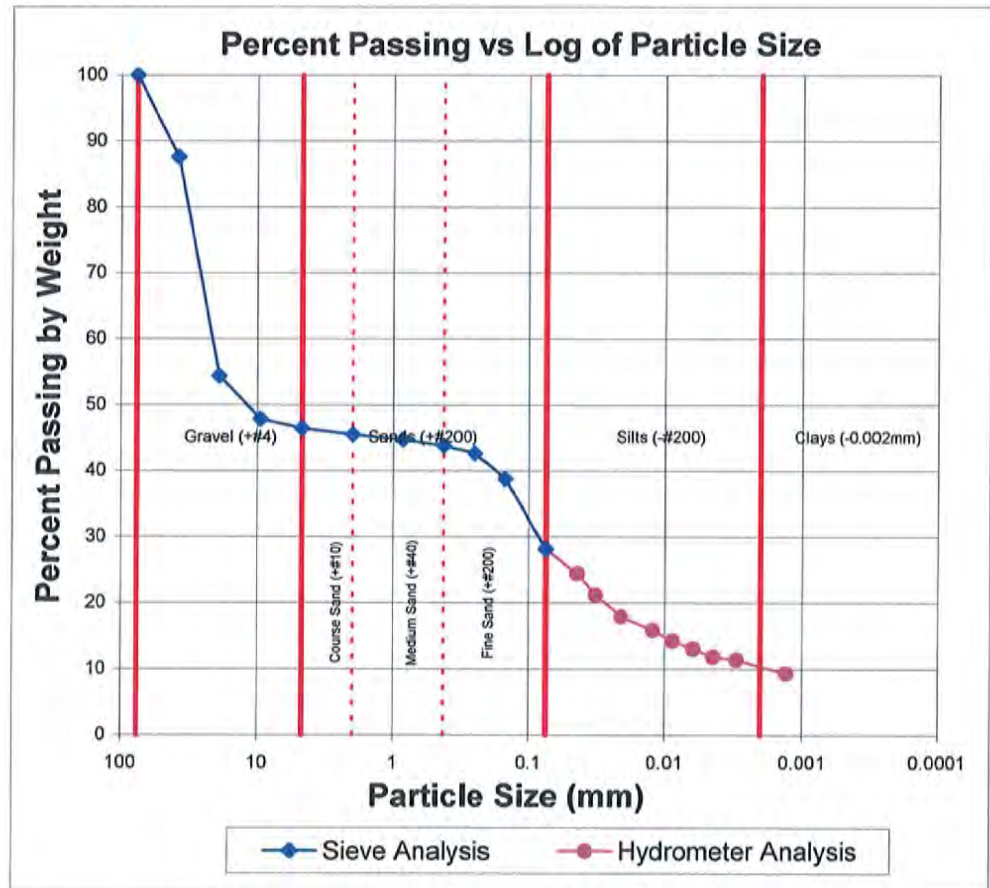
Plus Split Data

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: Q

Date: 12/16/2013

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

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

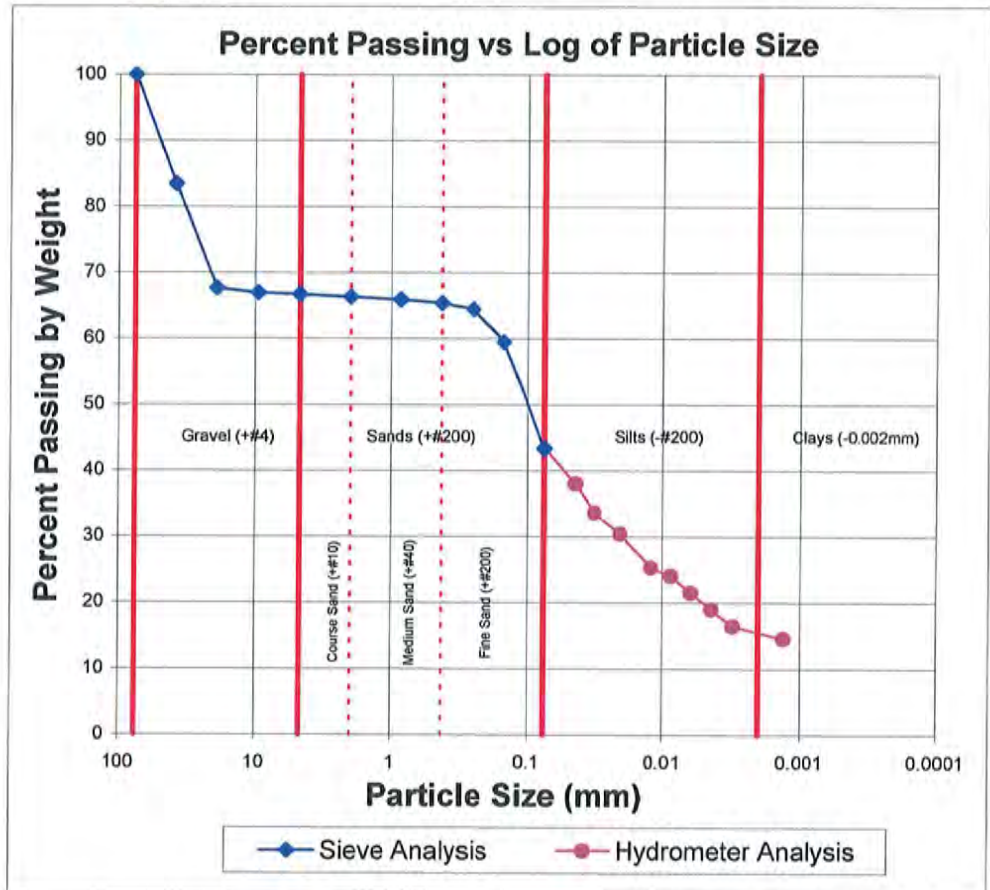
Plus Split Data

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

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: WJ

Date: 12/16/2013

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: CAE Date: 12/27/13
 File name: 2512_77_SpecificGravity-ASTM-854-R1_0.xls



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

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

Data entry by: CAL
 Data checked by: DM
 FileName: MWSGAS31

Date: 12/10/13

12/09/2013



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

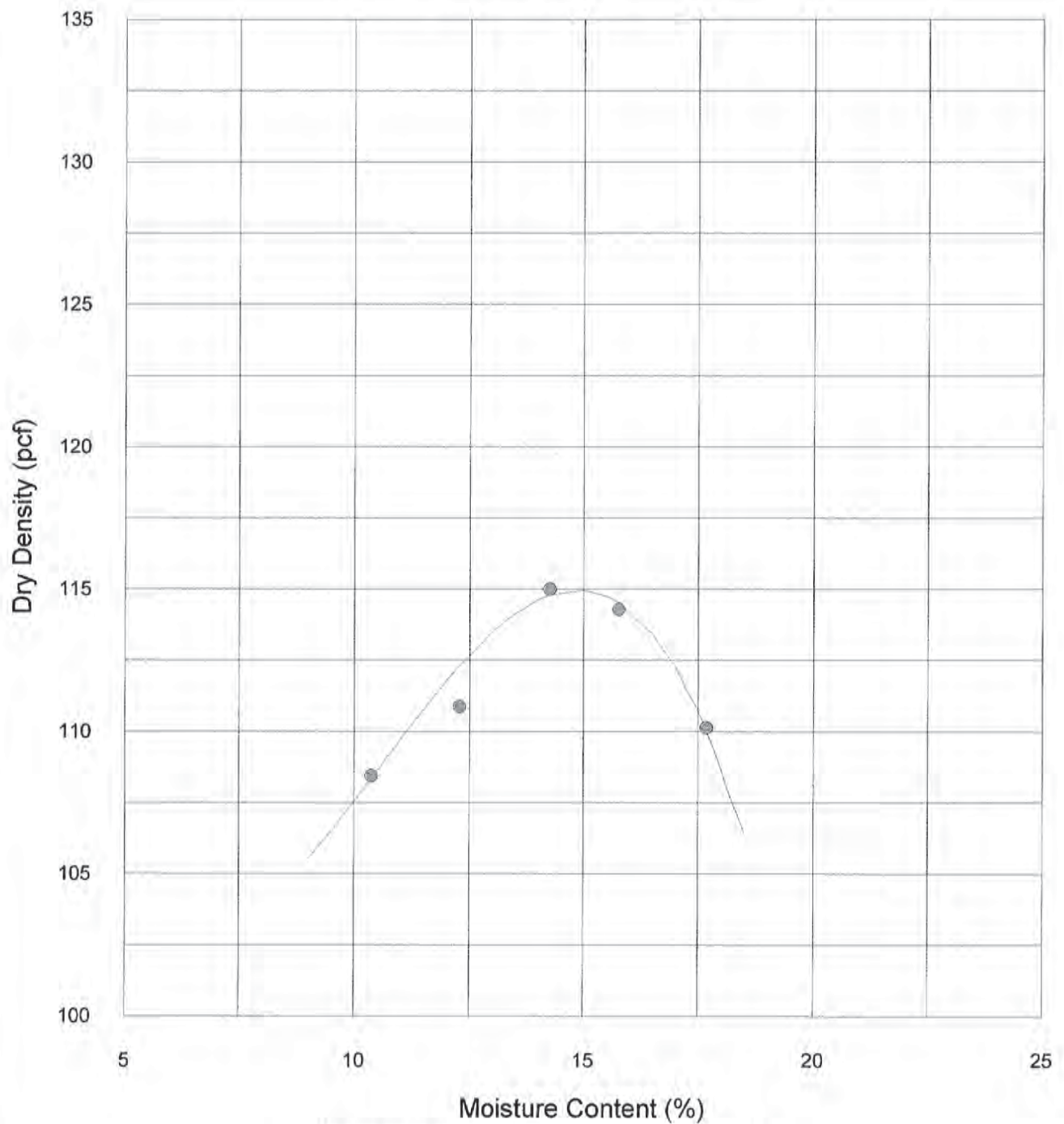
Wt of soil & mold (lb)	9.68	9.77	9.74	9.51	9.35
Wt. of mold (lb)	5.36	5.36	5.36	5.36	5.36
Net wt. of wet soil (lb)	4.32	4.41	4.38	4.15	3.99
Net wt of dry soil (lb)	3.67	3.81	3.83	3.70	3.61
Dry Density, (pcf)	110.13	114.29	115.00	110.87	108.45
Corrected Dry Density (pcf)					
Volume Factor	30	30	30	30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

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



Proctor Compaction Test

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



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

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

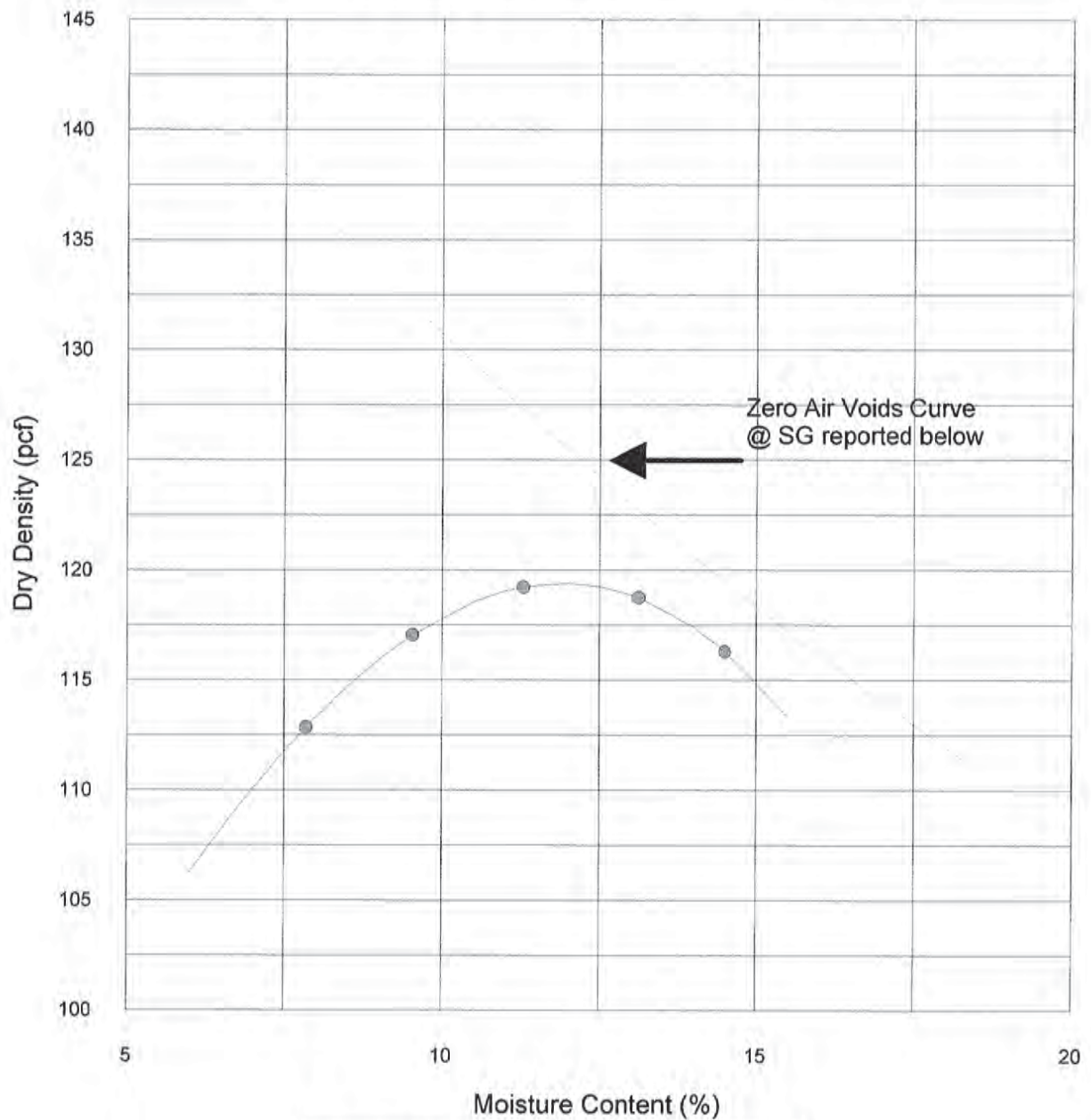
Wt of soil & mold (lb)	9.72	9.76	9.70	9.54	9.31
Wt. of mold (lb)	5.37	5.37	5.37	5.37	5.37
Net wt. of wet soil (lb)	4.35	4.39	4.33	4.17	3.94
Net wt of dry soil (lb)	3.74	3.83	3.84	3.77	3.62
Dry Density, (pcf)	112.25	114.81	115.31	113.03	108.65
Corrected Dry Density (pcf)	116.31	118.75	119.22	117.05	112.85
Volume Factor	30	30	30	30	30

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



Proctor Compaction Test

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



■ Best Fit Curve ▲ Zero Air Voids Curve @ 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

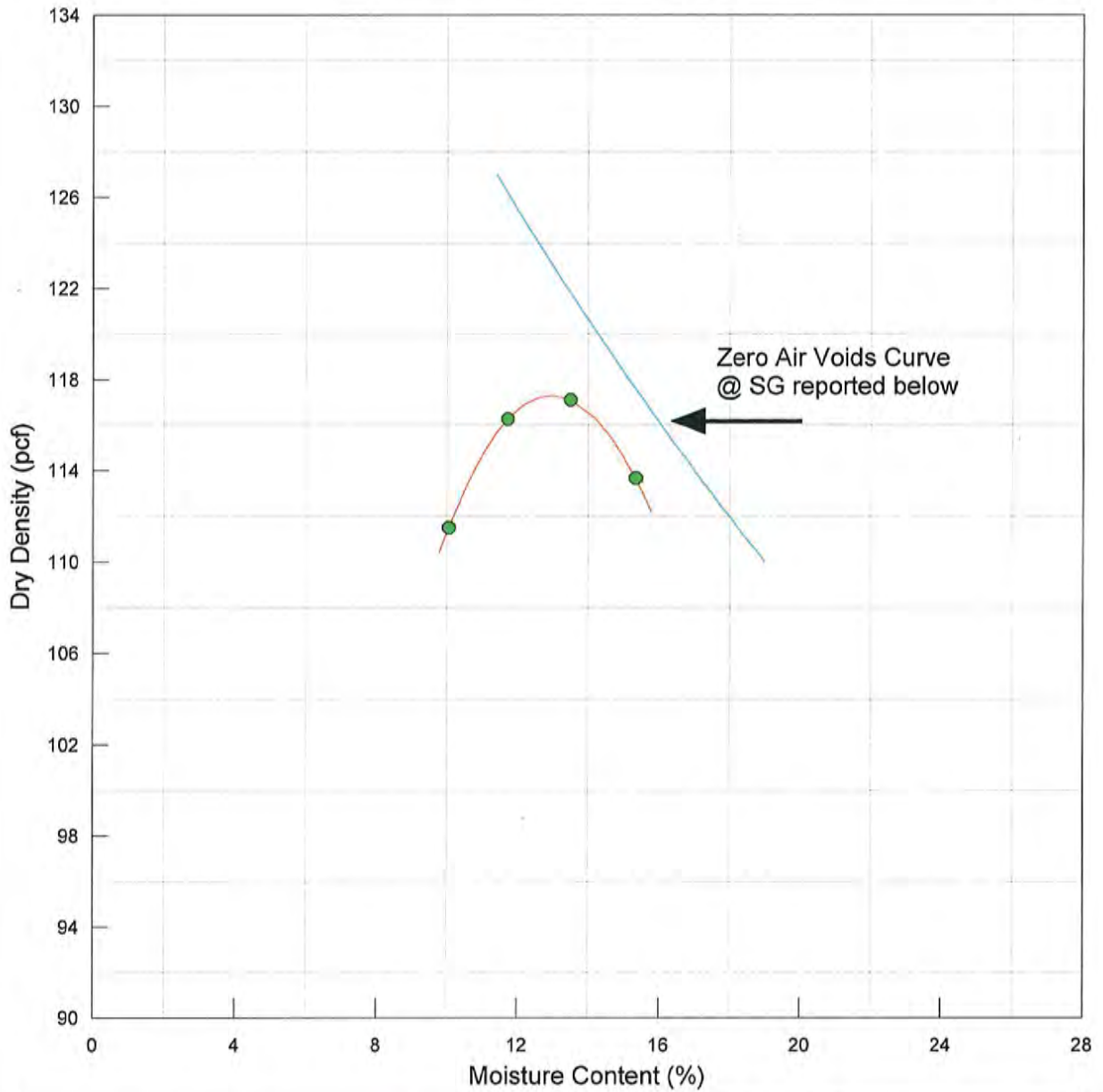
Wt of soil & mold (lb)	14.16	14.22	14.12	13.88
Wt. of mold (lb)	9.79	9.79	9.79	9.79
Net wt. of wet soil (lb)	4.37	4.43	4.33	4.09
Net wt of dry soil (lb)	3.79	3.90	3.88	3.72
Dry Density, (pcf)	113.66	117.09	116.26	111.49
Corrected Dry Density (pcf)				
Volume Factor	30	30	30	30

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



Proctor Compaction Test

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



- Best Fit Curve

● Actual Data

- Zero Air Voids Curve @ 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

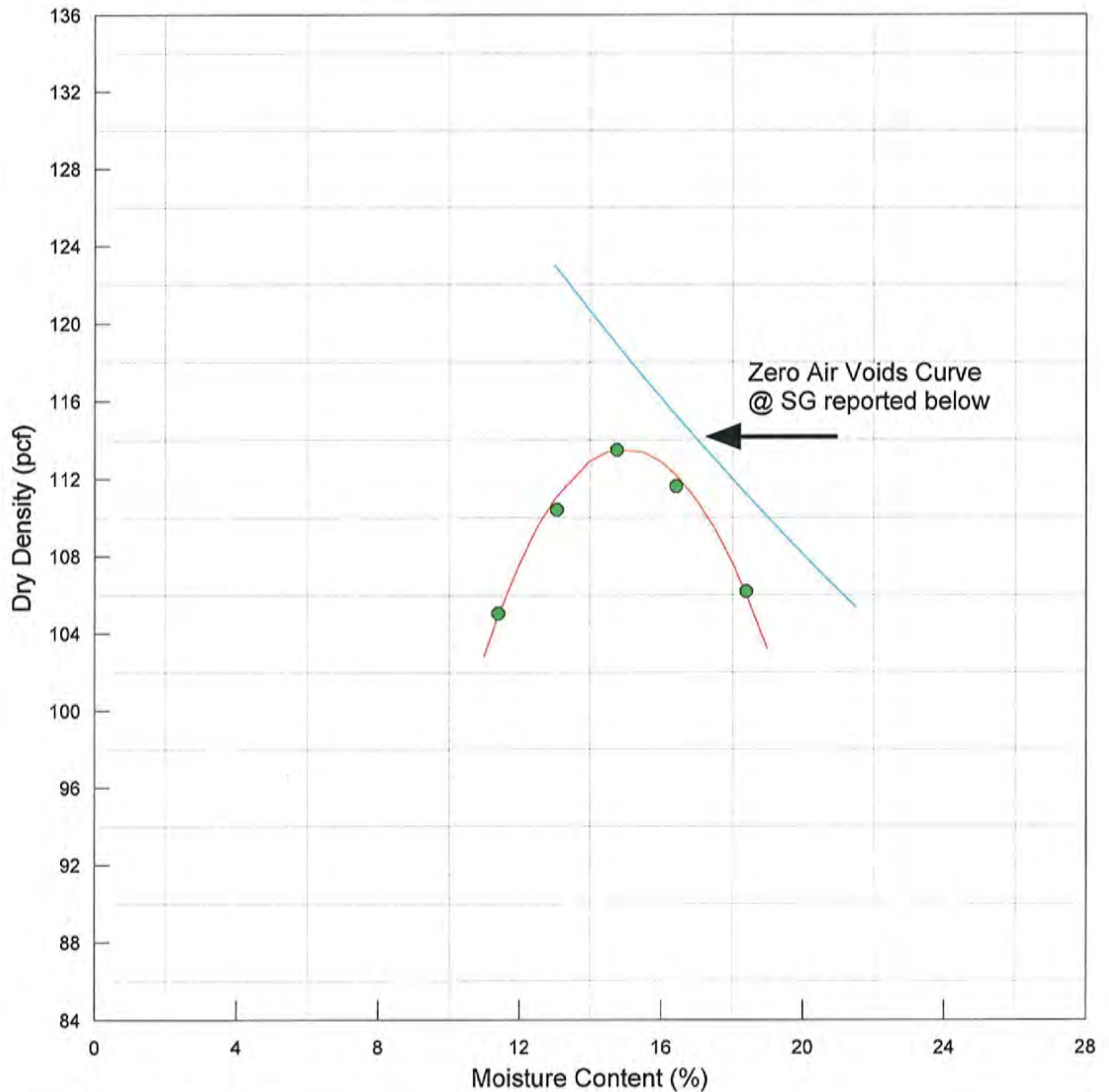
Data entered by: TMR
Data checked by: SLL
FileName: PRCS401

Date: 12/27/2013
Date: 12/29/13



Proctor Compaction Test

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



Best Fit Curve

● Actual Data

— Zero Air Voids Curve @ 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
DEPTH 10-24"
SAMPLE NO. TI-CS04-04A (10-24")
LOCATION Church Rock
PROJECT NO. --
SOIL DESCR. Remolded -#4 @ 90%

SAMPLED --
TEST STARTED 01/29/14 CAL
TEST FINISHED 02/13/14 CAL
CELL NUMBER 16S
SATURATED TEST Yes
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: oac Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_6.xls

TRIAXIAL TEST DATA

ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. Tailings Impoundment
DEPTH 10-24"
SAMPLE NO. TI-CS04-04A (10-24")
LOCATION Church Rock
PROJECT NO. --
SOIL DESCR. Remolded -#4 @ 90%

SAMPLED --
TEST STARTED 01/29/14 CAL
TEST FINISHED 02/13/14 CAL
SETUP NO. 16S
SATURATED TEST Yes
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		
40.0	38.0	3.9	17.6		
50.0	48.0	17.8	19.6	38.3	46.6
60.0	58.0	19.6	20.7	48.4	57.0
70.0	68.0	21.2	22.1	58.5	67.5
80.0	78.0	22.2	22.8	68.3	77.7
90.0	88.0	23.0	23.7	78.4	87.7
100.0		23.7	23.8	88.5	98.1

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: cm Date: 2/18/14

FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_6.xls



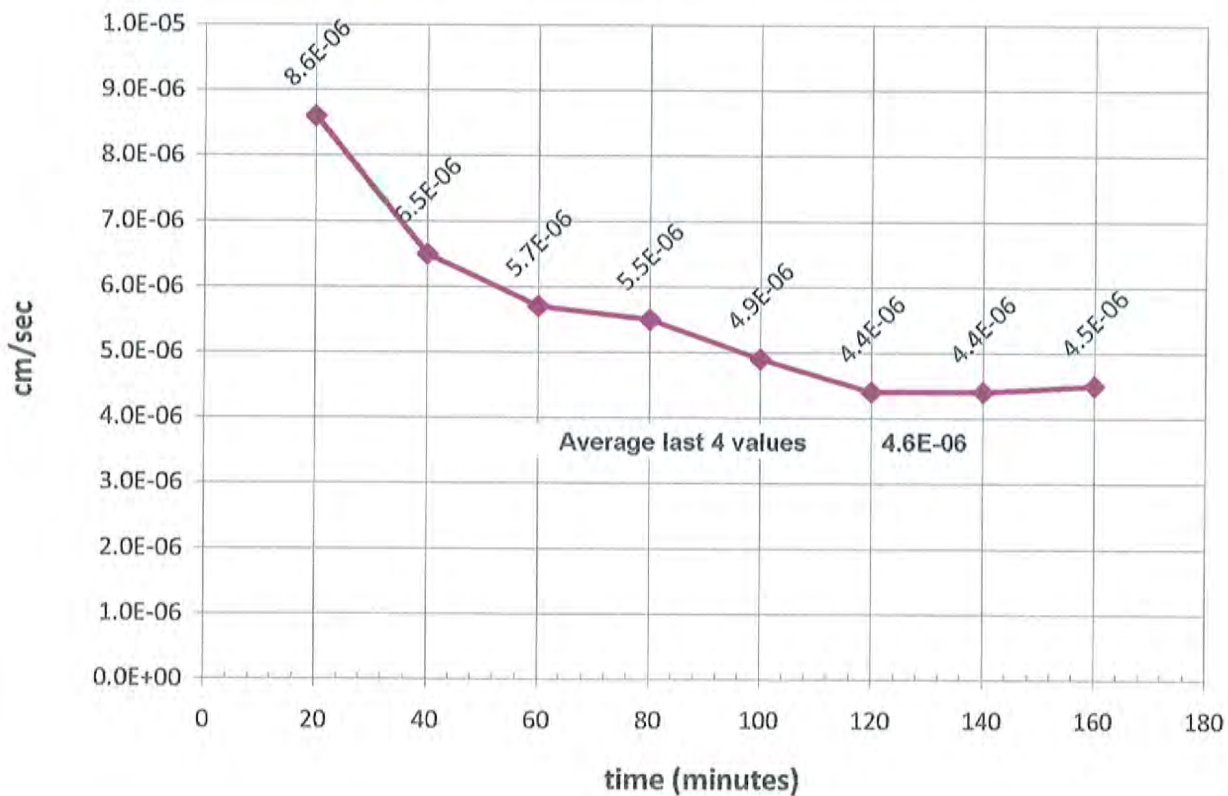
Preliminary Flow Pump Test Data ASTM D5084

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

Boring Number: Tailings Impoundment
Depth: 10-24"
Sample Number: TI-CS04-04A @ 90% D698
Sampled Date: -
Test Date: 2/13/2014

Sampled By: MWH
Technician: CAL

Preliminary Flow Pump Test Data

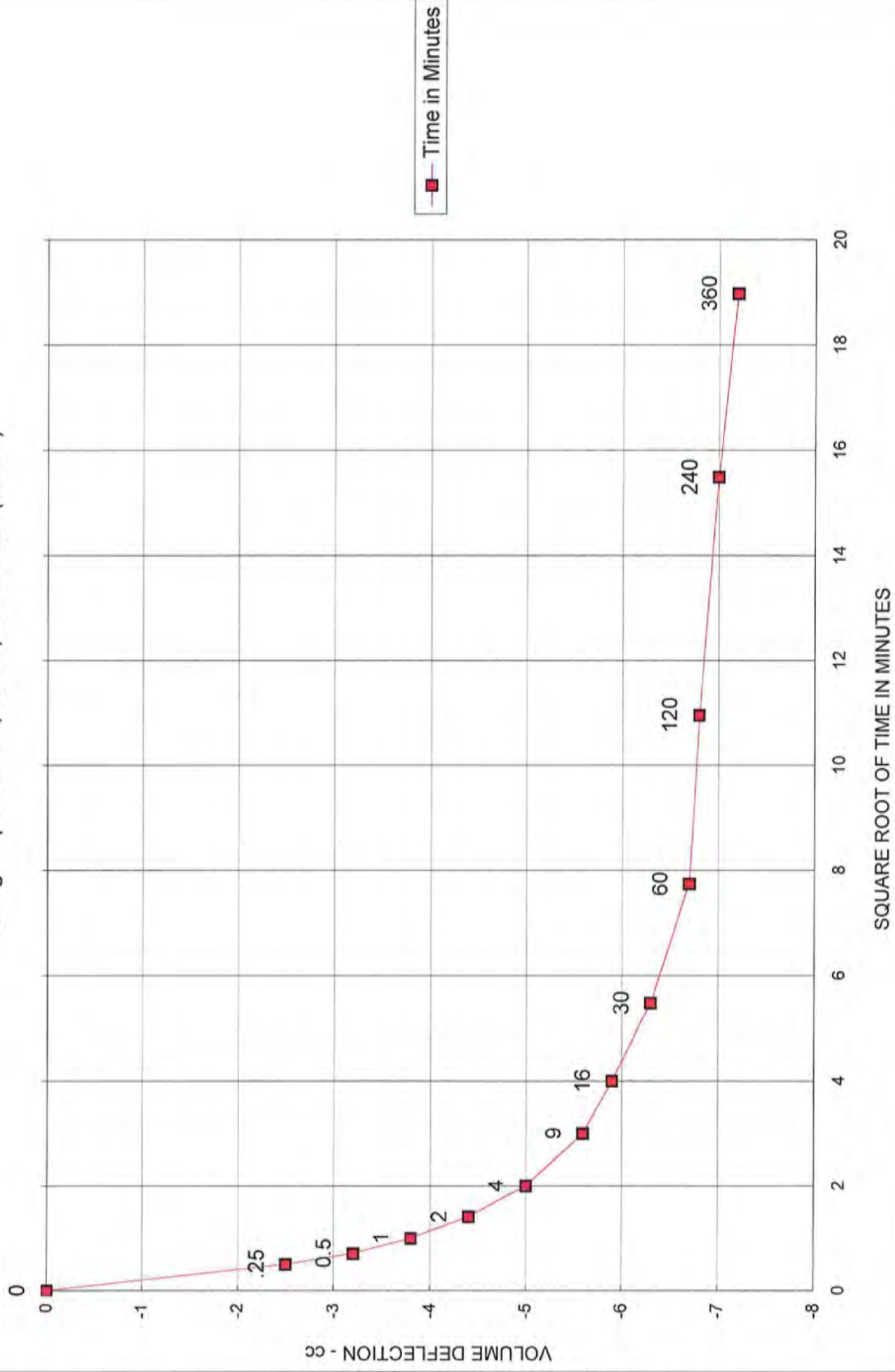


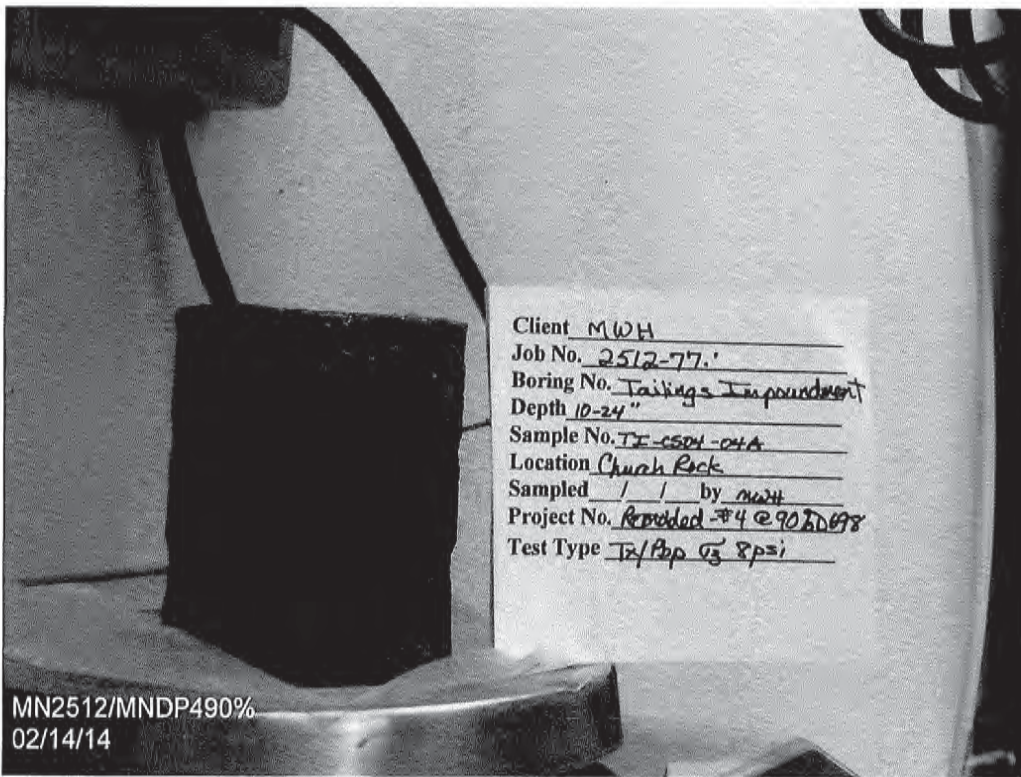
Data Entered By: CAL
Date: 2/13/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_8.xls

Checked By: DTW
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. T1-C504-04A
Location Church Rock
Sampled 1/1 by MWH
Project No. Revised #4 @ 9030698
Test Type T2/Pop 03 Sp=1

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: SKL Date: 2/13/14
 FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_3.xls

TRIAXIAL TEST DATA

ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. Tailings Impoundment
DEPTH 10-24"
SAMPLE NO. TI-CS04-04A (10-24")
LOCATION Church Rock
PROJECT NO. -
SOIL DESCR. Remolded #4 @ 95%

SAMPLED -
TEST STARTED 01/29/14 CAL
TEST FINISHED 02/11/14 CAL
SETUP NO. 7S
SATURATED TEST Yes
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

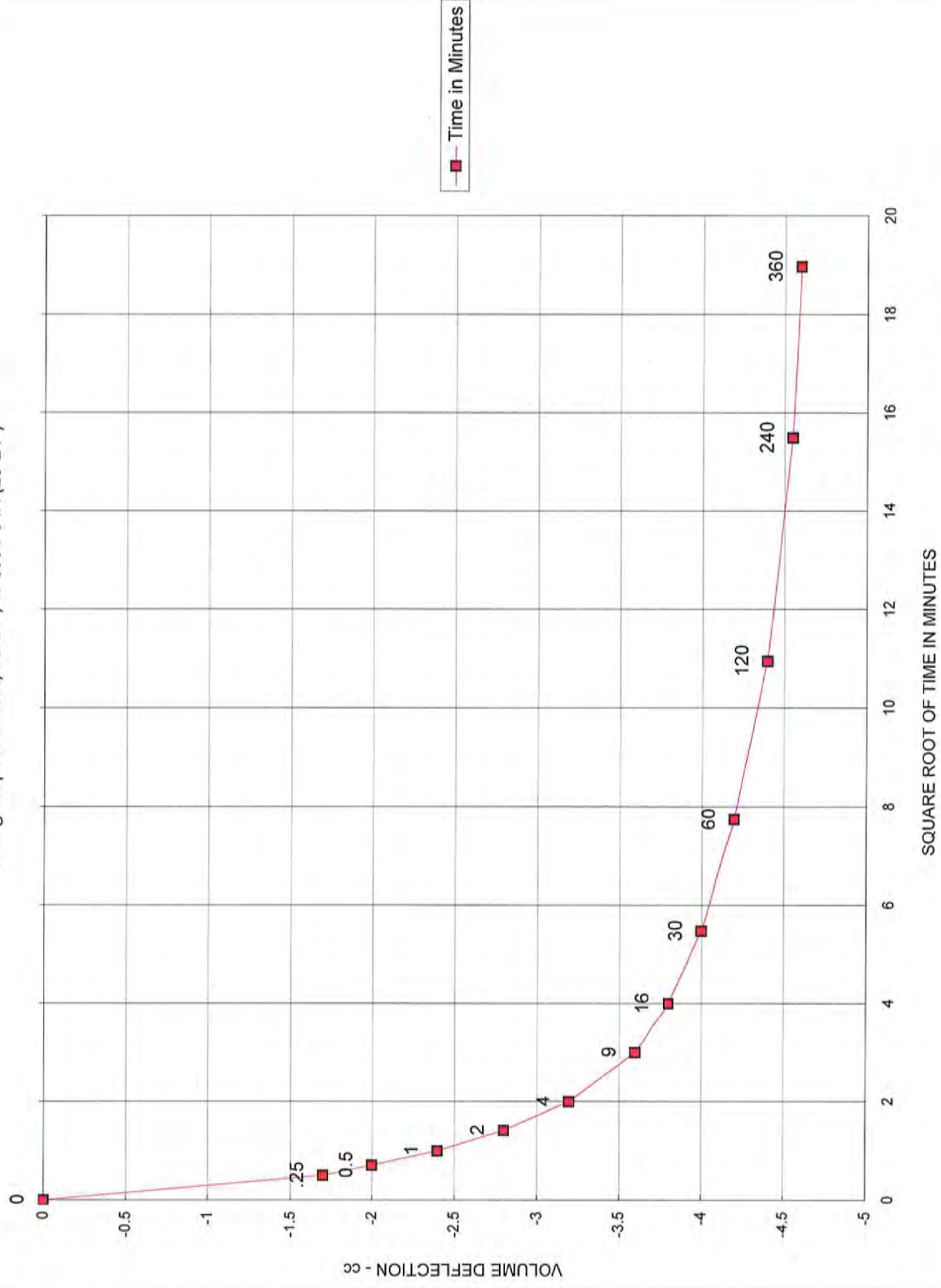
Checked by: one Date: 2/12/14

FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_3.xls



CONSOLIDATION DATA

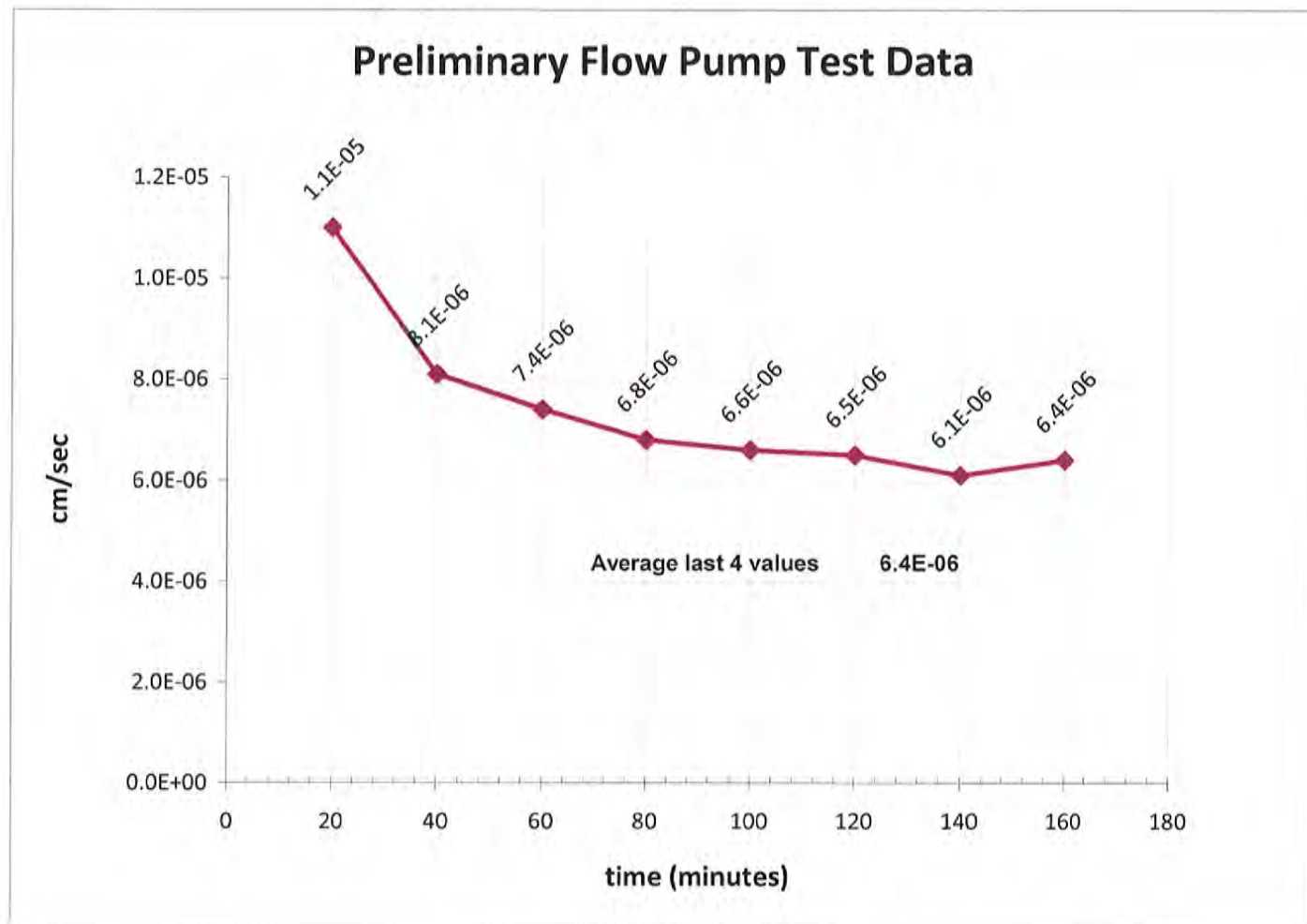
Tailings Impoundment, 10-24", TI-CS04-04A (10-24")



Preliminary Flow Pump Test Data ASTM D5084

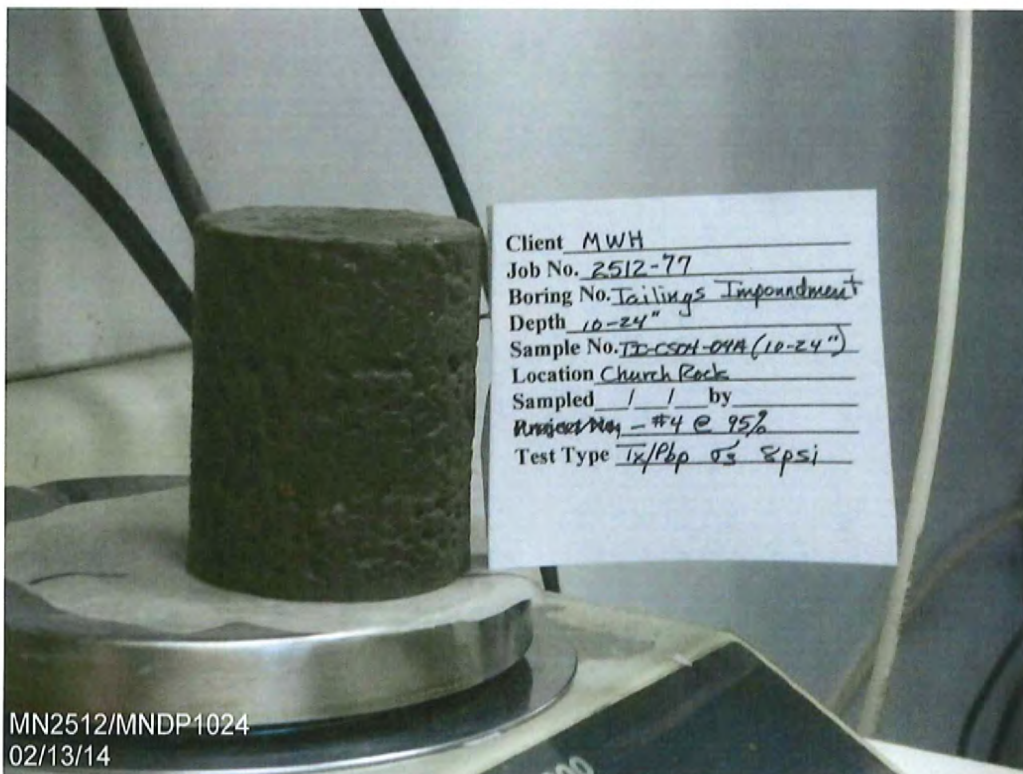
Client: MWH
Job Number: 2512_77
Project: --
Location: Church Rock
Project Number: --

Boring Number: Tailings Impoundment
Depth: 10-24"
Sample Number: TI-CS04-04A @ 95% D698
Sampled Date: -
Test Date: 2/11/2014
Sampled By: MWH
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



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: an Date: 2/18/14
 FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_7.xls

TRIAXIAL 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

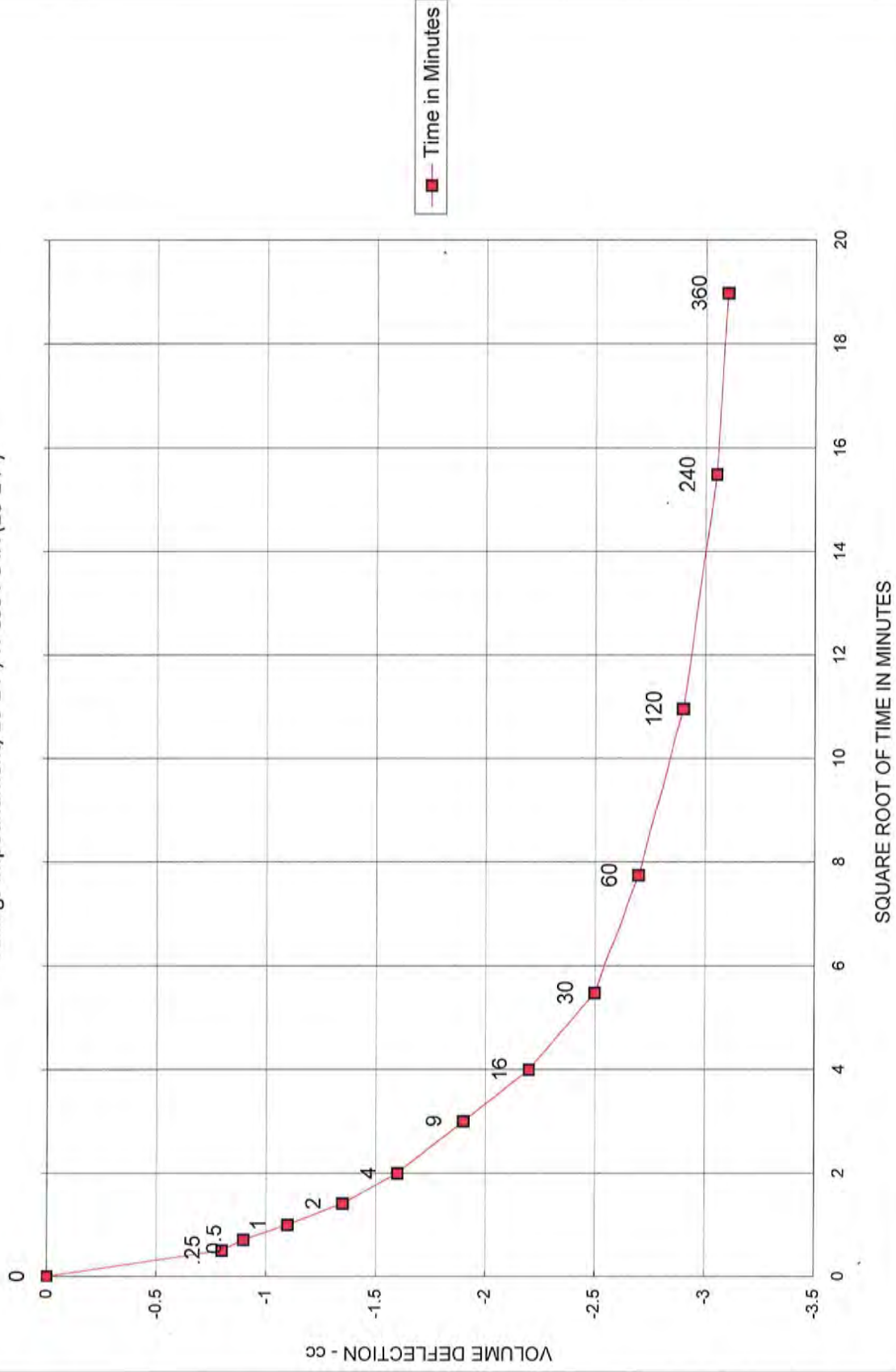
Checked by: ck Date: 2/18/14

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



CONSOLIDATION DATA

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



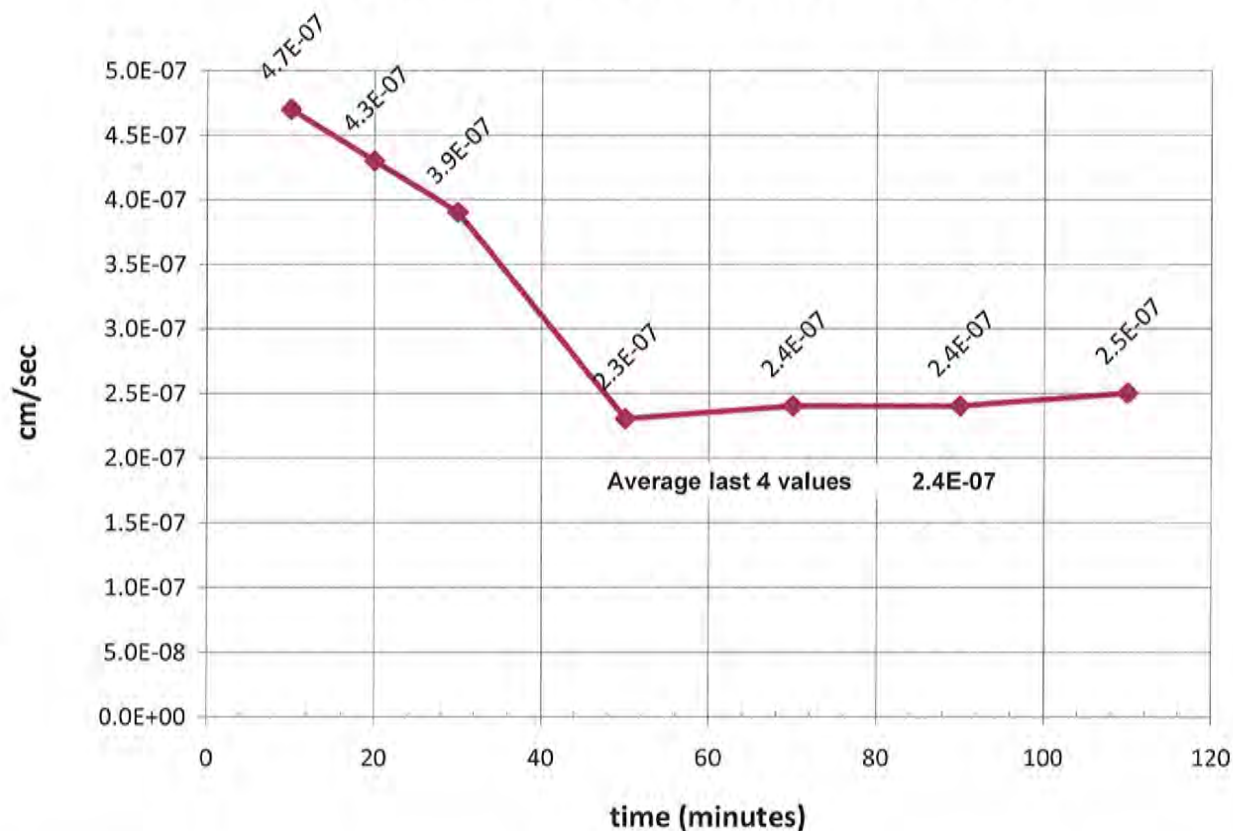
Preliminary Flow Pump Test Data ASTM D5084

Client: MWH
Job Number: 2512_77
Project: --
Location: Church Rock
Project Number: --

Boring Number: Tailings Impoundment
Depth: 10-24"
Sample Number: TI-CS04-04A
Sampled Date: -
Test Date: 2/12/2014

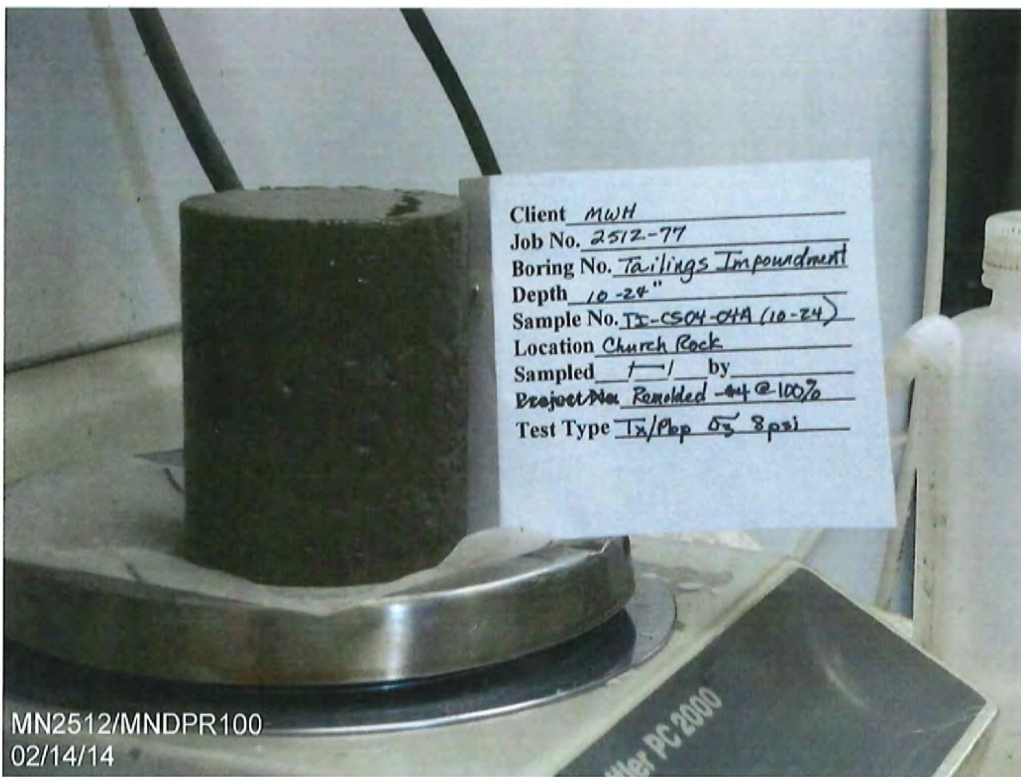
Sampled By: MWH
Technician: CAL

Preliminary Flow Pump Test Data



Data Entered By: CAL
Date: 2/12/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_0.xls

Checked By: DAW
Date: 02/14/14



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
DEPTH 11-24"
SAMPLE NO. TI-CS01-04A
LOCATION Church Rock
PROJECT NO. -
SOIL DESCR. Remolded -#4 @90%

SAMPLED -
TEST STARTED 1/28/14 CAL
TEST FINISHED 2/14/14 CAL
CELL NUMBER 4P
SATURATED TEST Yes
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: OK Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_8.xls

TRIAXIAL TEST DATA
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. Tailings Impoundment
DEPTH 11-24"
SAMPLE NO. TI-CS01-04A
LOCATION Church Rock
PROJECT NO. -
SOIL DESCR. Remolded -#4 @90%

SAMPLED -
TEST STARTED 1/28/14 CAL
TEST FINISHED 2/14/14 CAL
SETUP NO. 4P
SATURATED TEST Yes
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

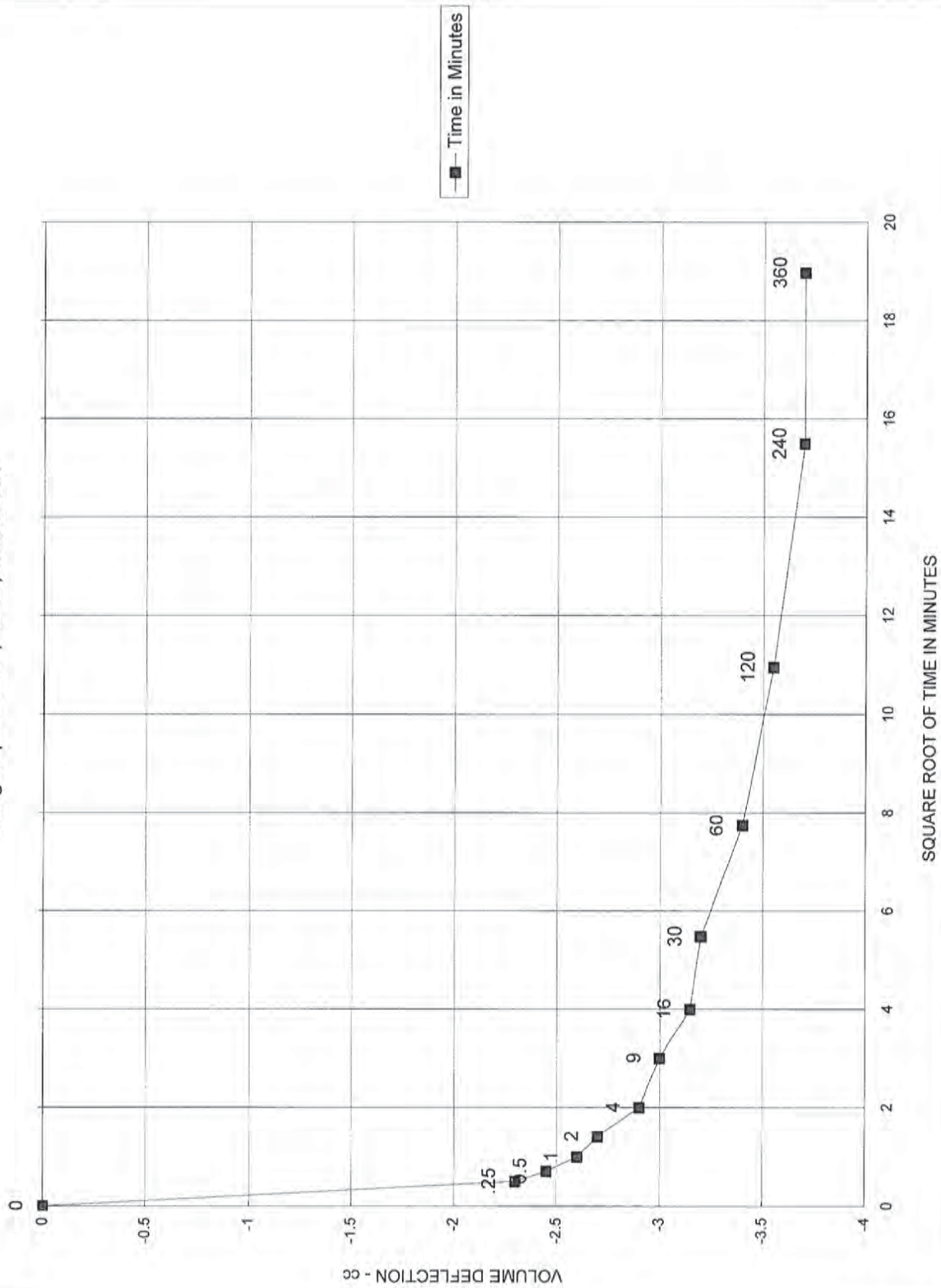
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FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_8.xls



CONSOLIDATION DATA

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



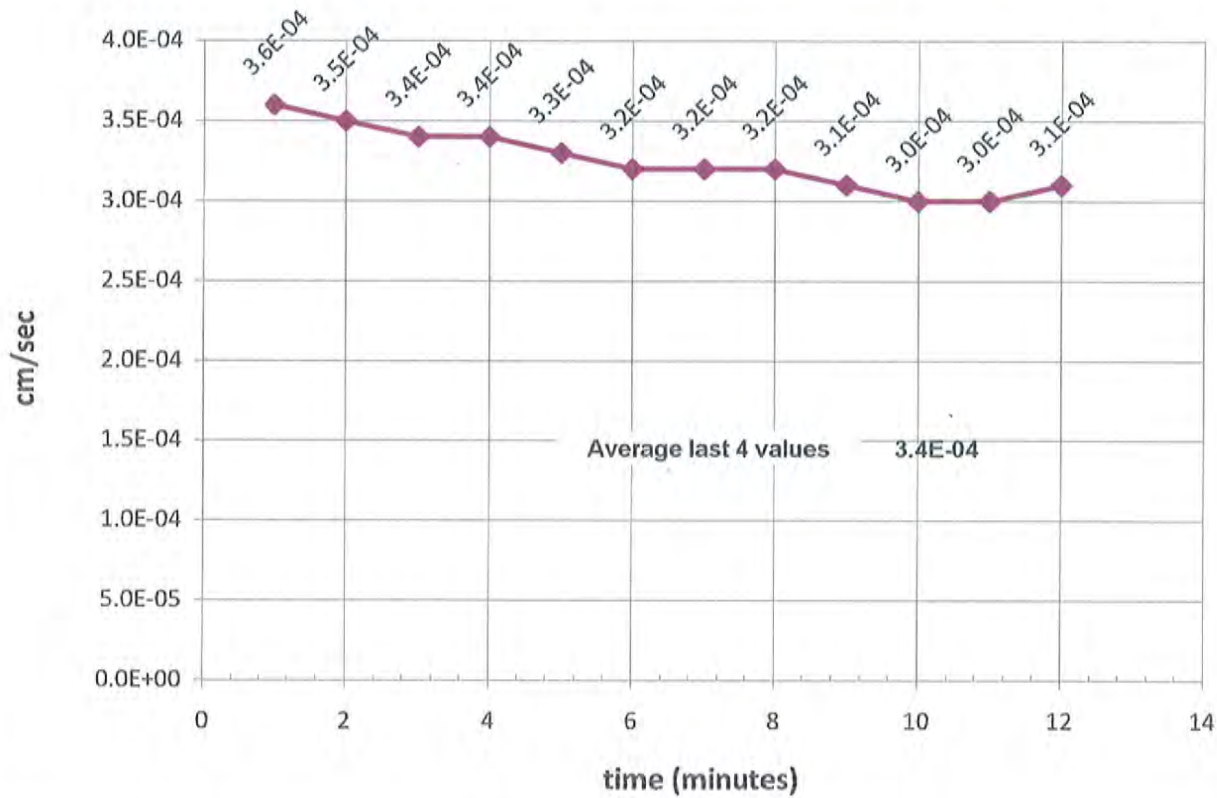
Preliminary Flow Pump Test Data ASTM D5084

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

Boring Number: Tailings Impoundment
Depth: 11-24"
Sample Number: TI-CS01-04A (11-24)
Sampled Date: --
Test Date: 2/14/2014

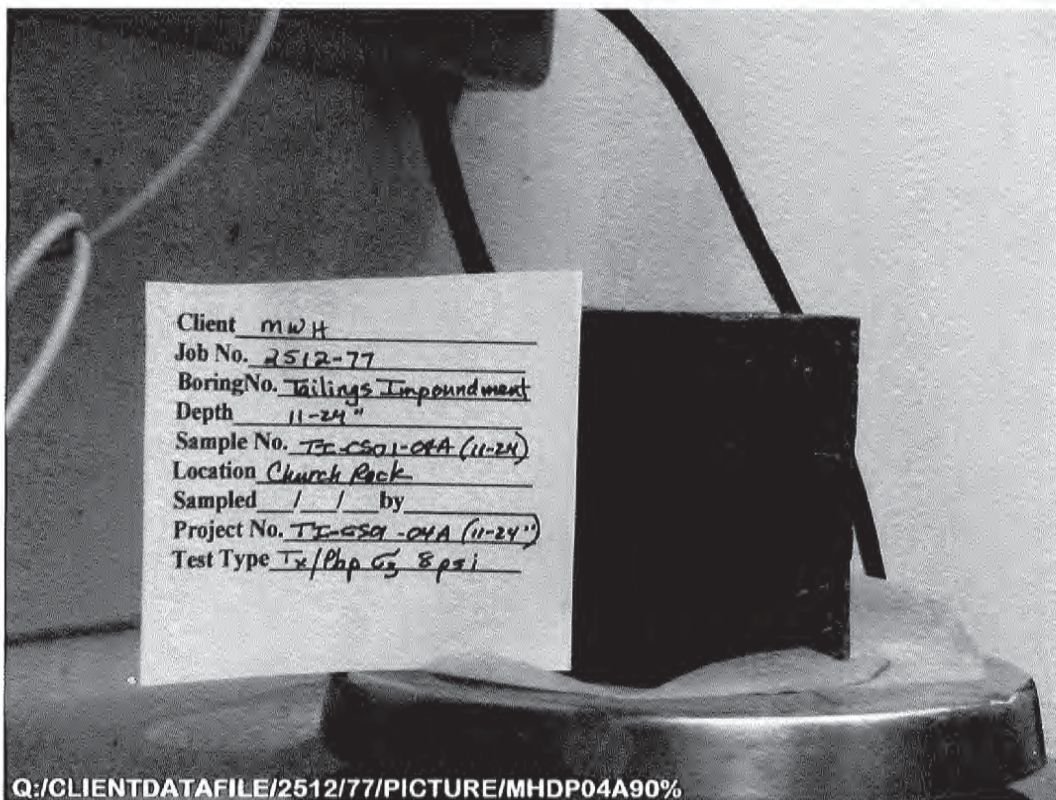
Sampled By: MWH
Technician: CAL

Preliminary Flow Pump Test Data



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

Checked By: gld
Date: 2/17/14



Client mwh
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 11-24"
Sample No. TE-CS01-04A (11-24)
Location Church Rock
Sampled / / by
Project No. TE-GSQ-04A (11-24")
Test Type Tx/Php G₃ 8 psi

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
DEPTH 11-24"
SAMPLE NO. TI-CS01-04A(11-24")
LOCATION Church Rock
PROJECT NO. -
SOIL DESCR. Remolded -#4 @95%

SAMPLED -
TEST STARTED 1/28/14 CAL
TEST FINISHED 2/14/14 CAL
CELL NUMBER 2P
SATURATED TEST Yes
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: SKL Date: 2/18/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_9.xls

TRIAXIAL 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

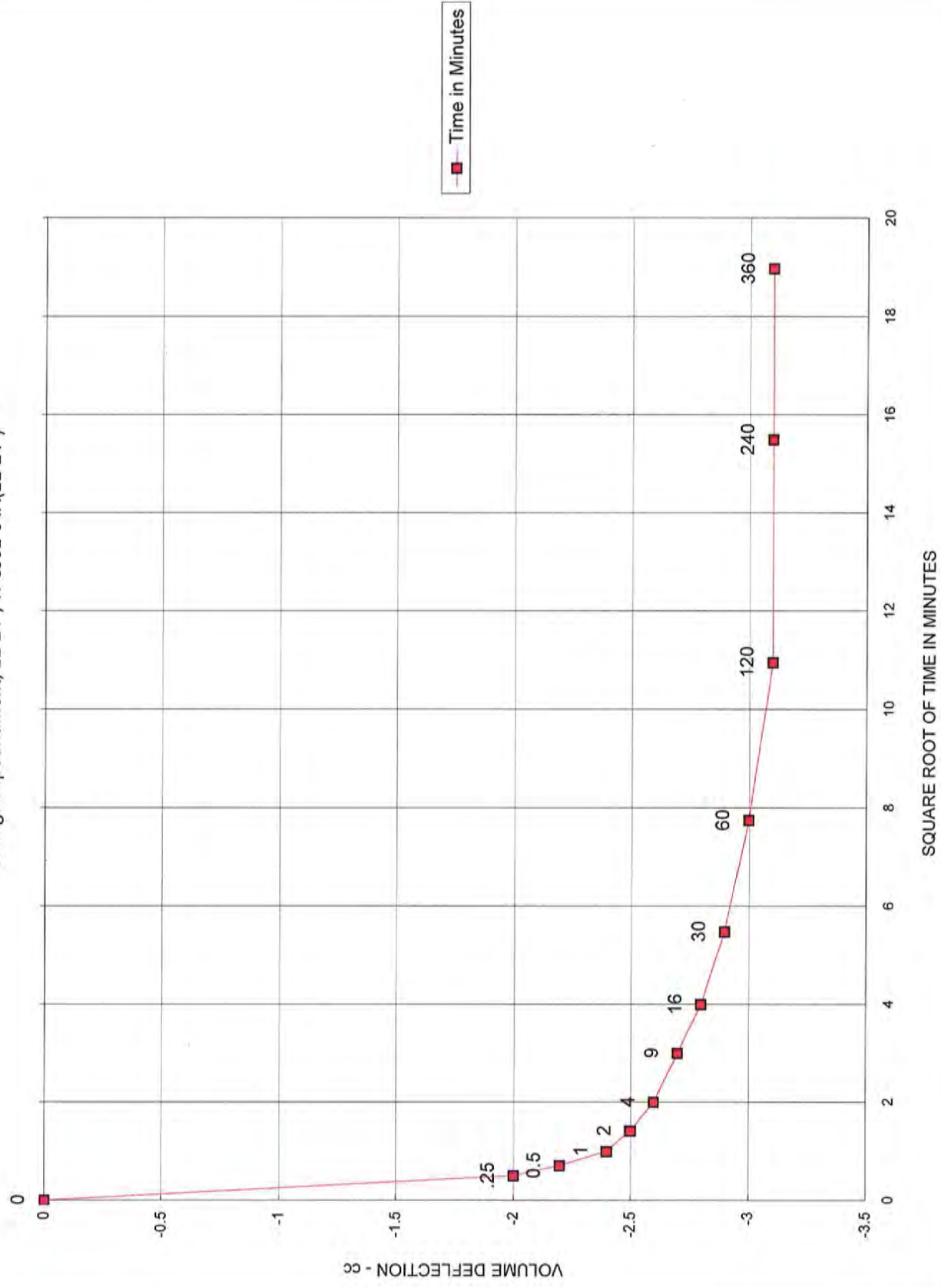
Checked by: CAL Date: 2/18/14

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



CONSOLIDATION DATA

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



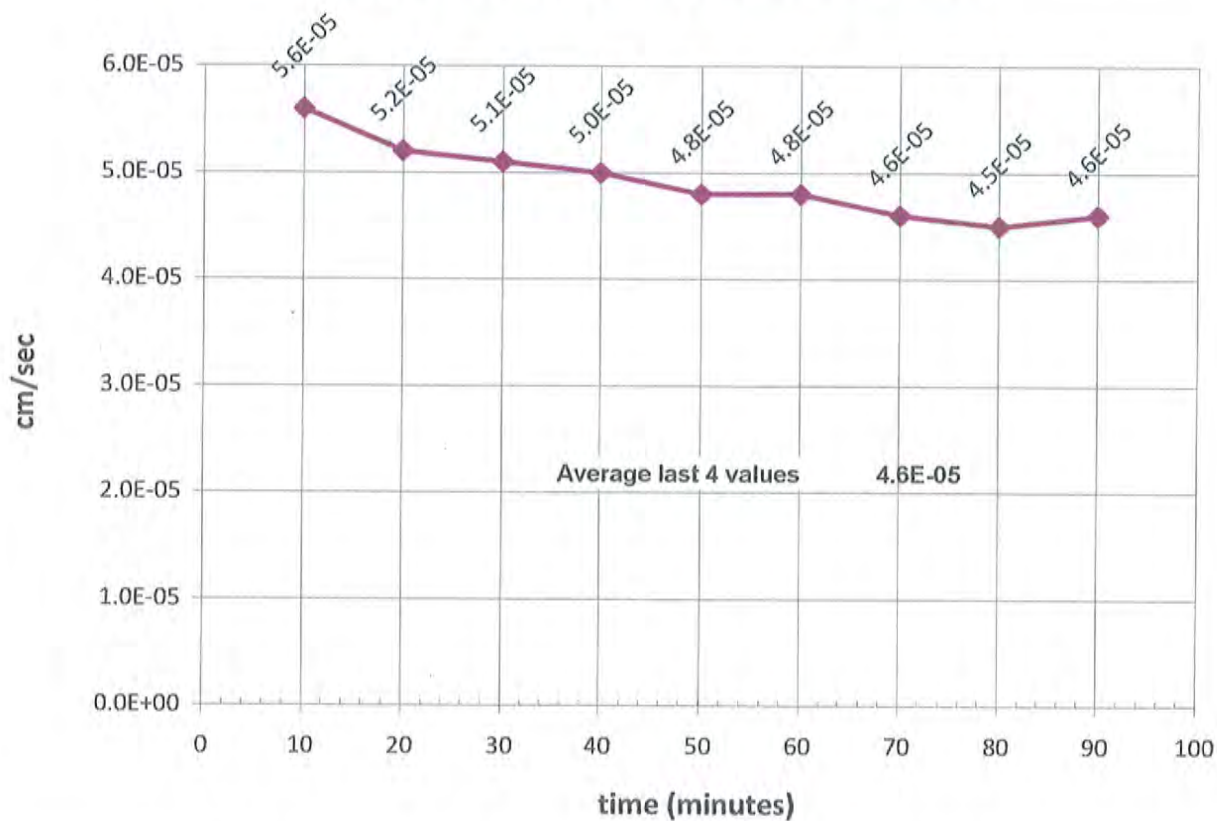
Preliminary Flow Pump Test Data ASTM D5084

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

Boring Number: Tailings Impoundment
Depth: 11-24"
Sample Number: TI-CS01-04A (11-24)
Sampled Date: --
Test Date: 2/14/2014

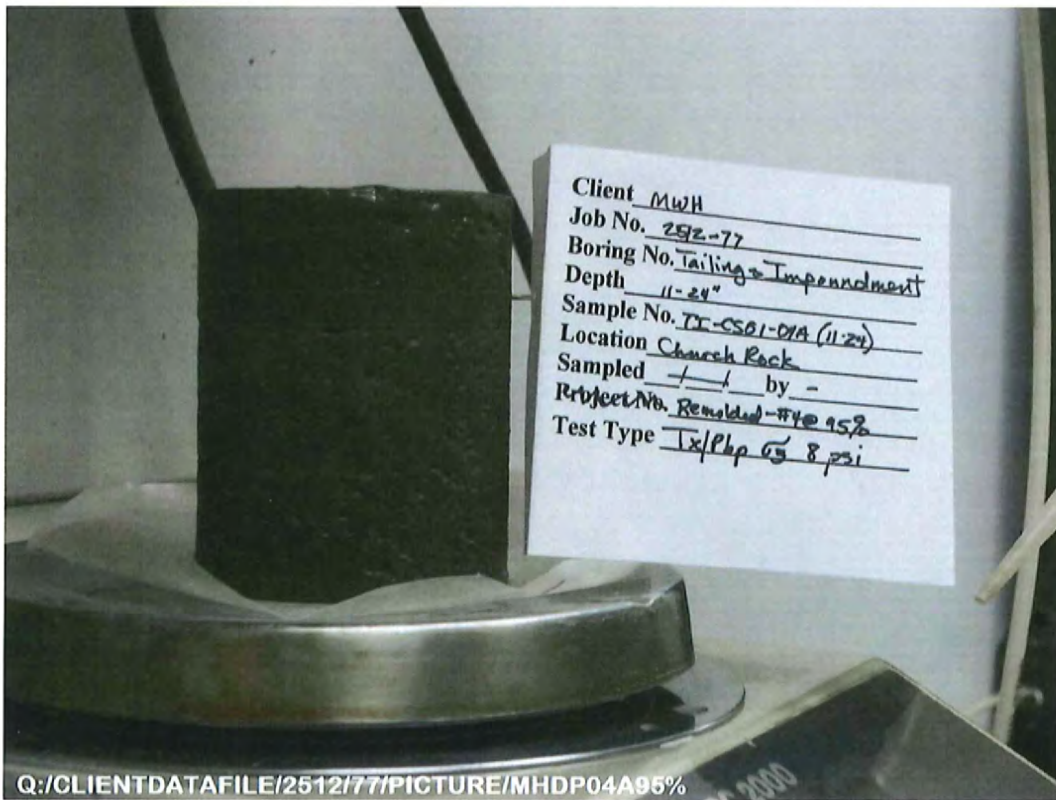
Sampled By: MWH
Technician: CAL

Preliminary Flow Pump Test Data



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

Checked By: SLL
Date: 2/17/14



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

CLIENT MWH

JOB NO. 2512-77

BORING NO. Tailings Impoundment
DEPTH 11-24"
SAMPLE NO. TI-CS01-04 (11-24")
LOCATION Church Rock
PROJECT NO. -
SOIL DESCR. Remolded -#4 @ 100%

SAMPLED -
TEST STARTED 01/28/14 CAL
TEST FINISHED 02/17/14 CAL
CELL NUMBER 1P
SATURATED TEST Yes
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: aw Date: 2/18/14

FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_10.xls

TRIAXIAL TEST DATA
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. Tailings Impoundment
DEPTH 11-24"
SAMPLE NO. TI-CS01-04 (11-24")
LOCATION Church Rock
PROJECT NO. -
SOIL DESCR. Remolded -#4 @ 100%

SAMPLED -
TEST STARTED 01/28/14 CAL
TEST FINISHED 02/17/14 CAL
SETUP NO. 1P
SATURATED TEST Yes
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

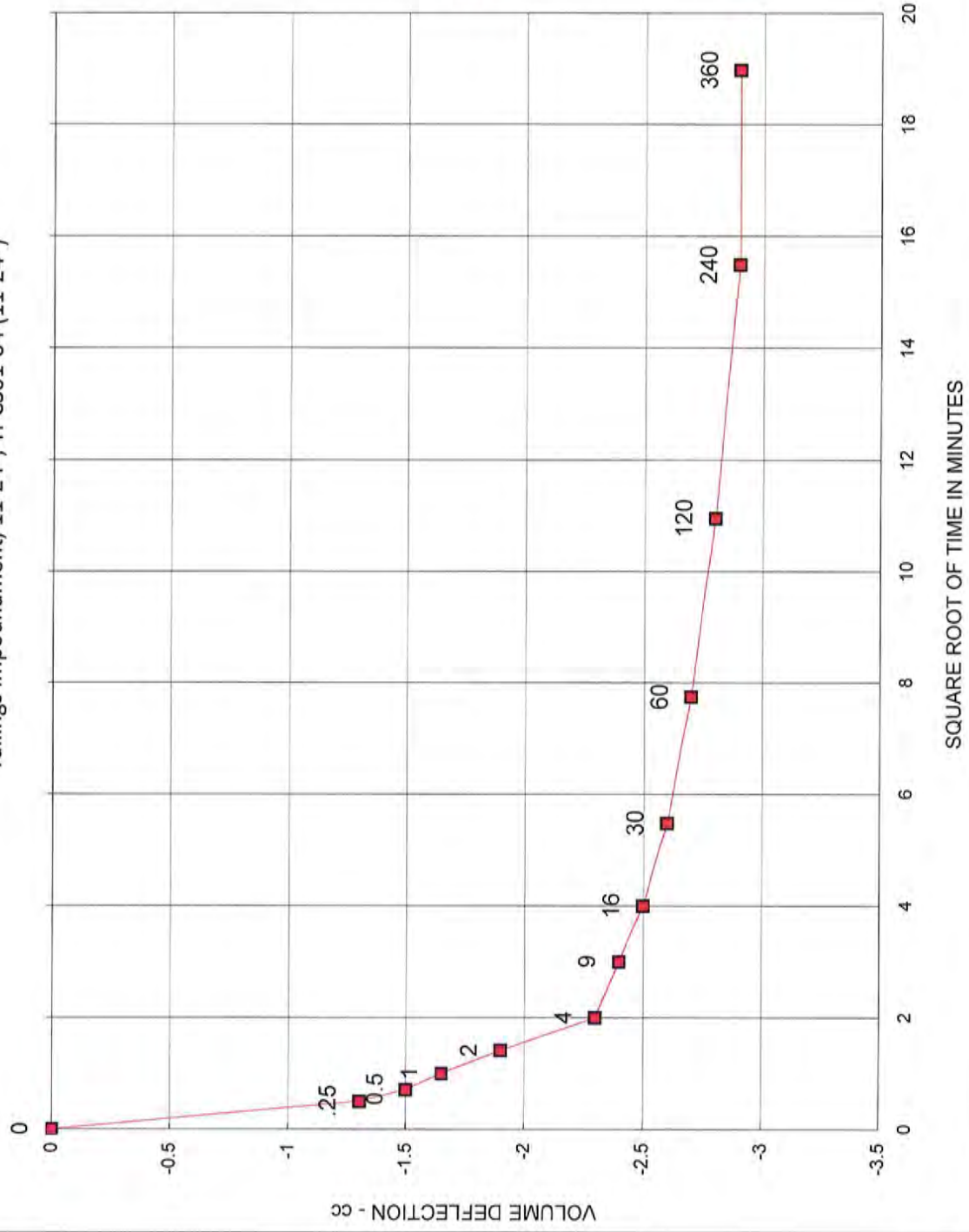
Initial Height (in)	3.013	Init. Vol. (CC)	224.522
Height Change (in)	0.018	Vol. Change (CC)	22.300
Ht. After Cons. (in)	2.995	Cell Exp. (CC)	12.338
Initial Area (sq in)	4.547	Net Change (CC)	9.962
Area After Cons. (sq in)	4.371	Cons. Vol. (CC)	214.560

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



CONSOLIDATION DATA

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



Time in Minutes



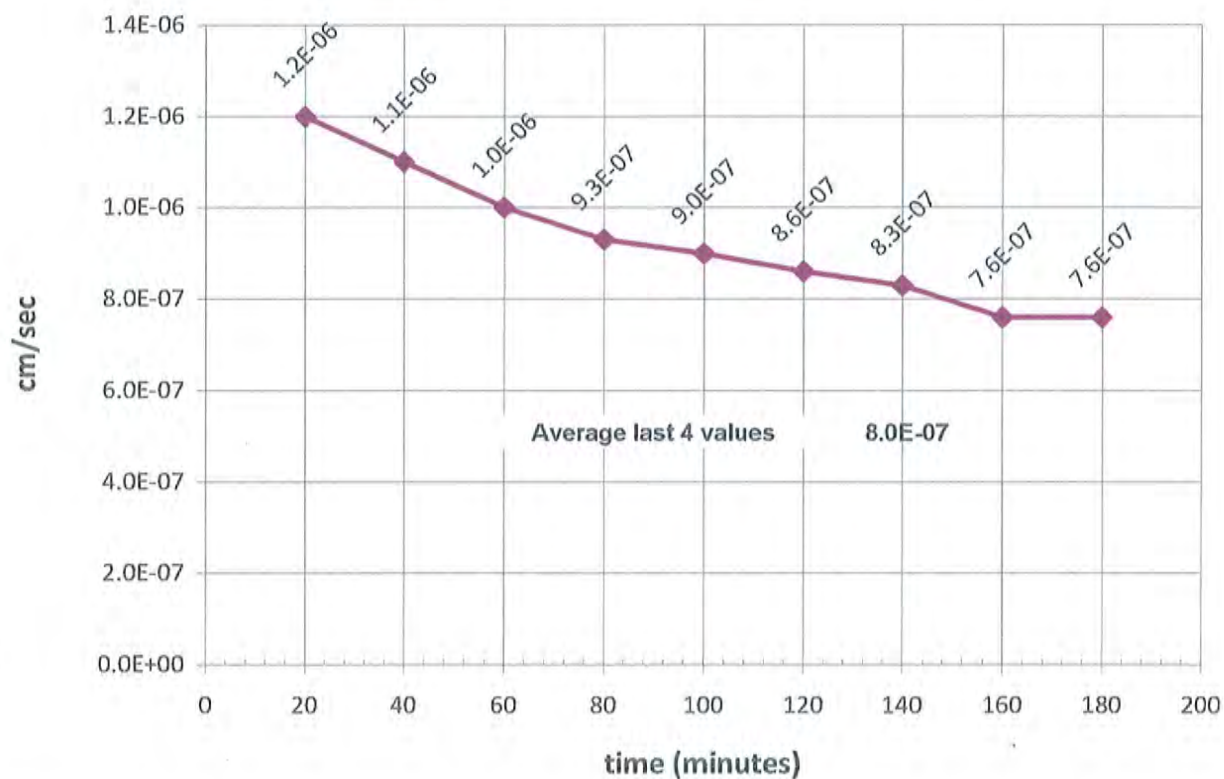
Preliminary Flow Pump Test Data ASTM D5084

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

Boring Number: Tailings Impoundment
Depth: 11-24"
Sample Number: TI-CS01-04A
Sampled Date: -
Test Date: 2/17/2014

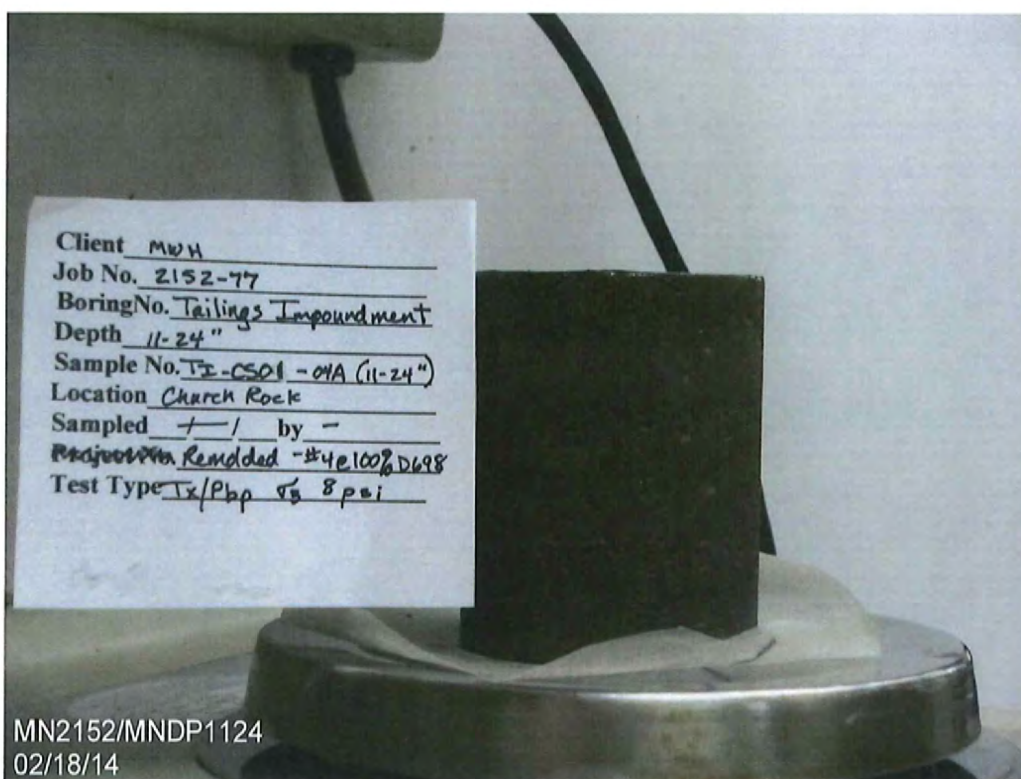
Sampled By: MWH
Technician: CAL

Preliminary Flow Pump Test Data



Data Entered By: CAL
Date: 2/17/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_11.xls

Checked By: DAW
Date: 2/18/14



Client MWH
Job No. 2152-77
Boring No. Tailings Impoundment
Depth 11-24"
Sample No. TX-CSO1 - 01A (11-24")
Location Church Rock
Sampled 1/1 by -
~~Project~~ Remolded - #4e100% D698
Test Type Tx/Pbp 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
DEPTH 9-24"
SAMPLE NO. TI-CS11-04A (9-24")
LOCATION Church Rock
PROJECT NO. --
SOIL DESCR. Remolded -#4 @ 90%

SAMPLED --
TEST STARTED 01/29/14 CAL
TEST FINISHED 02/10/14 CAL
CELL NUMBER 9P
SATURATED TEST Yes
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: DAW Date: 2/12/14
FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_2.xls

TRIAXIAL 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

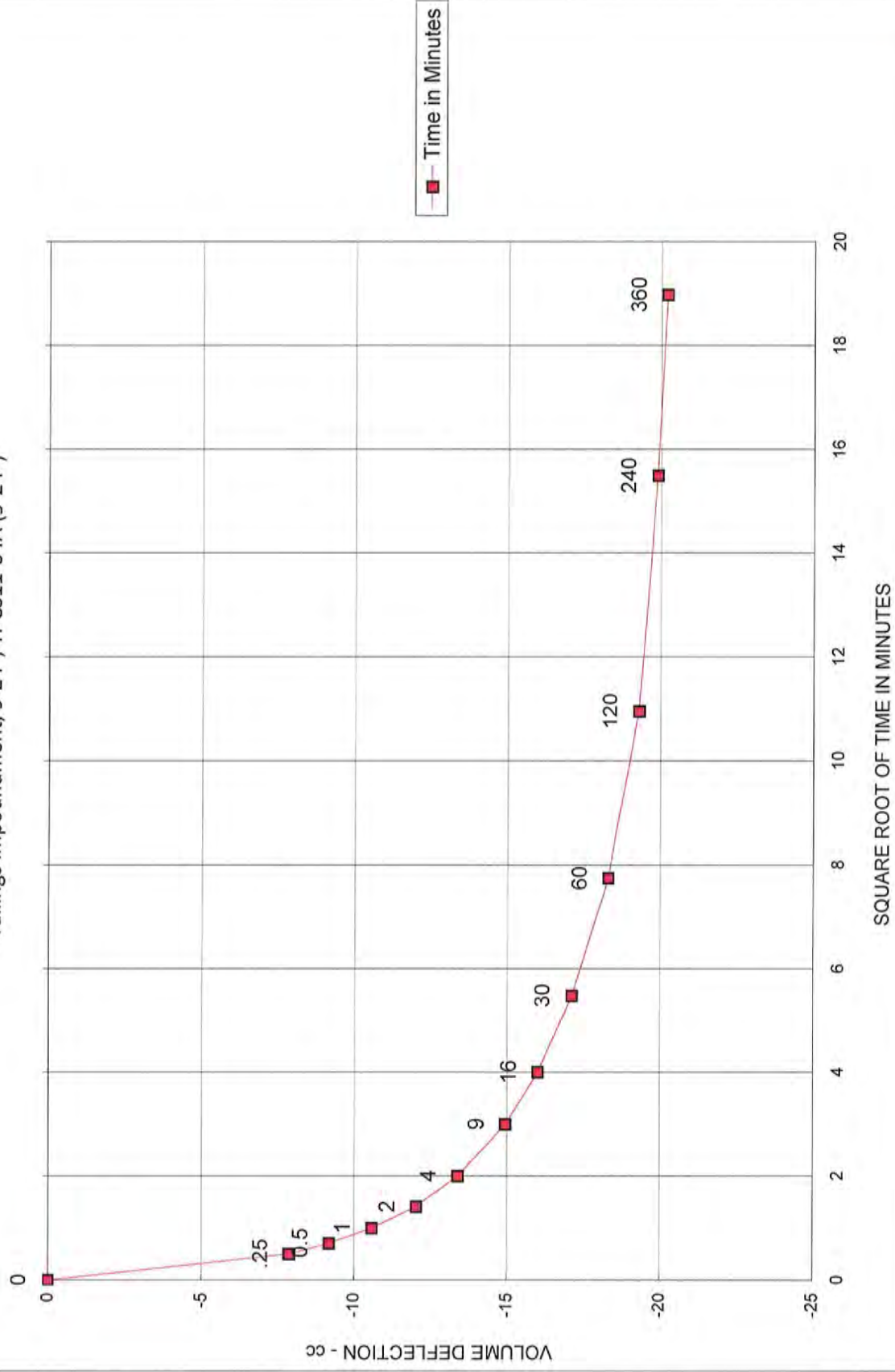
Initial Height (in)	3.002	Init. Vol. (CC)	222.959
Height Change (in)	0.085	Vol. Change (CC)	42.000
Ht. After Cons. (in)	2.917	Cell Exp. (CC)	14.735
Initial Area (sq in)	4.531	Net Change (CC)	27.265
Area After Cons. (sq in)	4.093	Cons. Vol. (CC)	195.694

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



CONSOLIDATION DATA

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



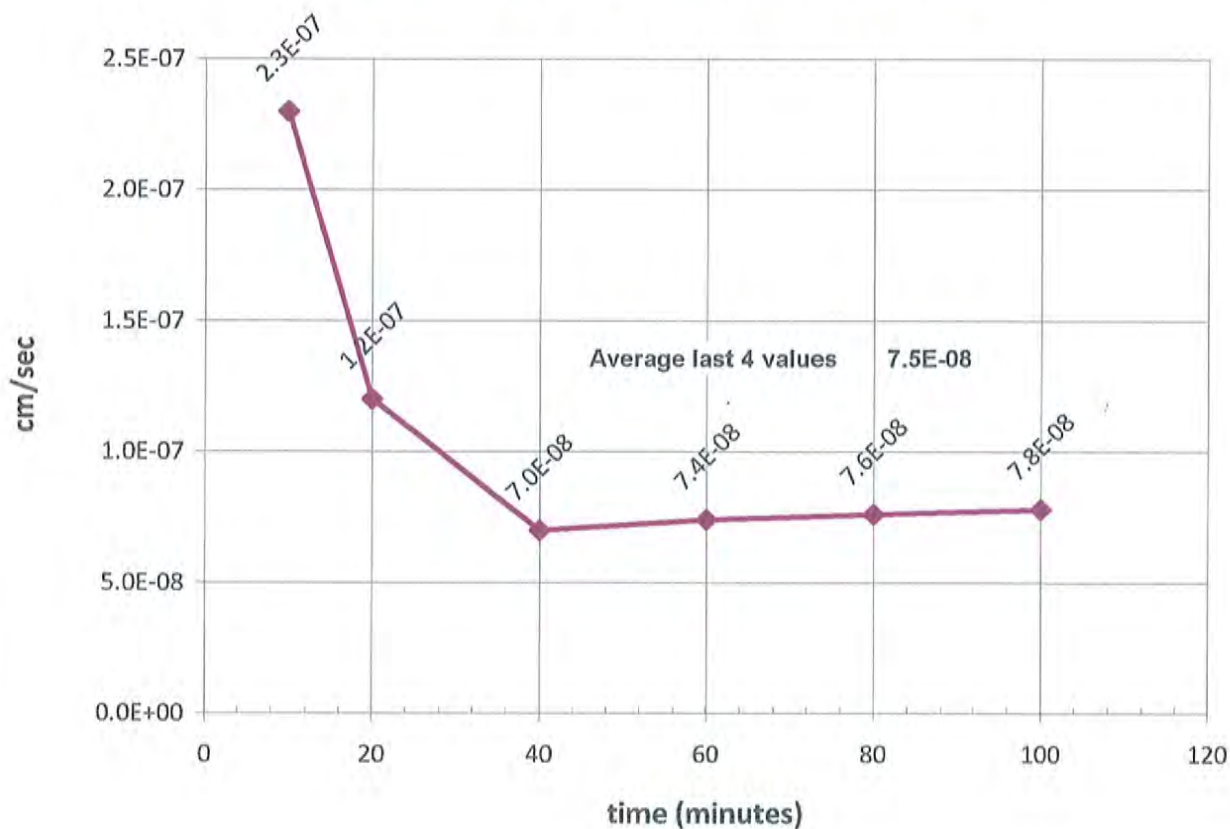
Preliminary Flow Pump Test Data ASTM D5084

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

Boring Number: Tailings Impoundment
Depth: 9-24"
Sample Number: TI-CS11-04A @90%D698
Sampled Date: -
Test Date: 2/10/2014

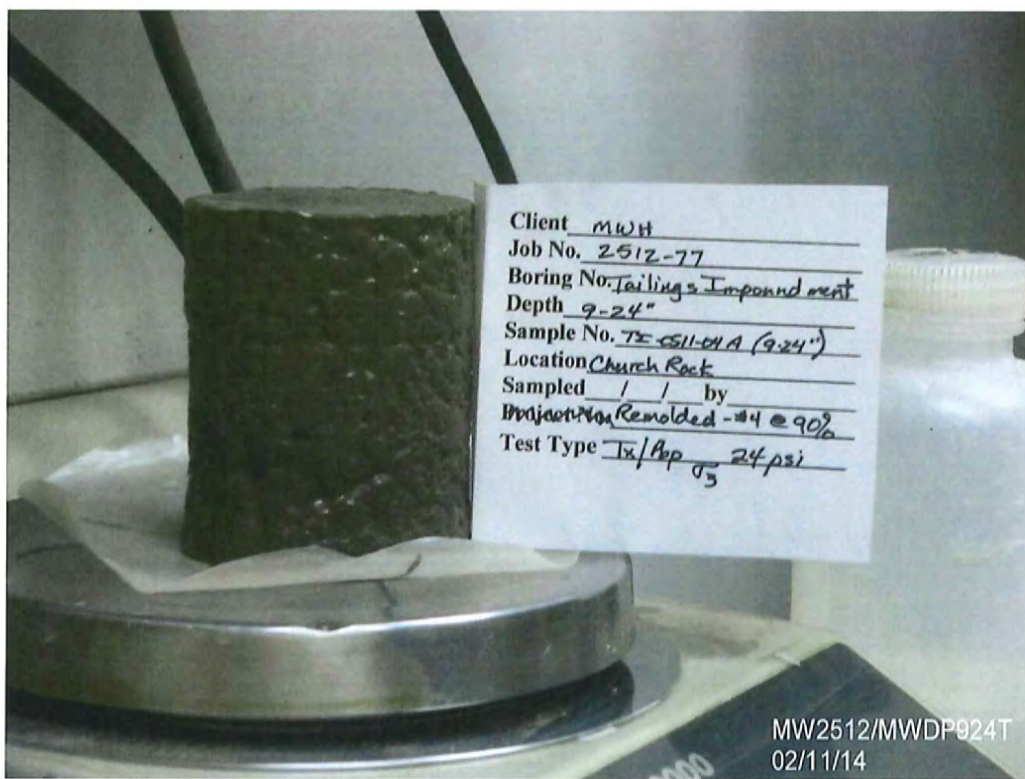
Sampled By: MWH
Technician: CAL

Preliminary Flow Pump Test Data



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

Checked By: OK
Date: 2/13/14



Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 9-24"
Sample No. TS-011-01A (9-24")
Location Church Rock
Sampled 1 / 1 by
~~Project~~ Remolded - #4 @ 90%
Test Type Tx/APP 24 psi
 σ_3

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: SKL Date: 2/13/14
 FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_5.xls

TRIAXIAL 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

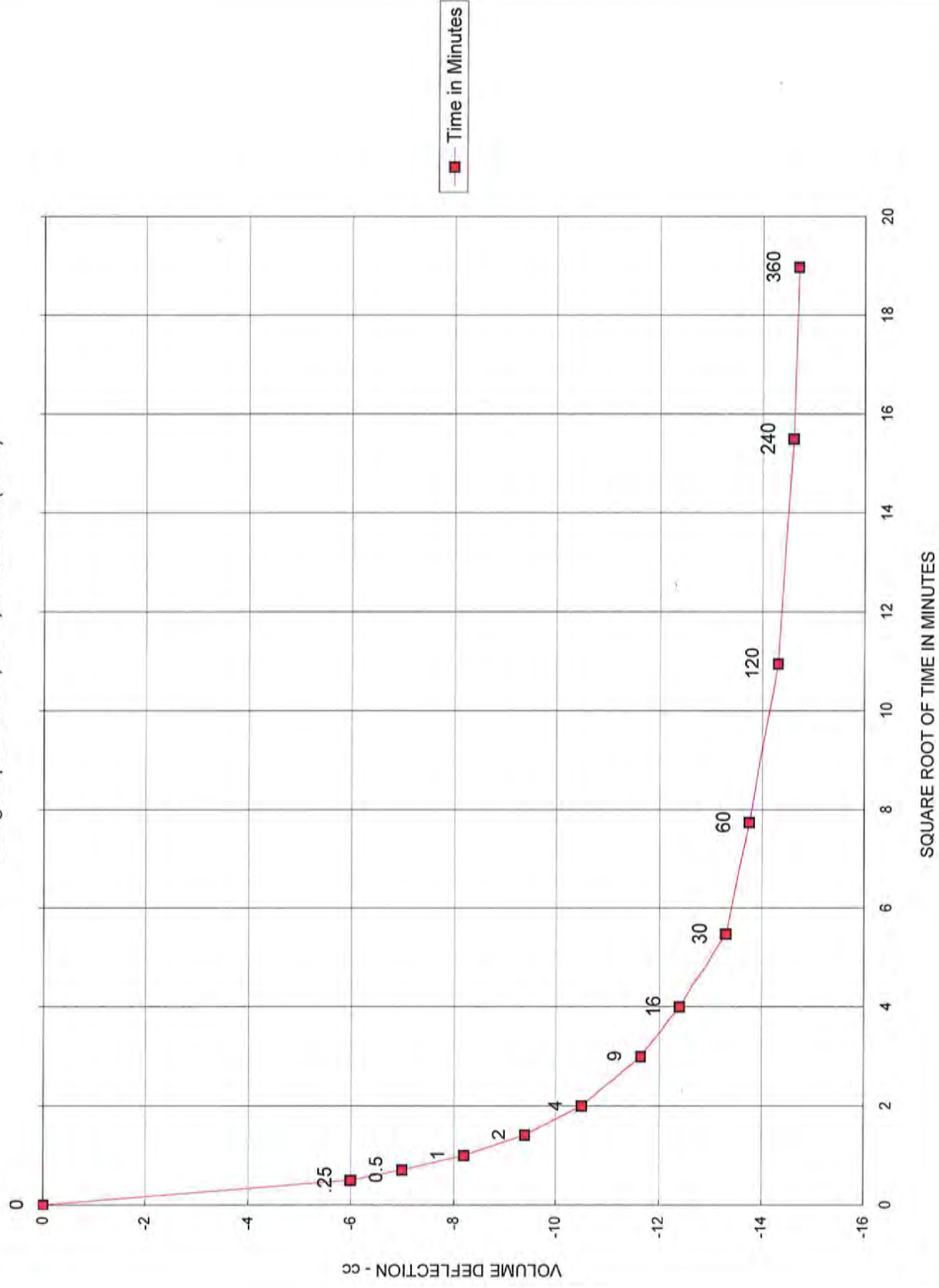
Checked by: CH Date: 2/13/14

FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_5.xls



CONSOLIDATION DATA

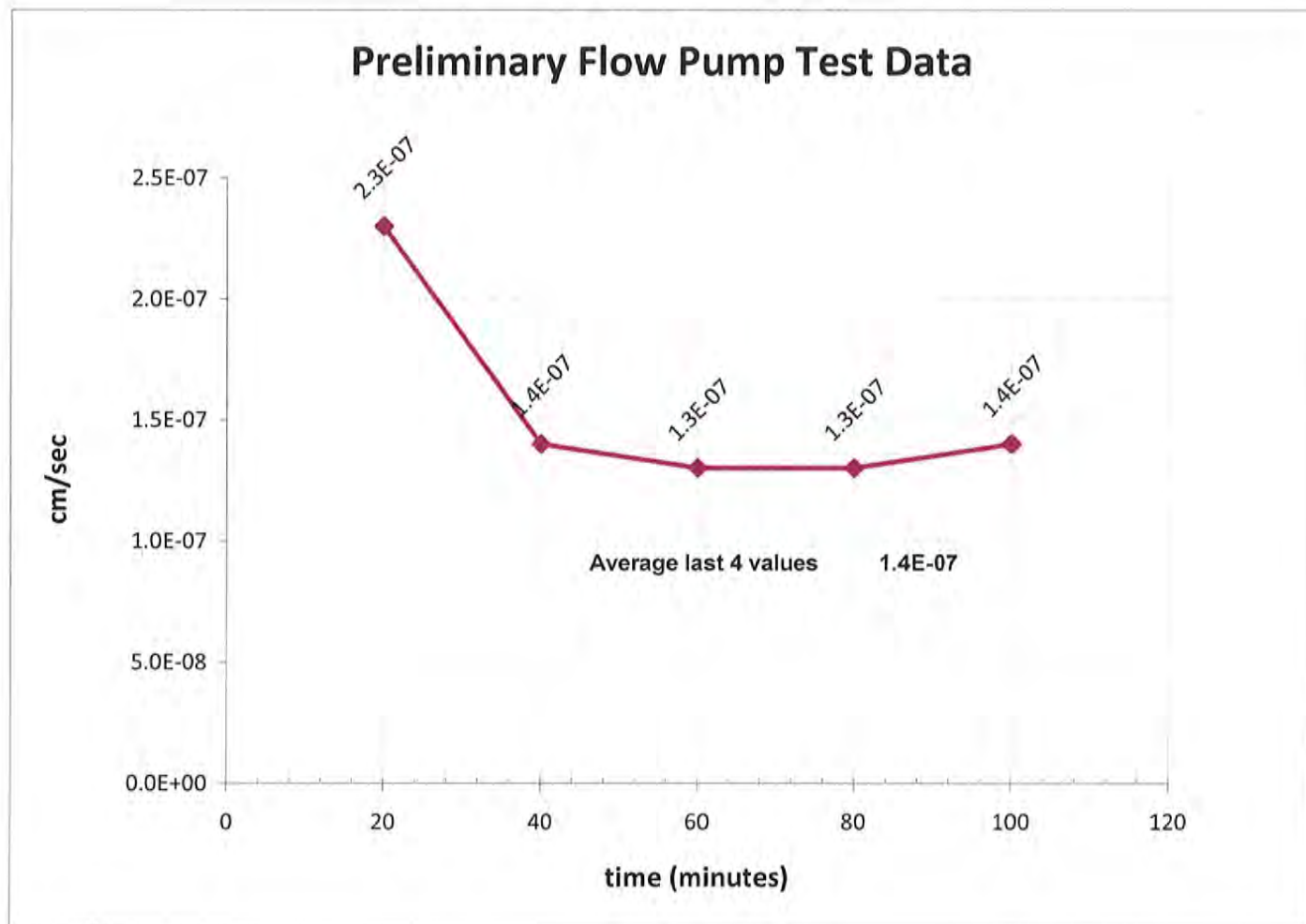
Tailings Impoundment, 9-24", TI-CS11-04A (9-24")



Preliminary Flow Pump Test Data ASTM D5084

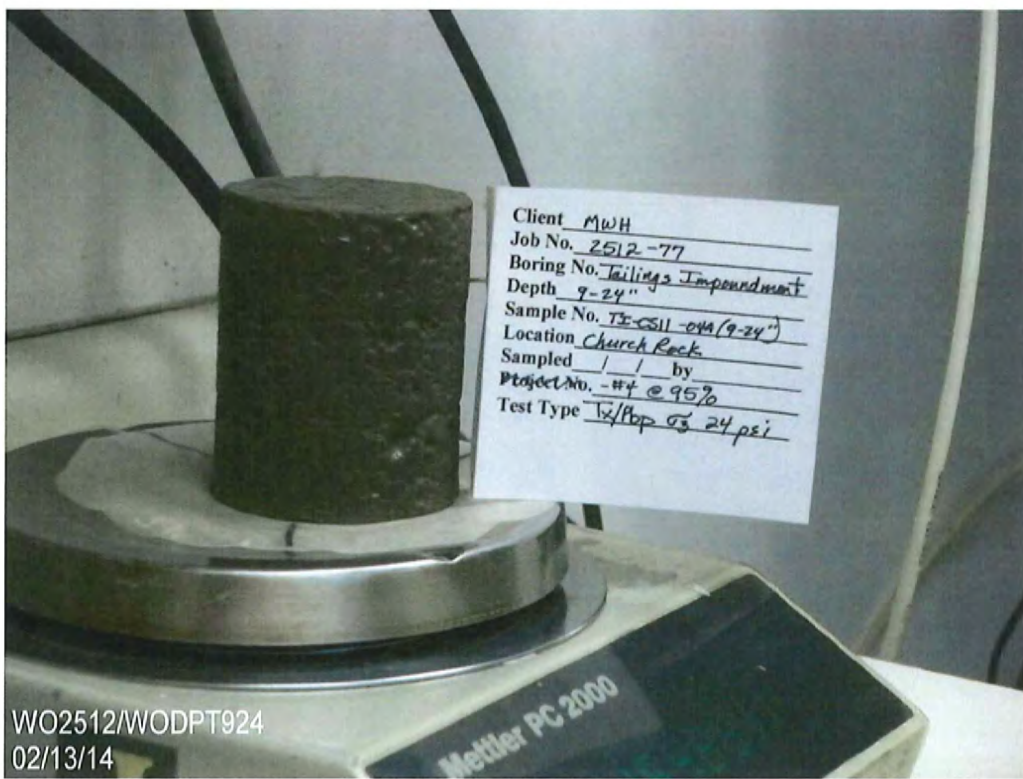
Client: MWH
Job Number: 2512_77
Project: --
Location: Church Rock
Project Number: --

Boring Number: Tailings Impoundment
Depth: 9-24"
Sample Number: TI-CS11-04A @ 95% D698
Sampled Date: -
Test Date: 2/11/2014
Sampled By: MWH
Technician: CAL



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

Checked By: CAL
Date: 2/13/14



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
DEPTH 9-24"
SAMPLE NO. TI-CS11-04A (9-24")
LOCATION Church Rock
PROJECT NO. -
SOIL DESCR. Remolded -#4 @ 100%

SAMPLED -
TEST STARTED 01/29/14 CAL
TEST FINISHED 02/10/14 CAL
CELL NUMBER 7P
SATURATED TEST Yes
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

TRIAXIAL 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

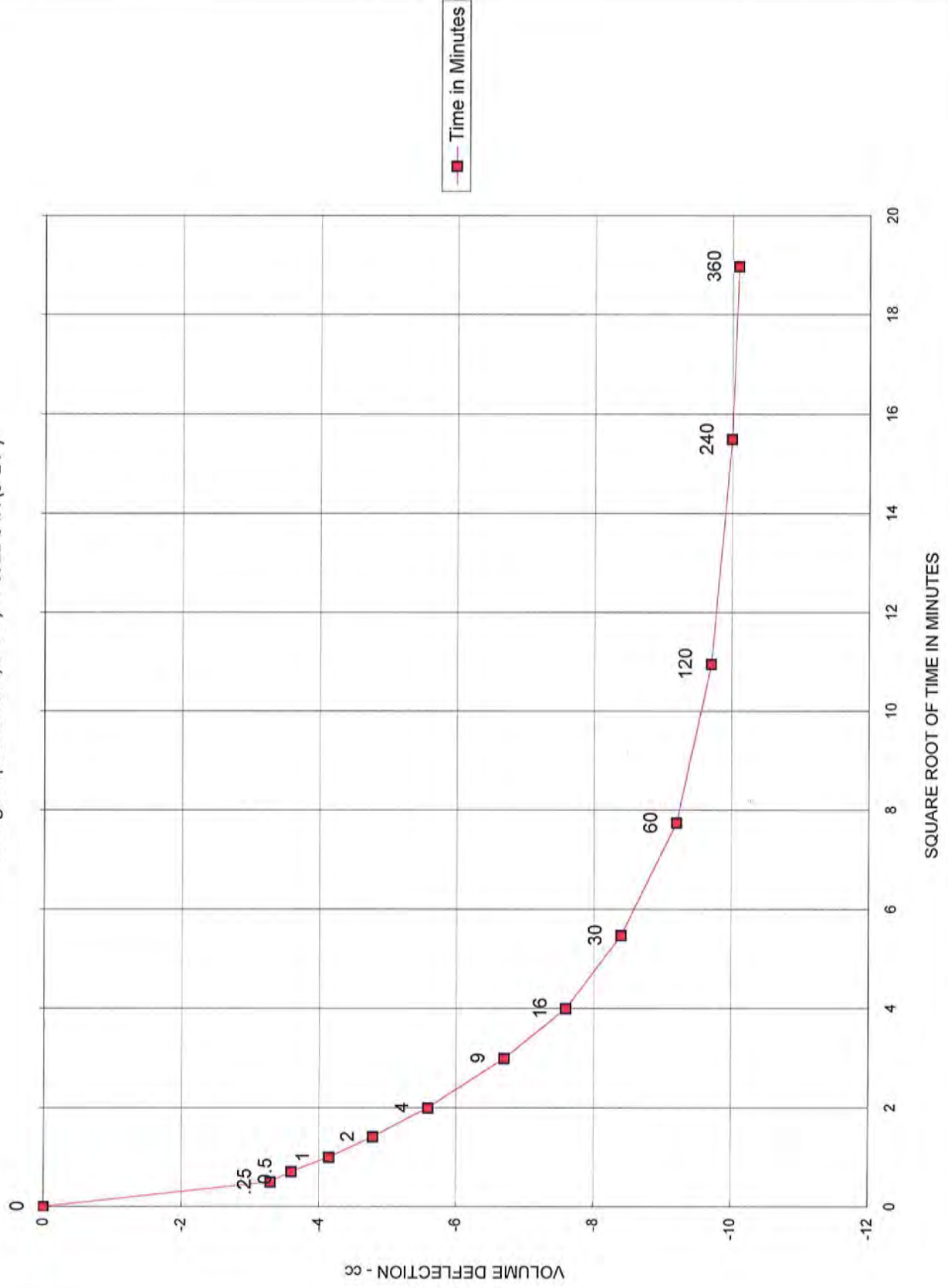
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FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_4.xls



CONSOLIDATION DATA

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

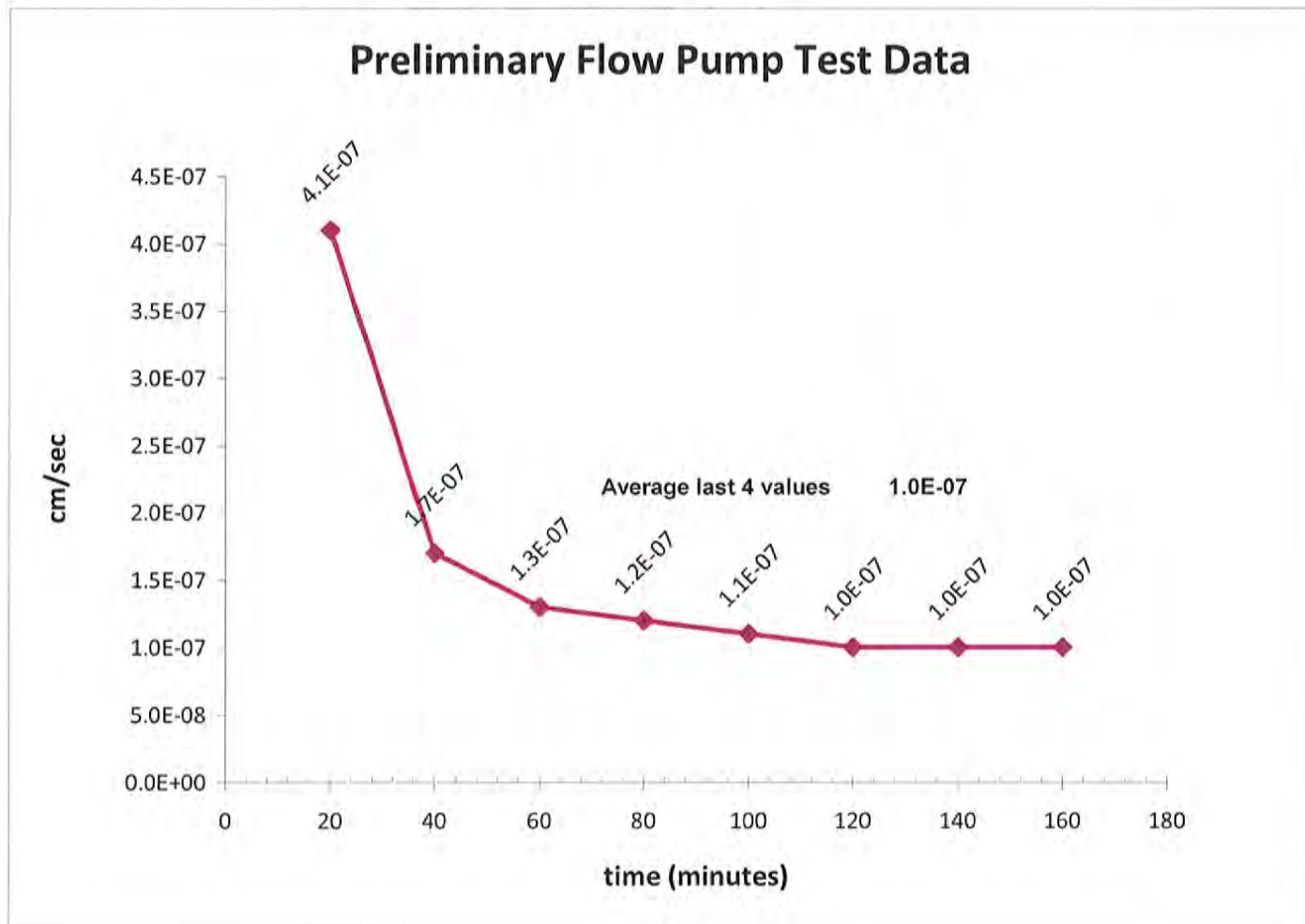


Preliminary Flow Pump Test Data ASTM D5084

Client: MWH
Job Number: 2512_77
Project: --
Location: Church Rock
Project Number: --

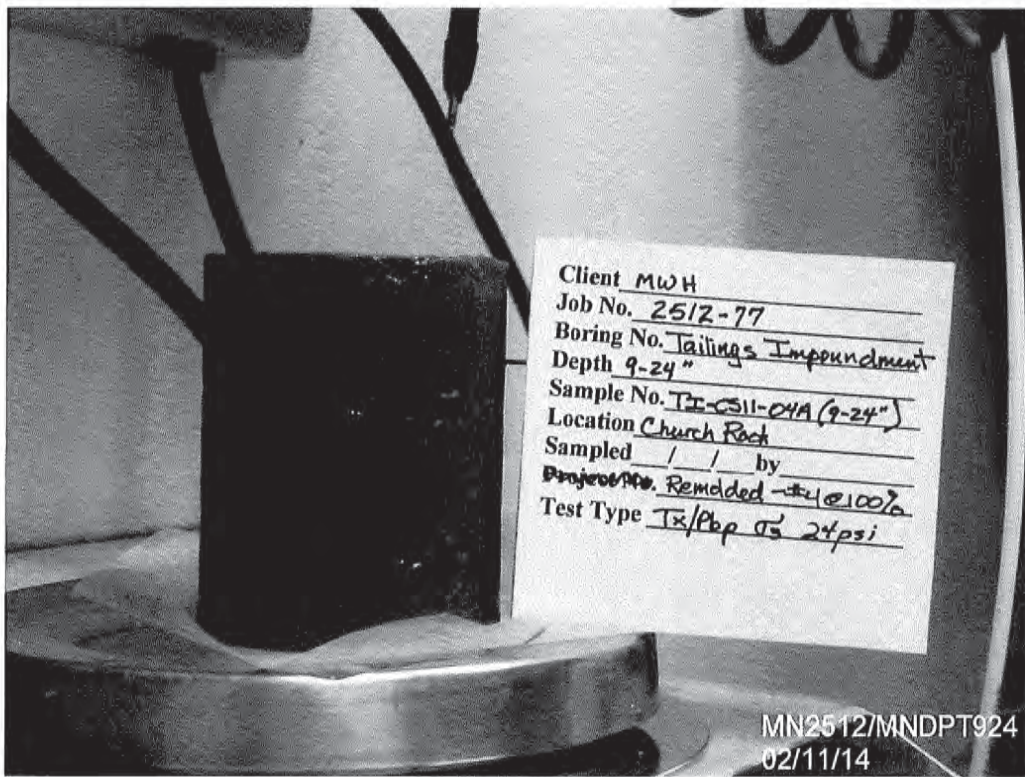
Boring Number: Tailings Impoundment
Depth: 9-24"
Sample Number: TI-CS11-04A @ 100%
Sampled Date: -
Test Date: 2/10/2014

Sampled By: MWH
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. TE-CS11-04A(9-24")
Location Church Rock
Sampled / / by
Project No. Remolded - #1 @ 100%
Test Type Tr/Pbp Ts 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: on Date: 2/06/14
 FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_0.xls

TRIAXIAL TEST DATA
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. Tailings Impoundment
DEPTH 8-28"
SAMPLE NO. TI-CS08-04A (8-28)
LOCATION Church Rock
PROJECT NO. --
SOIL DESCR. #4 @ 90%

SAMPLED --
TEST STARTED 01/27/14 CAL
TEST FINISHED 02/05/14 CAL
SETUP NO. 6P
SATURATED TEST Yes
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

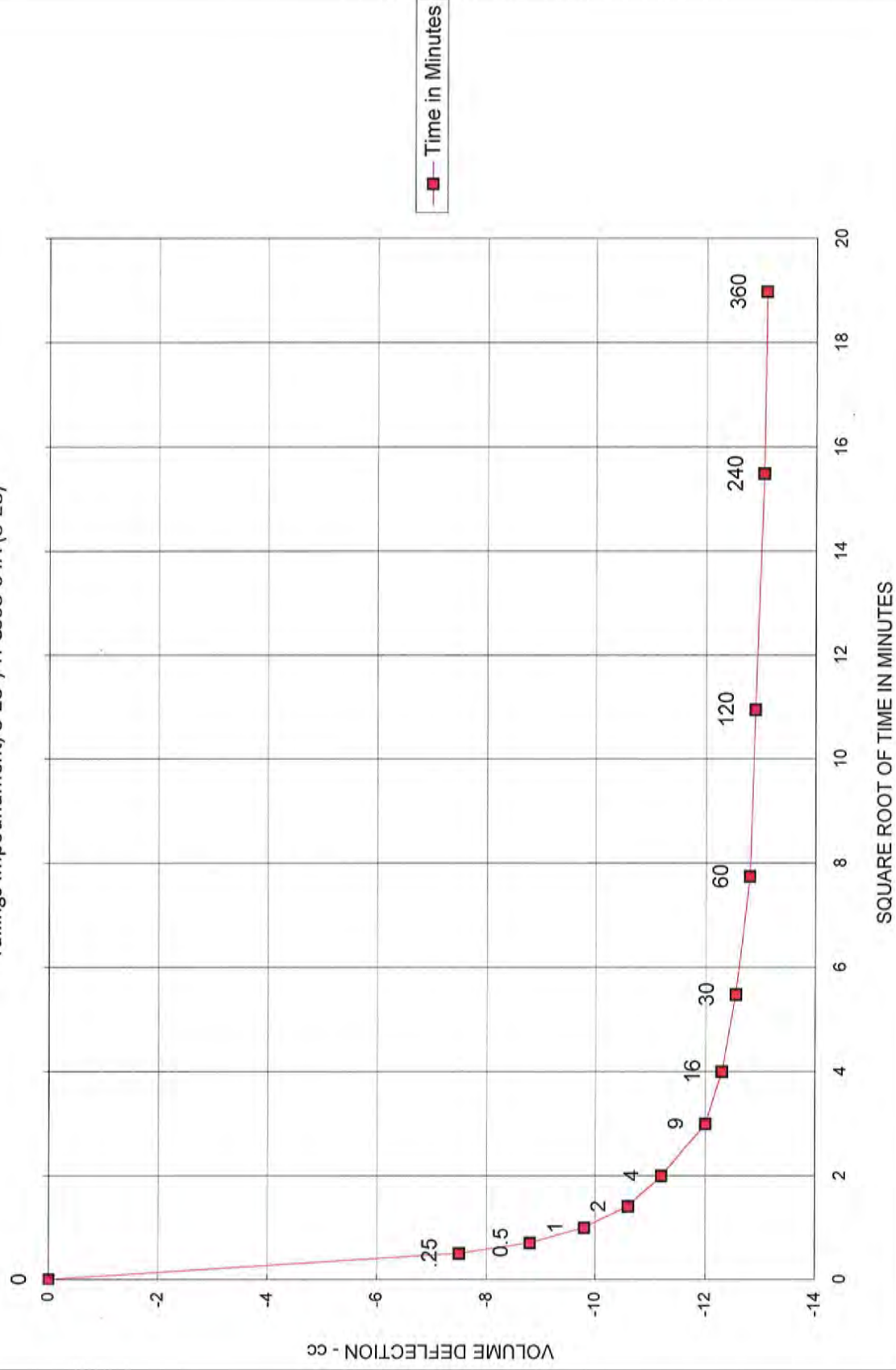
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FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_0.xls



CONSOLIDATION DATA

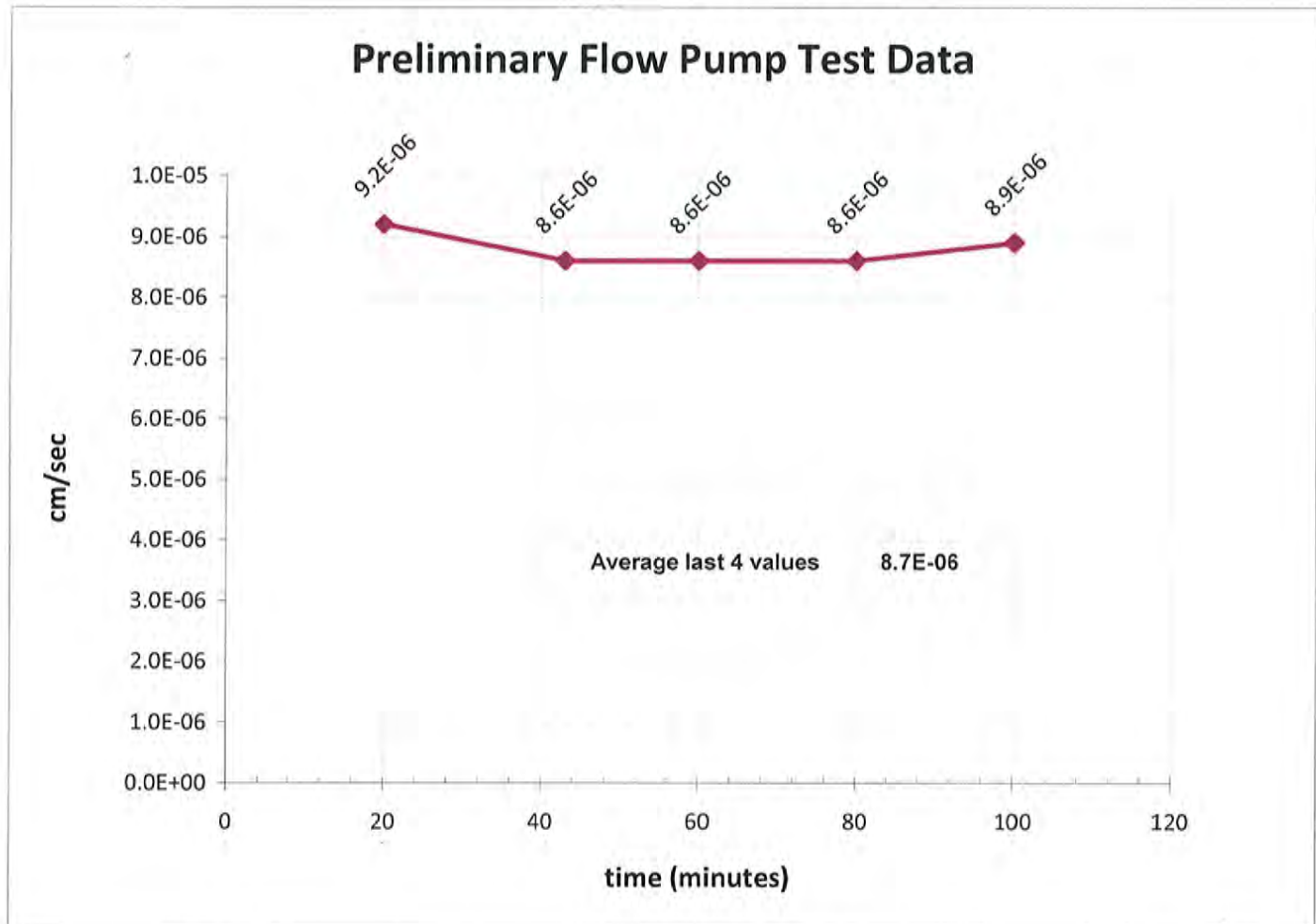
Tailings Impoundment, 8-28", TI-CS08-04A (8-28)



Preliminary Flow Pump Test Data ASTM D5084

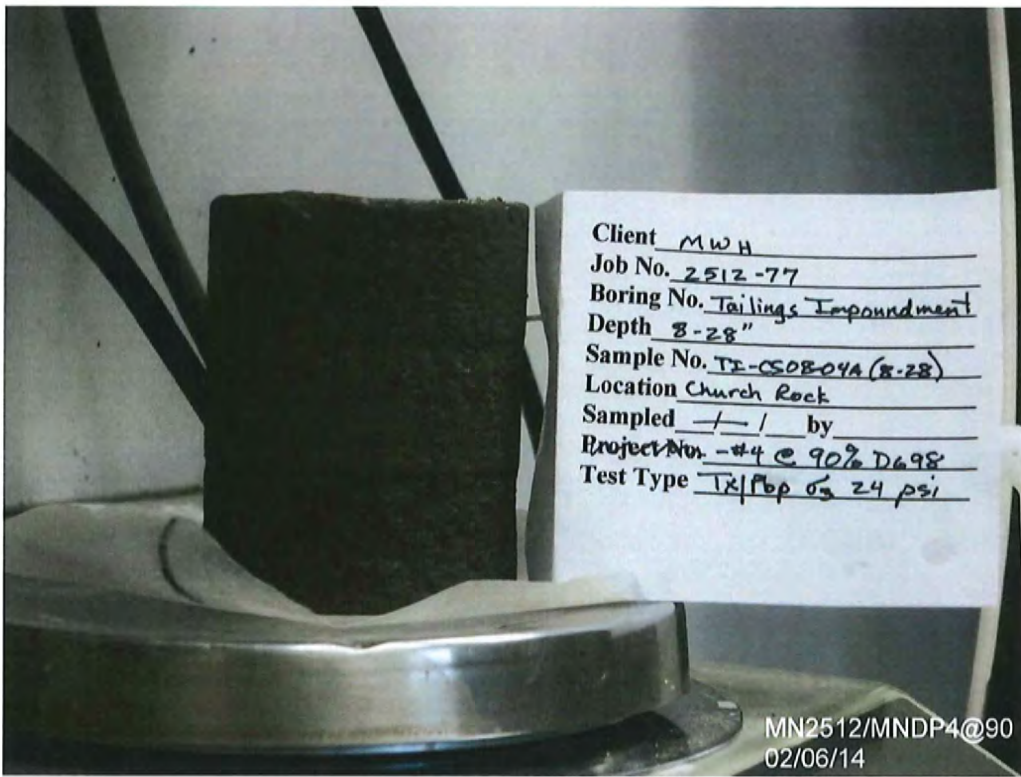
Client: MWH
Job Number: 2512_77
Project: --
Location: Church Rock
Project Number: --

Boring Number: Tailings Impoundment
Depth: 8-28"
Sample Number: TI-CS08-04A @90% D698
Sampled Date: -
Test Date: 2/5/2014
Sampled By: MWH
Technician: CAL



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

Checked By: CAL
Date: 2/12/14



Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 8-28"
Sample No. TI-CS0804A (8-28)
Location Church Rock
Sampled 1-1 by
Project No. -#4 @ 90% D698
Test Type T_x/f_{bp} 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
DEPTH 8-28"
SAMPLE NO. TI-CS08-04A (8-28)
LOCATION Church Rock
PROJECT NO. --
SOIL DESCR. -#4 @ 95%

SAMPLED --
TEST STARTED 01/27/14 CAL
TEST FINISHED 02/06/14 CAL
CELL NUMBER 5P
SATURATED TEST Yes
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

TRIAXIAL TEST DATA
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. Tailings Impoundment
DEPTH 8-28"
SAMPLE NO. TI-CS08-04A (8-28)
LOCATION Church Rock
PROJECT NO. --
SOIL DESCR. -#4 @ 95%

SAMPLED --
TEST STARTED 01/27/14 CAL
TEST FINISHED 02/06/14 CAL
SETUP NO. 5P
SATURATED TEST Yes
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

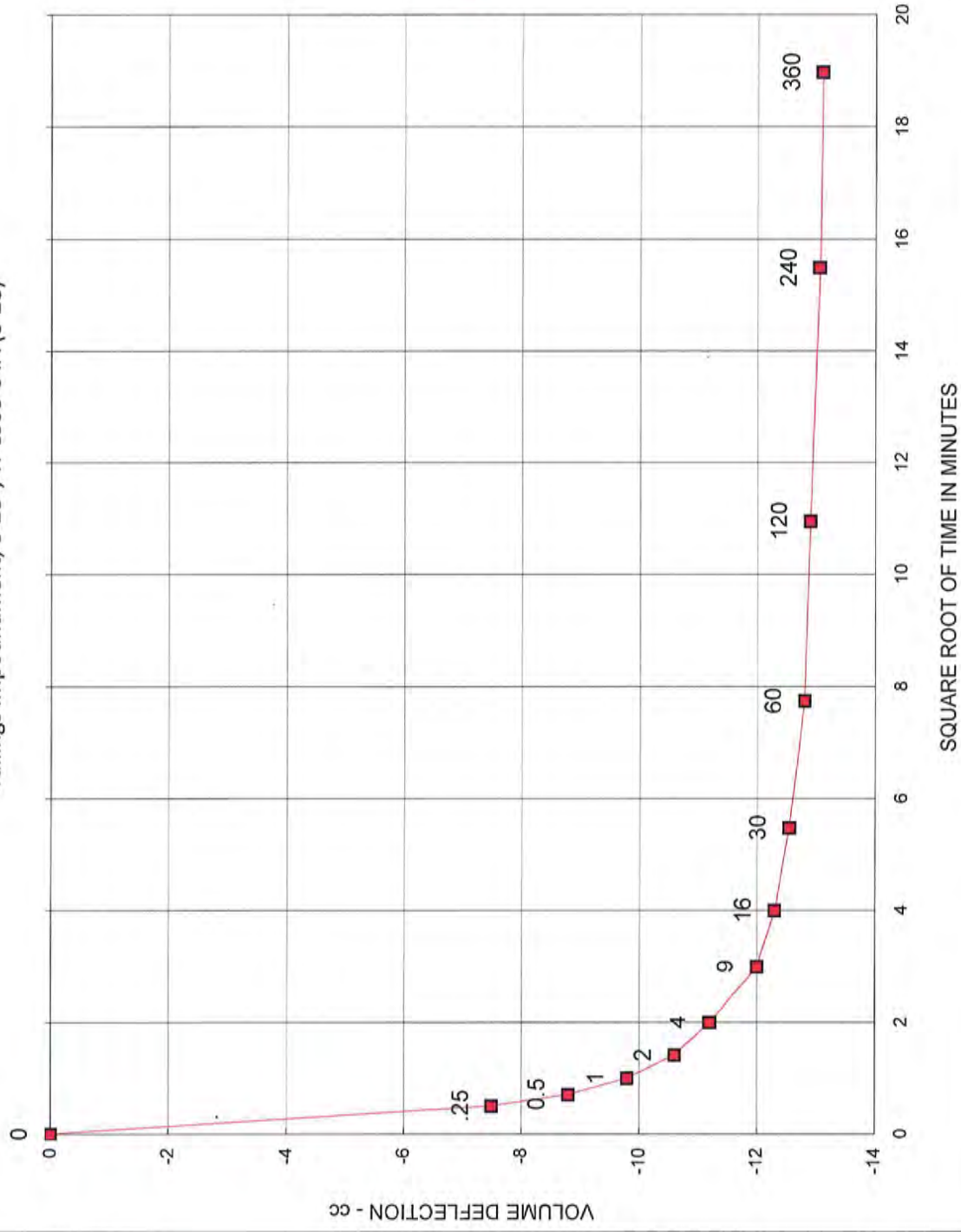
Initial Height (in)	2.993	Init. Vol. (CC)	223.217
Height Change (in)	0.061	Vol. Change (CC)	26.500
Ht. After Cons. (in)	2.932	Cell Exp. (CC)	15.972
Initial Area (sq in)	4.550	Net Change (CC)	10.528
Area After Cons. (sq in)	4.426	Cons. Vol. (CC)	212.689

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



CONSOLIDATION DATA

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



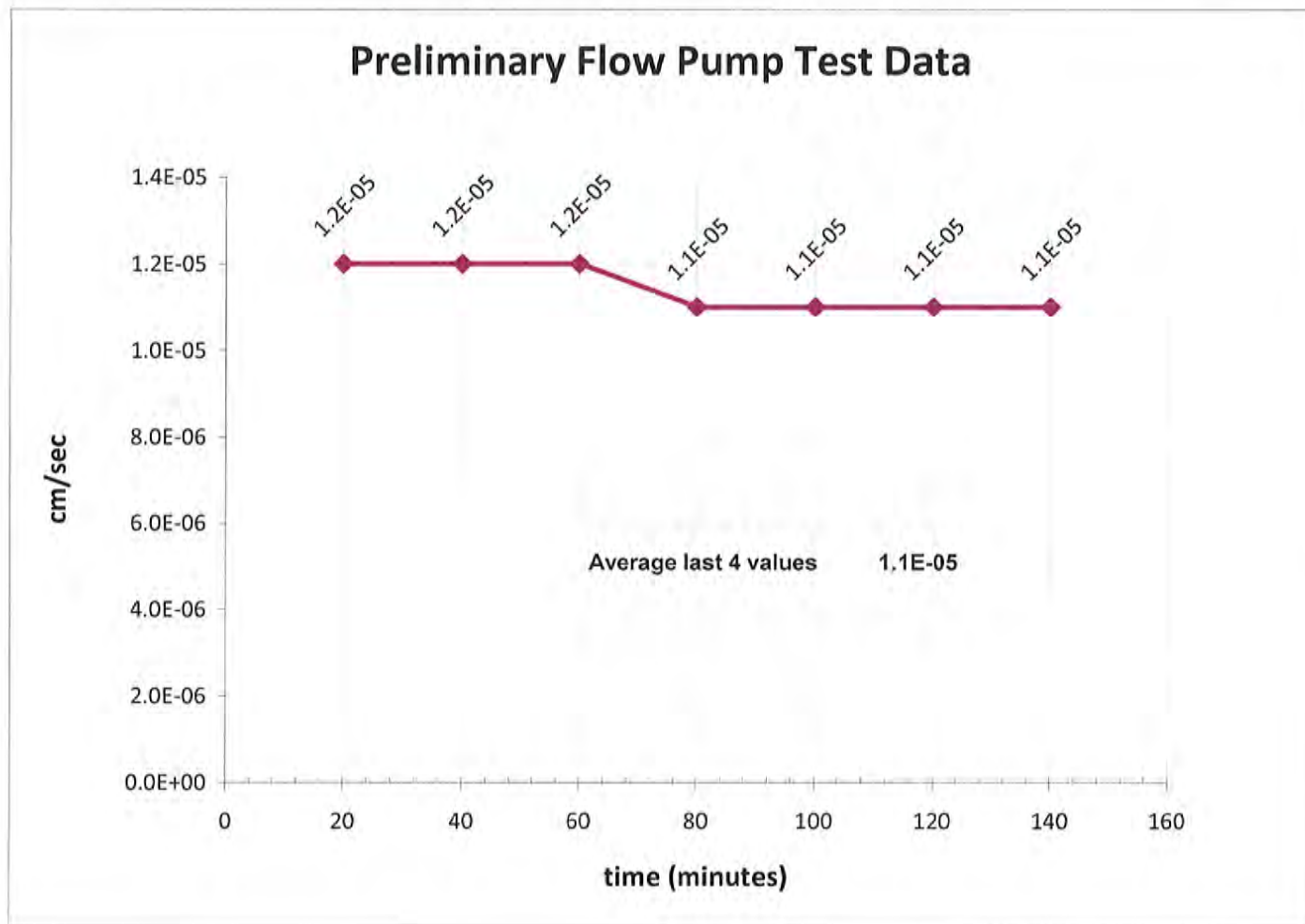
Time in Minutes



Preliminary Flow Pump Test Data ASTM D5084

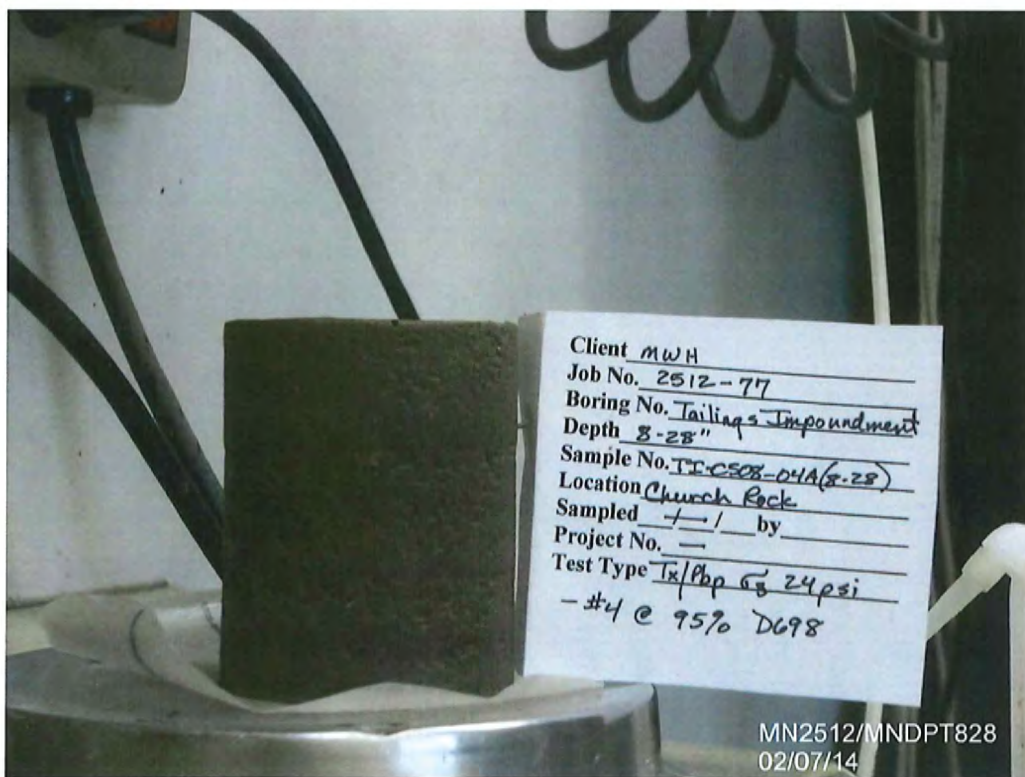
Client: MWH
Job Number: 2512_77
Project: --
Location: Church Rock
Project Number: --

Boring Number: Tailings Impoundment
Depth: 8-28"
Sample Number: TI-CS08-04A @ 95% D698
Sampled Date: --
Test Date: 2/6/2014
Sampled By: MWH
Technician: CAL



Data Entered By: CAL
Date: 2/12/2014
File Name: 2512_77_PrelimPerm_ASTMD-5084-methodD_3.xls

Checked By: CH
Date: 2/13/14



Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 8-28"
Sample No. TE-CS08-04A(8-28)
Location Church Rock
Sampled 1-1 by
Project No. -
Test Type Tx/Pop 63 24 psi
- #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: OK Date: 2/06/14
 FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_1.xls

TRIAXIAL TEST DATA
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. Tailings Impoundment
DEPTH 8-28"
SAMPLE NO. TI-CS08-04A (8-28)
LOCATION Church Rock
PROJECT NO. --
SOIL DESCR. #4 @ 100%

SAMPLED --
TEST STARTED 01/27/14 CAL
TEST FINISHED 02/05/14 CAL
SETUP NO. 19S
SATURATED TEST Yes
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

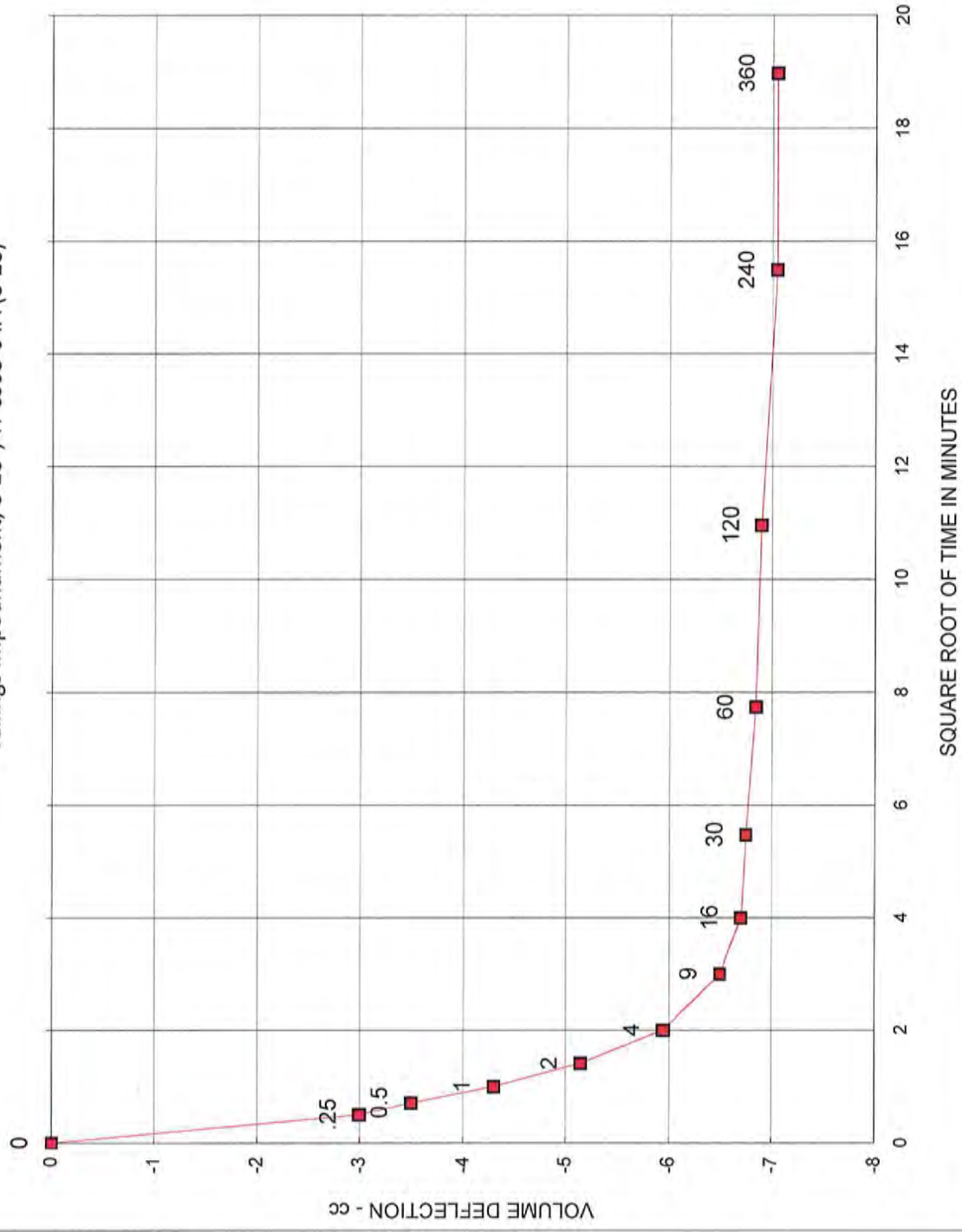
Checked by: cm Date: 2/06/14

FileName: 2512_77_HarvardFlowPump-Perm-ASTMD-5084-R1_1.xls



CONSOLIDATION DATA

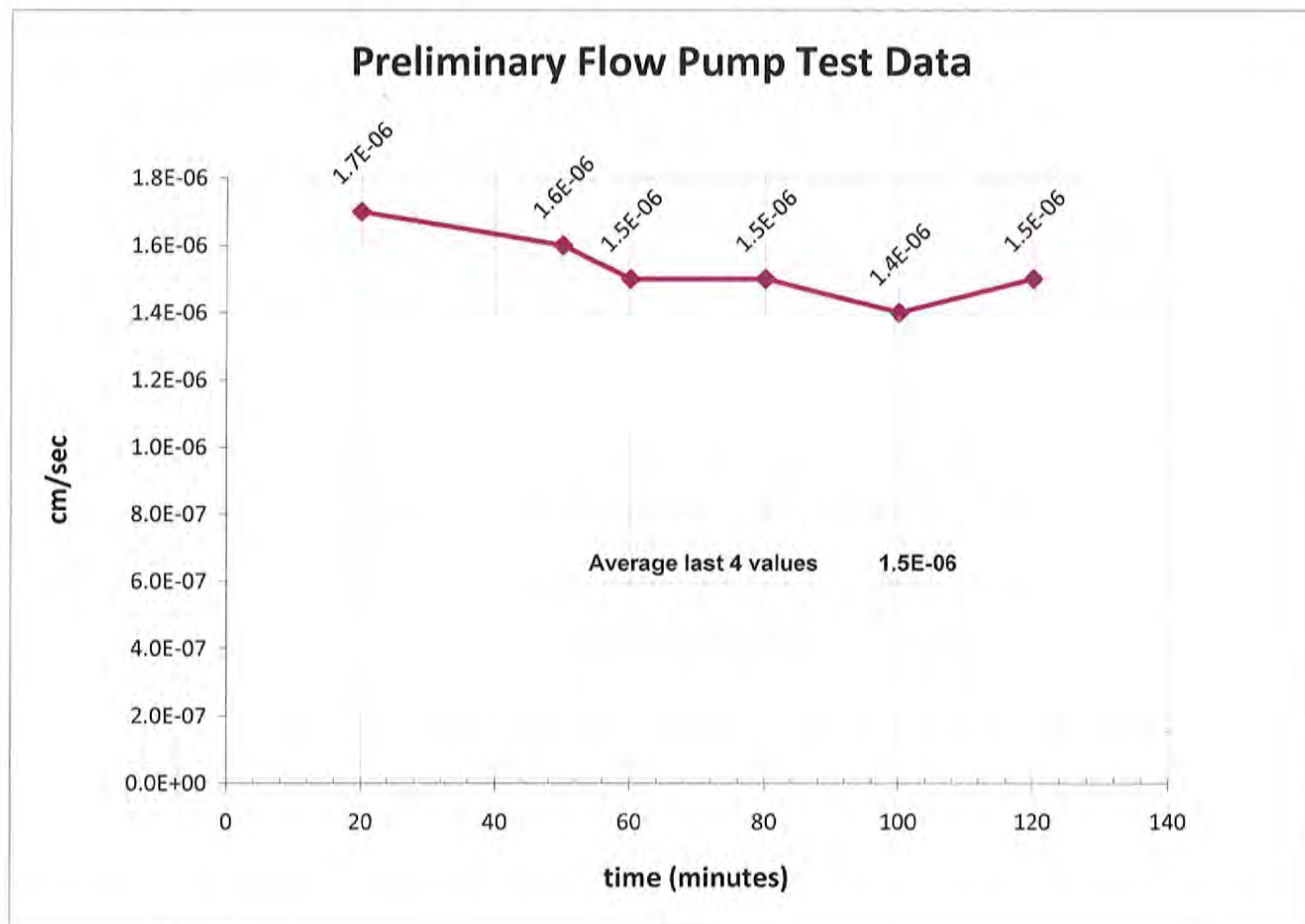
Tailings Impoundment, 8-28", TI-CS08-04A (8-28)



Preliminary Flow Pump Test Data ASTM D5084

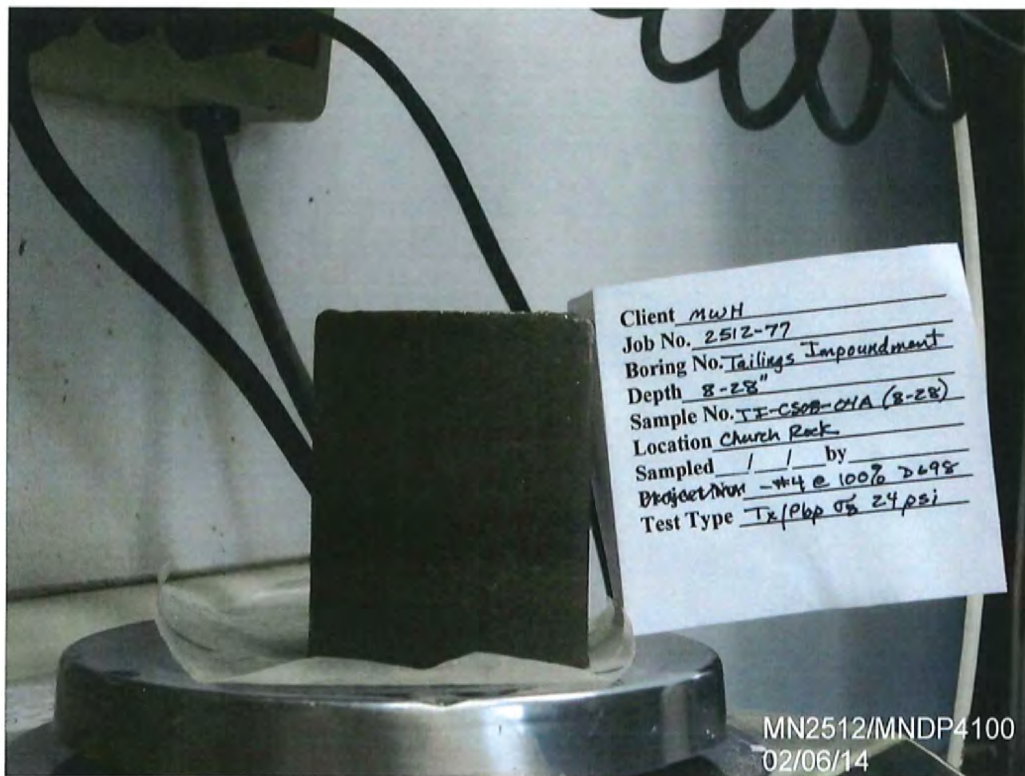
Client: MWH
Job Number: 2512_77
Project: --
Location: Church Rock
Project Number: --

Boring Number: Tailings Impoundment
Depth: 8-28"
Sample Number: TI-CS08-04A @ 100% D698
Sampled Date: --
Test Date: 2/5/2014
Sampled By: CAL
Technician: CAL



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

Checked By: OK
Date: 2/13/14



Client MWH
Job No. 2512-77
Boring No. Tailings Impoundment
Depth 8-28"
Sample No. TF-CSOB-CHA (8-28)
Location Church Rock
Sampled 1/1 by
Projection -#4 @ 100% > 698
Test Type Tr/Plp 0.5 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

	1	2	3	Average
Trial Number				
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

	1	2	3	Average
Trial Number				
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

Specific Gravity of Coarse Aggregate (ASTM C-127)

Sample: TI-CS09-02A

	1	2	3	Average
Trial Number				
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

CTC-GEOTEK, INC.155 South Navajo Street
Denver, Colorado 80223Project Name:
Quarry Source:
Project Number:Church Rock (ATT Job No. 2512 - 77)
Church Rock
143002Date: 6-20-2014
Technician: JW**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_4)**QUANTITATIVE EXAMINATION**

	INITIAL		FINAL				
	INDEPENDENT GRADING		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 Sieve 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					
1 1/2" (37.5 mm) to 1.0" (25.0 mm)	1000 ± 50	1000.8	100.0	1503.1	1498.1	0.3	0.33
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					
3/4" (19.0 mm) to 1/2" (12.5 mm)	670 ± 10	673.4	100.0	1005.3	1001.6	0.4	0.37
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					
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

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

QUALITATIVE EXAMINATION

	QUALITATIVE EXAMINATION									
	Particles Exhibiting Distress									
	Splitting		Crumbling		Cracking		Flaking		Total Number of Test Particles	
	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 80223Date: 6-20-2014
Technician: JWProject Name:
Quarry Source:
Project Number:Church Rock (ATT Job No. 2512 - 77)
Church Rock
143002ASTM C 88-93, "Standard Test Method for Soundness
of Aggregates by Use of Sodium Sulfate or
Magnesium Sulfate"

Sample Identification: T1 - CS06 - 02A

Chemical Used: Sodium Sulfate (Na_2SO_4)**QUANTITATIVE EXAMINATION**

	INITIAL		FINAL				
	INDEPENDENT GRADING		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 Sieve 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					
1 1/2" (37.5 mm) to 1.0" (25.0 mm)	1000 ± 50	1012.3	100.0	1513.2	1487.8	1.7	1.68
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					
3/4" (19.0 mm) to 1/2" (12.5 mm)	670 ± 10	670.2	100.0	1004.3	1002.9	0.1	0.14
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					
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

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

QUALITATIVE EXAMINATION

	QUALITATIVE EXAMINATION									
	Particles Exhibiting Distress									
	Splitting		Crumbing		Cracking		Flaking		Total Number of Test Particles	
	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:
Quarry Source:
Project Number:

Church Rock (ATT Job No. 2512 - 77)
Church Rock
143002

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

Sample Identification:

T1 - CS09 - 02A

Chemical Used: Sodium Sulfate (Na_2SO_4)

QUANTITATIVE EXAMINATION

	INITIAL		FINAL				
	INDEPENDENT GRADING		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 Sieve 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	—	—	—	—	—
1 1/2" (37.5 mm) to 1.0" (25.0 mm)	1000 ± 50	1001.1	100.0	1507.1	1488.0	1.3	1.27
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	—	—	—	—	—
3/4" (19.0 mm) to 1/2" (12.5 mm)	670 ± 10	669.3	100.0	1001.4	989.7	1.2	1.17
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	—	—	—	—	—
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

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

QUALITATIVE EXAMINATION

	QUALITATIVE EXAMINATION									
	Particles Exhibiting Distress									
	Splitting		Crumbling		Cracking		Flaking		Total Number of Test Particles	
	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 80223Date: 6-20-2014
Technician: JWProject Name: Church Rock (ATT Job No. 2512 -77)
Quarry Source: Church Rock
Project Number: 143002ASTM 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:
PROJECT
PROJECT NO.

MWH
Church Rock
-

JOB NO.
LOCATION

2512-77
Tailings Impoundi

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:
Checked by:
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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

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Moisture Content Determinations
ASTM D 2216

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock
-

JOB NO. 2512-77
LOCATION
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)	28.833	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

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Moisture Content Determinations
ASTM D 2216

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock

JOB NO. 2512-77
LOCATION
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

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**Moisture Content Determinations
ASTM D 2216**

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock
-

JOB NO. 2512-77
LOCATION
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

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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

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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

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Moisture Content Determinations
ASTM D 2216

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

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Date: 12/18/2013
Date: 12/18/2013



Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock
-

JOB NO. **2512-77**
LOCATION
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

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Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock

JOB NO. 2512-77
LOCATION
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'	6.0-8.5'	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	0.00836
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	65.666	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	61.0-81.5'	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	Gravelly 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	98.2	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

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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

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Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock
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JOB NO. 2512-77
LOCATION
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

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Date: 5/23/14



Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock
-

JOB NO. 2512-77
LOCATION
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:
Checked by:
File name:

DPM

53
2512-77-M&D-ASTMD-2216-2937-R0-11.xls

Date: 2/5/2014
Date: 02/06/14



Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock
-

JOB NO. 2512-77
LOCATION
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) 74.48
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:
Checked by:
File name:

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2512_77_M&D-ASTMD-2216-2937-R0-12.xls

Date: 2/6/2014
Date: 02/06/14



**Moisture & Density Determinations
ASTM D 2216 & D 2937**

CLIENT:
PROJECT
PROJECT NO.

MWH
Curch Rock

JOB NO. 2512-77
LOCATION
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:
Checked by:
File name:

DPM

Date: 3/13/2014

Date: 3/14/14

M&D-ASTMD-2216-2937-R0-13.xls



Moisture & Density Determinations
ASTM D 2216 & D 2937

CLIENT:
PROJECT
PROJECT NO.

MWH
Church Rock
-

JOB NO. 2512-77
LOCATION
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:
Checked by:
File name:

DPM
67
M&D-ASTMD-2216-2937-R0-14.xls

Date: 3/13/2014
Date: 3/14/14



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
File Name: atterberg-ASTM_4318-R6_28.xls

Date: 4/10/2014

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

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

Data Checked By: BDF

File Name: atterberg-ASTM_4318-R6_43.xls

Date: 5/7/14

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

Data Checked By: BDF

File Name: atterberg-ASTM_4318-R6_38.xls

Date: 5/7/14

Atterberg Limits Test
ASTM D 4318

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

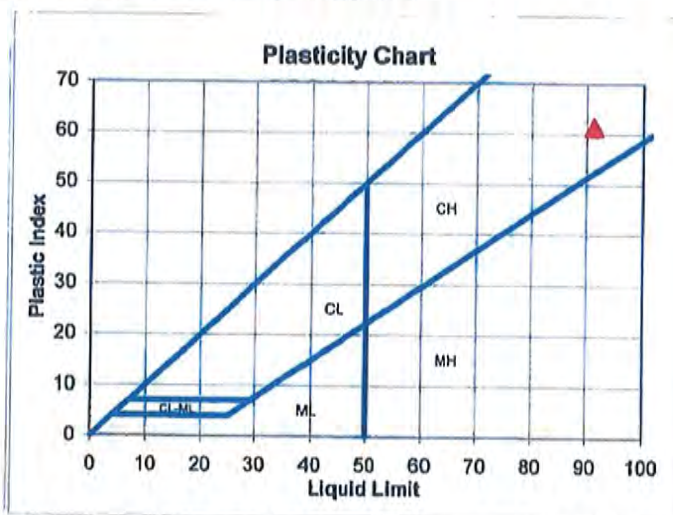
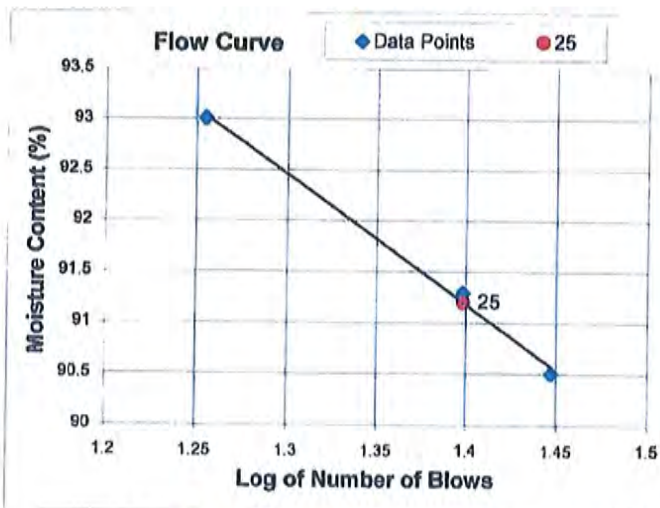
	Sample 1	Sample 2	Sample 3
Number of Blows:	25	28	18
Weight of Wet Soil & Pan (g):	12.330	12.685	12.216
Weight of Dry Soil & Pan (g):	7.003	7.204	6.884
Weight of Water (g):	5.327	5.481	5.332
Weight of Pan (g):	1.168	1.148	1.151
Moisture Content (%):	91.3	90.5	93.0

Plastic Limit: 30

Liquid Limit: 91

Plastic Index: 61

Atterberg Classification CH



Data Entered By: DPM

Date: 5/4/2014

Data Checked By: BDF

File Name: atterberg-ASTM_4318-R6_40.xls

Date: 5/7/14

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

Data Checked By: BDF

File Name: atterberg-ASTM_4318-R6_42.xls

Date: 5/7/14

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

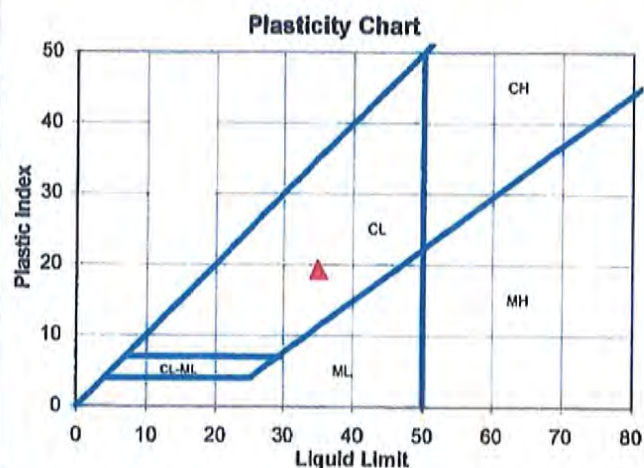
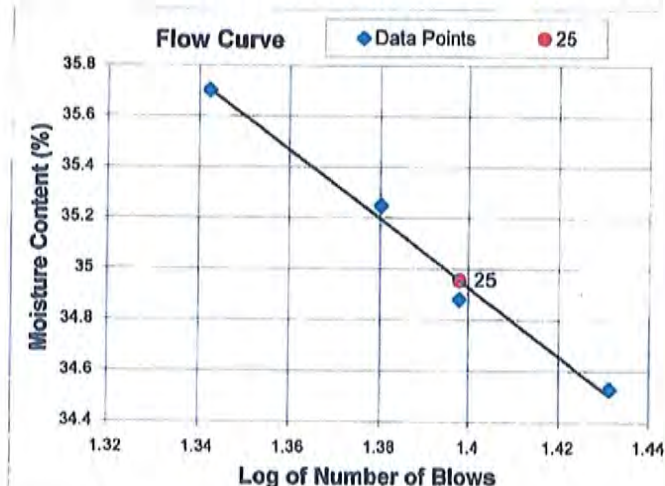
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	24	25	27	22
Weight of Wet Soil & Pan (g):	11.695	11.436	10.790	11.968
Weight of Dry Soil & Pan (g):	8.841	8.670	8.210	9.013
Weight of Water (g):	2.854	2.766	2.580	2.955
Weight of Pan (g):	0.744	0.740	0.738	0.736
Moisture Content (%):	35.2	34.9	34.5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

Plastic Limit: 16

Liquid Limit: 35

Plastic Index: 19

Atterberg Classification CL



Data Entered By: DPM

Date: 3/13/2014

Data Checked By: h

File Name: atterberg-ASTM_4318-R6_19.xls

Date: 3/14/14

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

Data Checked By: h

File Name: atterberg-ASTM_4318-R6_18.xls

Date: 03/06/2014

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: h
File Name: 2512_77_atterberg-ASTM_4318-R6_16.x Date: 03/06/2014

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

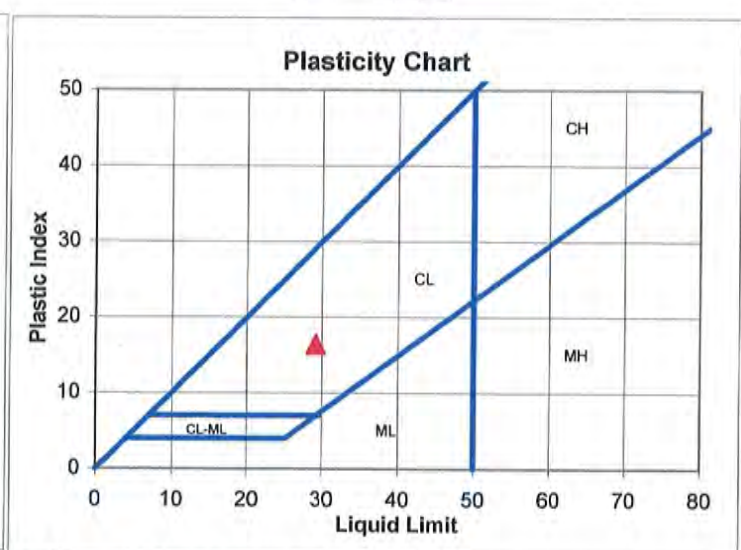
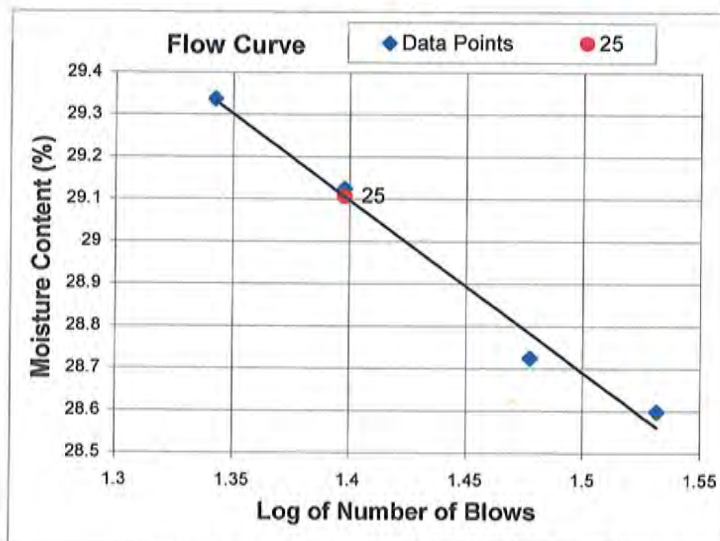
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	34	25	22	30
Weight of Wet Soil & Pan (g):	17.434	14.027	14.368	14.923
Weight of Dry Soil & Pan (g):	13.812	11.121	11.378	11.846
Weight of Water (g):	3.622	2.906	2.990	3.077
Weight of Pan (g):	1.147	1.143	1.186	1.134
Moisture Content (%):	28.6	29.1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

Plastic Limit: 13

Liquid Limit: 29

Plastic Index: 16

Atterberg Classification CL



Data Entered By: DPM

Date: 5/9/2014

Data Checked By: DAW

File Name: atterberg-ASTM_4318-R6_37-60c.xls

Date: 05/22/14

**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

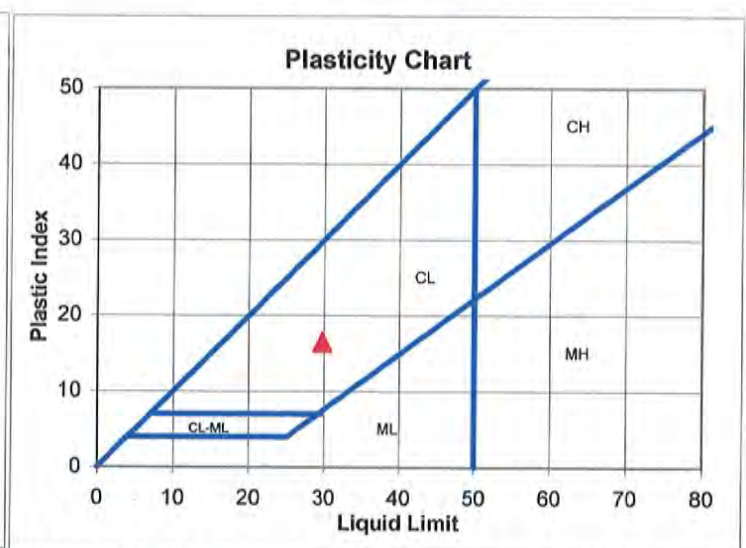
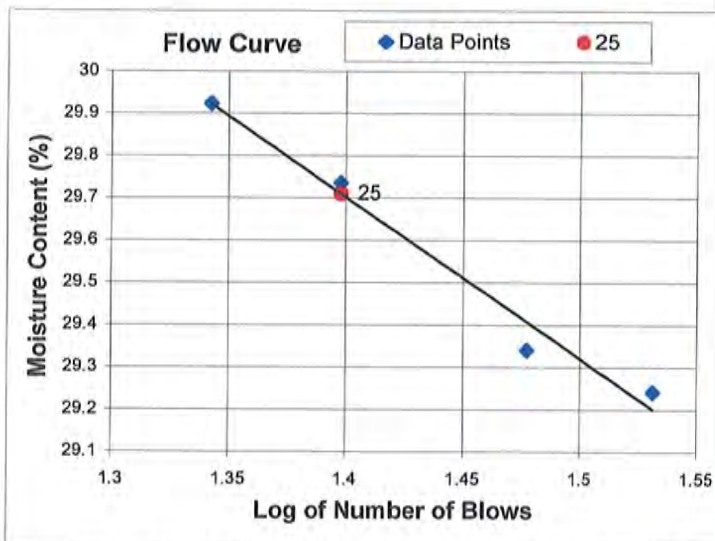
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	34	25	22	30
Weight of Wet Soil & Pan (g):	17.434	14.027	14.368	14.923
Weight of Dry Soil & Pan (g):	13.749	11.074	11.332	11.795
Weight of Water (g):	3.685	2.953	3.036	3.128
Weight of Pan (g):	1.147	1.143	1.186	1.134
Moisture Content (%):	29.2	29.7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

Plastic Limit: 13

Liquid Limit: 30

Plastic Index: 17

Atterberg Classification CL



Data Entered By: DPM

Date: 5/9/2014

Data Checked By: DAW

File Name: atterberg-ASTM_4318-R6_37-110c.xls

Date: 05/22/14

**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

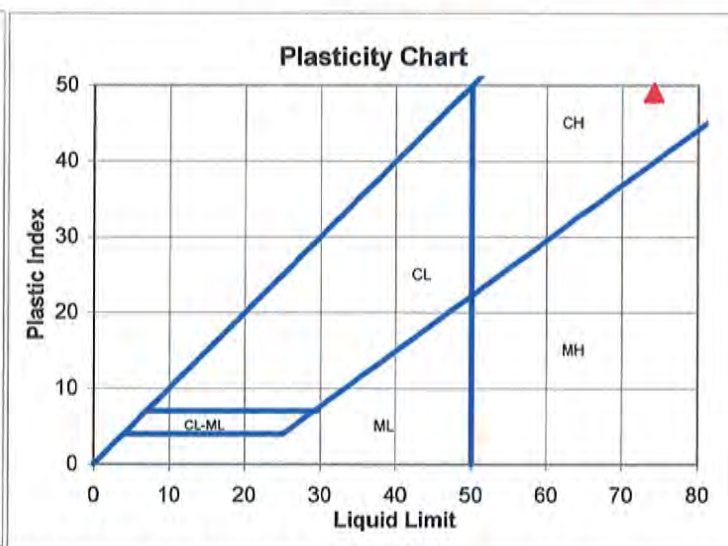
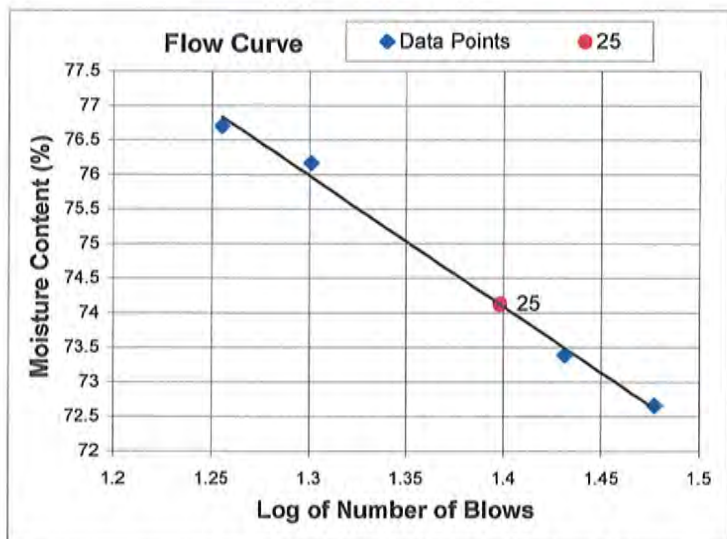
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	30	27	20	18
Weight of Wet Soil & Pan (g):	11.360	14.173	12.090	12.695
Weight of Dry Soil & Pan (g):	7.055	8.649	7.357	7.685
Weight of Water (g):	4.305	5.524	4.733	5.010
Weight of Pan (g):	1.130	1.122	1.143	1.153
Moisture Content (%):	72.7	73.4	76.2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

Plastic Limit: 25

Liquid Limit: 74

Plastic Index: 49

Atterberg Classification CH



Data Entered By: DPM

Date: 5/8/2014

Data Checked By: DAV

File Name: atterberg-ASTM_4318-R6_39-60c.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-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

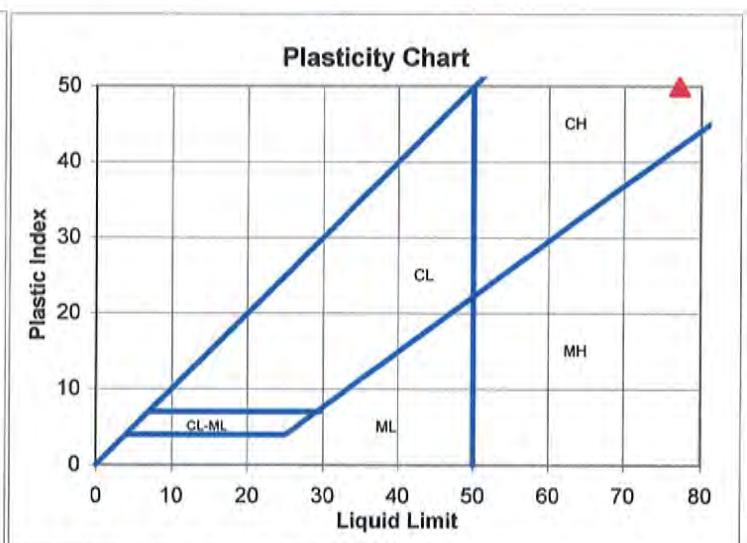
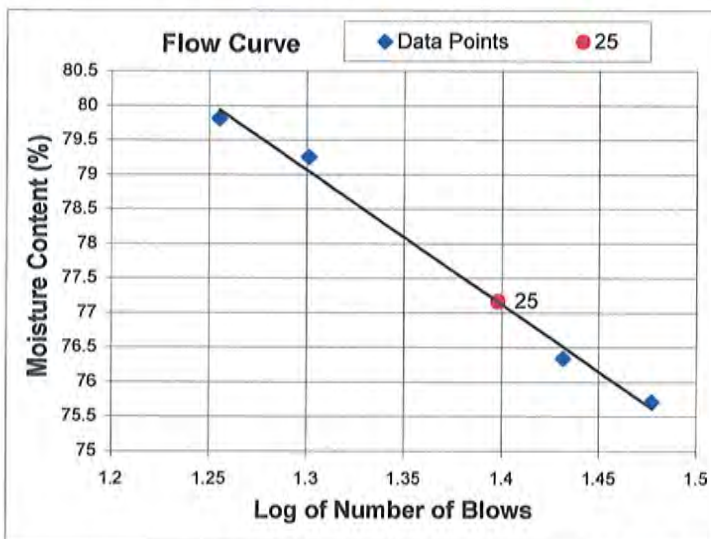
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	30	27	20	18
Weight of Wet Soil & Pan (g):	11.360	14.173	12.090	12.695
Weight of Dry Soil & Pan (g):	6.952	8.523	7.250	7.572
Weight of Water (g):	4.408	5.650	4.840	5.123
Weight of Pan (g):	1.130	1.122	1.143	1.153
Moisture Content (%):	75.7	76.3	79.3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

Plastic Limit: 27

Liquid Limit: 77

Plastic Index: 50

Atterberg Classification CH



Data Entered By: DPM

Date: 5/8/2014

Data Checked By: KR

File Name: atterberg-ASTM_4318-R6_39-110c.xls

Date: 5/23/14

**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

	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

Note: The sample was dried at 60c.

Average: 15.1%

Standard Deviation: 0.3%

Liquid Limits

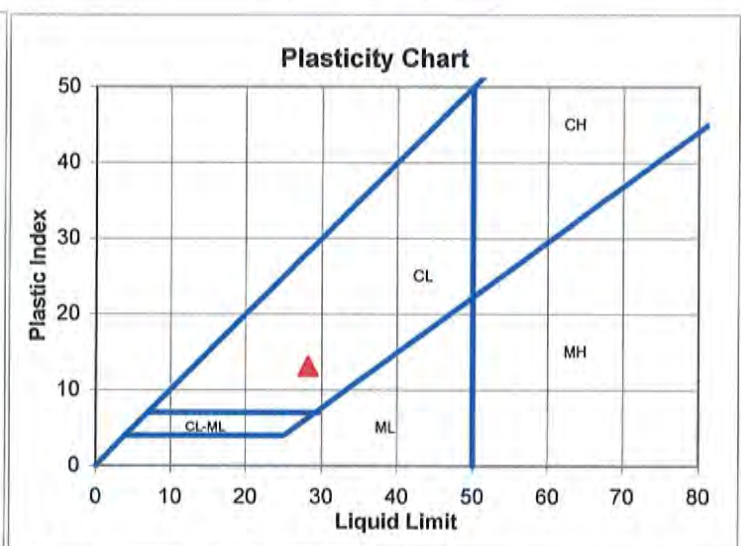
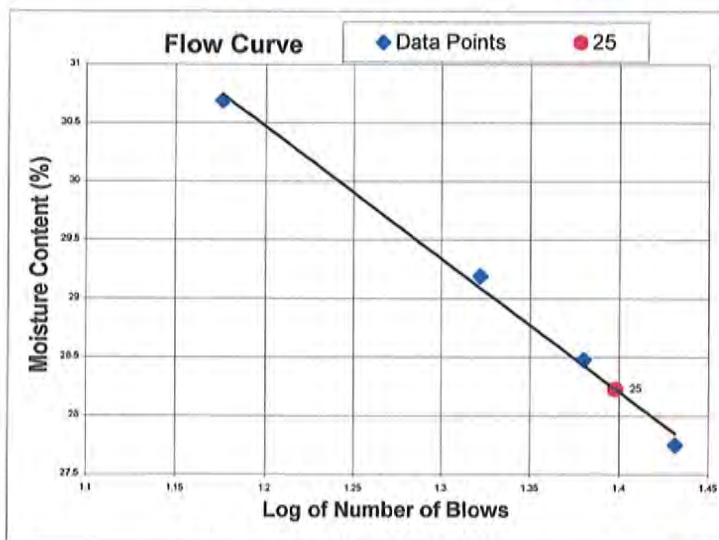
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	27	24	21	15
Weight of Wet Soil & Pan (g):	14.758	14.824	17.478	14.979
Weight of Dry Soil & Pan (g):	11.718	11.704	13.700	11.641
Weight of Water (g):	3.040	3.120	3.778	3.338
Weight of Pan (g):	0.763	0.741	0.756	0.764
Moisture Content (%):	27.7	28.5	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

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

	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

Note: The sample was dried at 110c.

Average: 16.2%

Standard Deviation: 0.3%

Liquid Limits

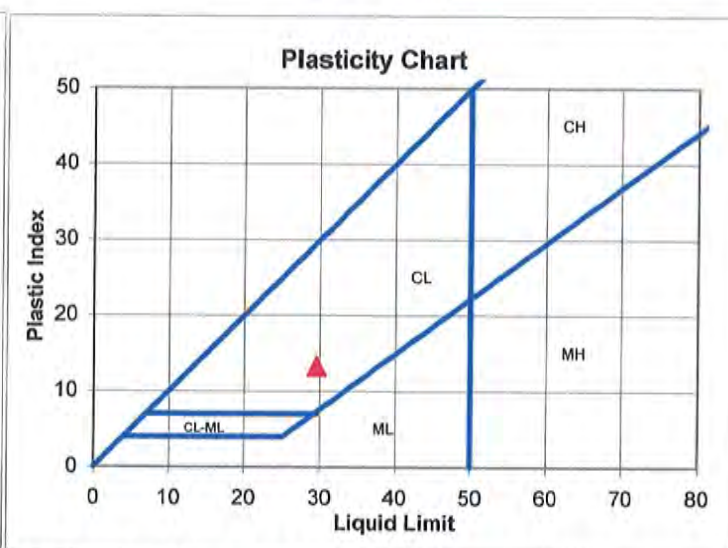
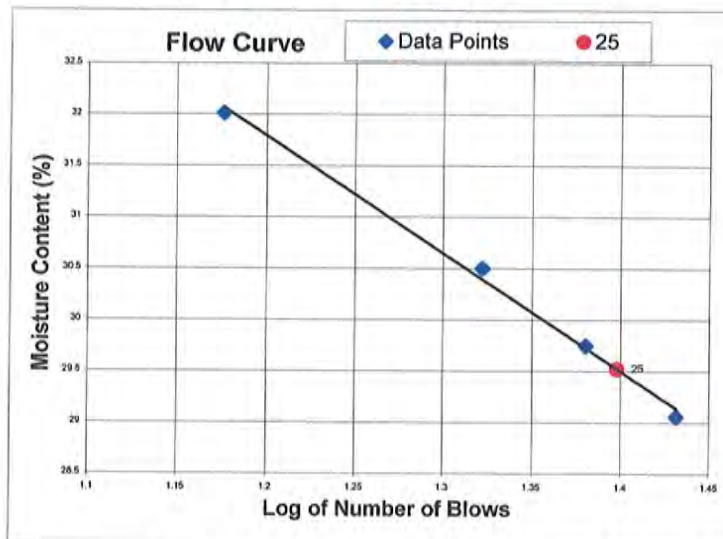
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	27	24	21	15
Weight of Wet Soil & Pan (g):	14.758	14.824	17.478	14.979
Weight of Dry Soil & Pan (g):	11.607	11.595	13.570	11.532
Weight of Water (g):	3.151	3.229	3.908	3.447
Weight of Pan (g):	0.763	0.741	0.756	0.764
Moisture Content (%):	29.1	29.7	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: DPM

File Name: atterberg-ASTM_4318-R6_36-110c.xls

Date: 05/22/14

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

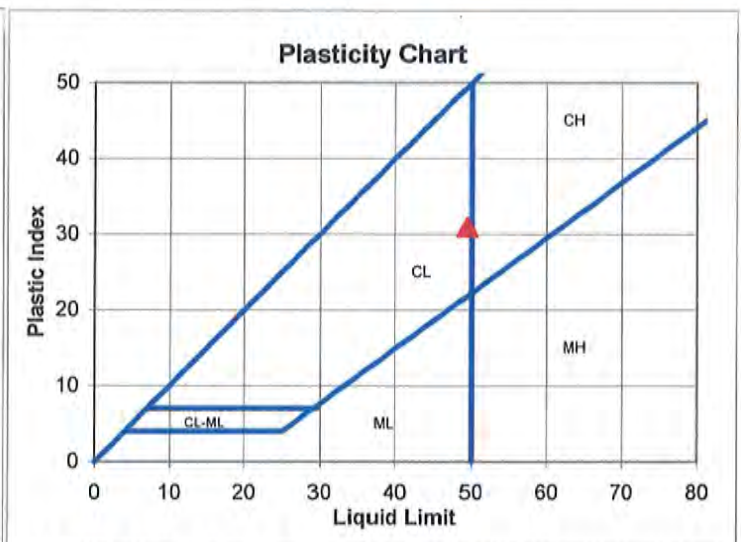
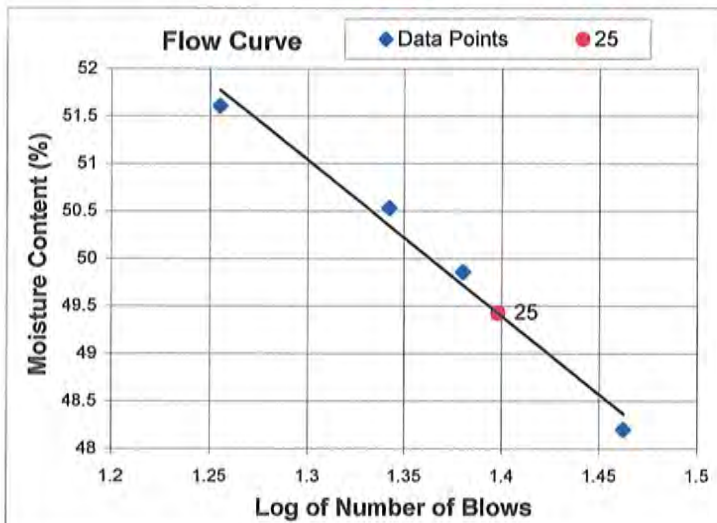
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	29	24	22	18
Weight of Wet Soil & Pan (g):	16.288	16.376	13.533	15.741
Weight of Dry Soil & Pan (g):	11.240	11.187	9.248	10.639
Weight of Water (g):	5.048	5.189	4.285	5.102
Weight of Pan (g):	0.767	0.779	0.768	0.753
Moisture Content (%):	48.2	49.9	50.5	51.6

Plastic Limit: 18

Liquid Limit: 49

Plastic Index: 31

Atterberg Classification CL



Data Entered By: DPM

Date: 5/1/2014

Data Checked By: DAW

File Name: 2512_77_atterberg-ASTM_4318-R6_32.x Date: 05/23/14

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

Data Checked By: CKP

File Name: atterberg-ASTM_4318-R6_35.xls

Date: 4/29/14

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

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

Data Checked By: bj

File Name: atterberg-ASTM_4318-R6_17.xls

Date: 03/06/2014

**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

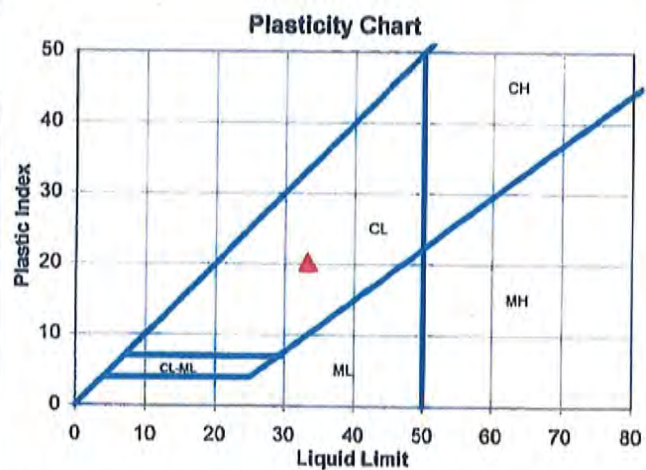
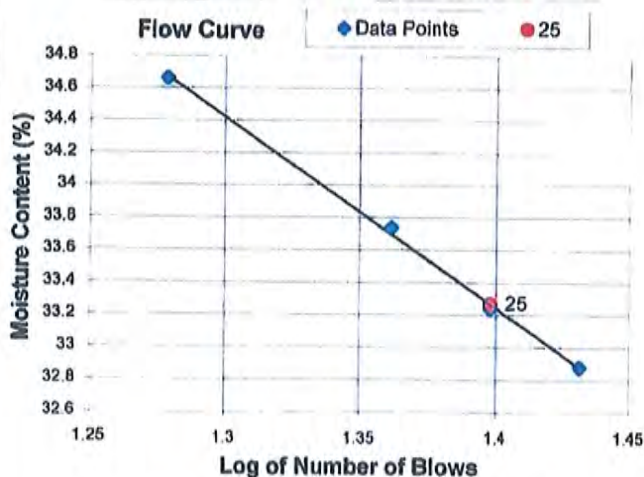
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	25	27	23	19
Weight of Wet Soil & Pan (g):	13.892	15.609	14.942	16.233
Weight of Dry Soil & Pan (g):	10.615	11.931	11.362	12.246
Weight of Water (g):	3.277	3.678	3.580	3.987
Weight of Pan (g):	0.756	0.744	0.750	0.743
Moisture Content (%):	33.2	32.9	33.7	34.7

Plastic Limit: 13

Liquid Limit: 33

Plastic Index: 20

Atterberg Classification CL



Data Entered By: DPM

Date: 3/13/2014

Data Checked By: h

File Name: atterberg-ASTM_4318-R6_21.xls

Date: 3/14/14

**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

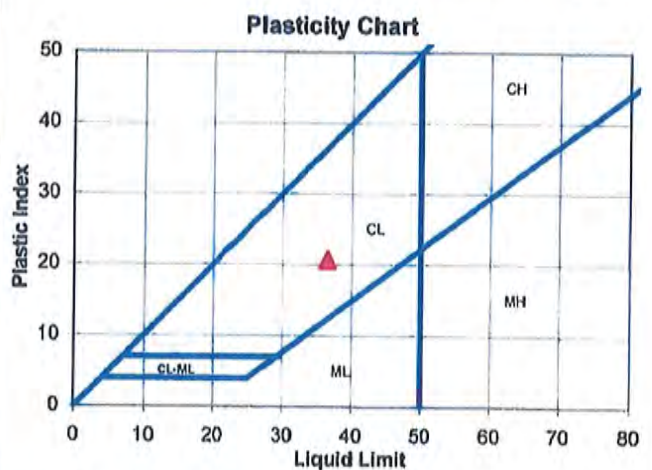
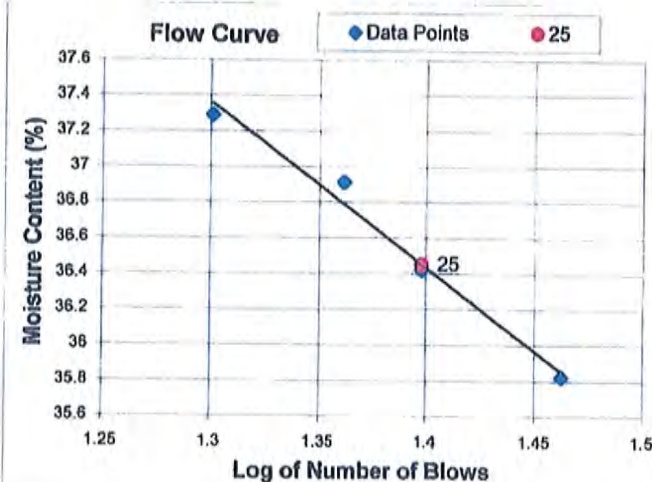
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	29	23	25	20
Weight of Wet Soil & Pan (g):	13.507	13.608	12.995	12.497
Weight of Dry Soil & Pan (g):	10.147	10.146	9.731	9.311
Weight of Water (g):	3.360	3.462	3.264	3.186
Weight of Pan (g):	0.767	0.767	0.769	0.767
Moisture Content (%):	35.8	36.9	36.4	37.3

Plastic Limit: 16

Liquid Limit: 36

Plastic Index: 21

Atterberg Classification CL



Data Entered By: DPM

Date: 3/13/2014

Data Checked By: by

File Name: atterberg-ASTM_4318-R6_20.xls

Date: 3/14/14

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
File Name: atterberg-ASTM_4318-R6_27.xls

Date: 4/10/2014

Data Checked By:
Date: 4/11/14

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

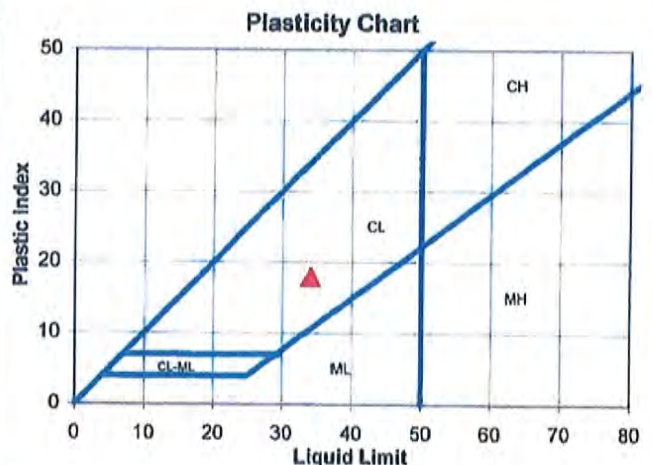
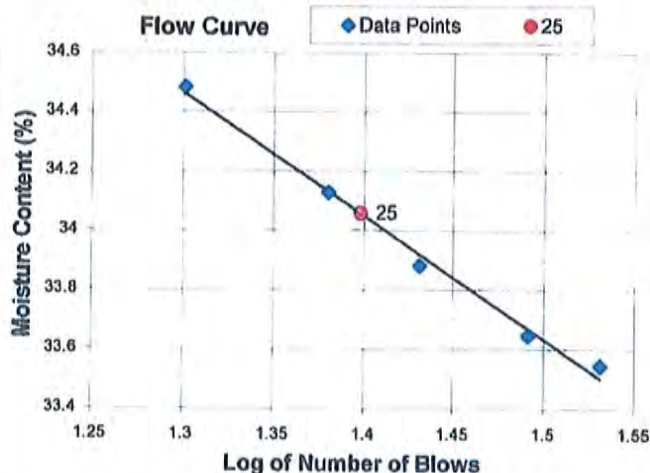
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	20	24	27	31	34
Weight of Wet Soil & Pan (g):	14.208	16.872	14.876	15.734	16.537
Weight of Dry Soil & Pan (g):	10.760	12.772	11.306	11.967	12.574
Weight of Water (g):	3.448	4.100	3.570	3.767	3.963
Weight of Pan (g):	0.761	0.758	0.769	0.771	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



Data Entered By: DPM

Date: 3/17/2014

Data Checked By: DPM

File Name: atterberg-ASTM_4318-R6_22.xls

Date: 4/11/14

Atterberg Limits Test
ASTM D 4318

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
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

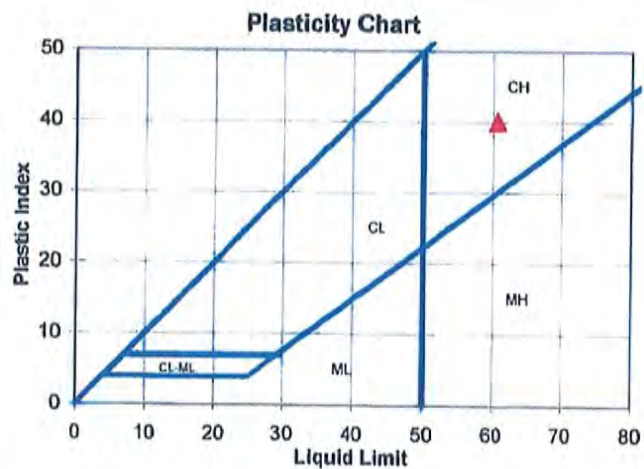
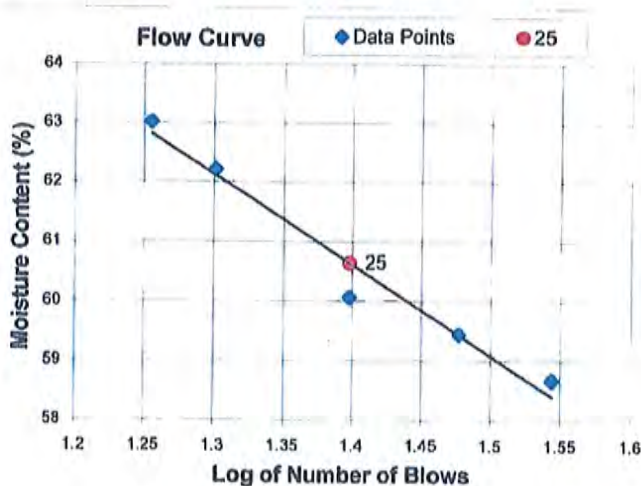
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	35	30	25	20	18
Weight of Wet Soil & Pan (g):	15.070	12.400	13.564	11.815	14.478
Weight of Dry Soil & Pan (g):	9.874	8.152	8.849	7.681	9.274
Weight of Water (g):	5.196	4.248	4.715	4.134	5.204
Weight of Pan (g):	1.018	1.006	0.999	1.036	1.016
Moisture Content (%):	58.7	59.4	60.1	62.2	63.0

Plastic Limit: 21

Liquid Limit: 61

Plastic Index: 40

Atterberg Classification CH



Data Entered By: DPM

Date: 4/10/2014

Data Checked By: bj

File Name: atterberg-ASTM_4318-R6_29.xls

Date: 4/11/14

**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

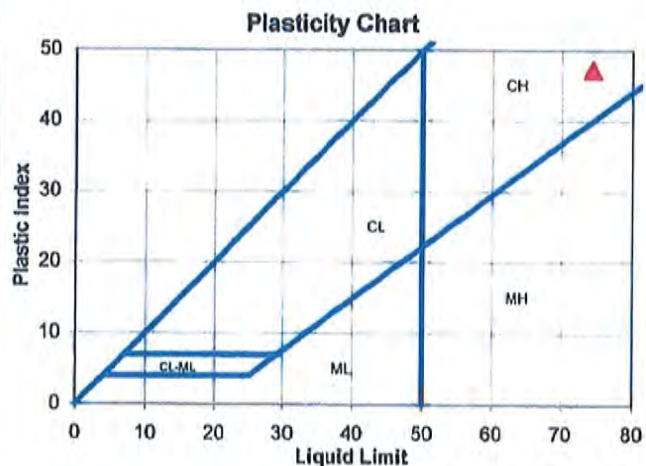
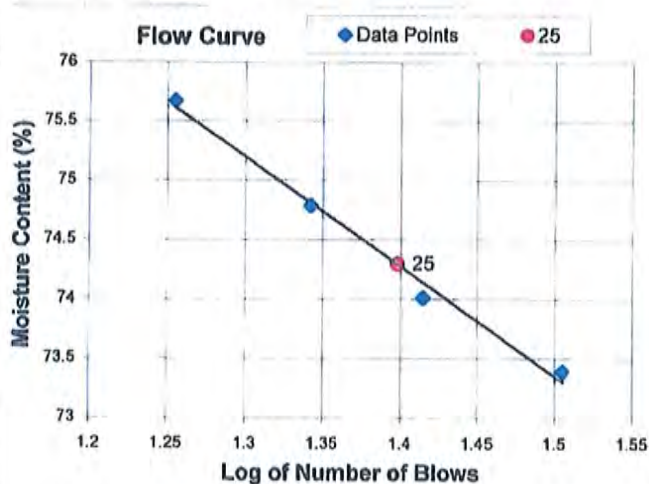
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	32	26	25	18	22
Weight of Wet Soil & Pan (g):	14.462	14.569	14.101	13.907	16.284
Weight of Dry Soil & Pan (g):	8.785	8.803	8.524	8.355	9.750
Weight of Water (g):	5.677	5.766	5.577	5.552	6.534
Weight of Pan (g):	1.050	1.012	1.018	1.018	1.013
Moisture Content (%):	73.4	74.0	74.3	75.7	74.8

Plastic Limit: 27

Liquid Limit: 74

Plastic Index: 47

Atterberg Classification CH



Data Entered By: DPM

Date: 3/17/2014

Data Checked By: bj

File Name: atterberg-ASTM_4318-R6_23.xls

Date: 4/11/14

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: bj

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

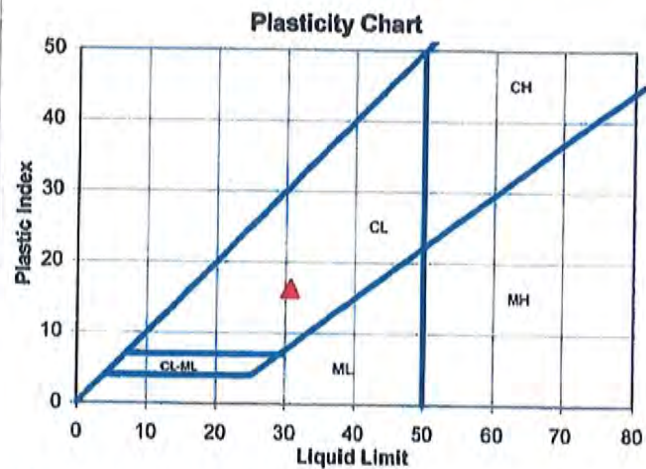
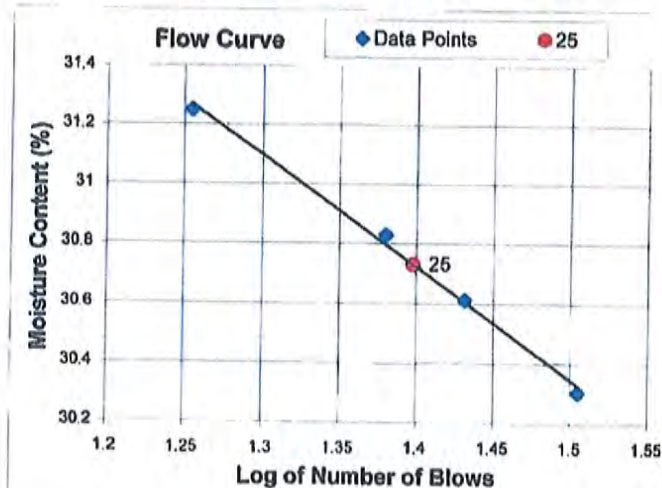
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	18	24	27	32
Weight of Wet Soil & Pan (g):	15.605	15.144	14.679	14.080
Weight of Dry Soil & Pan (g):	12.127	11.808	11.477	11.048
Weight of Water (g):	3.478	3.336	3.202	3.032
Weight of Pan (g):	0.997	0.987	1.017	1.043
Moisture Content (%):	31.2	30.8	30.6	30.3

Plastic Limit: 14

Liquid Limit: 31

Plastic Index: 16

Atterberg Classification CL



Data Entered By: DPM

Date: 4/14/2014

Data Checked By: bj

File Name: atterberg-ASTM_4318-R6_24.xls

Date: 4/18/14

**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

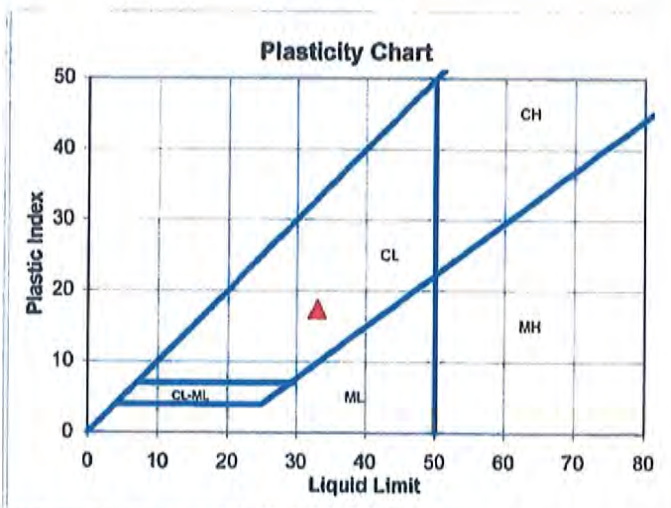
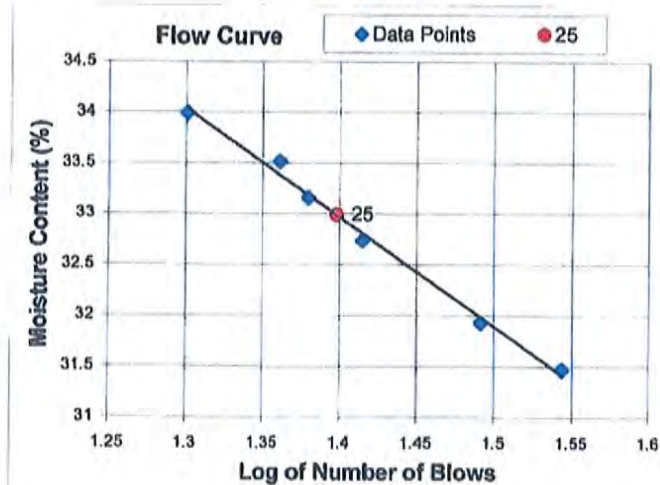
Plastic Limit: 16

Liquid Limit: 33

Plastic Index: 17

Atterberg Classification

CL



Data Entered By: DPM

Date: 4/16/2014

Data Checked By: h

File Name: atterberg-ASTM_4318-R6_30.xls

Date: 4/18/14

**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

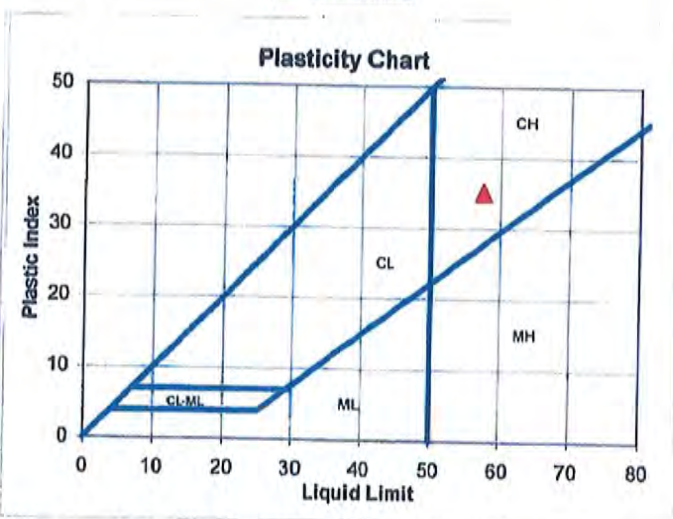
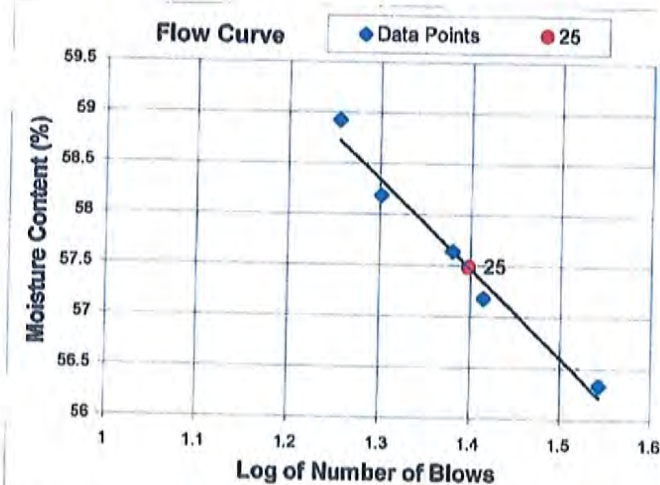
Plastic Limit: 22

Liquid Limit: 57

Plastic Index: 35

Atterberg Classification

CH



Data Entered By: DPM

File Name: atterberg-ASTM_4318-R6_31.xls

Date: 4/17/2014

Data Checked By: bj

Date: 4/18/14

**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

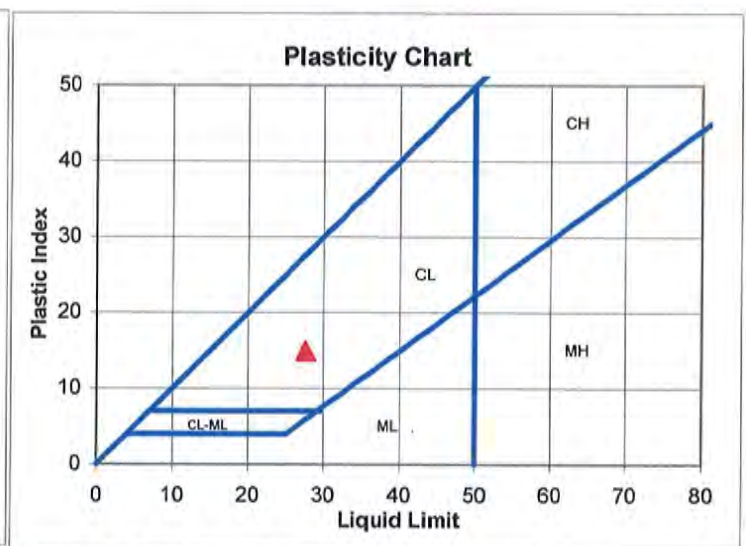
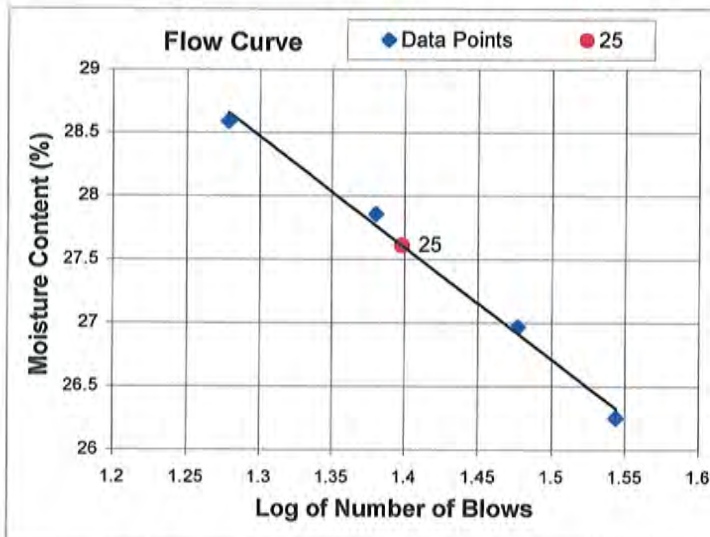
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	35	30	24	19
Weight of Wet Soil & Pan (g):	16.804	14.996	15.489	11.259
Weight of Dry Soil & Pan (g):	13.465	11.971	12.276	8.925
Weight of Water (g):	3.339	3.025	3.213	2.334
Weight of Pan (g):	0.746	0.753	0.742	0.761
Moisture Content (%):	26.3	27.0	27.9	28.6

Plastic Limit: 13

Liquid Limit: 28

Plastic Index: 15

Atterberg Classification CL



Data Entered By: DPM

Date: 2/11/2014

Data Checked By: hj

File Name: atterberg-ASTM_4318-R6_14.xls

Date: 2/14/14

**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

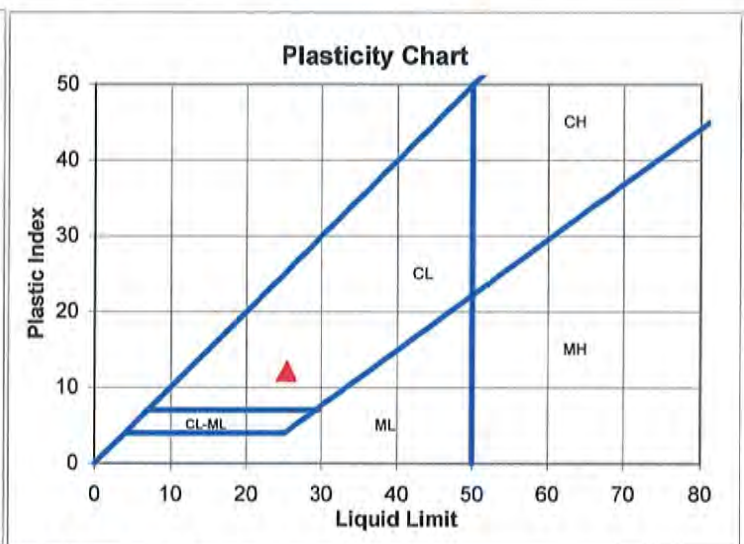
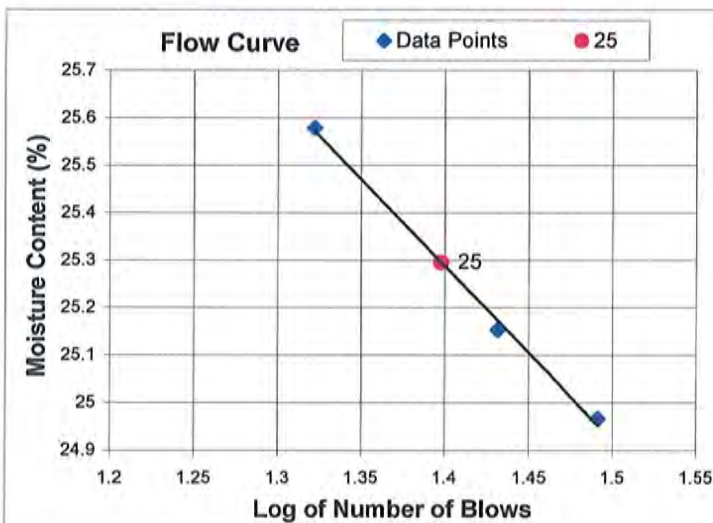
	Sample 1	Sample 2	Sample 3
Number of Blows:	21	27	31
Weight of Wet Soil & Pan (g):	15.310	16.899	15.564
Weight of Dry Soil & Pan (g):	12.348	13.655	12.608
Weight of Water (g):	2.962	3.244	2.956
Weight of Pan (g):	0.768	0.758	0.768
Moisture Content (%):	25.6	25.2	25.0

Plastic Limit: 13

Liquid Limit: 25

Plastic Index: 12

Atterberg Classification CL



Data Entered By: DPM

File Name: atterberg-ASTM_4318-R6_13.xls

Date: 2/11/2014

Data Checked By: bj

Date: 2/14/14

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

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

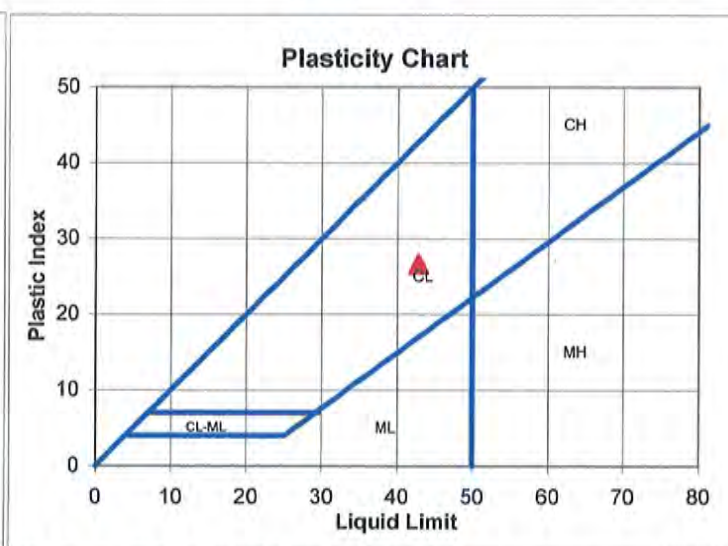
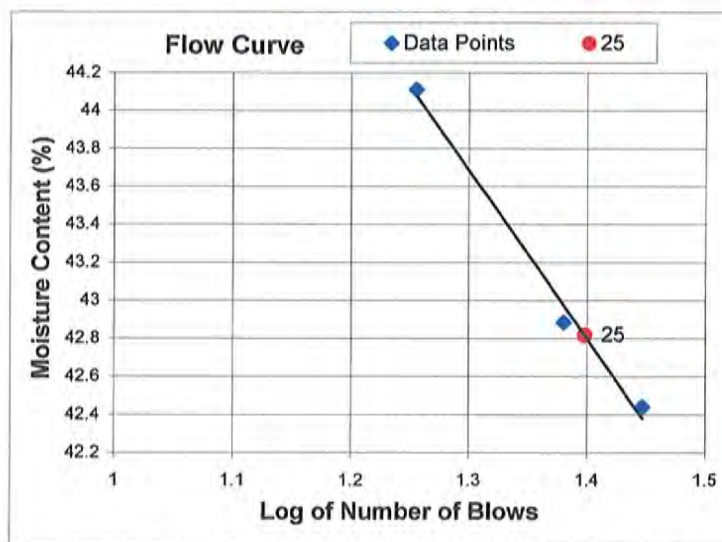
	Sample 1	Sample 2	Sample 3
Number of Blows:	28	24	18
Weight of Wet Soil & Pan (g):	14.338	12.470	13.759
Weight of Dry Soil & Pan (g):	10.417	9.065	9.891
Weight of Water (g):	3.921	3.405	3.868
Weight of Pan (g):	1.178	1.125	1.122
Moisture Content (%):	42.4	42.9	44.1

Plastic Limit: 16

Liquid Limit: 43

Plastic Index: 27

Atterberg Classification CL



Data Entered By: DPM

Date: 5/9/2014

Data Checked By: DAW

File Name: atterberg-ASTM_4318-R6_44-60c.xls

Date: 05/23/14

**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

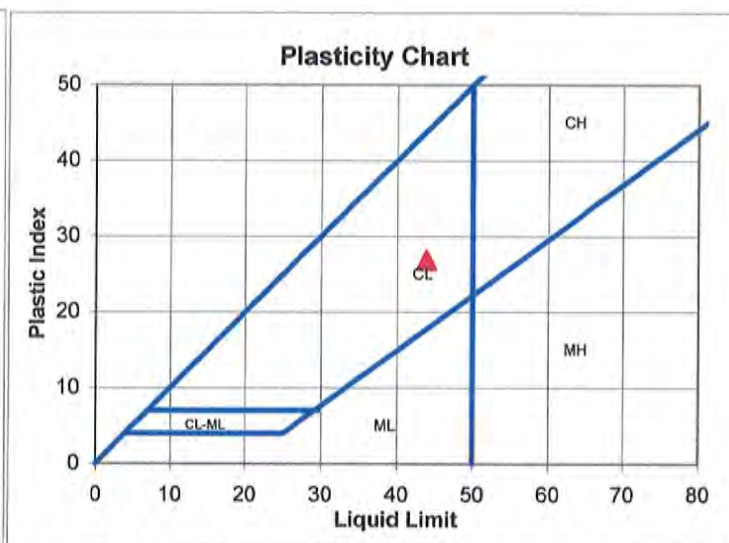
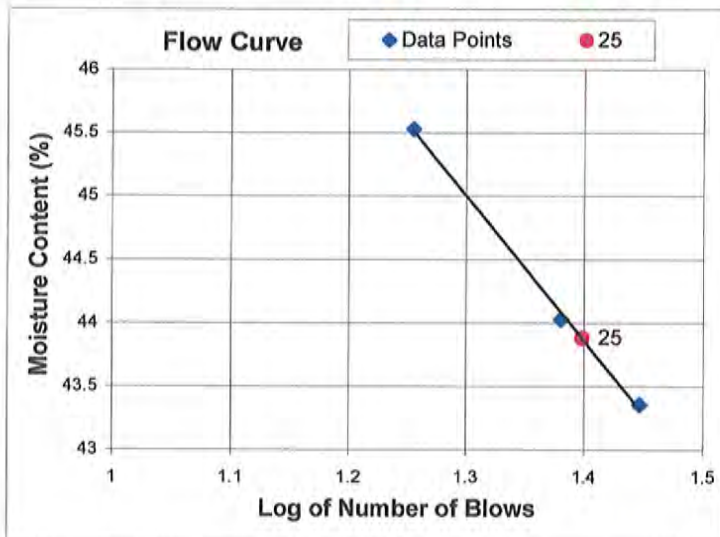
	Sample 1	Sample 2	Sample 3
Number of Blows:	28	24	18
Weight of Wet Soil & Pan (g):	14.338	12.470	13.860
Weight of Dry Soil & Pan (g):	10.358	9.002	9.878
Weight of Water (g):	3.980	3.468	3.982
Weight of Pan (g):	1.178	1.125	1.132
Moisture Content (%):	43.4	44.0	45.5

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

**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

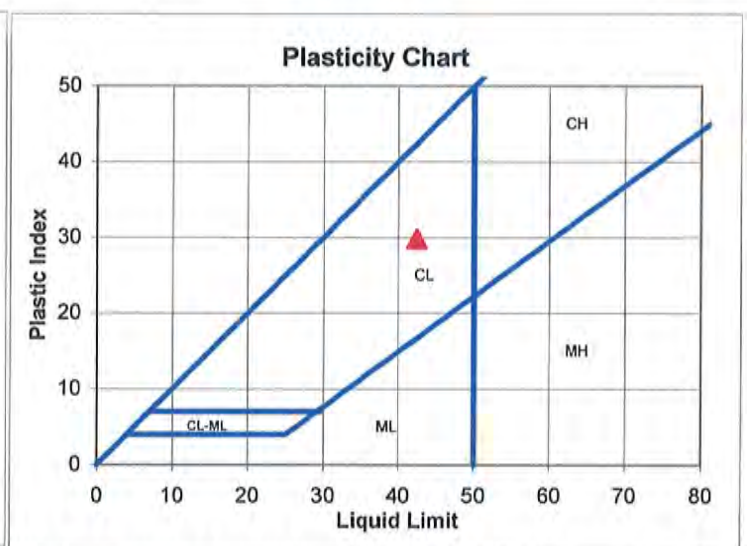
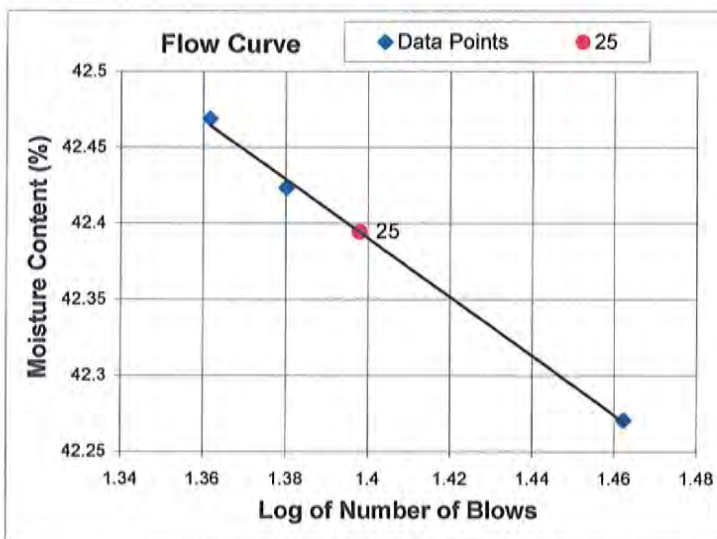
	Sample 1	Sample 2	Sample 3
Number of Blows:	23	24	29
Weight of Wet Soil & Pan (g):	12.698	15.305	13.182
Weight of Dry Soil & Pan (g):	9.247	11.086	9.600
Weight of Water (g):	3.451	4.219	3.582
Weight of Pan (g):	1.121	1.141	1.126
Moisture Content (%):	42.5	42.4	42.3

Plastic Limit: 13

Liquid Limit: 42

Plastic Index: 30

Atterberg Classification CL



Data Entered By: DPM

Date: 5/9/2014

Data Checked By: DAW

File Name: atterberg-ASTM_4318-R6_49.xls

Date: 05/23/14

**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

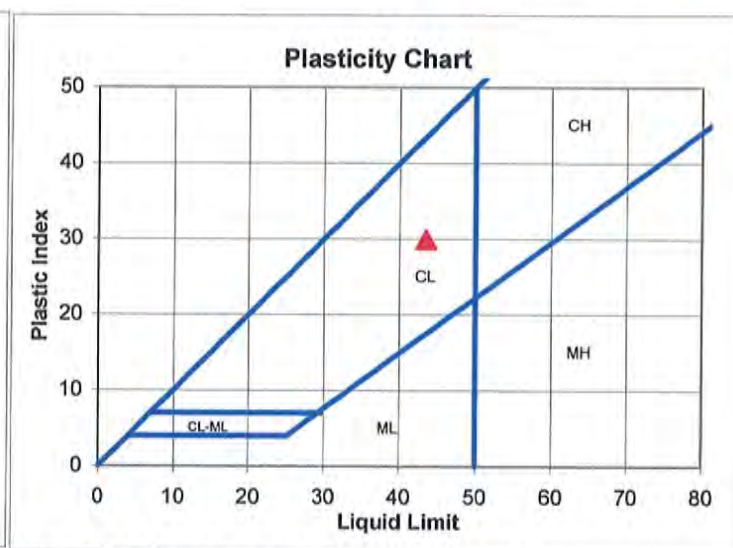
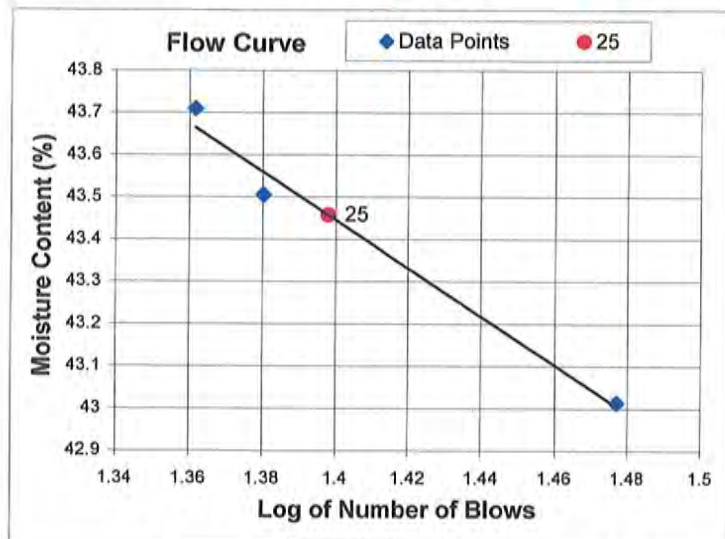
	Sample 1	Sample 2	Sample 3
Number of Blows:	24	30	23
Weight of Wet Soil & Pan (g):	15.305	14.857	14.719
Weight of Dry Soil & Pan (g):	11.011	10.732	10.595
Weight of Water (g):	4.294	4.125	4.124
Weight of Pan (g):	1.141	1.142	1.160
Moisture Content (%):	43.5	43.0	43.7

Plastic Limit: 14

Liquid Limit: 43

Plastic Index: 30

Atterberg Classification CL



Data Entered By: DPM

Date: 5/9/2014

Data Checked By: DAV

File Name: atterberg-ASTM_4318-R6_49-110c.xls

Date: 05/23/14

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

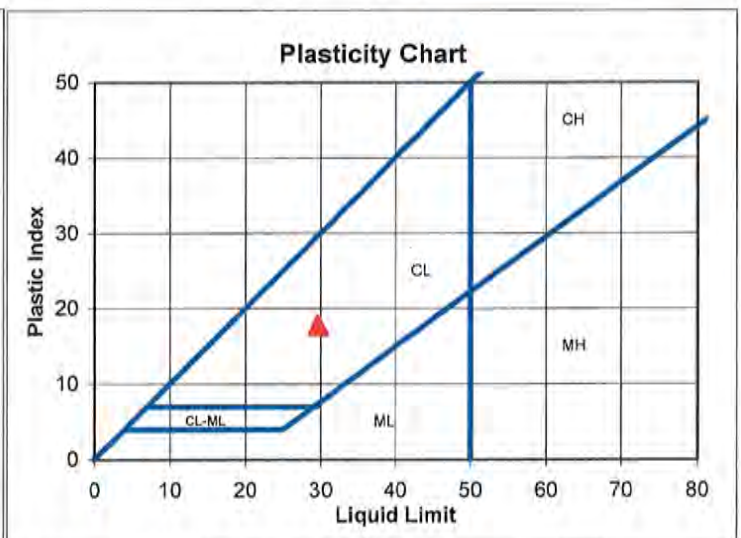
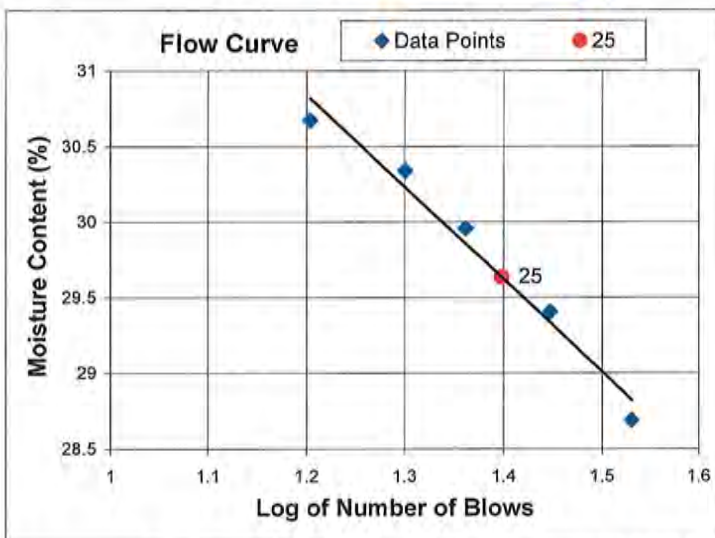
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	16	20	23	28	34
Weight of Wet Soil & Pan (g):	14.153	15.194	12.727	17.673	14.217
Weight of Dry Soil & Pan (g):	11.009	11.935	10.060	13.917	11.300
Weight of Water (g):	3.144	3.259	2.667	3.756	2.917
Weight of Pan (g):	0.758	1.192	1.157	1.143	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: DPM

File Name: atterberg-ASTM_4318-R6_41-60c.xls

Date: 05/23/14

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

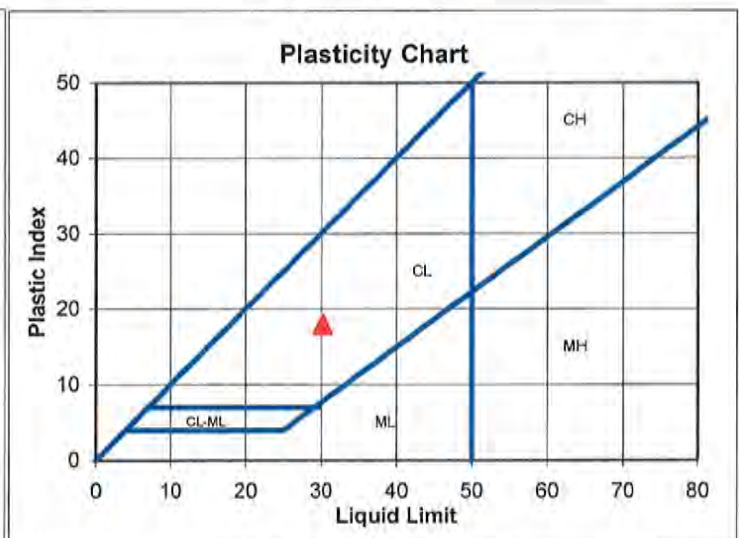
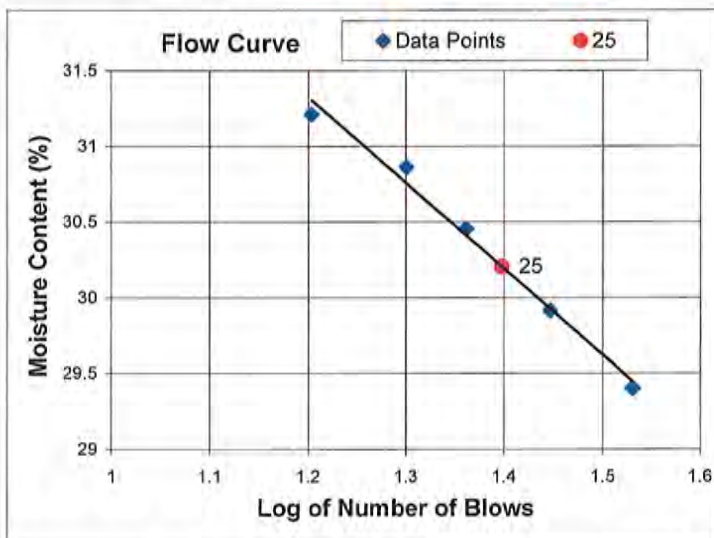
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Number of Blows:	16	20	23	28	34
Weight of Wet Soil & Pan (g):	14.153	15.194	12.727	17.673	14.217
Weight of Dry Soil & Pan (g):	10.967	11.892	10.026	13.867	11.244
Weight of Water (g):	3.186	3.302	2.701	3.806	2.973
Weight of Pan (g):	0.758	1.192	1.157	1.143	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: DAV

File Name: atterberg-ASTM_4318-R6_41-110c.xls

Date: 05/23/14

**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

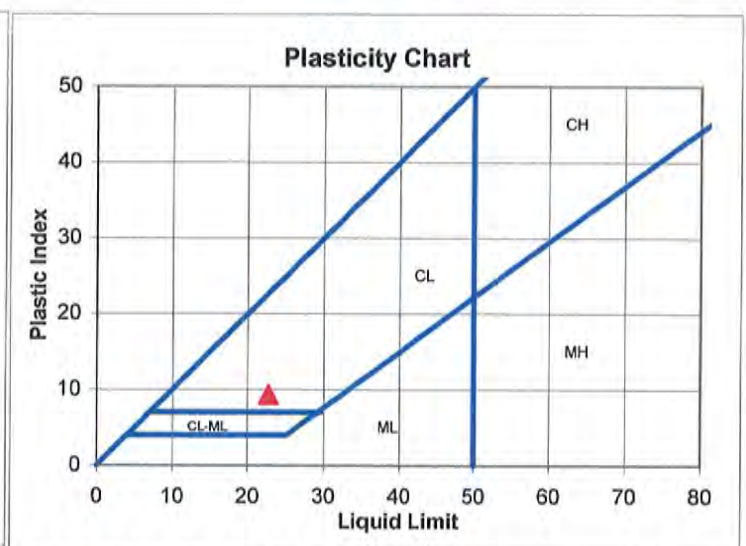
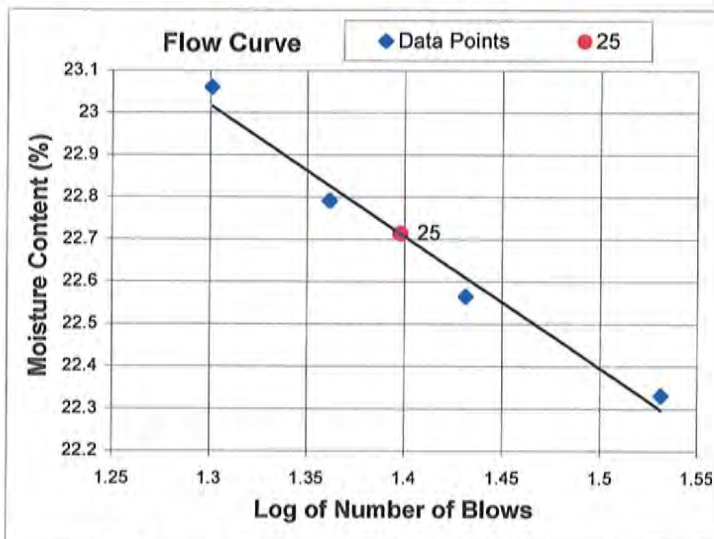
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	20	23	27	34
Weight of Wet Soil & Pan (g):	16.589	13.566	14.396	13.991
Weight of Dry Soil & Pan (g):	13.691	11.257	11.962	11.644
Weight of Water (g):	2.898	2.309	2.434	2.347
Weight of Pan (g):	1.124	1.126	1.175	1.134
Moisture Content (%):	23.1	22.8	22.6	22.3

Plastic Limit: 13

Liquid Limit: 23

Plastic Index: 9

Atterberg Classification CL



Data Entered By: DPM

Date: 5/9/2014

Data Checked By: DAW

File Name: atterberg-ASTM_4318-R6_51-60c.xls

Date: 05/22/14

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

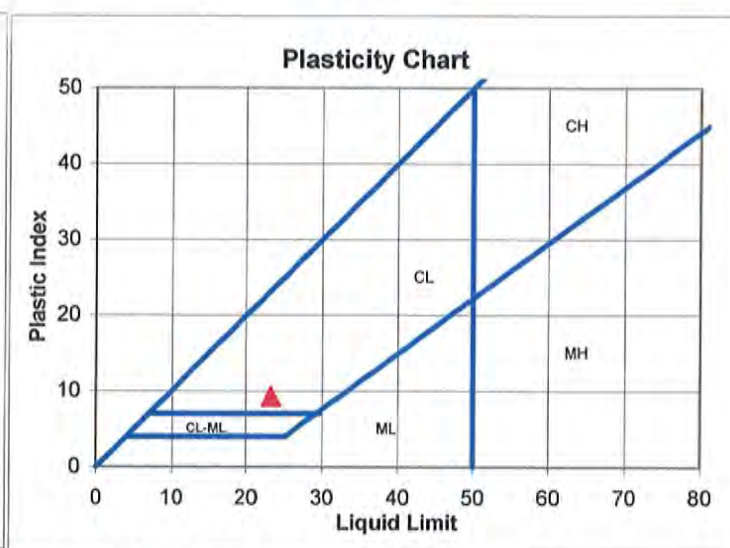
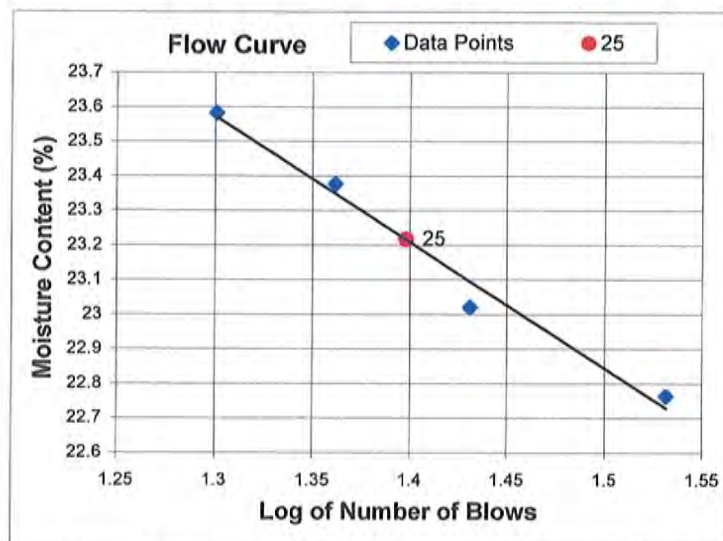
	Sample 1	Sample 2	Sample 3	Sample 4
Number of Blows:	20	23	27	34
Weight of Wet Soil & Pan (g):	16.589	13.566	14.396	13.991
Weight of Dry Soil & Pan (g):	13.638	11.209	11.922	11.607
Weight of Water (g):	2.951	2.357	2.474	2.384
Weight of Pan (g):	1.124	1.126	1.175	1.134
Moisture Content (%):	23.6	23.4	23.0	22.8

Plastic Limit: 14

Liquid Limit: 23

Plastic Index: 9

Atterberg Classification CL



Data Entered By: DPM

Date: 5/9/2014

Data Checked By: DAW

File Name: atterberg-ASTM_4318-R6_51-110c.xls

Date: 05/23/14

**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

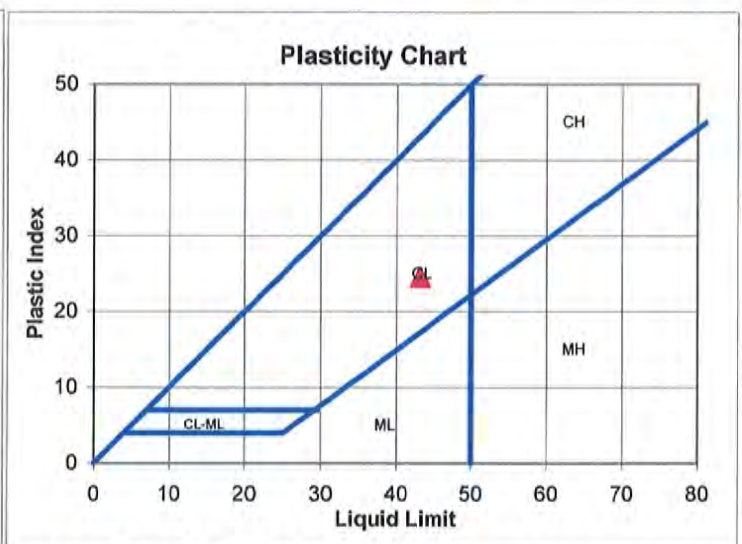
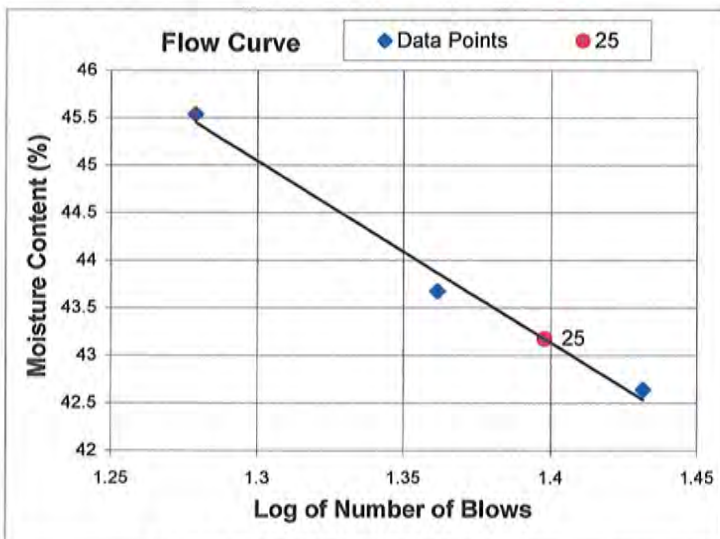
	Sample 1	Sample 2	Sample 3
Number of Blows:	19	23	27
Weight of Wet Soil & Pan (g):	14.949	13.477	15.777
Weight of Dry Soil & Pan (g):	10.506	9.608	11.285
Weight of Water (g):	4.443	3.869	4.492
Weight of Pan (g):	0.749	0.749	0.750
Moisture Content (%):	45.5	43.7	42.6

Plastic Limit: 19

Liquid Limit: 43

Plastic Index: 25

Atterberg Classification CL



Data Entered By: DPM

Date: 2/12/2014

Data Checked By: bj

File Name: atterberg-ASTM_4318-R6_15.xls

Date: 2/14/14

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
DEPTH	35-38'	56-57'	15-16'
SAMPLE NO.	-	-	-
DATE SAMPLED	-	12/02/13 MWH	12/02/13 MWH
DATE TESTED	01/30/14 DPM	01/31/14 DPM	03/14/14 DPM
			12/02/13 MWH
			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
 Data checked by:
 FileName: MWSGAS51

Date:
 Date: 4/11/14

04/10/2014



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	Gravelly 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
Data checked by: DAW
FileName: MWSGAS81

Date: 05/23/14

05/23/2014



SPECIFIC GRAVITY TESTS
CLIENT: MWH

ASTM D 854

JOB NO.
LOCATION

2512-77
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
Data checked by: KR
FileName: MNSA1214.WK4

Date: 6/4/14
Date:

06/04/2014



SPECIFIC GRAVITY TESTS
CLIENT: MWH

ASTM D 854

JOB NO.
LOCATION

2512-77
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
Data checked by: KR
FileName: MNSA1011.WK4

Date: 6/4/14
Date: 6/4/14

06/04/2014



SPECIFIC GRAVITY TESTS
CLIENT: MWH

ASTM D 854

JOB NO.
LOCATION

2512-77
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
Data checked by: CJ
FileName: MNSA101B.WK4

Date: 06/06/2014
Date: 06/06/2014

06/06/2014



SPECIFIC GRAVITY TESTS

ASTM D 854

CLIENT: MWH
PROJECT: Church RockJOB NO. 2512-77
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: BKLDate: 5/21/14

FileName: MWGAS91.WK4



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: bi
FileName: MWSGAS61Date: 3/1/14

SPECIFIC GRAVITY TESTS

ASTM D 854

CLIENT: MWH
PROJECT: Church RockJOB NO. 2512-77
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
Data checked by: bj
FileName: MWSGAS71Date: 03/13/2014
Date: 3/14/14

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

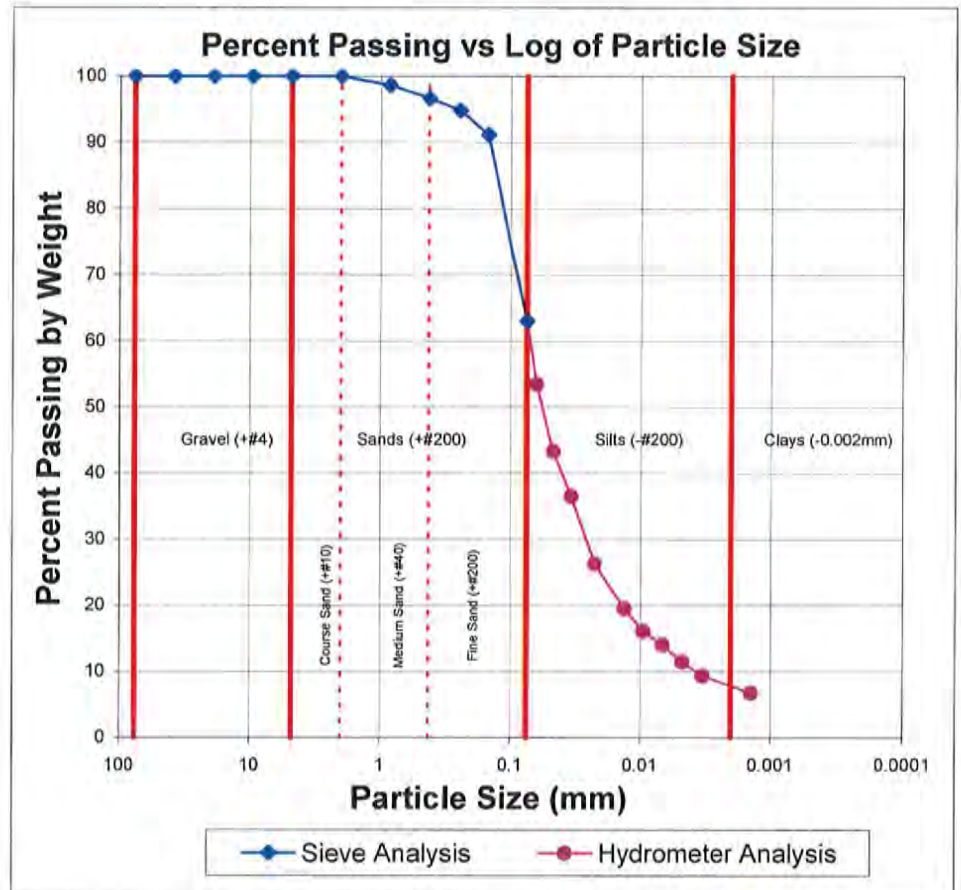
Plus Split Data

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: *4/18/14*

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: KR
Date: 6/18/14

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

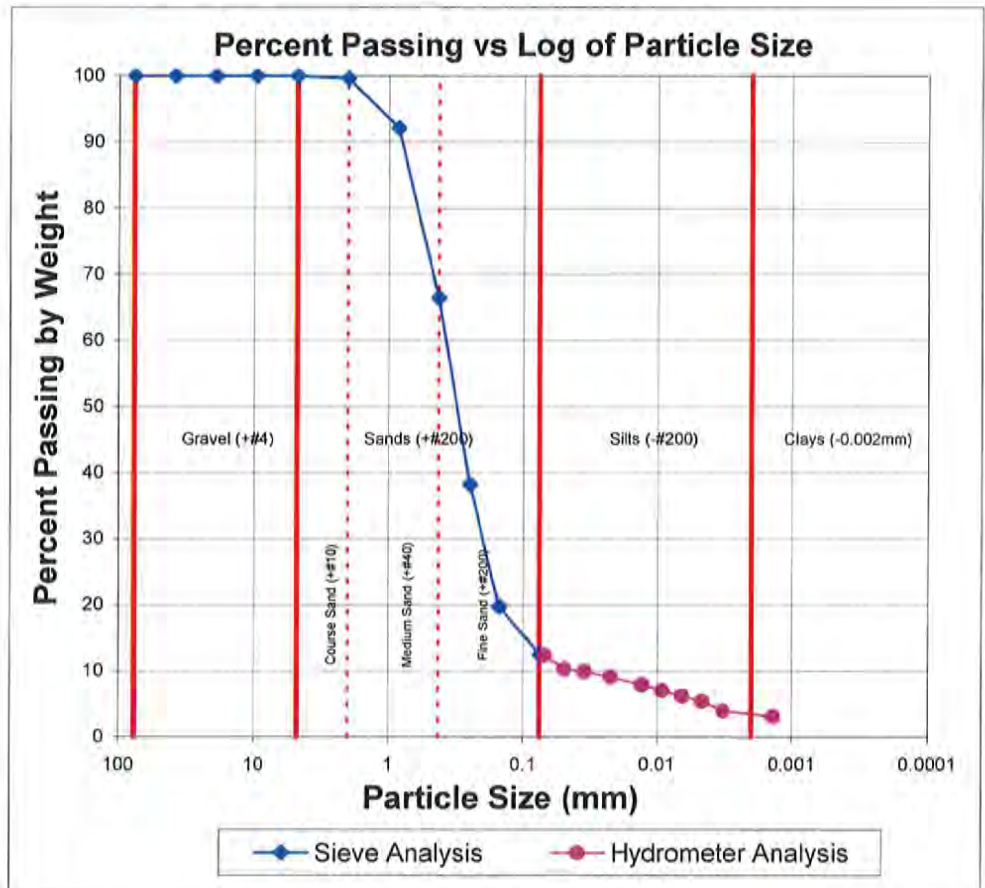
Plus Split Data

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

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

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

Specific Gravity Correction Factor - α : 0.99

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

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

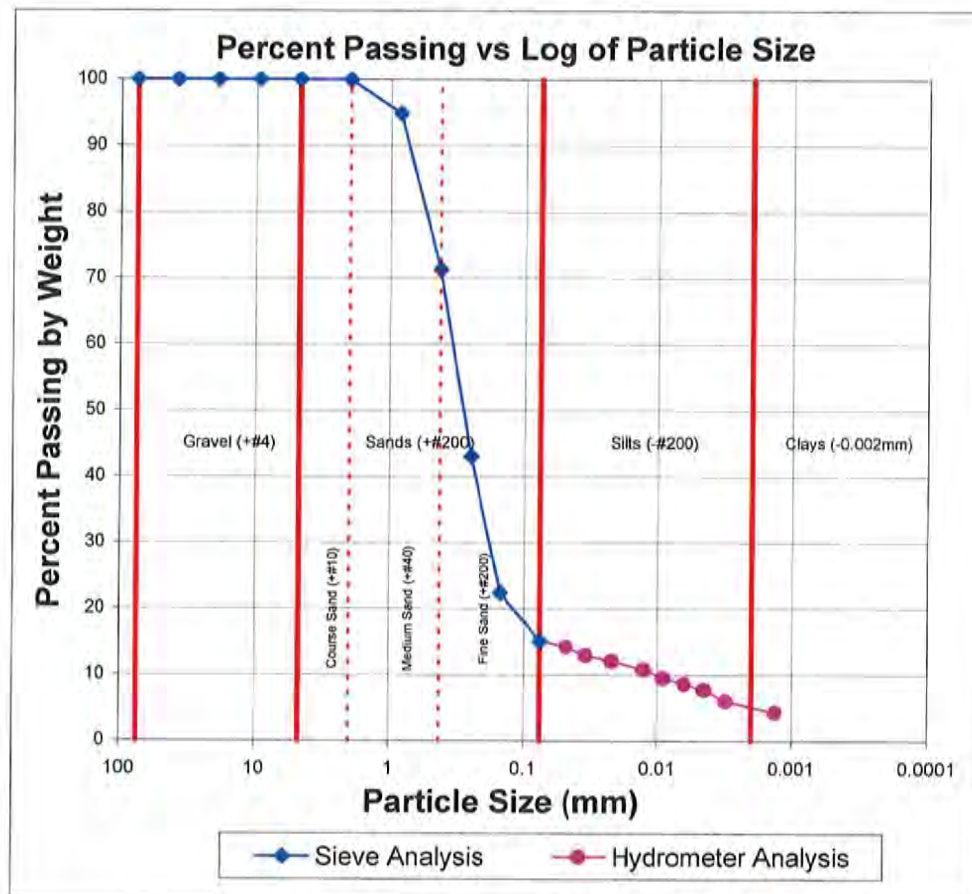
Plus Split Data

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



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

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: NR

Date: 6/18/14

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
Test Date: 4/15/2014
Sampled By: MWH
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

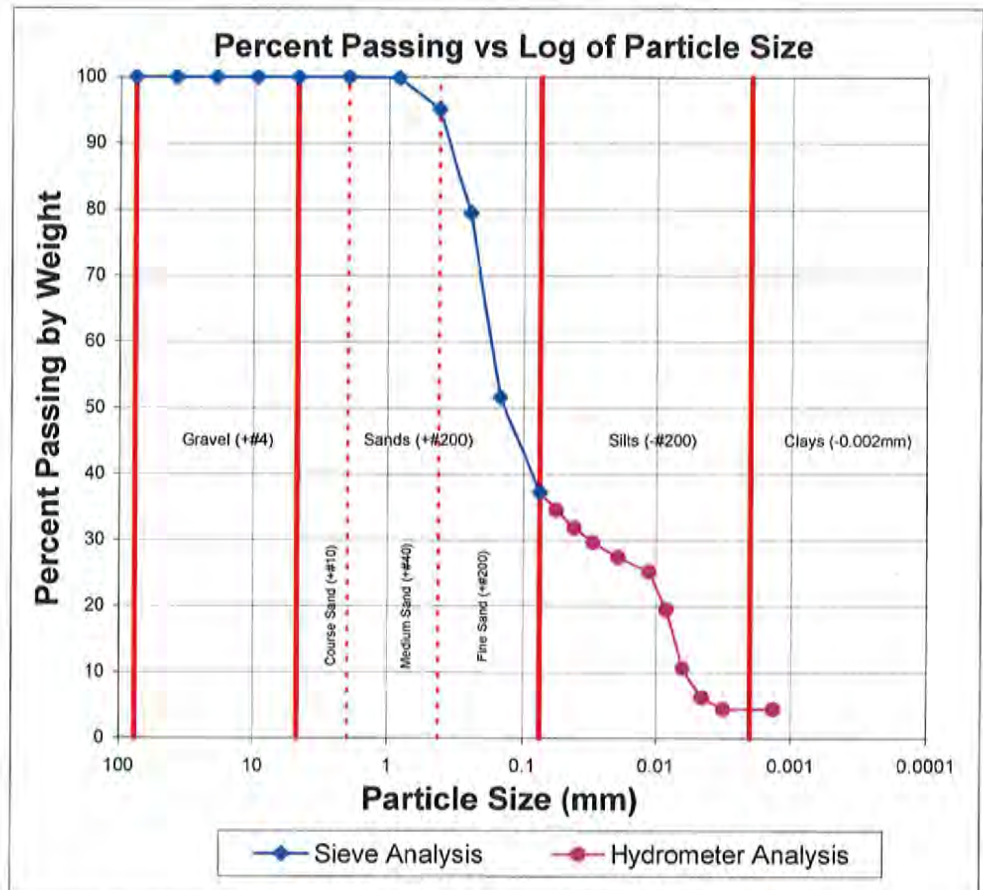
Minus Split Data

Original Weight of - #10 (g): 113.21
Calculated Dry Weight of - #10 (g): 111.96

Note: The sample started showing signs of flocculation at the 60 minute reading.

At the 24 hour reading the supernate was barely cloudy.

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



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

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
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

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

Specific Gravity Correction Factor - α : 0.99

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

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

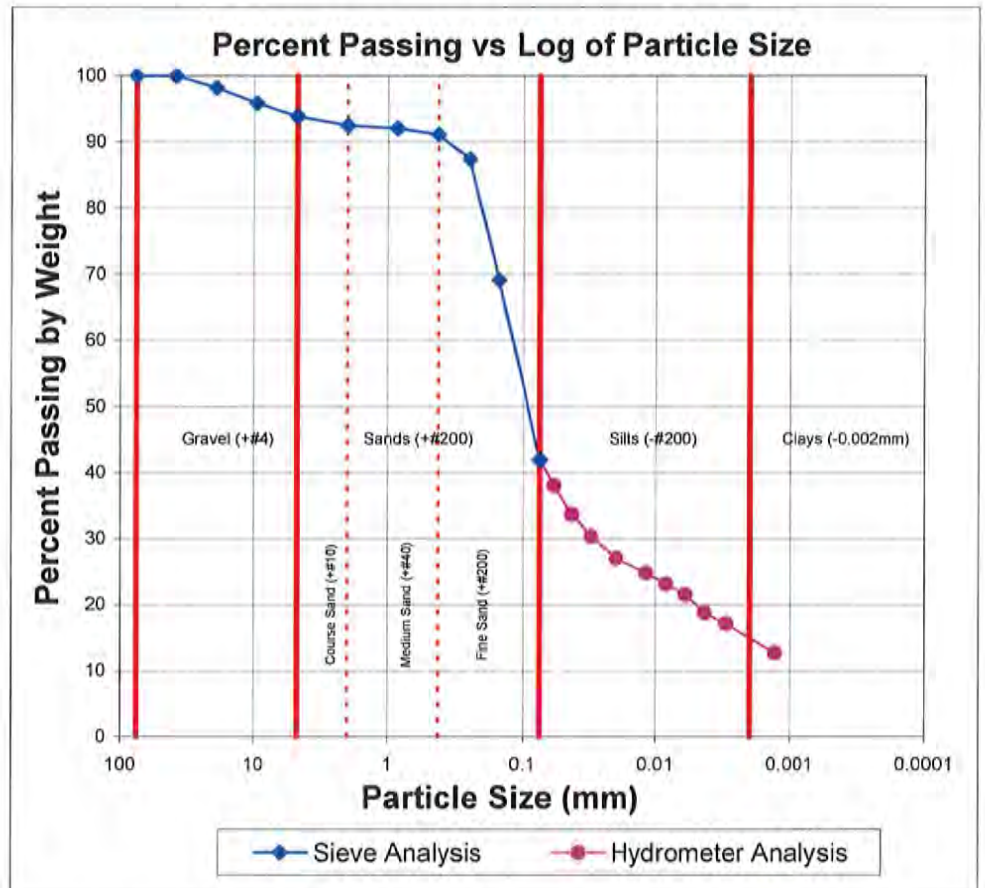
Plus Split Data

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*

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

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

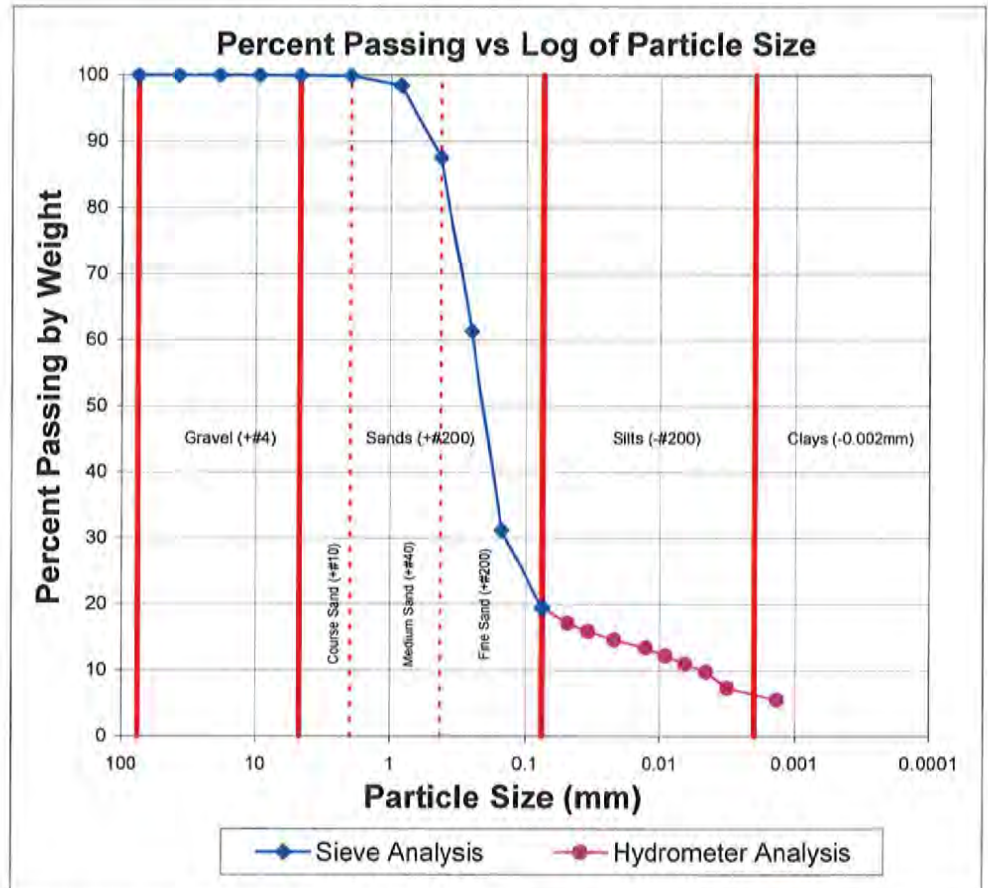
Plus Split Data

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

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

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
Test Date: 4/11/2014
Sampled By: MWH
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

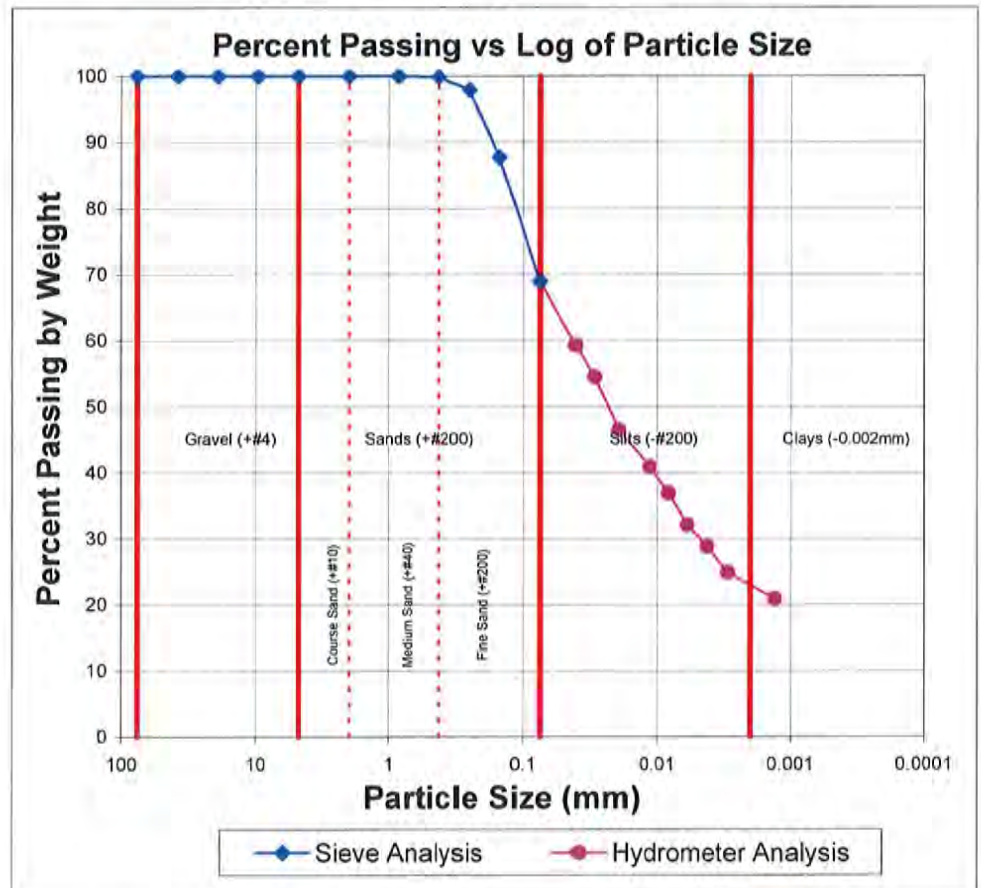
Plus Split Data

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

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
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

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

Specific Gravity Correction Factor - α : 0.99

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: NR
Date: 6/18/14

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
Test Date: 3/25/2014
Sampled By: MWH
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

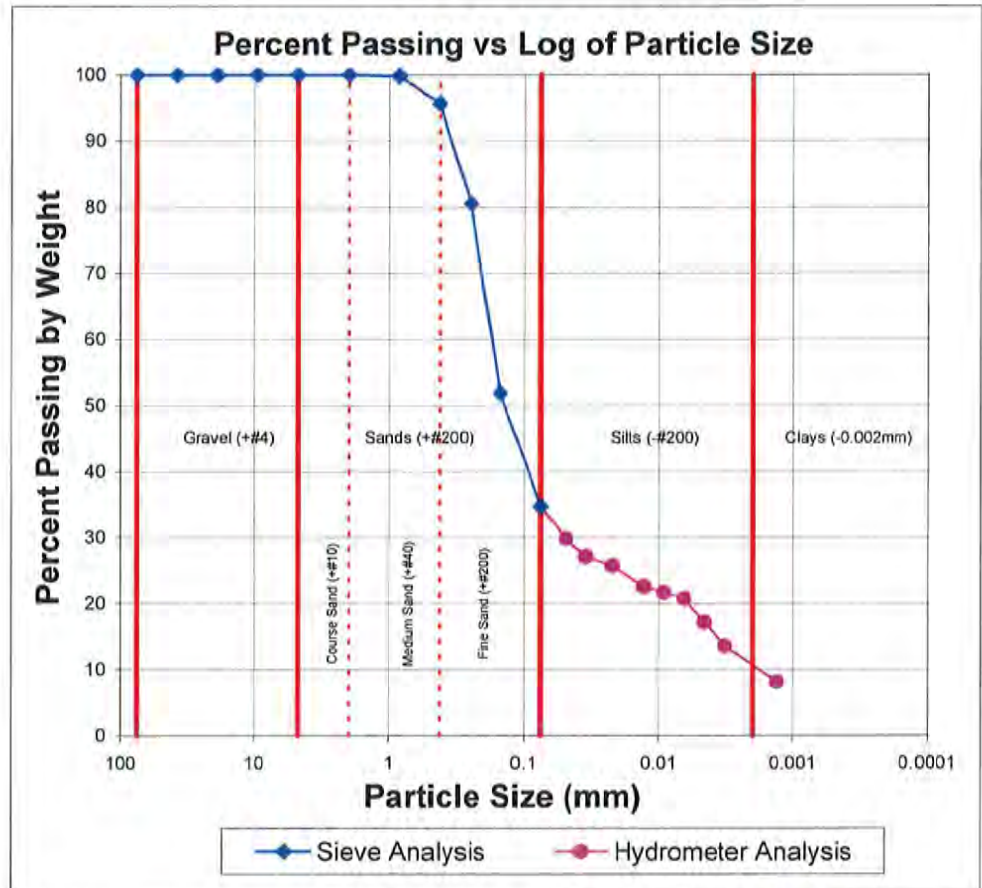
Plus Split Data

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

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
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): 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: KL
Date: 6/18/14

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
Test Date: 3/25/2014
Sampled By: MWH
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

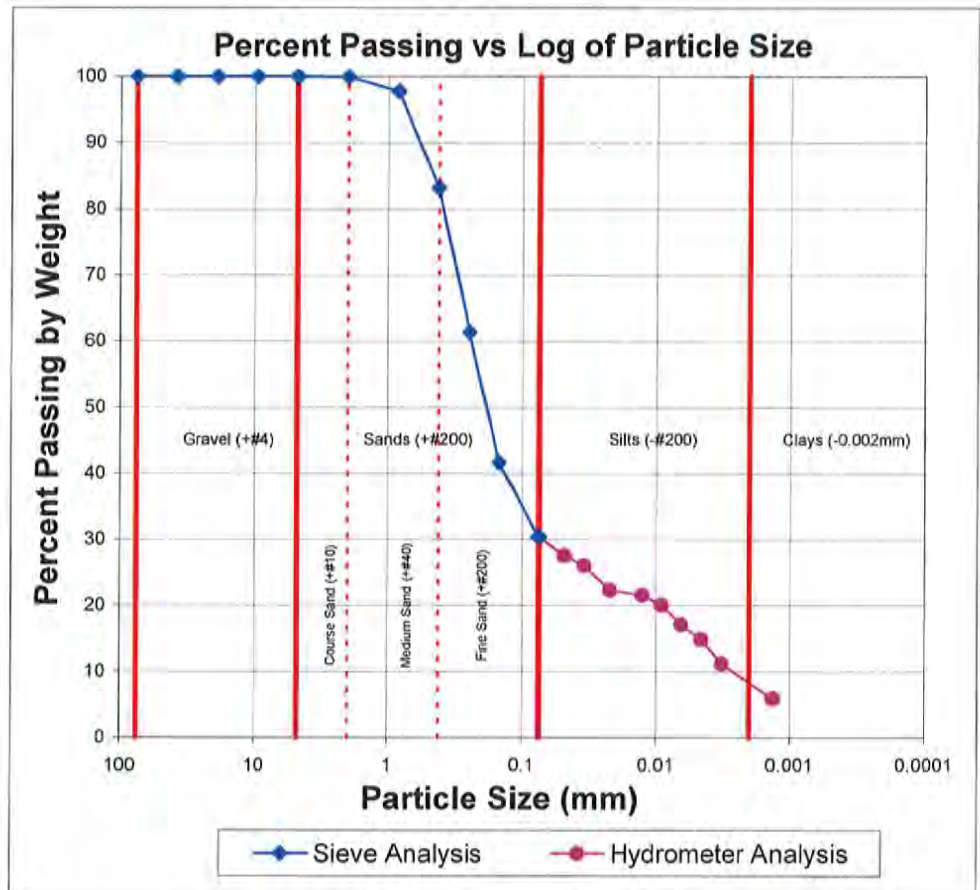
Plus Split Data

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: VR

Date: 6/18/14

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
 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

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

Specific Gravity Correction Factor - α : 0.99

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

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

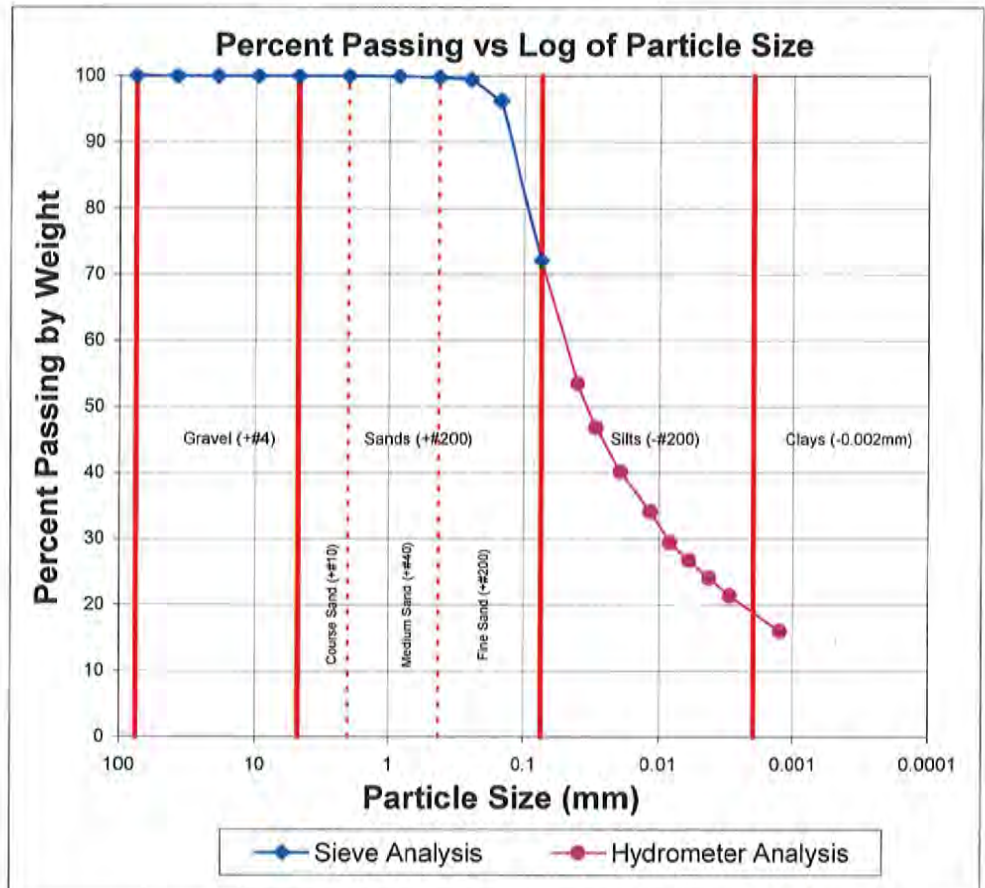
Plus Split Data

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*

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

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

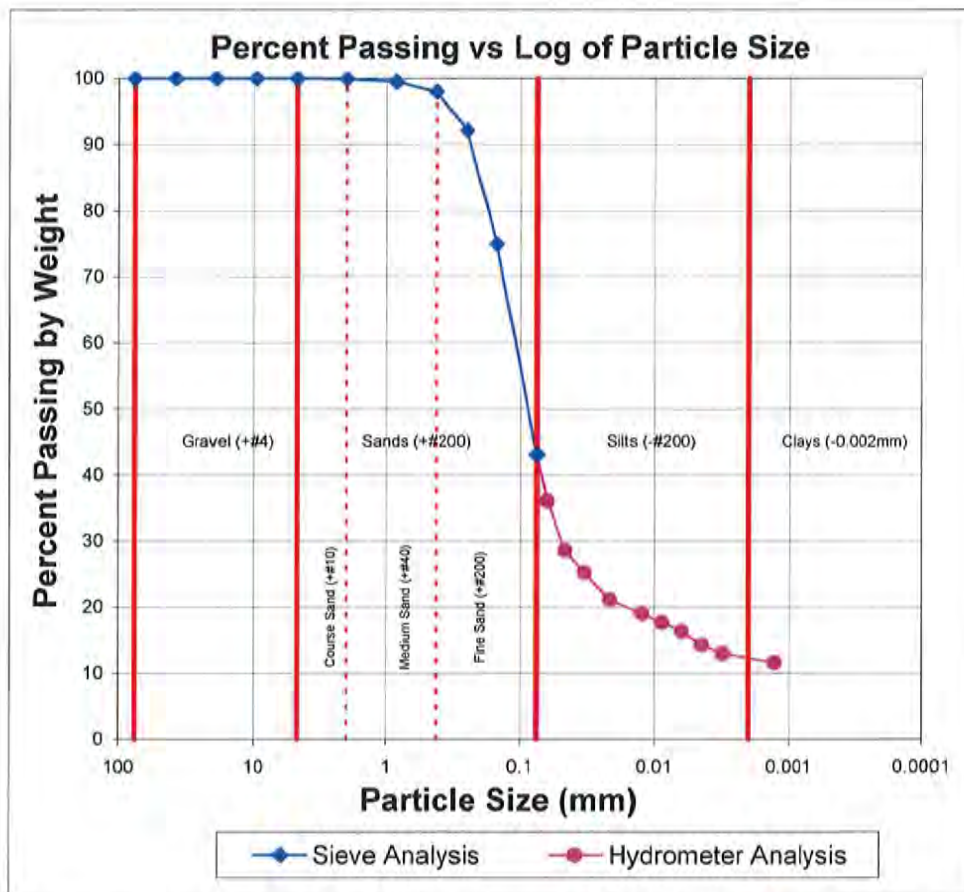
Plus Split Data

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

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

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

Specific Gravity Correction Factor - α : 0.99

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

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

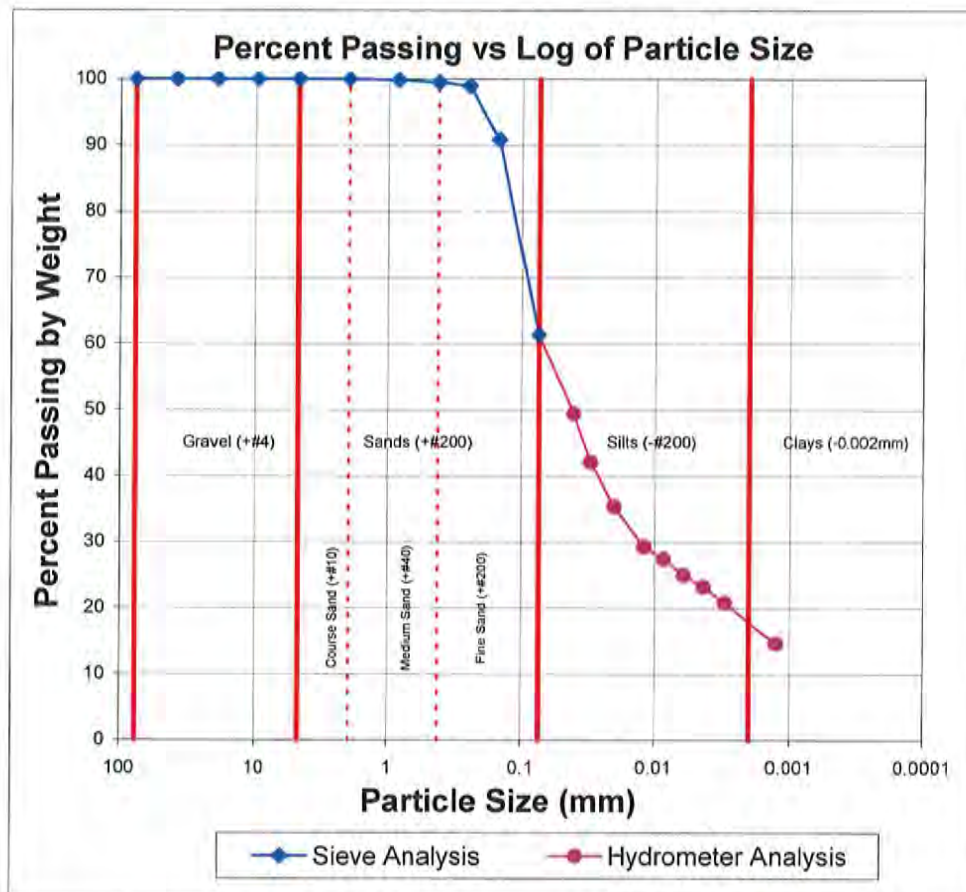
Plus Split Data

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

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

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

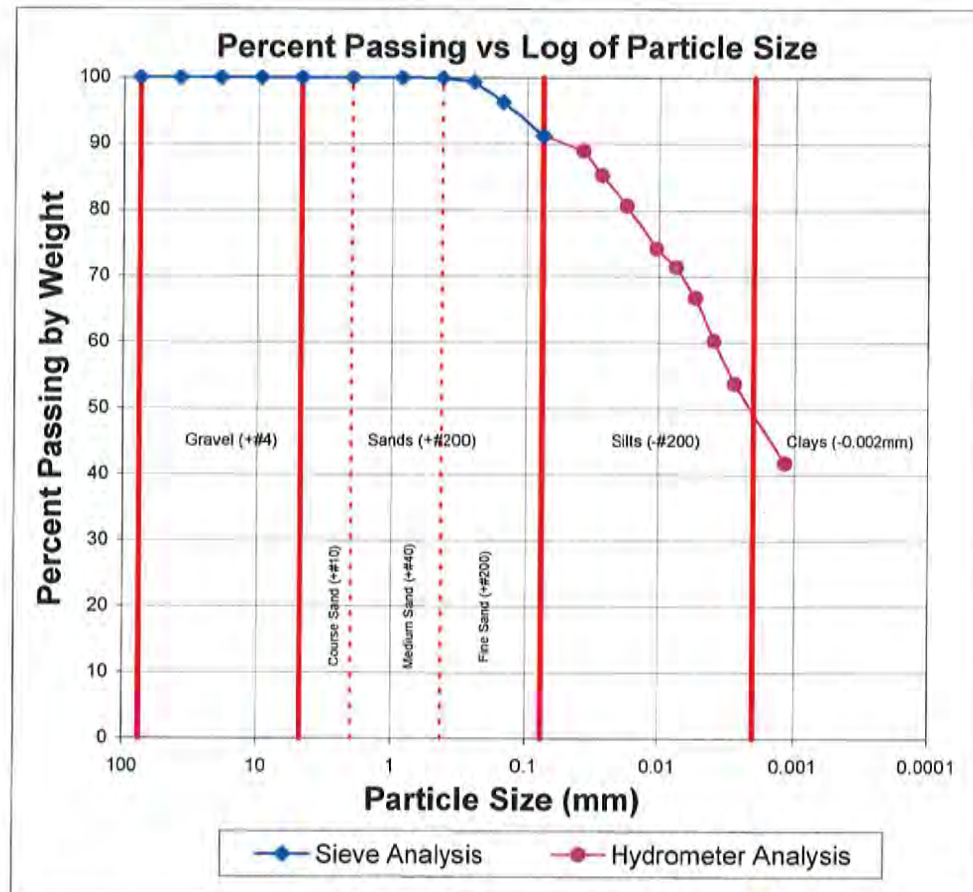
Plus Split Data

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



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: KE
Date: 6/18/14

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

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

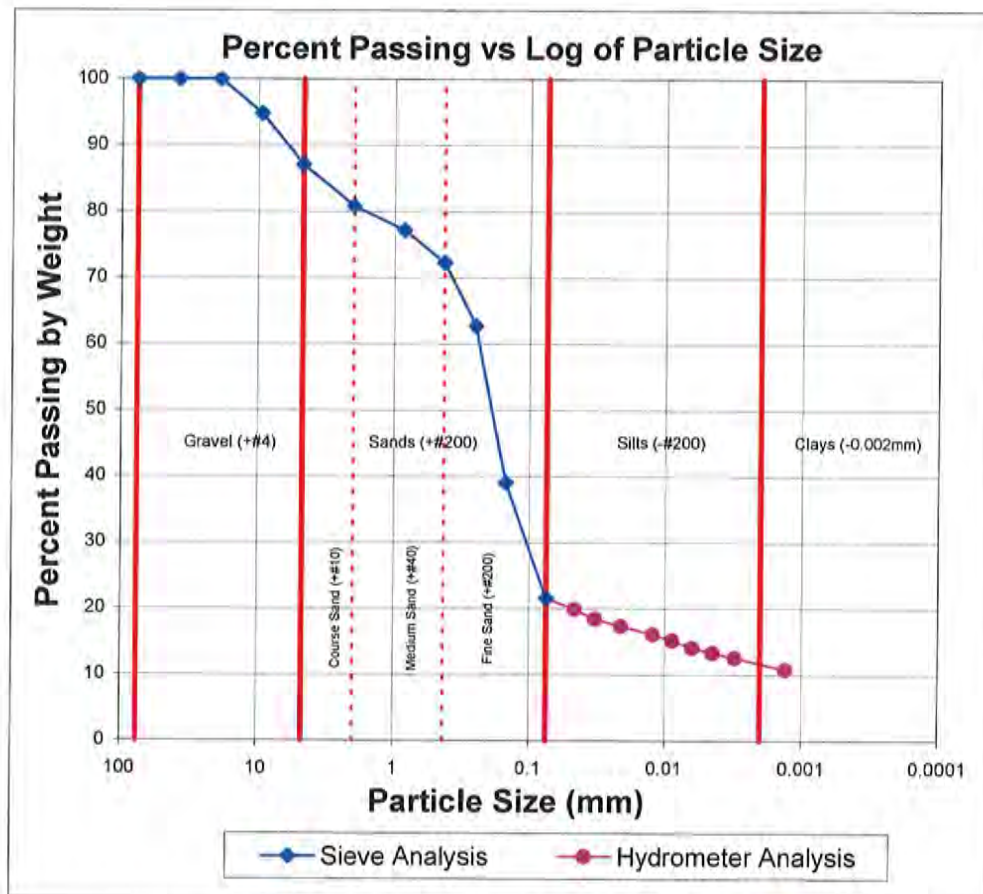
Plus Split Data

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

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



Data Entered By: DPM

Date: 6/18/2014

File Name: 2512_77_hydrometer-ASTM-D422-R0_52.xls

Checked By: *KE*

Date: *6/18/14*

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: KA
Date: 6/18/14

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

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

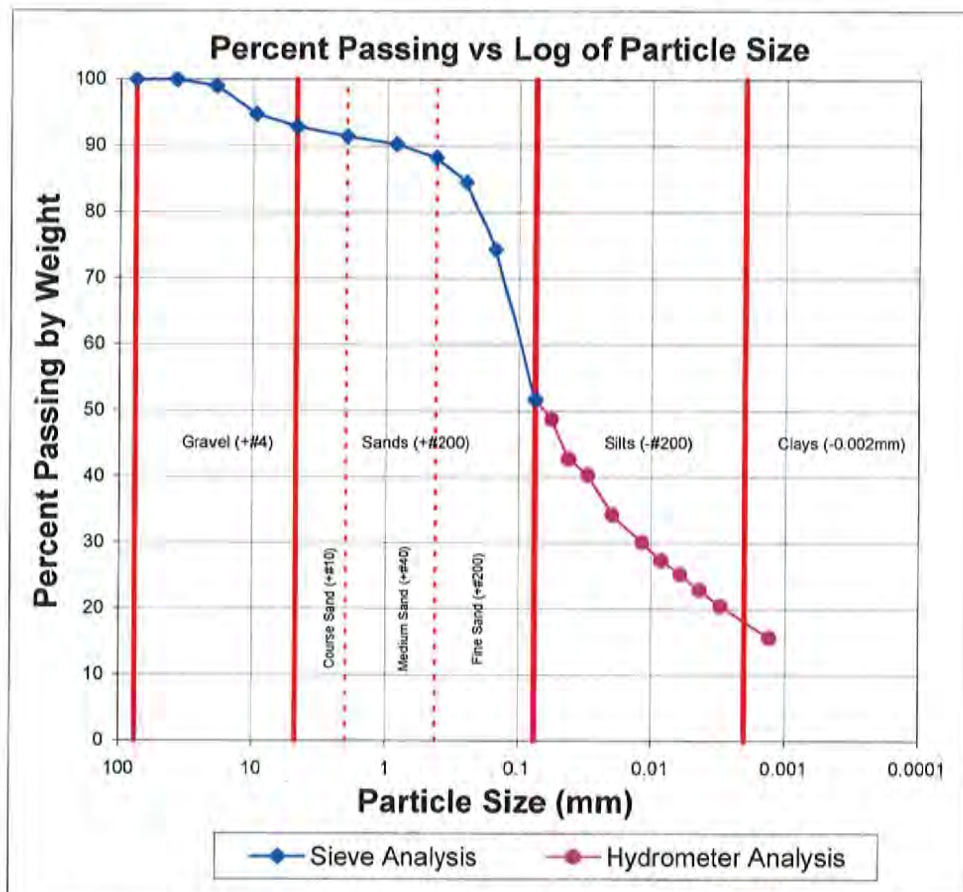
Plus Split Data

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

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



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

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

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

Specific Gravity Correction Factor - α : 0.99

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

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

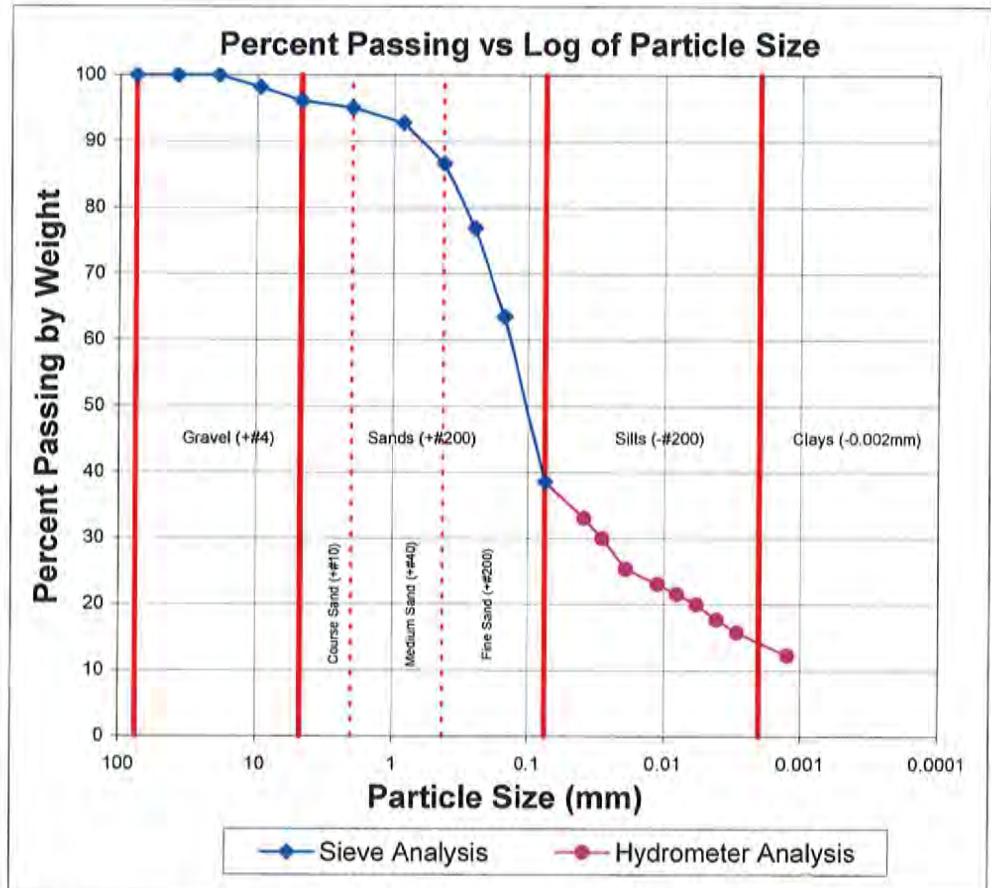
Plus Split Data

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: VR

Date: 6/18/14

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: VR

Date: 6/18/14

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

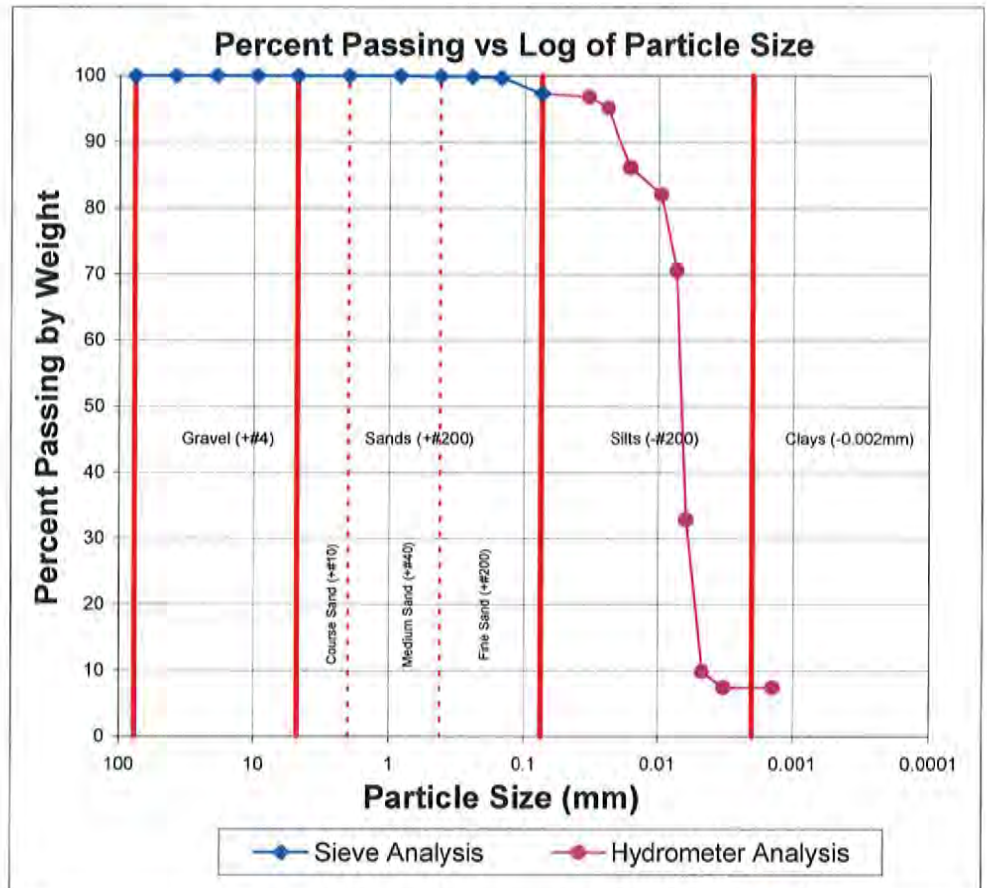
Minus Split Data

Original Weight of - #10 (g): 62.35
Calculated Dry Weight of - #10 (g): 60.41

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

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



Data Entered By: DPM

Date: 6/18/2014

File Name: 2512_77_hydrometer-ASTM-D422-R0_49.xls

Checked By: VP

Date: 6/18/14

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: KE
Date: 6/18/14

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

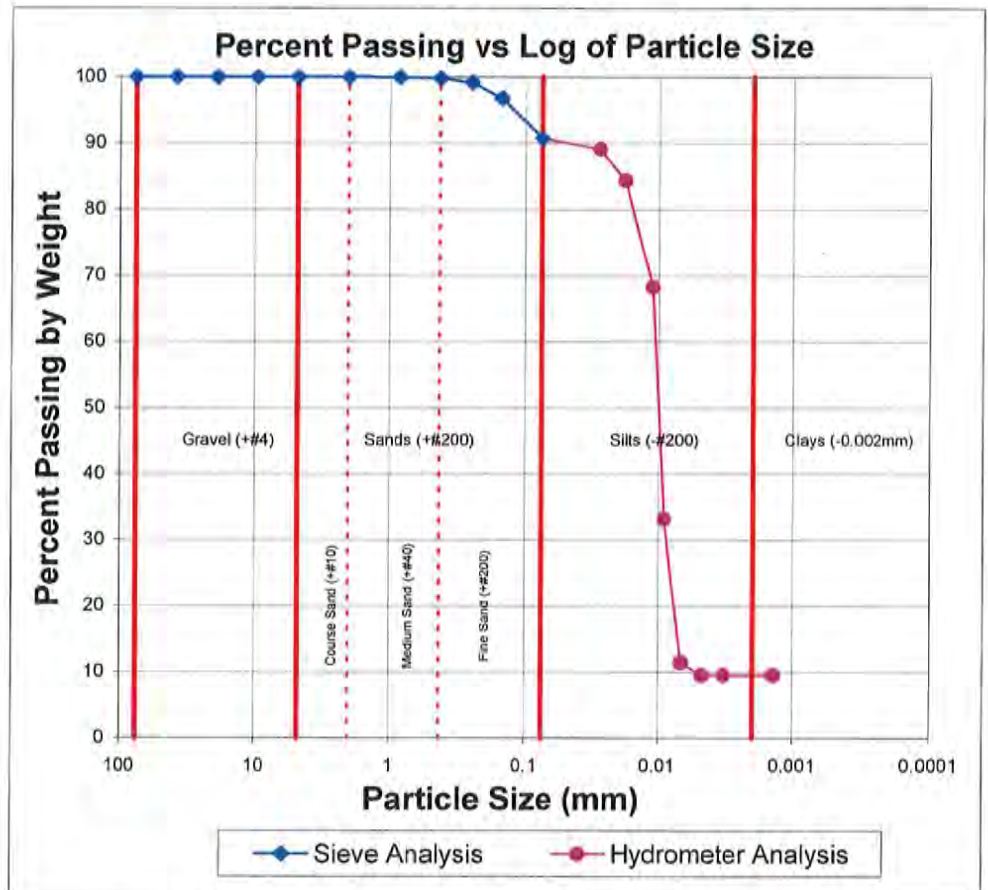
Notes:

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.

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



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: VR

Date: 6/18/14

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

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

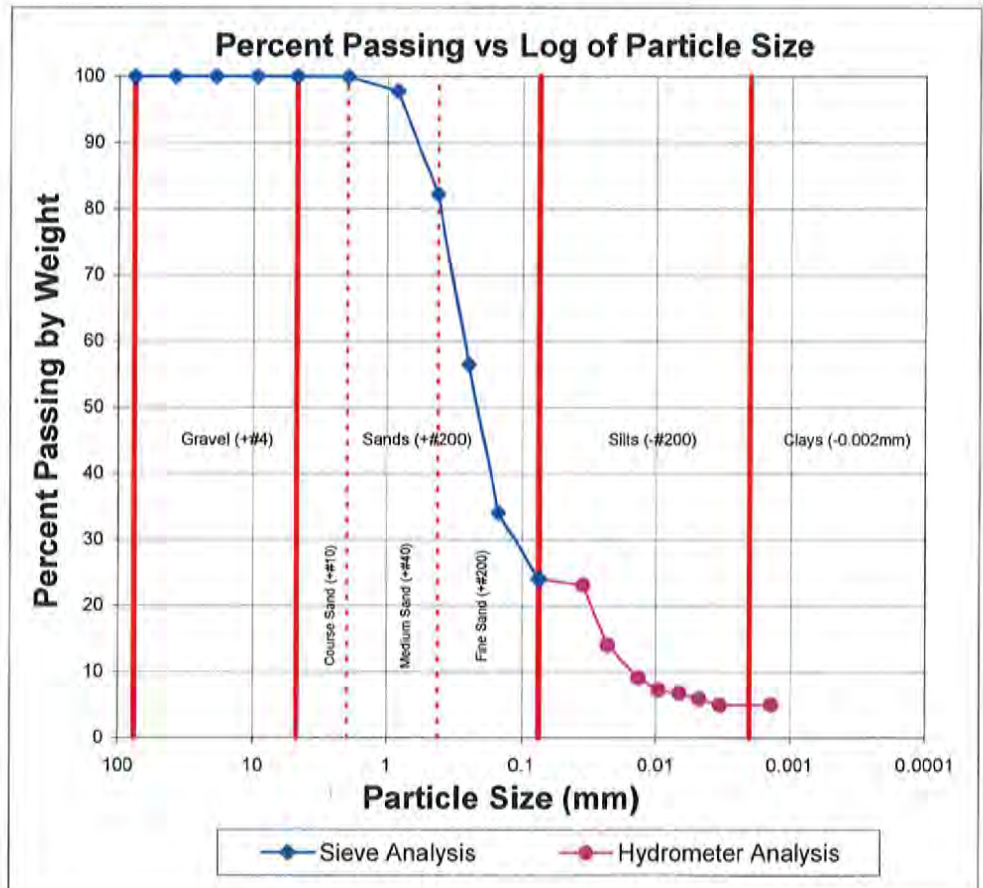
Minus Split Data

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.

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



Data Entered By: DPM

Date: 6/18/2014

File Name: 2512_77_hydrometer-ASTM-D422-R0_30.xls

Checked By: VR

Date: 6/18/14

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

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

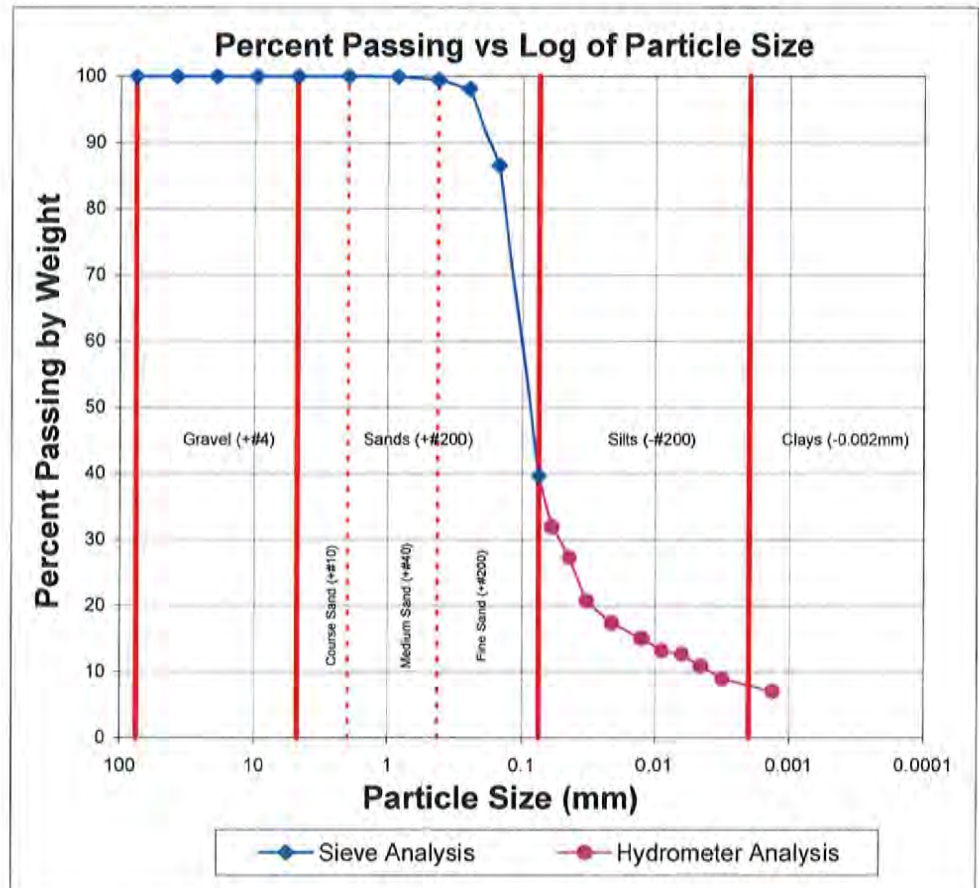
Plus Split Data

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: KA

Date: 6/18/14

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: KR
Date: 6/18/14

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

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

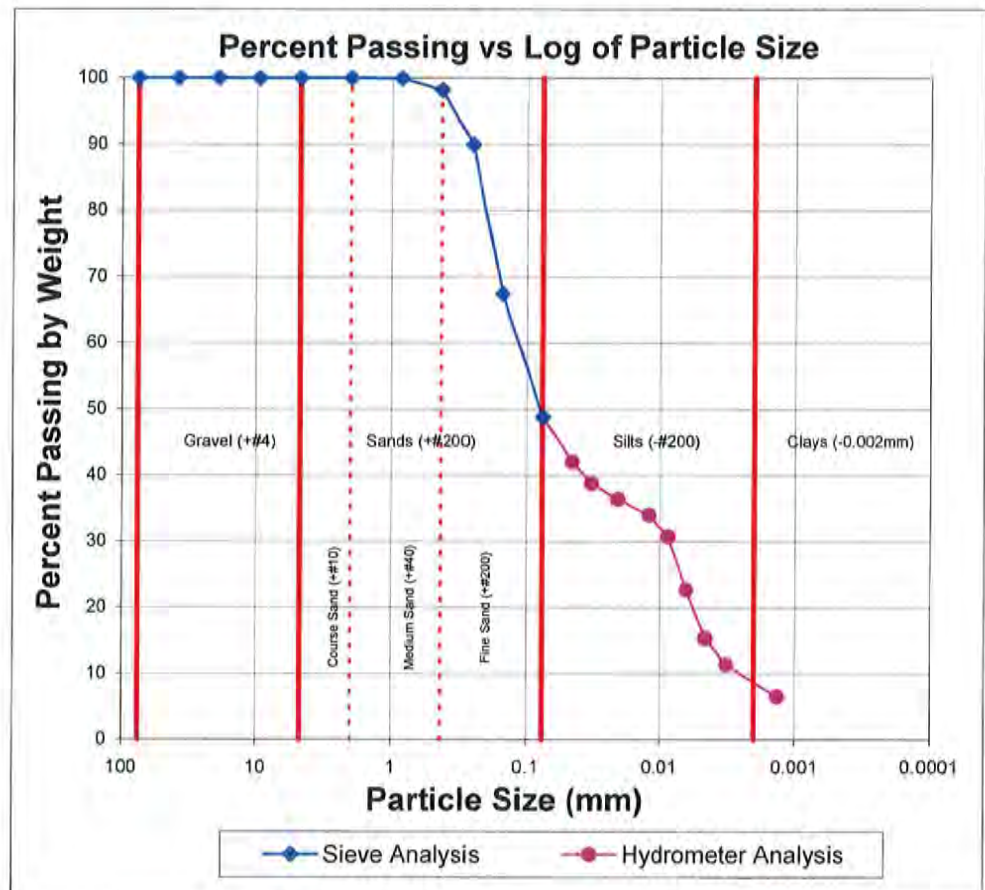
Plus Split Data

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

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



Data Entered By: DPM

Date: 6/18/2014

File Name: 2512_77_hydrometer-ASTM-D422-R0_27.xls

Checked By: VR

Date: 6/18/14

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

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

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

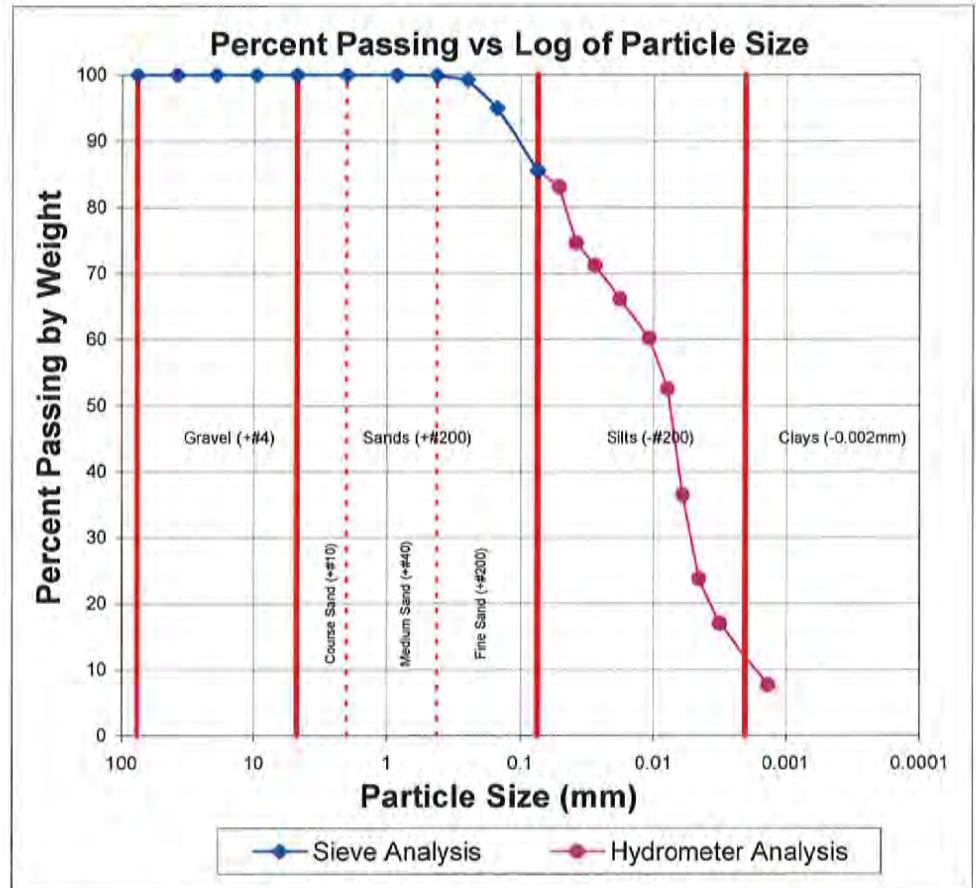
Plus Split Data

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

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



Data Entered By: DPM

Date: 6/18/2014

File Name: 2512_77_hydrometer-ASTM-D422-R0_24.xls

Checked By: KE

Date: 6/18/14

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

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

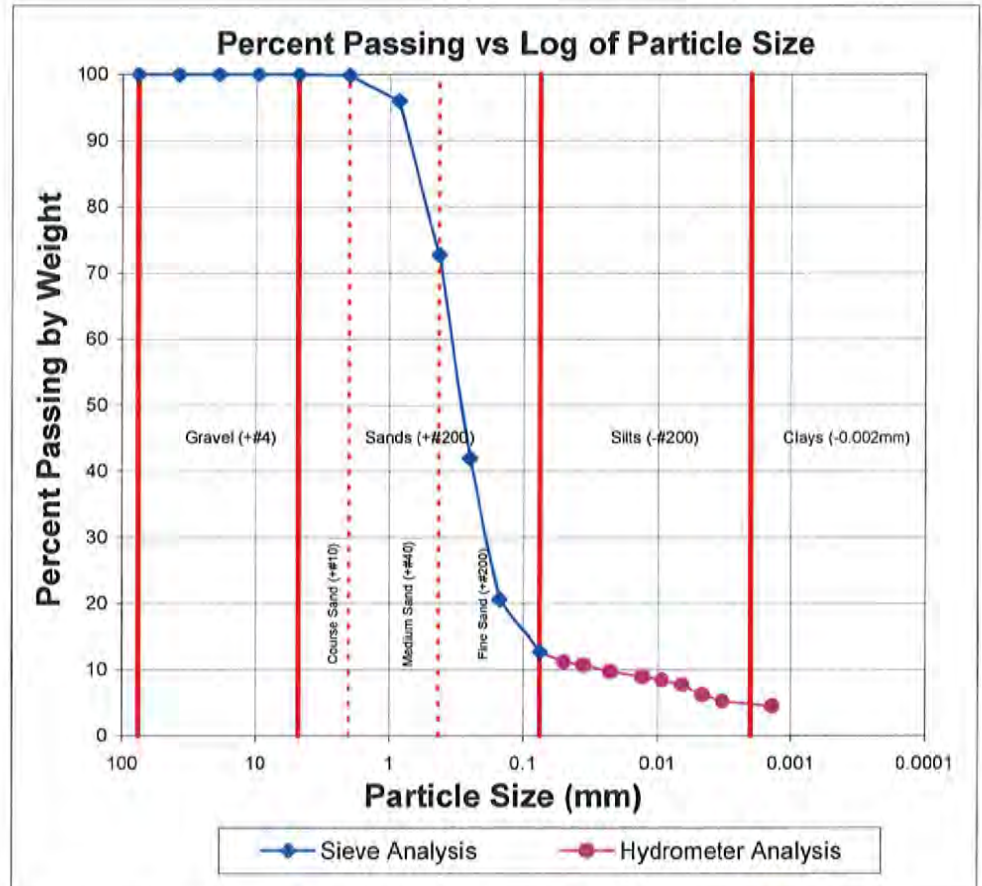
Plus Split Data

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

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: KC
Date: 6/18/14

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

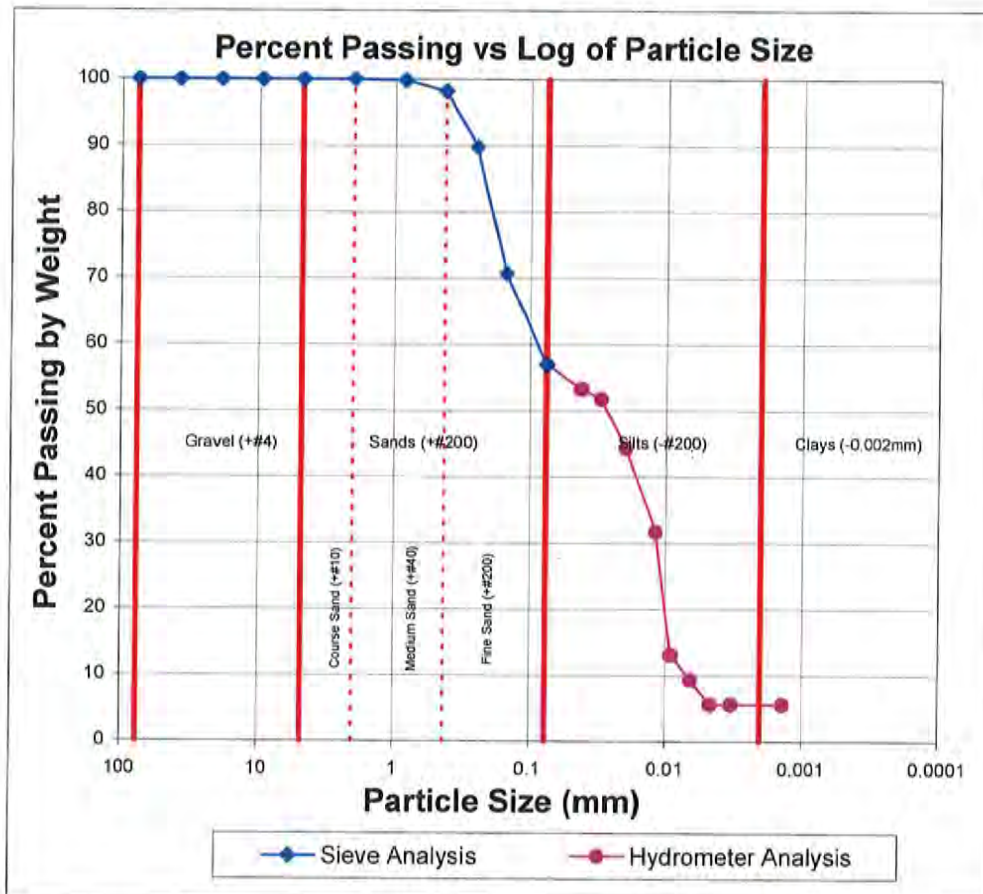
Minus Split Data

Original Weight of - #10 (g): 67.85
Calculated Dry Weight of - #10 (g): 66.57

Notes:

- At the 15min. Reading the sample started to show signs of flocculation.
- At the 24 hour reading, the suspension is almost completely clear. Any reading above zero is due to dissolved solids.

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



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

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

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

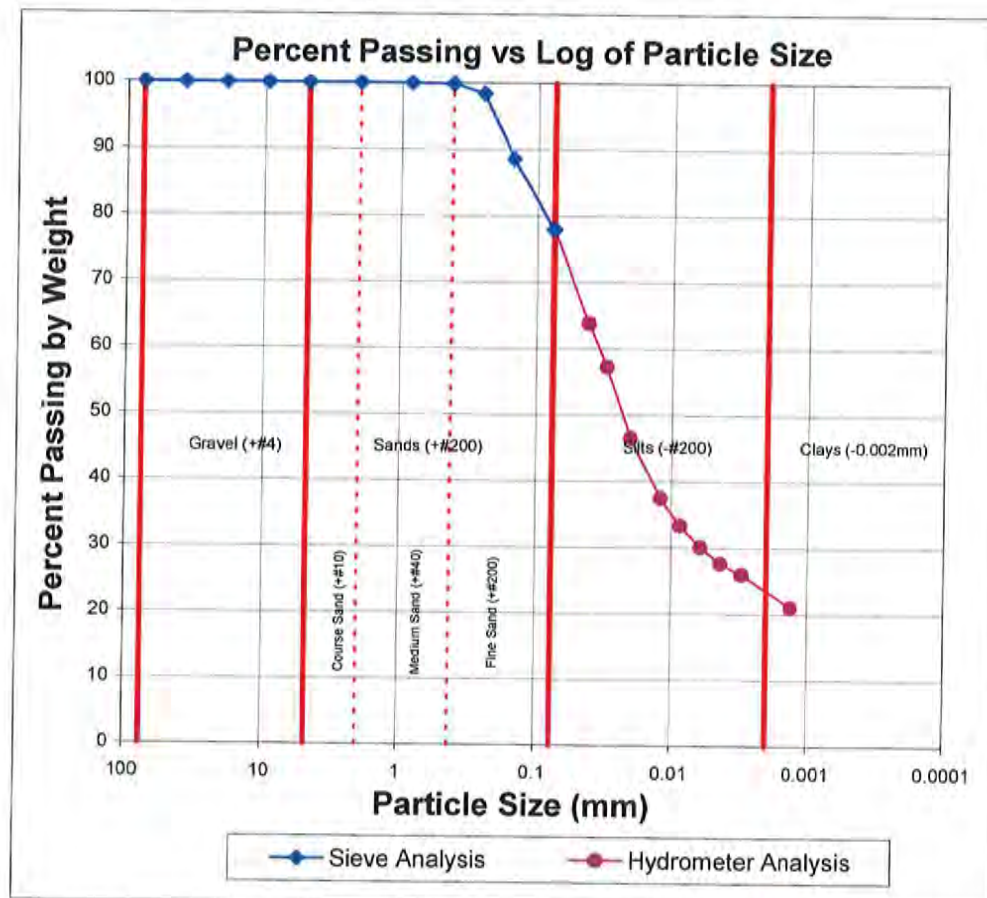
Plus Split Data

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

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

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-B3-01A
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

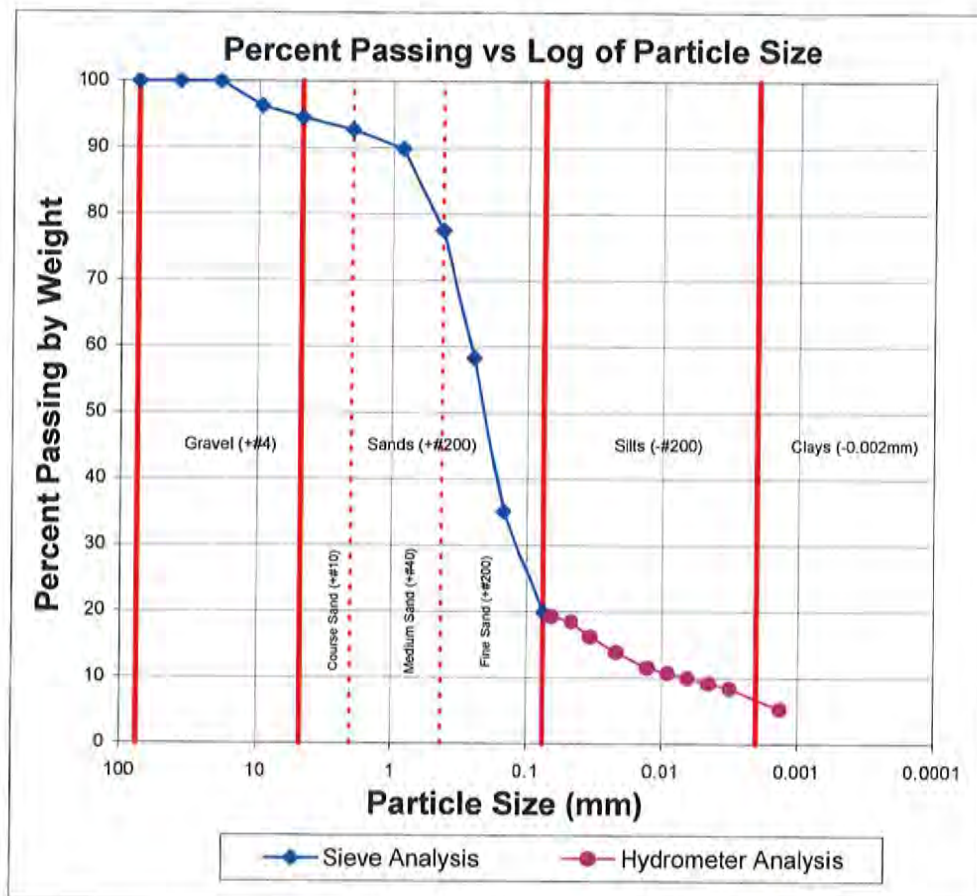
Plus Split Data

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: VC

Date: 6/18/14

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-B3-01A
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: VR
Date: 6/18/14

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
Test Date: 1/29/2014

Sampled By: MWH
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

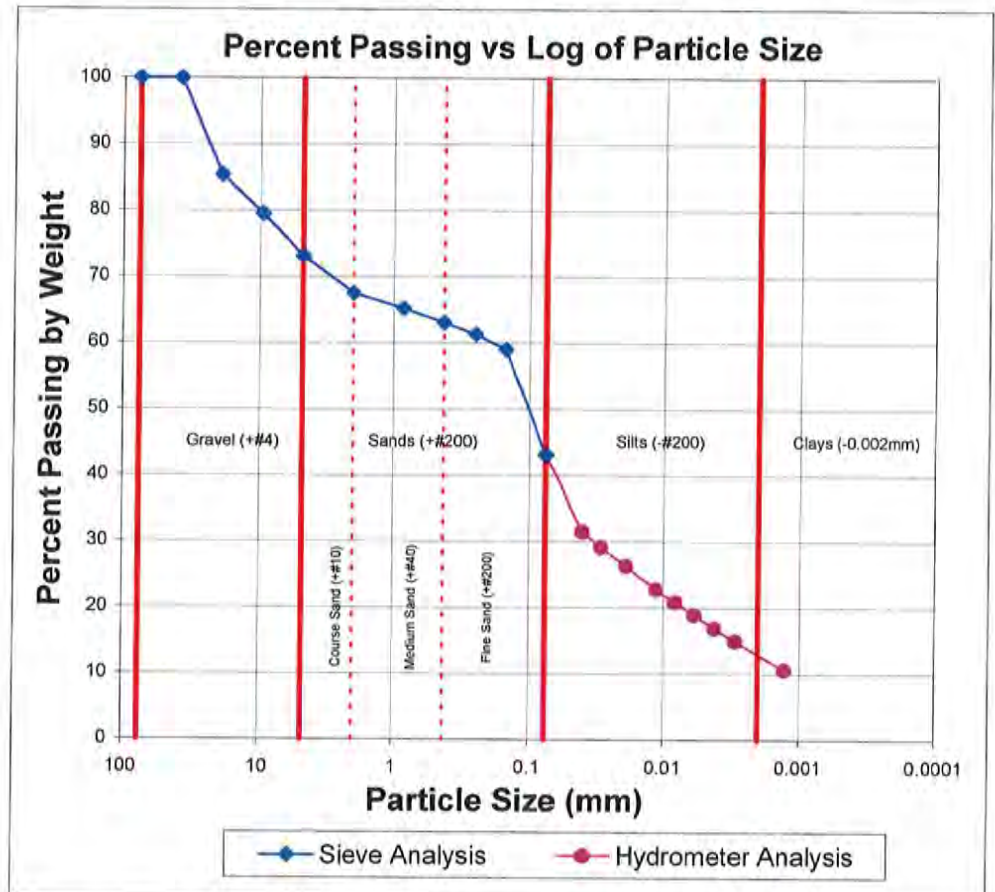
Plus Split Data

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

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
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): 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

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

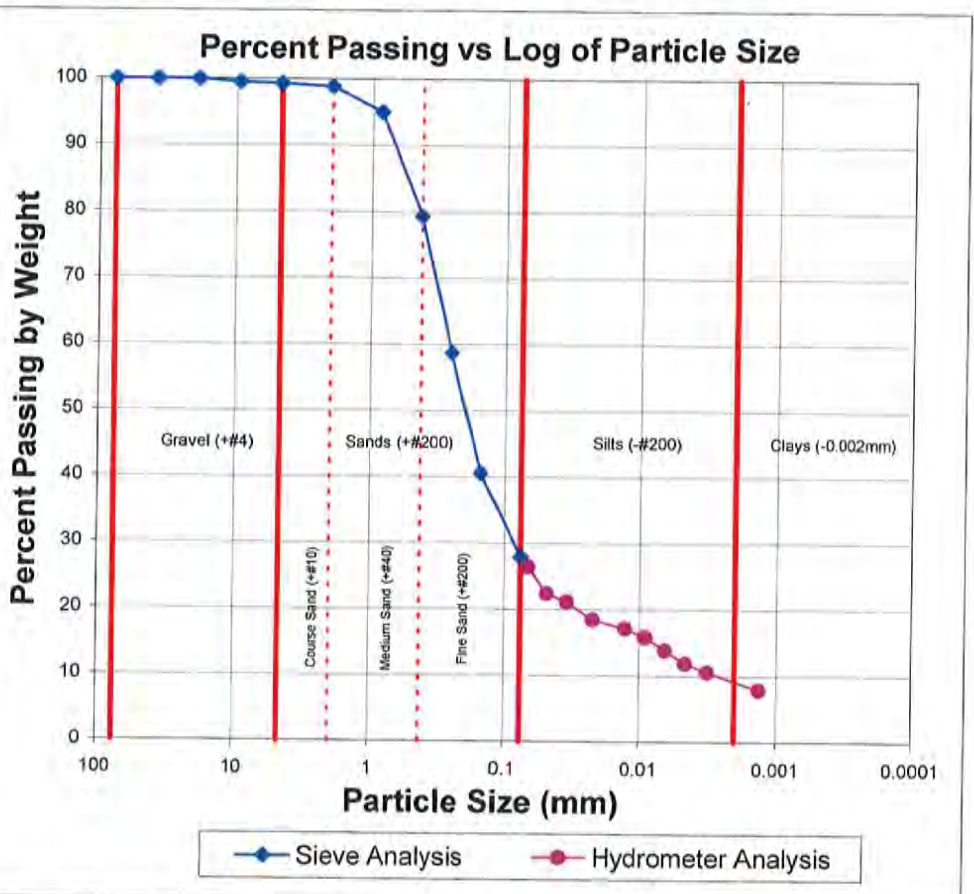
Plus Split Data

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*

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: KP
Date: 6/18/14

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

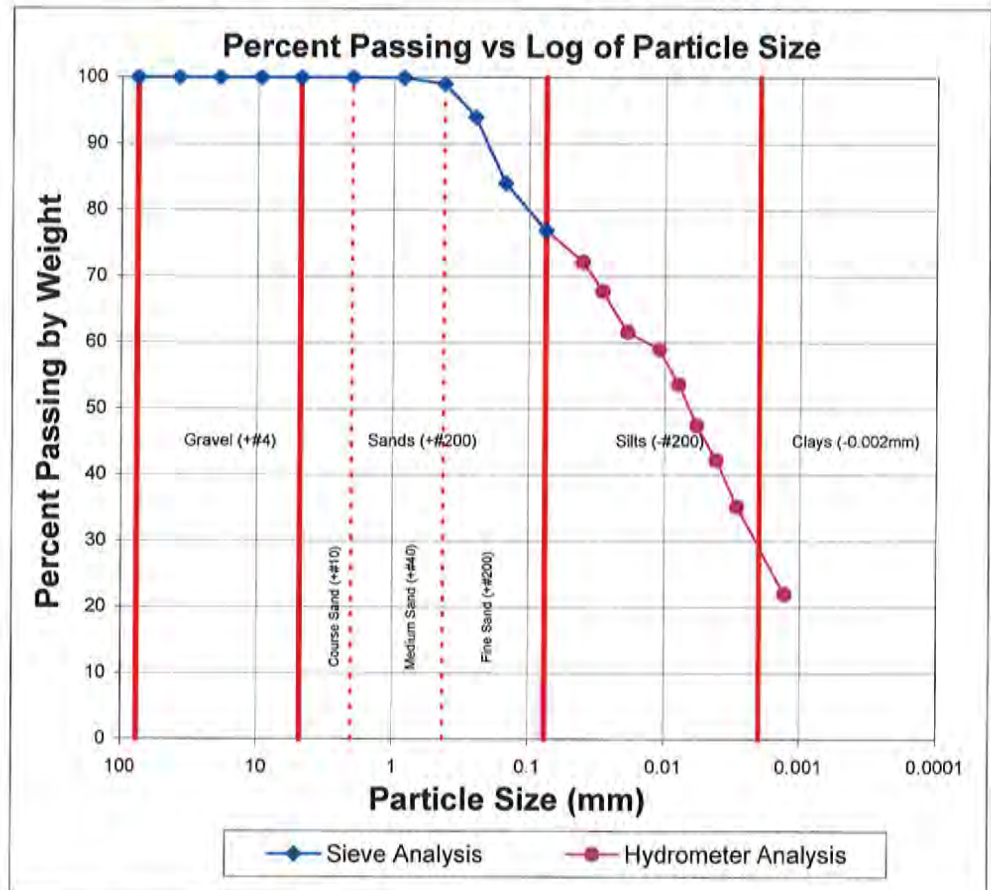
Plus Split Data

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: VP

Date: 6/18/14

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

Particle Size Analysis of Soils ASTM D 422

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

Boring Number: T1-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

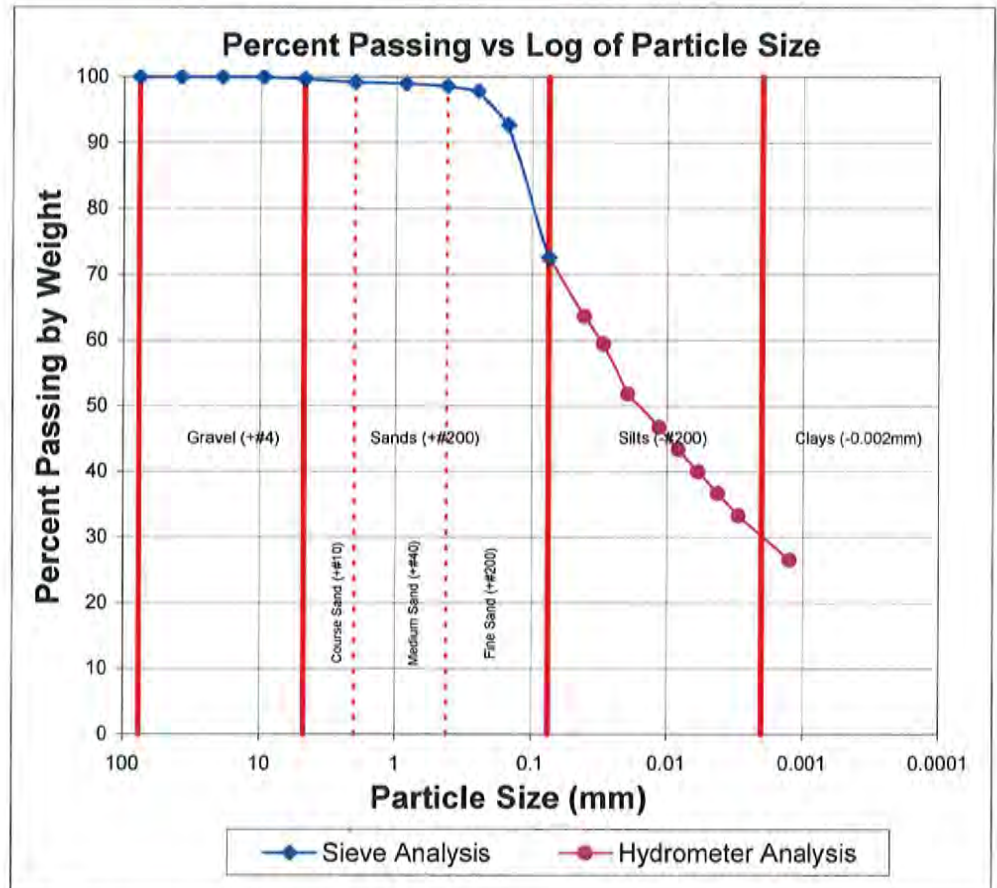
Plus Split Data

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

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

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

Specific Gravity Correction Factor - α : 0.99

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: HR

Date: 6/18/14

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

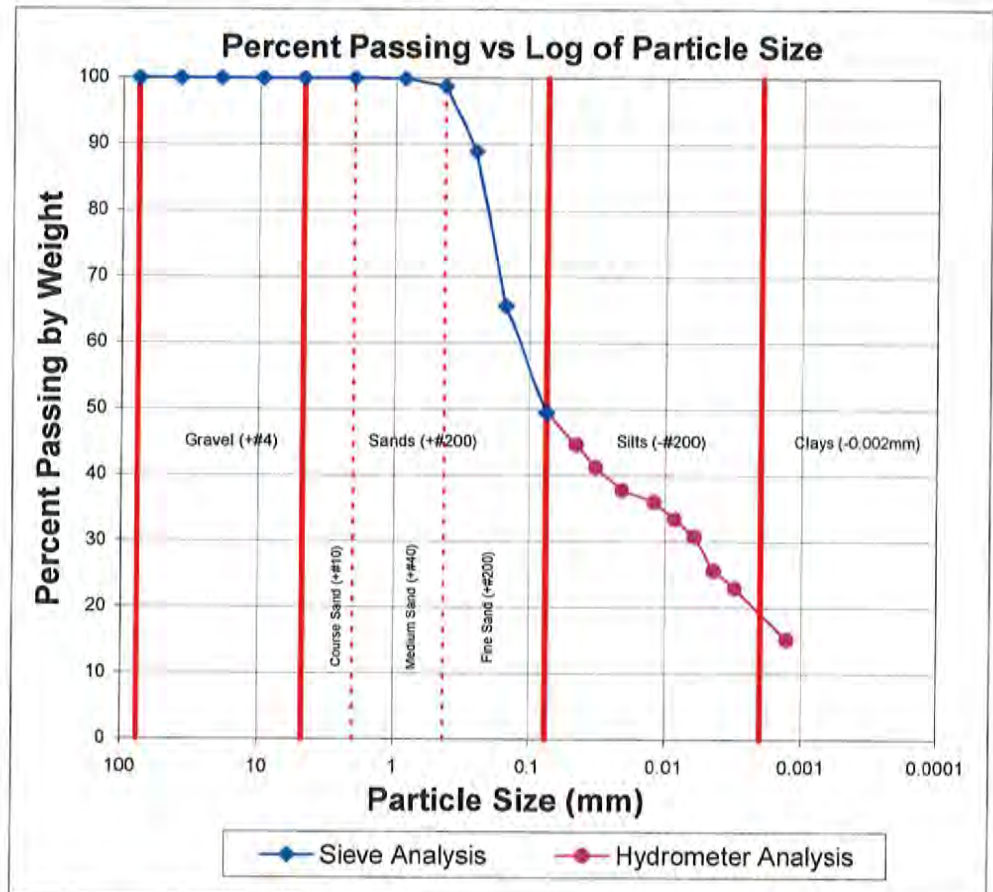
Plus Split Data

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: VR
Date: 6/18/14

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

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

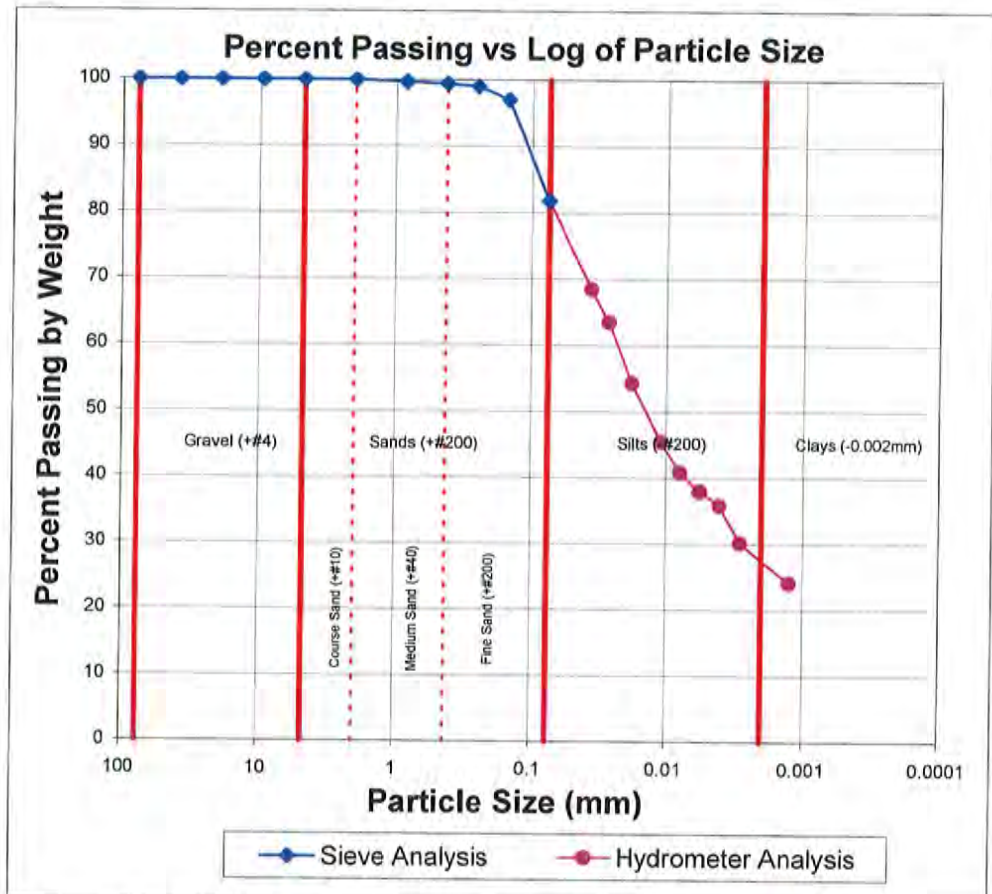
Plus Split Data

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

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: 24

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

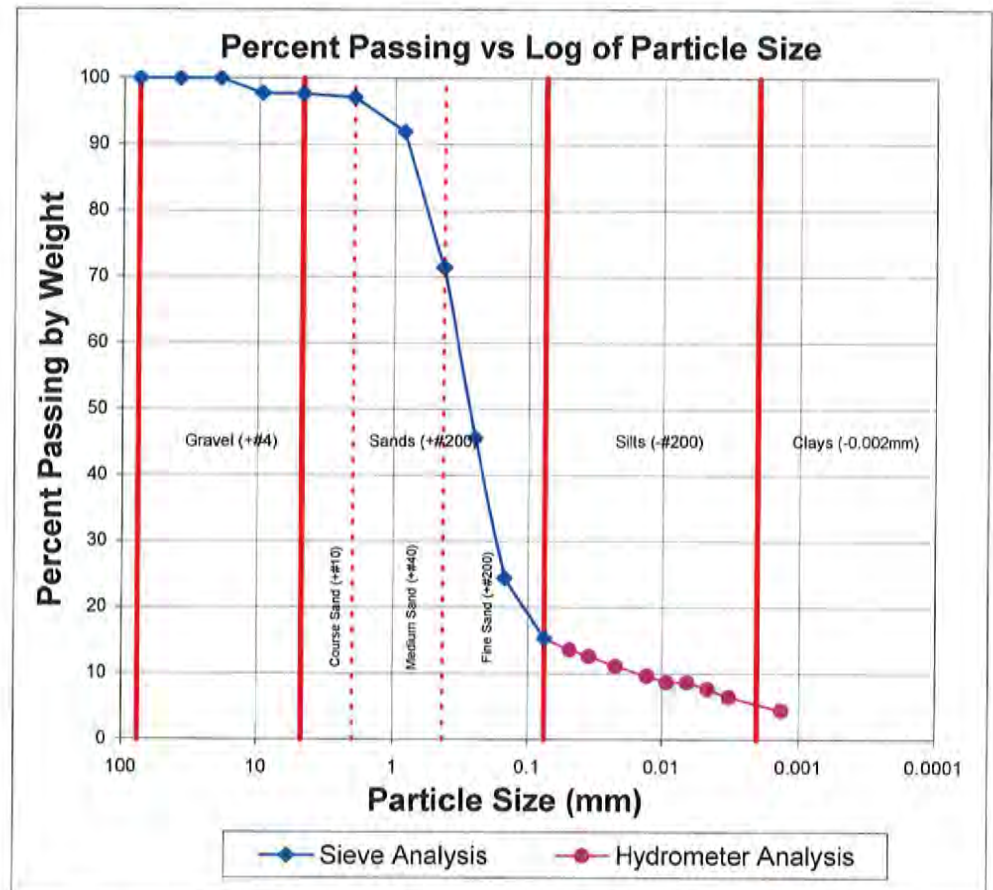
Plus Split Data

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: RP

Date: 6/18/14

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: VR
Date: 6/18/14

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

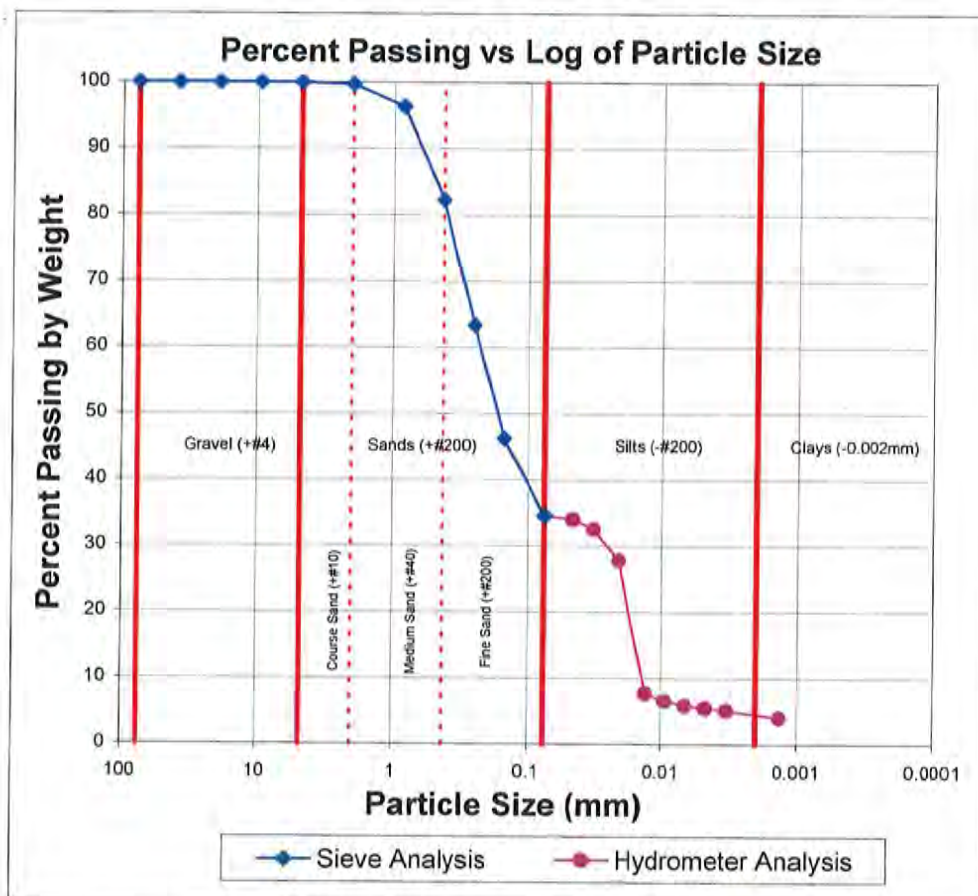
Original Weight of + #10 (g): 0.77
Calculated Weight of + #10 (g): 0.70

Minus Split Data

Original Weight of - #10 (g): 262.45
Calculated Dry Weight of - #10 (g): 254.31

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.

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



Data Entered By: DPM

Date: 6/18/2014

File Name: 2512_77_hydrometer-ASTM-D422-R0_35.xls

Checked By: VR

Date: 6/18/14

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

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

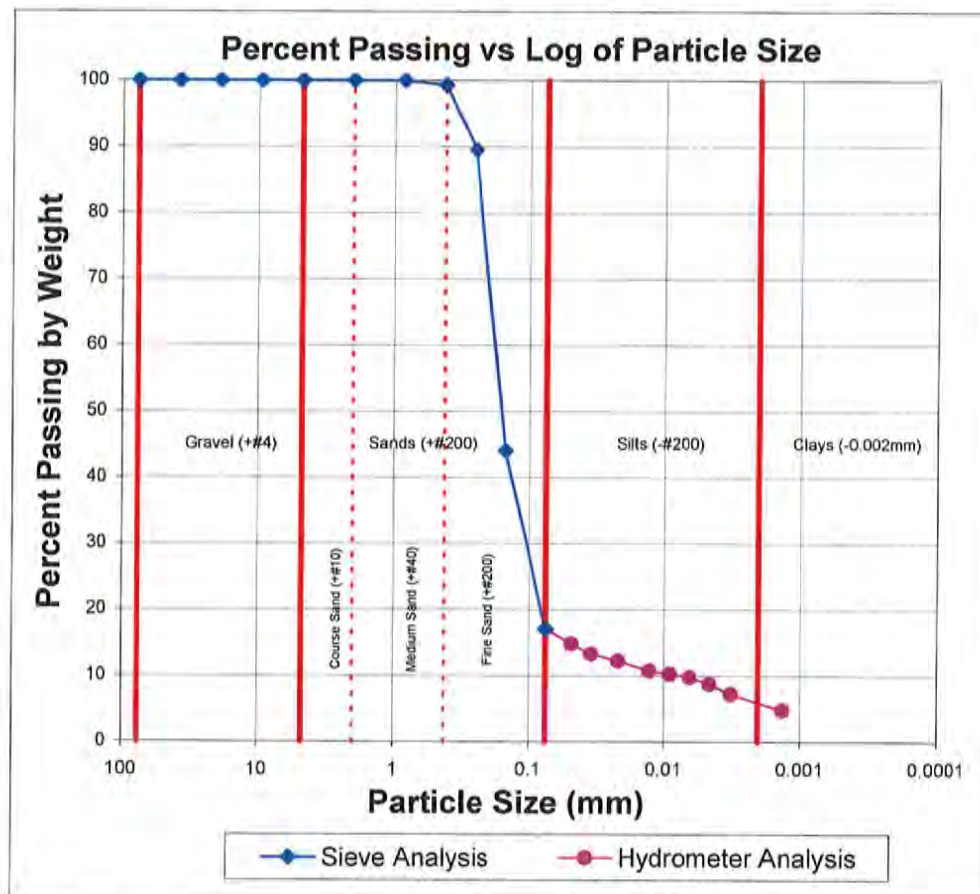
Plus Split Data

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: *VP*

Date: *6/18/14*



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

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

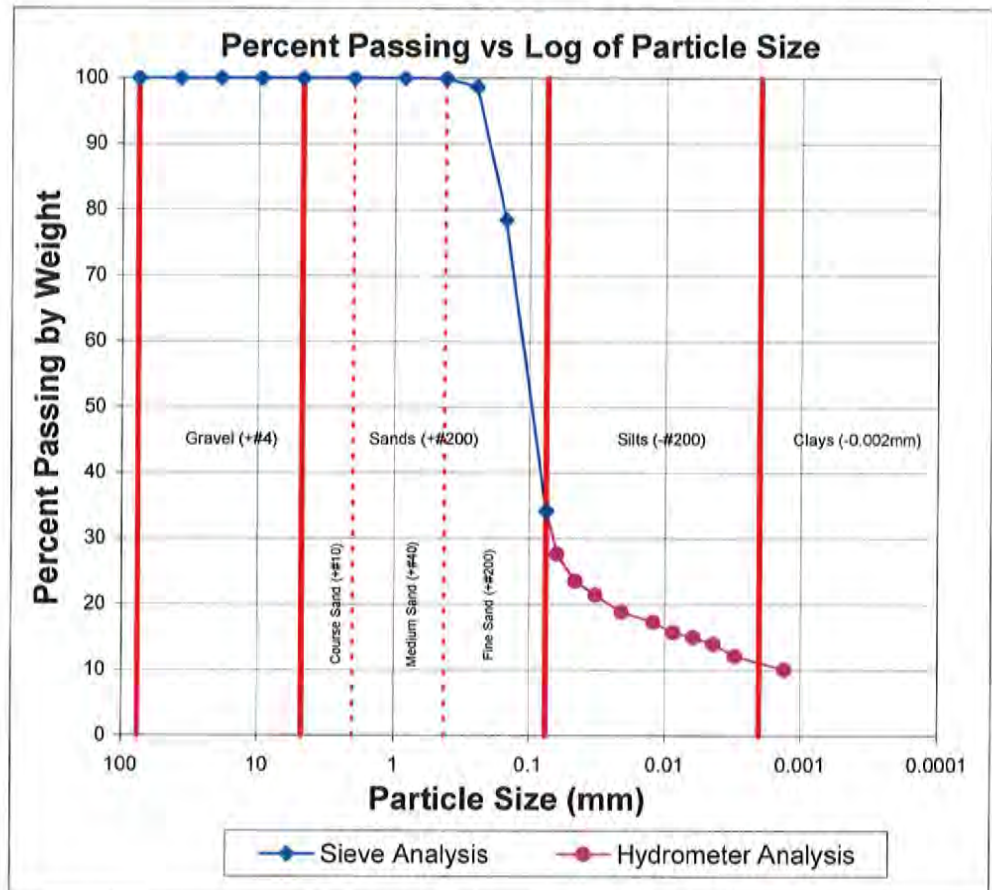
Plus Split Data

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: *[Signature]*

Date: *6/18/14*

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

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

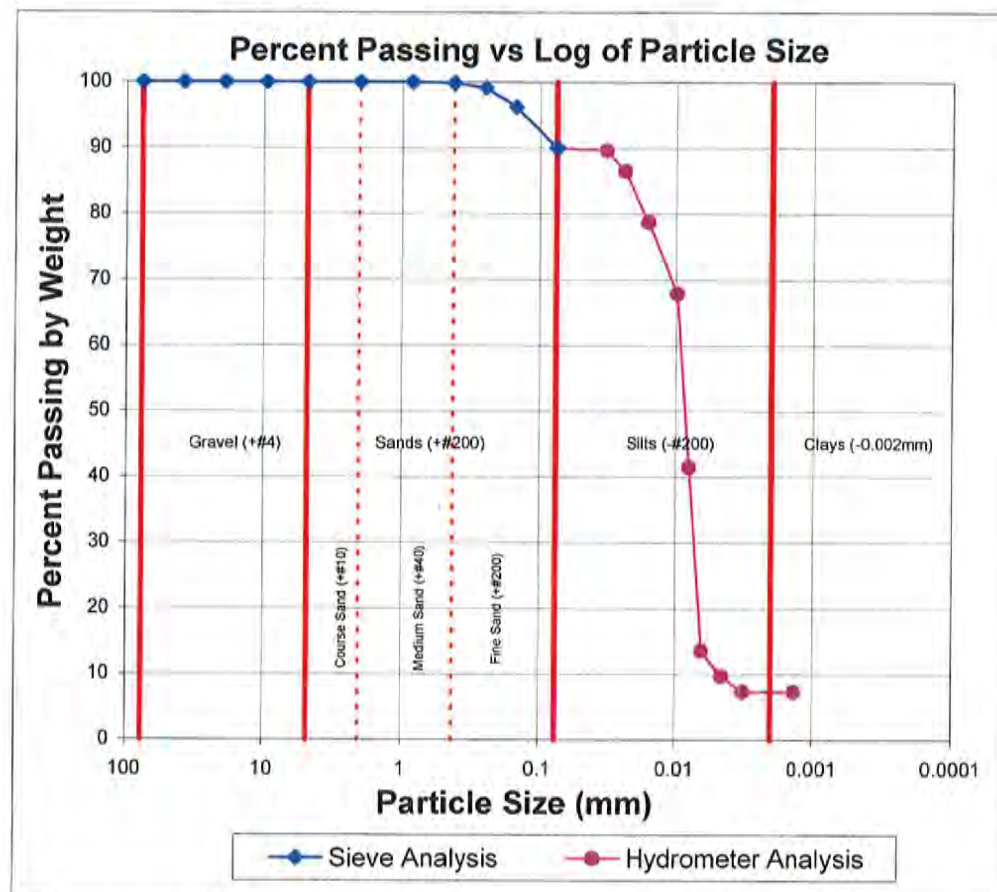
Original Weight of + #10 (g): 0.00
Calculated Weight of + #10 (g): 0.00

Minus Split Data

Original Weight of - #10 (g): 66.33
Calculated Dry Weight of - #10 (g): 63.87

Notes: The sample started showing signs of flocculation within 30 seconds of starting the test. (See photos.)
At the 24 hour reading, the supernate was clear. Any reading above zero is due to dissolved solids.

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



Data Entered By: DPM

Date: 6/18/2014

File Name: 2512_77_hydrometer-ASTM-D422-R0_38.xls

Checked By: *[Signature]*

Date: *6/18/14*

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: HA

Date: 6/18/14

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

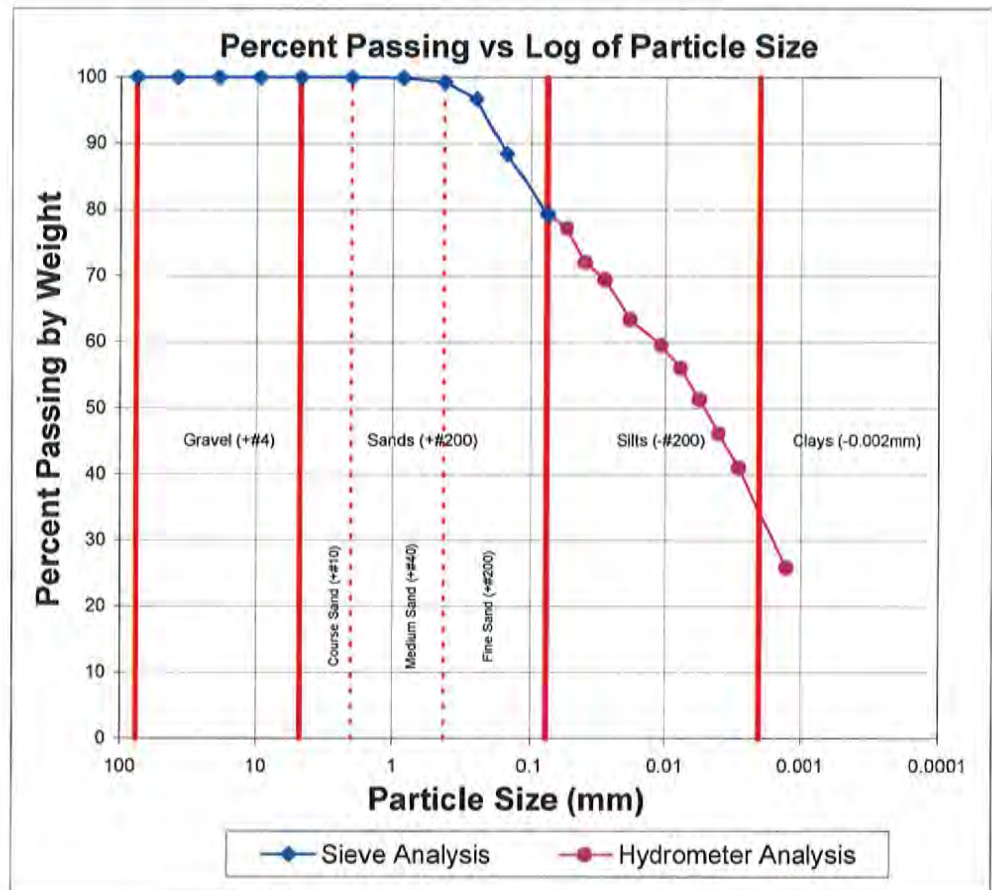
Plus Split Data

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

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: MP
Date: 6/18/14

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

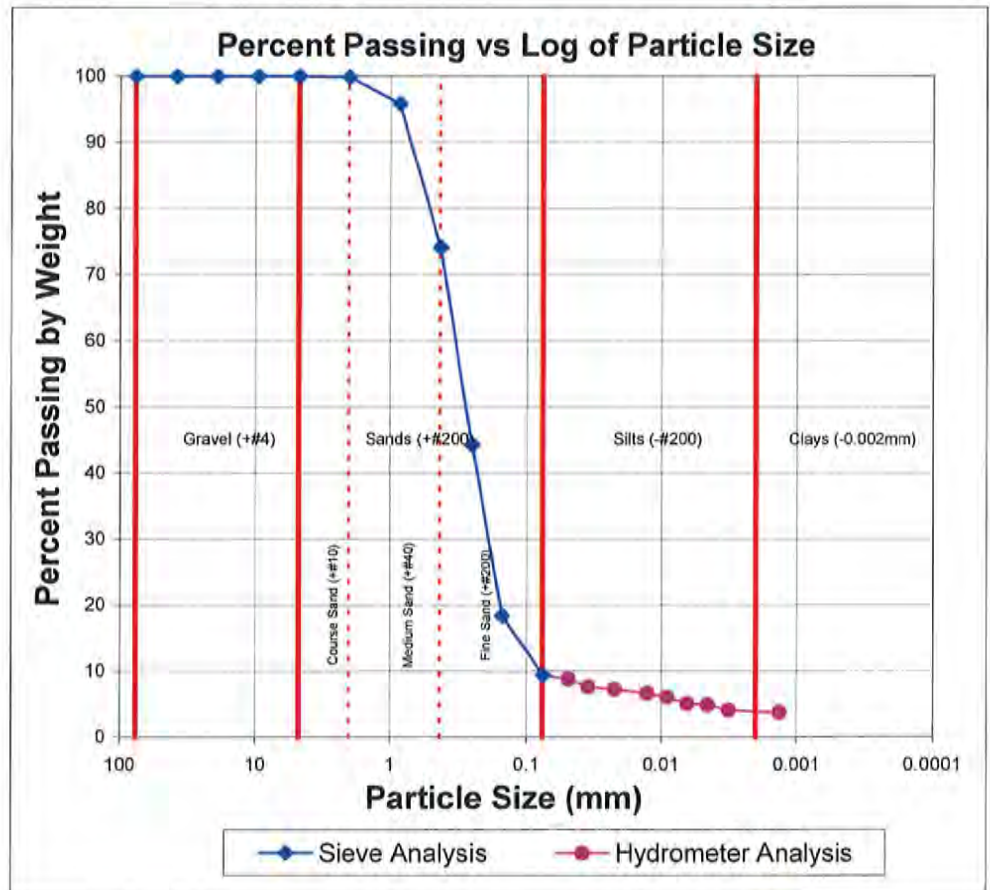
Plus Split Data

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: KP

Date: 6/18/14

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

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

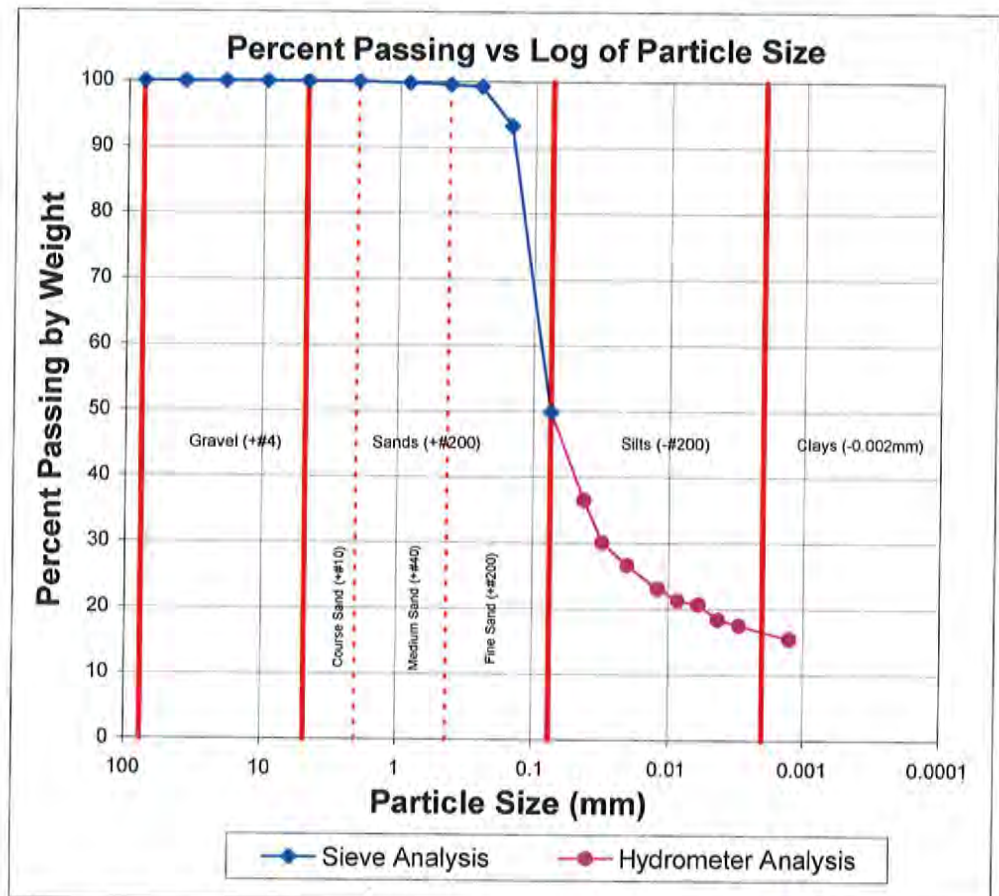
Plus Split Data

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: VP

Date: 6/18/14

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

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

Specific Gravity Correction Factor - α : 0.99

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: _____

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

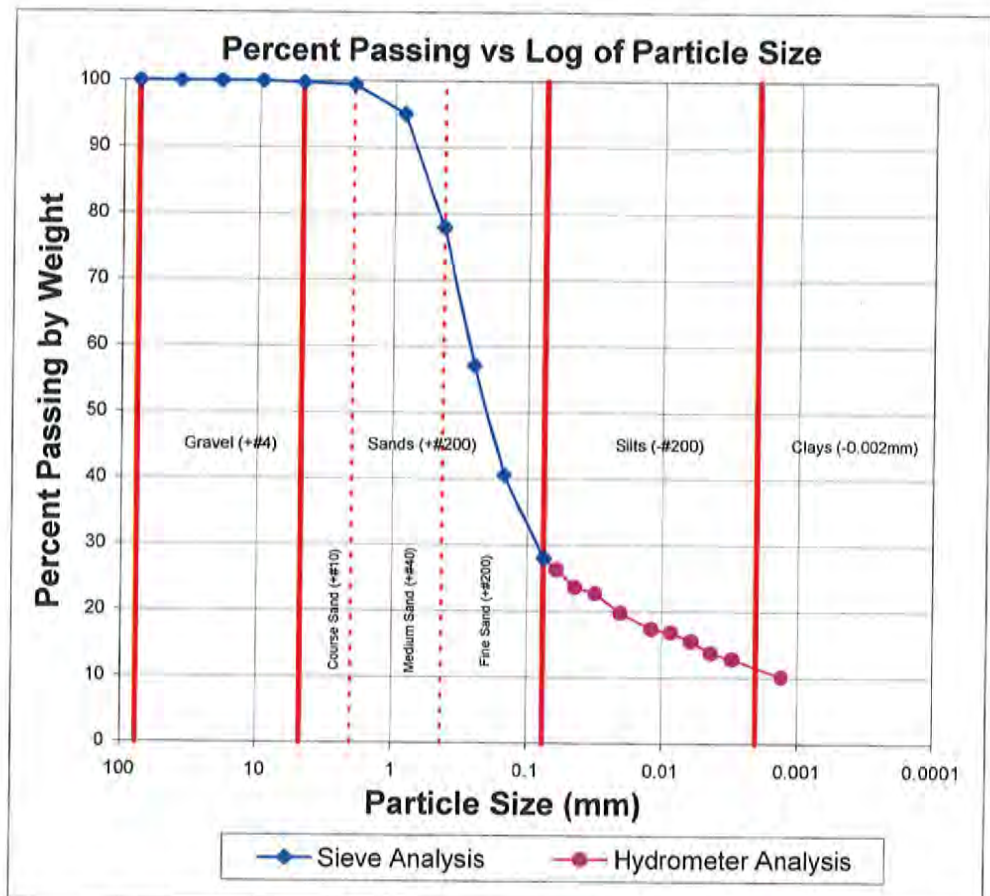
Plus Split Data

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: VR
Date: 6/18/14

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

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

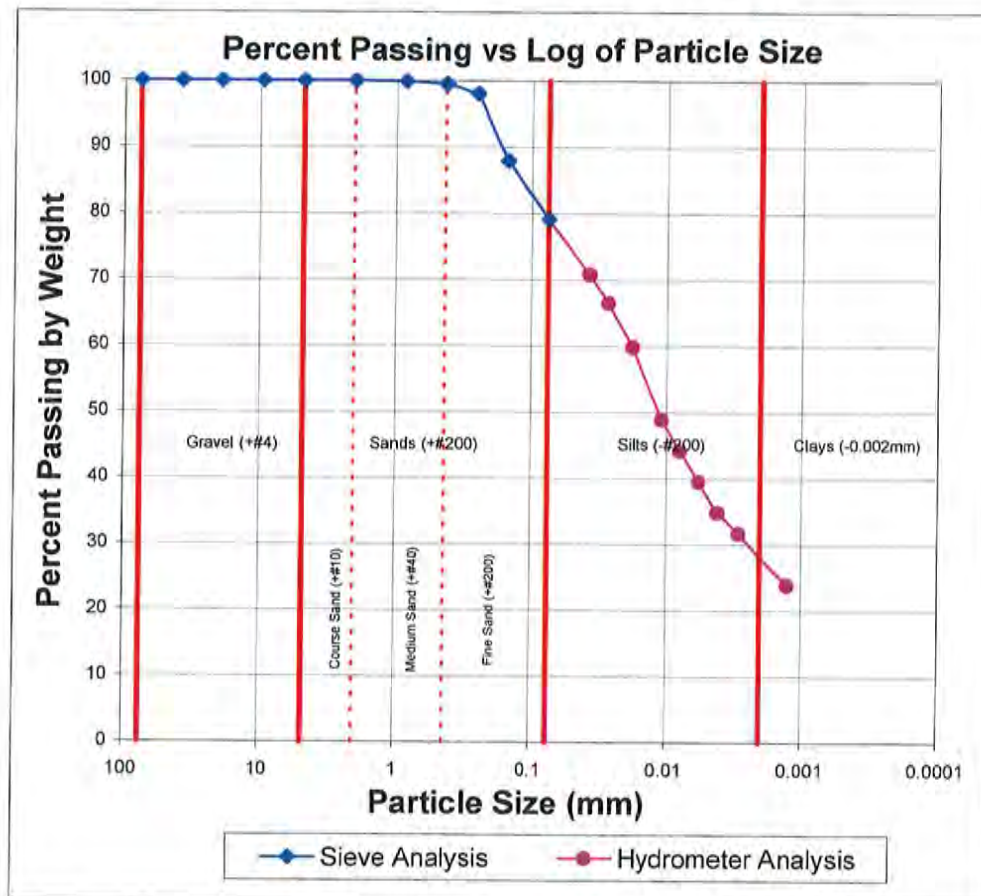
Plus Split Data

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: KZ

Date: 6/18/14

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: VR
Date: 6/18/14

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

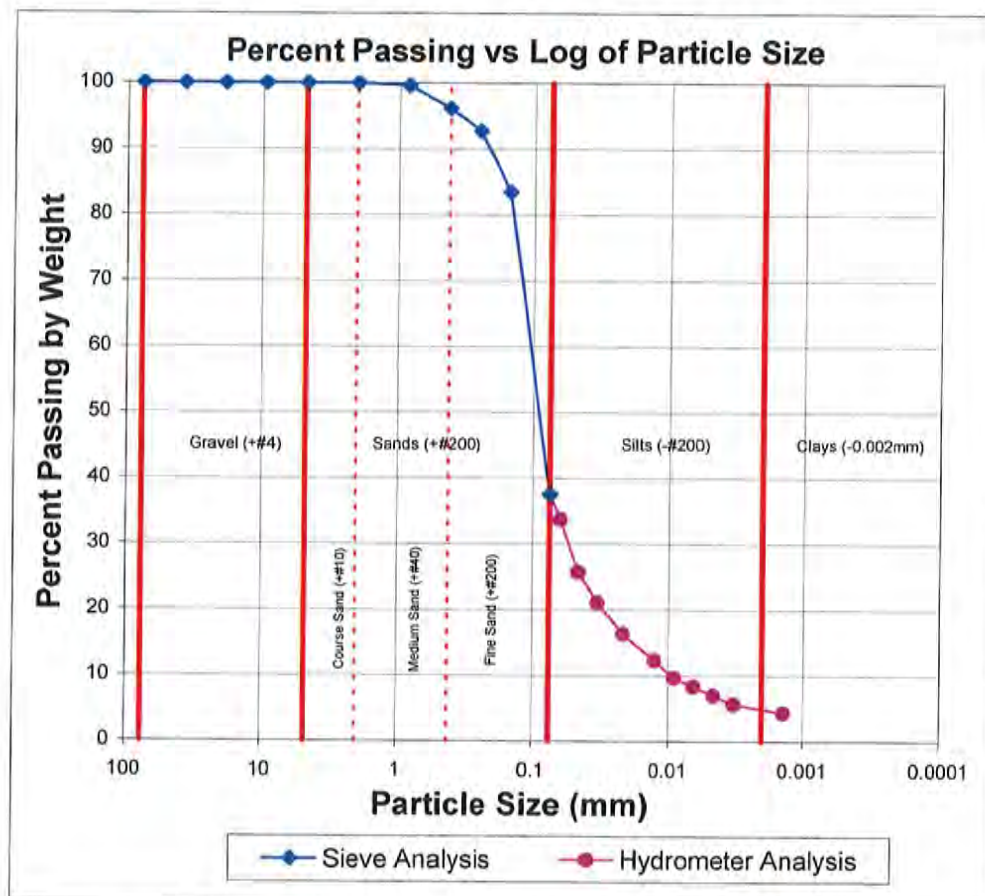
Plus Split Data

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

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: 12R

Date: 6/18/14

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
Test Date: 3/13/2014
Sampled By: MWH
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

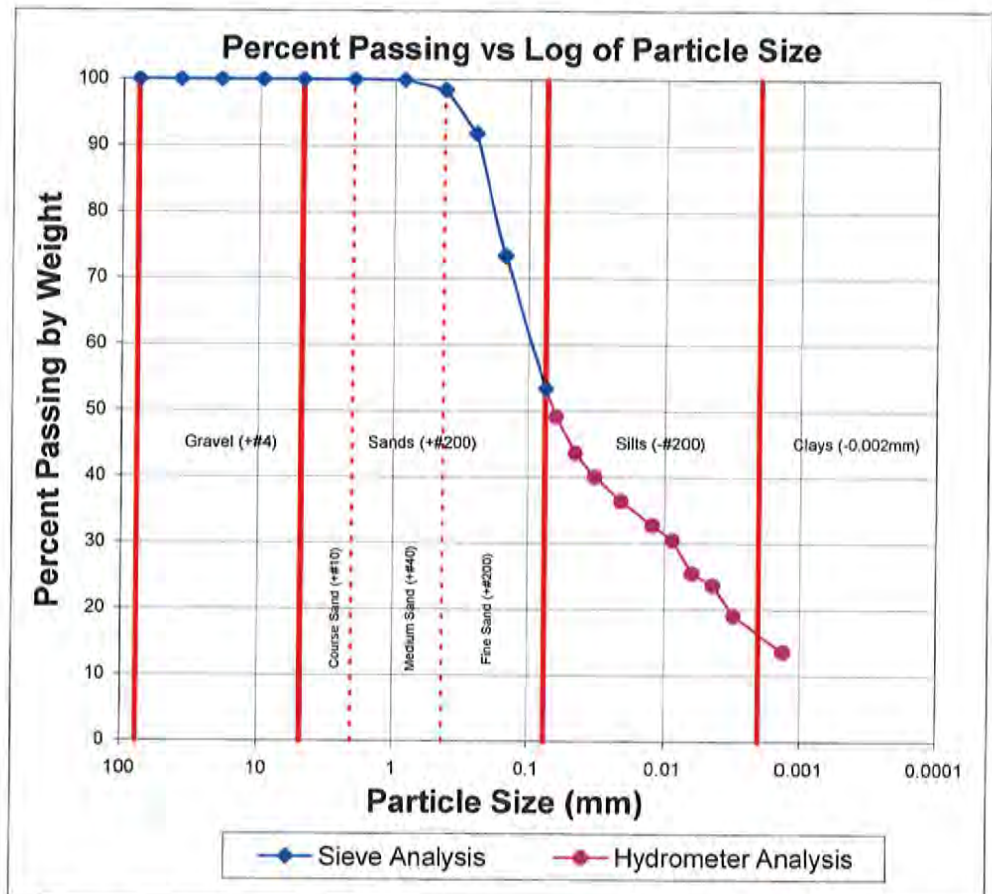
Plus Split Data

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*

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
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): 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

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

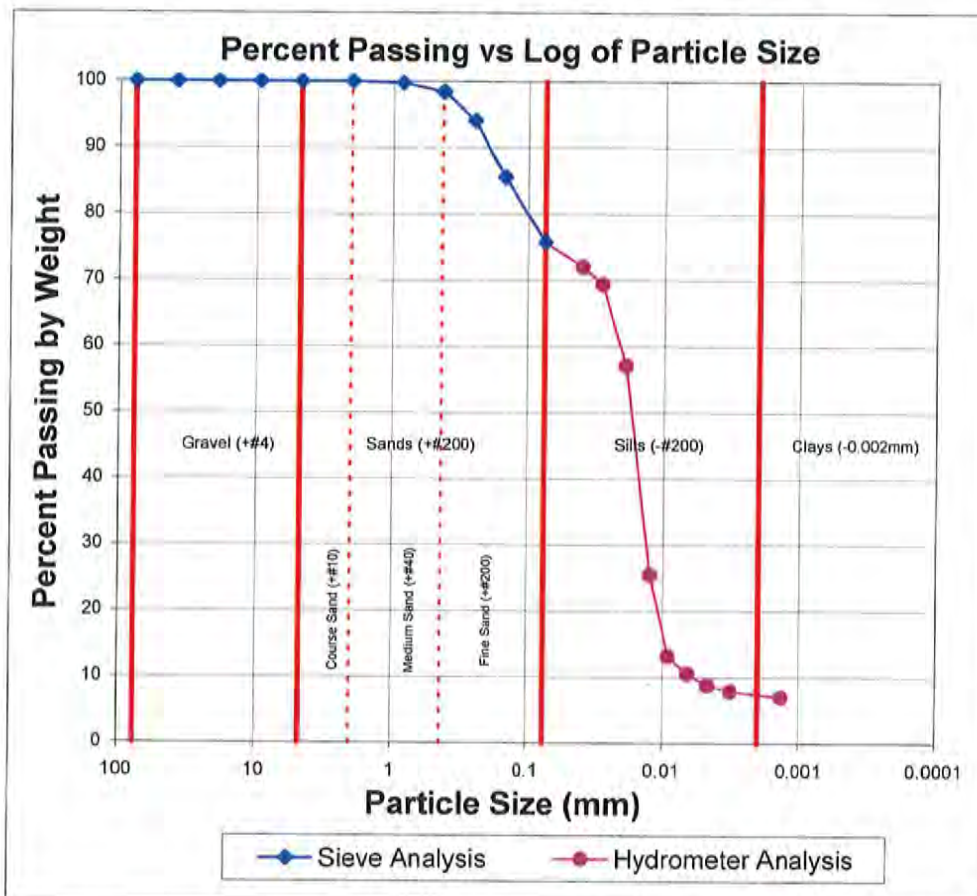
Original Weight of - #10 (g): 57.80
Calculated Dry Weight of - #10 (g): 56.39

Notes:

The sample started showing signs of flocculation at the five minute reading.

At the 24 hour reading the supernate was clear.

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



Data Entered By: DPM

Date: 6/18/2014

File Name: 2512_77_hydrometer-ASTM-D422-R0_46.xls

Checked By: va

Date: 6/18/14

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

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: 32.0-32.5' (30-32.5')
Sample Number: Bottom of Tube - Coarse
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): 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

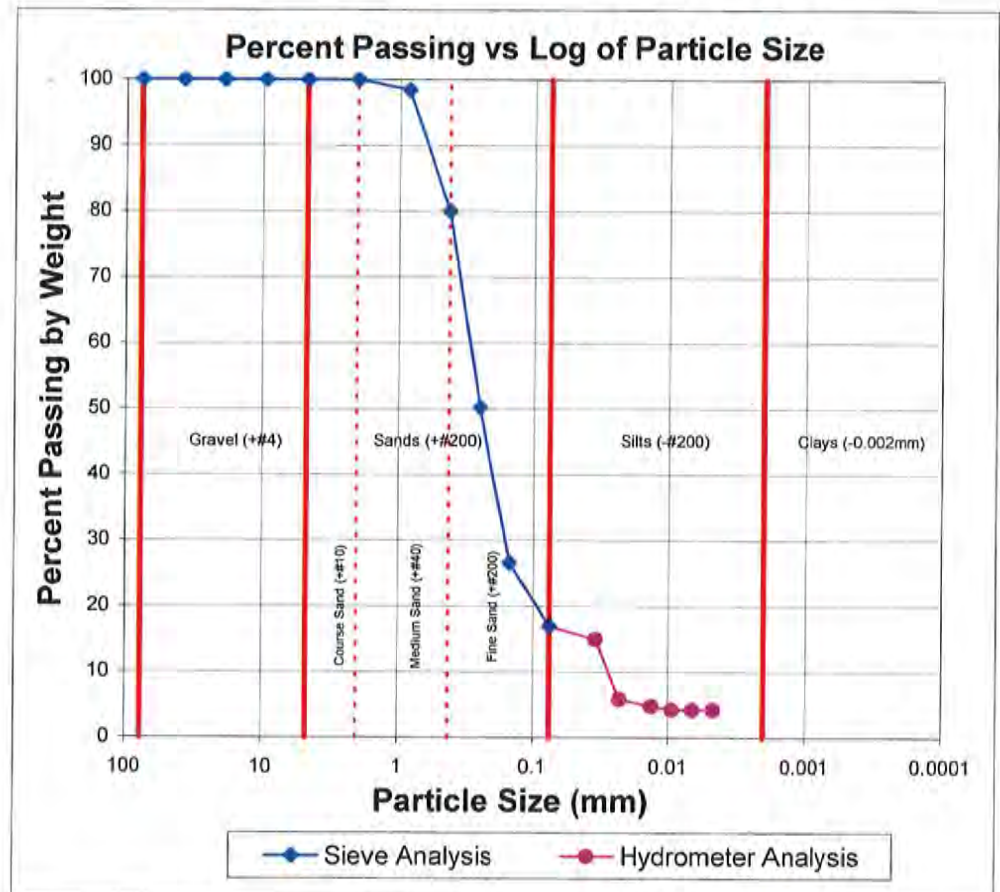
Original Weight of - #10 (g): 93.81
Calculated Dry Weight of - #10 (g): 92.72

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.

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



Data Entered By: DPM

Date: 6/18/2014

File Name: 2512_77_hydrometer-ASTM-D422-R0_47.xls

Checked By: *VA*

Date: *6/18/14*

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: 32.0-32.5' (30-32.5')
Sample Number: Bottom of Tube - Coarse
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): 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

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

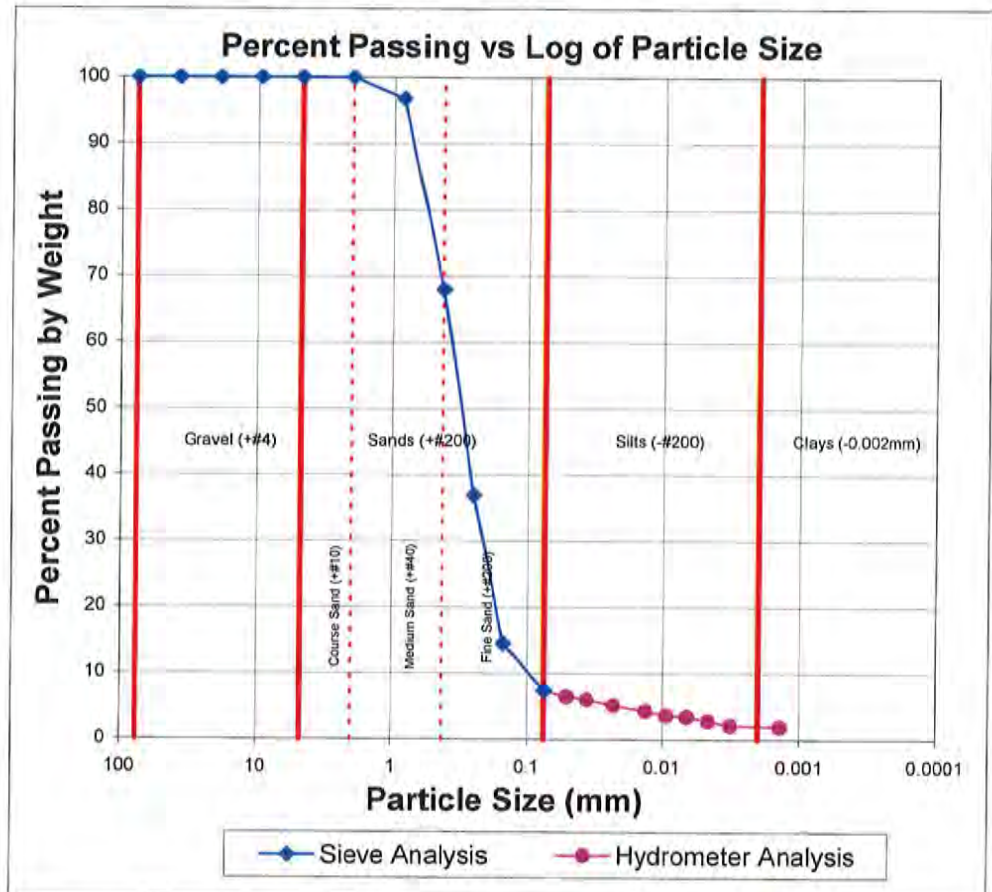
Plus Split Data

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: *va*

Date: *6/18/14*

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

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

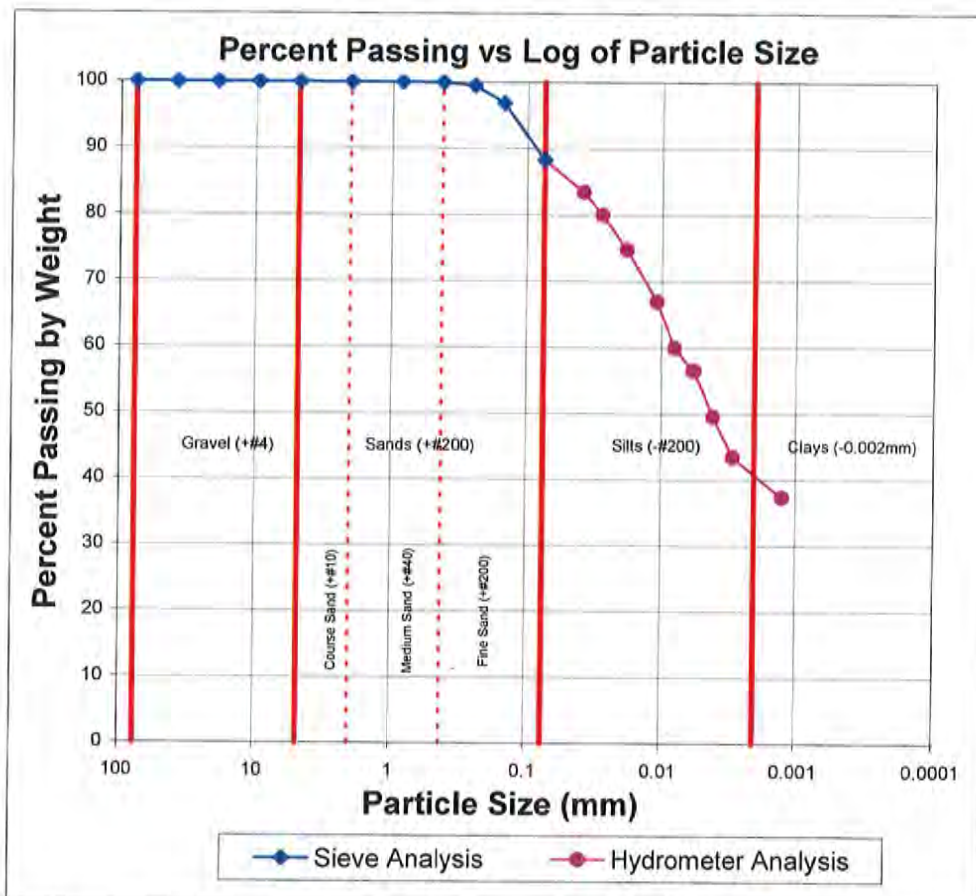
Plus Split Data

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



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: KP

Date: 6/18/14

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

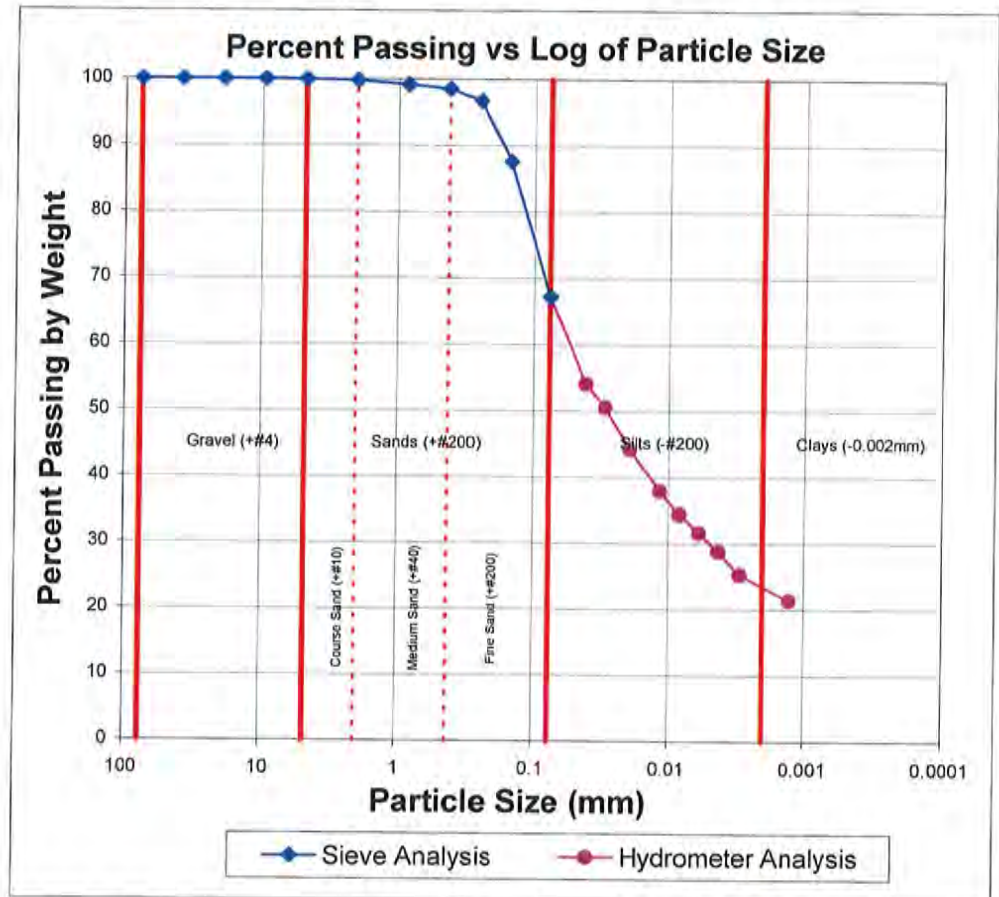
Plus Split Data

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

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

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

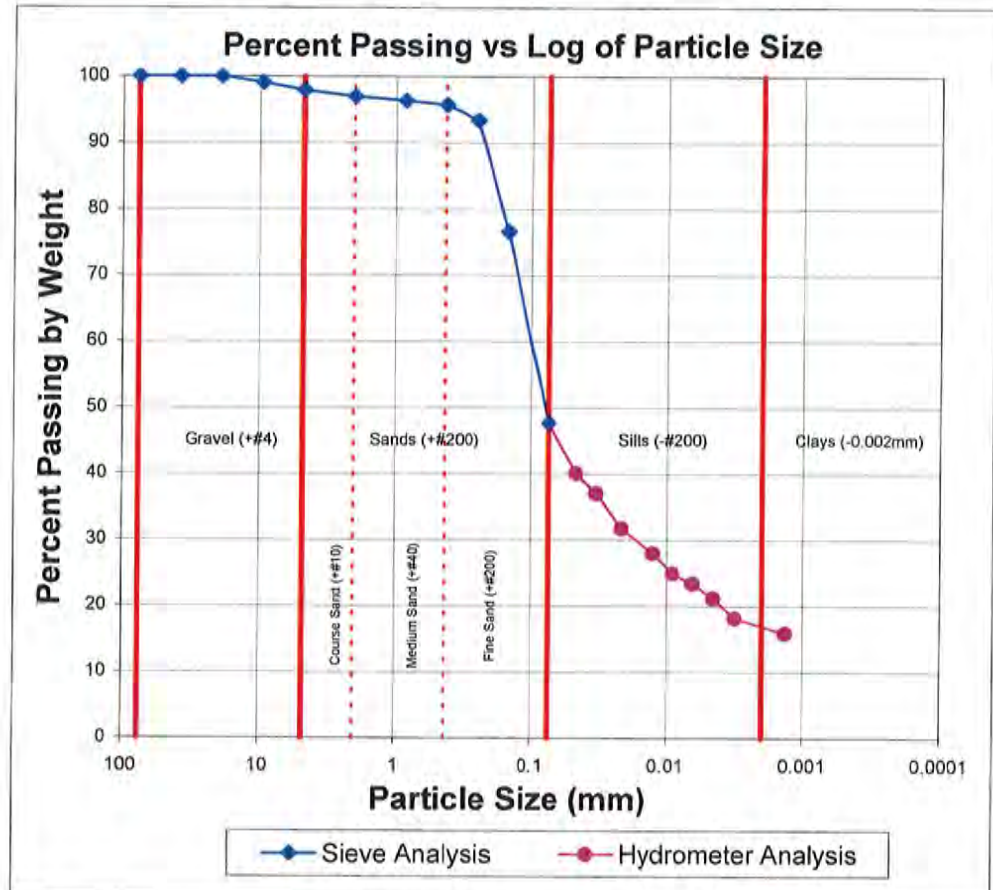
Plus Split Data

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: *VR*

Date: *6/18/14*

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: KP
Date: 6/18/14

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
Test Date: 05/05/14
Sampled By: MWH
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

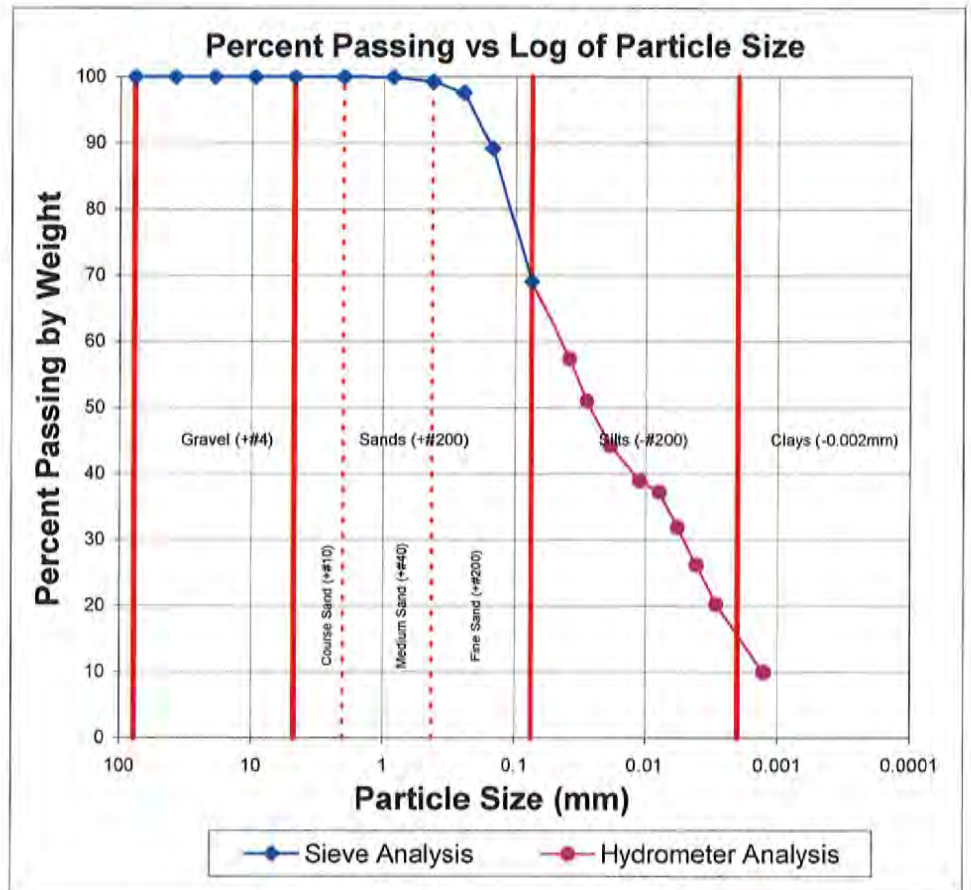
Plus Split Data

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: *VR*

Date: *6/18/14*

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
Test Date: 05/05/14
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): 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

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

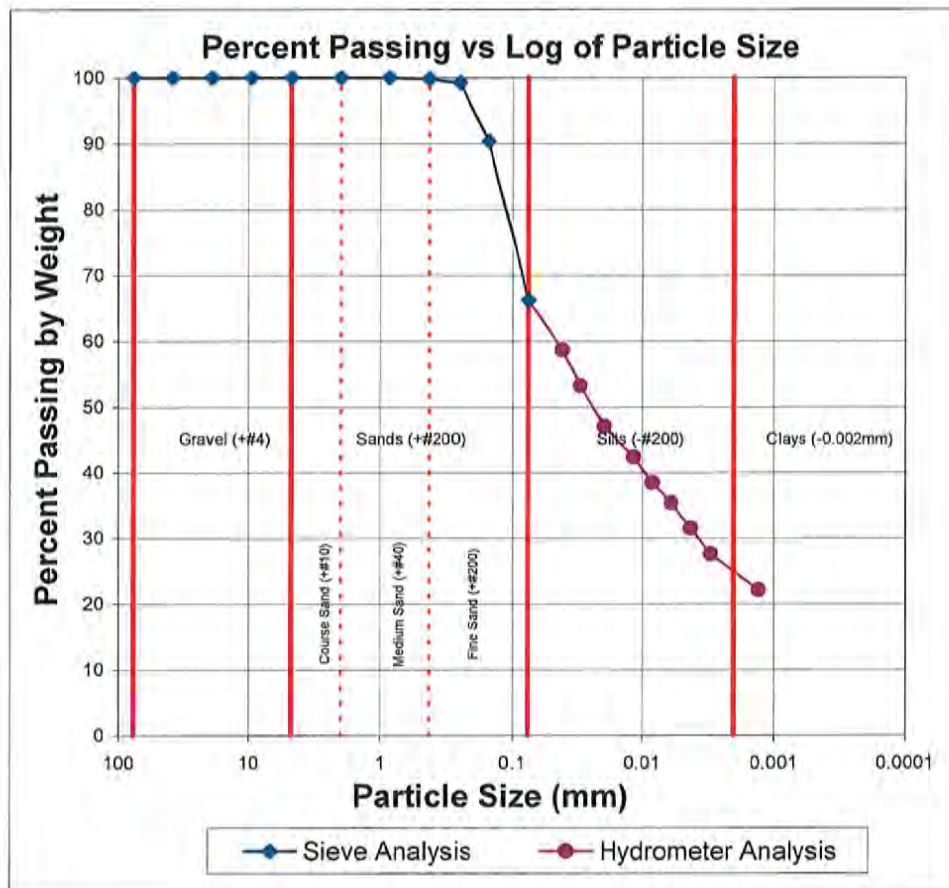
Plus Split Data

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

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: KA
Date: 6/18/14

**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: VP
Date: 6/25/14

CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-03
DEPTH 21.0-22.0' (20-22.4')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment

SAMPLED 11/19/13 MWH
TEST STARTED 04/13/14 DPM
TEST FINISHED 04/14/14 DPM
SETUP NO. ATT-02

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring(s) (g)	196.6	198.1	104.5	0.00000
Wt. Ring(s) (g)	42.1	42.1	2709	0.00630
Wt. Soil (g)	154.4	155.9	2709	0.00660
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

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
DEPTH 21.0-22.0' (20-22.4')
SAMPLE NO. -
SOIL DESCR. Silty Clay

SAMPLED 11/19/13 MWH
TEST STARTED 04/13/14 DPM
TEST FINISHED 04/14/14 DPM
SETUP NO. ATT-02

TIME READING DATA

2709 wet psf load

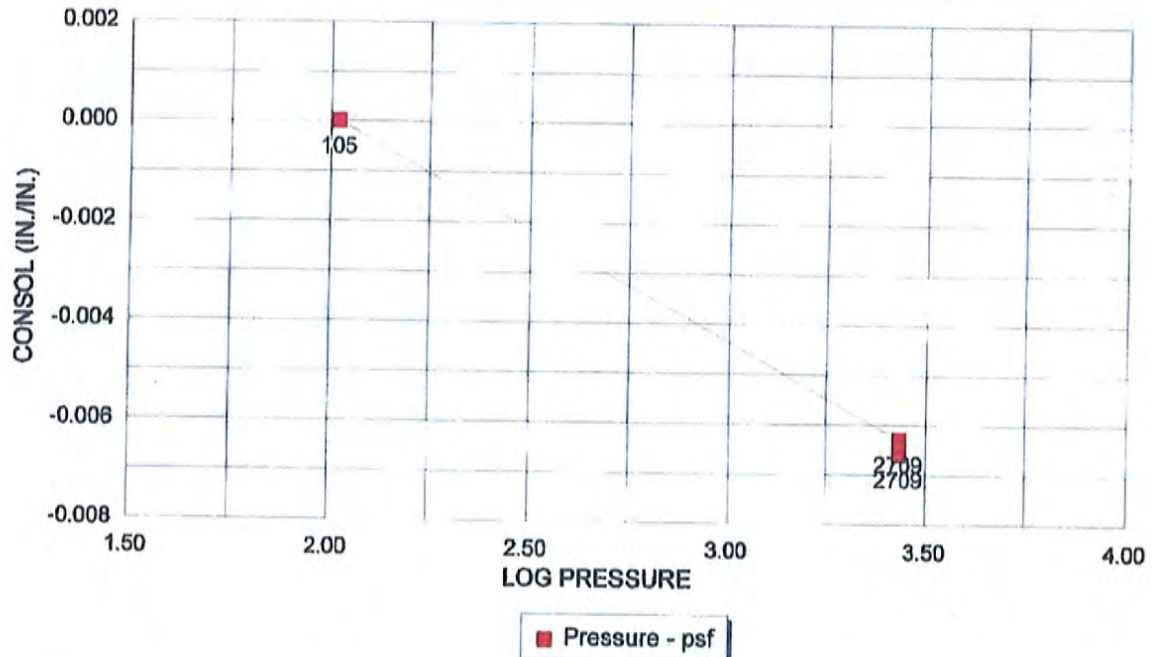
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.01200	0.00000
0.1	0.32	0.01220	-0.00020
0.3	0.50	0.01225	-0.00025
0.5	0.71	0.01230	-0.00030
1.0	1.00	0.01230	-0.00030
2.0	1.41	0.01230	-0.00030
4.0	2.00	0.01230	-0.00030
9.0	3.00	0.01230	-0.00030
16.0	4.00	0.01225	-0.00025
30.0	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



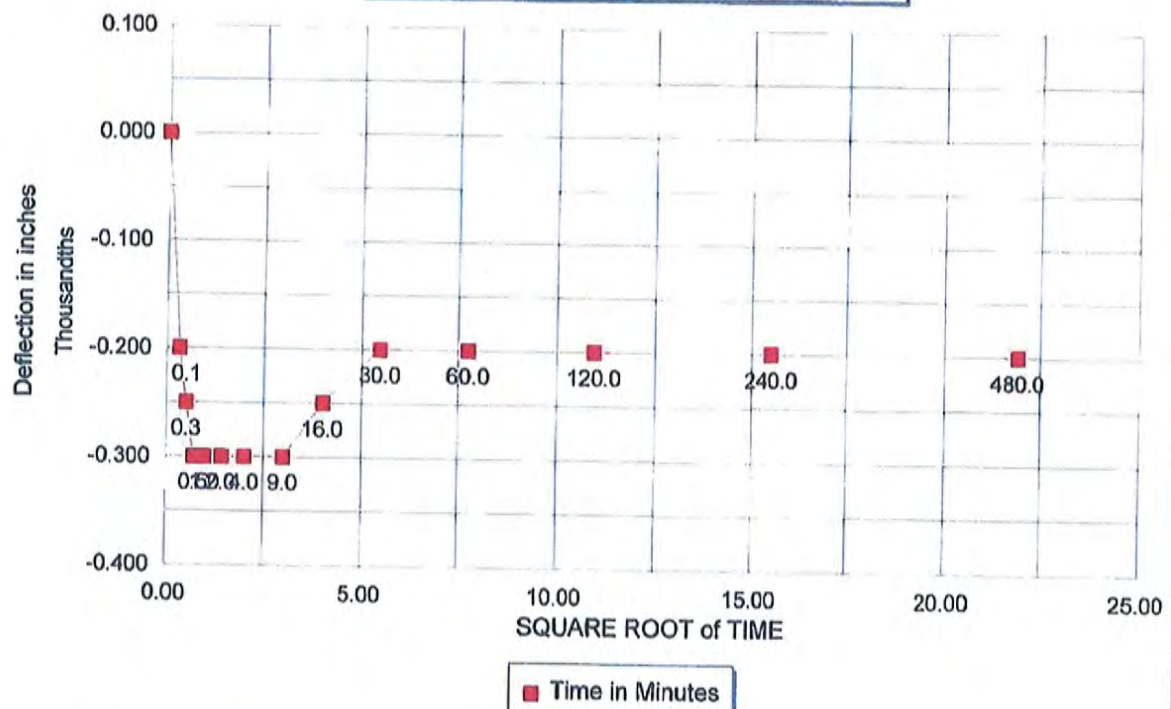
CONSOLIDATION TEST DATA

TI-B3-03,21.0-22.0' (20-22.4'),-



TIME READING DATA

TI-B3-03,21.0-22.0' (20-22.4'),-2709wet psf load



CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-02C
DEPTH 16.0-16.5'
SAMPLE NO. -
SOIL DESCR. Sand
LOCATION Tailings Impoundment

SAMPLED 11/19/13 MWH
TEST STARTED 02/05/14 DPM
TEST FINISHED 02/06/14 DPM
SETUP NO. ATT-05

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring(s) (g)	328.7	337.4	154	0.00000
Wt. Ring(s) (g)	243.3	243.3	2236	0.00815
Wt. Soil (g)	85.4	94.0	2236	0.03565
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)	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: DJ Date: 3/6/2014
Filename: MWSW302C



CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-02C
DEPTH 16.0-16.5'
SAMPLE NO. -
SOIL DESCR. Sand

SAMPLED 11/19/13 MWH
TEST STARTED 02/05/14 DPM
TEST FINISHED 02/06/14 DPM
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

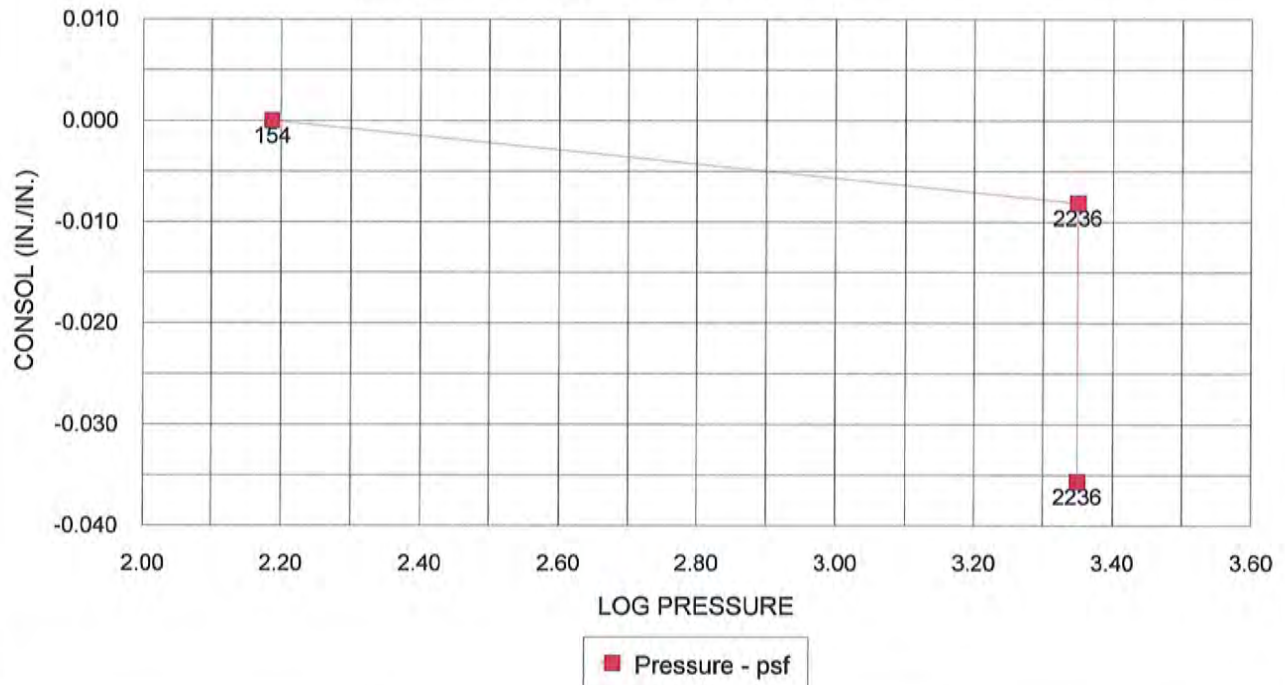
Data Entered By: DPM
Data Checked By: BS
Filename: MWSW302C

Date: *****
Date: 3/6/2014



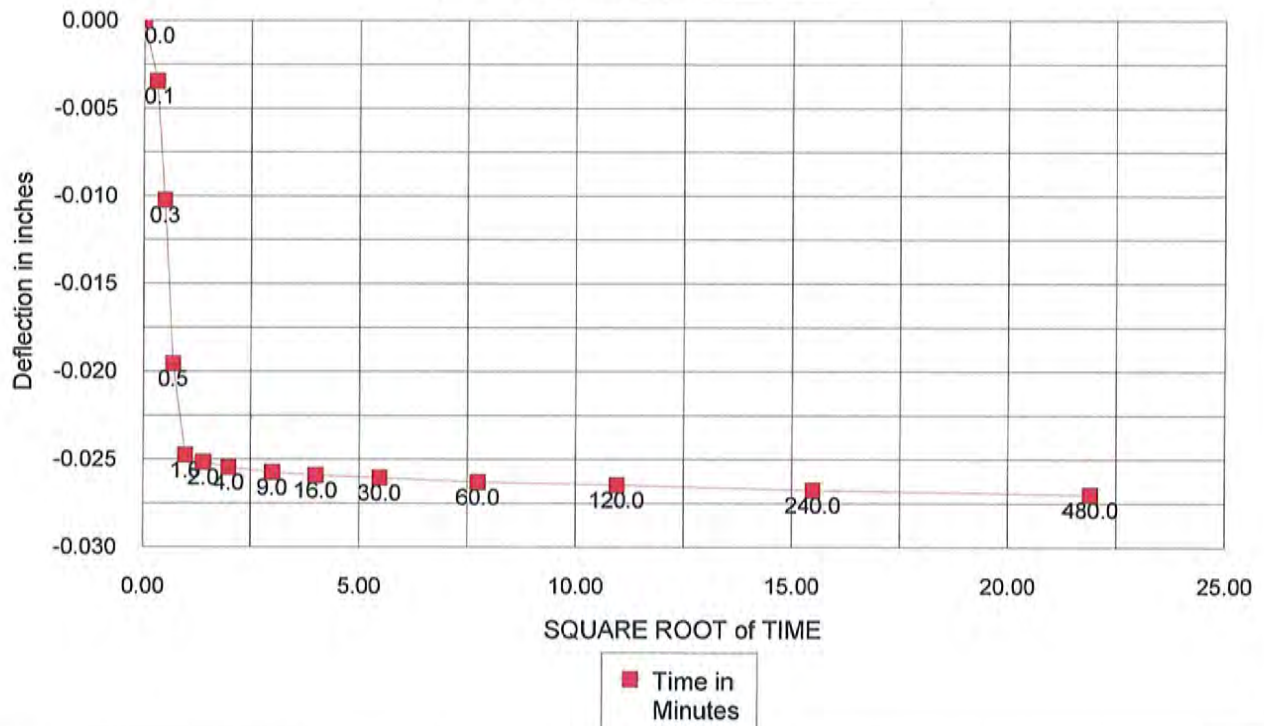
CONSOLIDATION TEST DATA

TI-B3-02C, 16.0-16.5', -



TIME READING DATA

TI-B3-02C, 16.0-16.5', -, 2236wet psf load



CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-6
DEPTH 35-36' (35-37.3)
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment

SAMPLED 11/19/13 MWH
TEST STARTED 04/19/14 DPM
TEST FINISHED 04/20/14 DPM
SETUP NO. ATT-05

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	182.5	186.8	99.4	0.00000
Wt. Ring (s) (g)	42.0	42.0	4608	0.03450
Wt. Soil (g)	140.4	144.7	4608	0.04170
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

Data Entered By: DPM Date: 05/23/2014
Data Checked By: VR Date: 5/23/14
Filename: MWSWB306



CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-6
DEPTH 35-36' (35-37.3')
SAMPLE NO. -
SOIL DESCR. Silty Clay

SAMPLED 11/19/13 MWH
TEST STARTED 04/19/14 DPM
TEST FINISHED 04/20/14 DPM
SETUP NO. ATT-05

TIME READING DATA

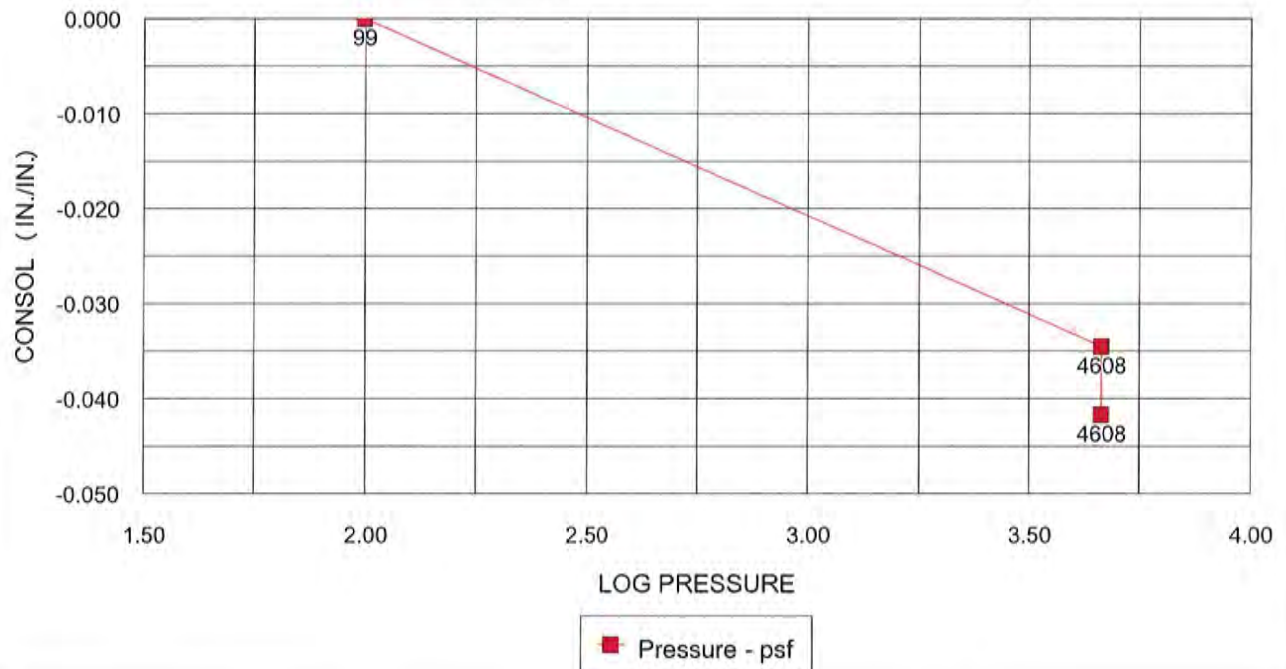
4608 wet psf load			
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.04140	-0.00000
0.1	0.32	0.04160	-0.00020
0.3	0.50	0.04170	-0.00030
0.5	0.71	0.04180	-0.00040
1.0	1.00	0.04225	-0.00085
2.0	1.41	0.04270	-0.00130
4.0	2.00	0.04335	-0.00195
9.0	3.00	0.04430	-0.00290
16.0	4.00	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



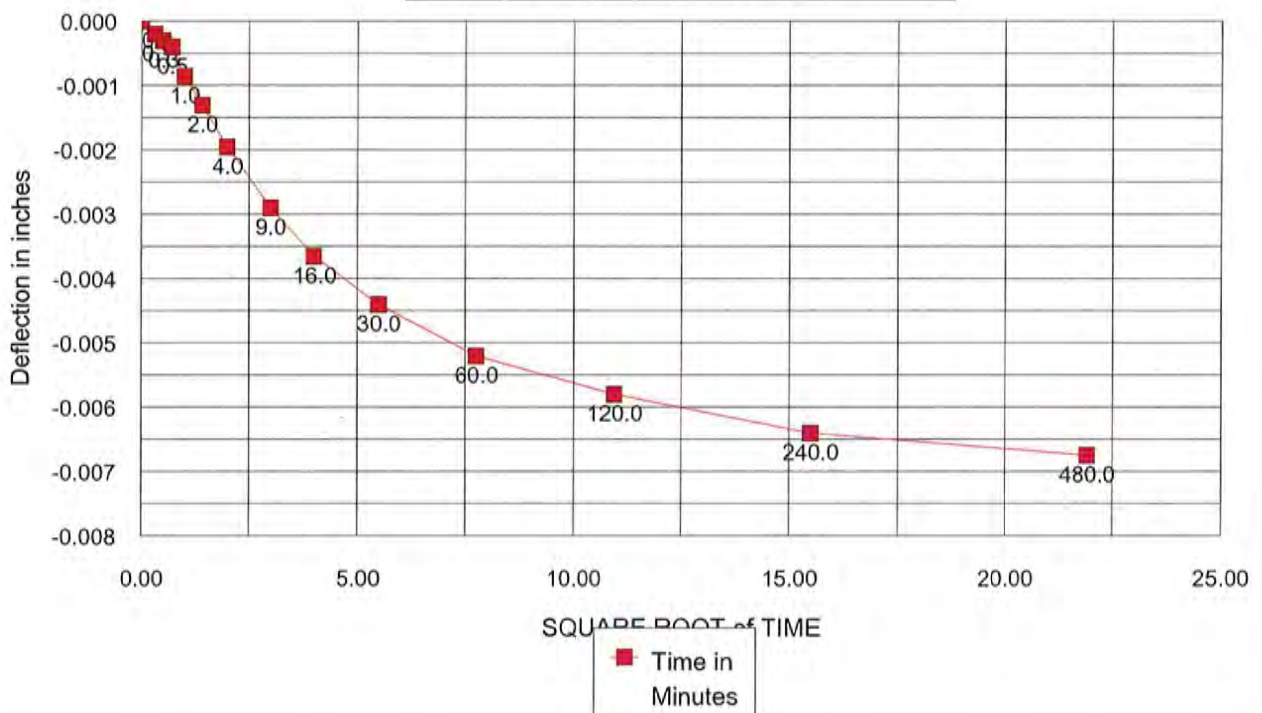
CONSOLIDATION TEST DATA

TI-B3-6,35-36' (35-37.3') , -



TIME READING DATA

TI-B3-6,35-36' (35-37.3') , -4608wet psf load



CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-10
DEPTH 56-57' (55-57')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment

SAMPLED 11/19/13 MWH
TEST STARTED 04/21/14 DPM
TEST FINISHED 04/22/14 DPM
SETUP NO. ATT-02

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring(s) (g)	198.7	197.5	104.5	0.00000
Wt. Ring(s) (g)	42.7	42.7	7204	0.01455
Wt. Soil (g)	156.0	154.8	7204	0.02995
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)	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: Kr Date: 5/27/14
Filename: MWSWB310



CONSOLIDATION/SWELL TEST
ASTM D 4546

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-10
DEPTH 56-57' (55-57')
SAMPLE NO. -
SOIL DESCR. Silty Clay

SAMPLED 11/19/13 MWH
TEST STARTED 04/21/14 DPM
TEST FINISHED 04/22/14 DPM
SETUP NO. ATT-02

TIME READING DATA

7204 wet psf load

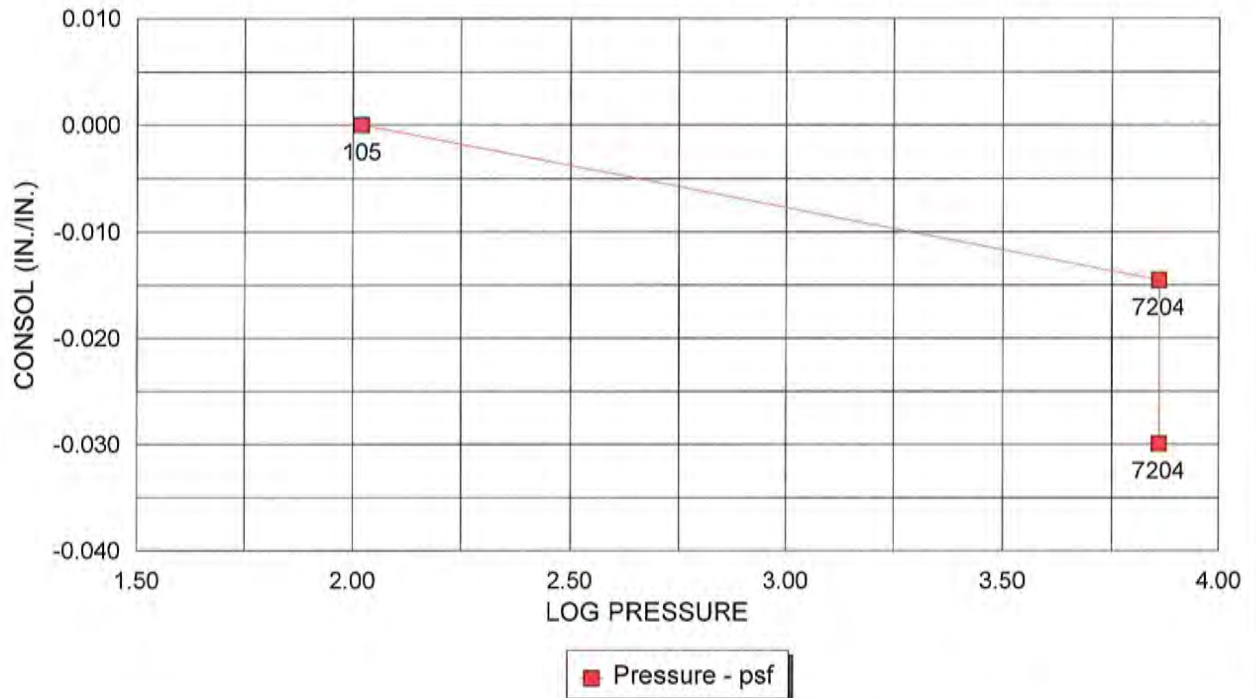
Elapsed Time (min)	SQRT Time (min)	Dial Reading (in)	Defl. (in)
0.0	0.00	0.02255	0.00000
0.1	0.32	0.02265	-0.00010
0.3	0.50	0.02270	-0.00015
0.5	0.71	0.02280	-0.00025
1.0	1.00	0.02300	-0.00045
2.0	1.41	0.02340	-0.00085
4.0	2.00	0.02410	-0.00155
9.0	3.00	0.02575	-0.00320
16.0	4.00	0.02745	-0.00490
30.0	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: KR Date: 5/27/14
Filename: MWSWB310



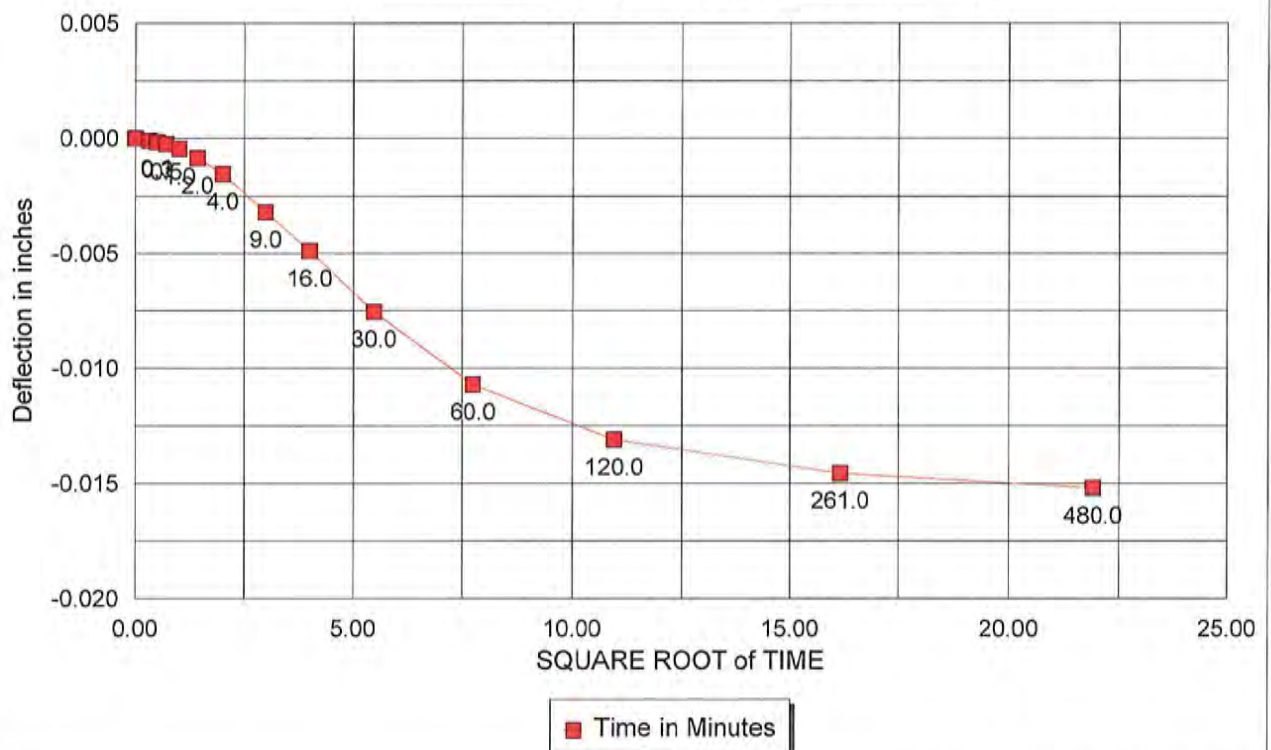
CONSOLIDATION TEST DATA

TI-B3-10,56-57' (55-57'),-



TIME READING DATA

TI-B3-10,56-57' (55-57'),-,7204wet psf load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-08
DEPTH 51.5-52.5' (50-52.5')
SAMPLE NO. -
SOIL DESCR. Fine Tailings
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 12/02/13 MWH
TEST STARTED 03/06/14 DPM
TEST FINISHED 03/18/14 DPM
CELL NUMBER ATT-04

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	163.9	151.9	108.9	0.00000
Wt. Ring (s) (g)	42.0	42.0	108.9	-0.00070
Wt. Soil (g)	121.9	109.9	207.4	-0.00150
Wet Density PCF	101.8	110.4	405.0	-0.00200
			802.8	-0.00125
Wt. Wet Soil & Pan (g)	125.7	113.7	1604	0.00525
Wt. Dry Soil & Pan (g)	78.6	78.6	3204	0.01905
Wt. Lost Moisture (g)	47.1	35.1	6377	0.04885
Wt. of Pan Only (g)	3.8	3.8	12869	0.12685
Wt. of Dry Soil (g)	74.8	74.8	25491	0.21550
Moisture Content %	63.0	47.0	6377	0.20195
Dry Density PCF	62.5	75.1	1604	0.16855

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	109	2.037	0.0000	0.0000	1.6990
	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
Data checked by: KR
FileName: MWC01108

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-08
 DEPTH 51.5-52.5' (50-52.5)
 SAMPLE NO. -
 SOIL DESCR. Fine Tailings
 LOCATION Tailings Impoundment

SAMPLED 12/02/13 MWH
 TEST STARTED 03/06/14 DPM
 TEST FINISHED 03/18/14 DPM
 CELL NUMBER ATT-04

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

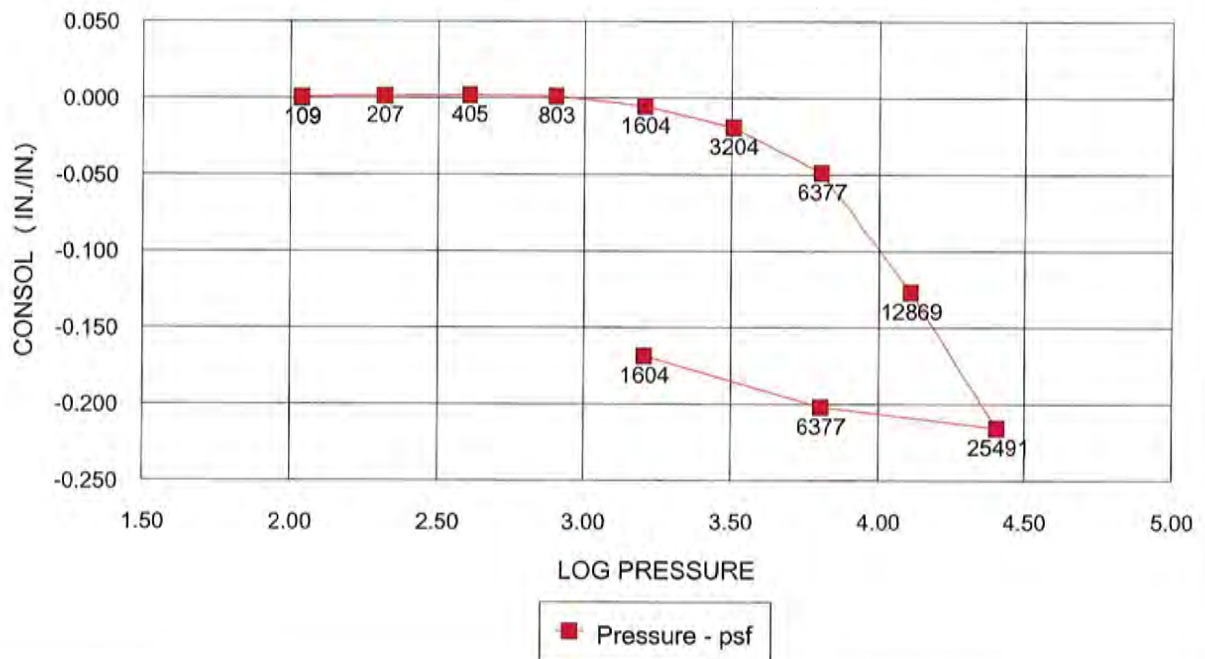
Data entry by: DPM
 Data checked by: KR
 FileName: MWC01108

Date: 06/11/2014
 Date: 6/11/14



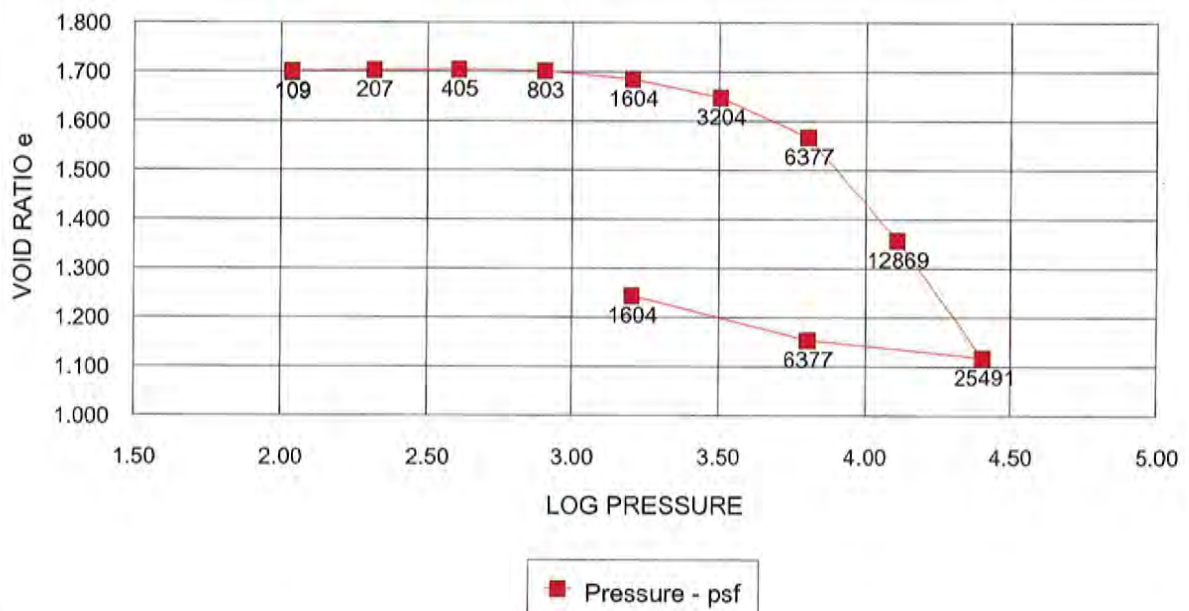
CONSOLIDATION TEST DATA

TI-B11-08,-,51.5-52.5' (50-52.5')



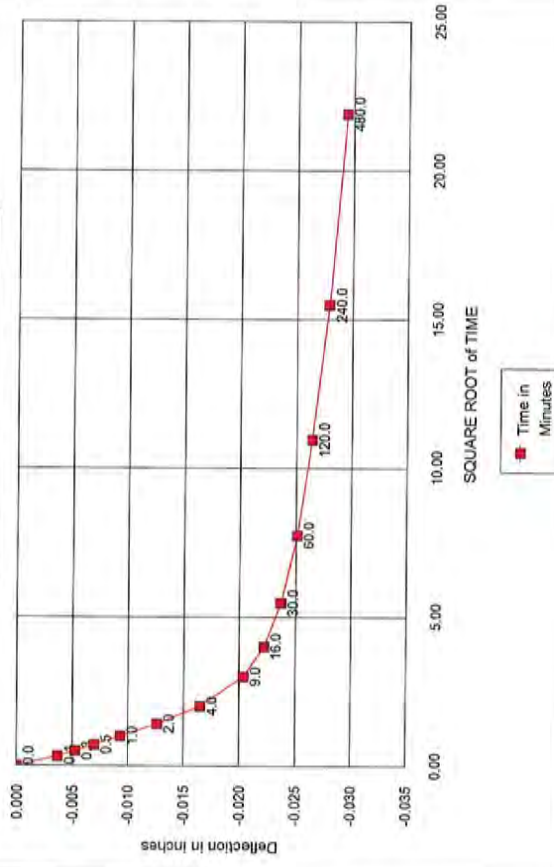
CONSOLIDATION TEST DATA

TI-B11-08,-,51.5-52.5' (50-52.5')



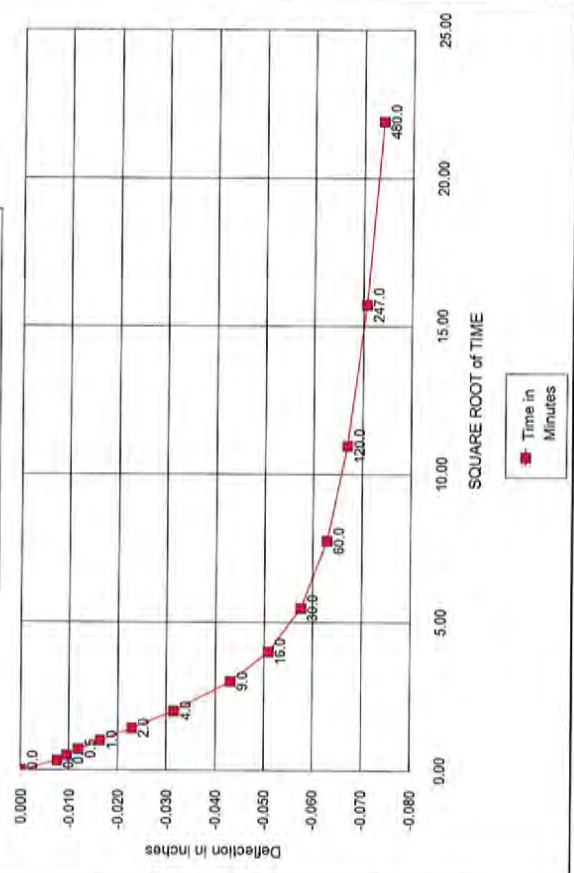
TIME READING DATA

TI-B11-08-.51.5-52.5' (50-52.5') .6377 psf Load



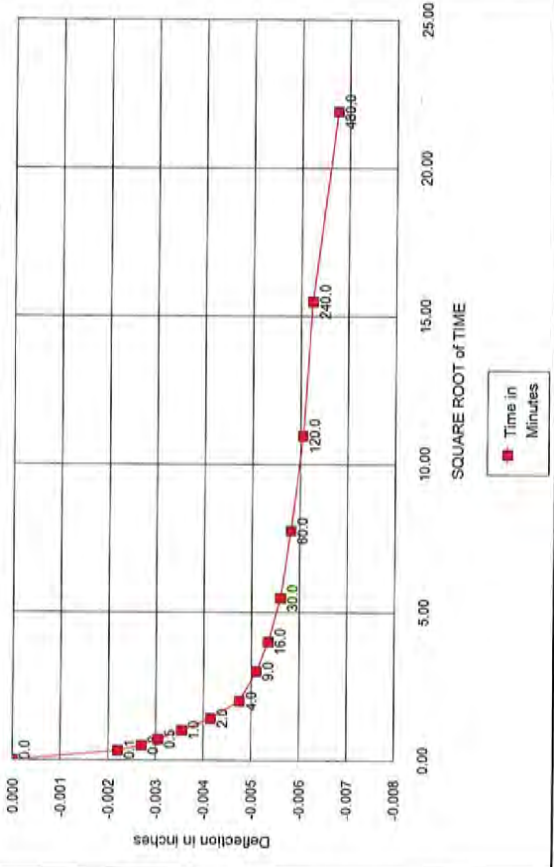
TIME READING DATA

TI-B11-08-.51.5-52.5' (50-52.5') .12869 psf Load



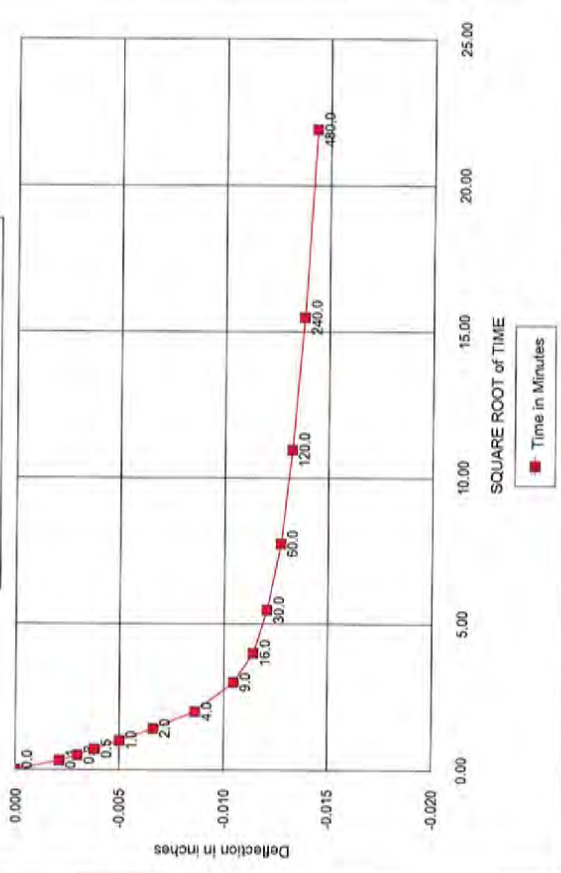
TIME READING DATA

TI-B11-08-.51.5-52.5' (50-52.5') .1604 psf Load



TIME READING DATA

TI-B11-08-.51.5-52.5' (50-52.5') .3204 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-08
DEPTH 41-42', (40-42.5')
SAMPLE NO. -
SOIL DESCR. Clayey Silt
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 12/04/13 MWH
TEST STARTED 01/21/14 DPM
TEST FINISHED 01/30/14 DPM
CELL NUMBER ATT-04

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	176.6	168.8	109	0.00000
Wt. Ring (s) (g)	42.1	42.1	109	-0.00060
Wt. Soil (g)	134.5	126.7	207	-0.00075
Wet Density PCF	112.3	118.1	405	-0.00035
			803	0.00200
Wt. Wet Soil & Pan (g)	138.3	130.5	1604	0.00995
Wt. Dry Soil & Pan (g)	98.6	98.6	3204	0.02520
Wt. Lost Moisture (g)	39.7	31.8	6377	0.05690
Wt. of Pan Only (g)	3.8	3.8	12769	0.09905
Wt. of Dry Soil (g)	94.8	94.8	25491	0.15795
Moisture Content %	41.8	33.6	6377	0.14955
Dry Density PCF	79.2	88.4	1604	0.13065
			405	0.10420

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	109	2.037	0.0000	0.0000	1.1284
	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
Data checked by: KR
FileName: MWC0B808

Date: 06/11/2014

Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-08
 DEPTH 41-42', (40-42.5')
 SAMPLE NO. -
 SOIL DESCR. Clayey Silt
 LOCATION Tailings Impoundment

SAMPLED 12/04/13 MWH
 TEST STARTED 01/21/14 DPM
 TEST FINISHED 01/30/14 DPM
 CELL NUMBER ATT-04

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

Data checked by: MR

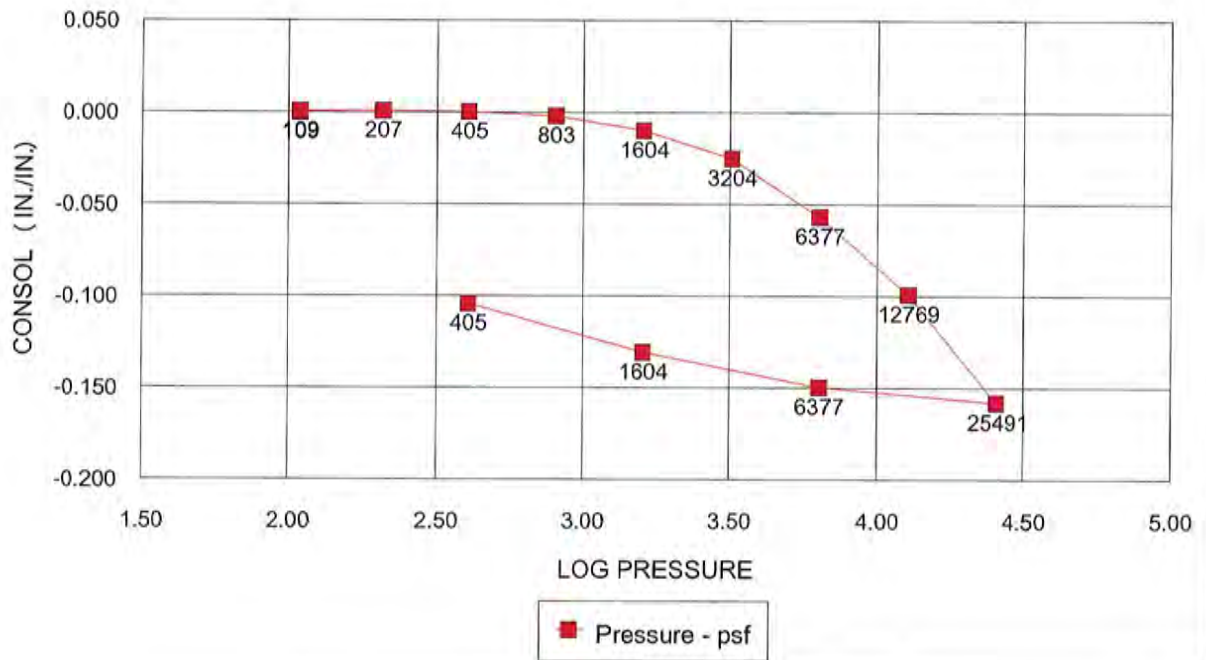
FileName: MWC0B808

Date: 06/11/2014

Date: 6/11/14

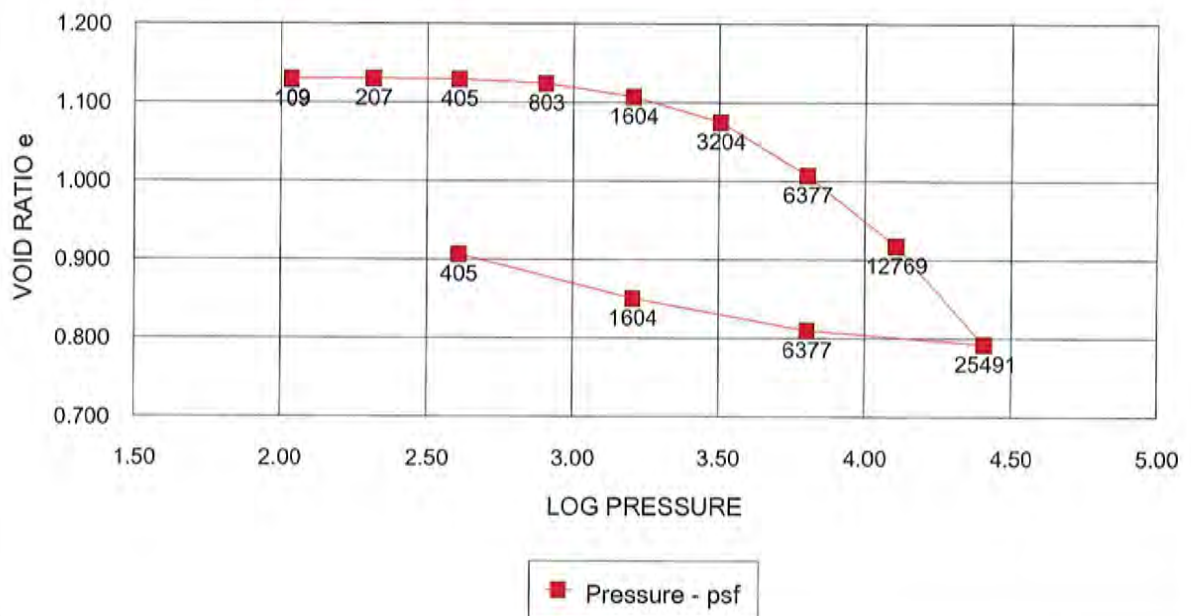
CONSOLIDATION TEST DATA

TI-B8-08,-,41-42', (40-42.5')



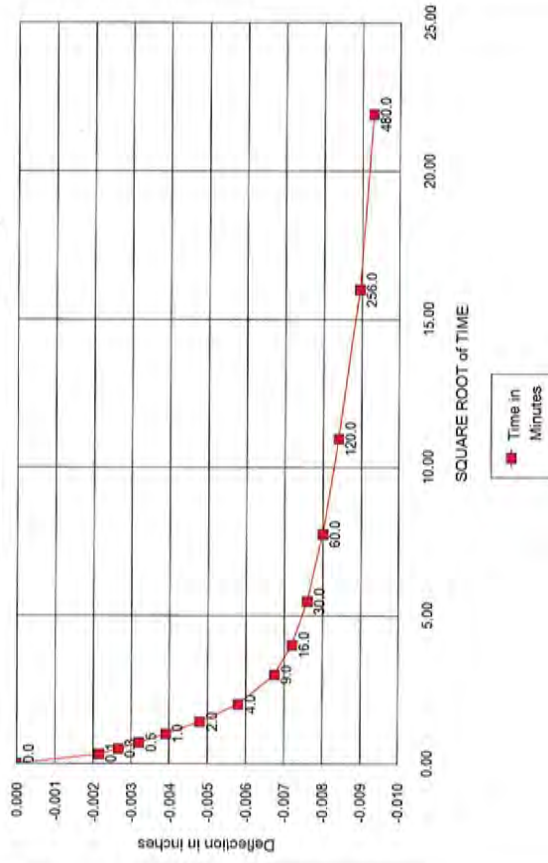
CONSOLIDATION TEST DATA

TI-B8-08,-,41-42', (40-42.5')



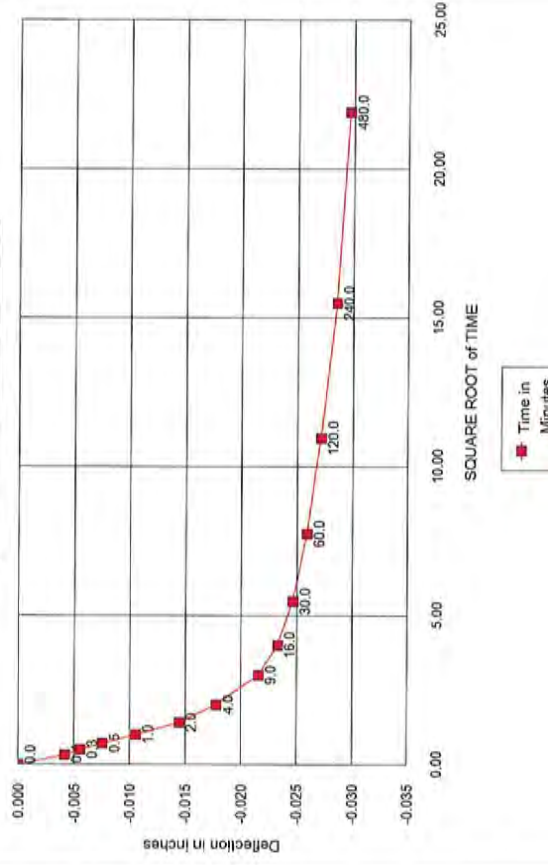
TIME READING DATA

TI-B8-08-.41-42', (40-42.5) .1604 psf Load



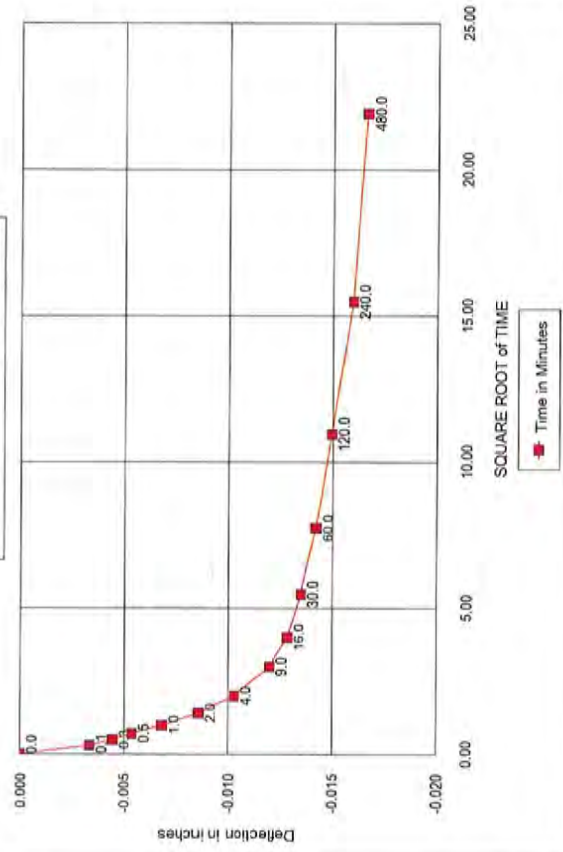
TIME READING DATA

TI-B8-08-.41-42', (40-42.5) .6377 psf Load



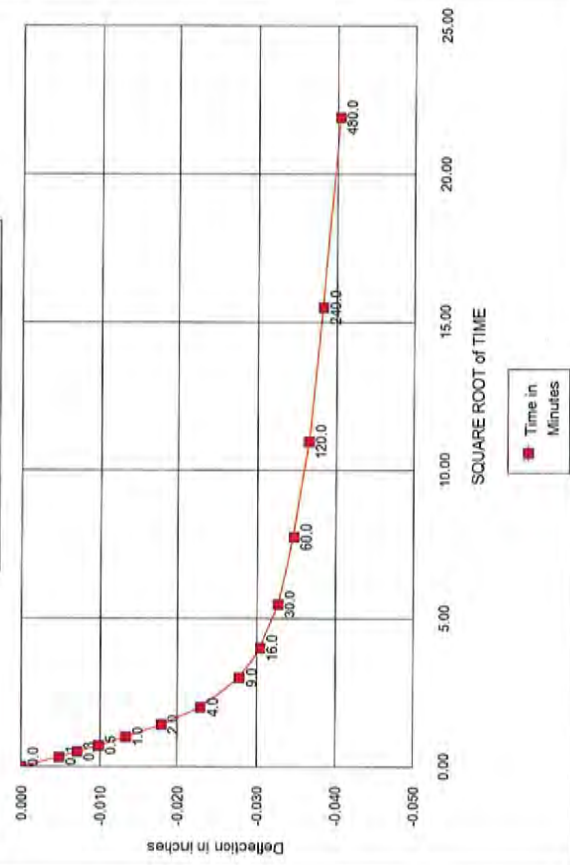
TIME READING DATA

TI-B8-08-.41-42', (40-42.5) .3204 psf Load



TIME READING DATA

TI-B8-08-.41-42', (40-42.5) .12769 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-10
DEPTH 56-57' (55-57')
SAMPLE NO. -
SOIL DESCR. Silty Sand
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 12/02/13 MWH
TEST STARTED 01/21/14 DPM
TEST FINISHED 01/30/14 DPM
CELL NUMBER ATT-5

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	151.1	162.3	99	0.00000
Wt. Ring (s) (g)	42.6	42.6	99	0.00565
Wt. Soil (g)	108.4	119.6	199	0.01050
Wet Density PCF	90.6	109.5	401	0.01780
			813	0.02830
Wt. Wet Soil & Pan (g)	112.1	123.3	1648	0.04260
Wt. Dry Soil & Pan (g)	97.0	97.0	3249	0.05495
Wt. Lost Moisture (g)	15.1	26.3	6487	0.06740
Wt. of Pan Only (g)	3.7	3.7	12943	0.08530
Wt. of Dry Soil (g)	93.3	93.3	25617	0.10260
Moisture Content %	16.2	28.2	6487	0.09910
Dry Density PCF	77.9	85.4	1648	0.09560
			401	0.09130
			99	0.08730

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	99	1.997	0.0000	0.0000	1.1631
	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
Data checked by: *[Signature]*
FileName: MWC01110

Date: 06/11/2014
Date: *6/11/14*



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-10
 DEPTH 56-57' (55-57')
 SAMPLE NO. -
 SOIL DESCR. Silty Sand
 LOCATION Tailings Impoundment

SAMPLED 12/02/13 MWH
 TEST STARTED 01/21/14 DPM
 TEST FINISHED 01/30/14 DPM
 CELL NUMBER ATT-5

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

Data checked by: RE

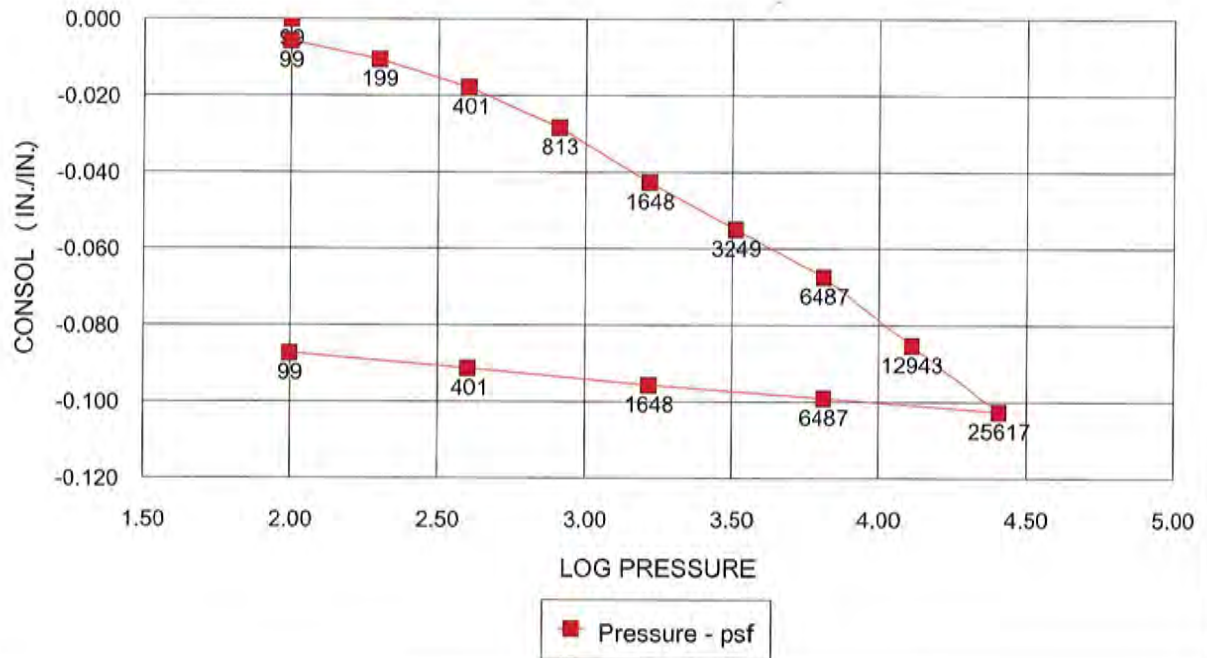
FileName: MWC01110

Date: 06/11/2014

Date: 6/11/14

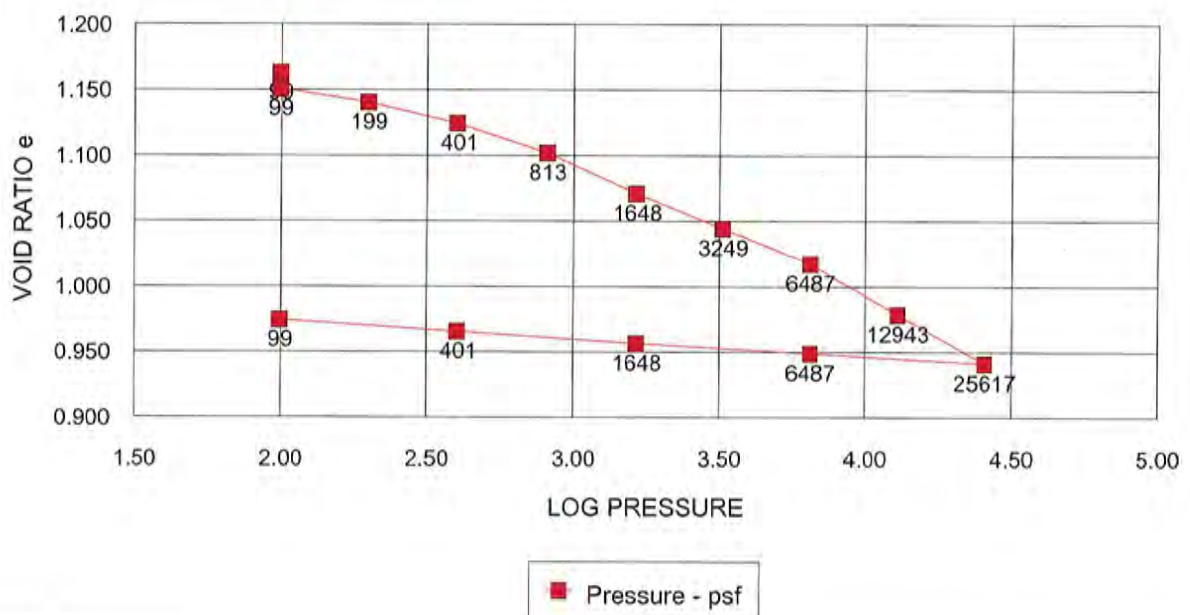
CONSOLIDATION TEST DATA

TI-B11-10,-,56-57' (55-57')



CONSOLIDATION TEST DATA

TI-B11-10,-,56-57' (55-57')



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B15-05
DEPTH 15.5-16.0' (15-17.5')
SAMPLE NO. -
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 12/05/13 MWH
TEST STARTED 03/19/14 DPM
TEST FINISHED 03/28/14 DPM
CELL NUMBER ATT-04

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	165.8	171.2	108.9	0.00000
Wt. Ring (s) (g)	42.1	42.1	108.9	-0.00035
Wt. Soil (g)	123.6	129.1	207.4	0.00220
Wet Density PCF	103.2	120.1	405.0	0.00620
			802.8	0.01525
Wt. Wet Soil & Pan (g)	127.4	132.9	1604	0.03025
Wt. Dry Soil & Pan (g)	112.1	112.1	3204	0.04995
Wt. Lost Moisture (g)	15.4	20.8	6377	0.07070
Wt. of Pan Only (g)	3.8	3.8	12769	0.09425
Wt. of Dry Soil (g)	108.2	108.2	25491	0.11755
Moisture Content %	14.2	19.2	6377	0.11520
Dry Density PCF	90.4	100.7	1604	0.11095
			405.0	0.10565
			207.4	0.10260

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	109	2.037	0.0000	0.0000	0.8650
	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
Data checked by: KR
FileName: MWC01505

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B15-05
 DEPTH 15.5-16.0' (15-17.5')
 SAMPLE NO. -
 SOIL DESCR. Sand Tailings
 LOCATION Tailings Impoundment

SAMPLED 12/05/13 MWH
 TEST STARTED 03/19/14 DPM
 TEST FINISHED 03/28/14 DPM
 CELL NUMBER ATT-04

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

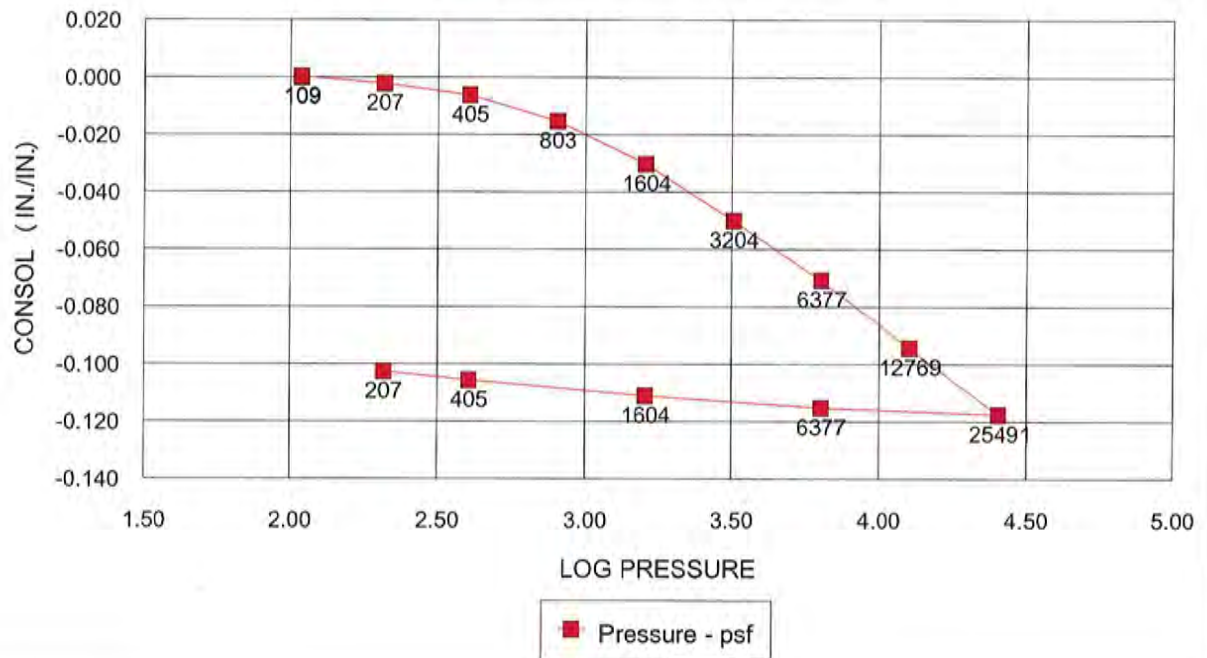
Data entry by: DPM
 Data checked by: KR
 FileName: MWC01505

Date: 06/11/2014
 Date: 6/11/14



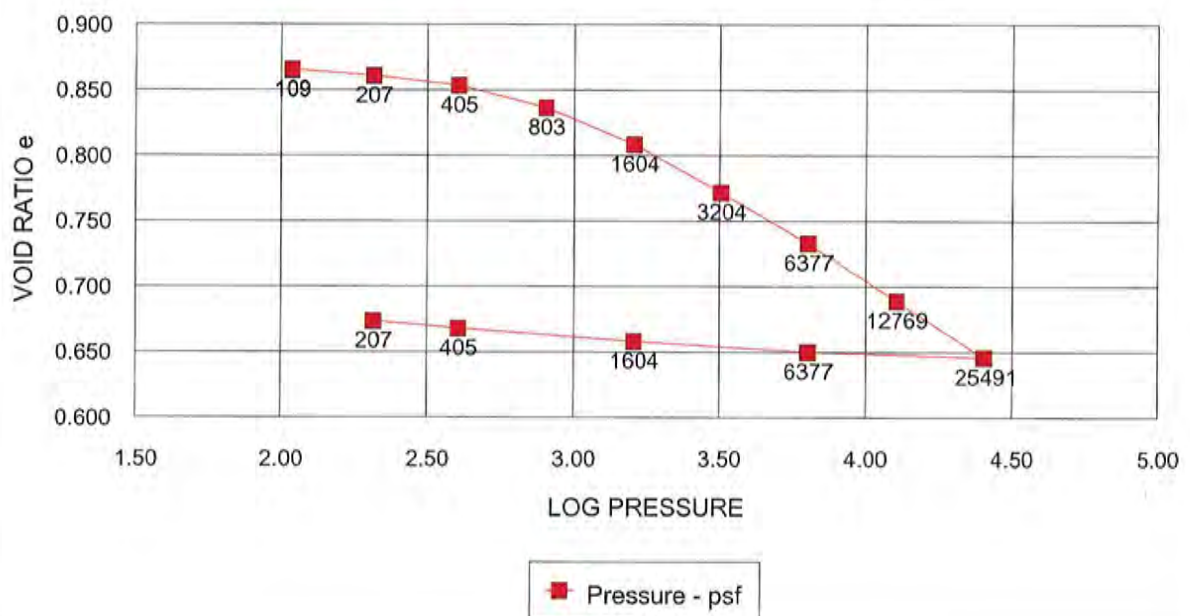
CONSOLIDATION TEST DATA

TI-B15-05,-,15.5-16.0' (15-17.5')



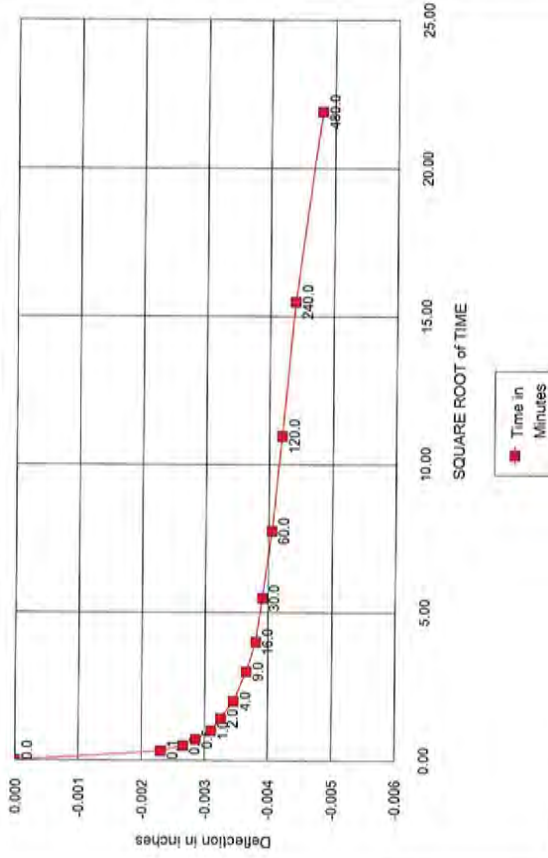
CONSOLIDATION TEST DATA

TI-B15-05,-,15.5-16.0' (15-17.5')



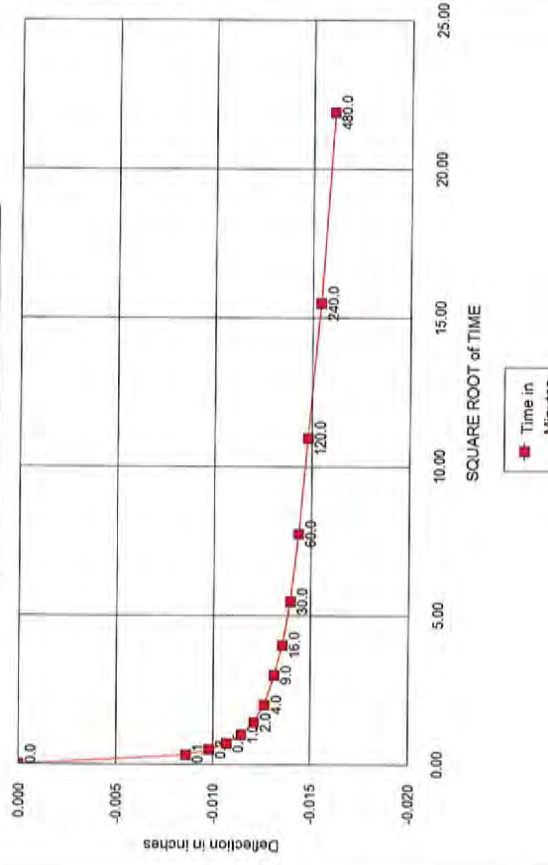
TIME READING DATA

TI-B15-05-, 15.5-16.0' (15-17.5') .405.0 psf Load



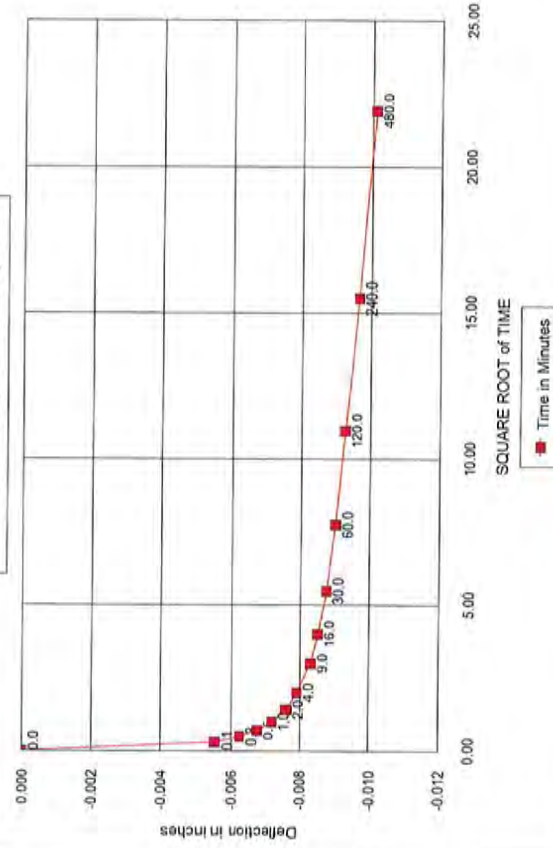
TIME READING DATA

TI-B15-05-, 15.5-16.0' (15-17.5') .1604 psf Load



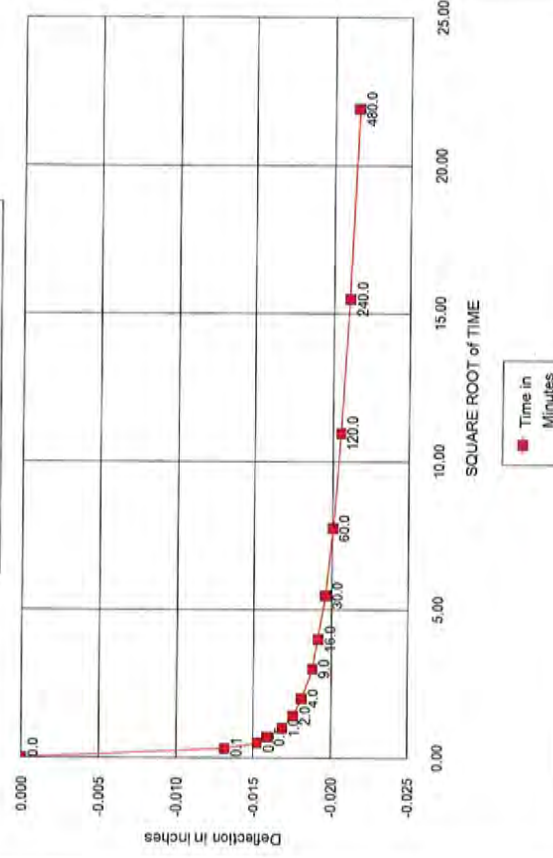
TIME READING DATA

TI-B15-05-, 15.5-16.0' (15-17.5') .802.8 psf Load



TIME READING DATA

TI-B15-05-, 15.5-16.0' (15-17.5') .3204 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B23-06
DEPTH 26-27' (25-27.5)
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 12/06/13 MWH
TEST STARTED 03/20/14 DPM
TEST FINISHED 03/29/14 DPM
CELL NUMBER ATT-05

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	190.1	190.1	99.4	0.00000
Wt. Ring (s) (g)	41.9	41.9	99.4	-0.00035
Wt. Soil (g)	148.1	148.2	198.9	-0.00035
Wet Density PCF	123.7	128.4	400.9	-0.00035
			813.2	-0.00020
Wt. Wet Soil & Pan (g)	152.0	152.0	1648	0.00175
Wt. Dry Soil & Pan (g)	125.6	125.6	3249	0.00660
Wt. Lost Moisture (g)	26.3	26.4	6487	0.01830
Wt. of Pan Only (g)	3.8	3.8	12943	0.03840
Wt. of Dry Soil (g)	121.8	121.8	25617	0.06585
Moisture Content %	21.6	21.7	6487	0.05810
Dry Density PCF	101.7	105.5	1648	0.04215
			813.2	0.03595

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	99	1.997	0.0000	0.0000	0.6574
	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
Data checked by: MR
FileName: MWC02306

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B23-06
 DEPTH 26-27' (25-27.5)
 SAMPLE NO. -
 SOIL DESCR. Silty Clay
 LOCATION Tailings Impoundment

SAMPLED 12/06/13 MWH
 TEST STARTED 03/20/14 DPM
 TEST FINISHED 03/29/14 DPM
 CELL NUMBER ATT-05

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

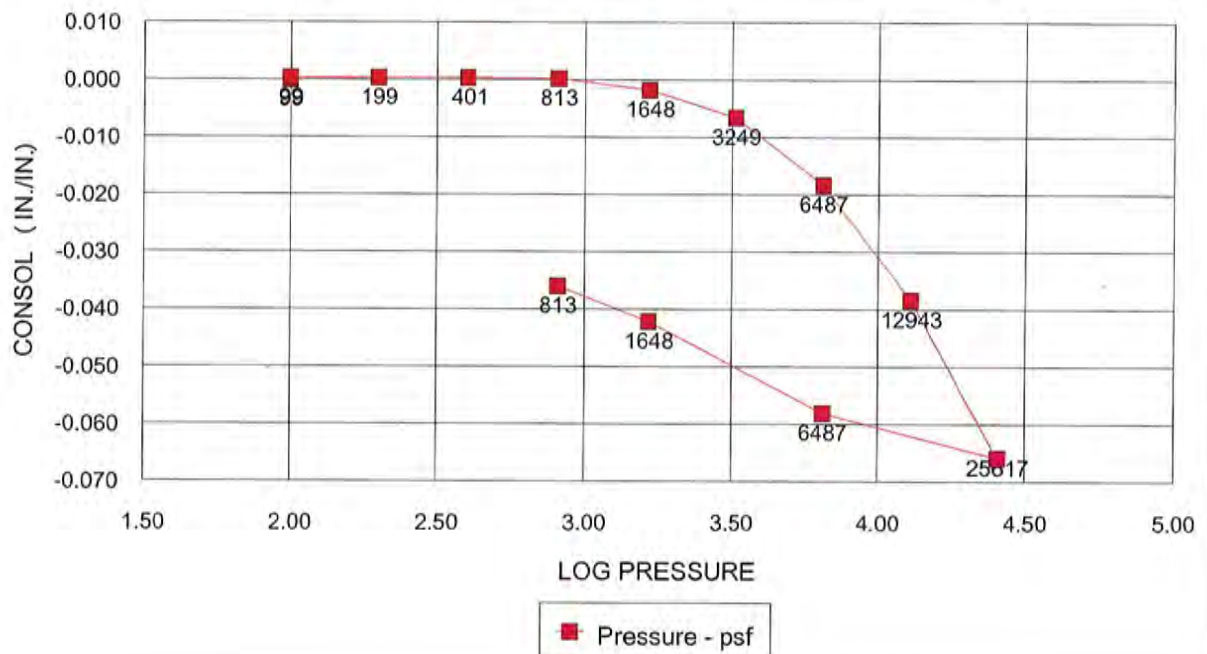
Data entry by: DPM
 Data checked by: KR
 FileName: MWC02306

Date: 06/11/2014
 Date: 6/11/14



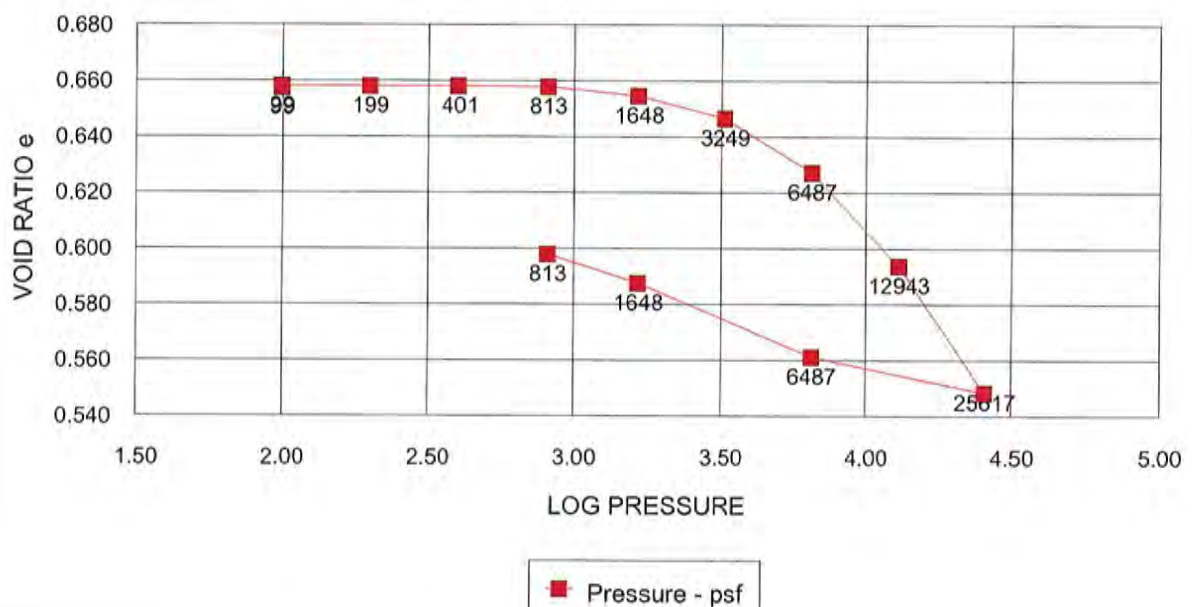
CONSOLIDATION TEST DATA

TI-B23-06,-,26-27' (25-27.5')



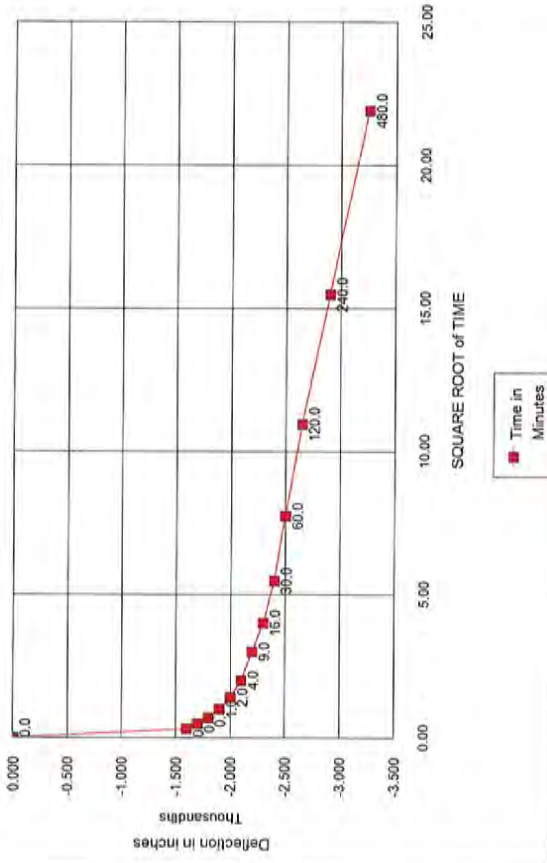
CONSOLIDATION TEST DATA

TI-B23-06,-,26-27' (25-27.5')



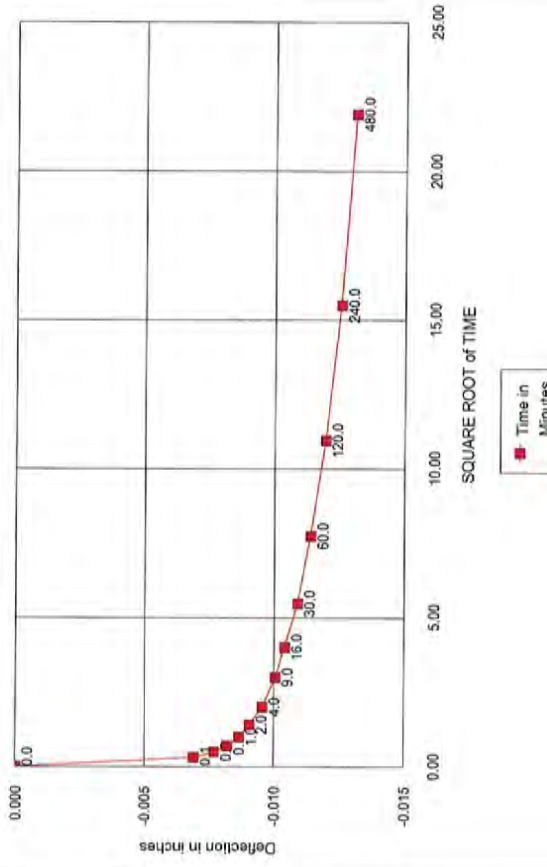
TIME READING DATA

TI-B23-06-.26-27' (25-27.5) .1648 psf Load



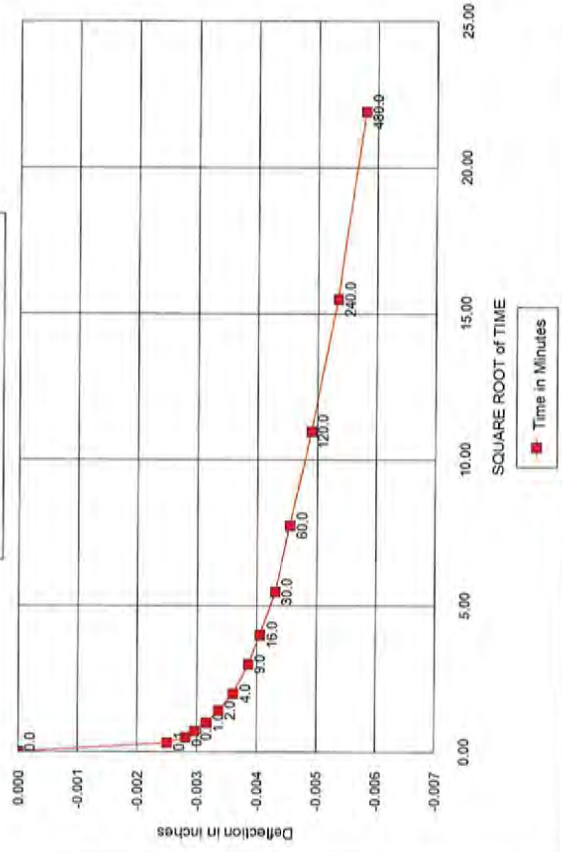
TIME READING DATA

TI-B23-06-.26-27' (25-27.5) .6487 psf Load



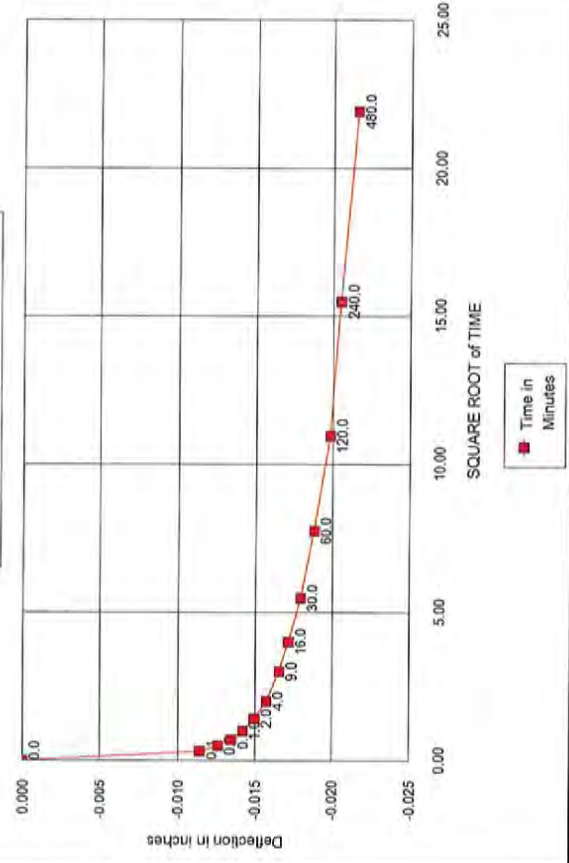
TIME READING DATA

TI-B23-06-.26-27' (25-27.5) .3249 psf Load



TIME READING DATA

TI-B23-06-.26-27' (25-27.5) .12943 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-03
DEPTH 15-16'
SAMPLE NO. -
SOIL DESCR. Sand
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 12/02/13 MWH
TEST STARTED 03/03/14 DPM
TEST FINISHED 03/14/14 DPM
CELL NUMBER ATT-02

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	175.6	185.1	104.5	0.00000
Wt. Ring (s) (g)	41.9	41.9	104.5	0.00320
Wt. Soil (g)	133.6	143.2	206.8	0.00775
Wet Density PCF	111.6	133.7	417.0	0.02475
			833.7	0.04160
Wt. Wet Soil & Pan (g)	137.5	147.0	1489	0.05625
Wt. Dry Soil & Pan (g)	128.9	128.9	3128	0.07355
Wt. Lost Moisture (g)	8.6	18.1	6392	0.08965
Wt. of Pan Only (g)	3.8	3.8	13179	0.10835
Wt. of Dry Soil (g)	125.1	125.1	26075	0.12505
Moisture Content %	6.8	14.5	6392	0.12250
Dry Density PCF	104.5	116.8	1489	0.11825
			417.0	0.11215
			104.5	0.10595

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	105	2.019	0.0000	0.0000	0.6136
	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
Data checked by: *kr*
FileName: MWC01103

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-03
 DEPTH 15-16'
 SAMPLE NO. -
 SOIL DESCR. Sand
 LOCATION Tailings Impoundment

SAMPLED 12/02/13 MWH
 TEST STARTED 03/03/14 DPM
 TEST FINISHED 03/14/14 DPM
 CELL NUMBER ATT-02

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

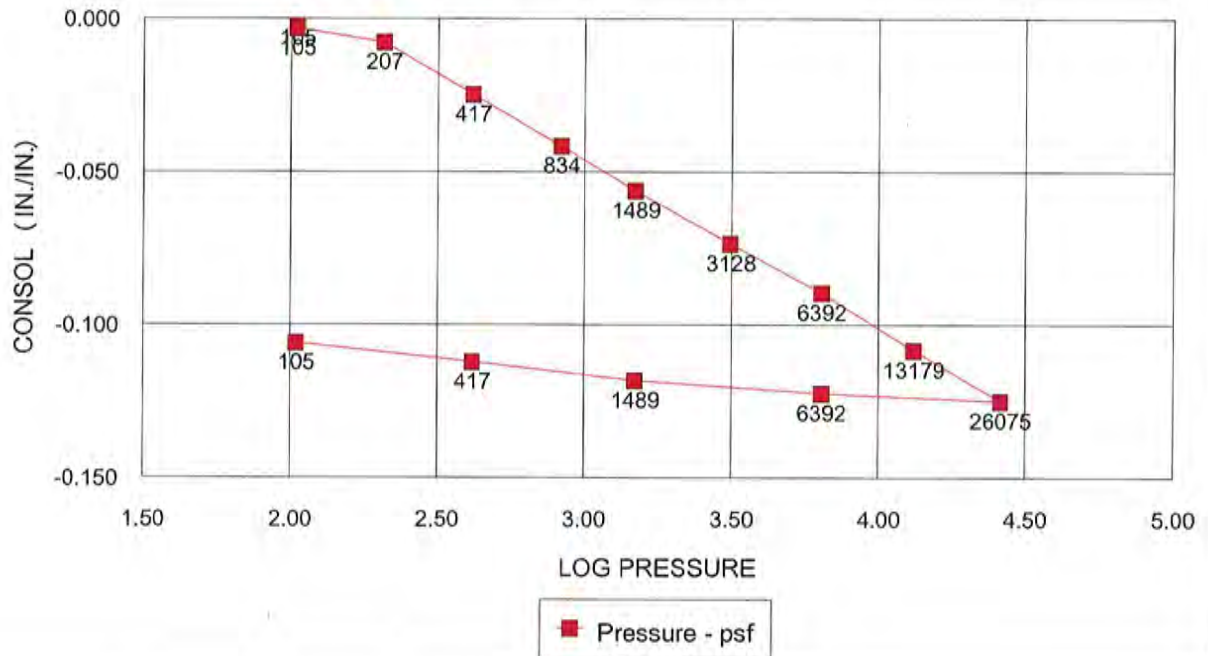
Data entry by: DPM
 Data checked by: KR
 FileName: MWC01103

Date: 06/11/2014
 Date: 6/11/14



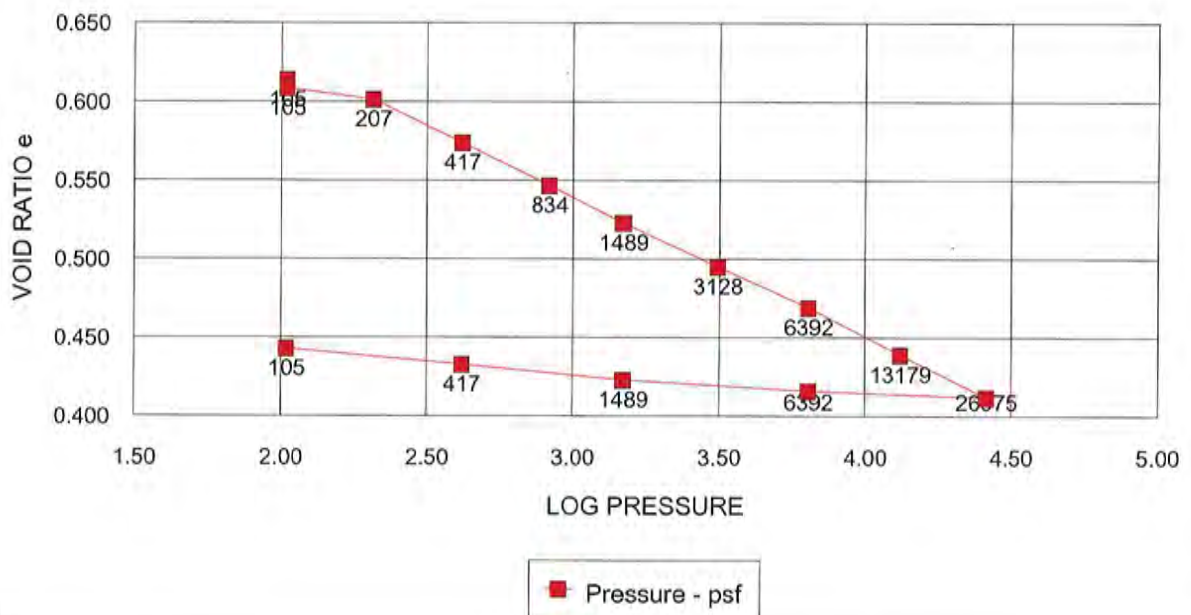
CONSOLIDATION TEST DATA

TI-B11-03,-,15-16'



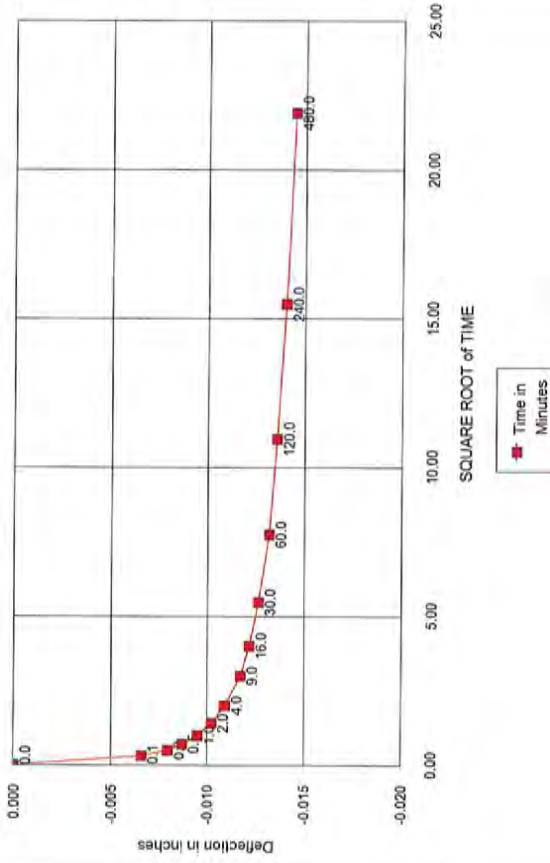
CONSOLIDATION TEST DATA

TI-B11-03,-,15-16'



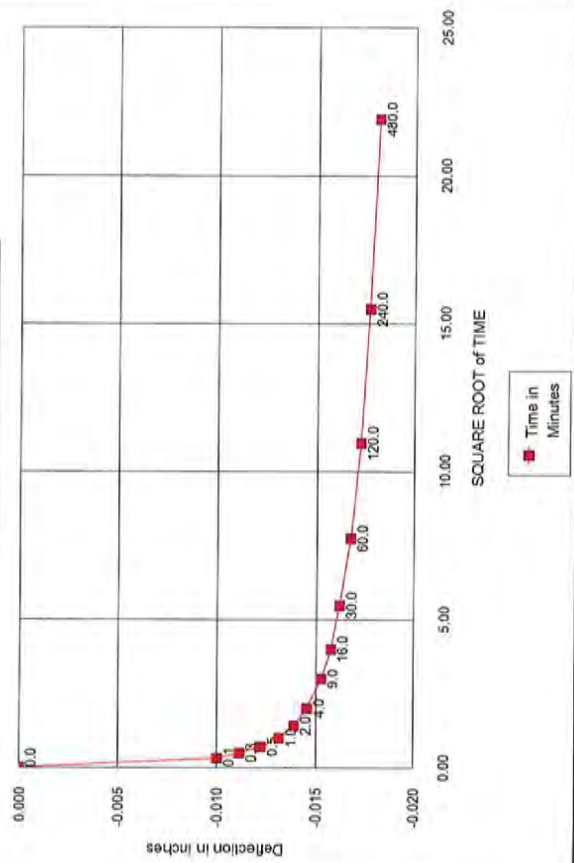
TIME READING DATA

TI-B11-03-,15-16',1484 psf Load



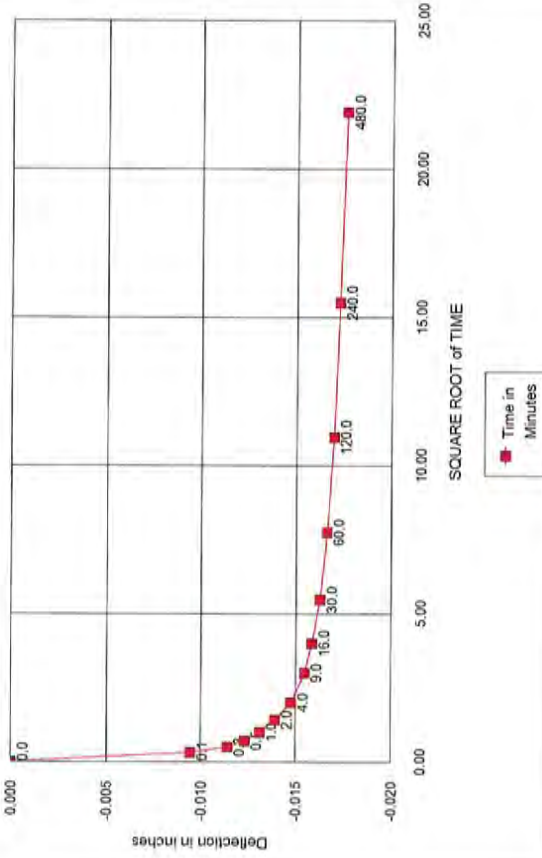
TIME READING DATA

TI-B11-03-,15-16',3128 psf Load



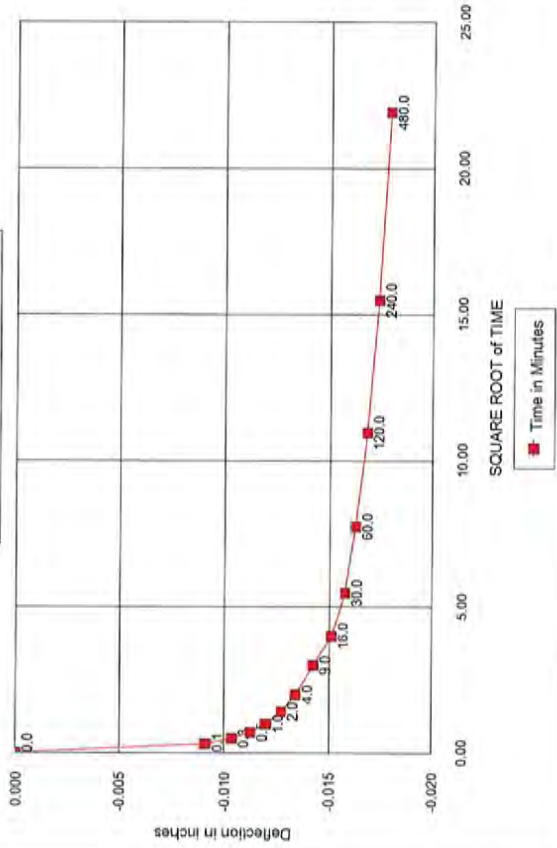
TIME READING DATA

TI-B11-03-,15-16',417.0 psf Load



TIME READING DATA

TI-B11-03-,15-16',833.7 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-04
DEPTH 30.0-31.0' (30-32')
SAMPLE NO. -
SOIL DESCR. Clayey Silt
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 12/03/13 MWH
TEST STARTED 03/06/14 DPM
TEST FINISHED 03/20/14 DPM
CELL NUMBER ATT-05

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	164.2	150.2	99.4	0.00000
Wt. Ring (s) (g)	42.6	42.6	99.4	-0.00030
Wt. Soil (g)	121.5	107.5	198.9	-0.00045
Wet Density PCF	101.5	109.6	400.9	0.00130
			813.2	0.01095
Wt. Wet Soil & Pan (g)	125.4	111.4	1648	0.03900
Wt. Dry Soil & Pan (g)	77.5	77.5	3249	0.07960
Wt. Lost Moisture (g)	47.9	33.9	6487	0.12625
Wt. of Pan Only (g)	3.8	3.8	12943	0.18410
Wt. of Dry Soil (g)	73.6	73.6	25617	0.24845
Moisture Content %	65.1	46.1	6487	0.23925
Dry Density PCF	61.5	75.0	1648	0.21315
			400.9	0.18065

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	99	1.997	0.0000	0.0000	1.7418
	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
Data checked by: KP
FileName: MWC0B804

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-04
 DEPTH 30.0-31.0' (30-32')
 SAMPLE NO. -
 SOIL DESCR. Clayey Silt
 LOCATION Tailings Impoundment

SAMPLED 12/03/13 MWH
 TEST STARTED 03/06/14 DPM
 TEST FINISHED 03/20/14 DPM
 CELL NUMBER ATT-05

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

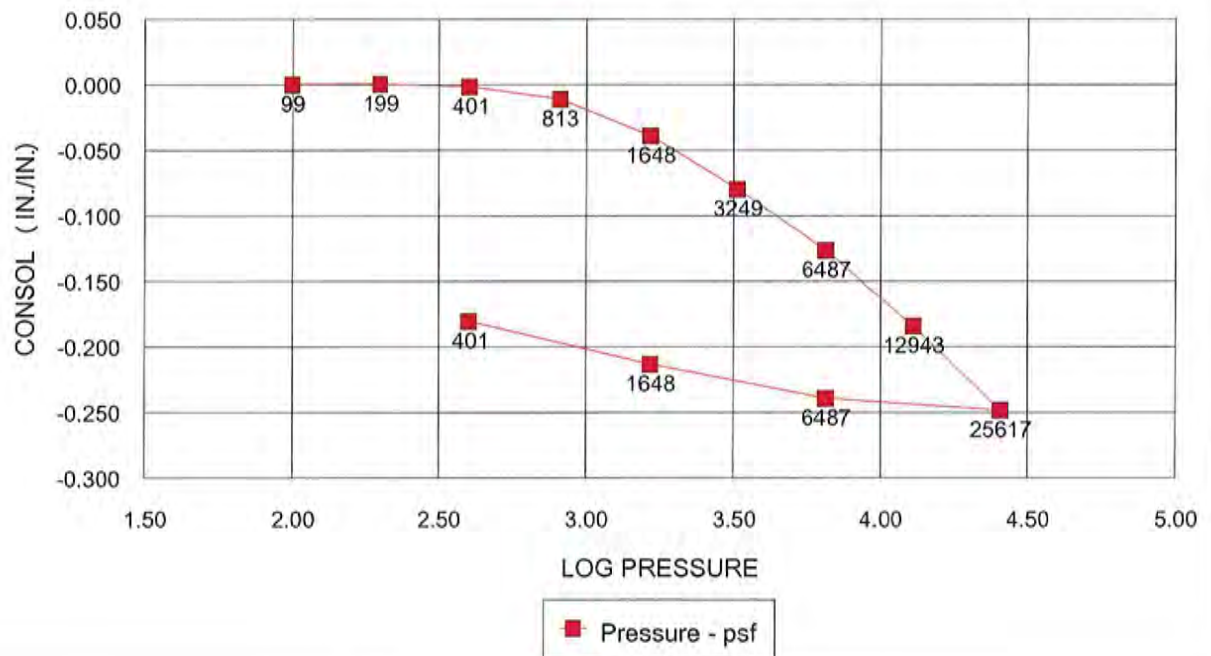
Data entry by: DPM
 Data checked by: KR
 FileName: MWC0B804

Date: 06/11/2014
 Date: 6/11/14



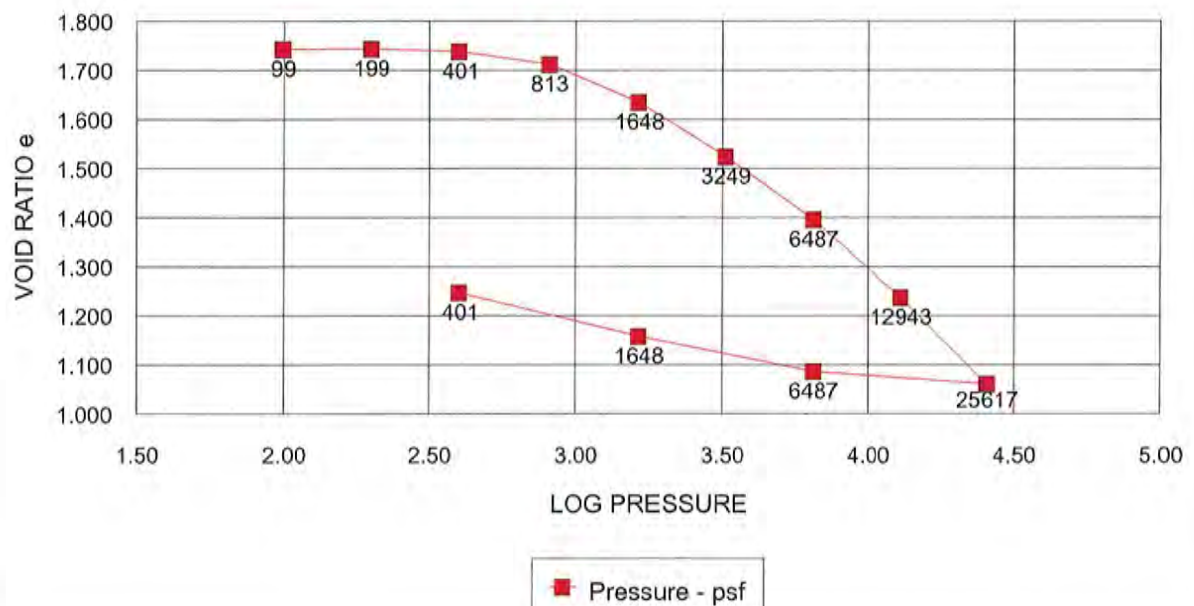
CONSOLIDATION TEST DATA

TI-B8-04,-,30.0-31.0' (30-32')



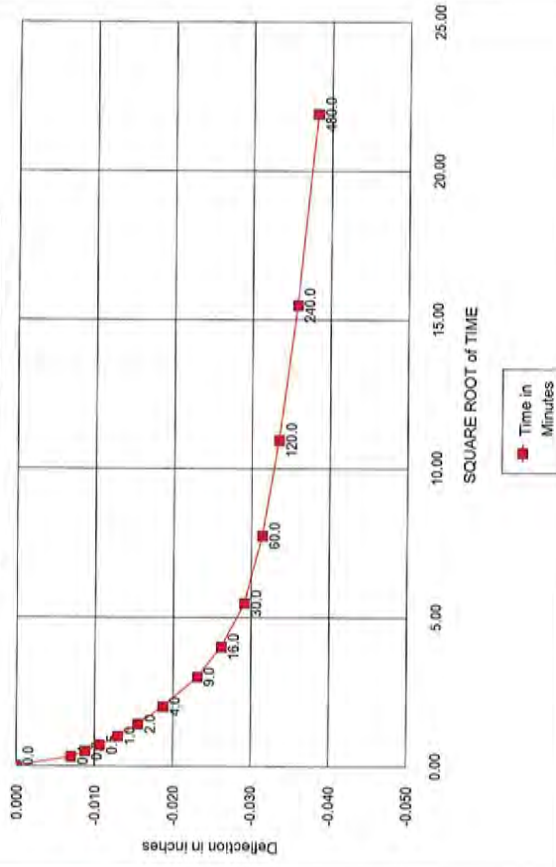
CONSOLIDATION TEST DATA

TI-B8-04,-,30.0-31.0' (30-32')



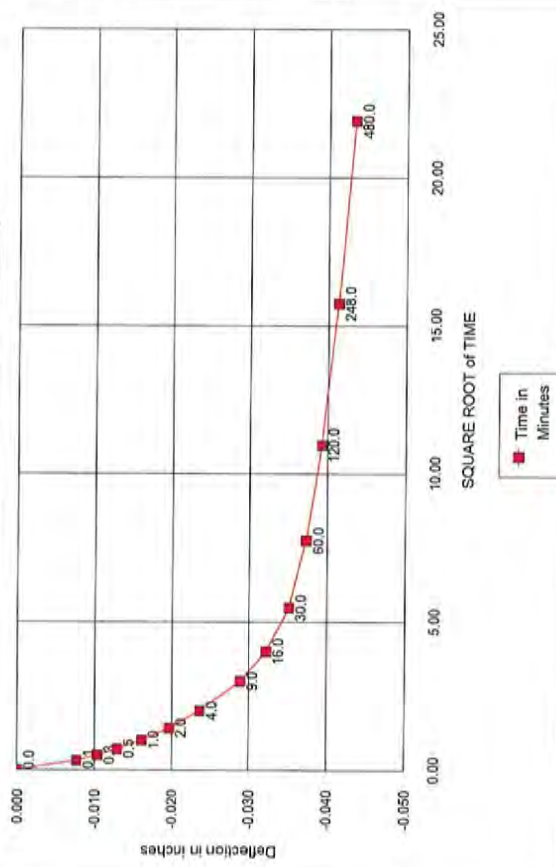
TIME READING DATA

T1-B8-04.-30.0-31.0' (30-32) .3249 psf Load



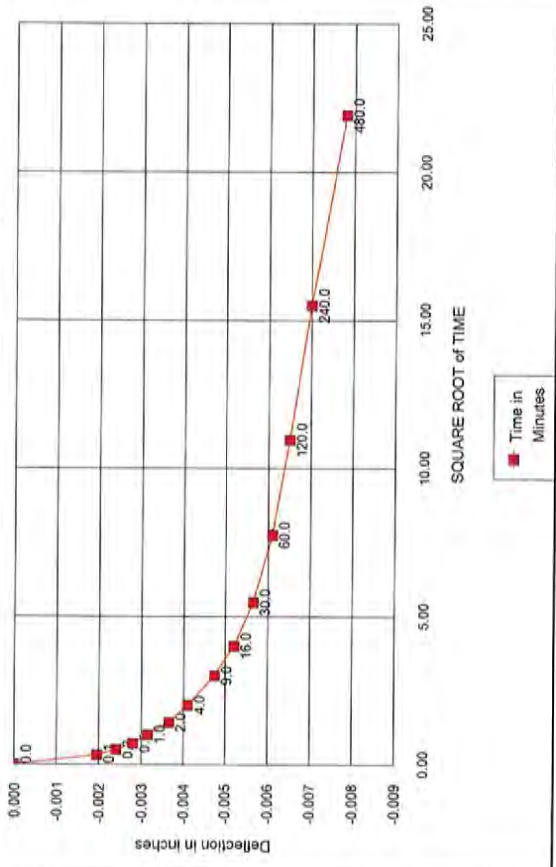
TIME READING DATA

T1-B8-04.-30.0-31.0' (30-32) .6487 psf Load



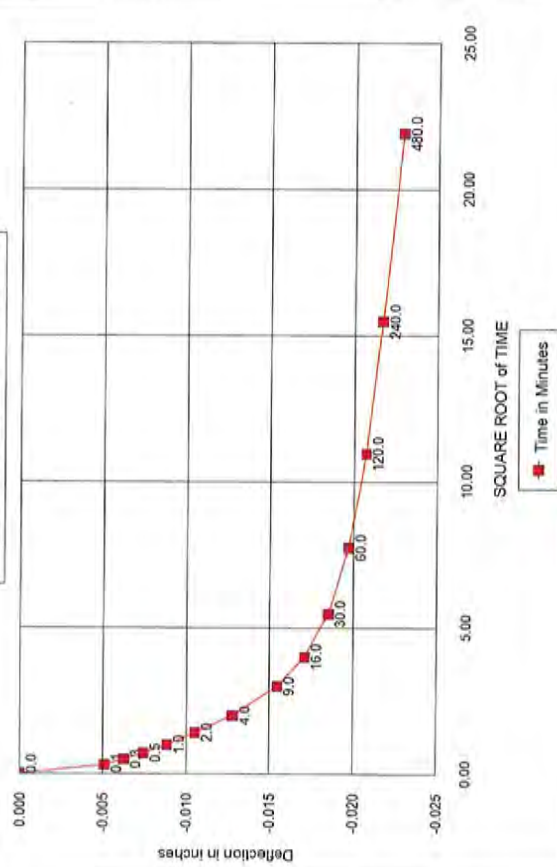
TIME READING DATA

T1-B8-04.-30.0-31.0' (30-32) .813.2 psf Load



TIME READING DATA

T1-B8-04.-30.0-31.0' (30-32) .1648 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-06
DEPTH 30.5-31.5' (30-31.7)
SAMPLE NO. -
SOIL DESCR. Sandy Clay
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 12/02/13 MWH
TEST STARTED 03/18/14 DPM
TEST FINISHED 03/27/14 DPM
CELL NUMBER ATT-02

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	196.8	198.2	104.5	0.00000
Wt. Ring (s) (g)	42.0	42.0	104.5	-0.00030
Wt. Soil (g)	154.8	156.2	206.8	-0.00030
Wet Density PCF	129.3	136.4	417.0	0.00165
			833.7	0.00495
Wt. Wet Soil & Pan (g)	158.4	159.8	1489	0.00975
Wt. Dry Soil & Pan (g)	140.2	140.2	3128	0.01790
Wt. Lost Moisture (g)	18.2	19.6	6392	0.02885
Wt. of Pan Only (g)	3.6	3.6	13179	0.04280
Wt. of Dry Soil (g)	136.6	136.6	26075	0.05965
Moisture Content %	13.3	14.4	6392	0.05650
Dry Density PCF	114.1	119.3	1489	0.05030
			417.0	0.04370

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	105	2.019	0.0000	0.0000	0.4779
	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
Data checked by: KE
FileName: MWC01106

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-06
 DEPTH 30.5-31.5' (30-31.7')
 SAMPLE NO. -
 SOIL DESCR. Sandy Clay
 LOCATION Tailings Impoundment

SAMPLED 12/02/13 MWH
 TEST STARTED 03/18/14 DPM
 TEST FINISHED 03/27/14 DPM
 CELL NUMBER ATT-02

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

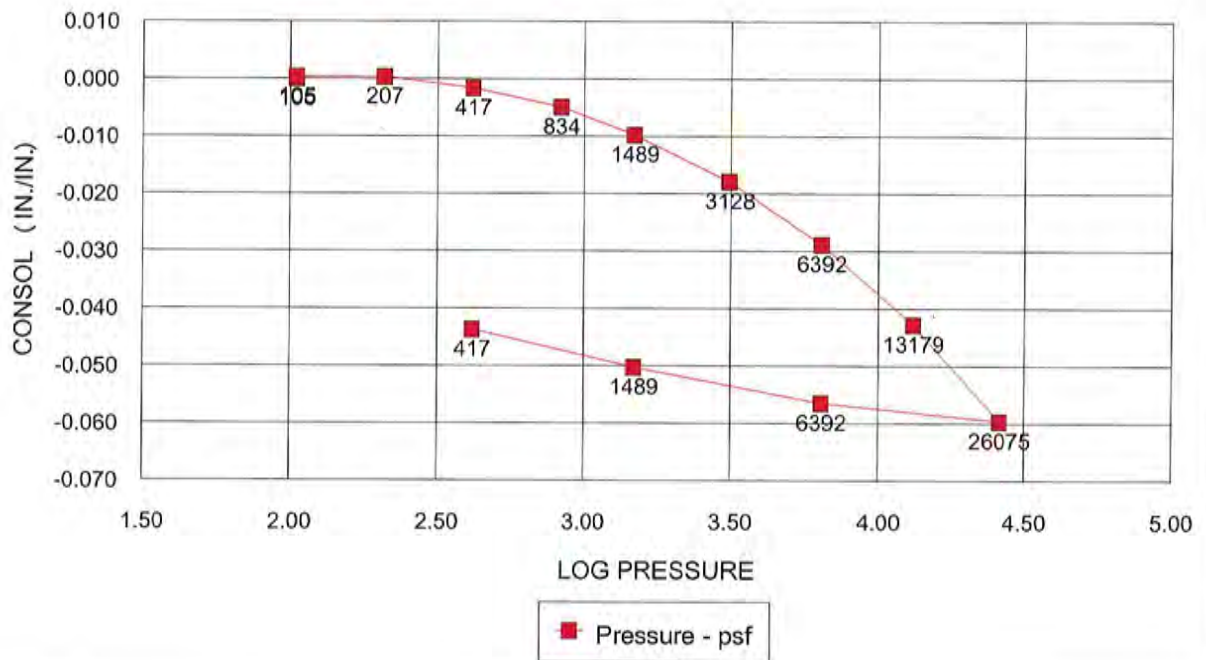
Data entry by: DPM
 Data checked by: KP
 FileName: MWC01106

Date: 06/11/2014
 Date: 6/11/14



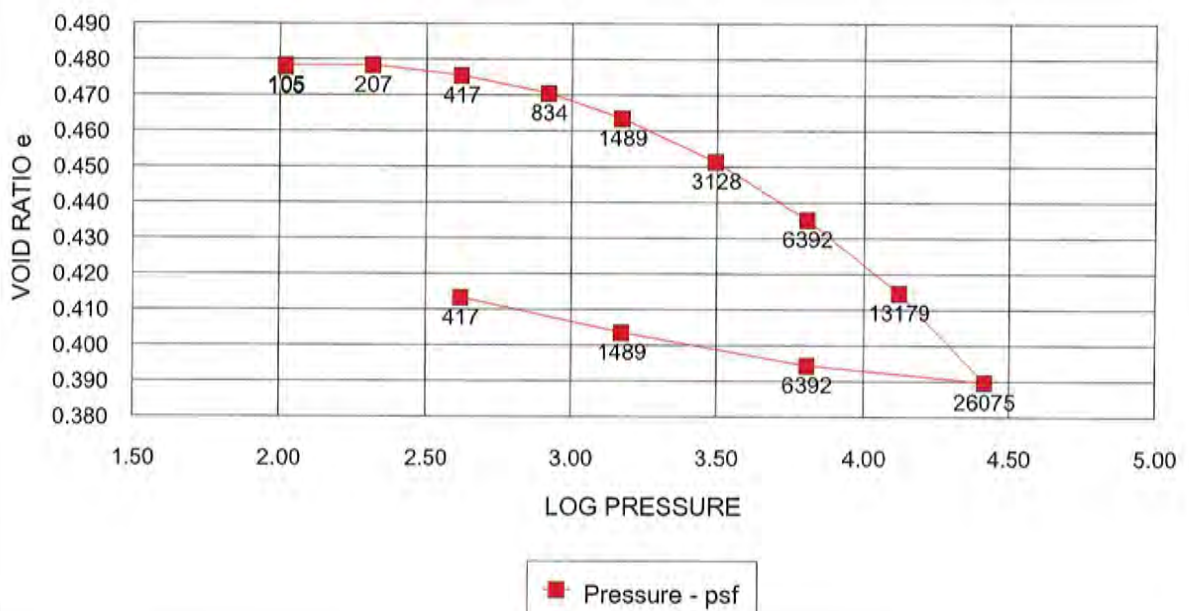
CONSOLIDATION TEST DATA

TI-B11-06,-,30.5-31.5' (30-31.7')



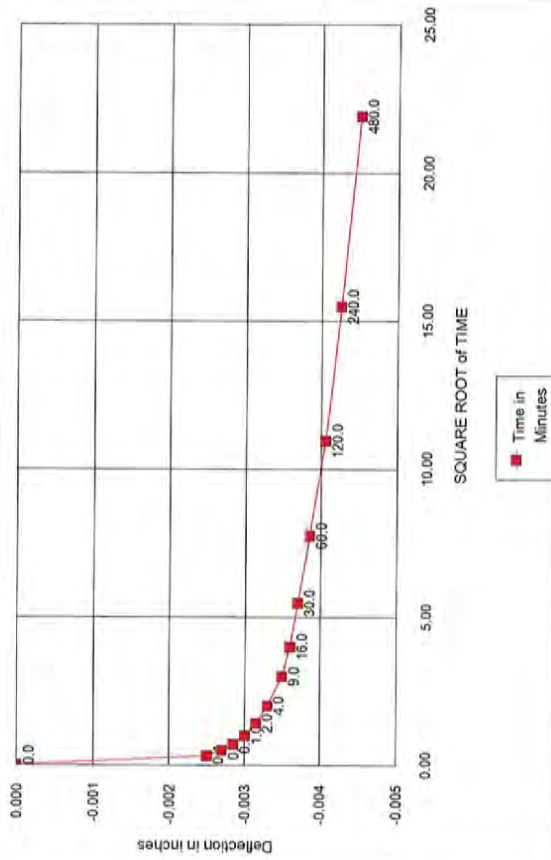
CONSOLIDATION TEST DATA

TI-B11-06,-,30.5-31.5' (30-31.7')



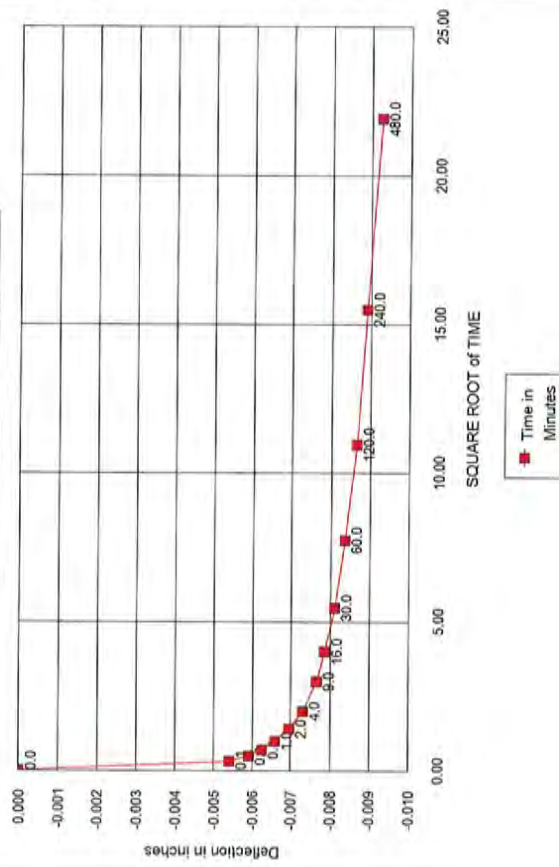
TIME READING DATA

TI-B11-06-.30.5-31.5' (30-31.7) .833.7 psf Load



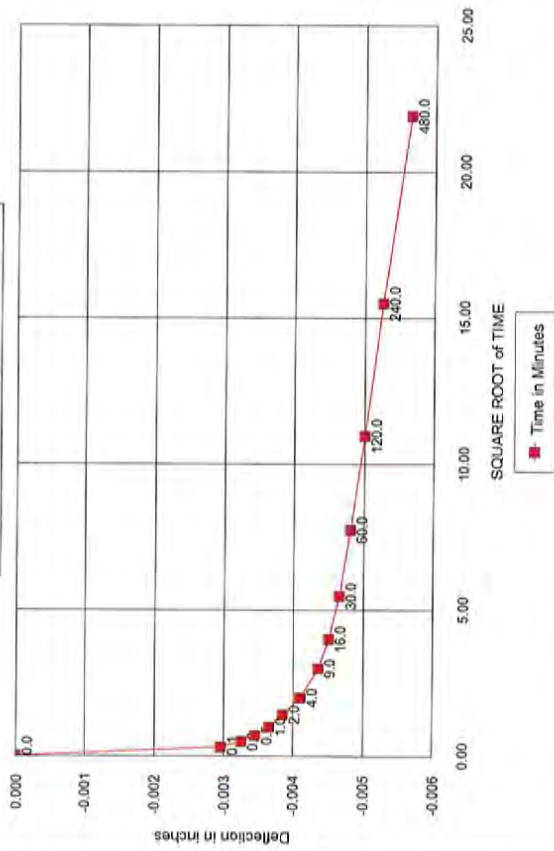
TIME READING DATA

TI-B11-06-.30.5-31.5' (30-31.7) .3128 psf Load



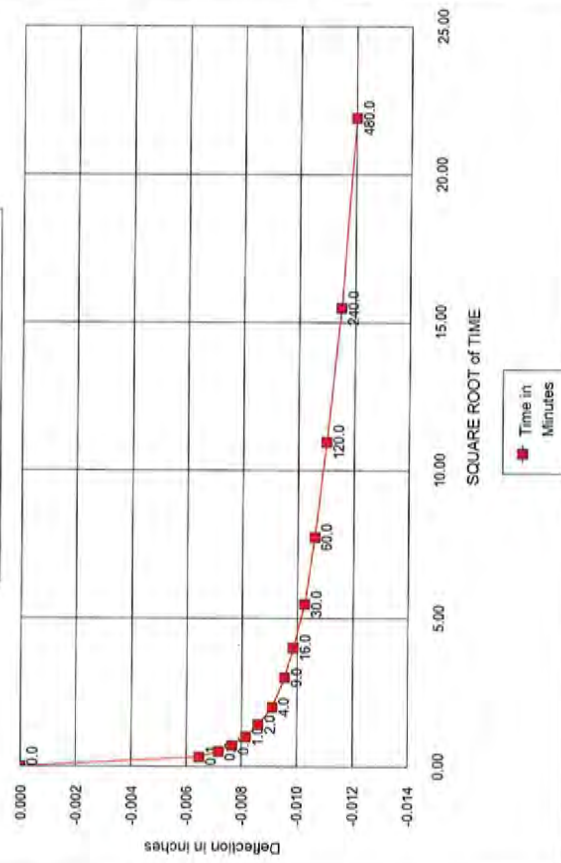
TIME READING DATA

TI-B11-06-.30.5-31.5' (30-31.7) .1489 psf Load



TIME READING DATA

TI-B11-06-.30.5-31.5' (30-31.7) .6392 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-07A
DEPTH 21.0-21.5'
SAMPLE NO. -
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 1.938

SAMPLED 11/21/13 MWH
TEST STARTED 02/04/14 DPM
TEST FINISHED 02/13/14 DPM
CELL NUMBER ATT-02

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	337.8	344.0	162	0.00000
Wt. Ring (s) (g)	249.9	249.9	162	0.00070
Wt. Soil (g)	87.9	94.1	320	0.00260
Wet Density PCF	113.5	124.9	645	0.00545
			1289	0.00885
Wt. Wet Soil & Pan (g)	91.4	97.6	2303	0.01300
Wt. Dry Soil & Pan (g)	85.3	85.3	4837	0.01785
Wt. Lost Moisture (g)	6.2	12.4	9885	0.02315
Wt. of Pan Only (g)	3.6	3.6	20380	0.02925
Wt. of Dry Soil (g)	81.7	81.7	40322	0.03730
Moisture Content %	7.5	15.1	9885	0.03560
Dry Density PCF	105.5	108.5	2303	0.03295
			645	0.03015
			162	0.02715

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	162	2.208	0.0000	0.0000	0.5971
	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
Data checked by: KR
FileName: MWC0107A

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-07A
 DEPTH 21.0-21.5'
 SAMPLE NO. -
 SOIL DESCR. Sand Tailings
 LOCATION Tailings Impoundment

SAMPLED 11/21/13 MWH
 TEST STARTED 02/04/14 DPM
 TEST FINISHED 02/13/14 DPM
 CELL NUMBER ATT-02

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

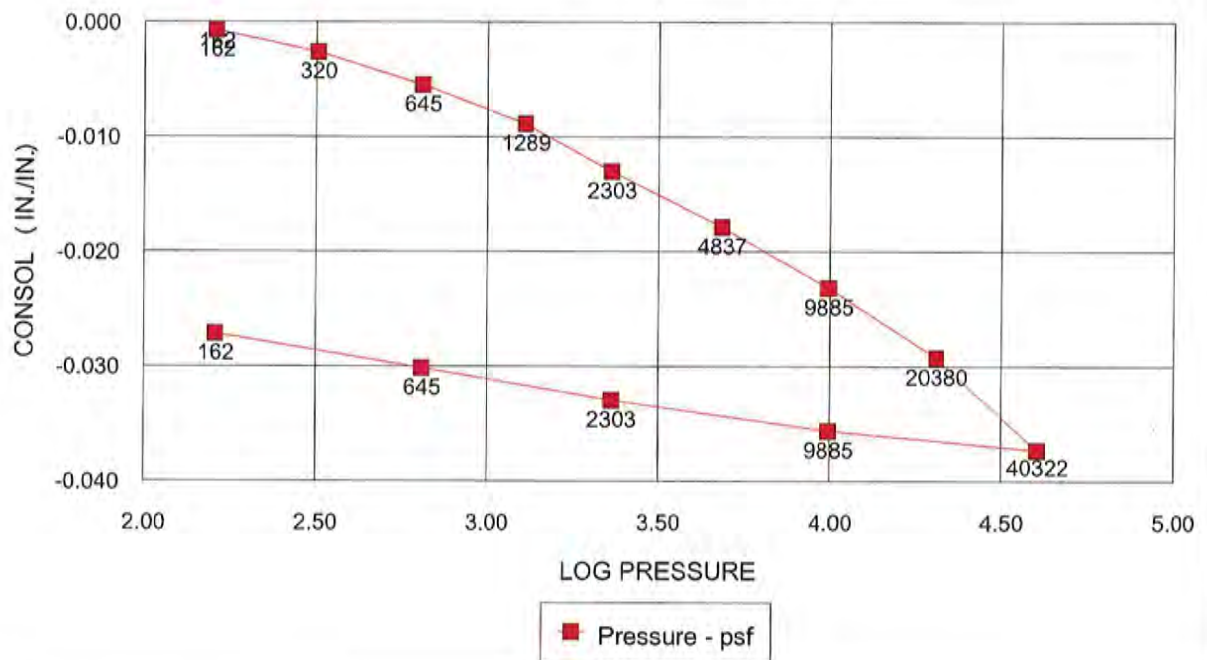
Data entry by: DPM
 Data checked by: KL
 FileName: MWC0107A

Date: 06/11/2014
 Date: 6/11/14



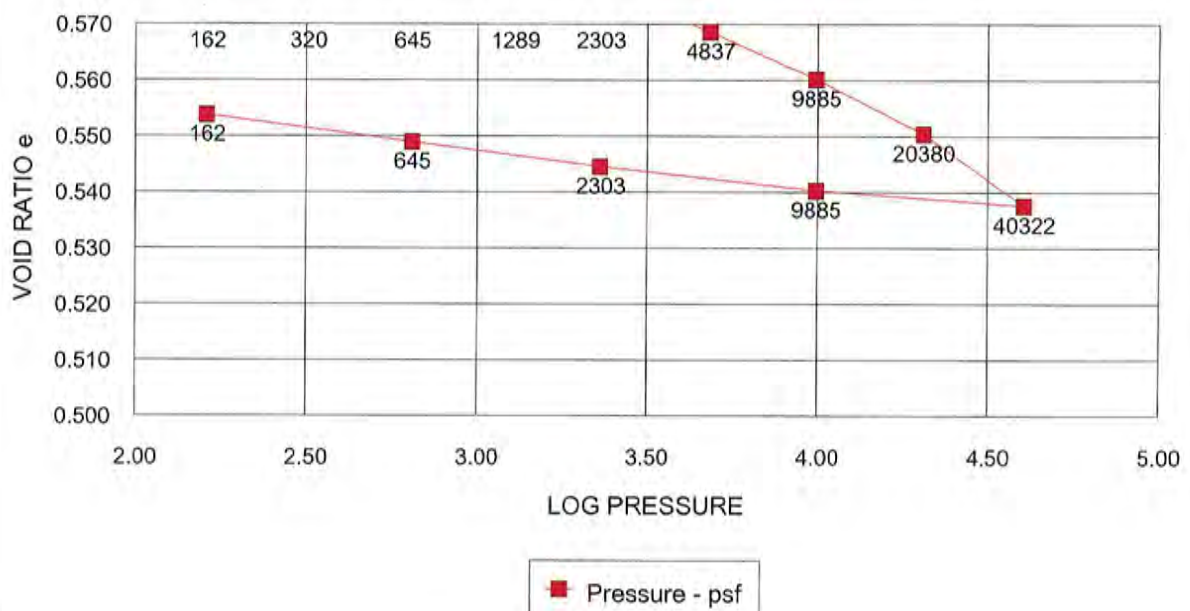
CONSOLIDATION TEST DATA

TI-B1-07A,-,21.0-21.5'



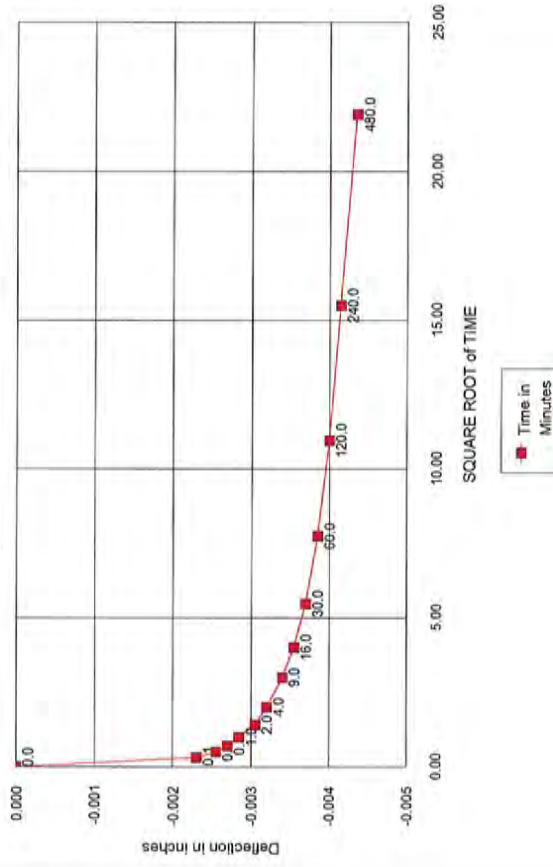
CONSOLIDATION TEST DATA

TI-B1-07A,-,21.0-21.5'



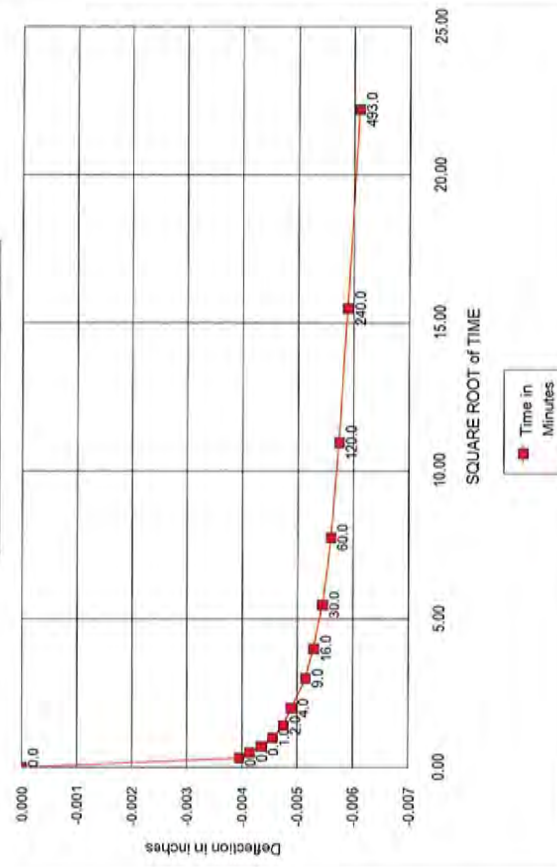
TIME READING DATA

TI-B1-07A-,21.0-21.5,2303 psf Load



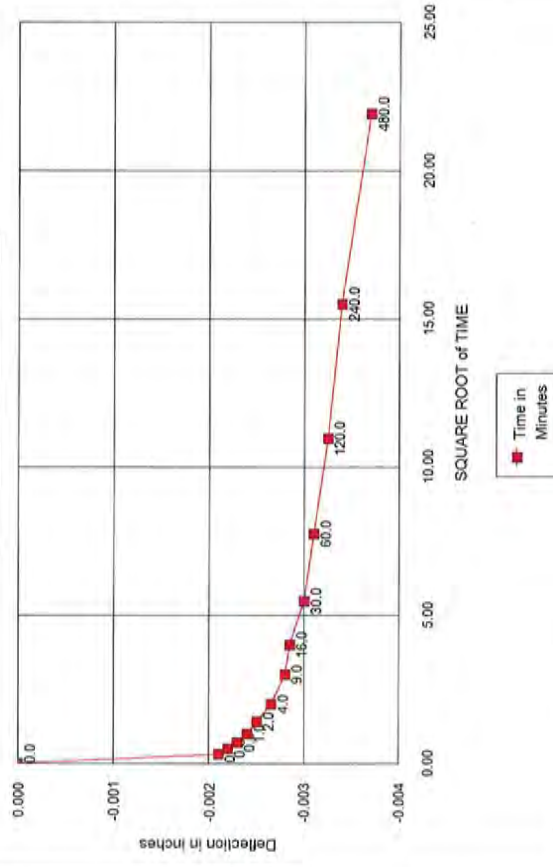
TIME READING DATA

TI-B1-07A-,21.0-21.5,4837 psf Load



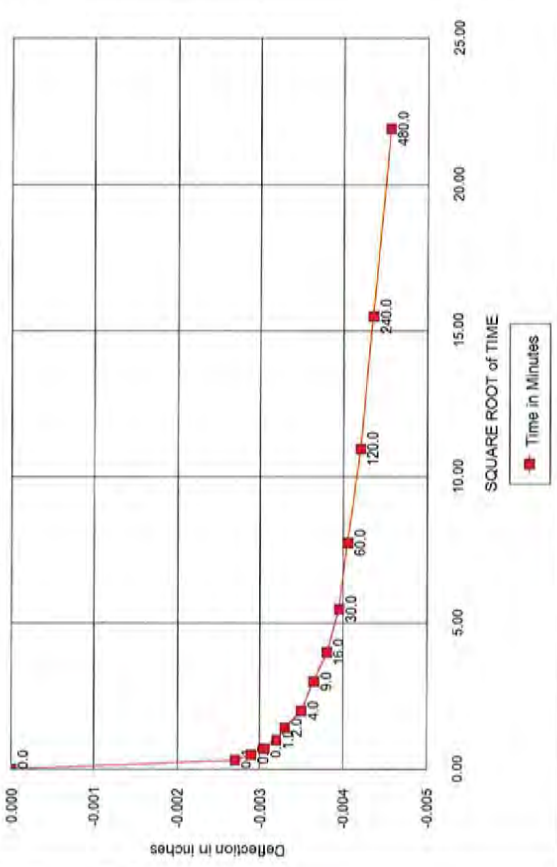
TIME READING DATA

TI-B1-07A-,21.0-21.5,644.8 psf Load



TIME READING DATA

TI-B1-07A-,21.0-21.5,1289 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-11B
DEPTH 30.5-31'
SAMPLE NO. -
SOIL DESCR. Sand Tailings (V. Fine)
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 1.938

SAMPLED 11/21/13 MWH
TEST STARTED 02/04/14 DPM
TEST FINISHED 02/13/14 DPM
CELL NUMBER ATT-04

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	329.3	335.0	168	0.00000
Wt. Ring (s) (g)	248.0	248.0	168	-0.00050
Wt. Soil (g)	81.3	87.0	321	0.00095
Wet Density PCF	105.0	120.7	626	0.00405
			1241	0.00915
Wt. Wet Soil & Pan (g)	84.4	90.1	2480	0.01850
Wt. Dry Soil & Pan (g)	74.0	74.0	4955	0.03315
Wt. Lost Moisture (g)	10.3	16.1	9861	0.04855
Wt. of Pan Only (g)	3.1	3.1	19746	0.06575
Wt. of Dry Soil (g)	70.9	70.9	39419	0.08765
Moisture Content %	14.6	22.7	9861	0.08480
Dry Density PCF	91.6	98.4	2480	0.07995
			626	0.07285
			321	0.06920

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	168	2.226	0.0000	0.0000	0.8399
	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
Data checked by: KR
FileName: MWC0111B

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-11B
 DEPTH 30.5-31'
 SAMPLE NO. -
 SOIL DESCR. Sand Tailings (V. Fine)
 LOCATION Tailings Impoundment

SAMPLED 11/21/13 MWH
 TEST STARTED 02/04/14 DPM
 TEST FINISHED 02/13/14 DPM
 CELL NUMBER ATT-04

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

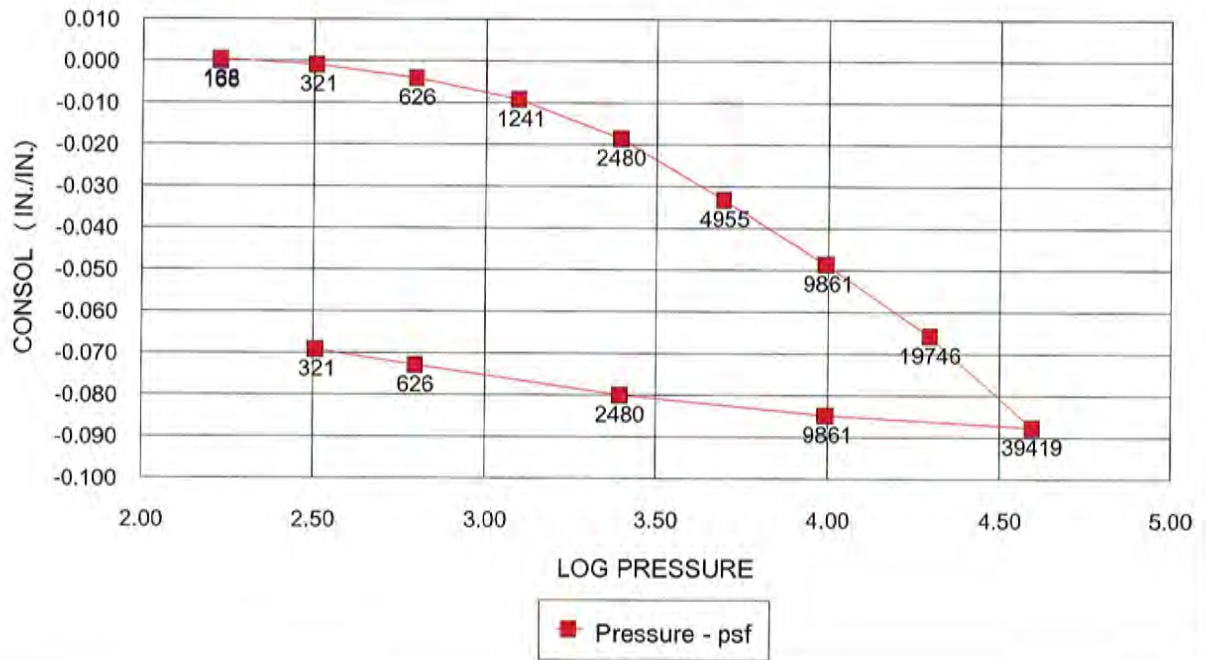
Data checked by: KEDate: 6/11/14

FileName: MWC0111B



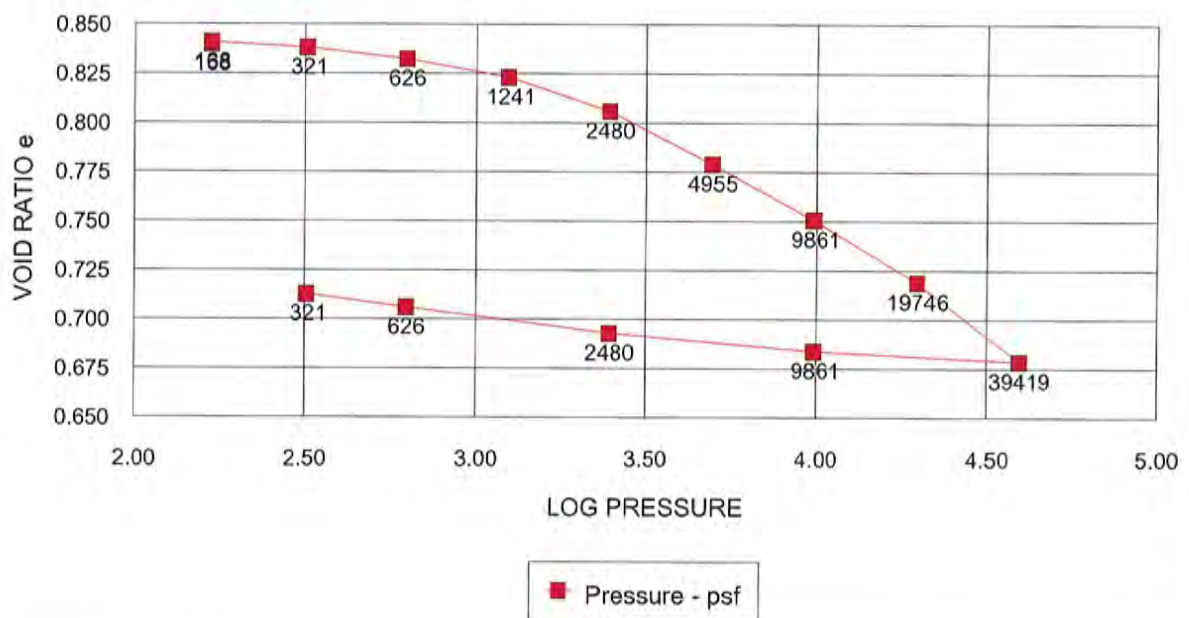
CONSOLIDATION TEST DATA

TI-B1-11B,-,30.5-31'



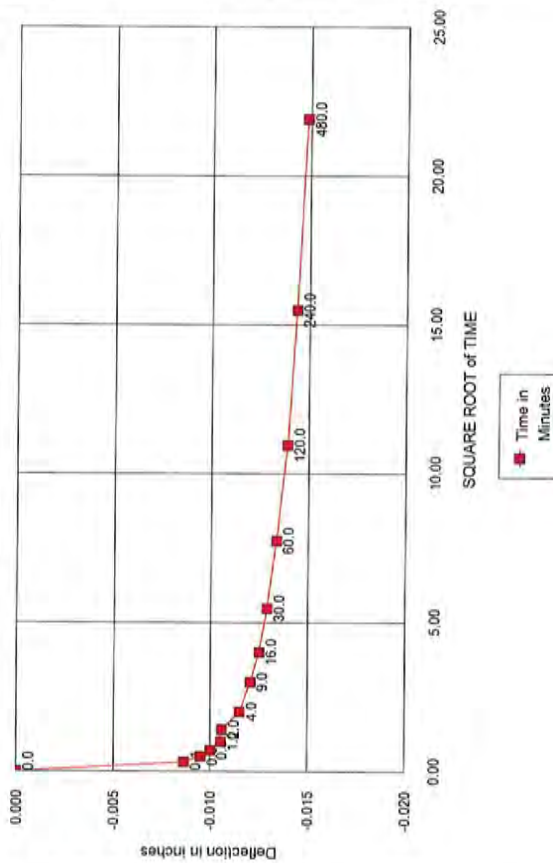
CONSOLIDATION TEST DATA

TI-B1-11B,-,30.5-31'



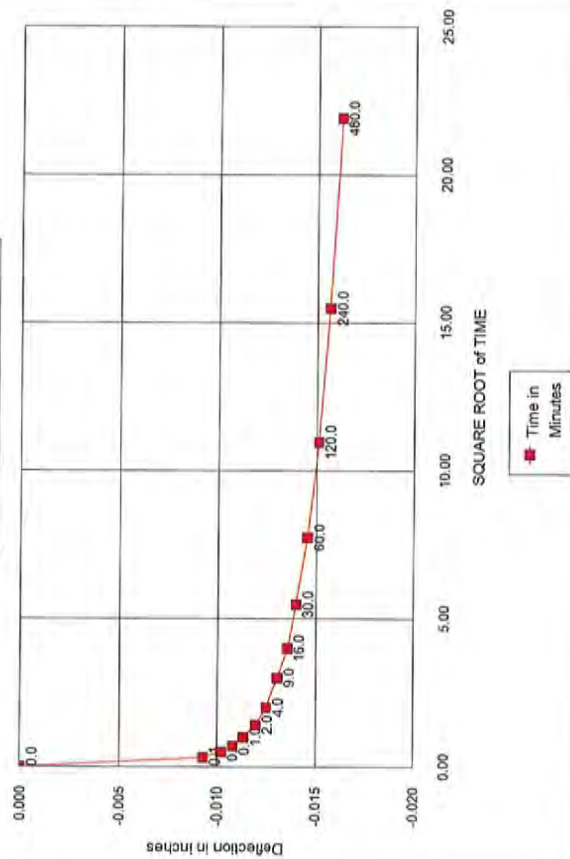
TIME READING DATA

TI-B1-11B-.30.5-31'.4955 psf Load



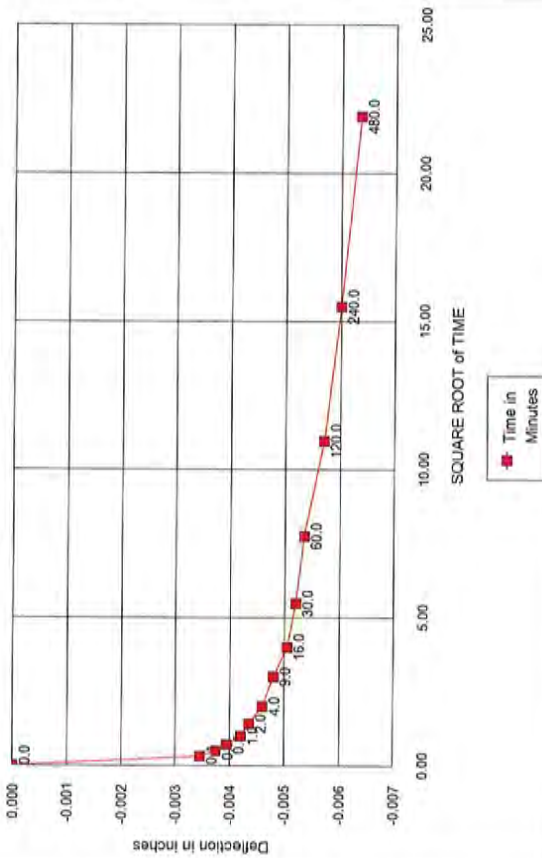
TIME READING DATA

TI-B1-11B-.30.5-31'.9861 psf Load



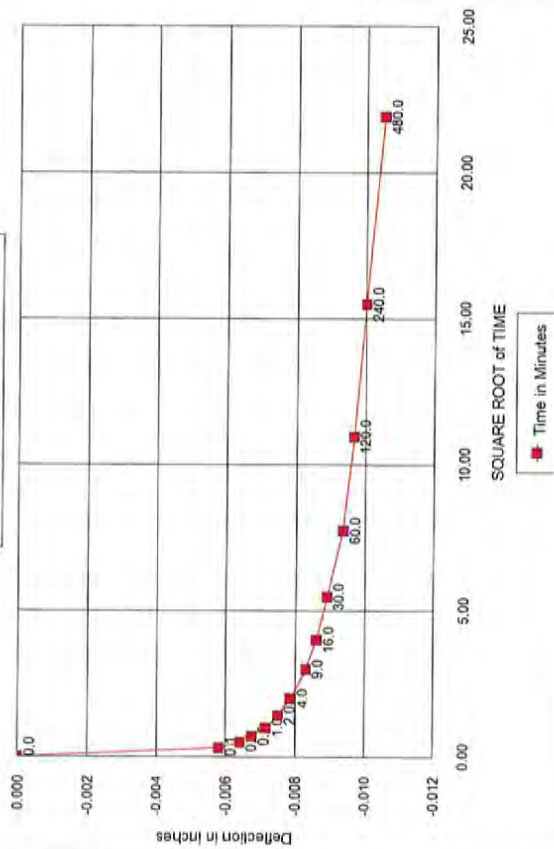
TIME READING DATA

TI-B1-11B-.30.5-31'.1241 psf Load



TIME READING DATA

TI-B1-11B-.30.5-31'.2480 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-13A
DEPTH 36.0-36.5'
SAMPLE NO. -
SOIL DESCR. Clayey Sand
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 1.938

SAMPLED 11/21/13 MWH
TEST STARTED 02/09/14 DPM
TEST FINISHED 02/20/14 DPM
CELL NUMBER ATT-05

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	334.5	335.2	154	0.00000
Wt. Ring (s) (g)	243.3	243.3	154	0.00050
Wt. Soil (g)	91.2	91.9	308	0.00400
Wet Density PCF	117.8	128.4	620	0.00815
			1258	0.01380
Wt. Wet Soil & Pan (g)	95.0	95.7	2548	0.02505
Wt. Dry Soil & Pan (g)	79.2	79.2	5024	0.03385
Wt. Lost Moisture (g)	15.8	16.5	10031	0.04550
Wt. of Pan Only (g)	3.8	3.8	20015	0.06565
Wt. of Dry Soil (g)	75.3	75.3	39614	0.08745
Moisture Content %	21.0	21.9	10031	0.08575
Dry Density PCF	97.3	105.3	2548	0.08225
			620	0.07735
			154	0.07595

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	154	2.187	0.0000	0.0000	0.7323
	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
Data checked by: KR
FileName: MWC0113A

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-13A
 DEPTH 36.0-36.5'
 SAMPLE NO. -
 SOIL DESCR. Clayey Sand
 LOCATION Tailings Impoundment

SAMPLED 11/21/13 MWH
 TEST STARTED 02/09/14 DPM
 TEST FINISHED 02/20/14 DPM
 CELL NUMBER ATT-05

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

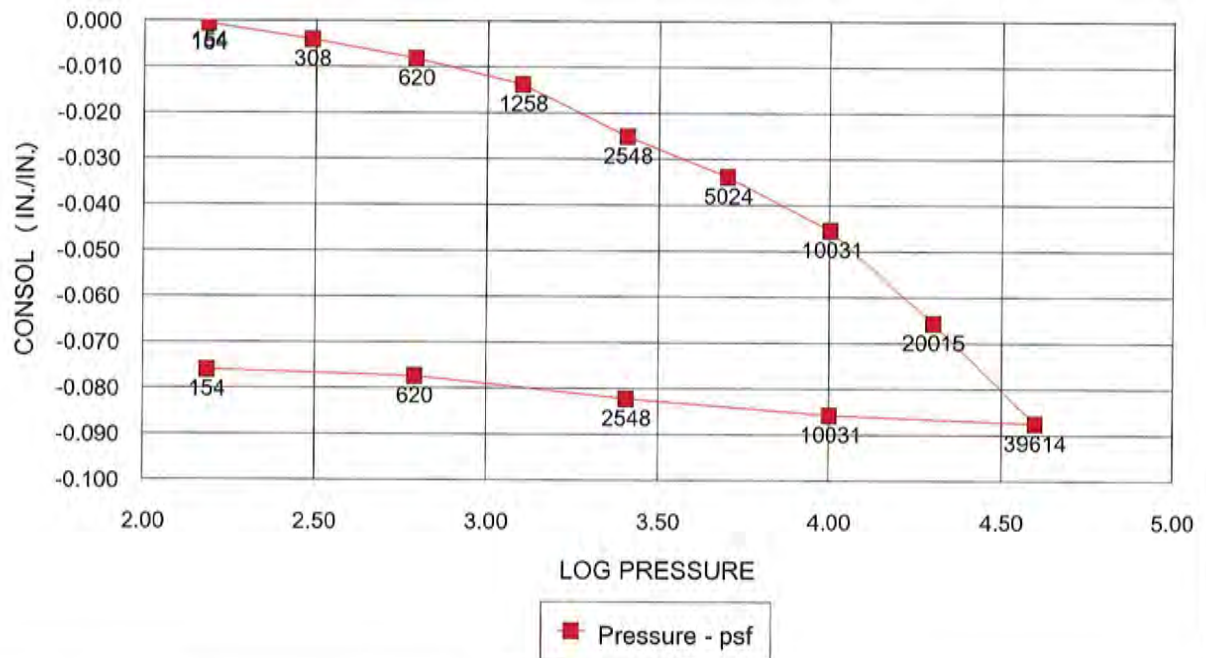
Data entry by: DPM
 Data checked by: KA
 FileName: MWC0113A

Date: 06/11/2014
 Date: 6/11/14



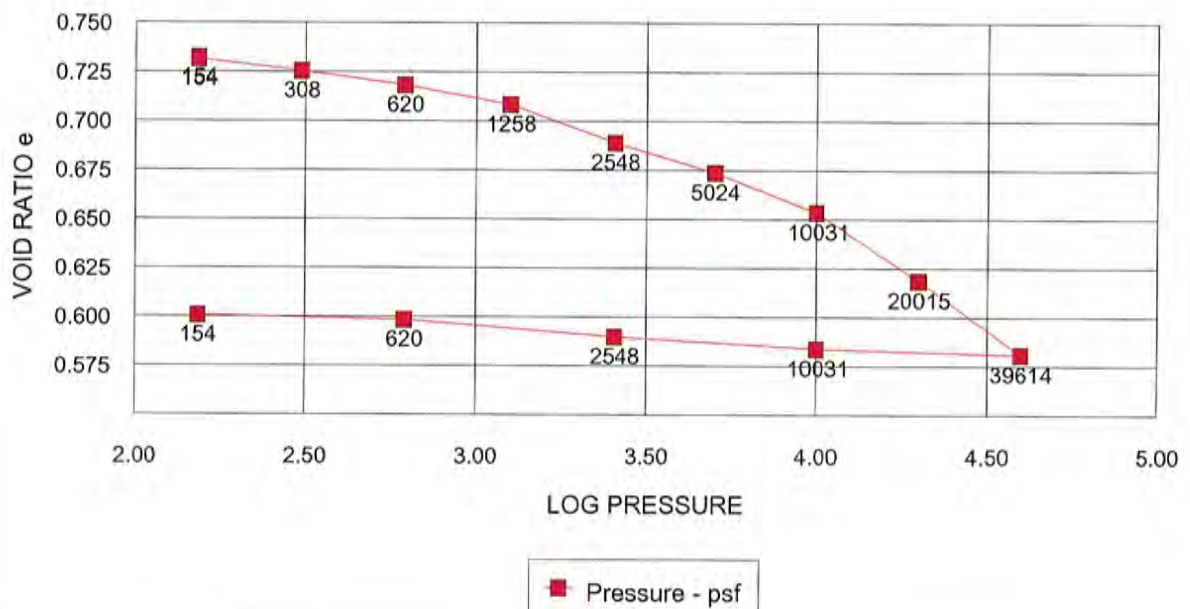
CONSOLIDATION TEST DATA

TI-B1-13A,-,36.0-36.5'



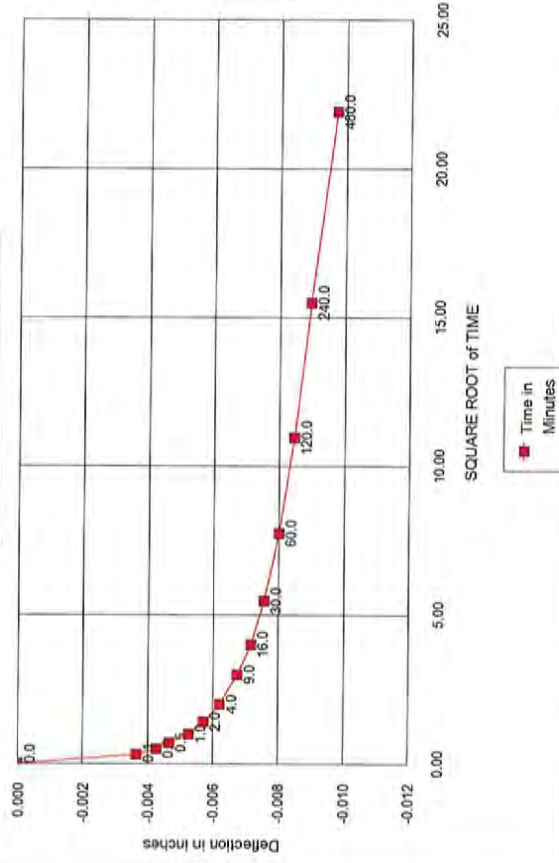
CONSOLIDATION TEST DATA

TI-B1-13A,-,36.0-36.5'



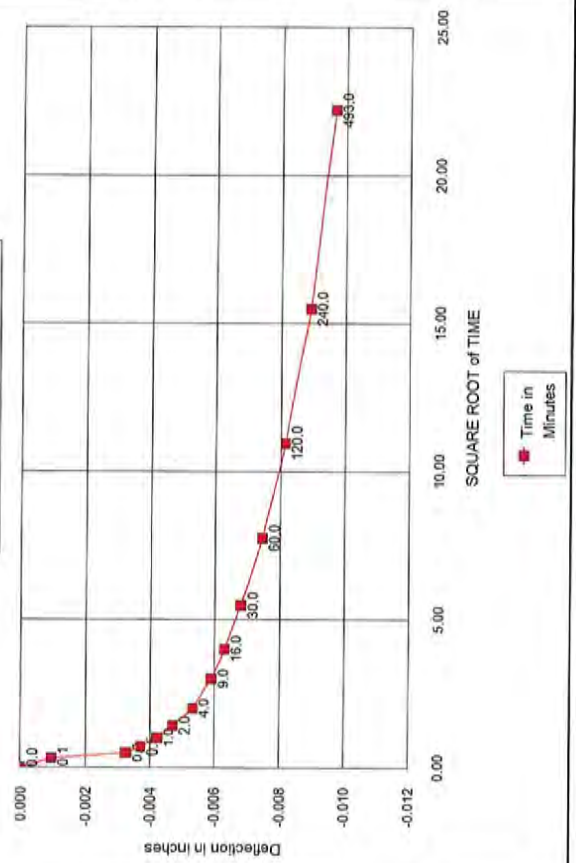
TIME READING DATA

TI-B1-13A, -36.0-36.5' 22548 psf Load



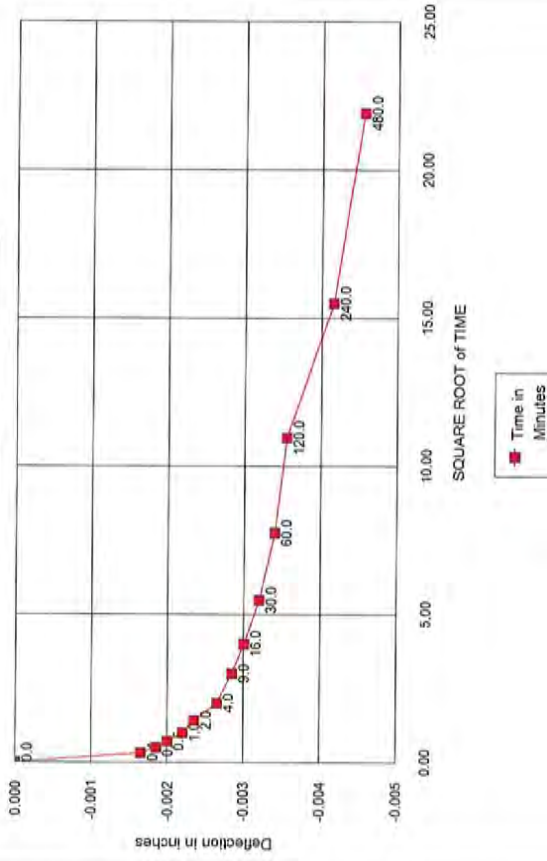
TIME READING DATA

TI-B1-13A, -36.0-36.5' 5024 psf Load



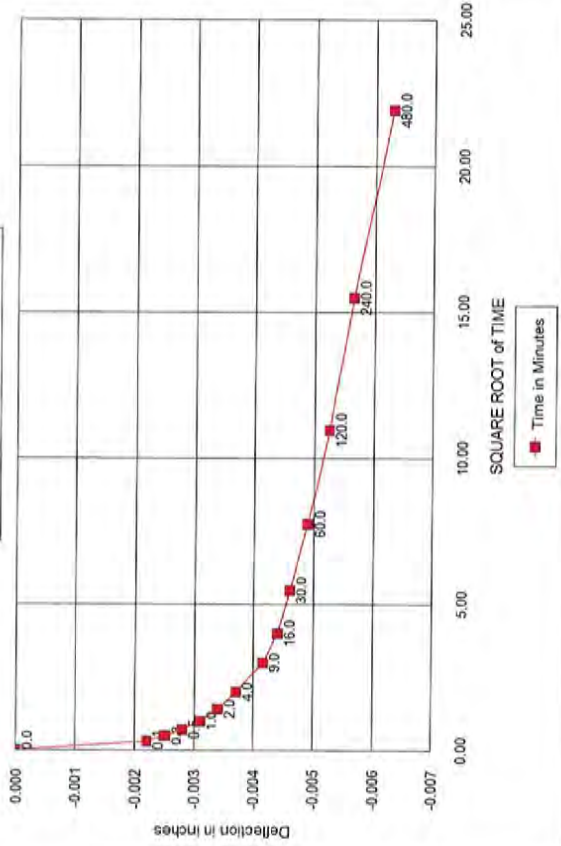
TIME READING DATA

TI-B1-13A, -36.0-36.5' 520 psf Load



TIME READING DATA

TI-B1-13A, -36.0-36.5' 1258 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-02
DEPTH 10-11' (10-12.5)
SAMPLE NO. -
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 11/26/13 MWH
TEST STARTED 02/20/14 DPM
TEST FINISHED 03/01/14 DPM
CELL NUMBER ATT-02

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	169.1	176.9	104.5	0.00000
Wt. Ring (s) (g)	42.7	42.7	104.5	0.00815
Wt. Soil (g)	126.4	134.2	206.8	0.02340
Wet Density PCF	105.6	127.8	417.0	0.04155
			833.7	0.05935
Wt. Wet Soil & Pan (g)	130.2	138.0	1489	0.07405
Wt. Dry Soil & Pan (g)	119.8	119.8	3128	0.09205
Wt. Lost Moisture (g)	10.5	18.3	6392	0.10690
Wt. of Pan Only (g)	3.8	3.8	13179	0.12195
Wt. of Dry Soil (g)	116.0	116.0	26075	0.13870
Moisture Content %	9.0	15.7	6392	0.13650
Dry Density PCF	96.8	110.4	1489	0.13305
			417.0	0.12845
			104.5	0.12325

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	105	2.019	0.0000	0.0000	0.7408
	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
Data checked by: KA
FileName: MWC01002

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-02
 DEPTH 10-11' (10-12.5')
 SAMPLE NO. -
 SOIL DESCR. Sand Tailings
 LOCATION Tailings Impoundment

SAMPLED 11/26/13 MWH
 TEST STARTED 02/20/14 DPM
 TEST FINISHED 03/01/14 DPM
 CELL NUMBER ATT-02

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

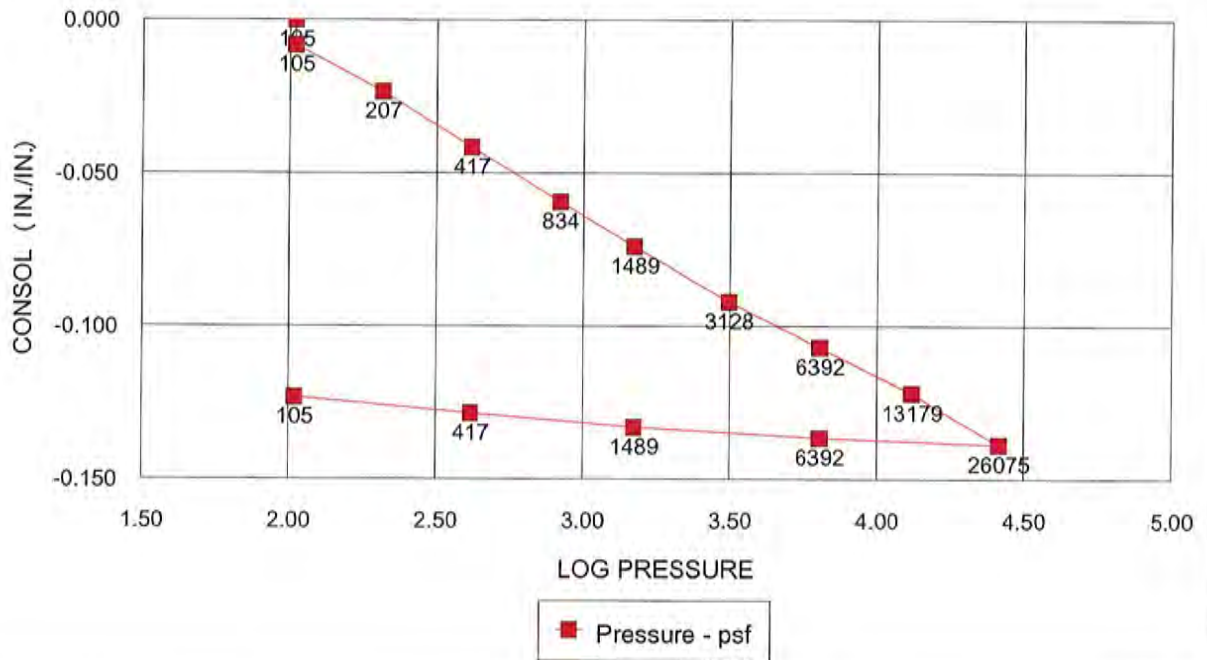
Data entry by: DPM
 Data checked by: Ka
 FileName: MWC01002

Date: 06/11/2014

Date: 6/11/14

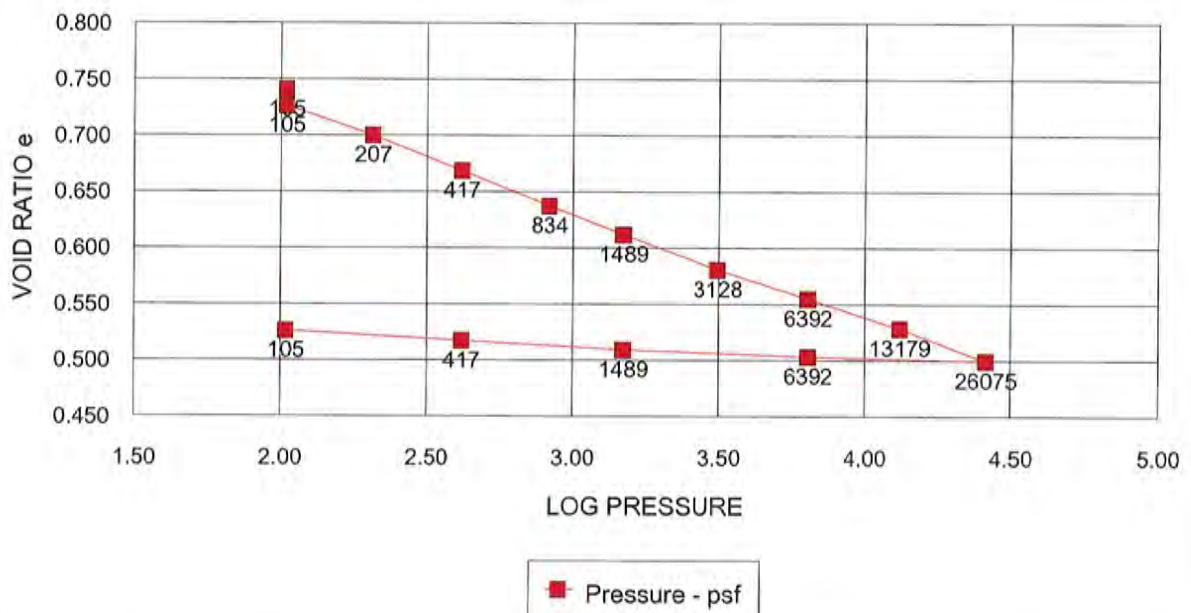
CONSOLIDATION TEST DATA

TI-B10-02,-,10-11' (10-12.5')



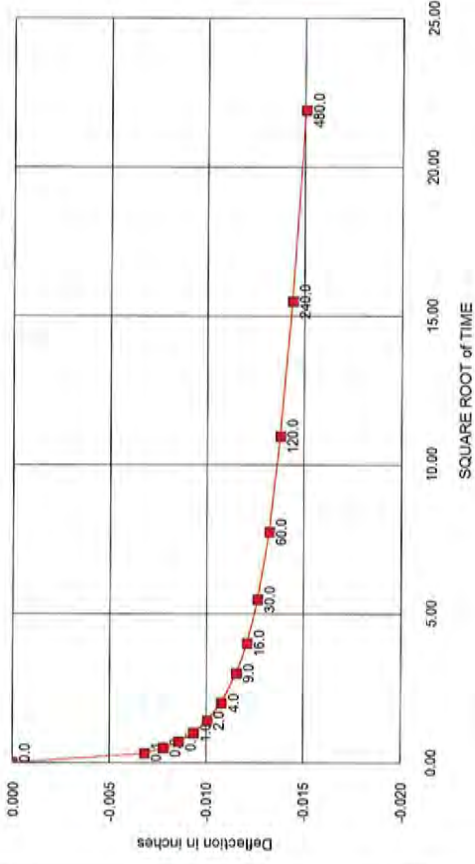
CONSOLIDATION TEST DATA

TI-B10-02,-,10-11' (10-12.5')



TIME READING DATA

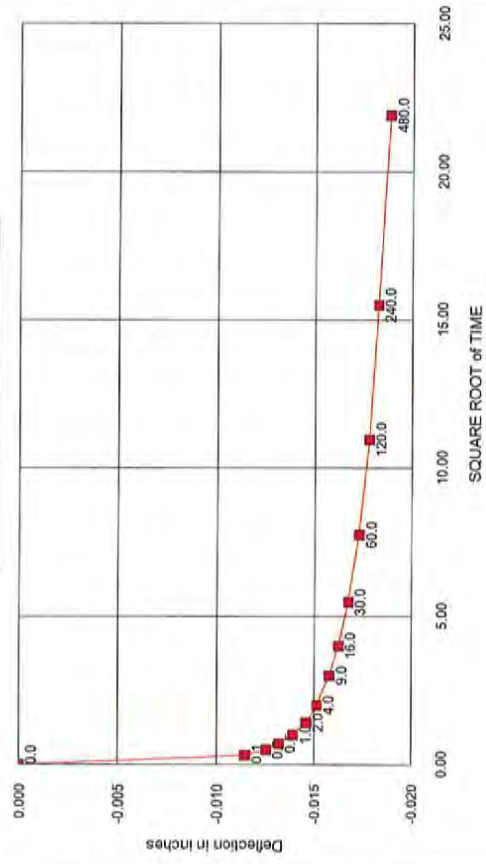
TI-B10-02-,10-11" (10-12.5) .1489 psf Load



Time in Minutes

TIME READING DATA

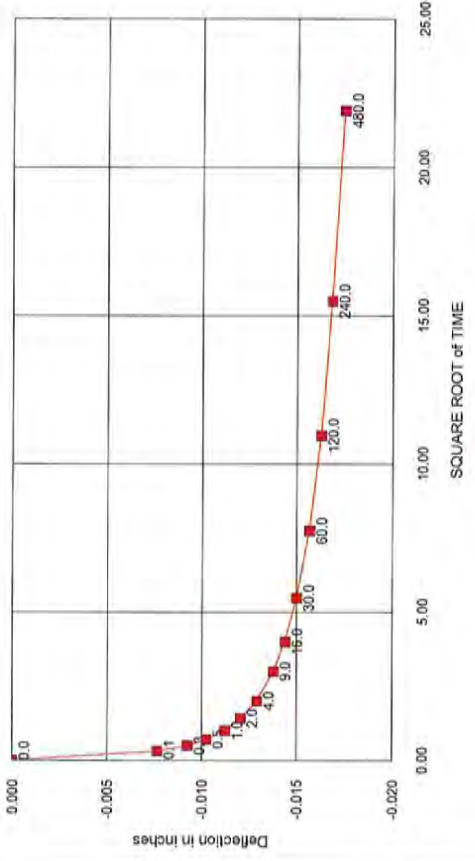
TI-B10-02-,10-11" (10-12.5) .3128 psf Load



Time in Minutes

TIME READING DATA

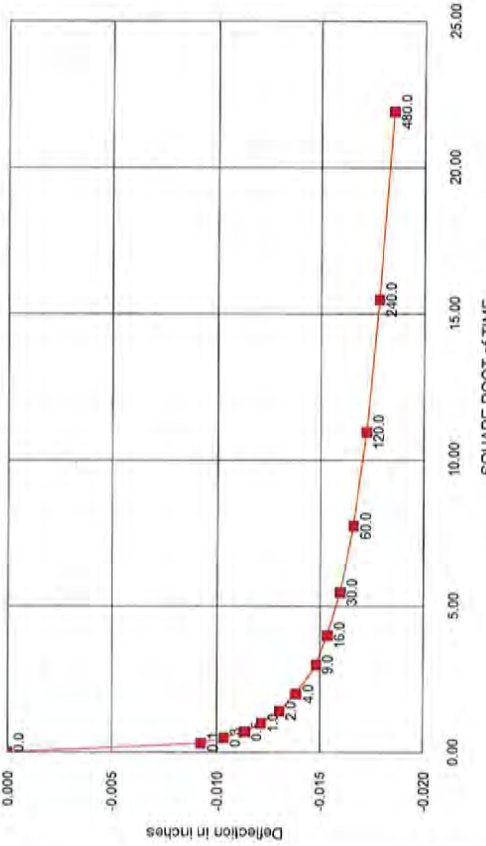
TI-B10-02-,10-11" (10-12.5) .417 psf Load



Time in Minutes

TIME READING DATA

TI-B10-02-,10-11" (10-12.5) .833.7 psf Load



Time in Minutes

CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-14
DEPTH 40.0-41.0' (40-42.5)
SAMPLE NO. -
SOIL DESCR. Clayey Silt Tailings
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 11/26/13 MWH
TEST STARTED 02/20/14 DPM
TEST FINISHED 03/03/14 DPM
CELL NUMBER ATT-04

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
Inundate	109	2.037	0.0000	0.0000	1.3009
	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
Data checked by: *KA*
FileName: MWC01014

Date: 06/11/2014
Date: *6/9/14*



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-14
 DEPTH 40.0-41.0' (40-42.5)
 SAMPLE NO. -
 SOIL DESCR. Clayey Silt Tailings
 LOCATION Tailings Impoundment

SAMPLED 11/26/13 MWH
 TEST STARTED 02/20/14 DPM
 TEST FINISHED 03/03/14 DPM
 CELL NUMBER ATT-04

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

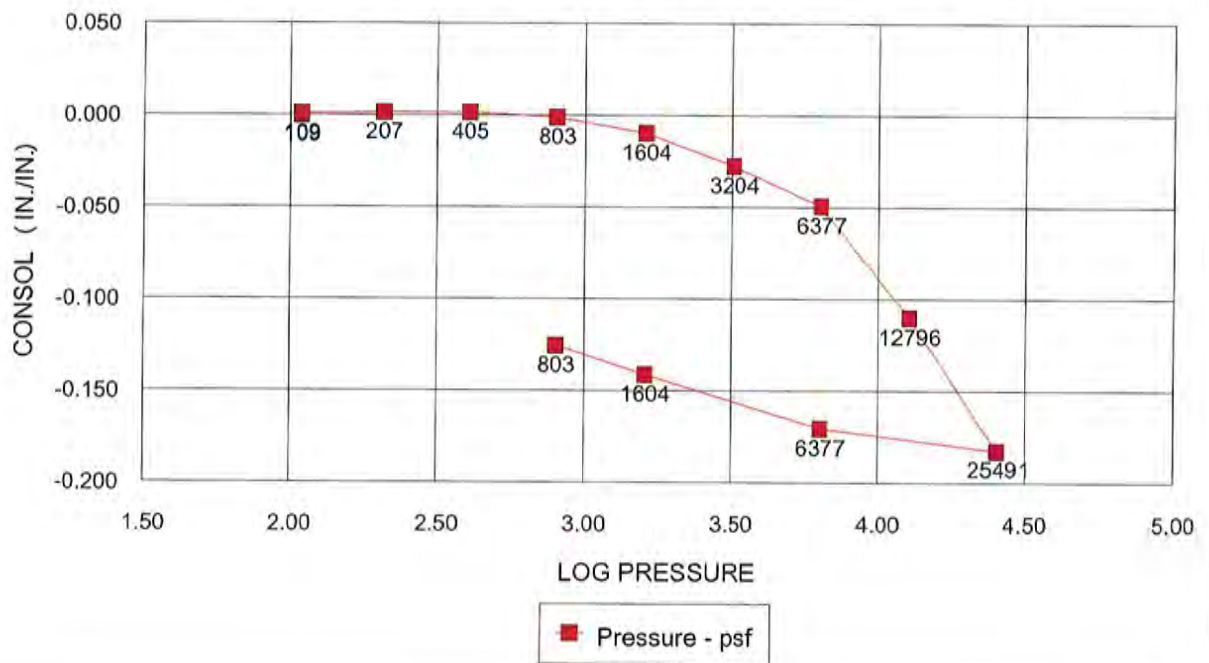
Date: 6/11/14

FileName: MWC01014



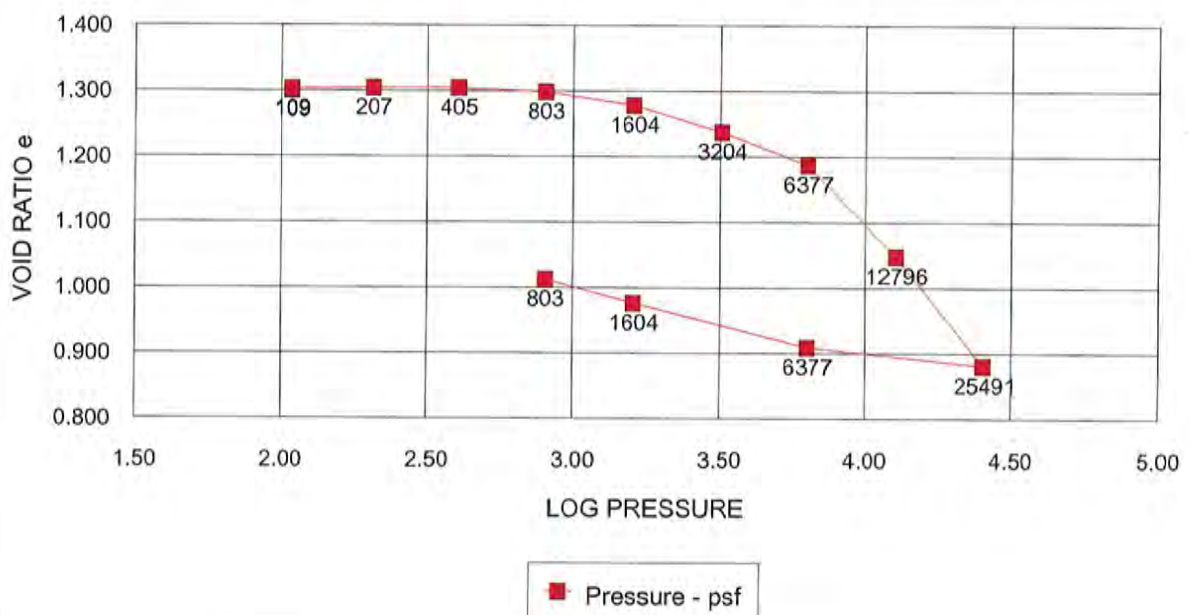
CONSOLIDATION TEST DATA

TI-B10-14,-,40.0-41.0' (40-42.5')



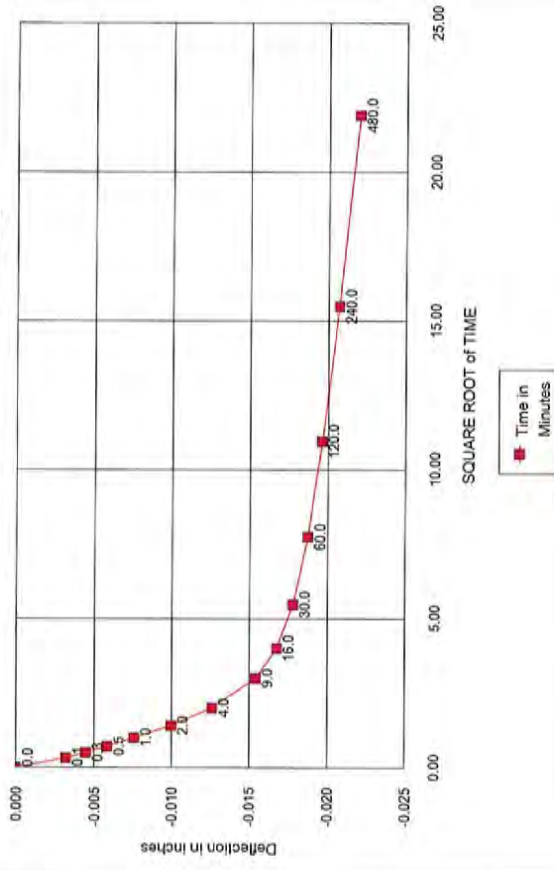
CONSOLIDATION TEST DATA

TI-B10-14,-,40.0-41.0' (40-42.5')



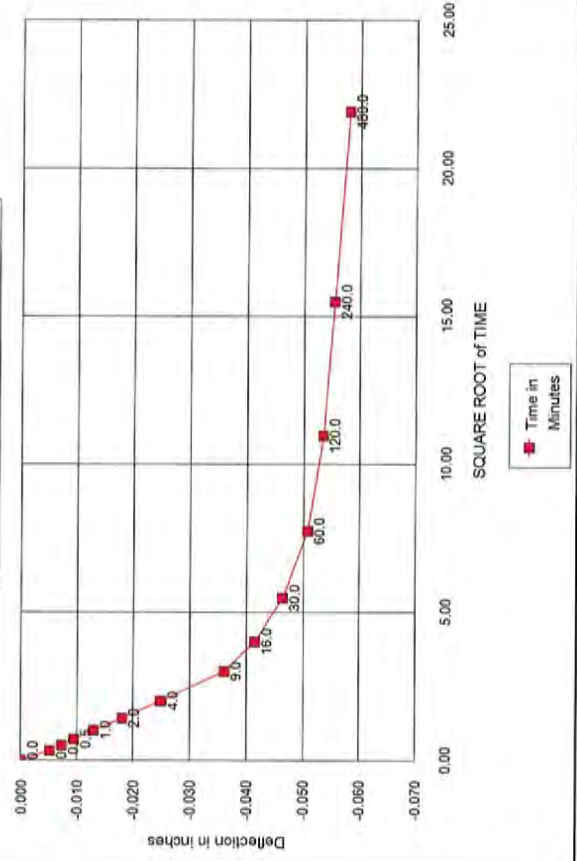
TIME READING DATA

TI-B10-14--40.0-41.0' (40-42.5) .6377 psf Load



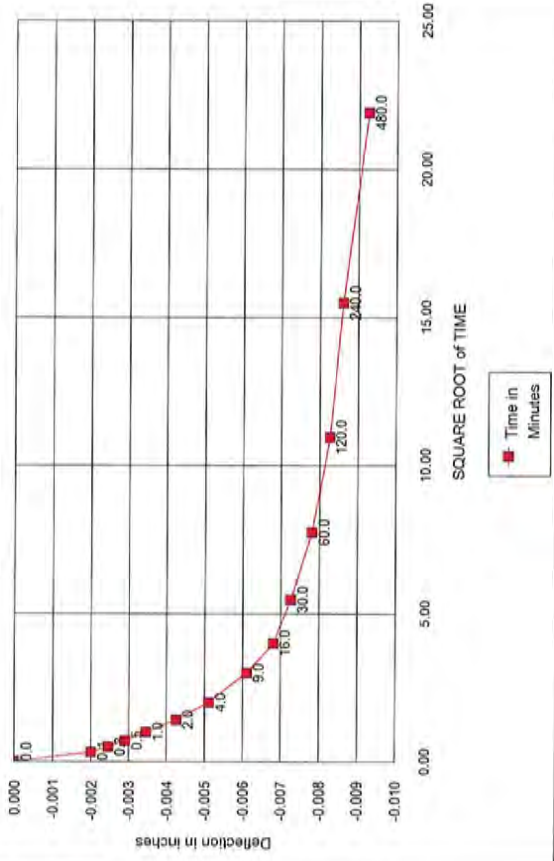
TIME READING DATA

TI-B10-14--40.0-41.0' (40-42.5) .12769 psf Load



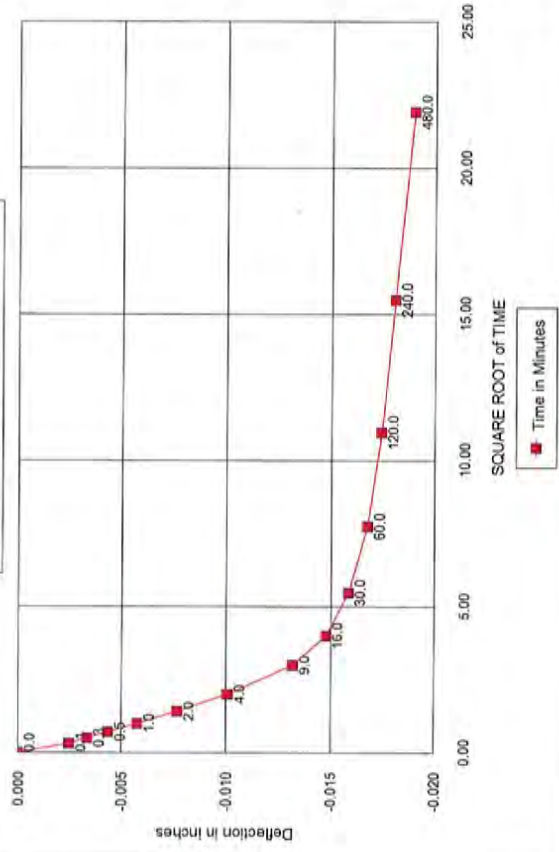
TIME READING DATA

TI-B10-14--40.0-41.0' (40-42.5) .1604 psf Load



TIME READING DATA

TI-B10-14--40.0-41.0' (40-42.5) .3204 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-18
DEPTH 55-56' (55-56.5')
SAMPLE NO. -
SOIL DESCR. Silty Sand
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 11/26/13 MWH
TEST STARTED 02/24/14 DPM
TEST FINISHED 03/05/14 DPM
CELL NUMBER ATT-05

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	180.9	185.3	99.4	0.00000
Wt. Ring (s) (g)	43.2	43.2	99.4	-0.00040
Wt. Soil (g)	137.7	142.1	198.9	0.00035
Wet Density PCF	115.0	130.9	400.9	0.00245
			813.2	0.00685
Wt. Wet Soil & Pan (g)	141.5	145.9	1648	0.01520
Wt. Dry Soil & Pan (g)	124.5	124.5	3249	0.03065
Wt. Lost Moisture (g)	17.0	21.4	6487	0.05470
Wt. of Pan Only (g)	3.8	3.8	12943	0.08075
Wt. of Dry Soil (g)	120.7	120.7	25617	0.10300
Moisture Content %	14.1	17.7	6487	0.10115
Dry Density PCF	100.8	111.2	1648	0.09900
			400.9	0.09515
			198.9	0.09320

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	99	1.997	0.0000	0.0000	0.6719
	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
Data checked by: KE
FileName: MWC01018

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-18
 DEPTH 55-56' (55-56.5')
 SAMPLE NO. -
 SOIL DESCR. Silty Sand
 LOCATION Tailings Impoundment

SAMPLED 11/26/13 MWH
 TEST STARTED 02/24/14 DPM
 TEST FINISHED 03/05/14 DPM
 CELL NUMBER ATT-05

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

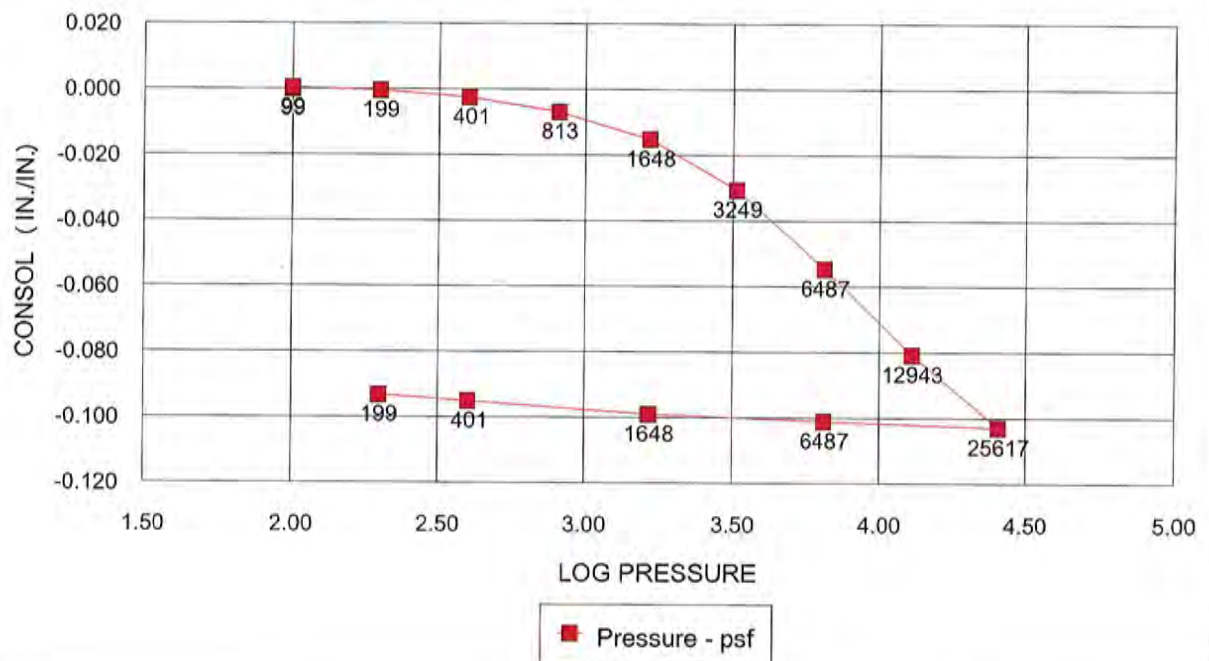
Data entry by: DPM
 Data checked by: KR
 FileName: MWC01018

Date: 06/11/2014
 Date: 6/11/14



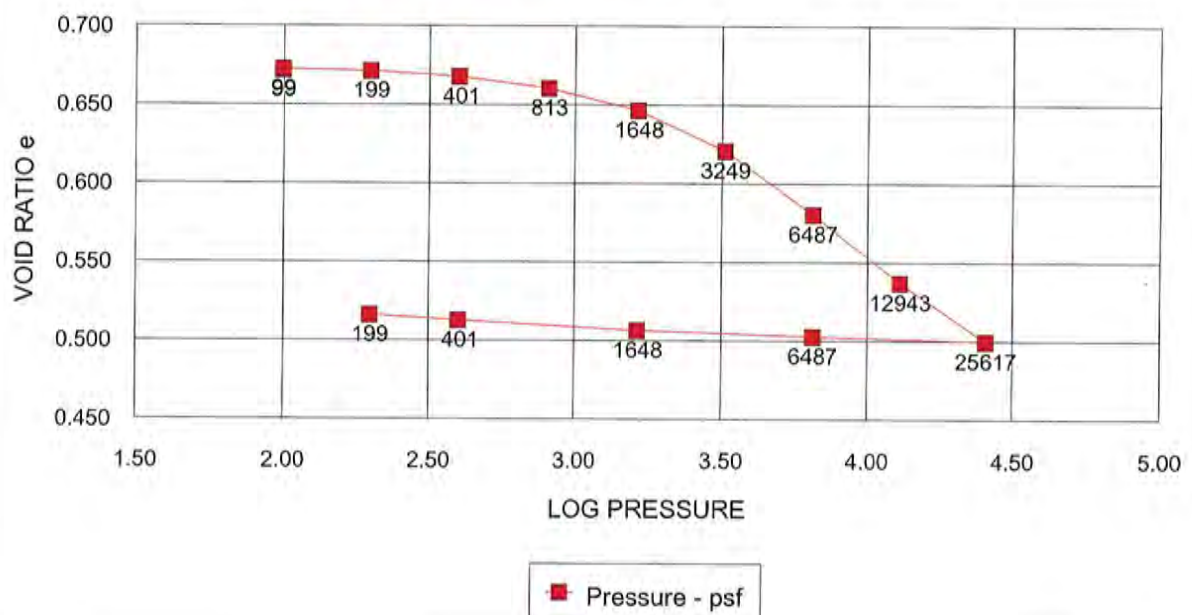
CONSOLIDATION TEST DATA

TI-B10-18,-,55-56' (55-56.5')



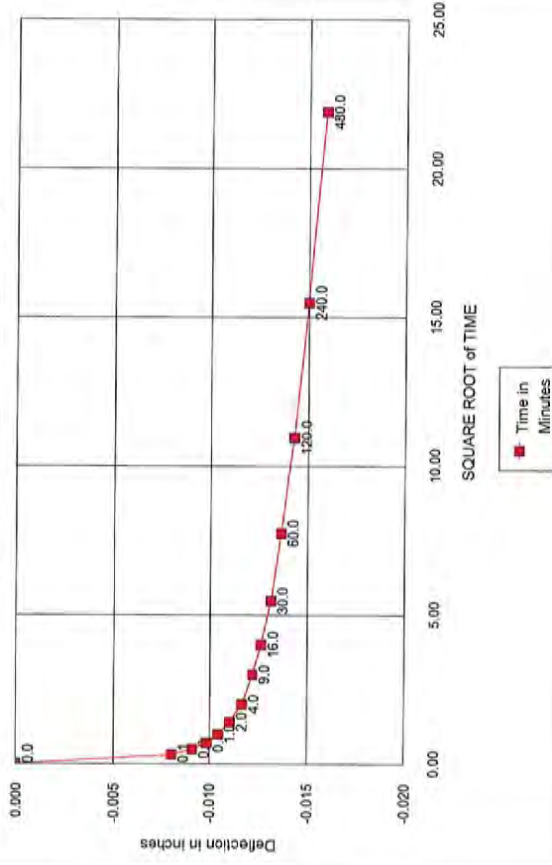
CONSOLIDATION TEST DATA

TI-B10-18,-,55-56' (55-56.5')



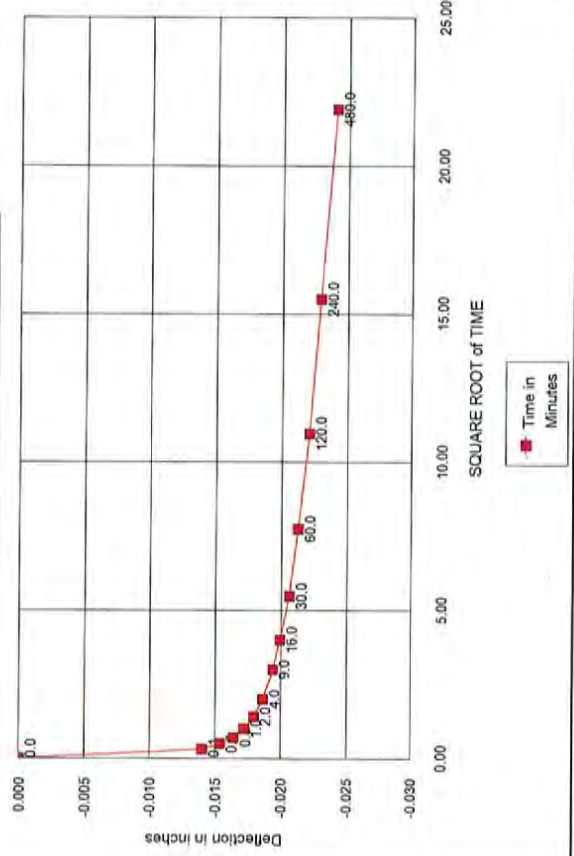
TIME READING DATA

TI-B10-18-.55-56' (.3248 psf Load)



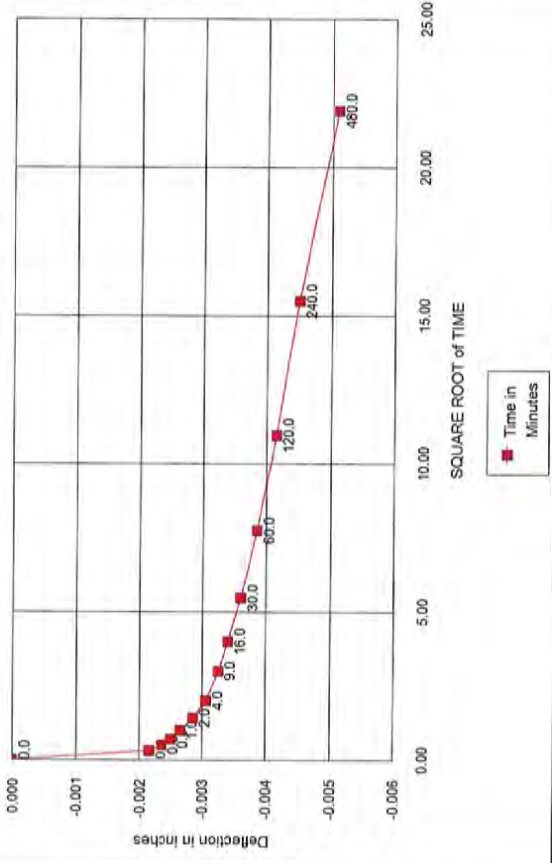
TIME READING DATA

TI-B10-18-.55-56' (.6487 psf Load)



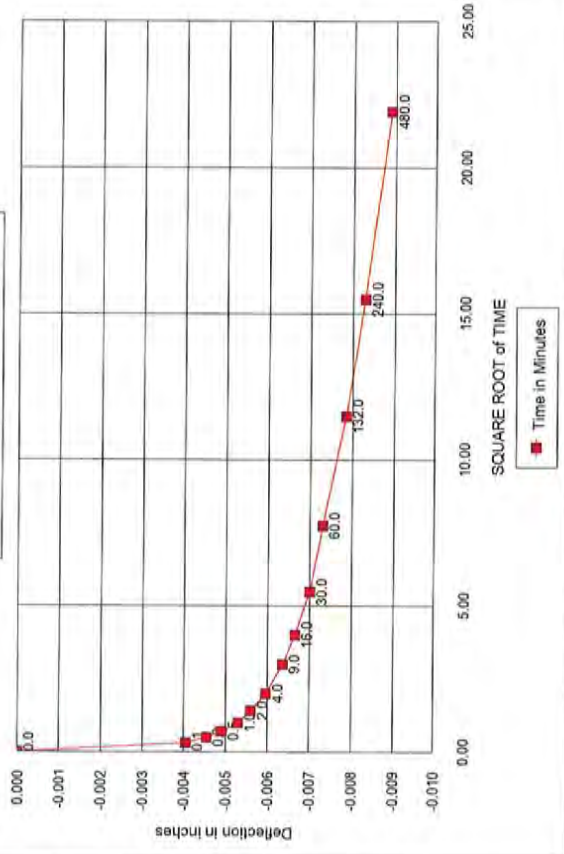
TIME READING DATA

TI-B10-18-.55-56' (.813.2 psf Load)



TIME READING DATA

TI-B10-18-.55-56' (.1648 psf Load)



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-17
DEPTH 45-46' (45-47.5')
SAMPLE NO. -
SOIL DESCR. Clayey Sand
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 11/21/13 MWH
TEST STARTED 04/11/14 DPM
TEST FINISHED 04/19/14 DPM
CELL NUMBER ATT-04

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	191.2	188.6	108.9	0.00000
Wt. Ring (s) (g)	39.5	39.5	108.9	-0.00035
Wt. Soil (g)	151.8	149.2	207.4	0.00045
Wet Density PCF	126.7	130.8	405.0	0.00390
			802.8	0.00805
Wt. Wet Soil & Pan (g)	155.3	152.7	1604	0.01560
Wt. Dry Soil & Pan (g)	130.4	130.4	3204	0.02455
Wt. Lost Moisture (g)	24.9	22.3	6377	0.03530
Wt. of Pan Only (g)	3.6	3.6	12769	0.04650
Wt. of Dry Soil (g)	126.9	126.9	25491	0.06170
Moisture Content %	19.6	17.5	6377	0.05870
Dry Density PCF	106.0	111.3	1604	0.05515
			405.0	0.05100
			207.4	0.04805

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	109	2.037	0.0000	0.0000	0.5907
	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
Data checked by: KA
FileName: MWC0B117

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-17
 DEPTH 45-46' (45-47.5')
 SAMPLE NO. -
 SOIL DESCR. Clayey Sand
 LOCATION Tailings Impoundment

SAMPLED 11/21/13 MWH
 TEST STARTED 04/11/14 DPM
 TEST FINISHED 04/19/14 DPM
 CELL NUMBER ATT-04

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

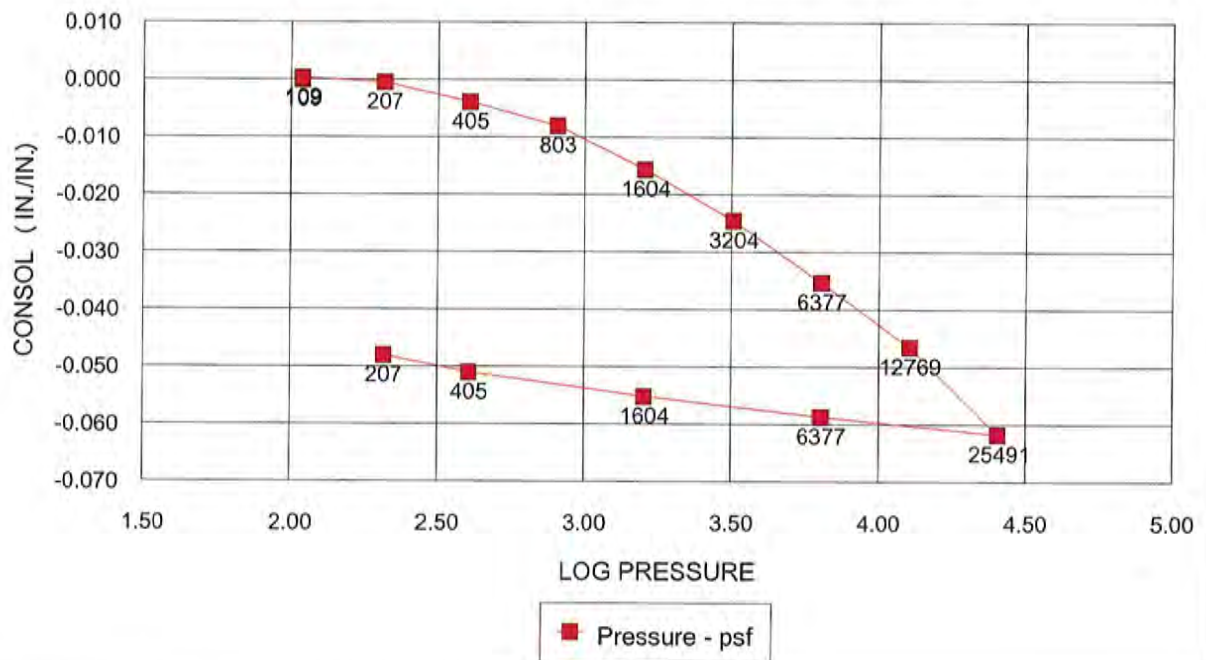
Data entry by: DPM
 Data checked by: KK
 FileName: MWC0B117

Date: 06/11/2014
 Date: 6/11/14



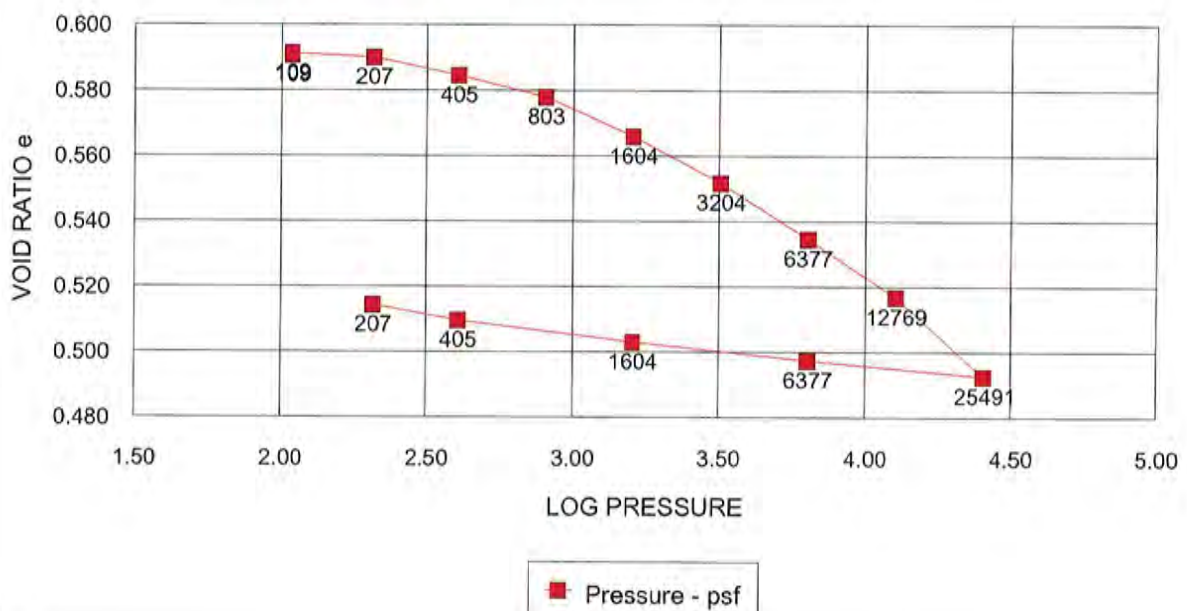
CONSOLIDATION TEST DATA

TI-B1-17,-,45-46' (45-47.5')



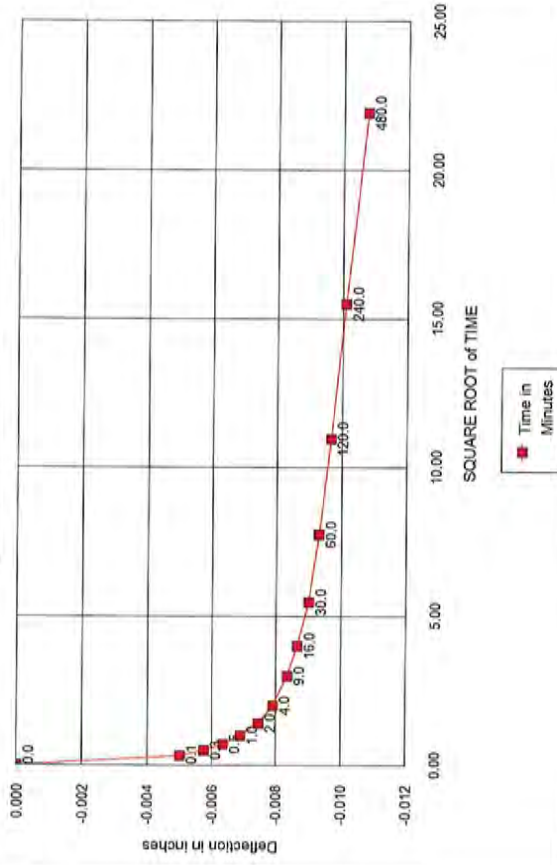
CONSOLIDATION TEST DATA

TI-B1-17,-,45-46' (45-47.5')



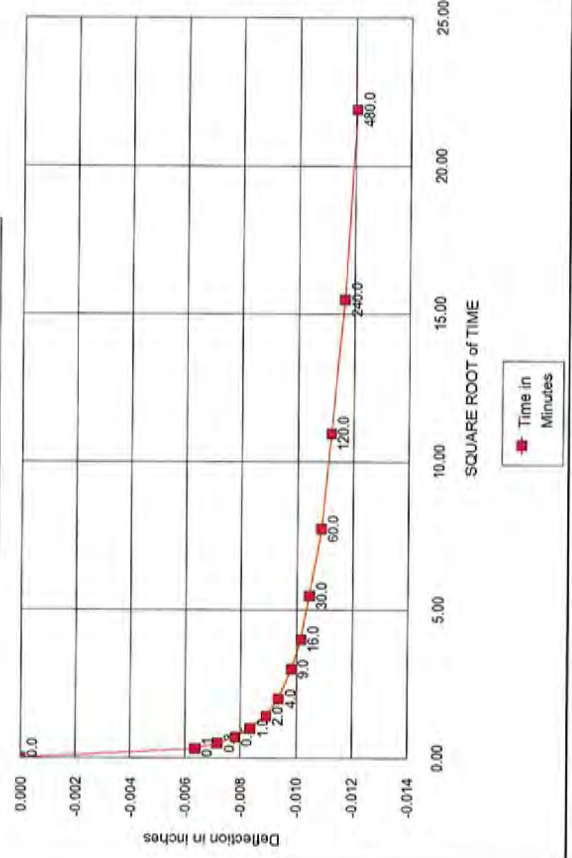
TIME READING DATA

TI-B1-17-.45-46' (45-47.5) .3204 psf Load



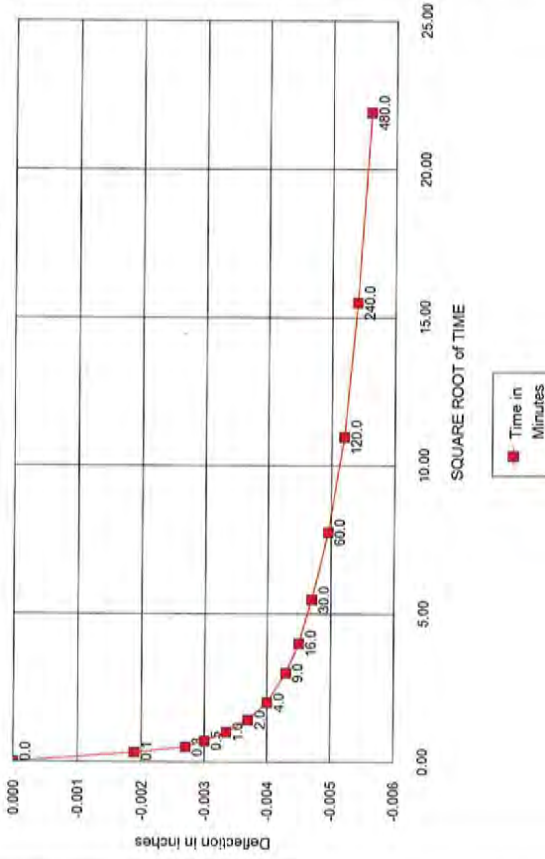
TIME READING DATA

TI-B1-17-.45-46' (45-47.5) .6377 psf Load



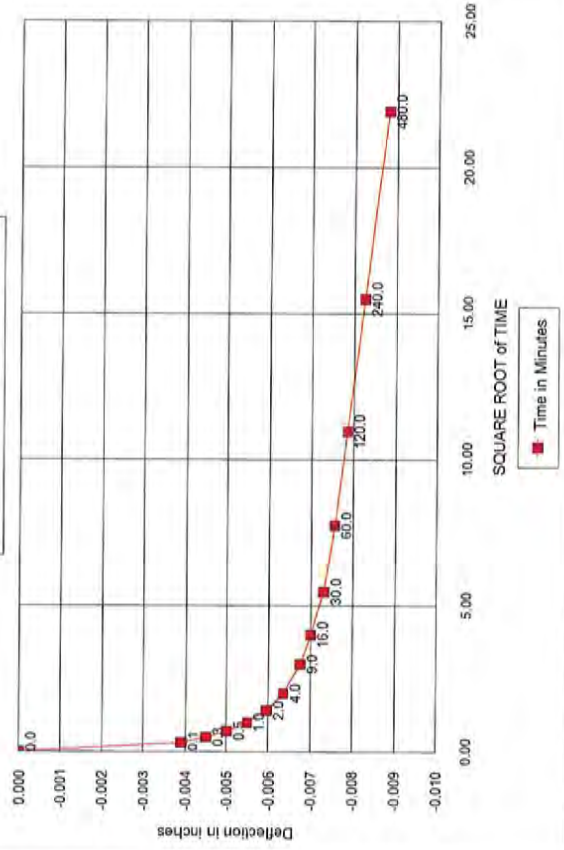
TIME READING DATA

TI-B1-17-.45-46' (45-47.5) .802.8 psf Load



TIME READING DATA

TI-B1-17-.45-46' (45-47.5) .1604 psf Load



CONSOLIDATION TEST
ASTM D-2435

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-06
DEPTH 21.5-22.5 (20.0-22.5)
SAMPLE NO. -
SOIL DESCR. Clayey Silt Tailings
LOCATION Tailings Impoundment
SAMPLE DIA. (in) 2.410

SAMPLED 11/26/13 MWH
TEST STARTED 01/22/14 DPM
TEST FINISHED 01/30/14 DPM
CELL NUMBER ATT-02

INITIAL HT. (in) 1.000

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	LOAD (PSF)	CONSOL. (IN.)
Wt. Soil & Ring (s) (g)	184.1	179.0	105	0.00000
Wt. Ring (s) (g)	43.2	43.2	105	-0.00050
Wt. Soil (g)	141.0	135.8	207	-0.00025
Wet Density PCF	117.7	125.7	417	0.00220
			834	0.00775
Wt. Wet Soil & Pan (g)	144.8	139.6	1489	0.01720
Wt. Dry Soil & Pan (g)	113.8	113.8	3128	0.03300
Wt. Lost Moisture (g)	31.0	25.8	6392	0.05555
Wt. of Pan Only (g)	3.8	3.8	13179	0.08250
Wt. of Dry Soil (g)	110.0	110.0	26075	0.12010
Moisture Content %	28.1	23.4	6392	0.11605
Dry Density PCF	91.9	101.8	1489	0.10875
			417	0.09770

	LOAD (PSF)	LOG p	CONSOL. (IN.)	DEFL. (IN.)	VOID RATIO e
Inundate	105	2.019	0.0000	0.0000	0.8342
	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
Data checked by: WZ
FileName: MWC01006

Date: 06/11/2014
Date: 6/11/14



CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-06
 DEPTH 21.5-22.5 (20.0-22.5)
 SAMPLE NO. -
 SOIL DESCR. Clayey Silt Tailings
 LOCATION Tailings Impoundment

SAMPLED 11/26/13 MWH
 TEST STARTED 01/22/14 DPM
 TEST FINISHED 01/30/14 DPM
 CELL NUMBER ATT-02

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

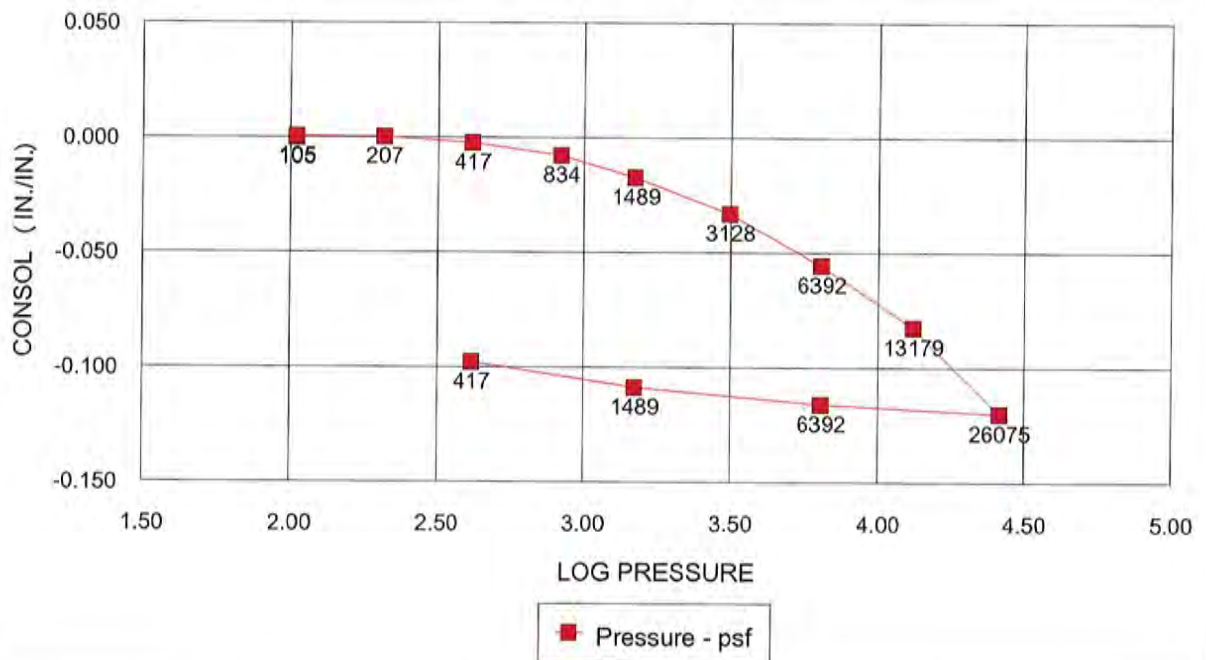
Data entry by: DPM
 Data checked by: KP
 FileName: MWC01006

Date: 06/11/2014
 Date: 6/2/14



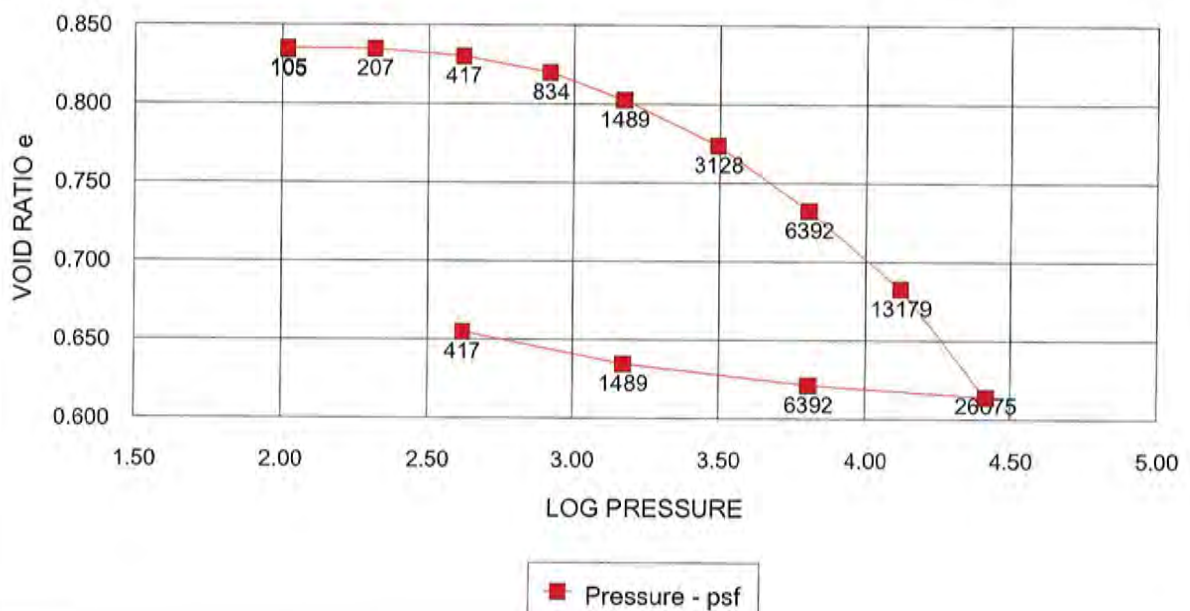
CONSOLIDATION TEST DATA

TI-B10-06,-,21.5-22.5 (20.0-22.5')



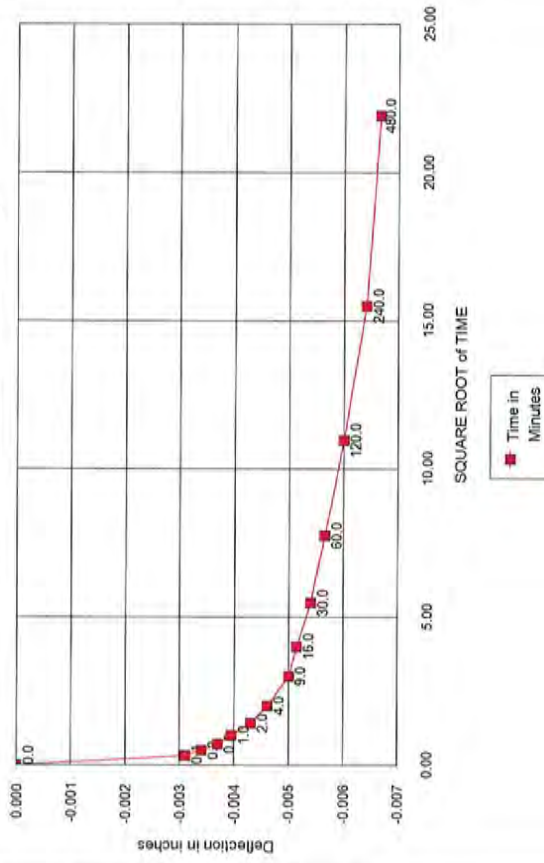
CONSOLIDATION TEST DATA

TI-B10-06,-,21.5-22.5 (20.0-22.5')



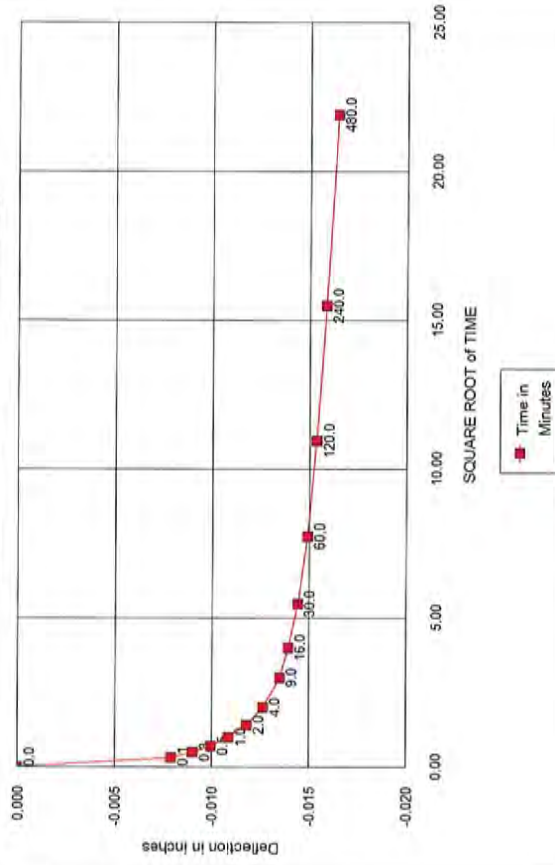
TIME READING DATA

TI-B10-06-.21.5-22.5 (20.0-22.5) .834 psf Load



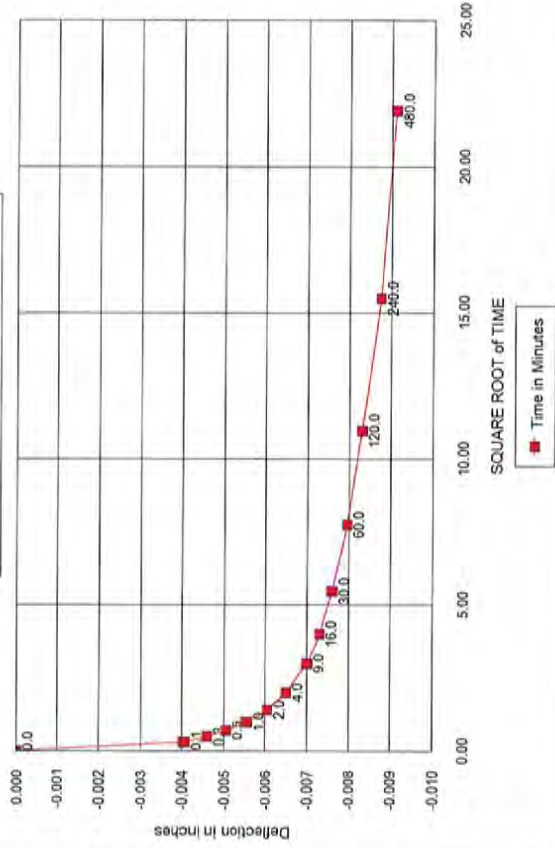
TIME READING DATA

TI-B10-06-.21.5-22.5 (20.0-22.5) .3228 psf Load



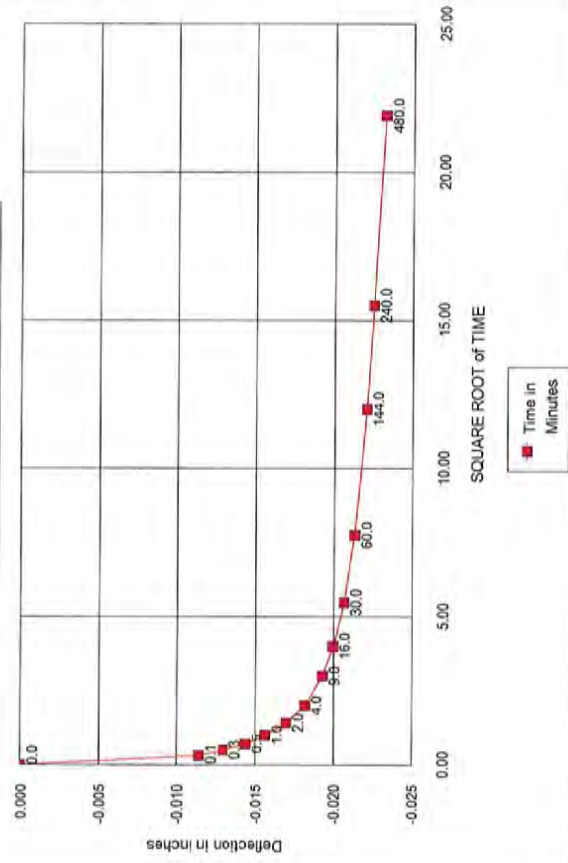
TIME READING DATA

TI-B10-06-.21.5-22.5 (20.0-22.5) .1489 psf Load



TIME READING DATA

TI-B10-06-.21.5-22.5 (20.0-22.5) .6392 psf Load



CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT

MWH

JOB NO. 2512-77

SAMPLE DATE

SOIL DESCR.

LOCATION

Church Rock
Tailings Impoundment

TEST STARTED 12/20/13 DPM
TEST FINISHED 03/11/14 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	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: KL Date: 3/19/14
Filename: CMRSETB



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 H ₂ O (g)	Sat. M.C. % D.M.	Sat. M.C. % Vol.	Retained H ₂ O	% DM	% Vol.	Retained H ₂ O	% 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: PK Date: 3/18/14
 Filename: CMRSETB



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 H ₂ O	% DM	% Vol.	Retained H ₂ O	% DM	% Vol.	Retained H ₂ O	% DM	% Vol.	Retained H ₂ O	% 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: KE Date: 3/18/14
 Filename: CMRSETB



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 H ₂ O	% DM	% Vol.	Retained H ₂ O	% 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: PK Date: 3/18/14
 Filename: CMRSETB

**CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152**

Page 5 of 5

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

	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

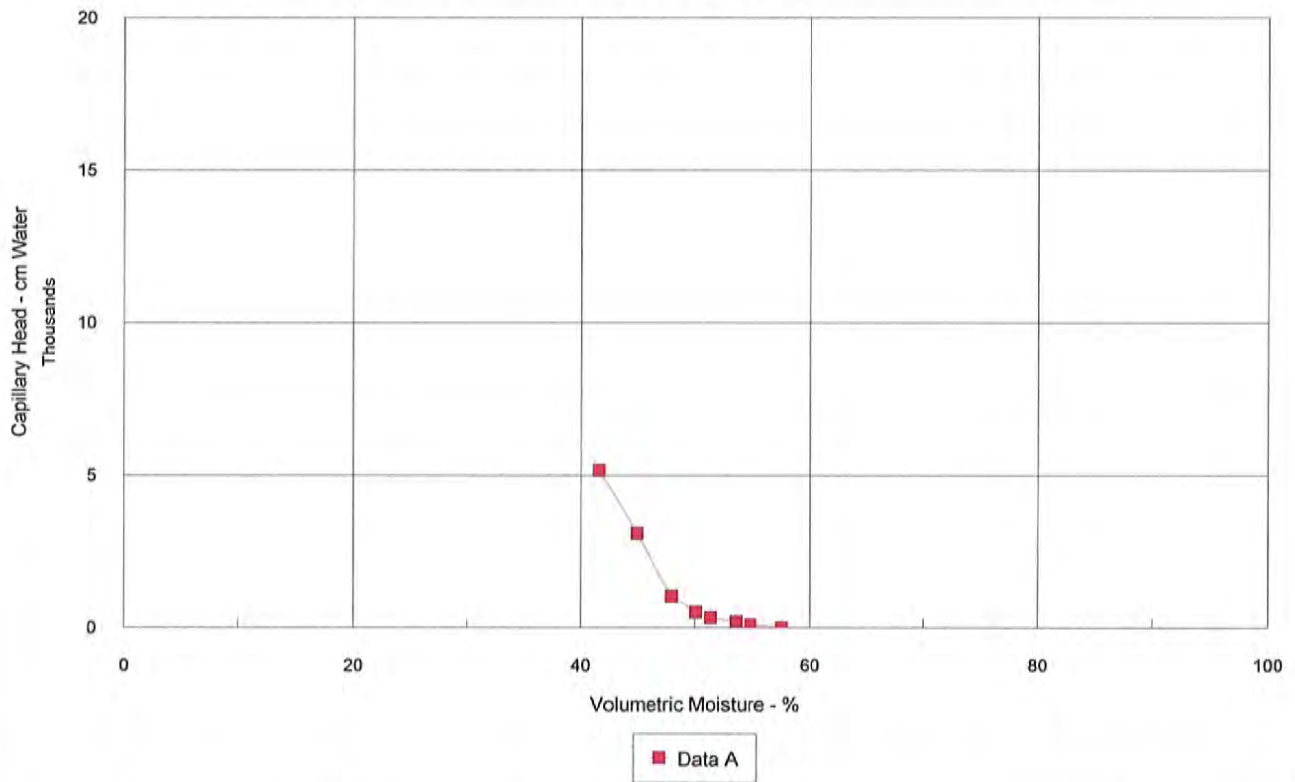
Date: 3/18/14

Filename: CMRSETB



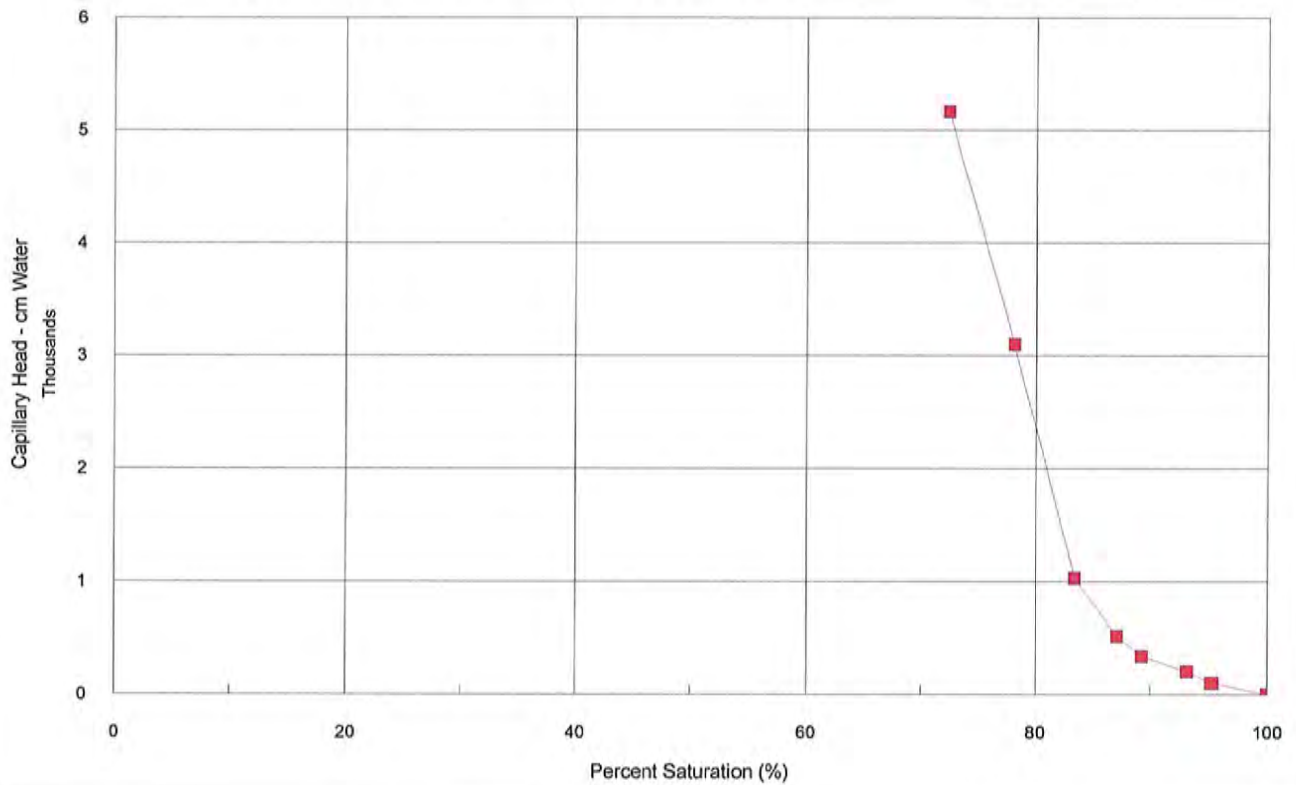
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-14, 40-41'



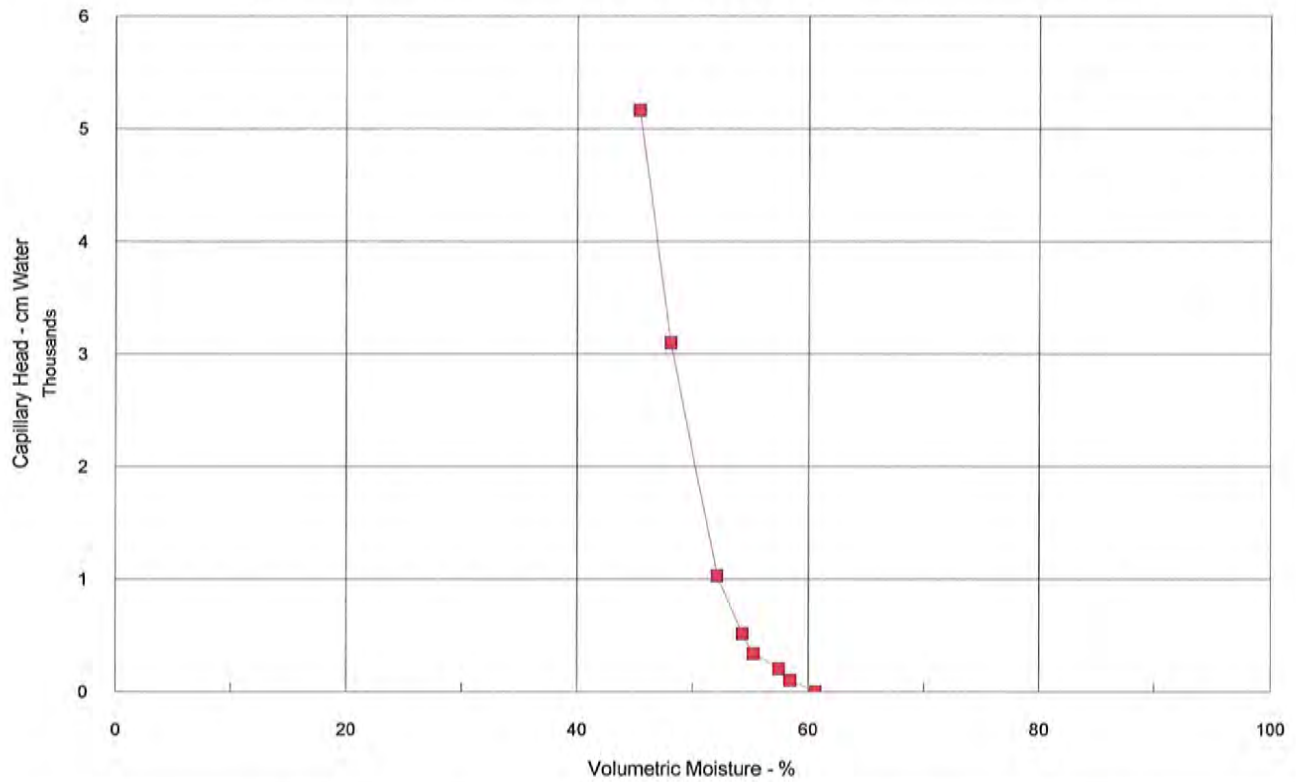
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TI-B10-14, 40-41'



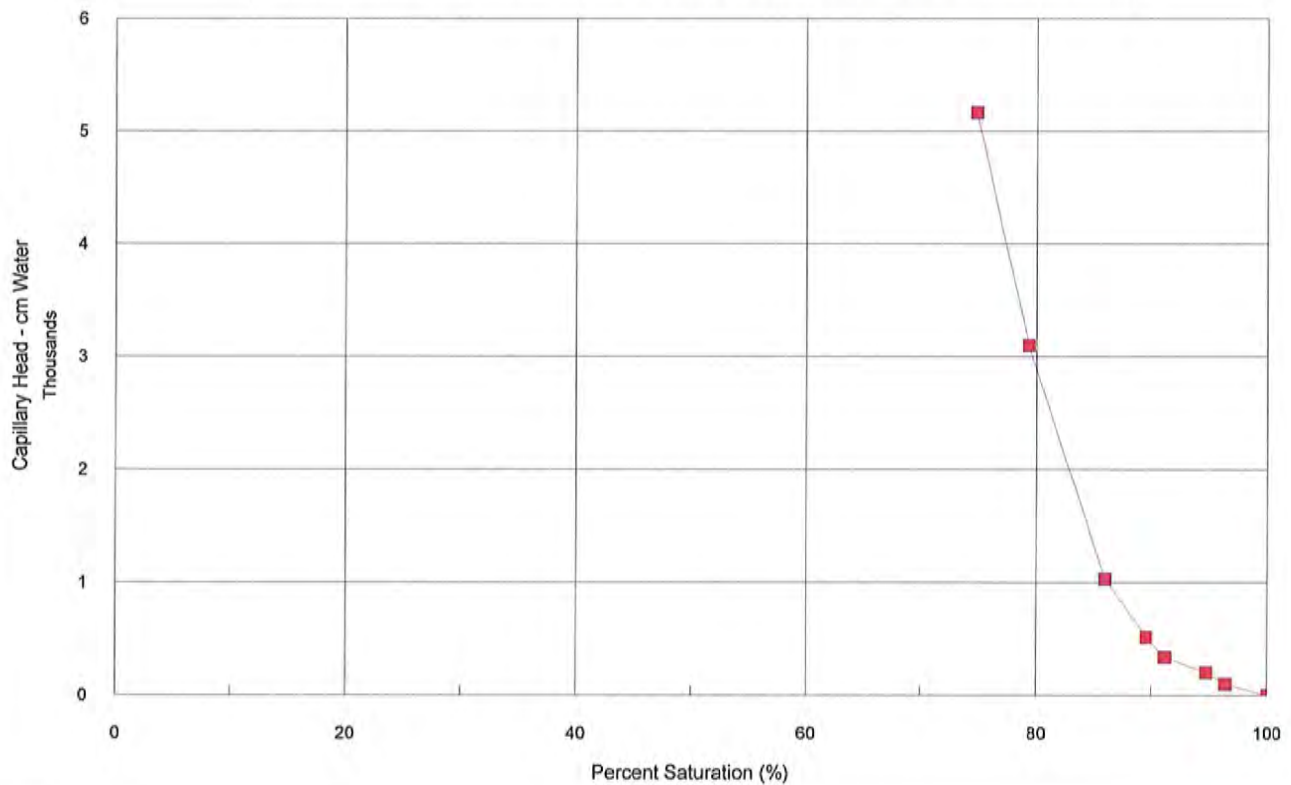
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-14, 40-41' - R



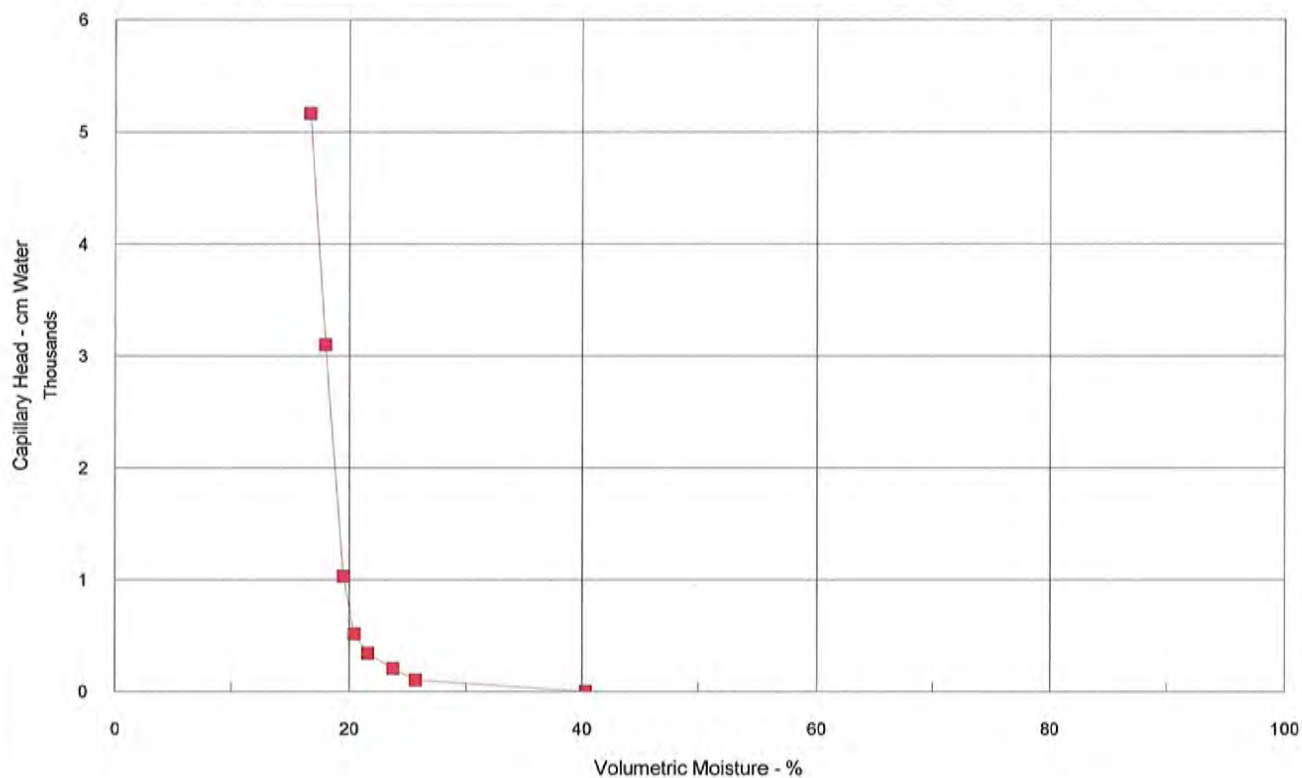
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-14, 40-41' - R



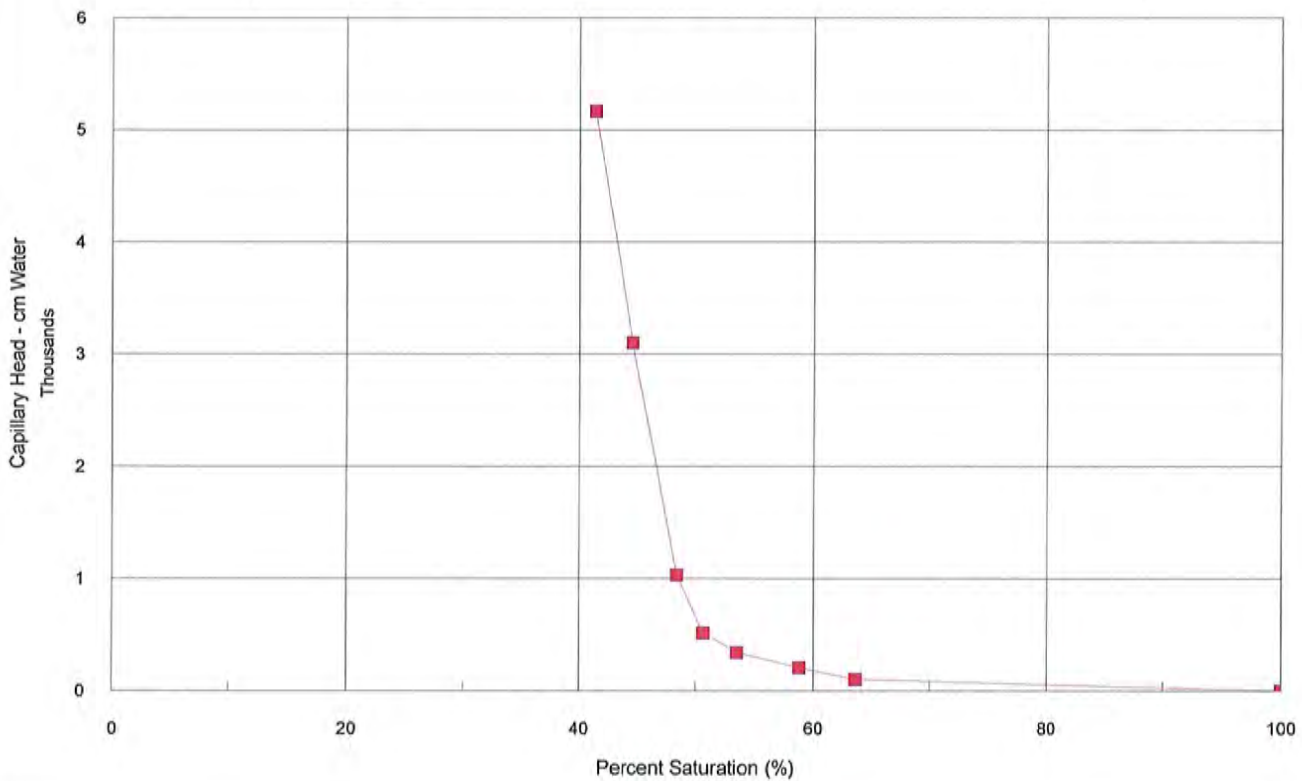
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-18, 55-56'



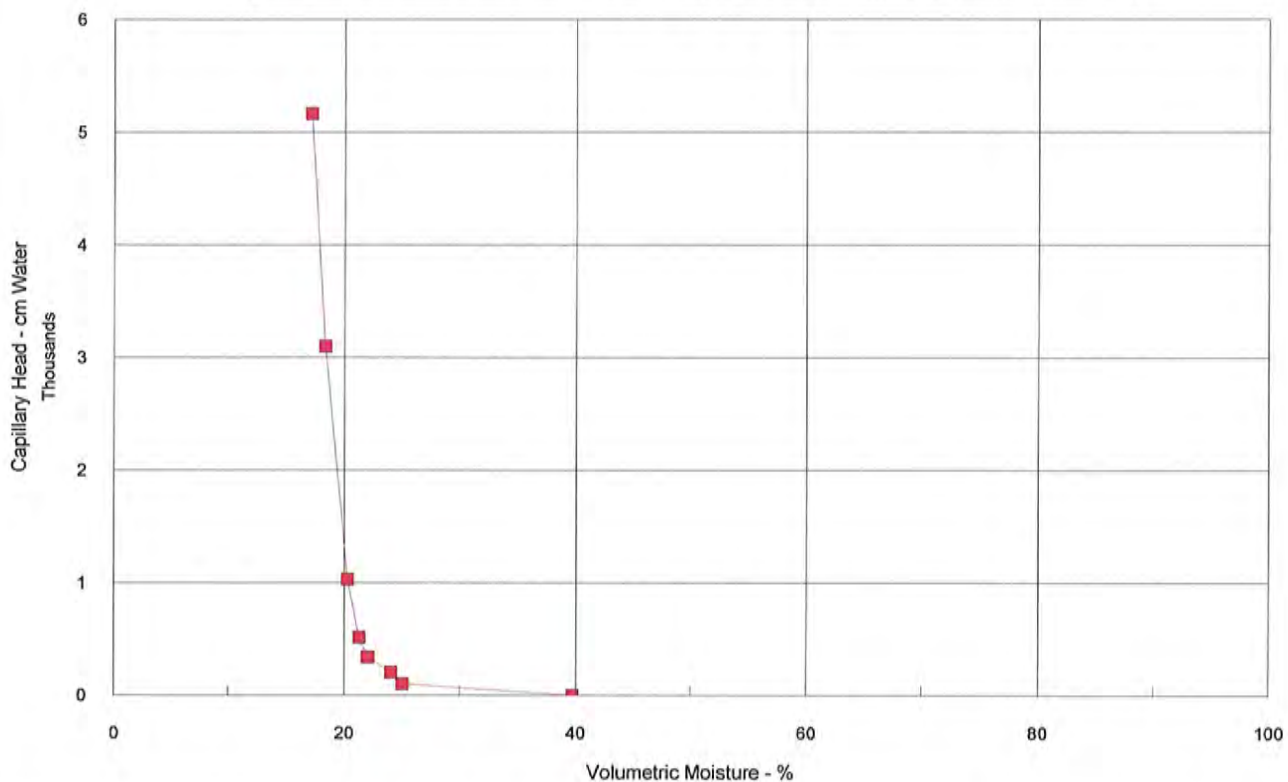
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TI-B10-18, 55-56'



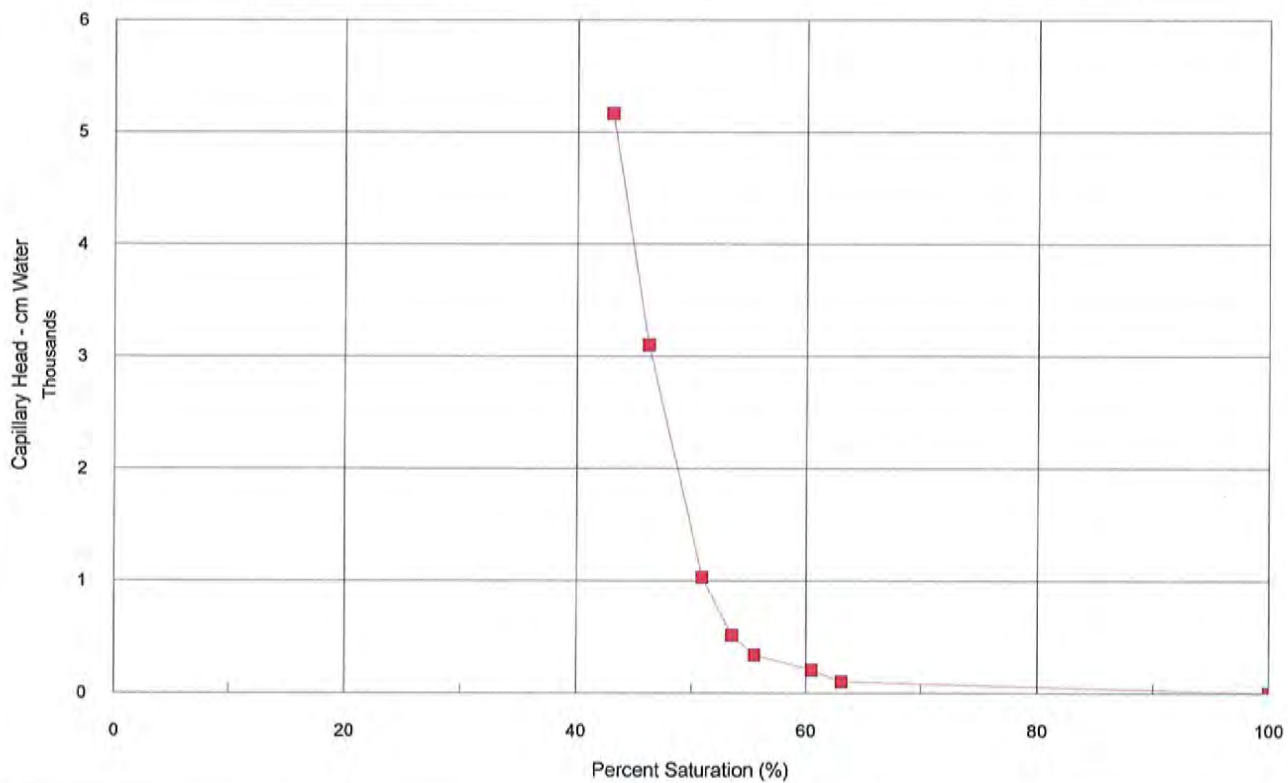
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TI-B10-18, 55-56' - R



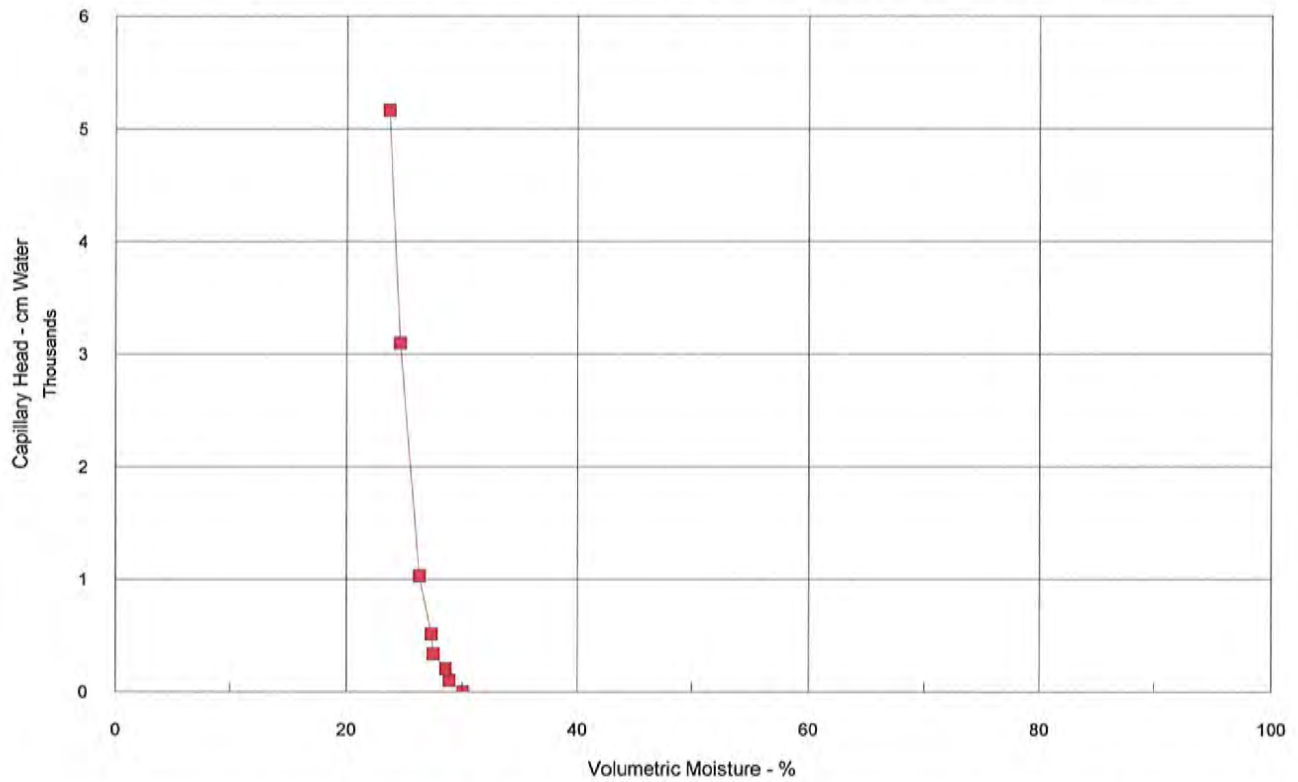
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TI-B10-18, 55-56' - R



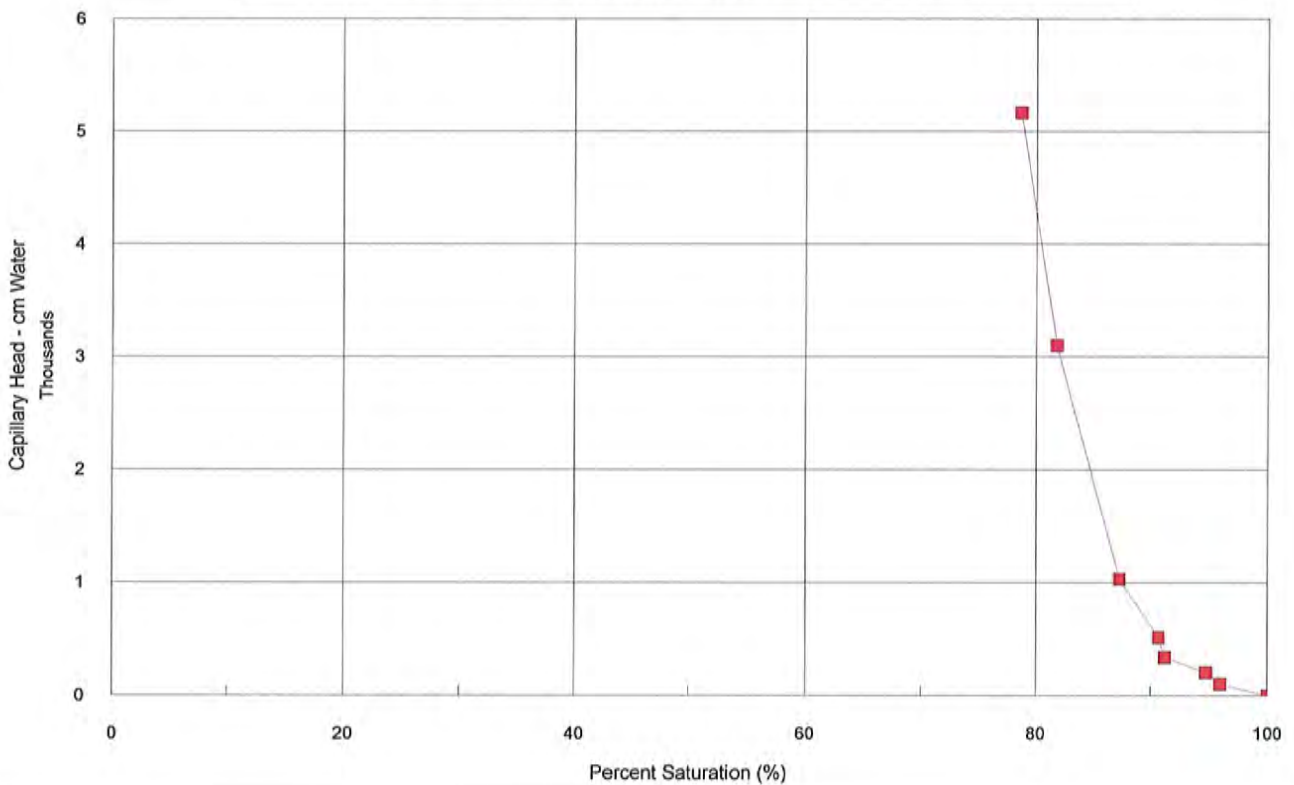
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B11-03, 15-16'



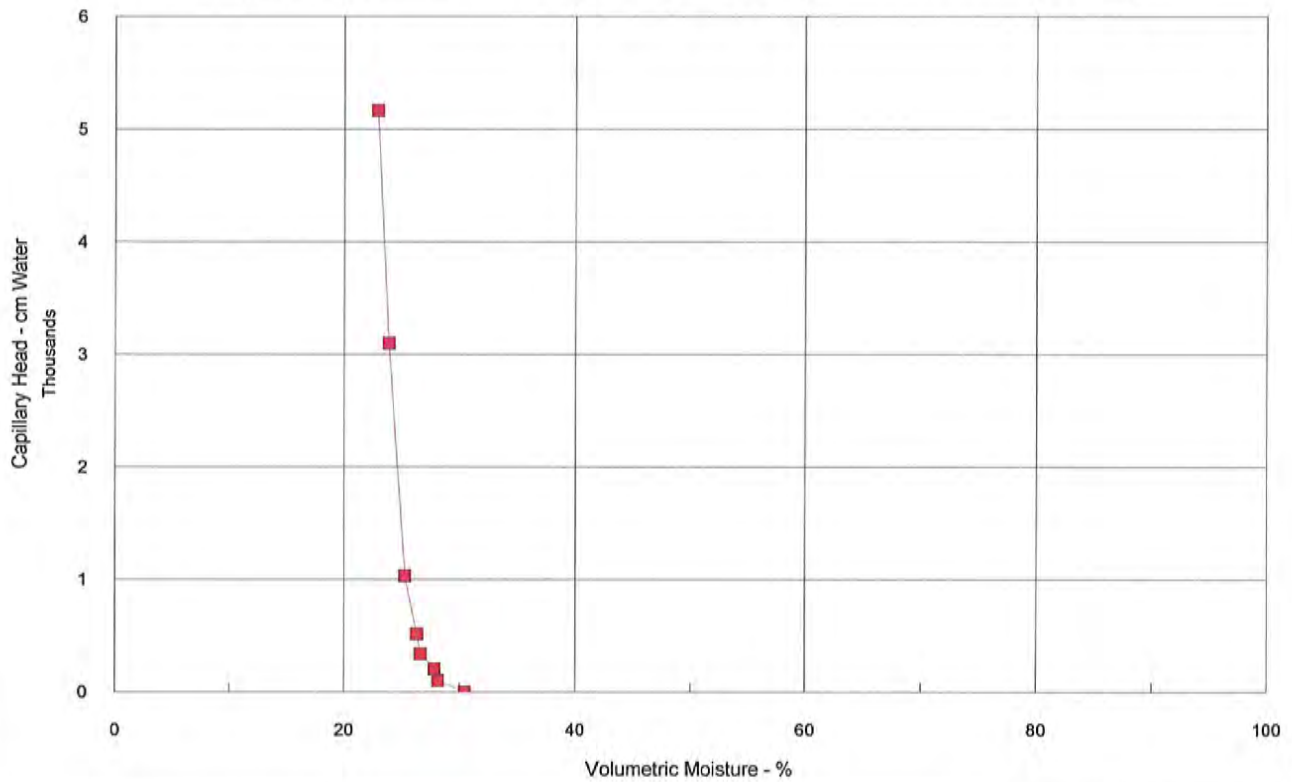
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TI-B11-03, 15-16'



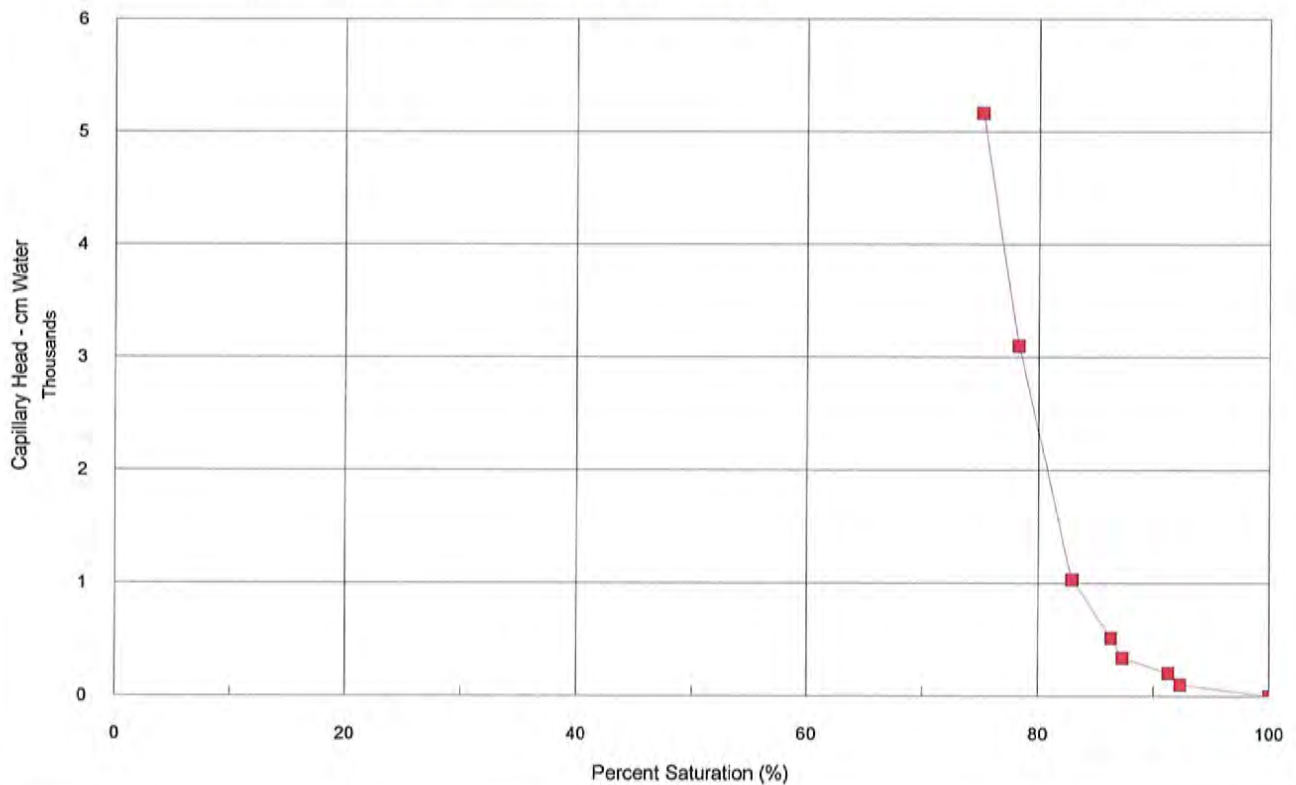
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TI-B11-03, 15-16' -R



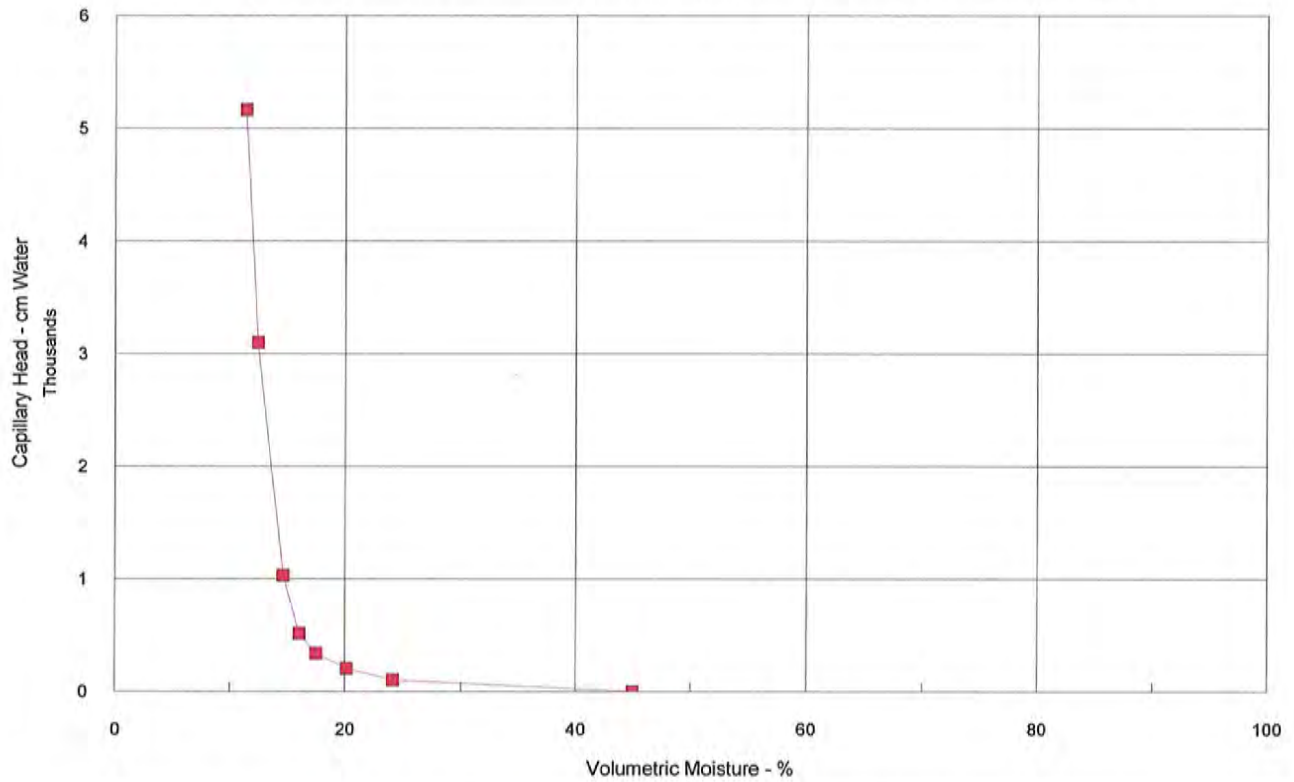
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TI-B11-03, 15-16' -R



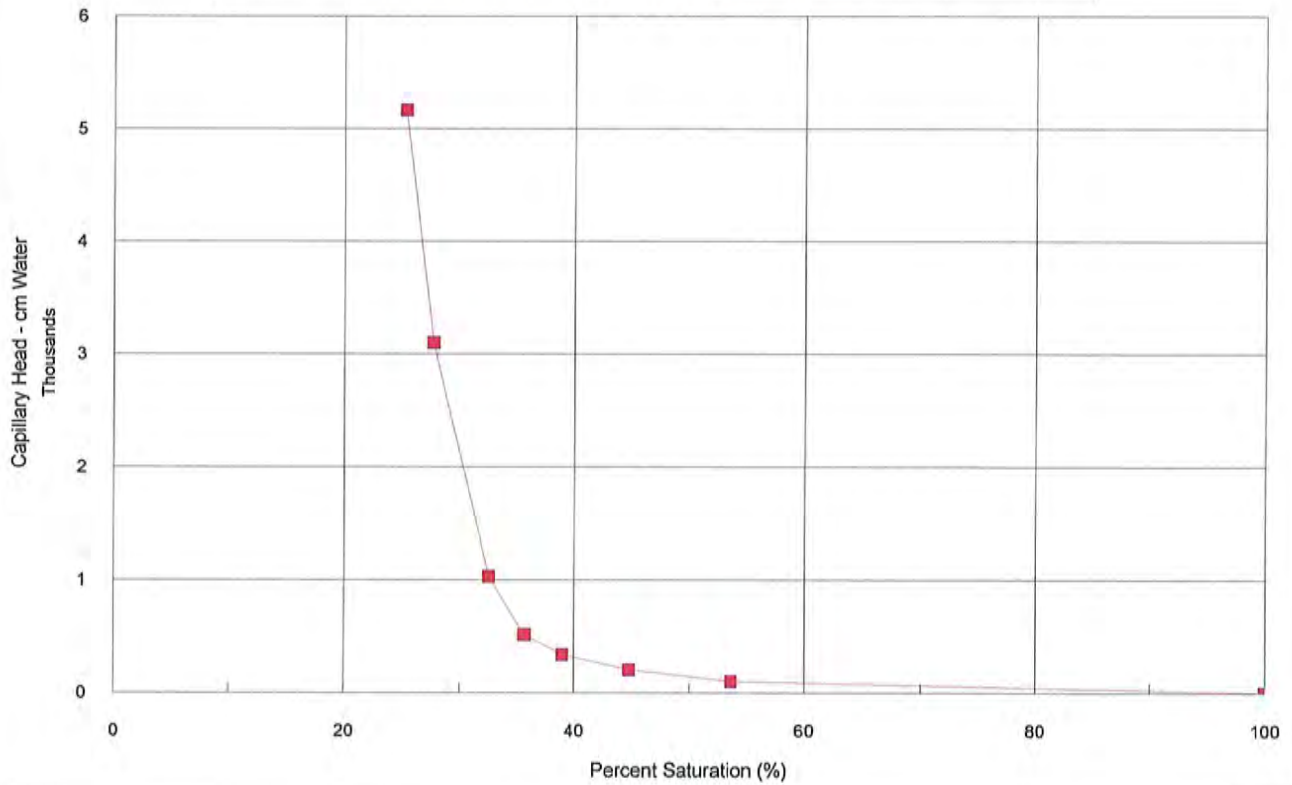
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B11-10, 56-57'



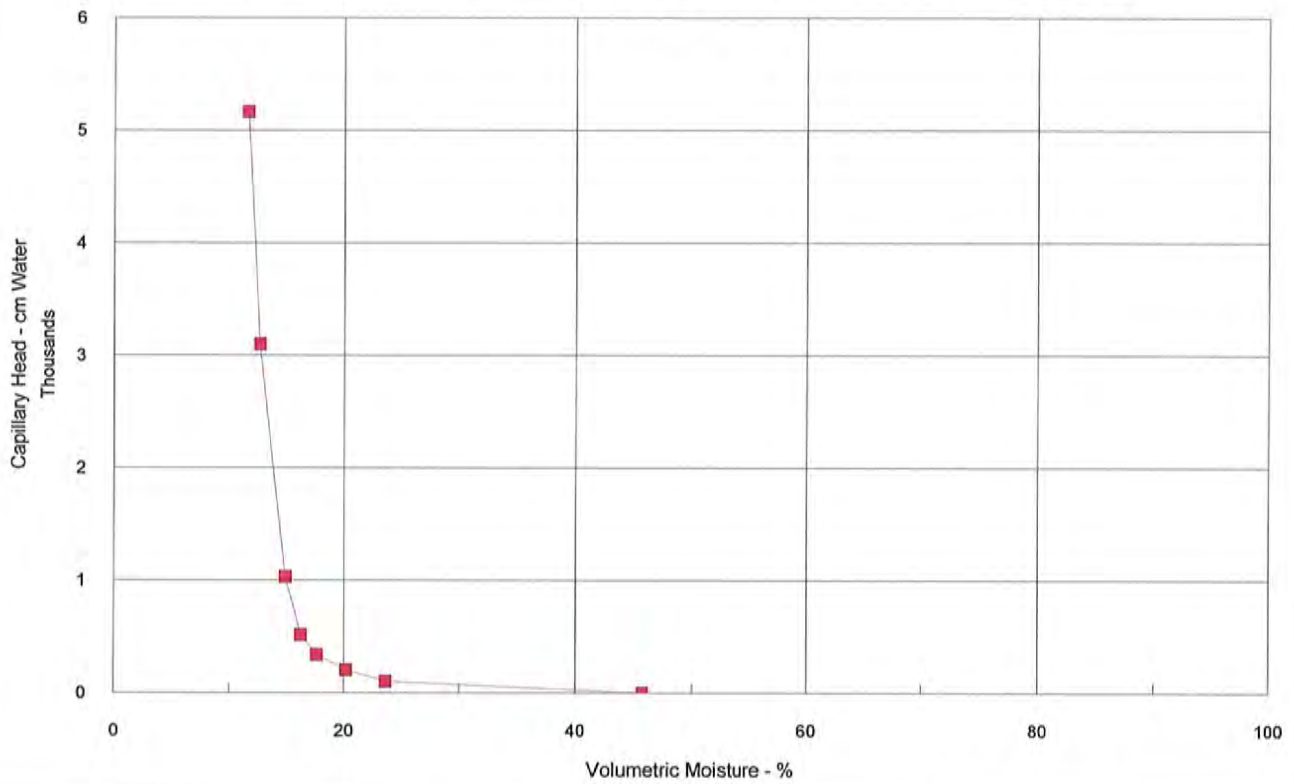
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TI-B11-10, 56-57'



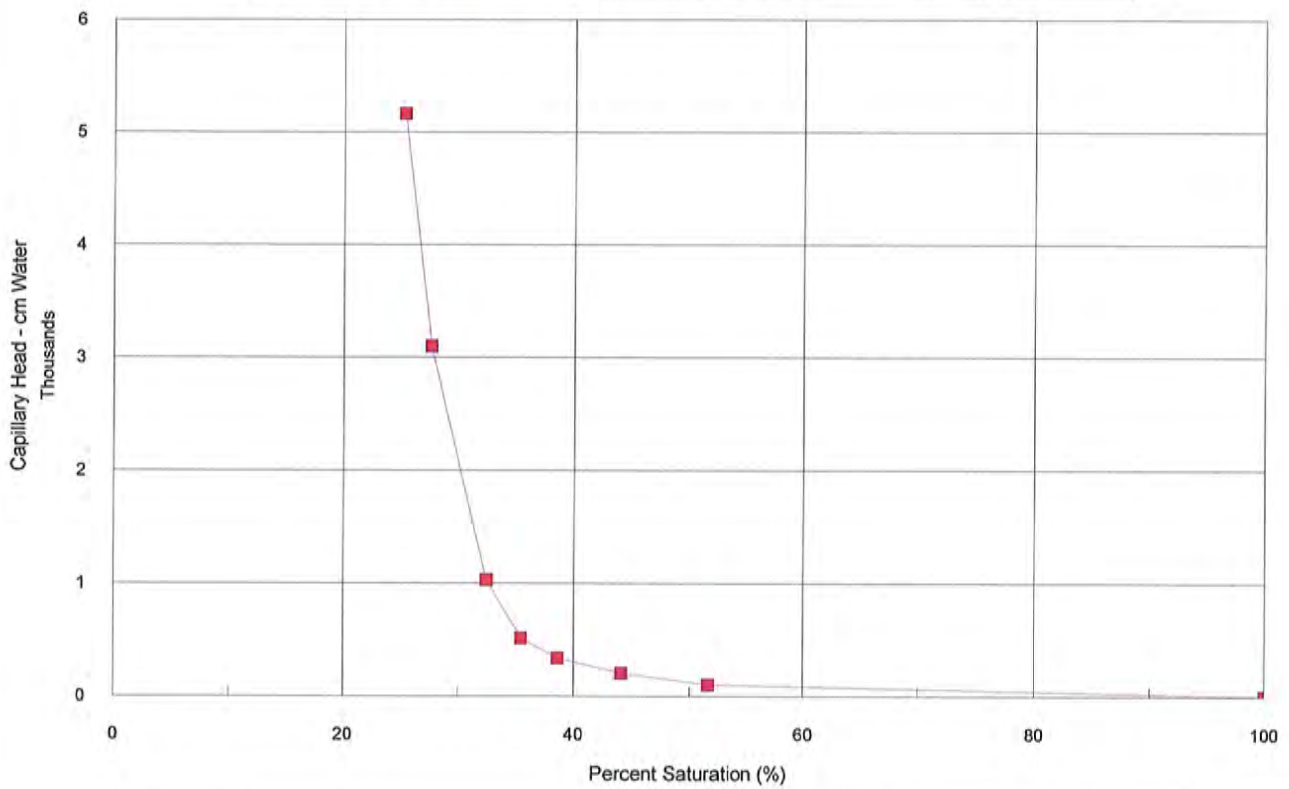
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B11-10, 56-57' -R



CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B11-10, 56-57' -R



**CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152**

CLIENT MWH

JOB NO. 2512-77

SAMPLE DATE
SOIL DESCR.
LOCATION

- Church Rock
Tailings Impoundment

TEST STARTED 12/20/13 DPM
TEST FINISHED 03/11/14 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	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: KA 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 H ₂ O (g)	Sat. M.C. % D.M.	Sat. M.C. % Vol.	Retained H ₂ O	% DM	% Vol.	Retained H ₂ O	% 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: KAC DPM Date: 03/18/2014
 Data Checked By: 142 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	0.33 Bar			0.5 Bar			1 Bar			3 Bar		
	Retained H ₂ O	% DM	% Vol.	Retained H ₂ O	% DM	% Vol.	Retained H ₂ O	% DM	% Vol.	Retained H ₂ O	% 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: _____ Date: *****
 Data Checked By: KE 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	5 Bar			15 Bar		
	Retained H ₂ O	% DM	% Vol.	Retained H ₂ O	% 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: 3/18/14 Date: 3/18/14
 Filename: CMRSETC

**CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152**

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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

	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

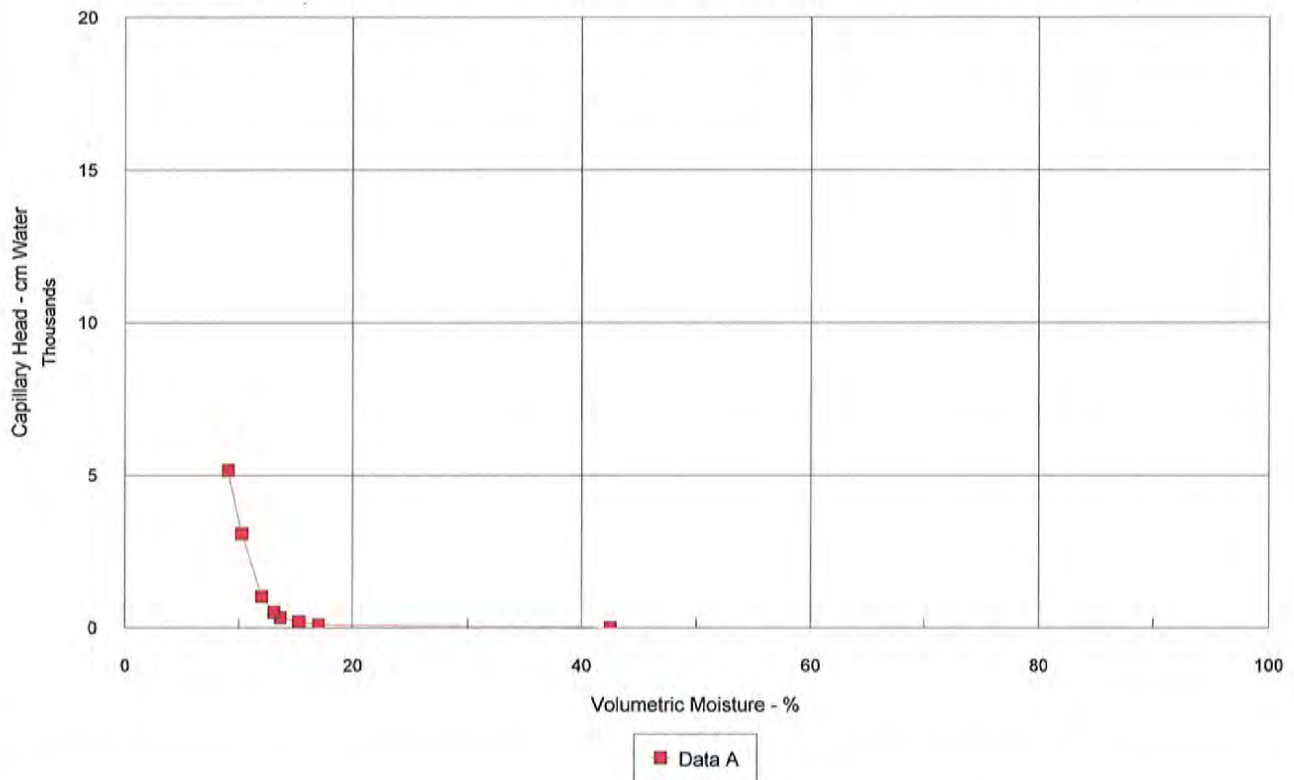
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Data Checked By: KE
Filename: CMRSETC

Date: 03/18/2014
Date: 3/18/14



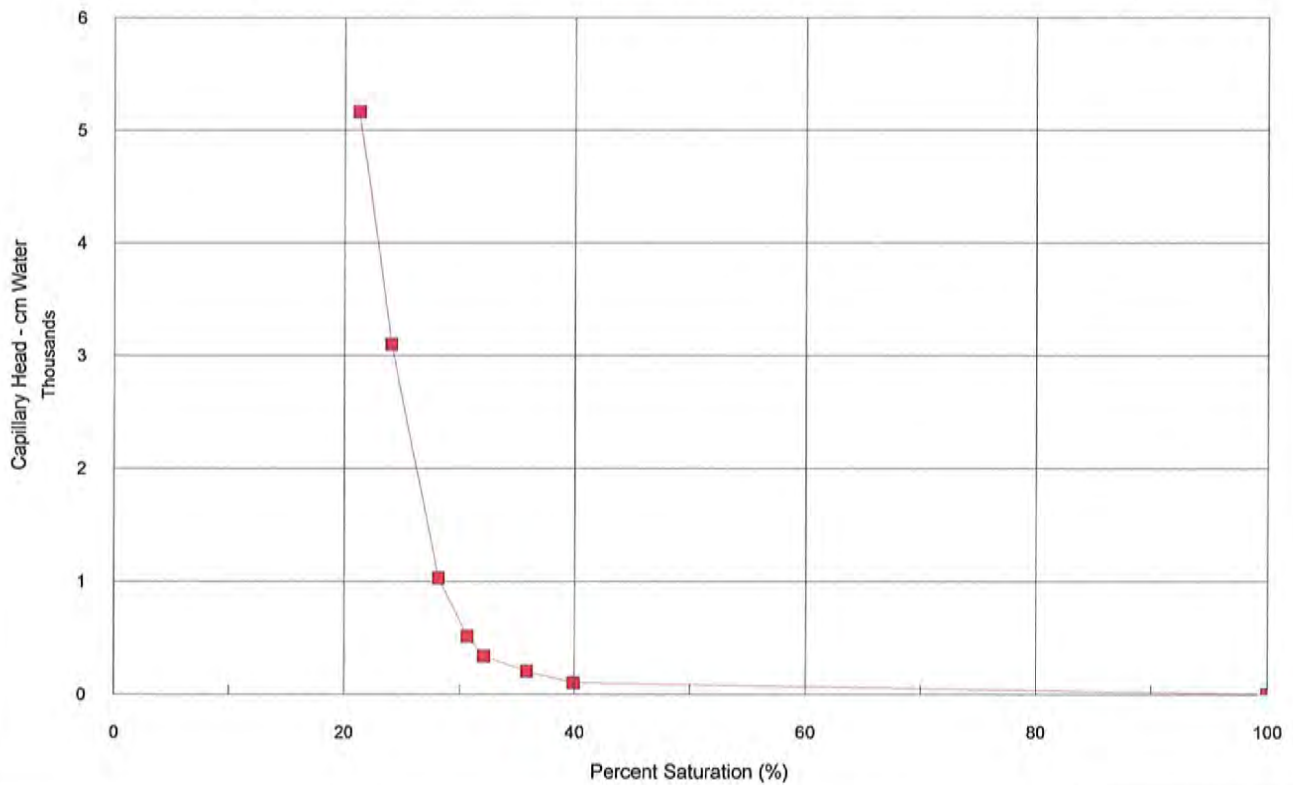
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-03, 12.5-14.0'



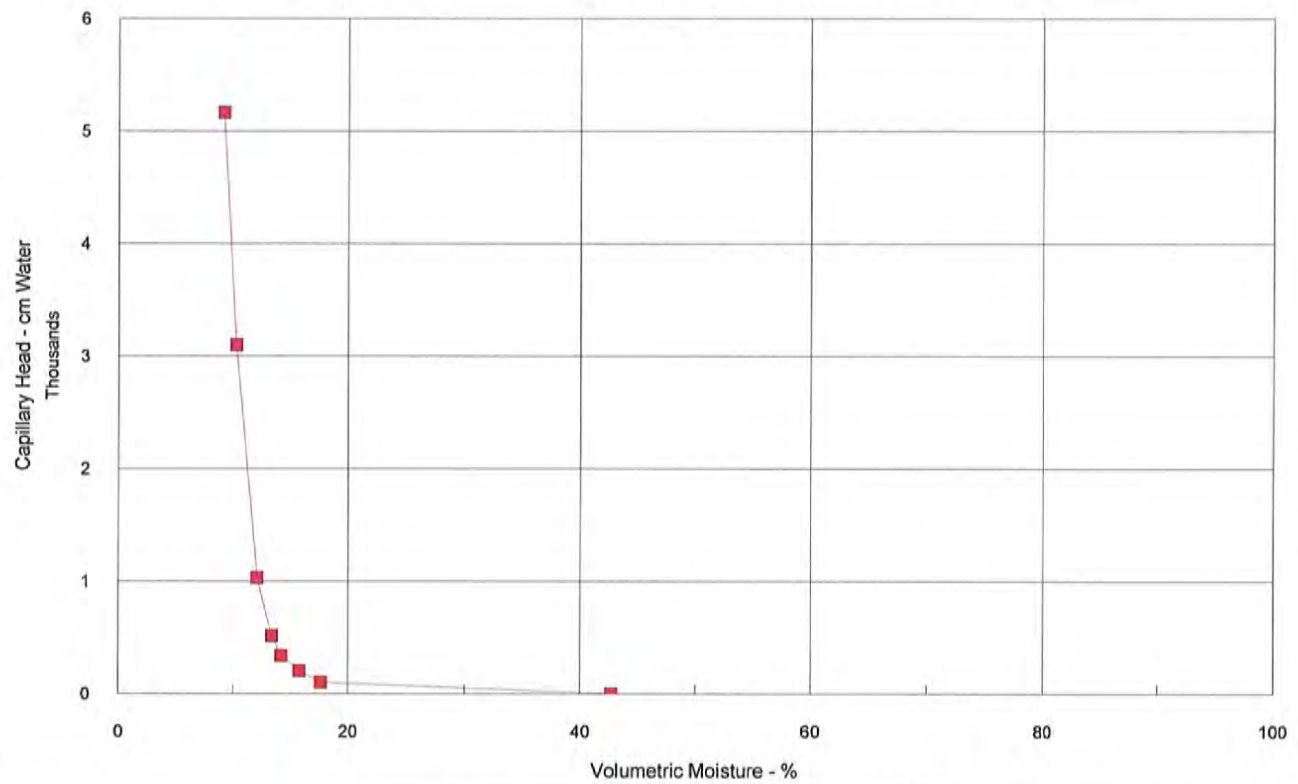
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-03, 12.5-14.0'



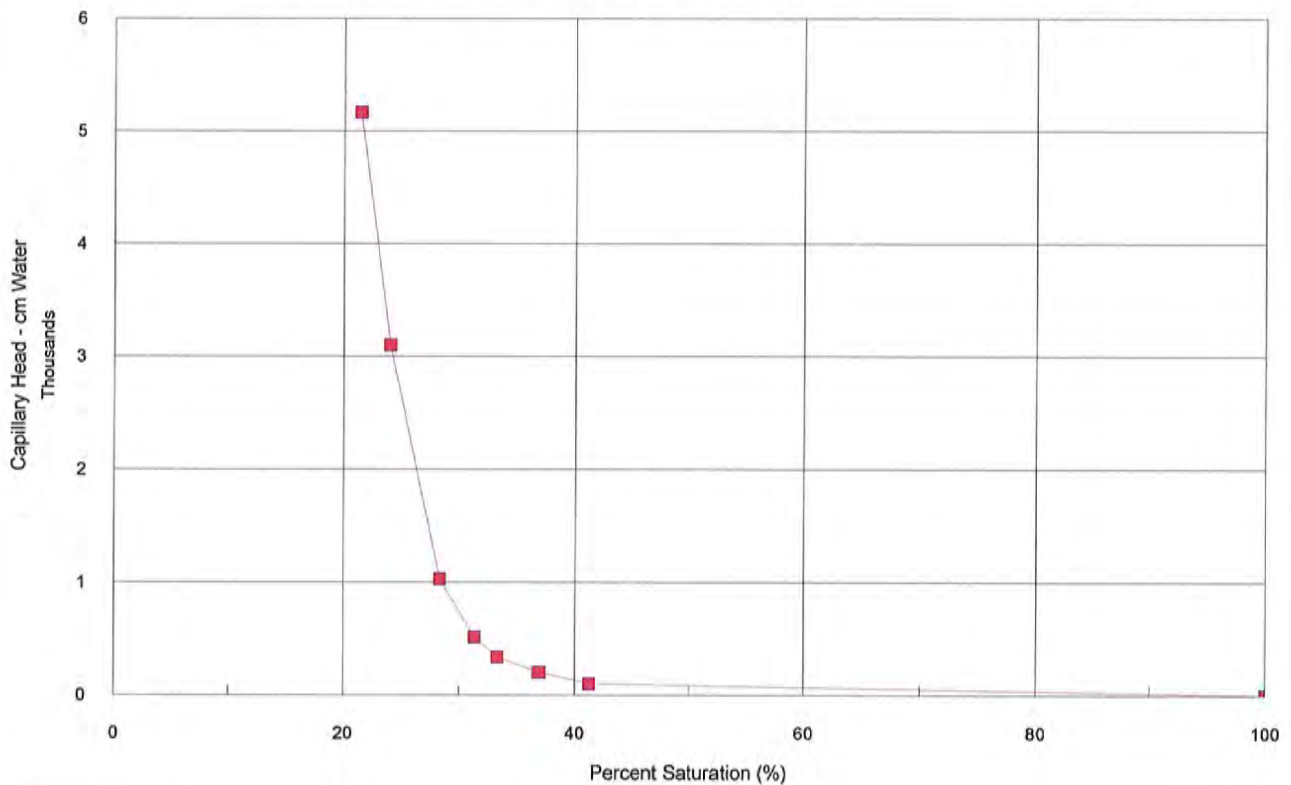
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-03, 12.5-14.0' -R



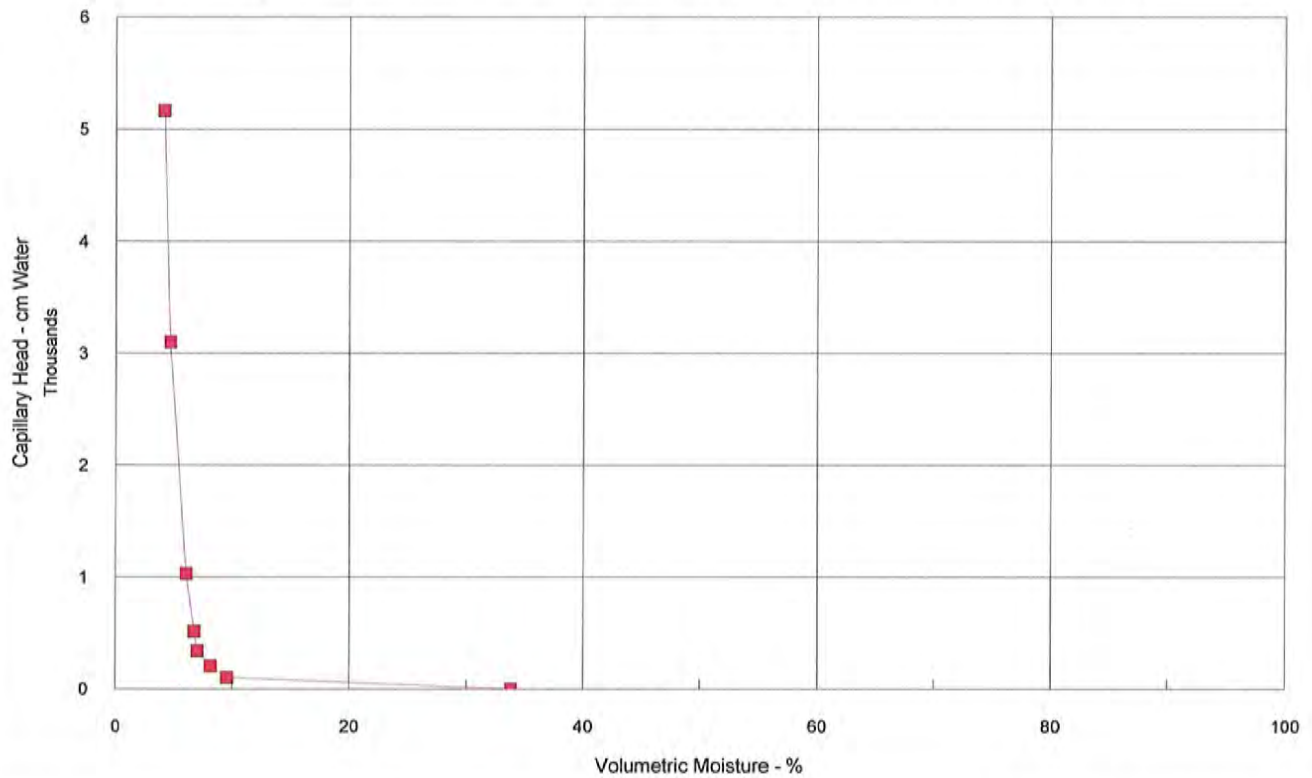
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-03, 12.5-14.0' -R



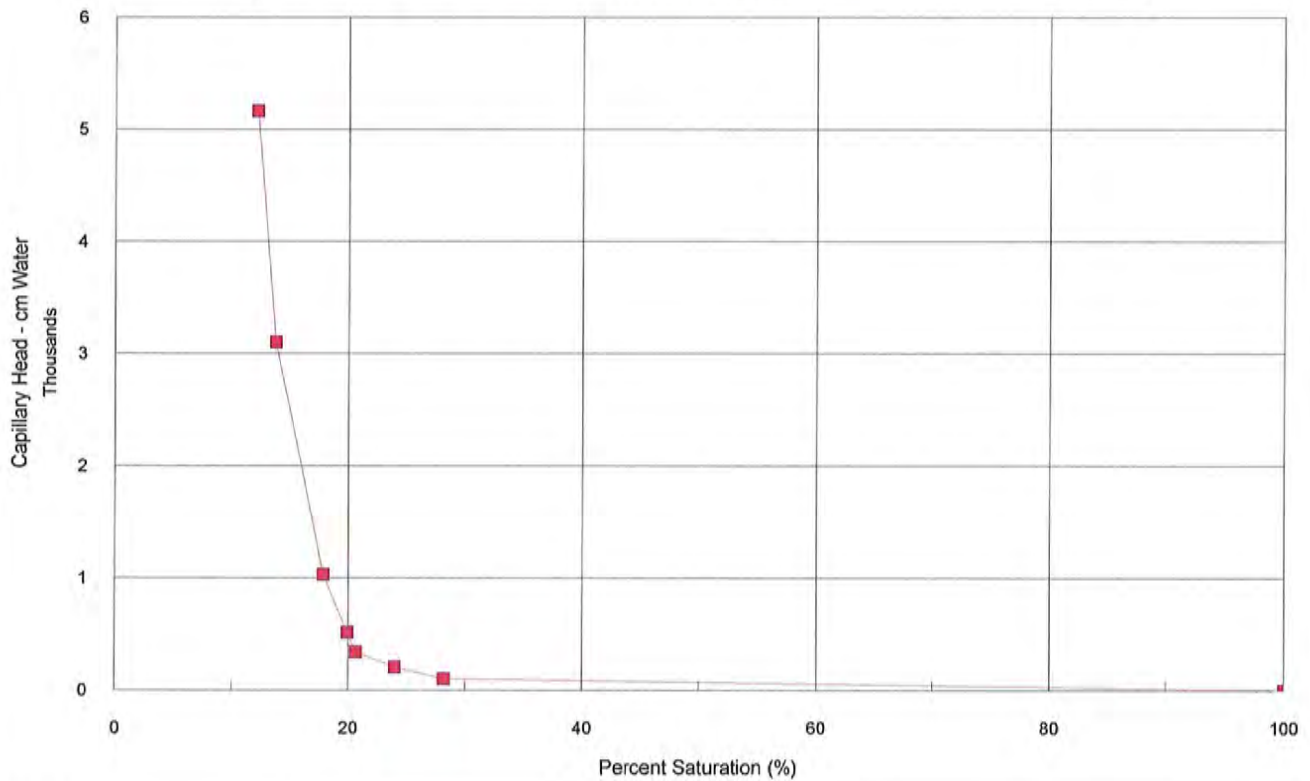
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-07A, 21-21.5'



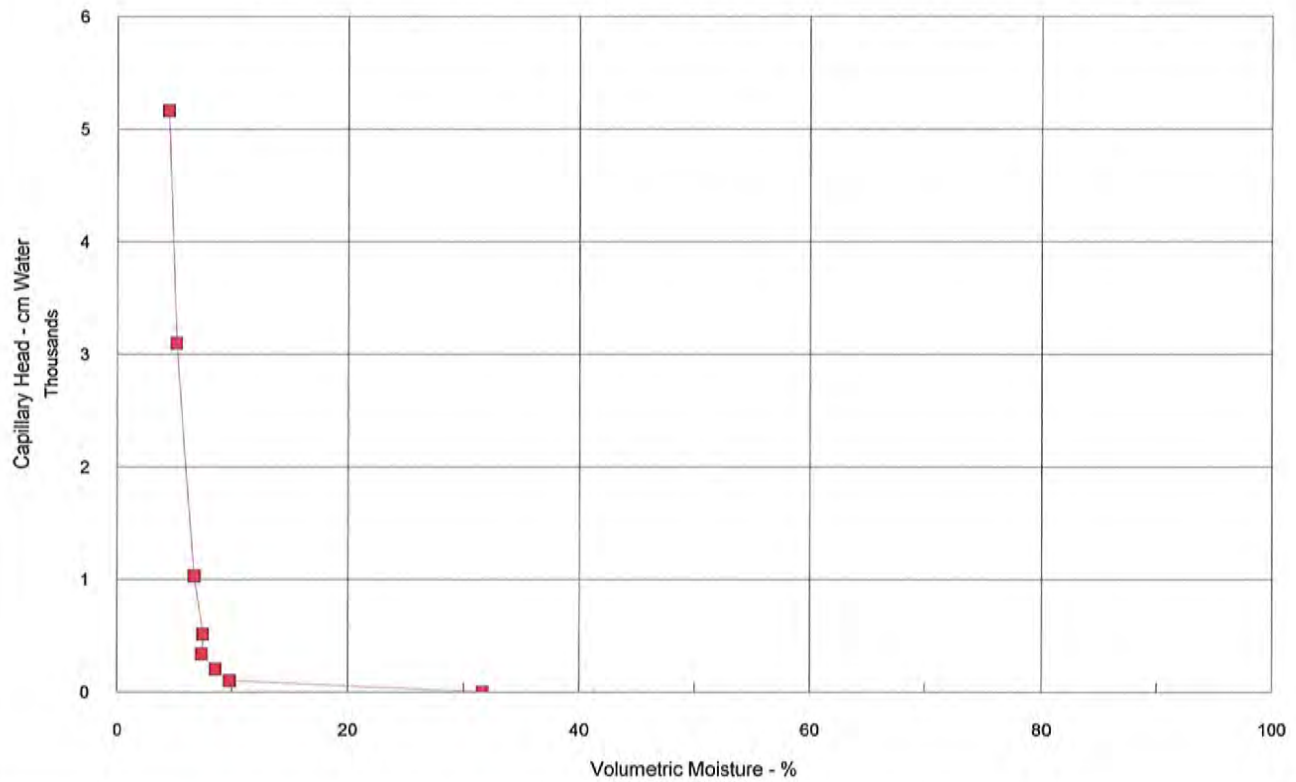
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TI-B1-07A, 21-21.5'



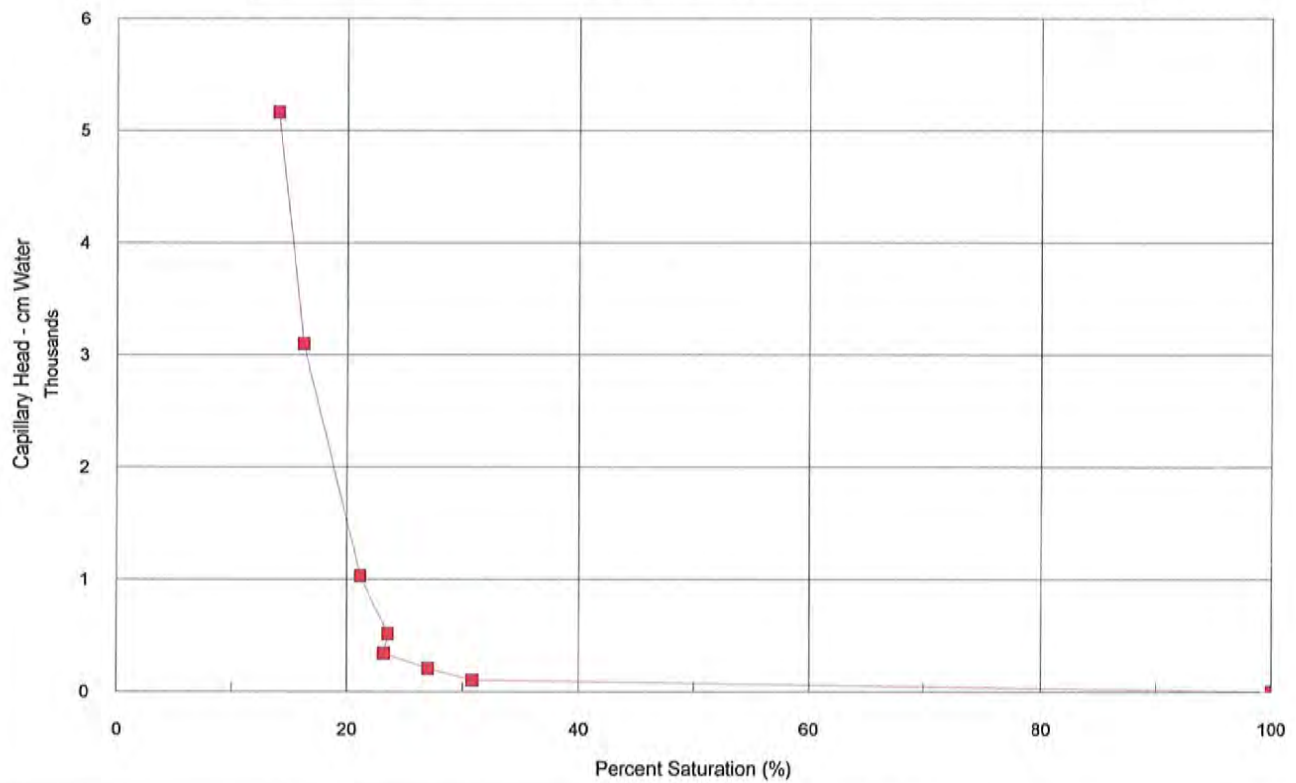
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-07A, 21-21.5' -R



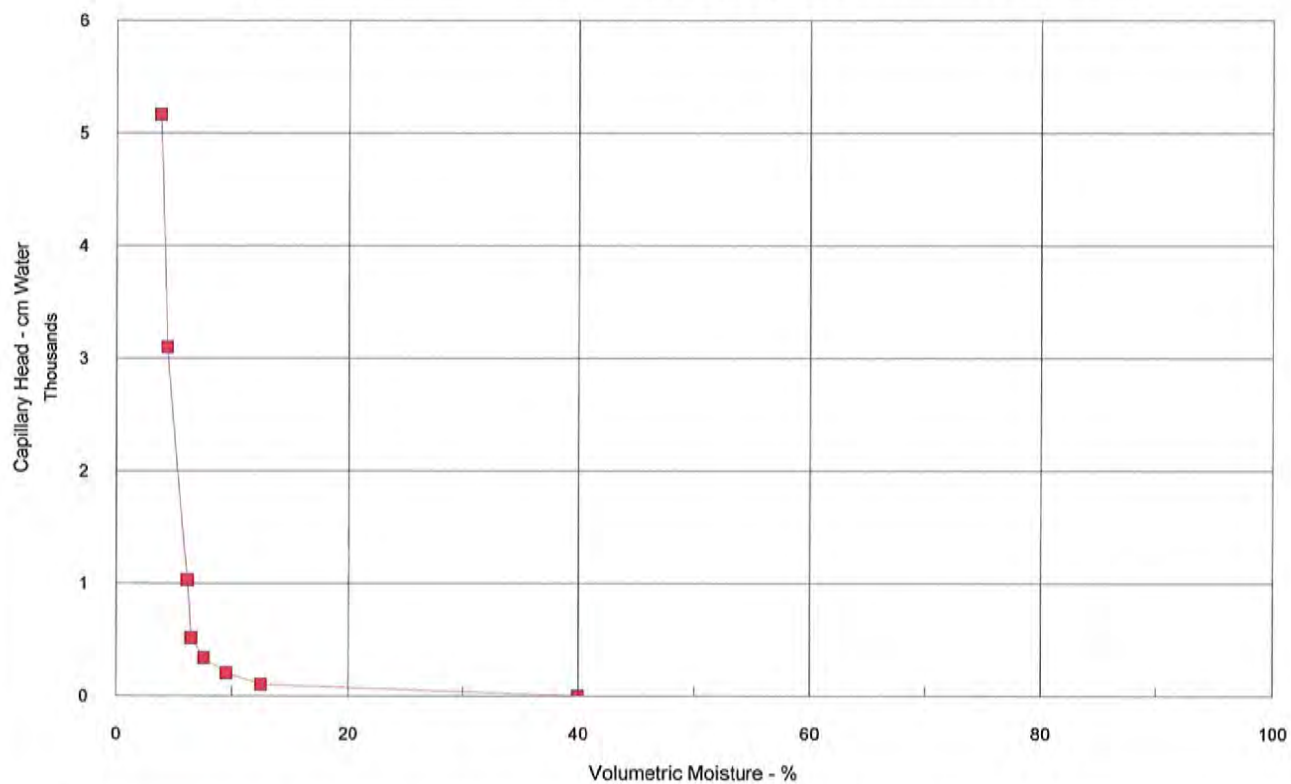
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-07A, 21-21.5' -R



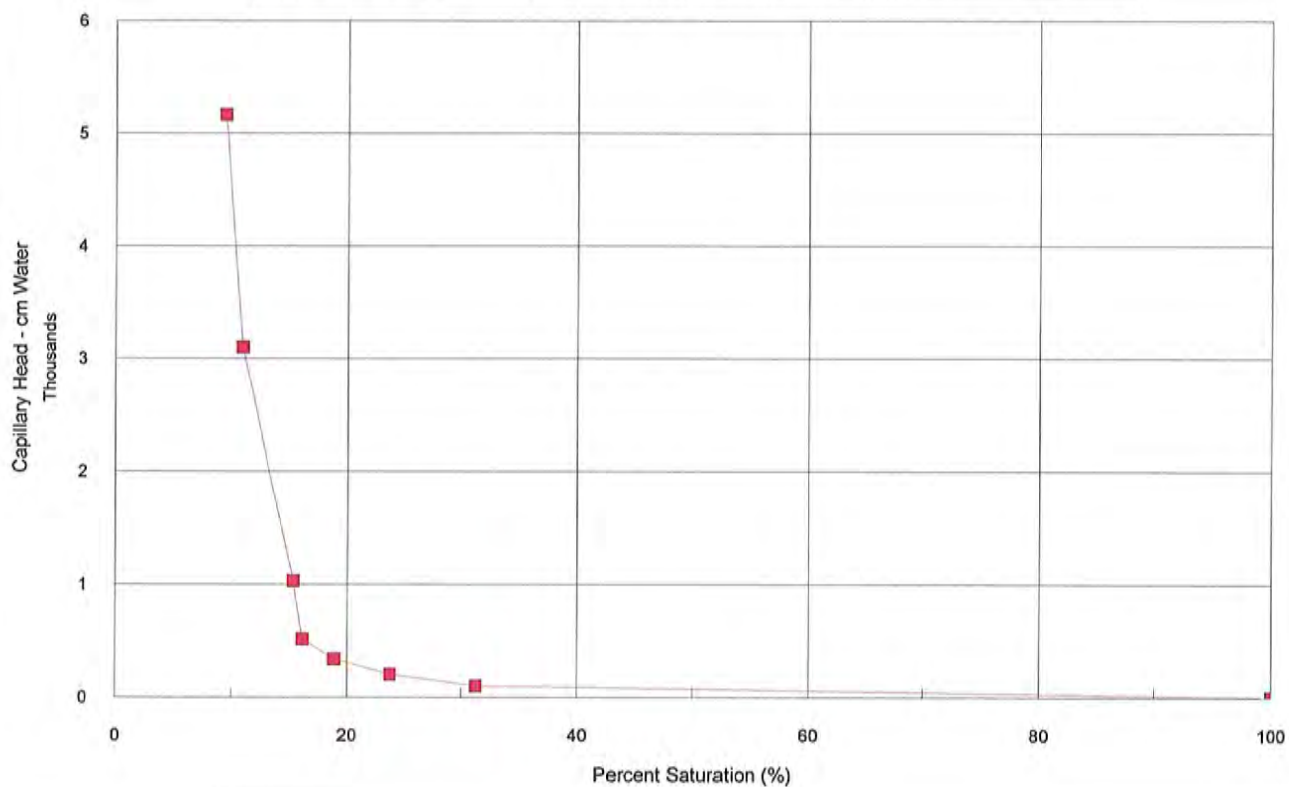
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-11B, 30.5-31'



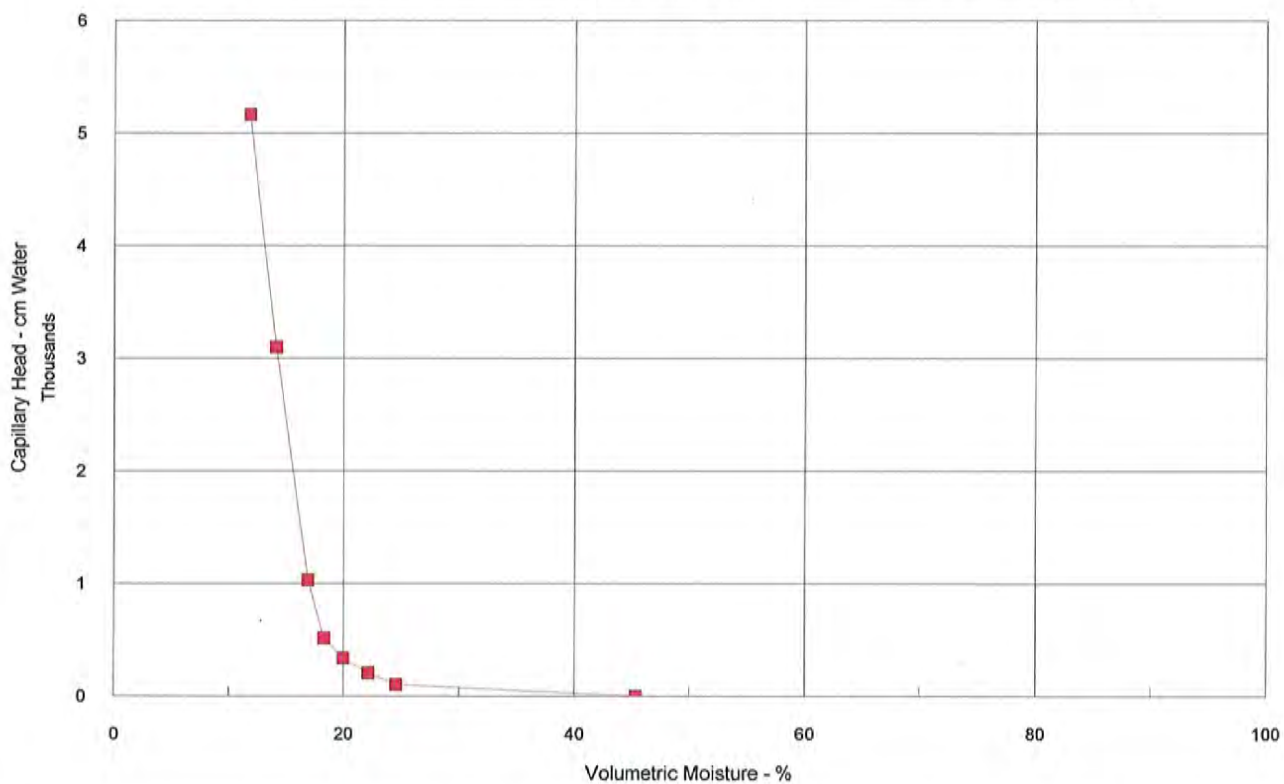
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TI-B1-11B, 30.5-31'



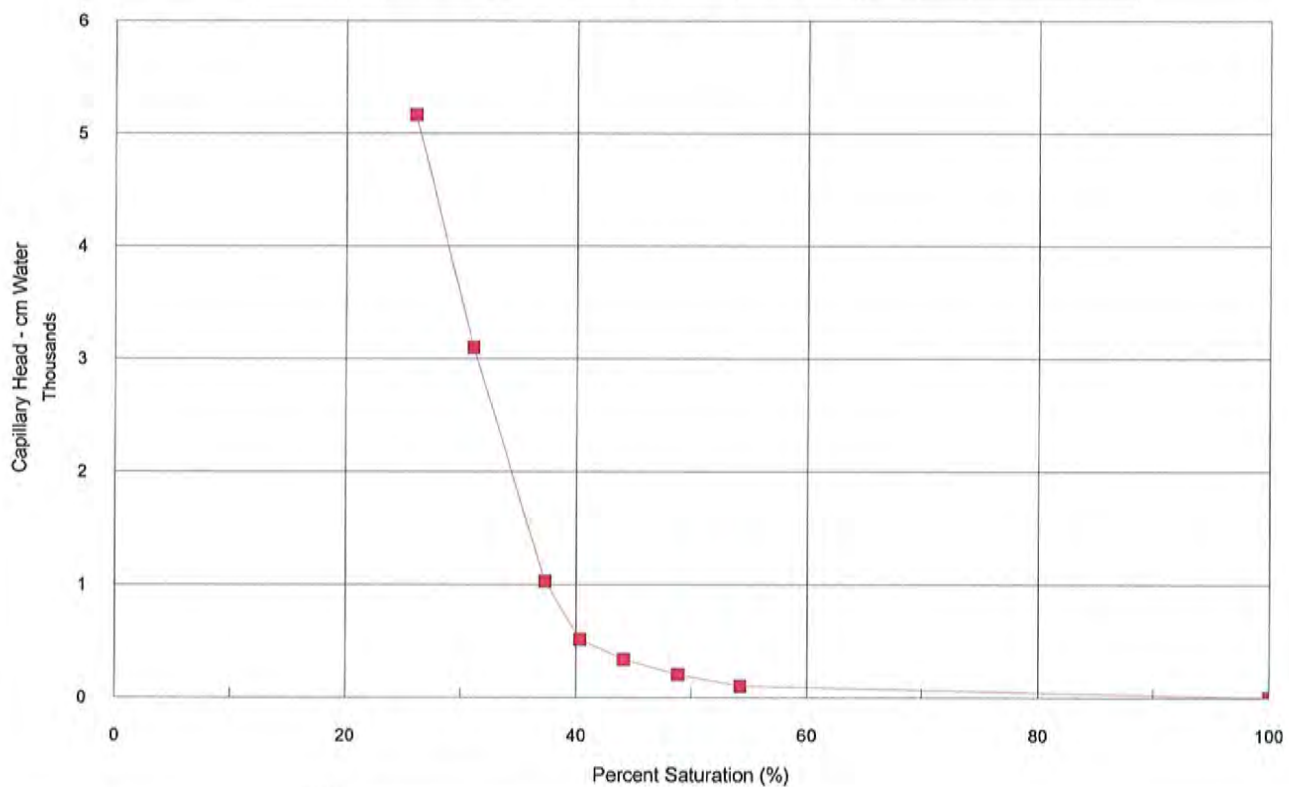
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-11B, 30.5-31' -R



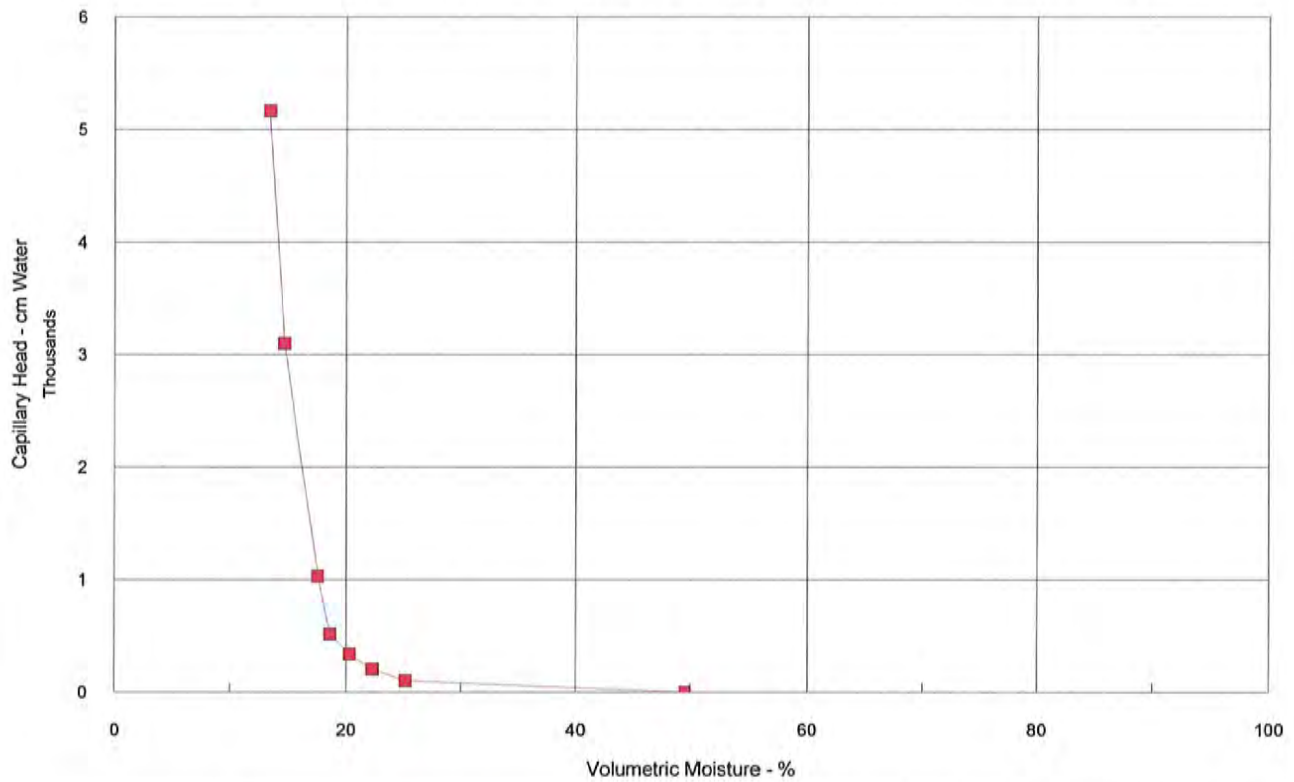
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-11B, 30.5-31' -R



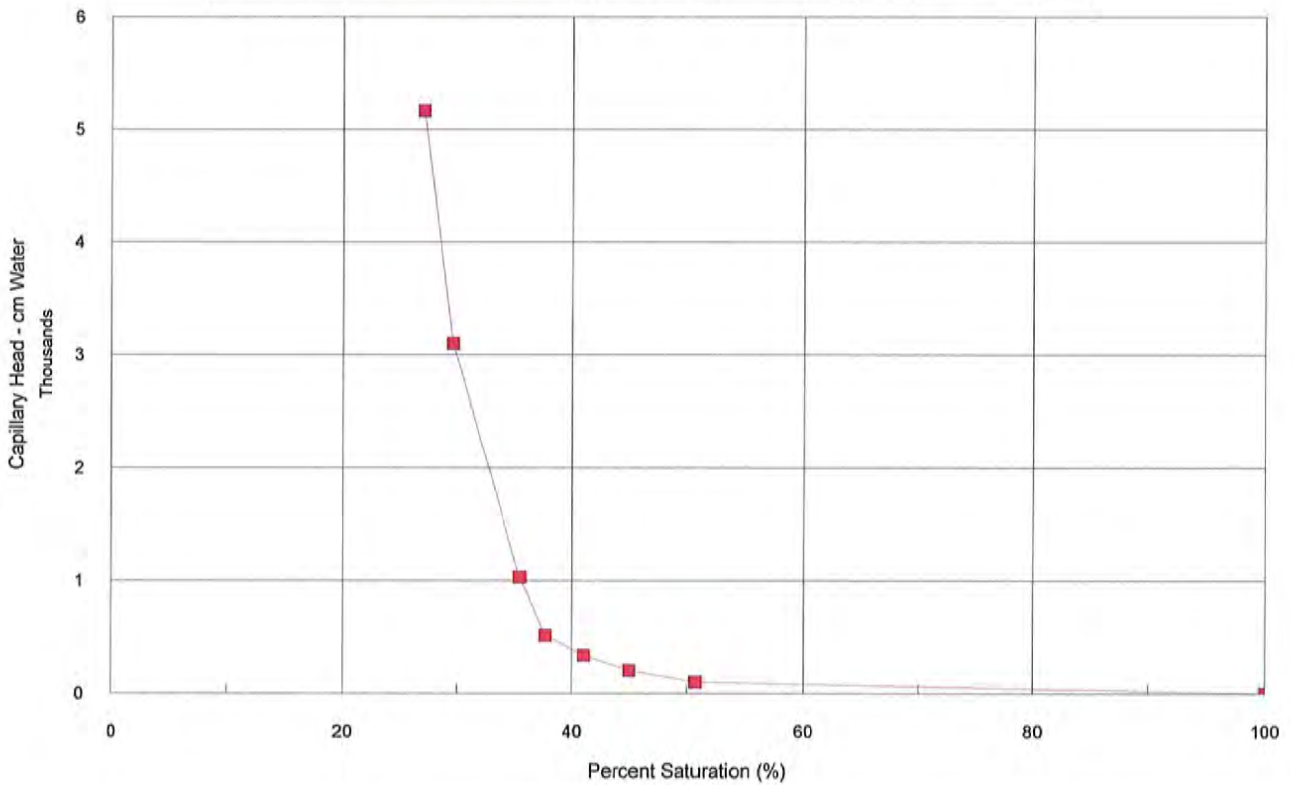
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-13A, 36-36.5'



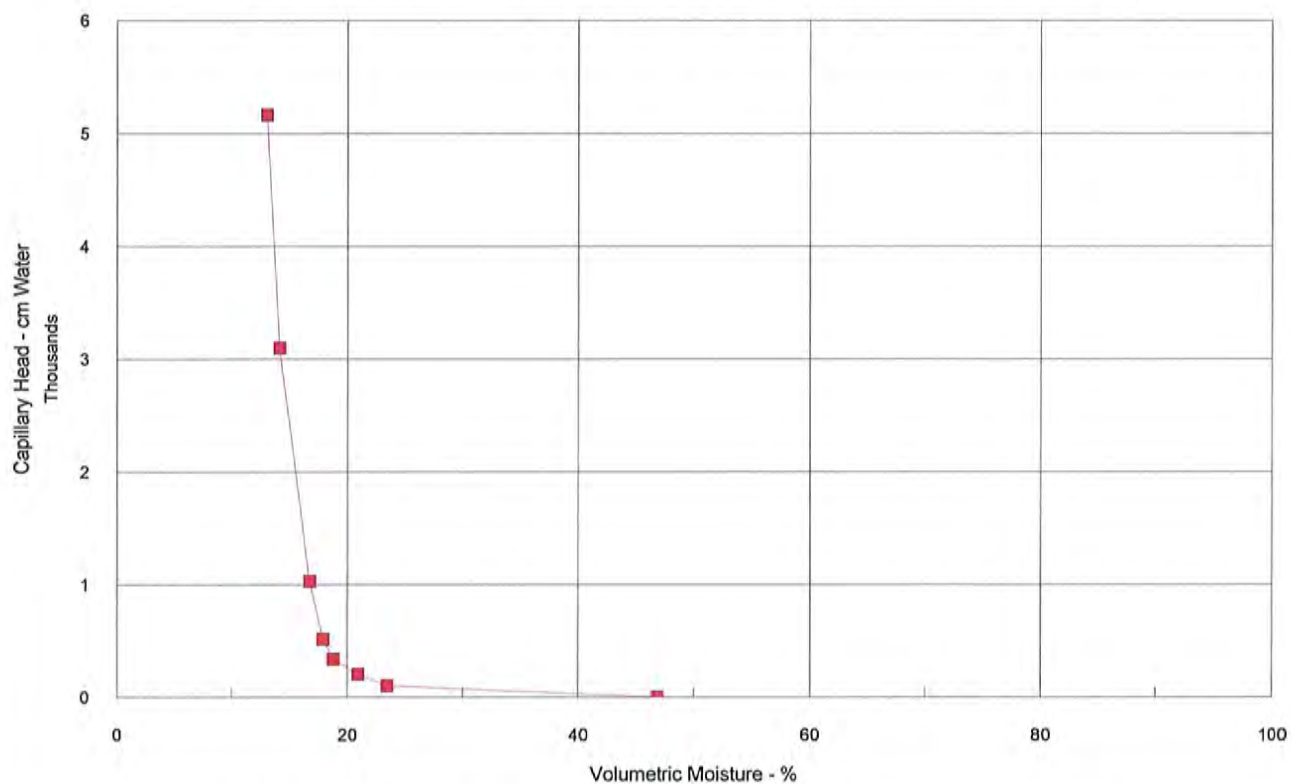
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-13A, 36-36.5'



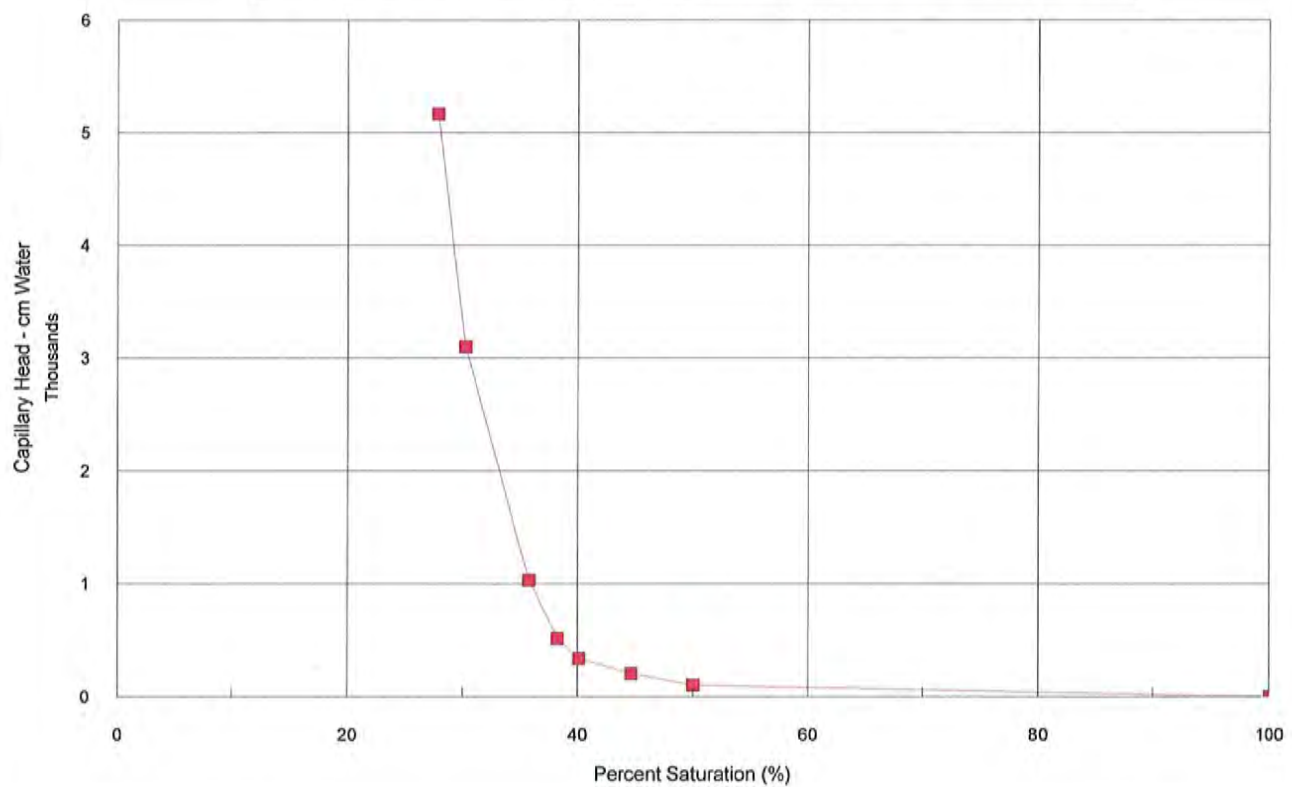
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-13A, 36-36.5' - R



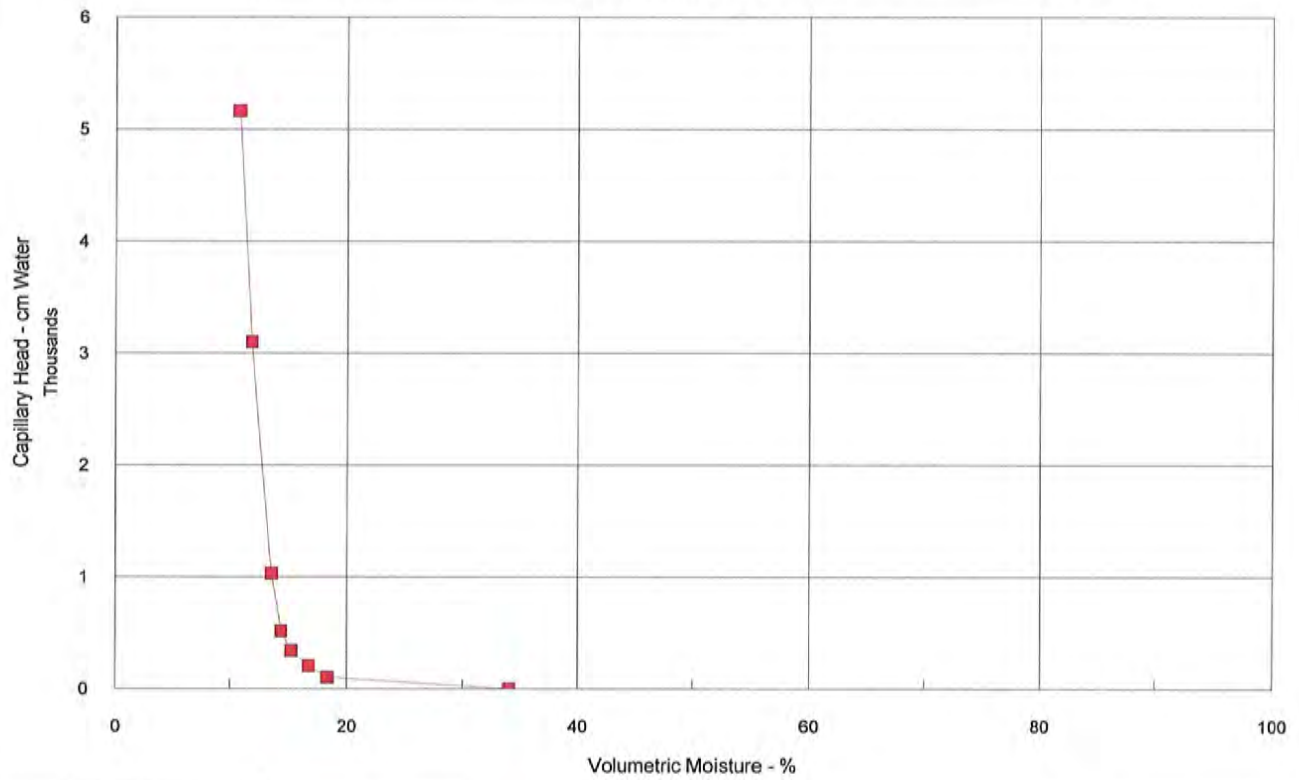
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B1-13A, 36-36.5' - R



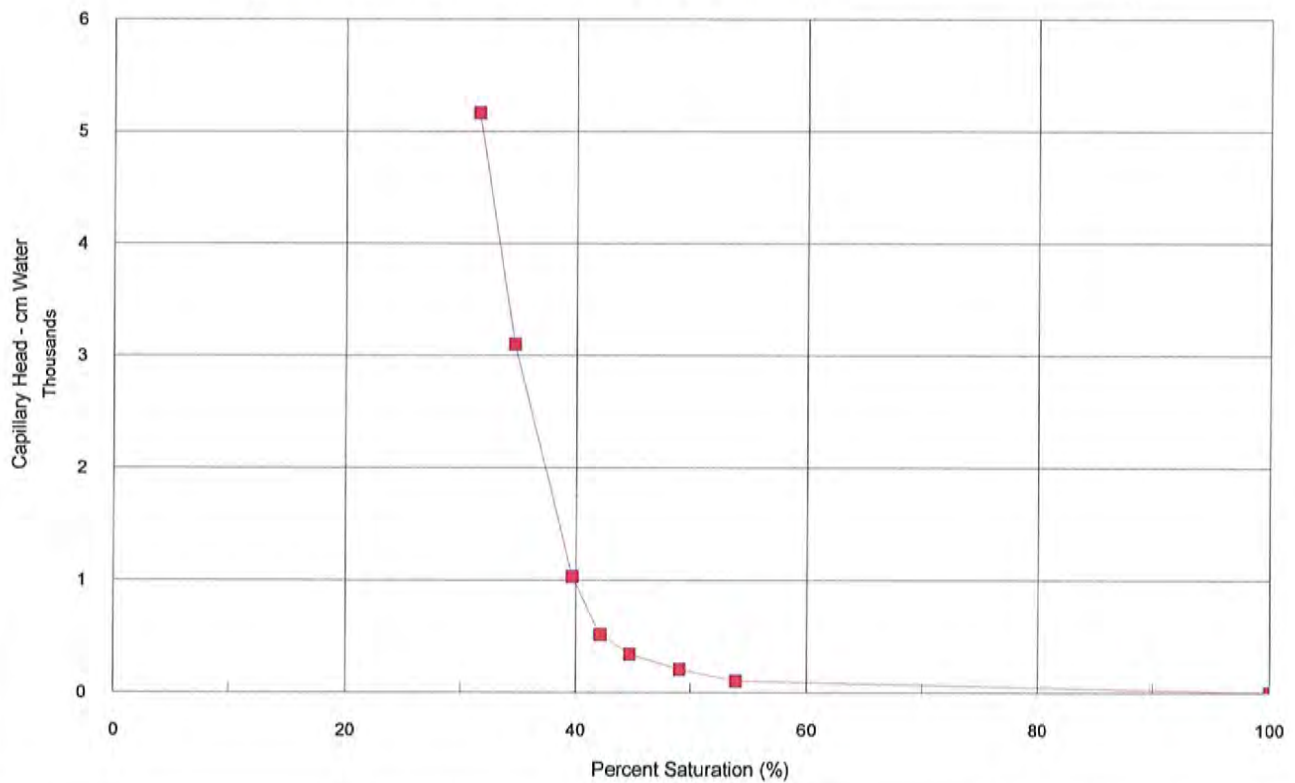
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-02, 10-11'



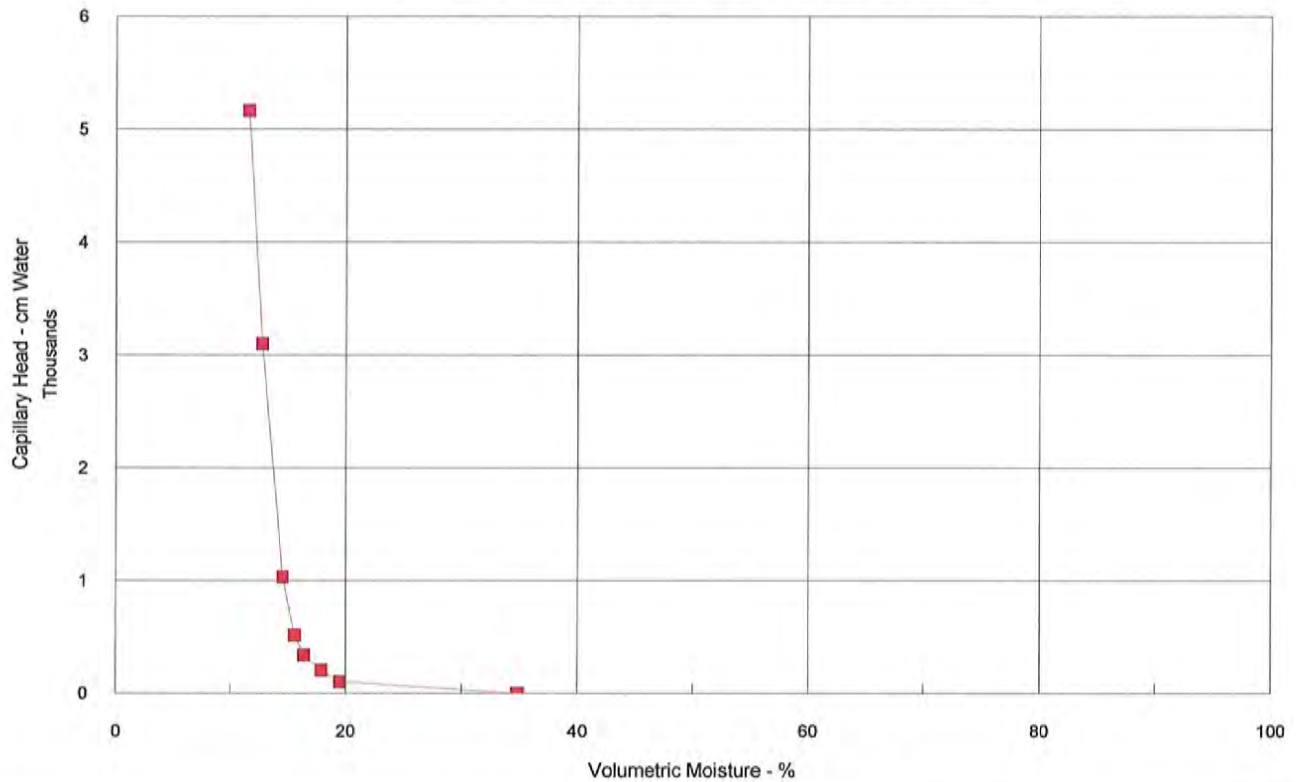
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-02, 10-11'



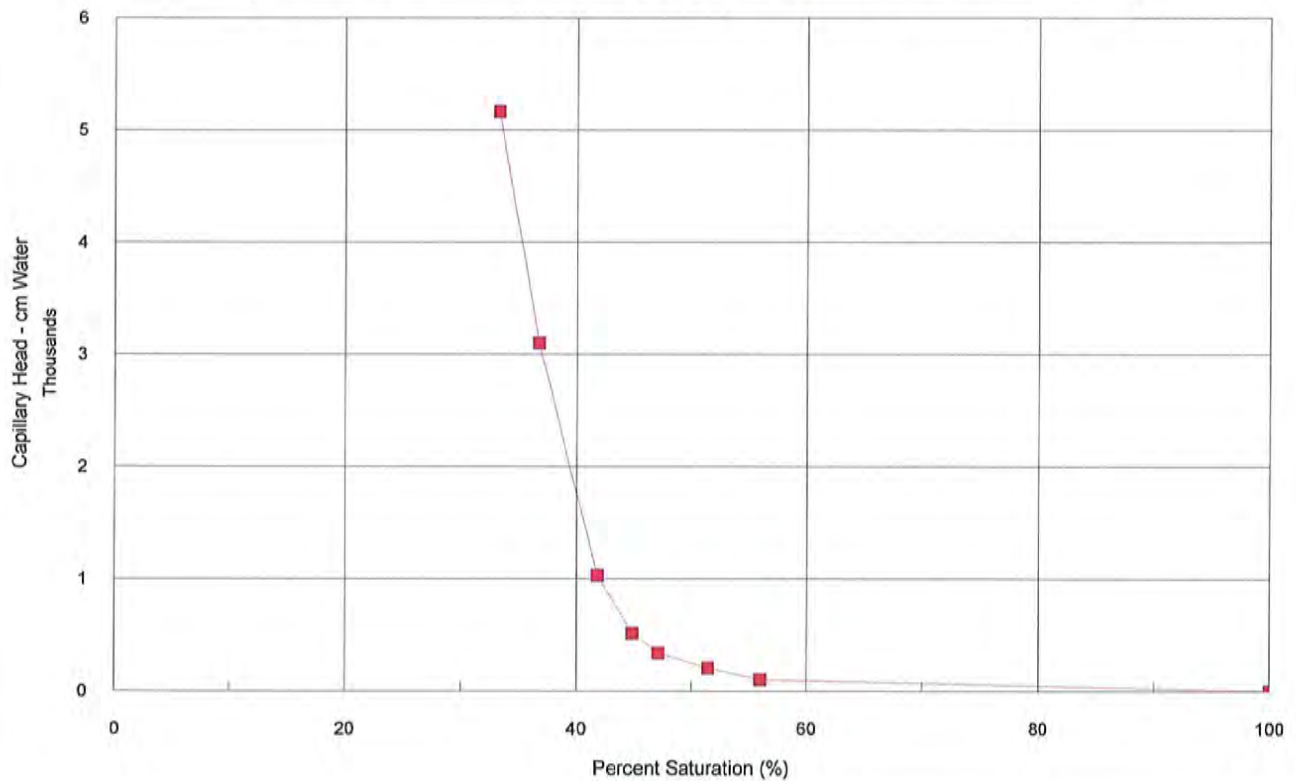
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-02, 10-11' - R



CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-B10-02, 10-11' - R



CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT MWH

JOB NO. 2512-77

SAMPLE DATE
SOIL DESCR.
LOCATION

-- Remolded -10 --

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

Page 2 of 5

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE		TEST STARTED	04/09/14 SKL
SOIL DESCR.	Remolded -10	TEST FINISHED	06/20/14 DPM
LOCATION			

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 H ₂ O (g)	Sat. M.C. % D.M.	Sat. M.C. % Vol.	Retained H ₂ O	% DM	% Vol.	Retained H ₂ O	% 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: *OPM* Date: *6/26/14*
 Filename: CMRSETS.WK4



CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE		TEST STARTED	04/09/14 SKL
SOIL DESCR.	Remolded -10	TEST FINISHED	06/20/14 DPM
LOCATION			

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



CAPILLARY MOISTURE RETENTION TEST ASTM D 3152

CLIENT	MWH	JOB NO.	2512-77
SAMPLE DATE		TEST STARTED	04/09/14 SKL
SOIL DESCR.	Remolded -10	TEST FINISHED	06/20/14 DPM
LOCATION			

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: *DDM* Date: *6/26/14*
Filename: CMRSETS.WK4



**CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152**

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CLIENT MWH

JOB NO.

2512-77

SAMPLE DATE

--
Remolded -10
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SOIL DESCR.

TEST STARTED

04/09/14 SKL

LOCATION

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

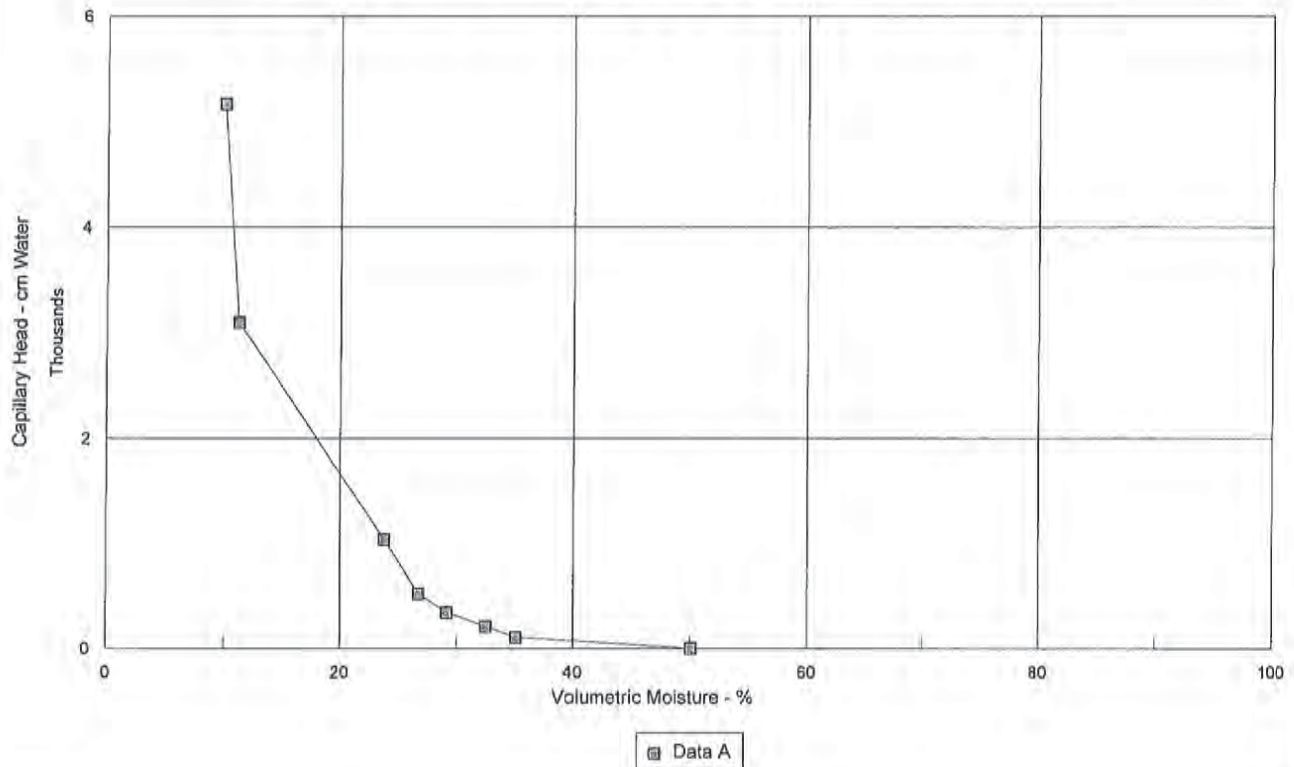
	% Saturation							
	Sat.	0.1 Bar	0.2 Bar	0.33 Bar	0.5 Bar	1 Bar	3 Bar	5 Bar
SB-B1-04, 0-25'	100.00	70.12	65.01	58.29	53.32	47.52	22.47	19.98
SB-B1-04, 0-25'-R	100.00	76.67	70.97	63.52	58.14	50.77	22.58	19.39
SB-B4-01, 0-15'	100.00	73.86	69.03	62.69	59.61	52.63	43.19	30.65
SB-B4-01, 0-15'-R	100.00	68.38	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



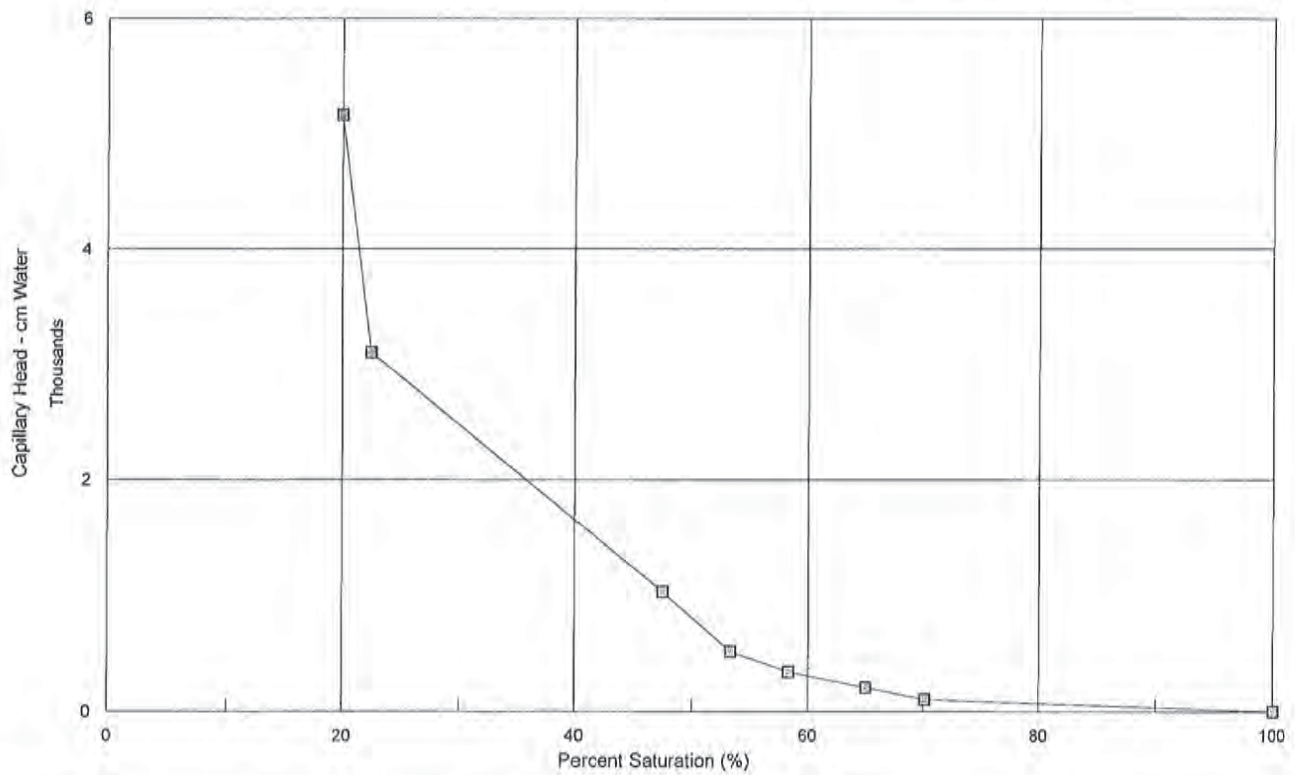
CAPILLARY MOISTURE CHARACTERISTIC CURVE

SB-B1-04, 0-25'



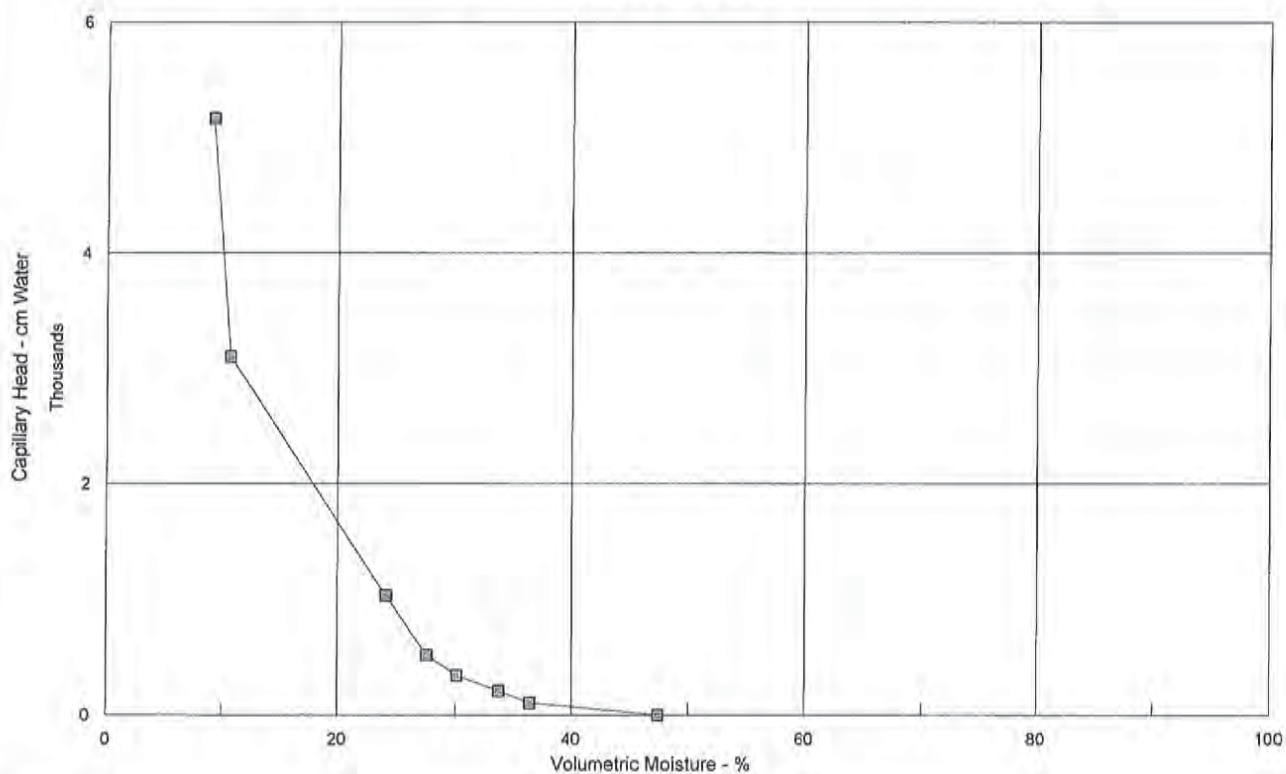
CAPILLARY MOISTURE CHARACTERISTIC CURVE

SB-B1-04, 0-25'



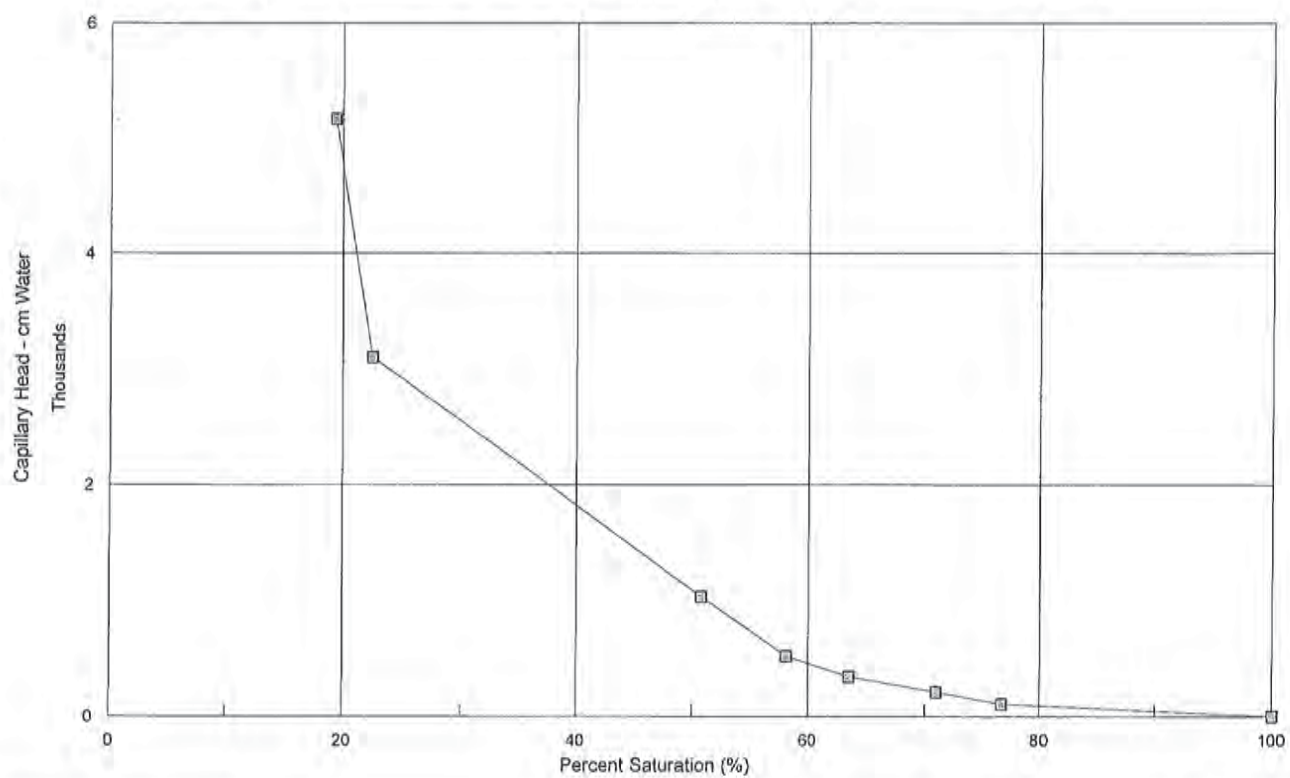
CAPILLARY MOISTURE CHARACTERISTIC CURVE

SB-B1-04, 0-25'-R



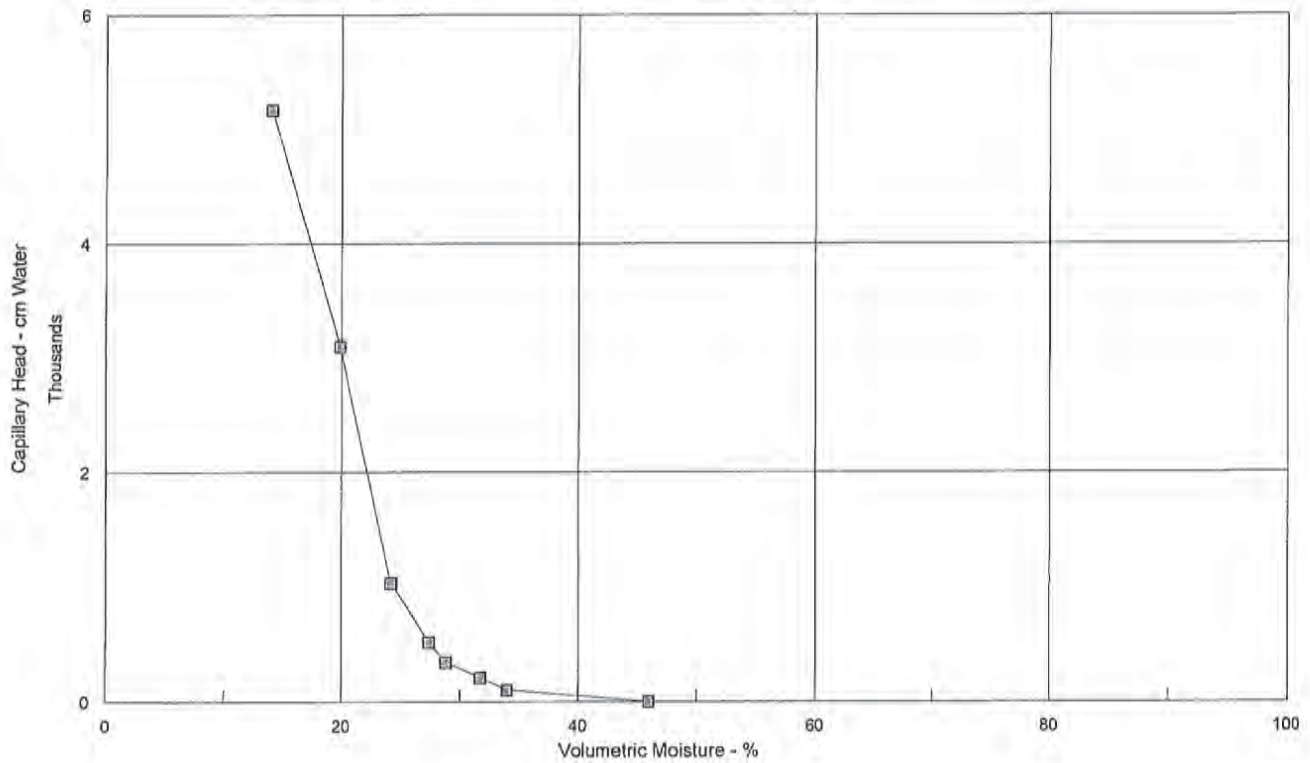
CAPILLARY MOISTURE CHARACTERISTIC CURVE

SB-B1-04, 0-25'-R



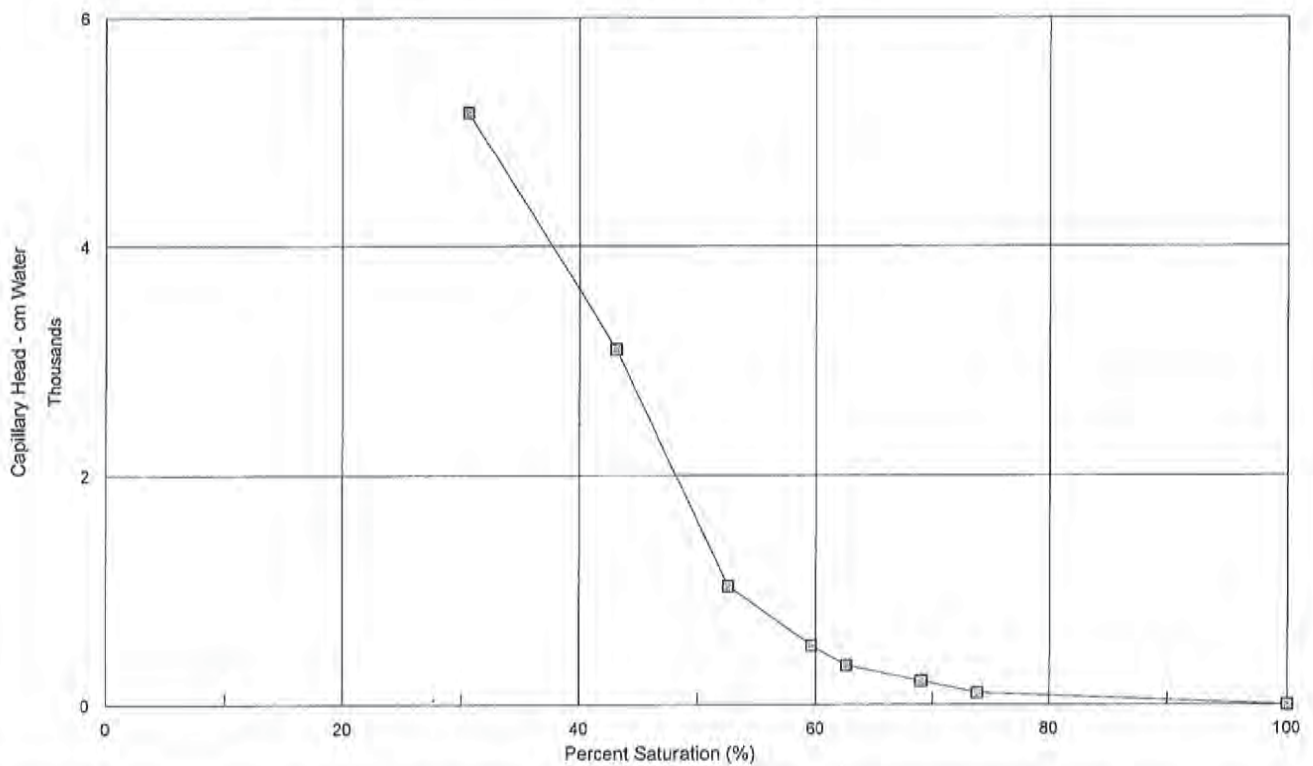
CAPILLARY MOISTURE CHARACTERISTIC CURVE

SB-B4-01, 0-15'



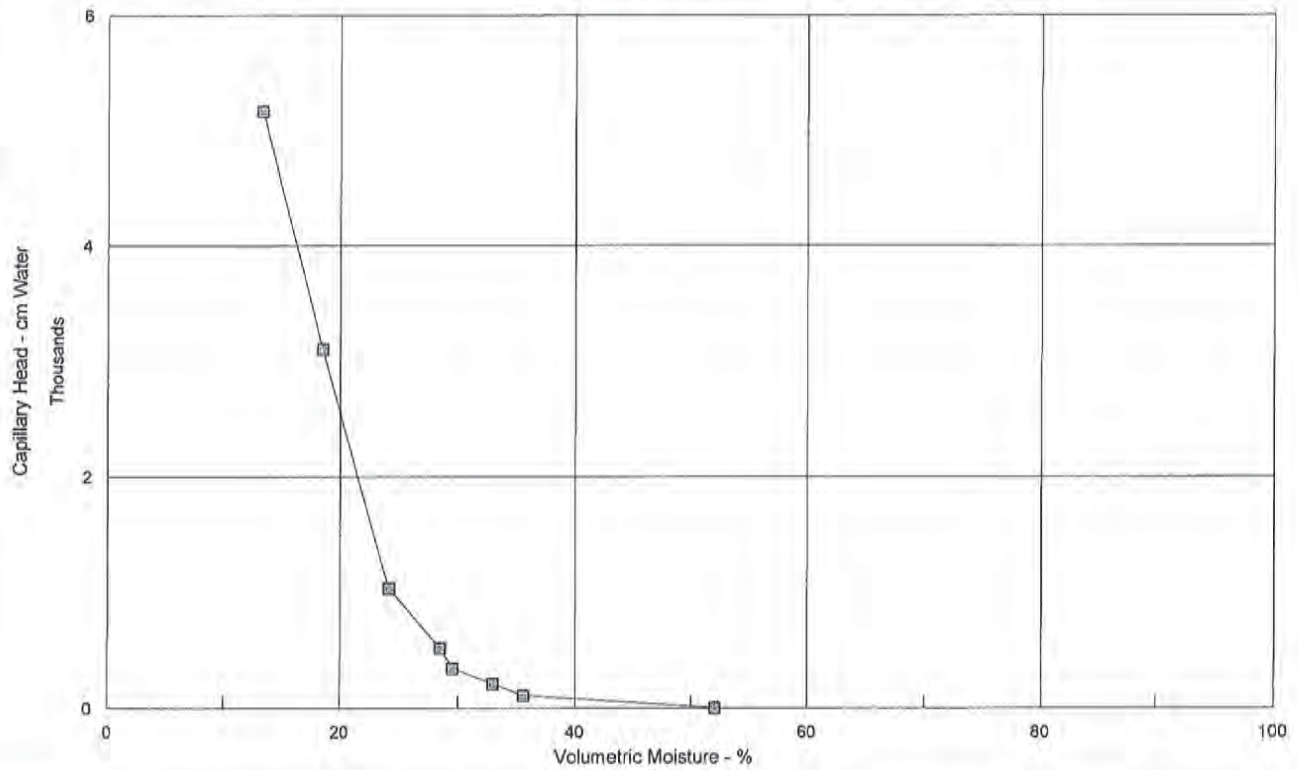
CAPILLARY MOISTURE CHARACTERISTIC CURVE

SB-B4-01, 0-15'



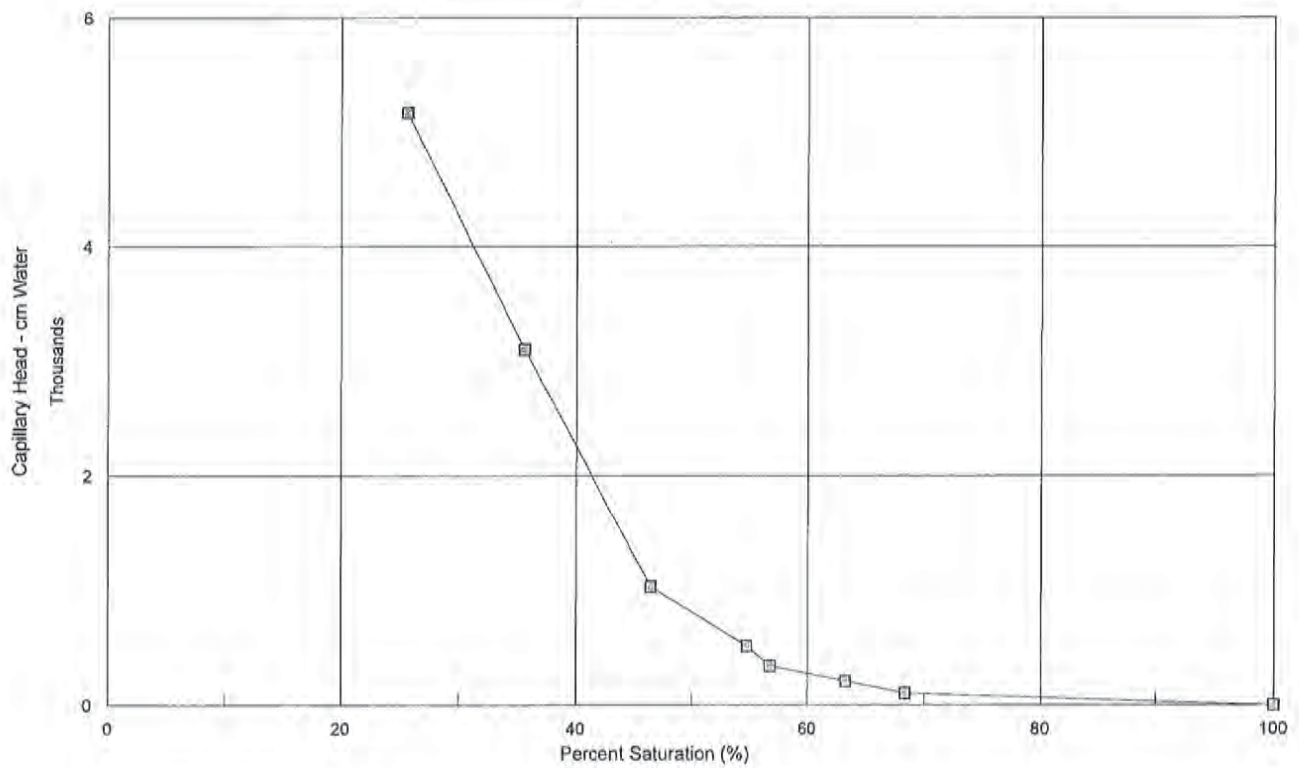
CAPILLARY MOISTURE CHARACTERISTIC CURVE

SB-B4-01, 0-15'-R



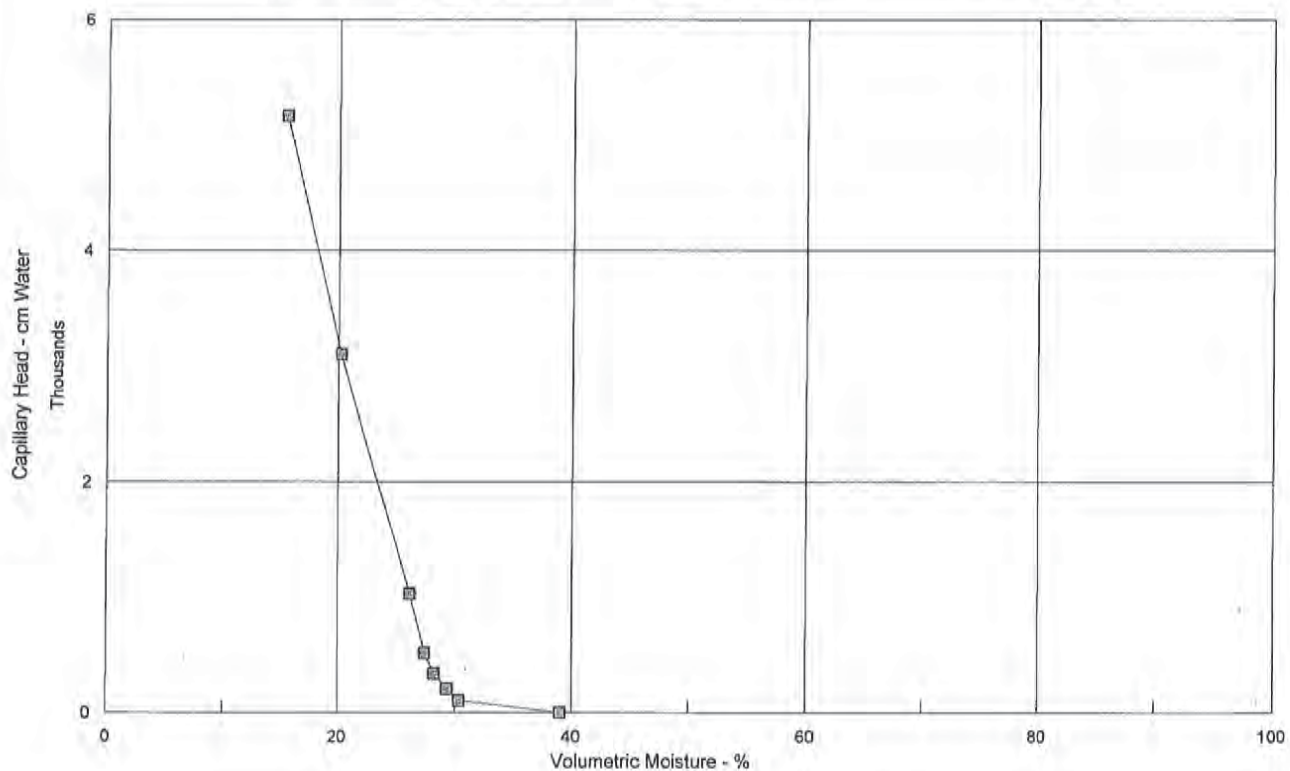
CAPILLARY MOISTURE CHARACTERISTIC CURVE

SB-B4-01, 0-15'-R



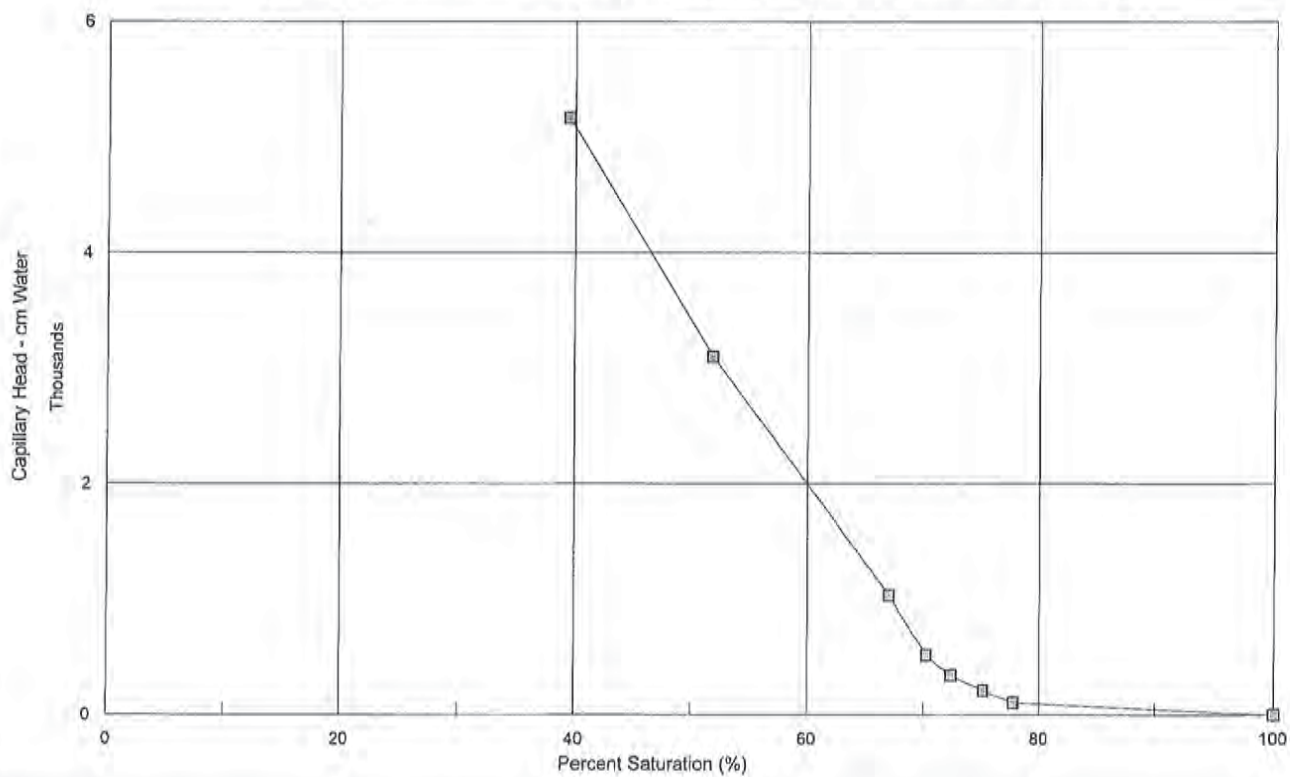
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-CS01-04A, 11-24"



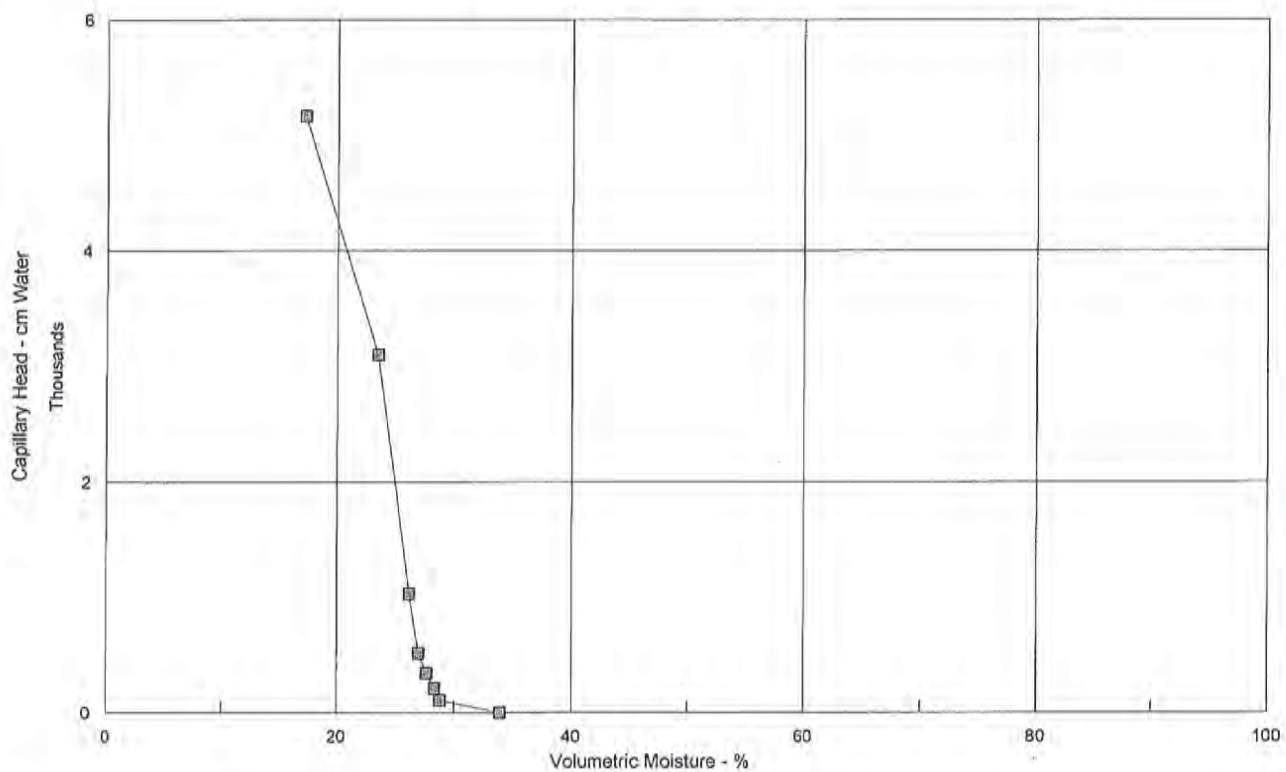
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-CS01-04A, 11-24"



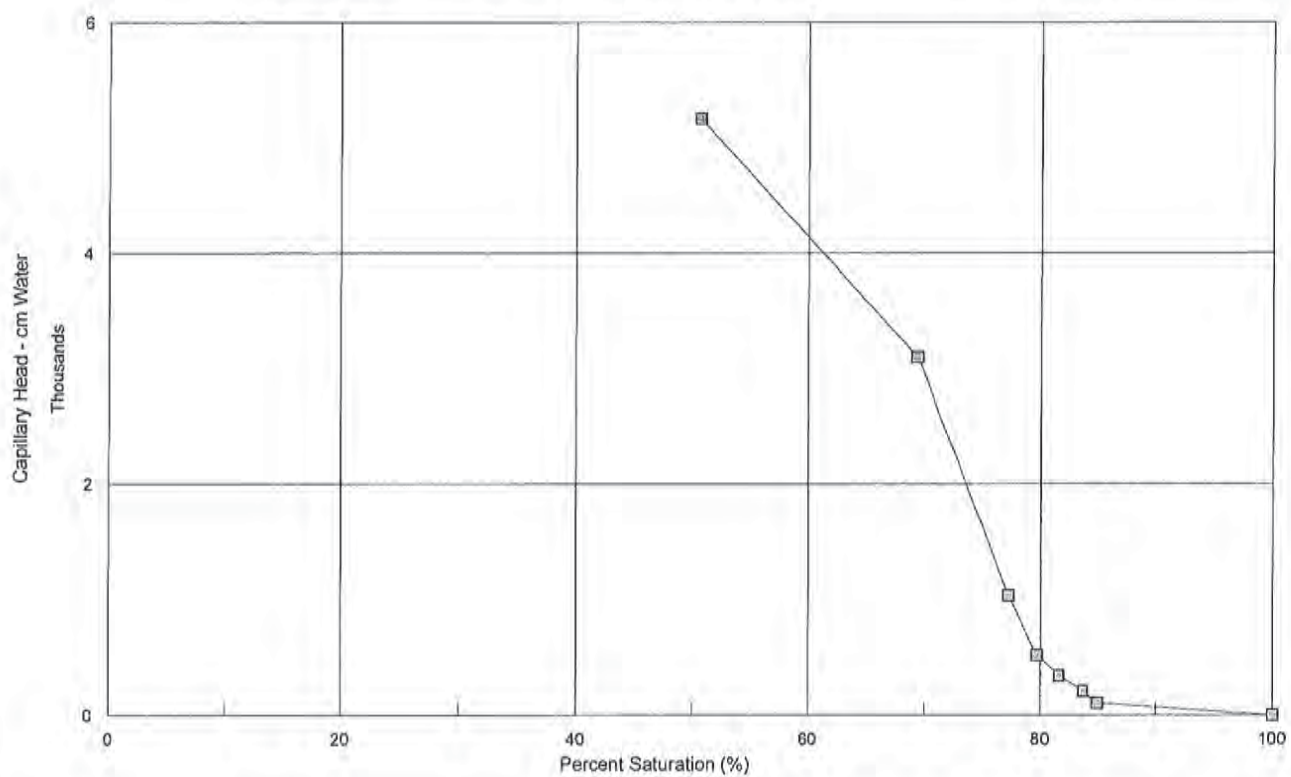
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-CS01-04A, 11-24"-R



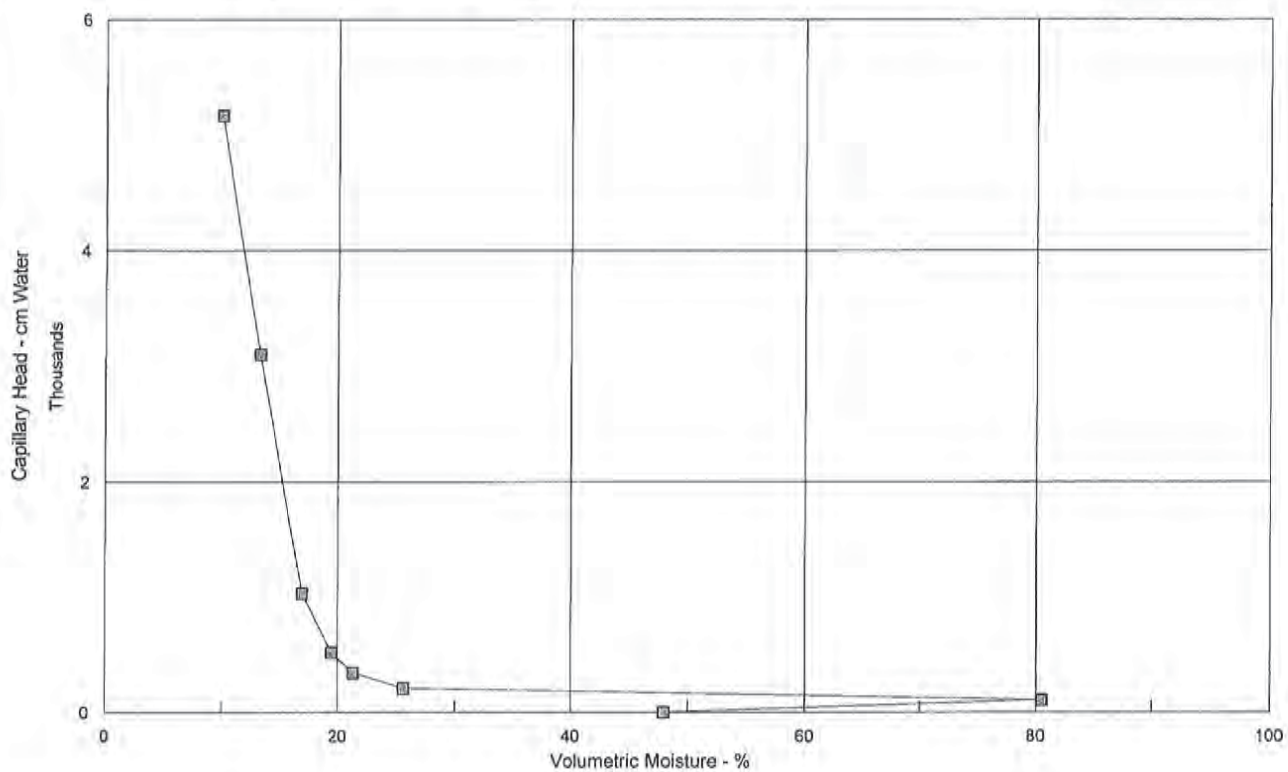
CAPILLARY MOISTURE CHARACTERISTIC CURVE

TI-CS01-04A, 11-24"-R



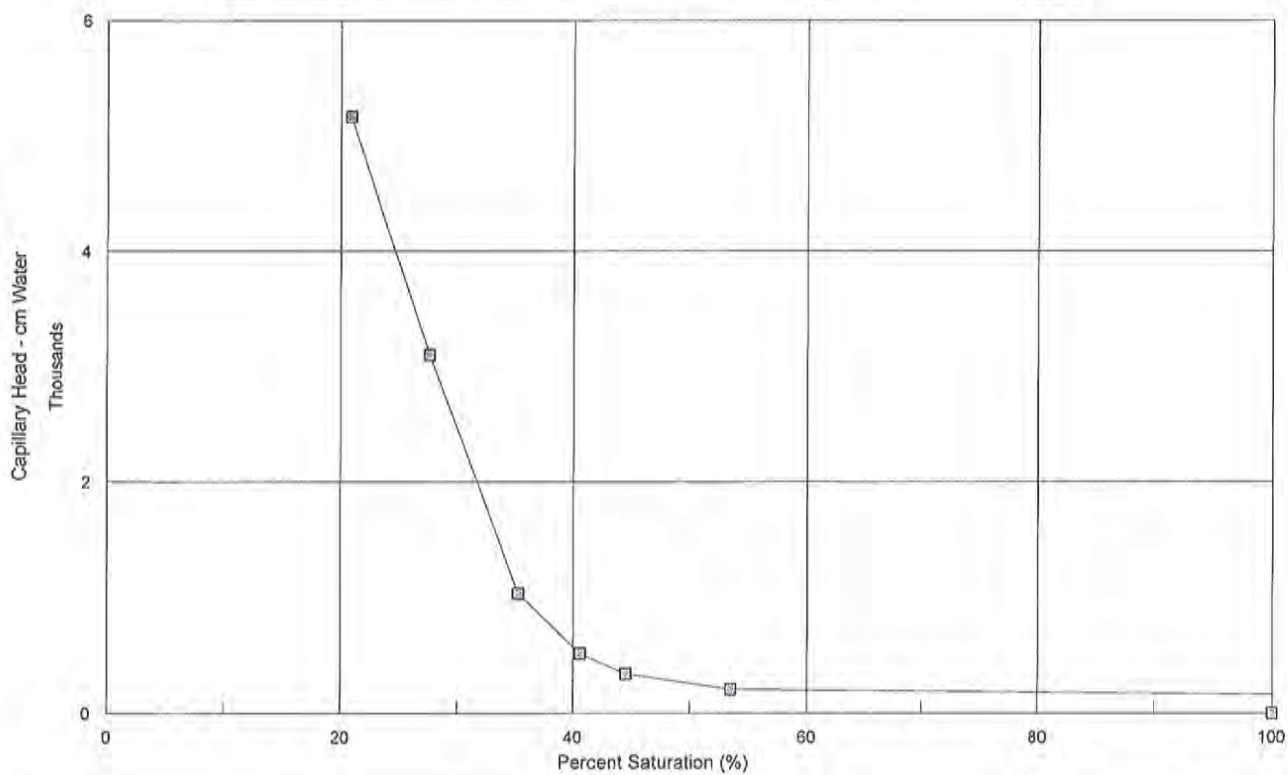
CAPILLARY MOISTURE CHARACTERISTIC CURVE

WB-B1-06, 5-10'



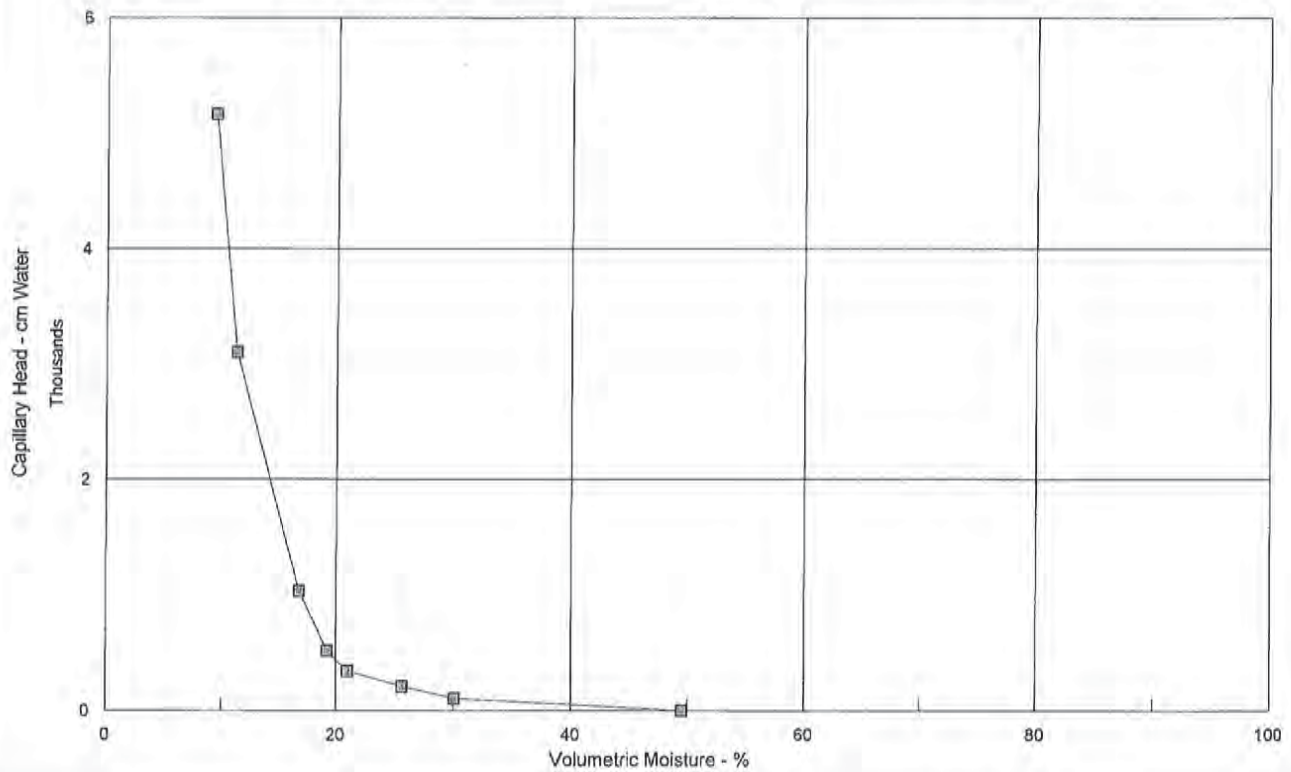
CAPILLARY MOISTURE CHARACTERISTIC CURVE

WB-B1-06, 5-10'



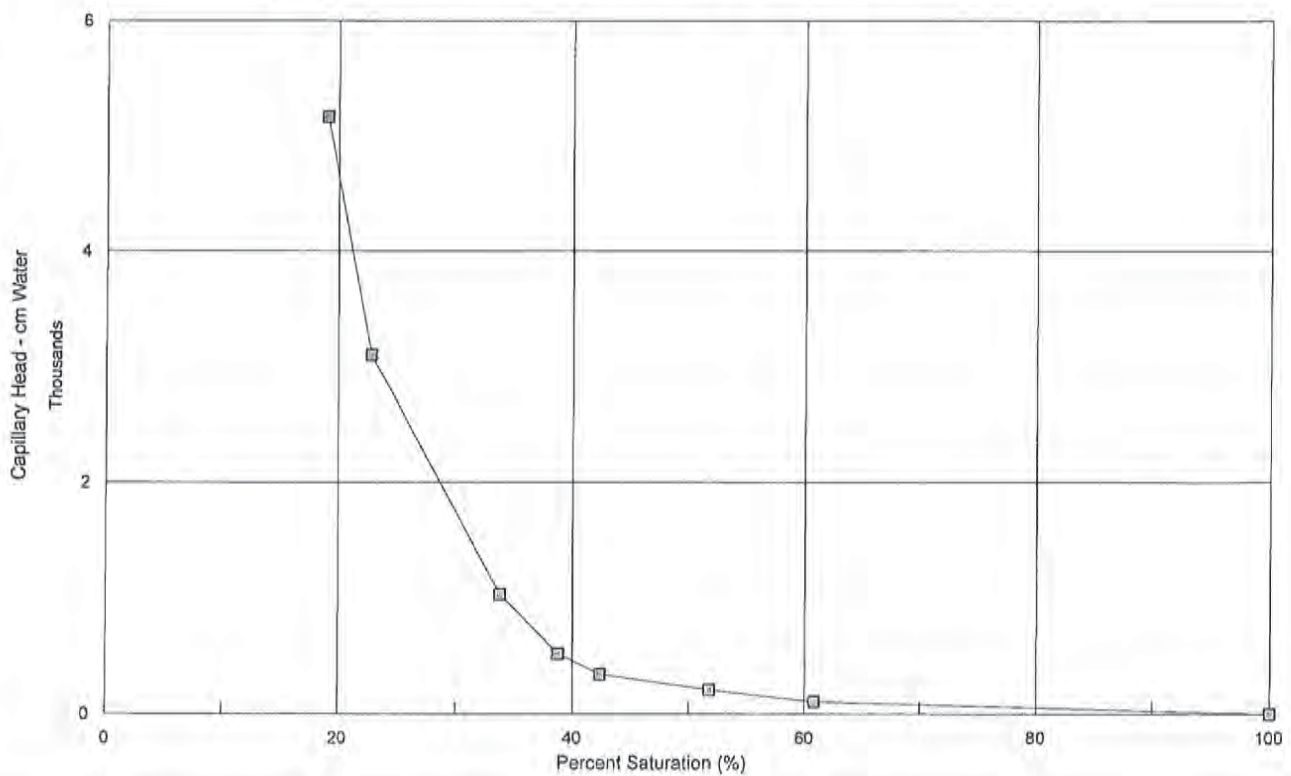
CAPILLARY MOISTURE CHARACTERISTIC CURVE

WB-B1-06, 5-10'-R



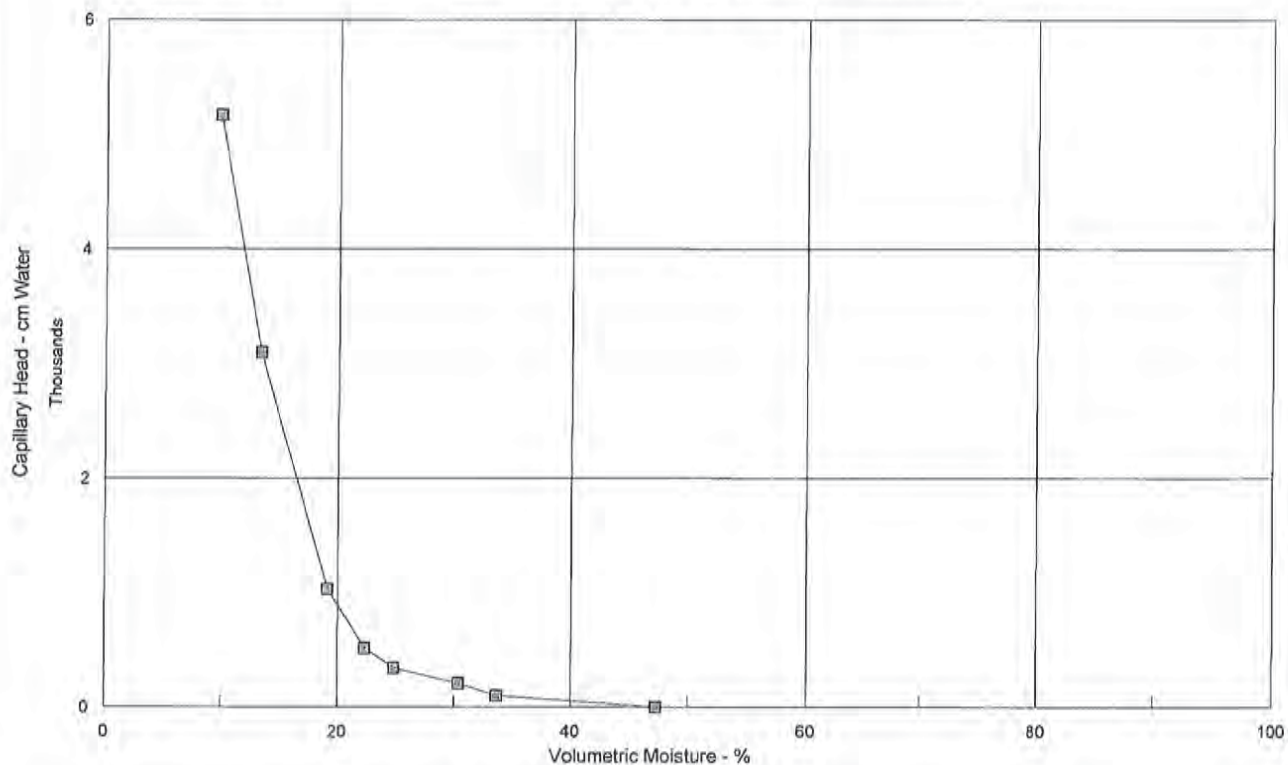
CAPILLARY MOISTURE CHARACTERISTIC CURVE

WB-B1-06, 5-10'-R



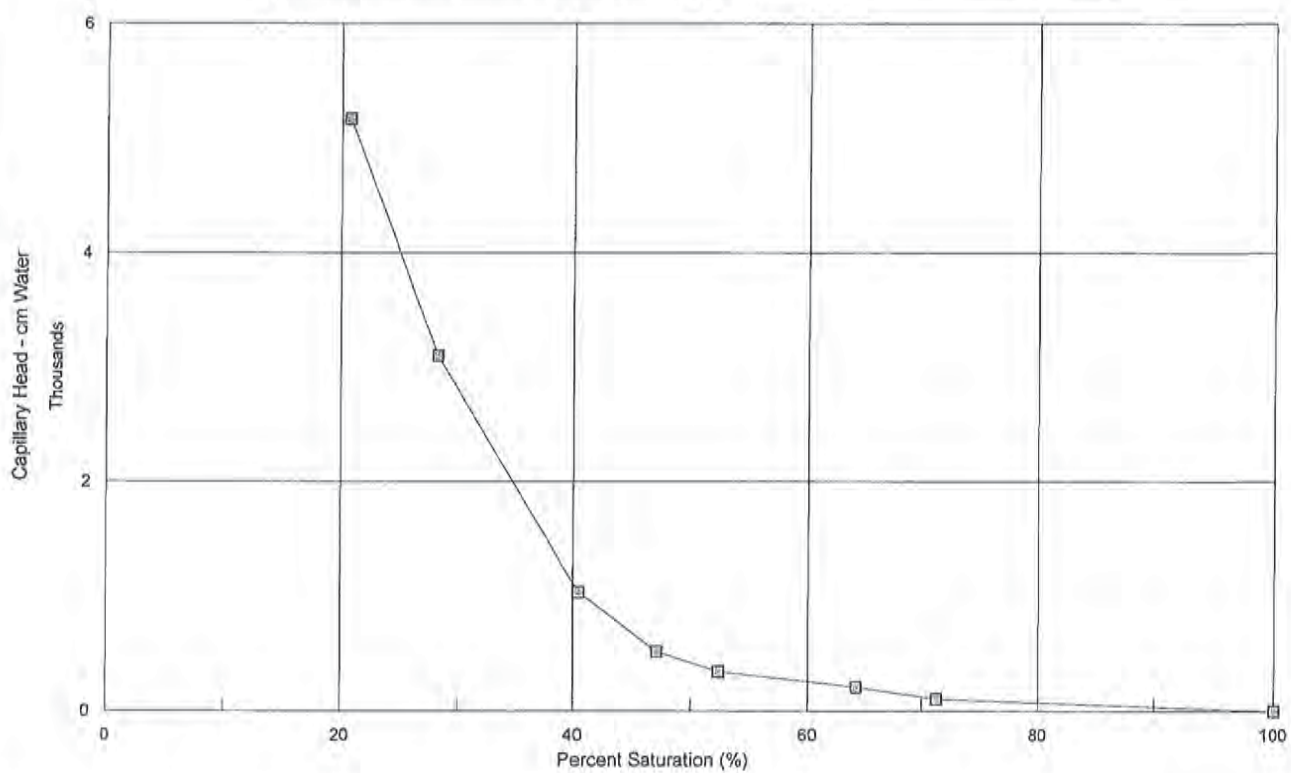
CAPILLARY MOISTURE CHARACTERISTIC CURVE

WB-B2-05, 10-20'



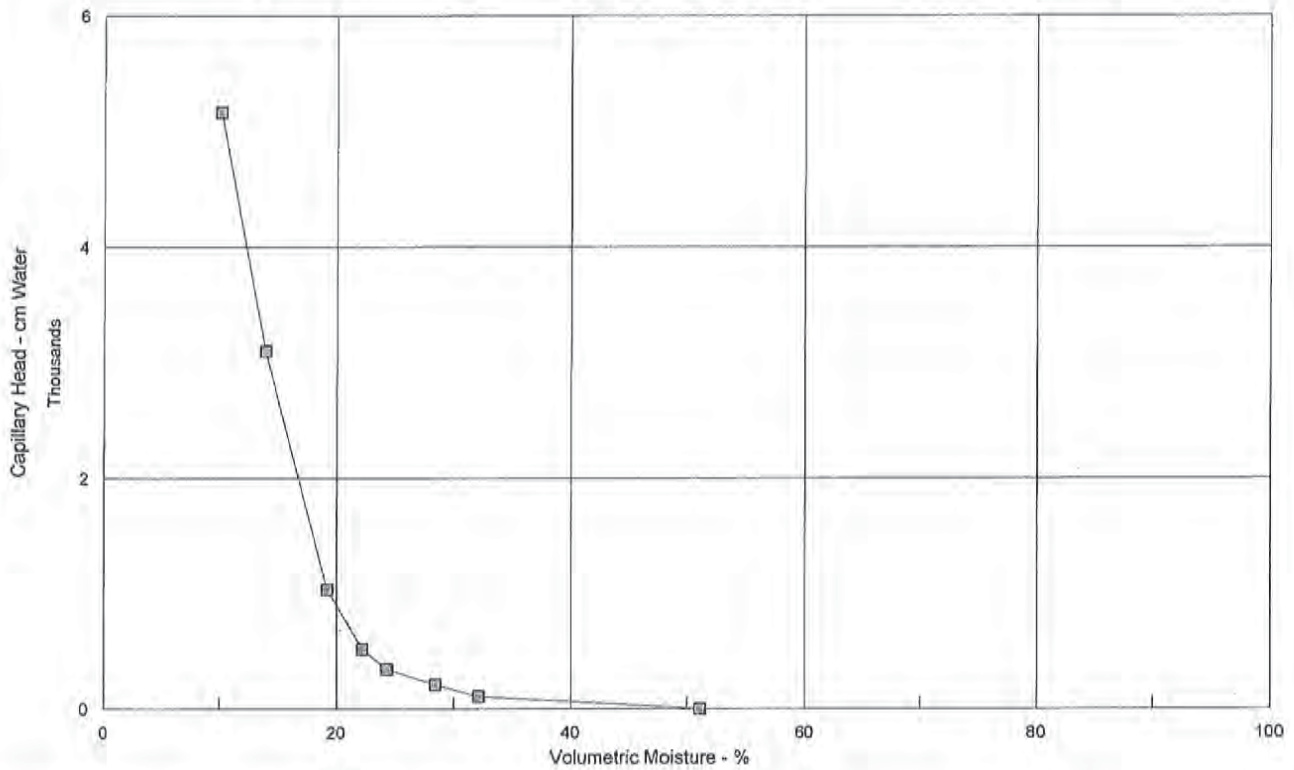
CAPILLARY MOISTURE CHARACTERISTIC CURVE

WB-B2-05, 10-20'



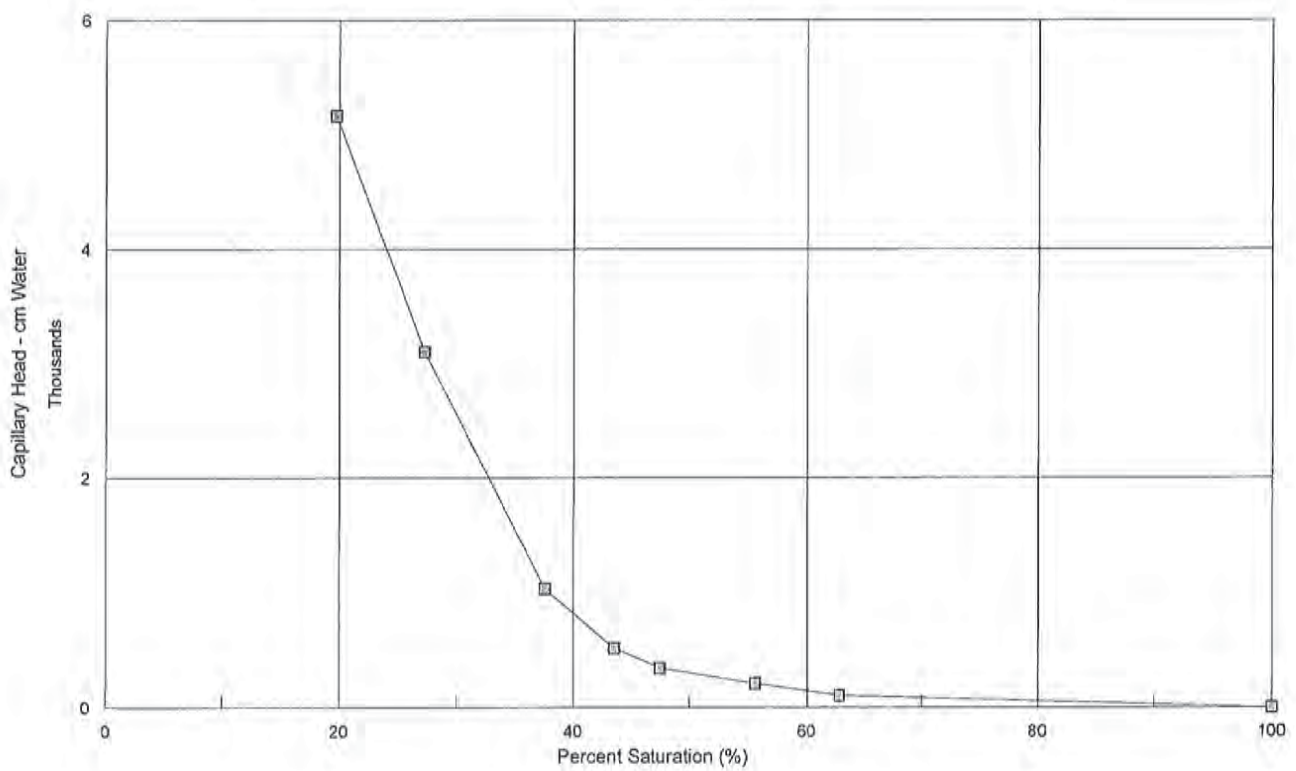
CAPILLARY MOISTURE CHARACTERISTIC CURVE

WB-B2-05,10-20'-R



CAPILLARY MOISTURE CHARACTERISTIC CURVE

WB-B2-05,10-20'-R



PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-07A
DEPTH 21.0-21.5'
SAMPLE NO. -
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
CONF. PRES. PSF 2592

SAMPLED 11/21/13 MWH
TEST STARTED 01/31/14 DPM
TEST FINISHED 02/08/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
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: KE DPM Date: 04/04/2014
Checked by: KE Date: 4/6/14
FileName: PBCH107A



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-07A
 DEPTH 21.0-21.5'
 SAMPLE NO. -
 SOIL DESCR. Sand Tailings
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 2592

SAMPLED 11/21/13 MWH
 TEST STARTED 01/31/14 DPM
 TEST FINISHED 02/08/14 DPM
 CELL NUMBER 25S
 SATURATED TEST Yes
 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

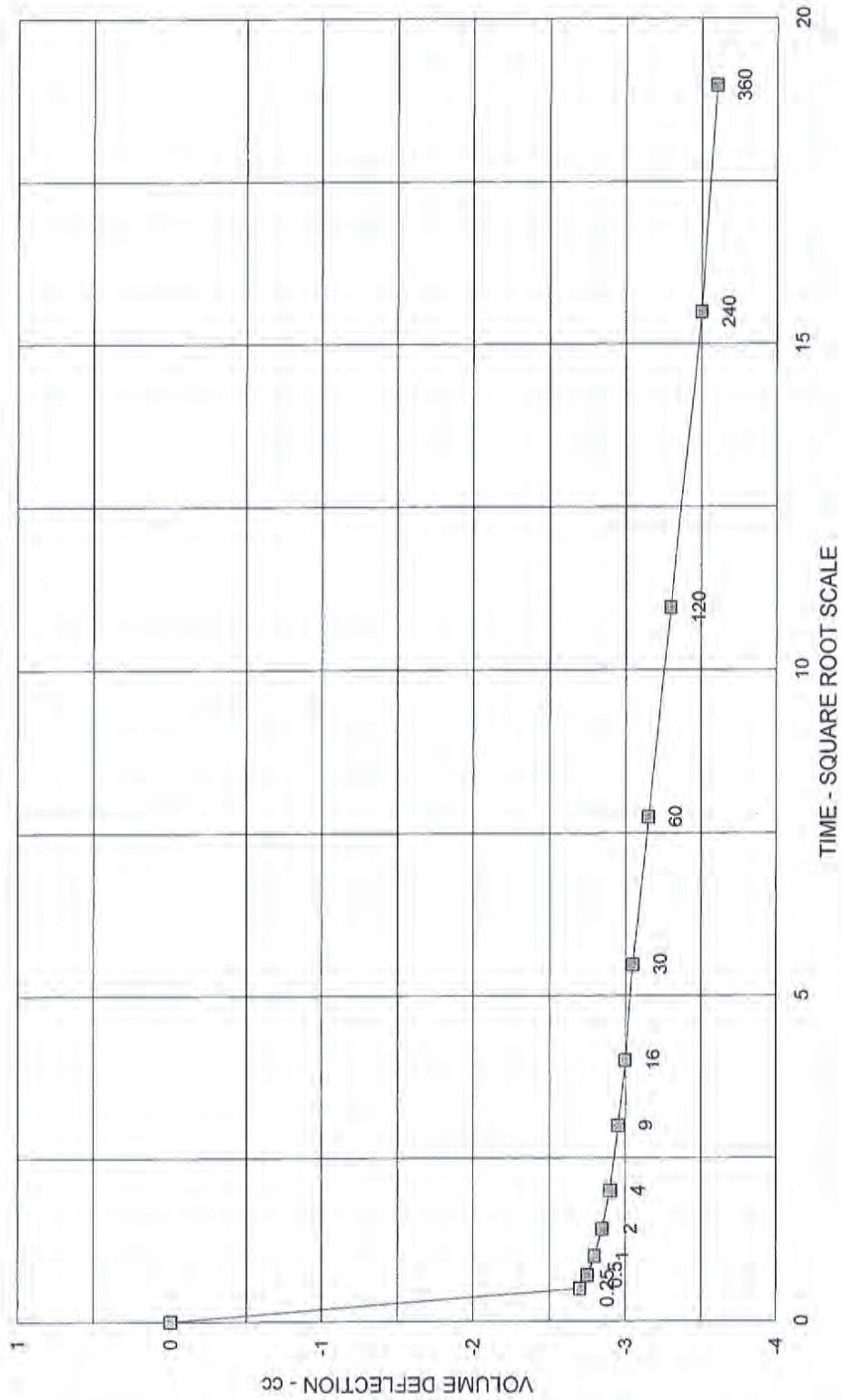
Initial Height (in)	4.191	Init. Vol. (CC)	199.71
Height Change (in)	0.023	Vol. Change (CC)	16.10
Ht. After Cons. (in)	4.168	Cell Exp. (CC)	16.20
Initial Area (sq in)	2.907	Net Change (CC)	-0.10
Area After Cons. (sq in)	2.925	Cons. Vol. (CC)	199.81

Data entry by: DPM Date: 04/04/2014
 Checked by: KR Date: 4/6/14
 FileName: PBCH107A



CONSOLIDATION DATA

TI-B1-07A, 21.0-21.5', -



Time in Minutes CONF. PRES. PSF 2592

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	619.8
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	Time	Init.	Final	Head	Permeability
Min	Sec	Burette	Burette	Corr.	k
		CC	CC	CM	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: Date: 4/9/14
 FileName: PBCH1018



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

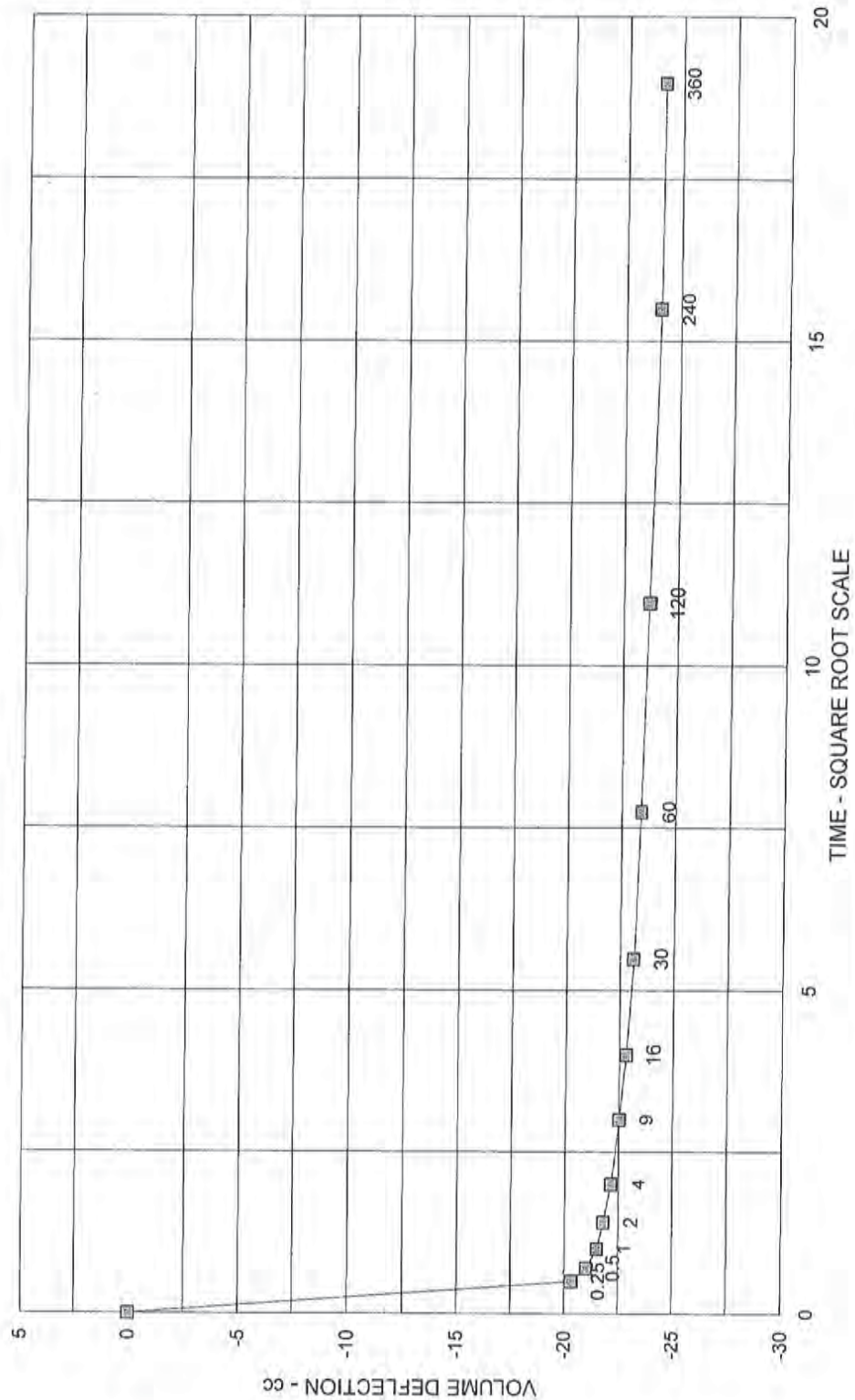
Initial Height (in)	2.955	Init. Vol. (CC)	305.73
Height Change (in)	0.096	Vol. Change (CC)	45.00
Ht. After Cons. (in)	2.859	Cell Exp. (CC)	26.48
Initial Area (sq in)	6.312	Net Change (CC)	18.52
Area After Cons. (sq in)	6.129	Cons. Vol. (CC)	287.20

Data entry by: DPM Date: 04/07/2014
 Checked by: WZ Date: 4/7/14
 FileName: PBCH1018



CONSOLIDATION DATA

TI-B10-18, 55-56' (55-56.5'), -



Time in Minutes CONF. PRES. PSF 10368

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-03
DEPTH 12.5-14.0'
SAMPLE NO. -
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
CONF. PRES. PSF 5184

SAMPLED -
TEST STARTED 03/11/14 DPM
TEST FINISHED 03/15/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
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: KR DPM Date: 04/07/2014
Checked by: KR Date: 4/7/14
FileName: PBCH1003



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
60.0	58.0	21.8	22.7	48.1	56.9
70.0		23.0	23.9	58.2	67.7
				7.9	0.79
				8.8	0.88
				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

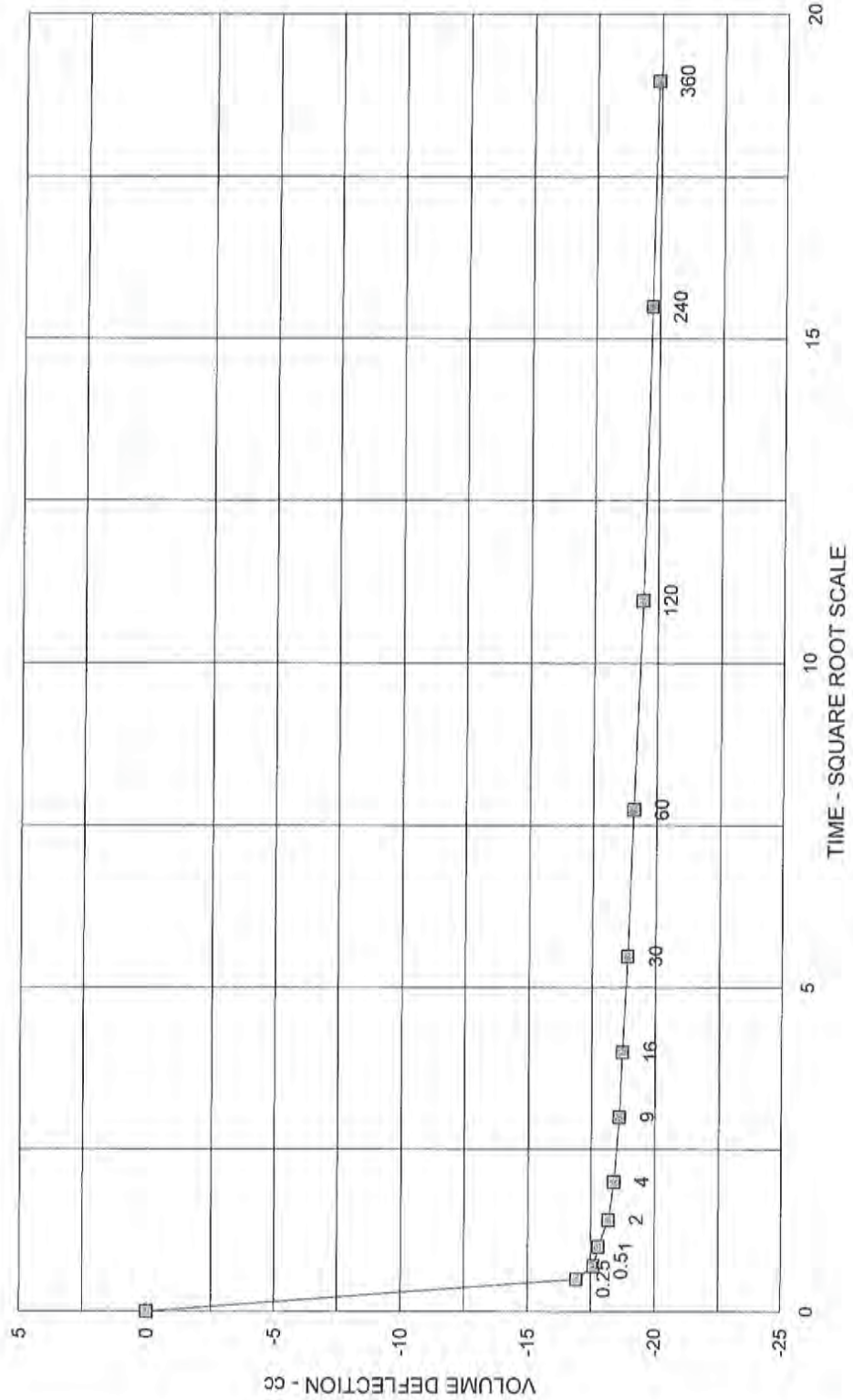
Initial Height (in)	3.107	Init. Vol. (CC)	229.03
Height Change (in)	0.093	Vol. Change (CC)	41.50
Ht. After Cons. (in)	3.014	Cell Exp. (CC)	21.30
Initial Area (sq in)	4.498	Net Change (CC)	20.20
Area After Cons. (sq in)	4.227	Cons. Vol. (CC)	208.83

Data entry by: DPM Date: 04/04/2014
 Checked by: Date: 4/7/14
 FileName: PBCH1003



CONSOLIDATION DATA

TI-B10-03, 12.5-14.0', -



Time in Minutes CONF. PRES. PSF 5184

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-02
DEPTH 10-11' (10-12.5')
SAMPLE NO. -
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
CONF. PRES. PSF 4896

SAMPLED 11/26/13 MWH
TEST STARTED 02/20/14 DPM
TEST FINISHED 02/22/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
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: KR DPM Date: 04/04/2014
Checked by: KR Date: 4/5/14
FileName: PBCH1002



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-02
 DEPTH 10-11' (10-12.5')
 SAMPLE NO. -
 SOIL DESCR. Sand Tailings
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 4896

SAMPLED 11/26/13 MWH
 TEST STARTED 02/20/14 DPM
 TEST FINISHED 02/22/14 DPM
 CELL NUMBER 27S
 SATURATED TEST Yes
 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

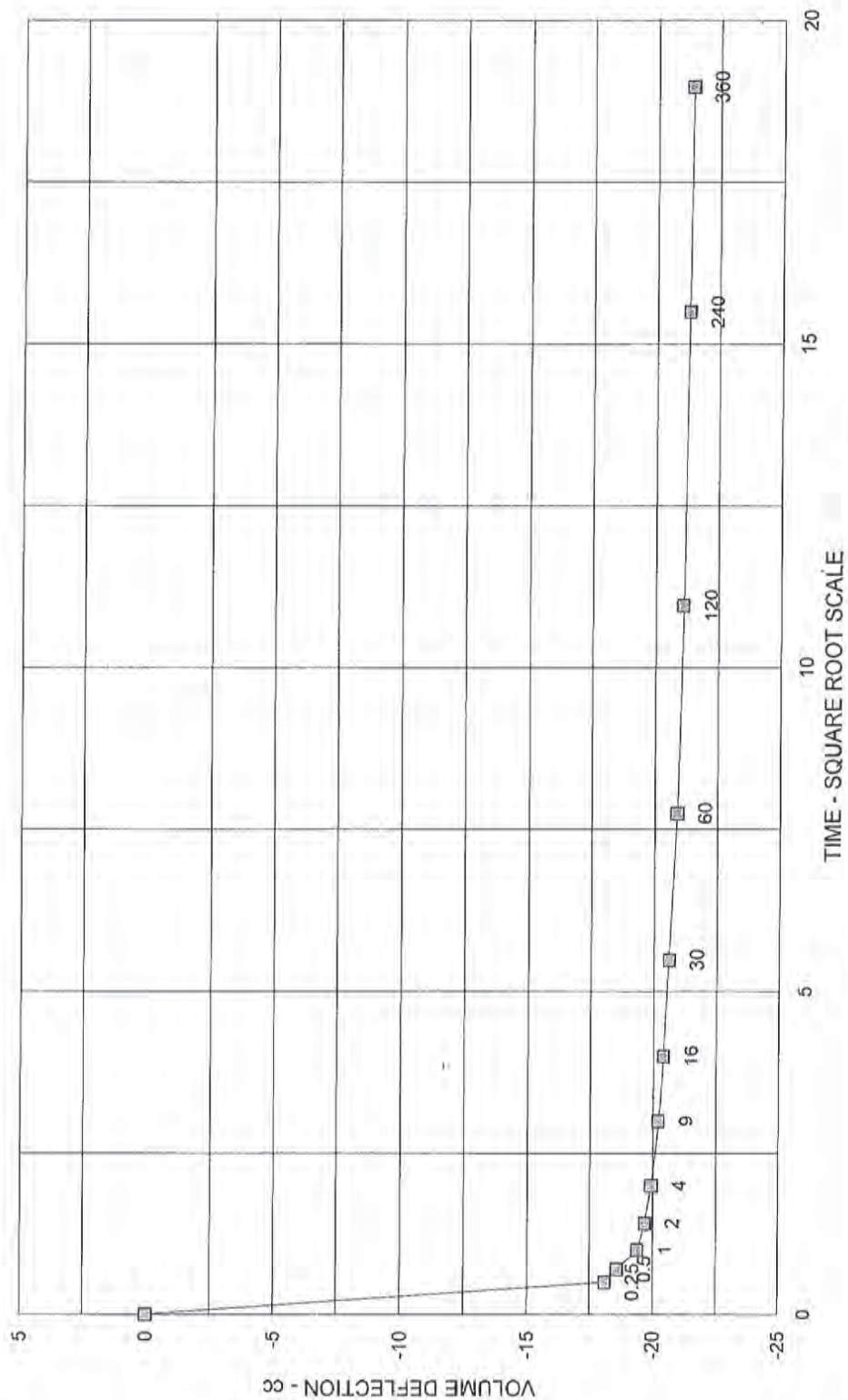
Initial Height (in)	3.044	Init. Vol. (CC)	313.16
Height Change (in)	0.132	Vol. Change (CC)	41.20
Ht. After Cons. (in)	2.912	Cell Exp. (CC)	18.82
Initial Area (sq in)	6.277	Net Change (CC)	22.38
Area After Cons. (sq in)	6.092	Cons. Vol. (CC)	290.78

Data entry by: DPM Date: 04/04/2014
 Checked by: KR Date: 4/5/14
 FileName: PBCH1002



CONSOLIDATION DATA

TI-B10-02, 10-11' (10-12.5'), -



Time in Minutes CONF. PRES. PSF 4896

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-15A
DEPTH 41.0-41.5'
SAMPLE NO. -
SOIL DESCR. Sandy Clay
LOCATION Tailings Impoundment
CONF. PRES. PSF 5040

SAMPLED 11/21/13 MWH
TEST STARTED 02/09/14 DPM
TEST FINISHED 02/19/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
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: KA
Checked by: KA
FileName:

DPM
PBCH115A

Date: 04/04/2014
Date: 4/5/14



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-15A
 DEPTH 41.0-41.5'
 SAMPLE NO. -
 SOIL DESCR. Sandy Clay
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 5040

SAMPLED 11/21/13 MWH
 TEST STARTED 02/09/14 DPM
 TEST FINISHED 02/19/14 DPM
 CELL NUMBER 25S
 SATURATED TEST Yes
 TEST TYPE TX/Pbp/Tap Water

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)	Pore Pressure (PSI)	Change	B
		Close	Open		
40.0	38.0	1.4	10.0		
50.0		11.5	11.7		
			Close	Open	
			38.5	48.3	9.8
					0.98

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Def. (CC)
0.00	0.00	11.70	0.00
0.25	0.50	14.45	-2.75
0.5	0.71	14.70	-3.00
1	1.00	14.95	-3.25
2	1.41	15.35	-3.65
4	2.00	16.10	-4.40
9	3.00	17.35	-5.65
16	4.00	18.60	-6.90
30	5.48	20.00	-8.30
60	7.75	21.10	-9.40
120	10.95	21.50	-9.80
240	15.49	21.85	-10.15
360	18.97	22.00	-10.30

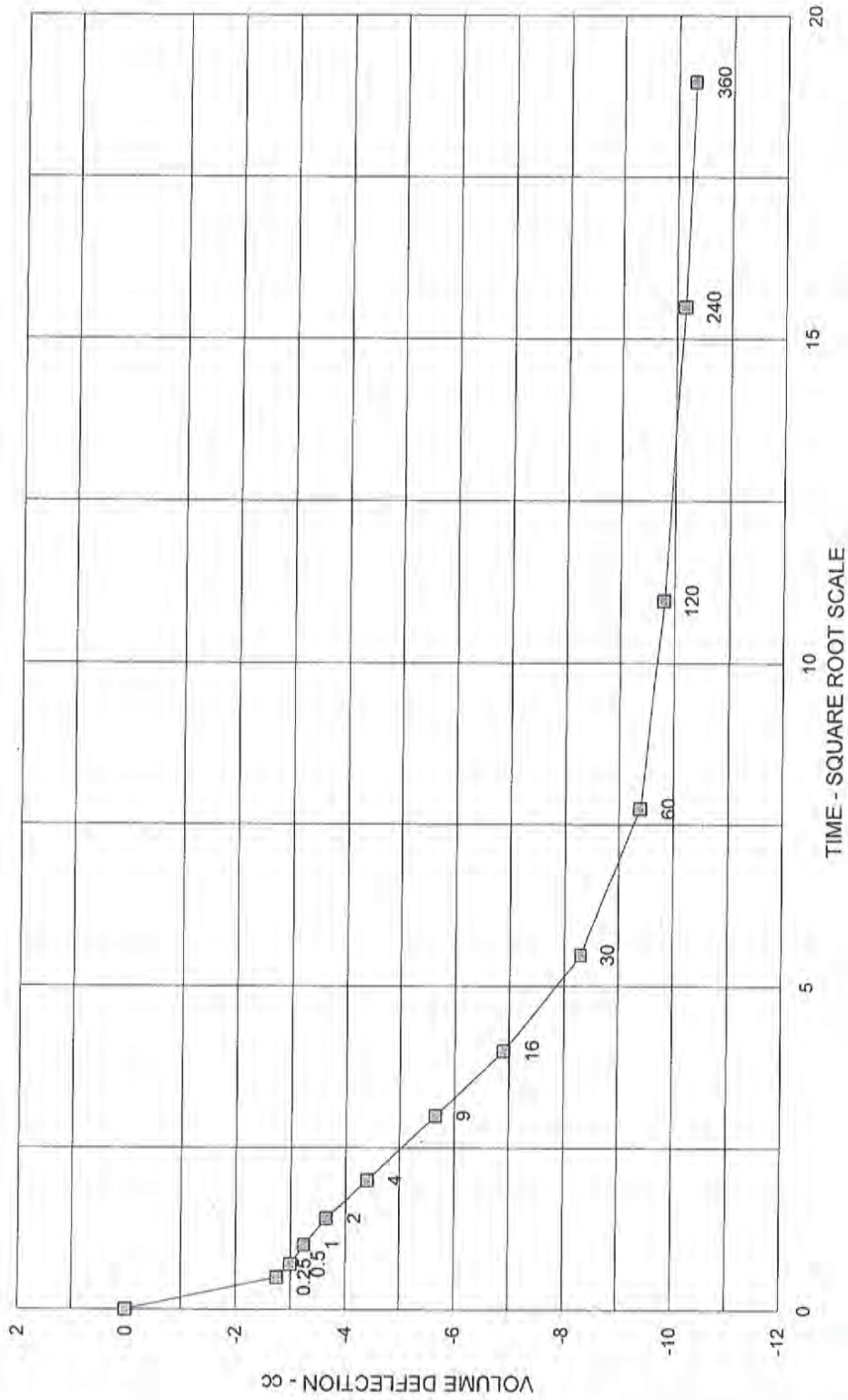
Initial Height (in)	2.960	Init. Vol. (CC)	141.42
Height Change (in)	0.085	Vol. Change (CC)	23.20
Ht. After Cons. (in)	2.875	Cell Exp. (CC)	14.50
Initial Area (sq in)	2.915	Net Change (CC)	8.70
Area After Cons. (sq in)	2.816	Cons. Vol. (CC)	132.71

Data entry by: 142 Date: 04/04/2014
 Checked by: 142 Date: 4/5/14
 FileName: PBCH115A



CONSOLIDATION DATA

TI-B1-15A, 41.0-41.5', -



Time in Minutes / CONF. PRES. PSF 5040

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-13A	SAMPLED	11/21/13 MWH
DEPTH	36.0-36.5'	TEST STARTED	02/08/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/19/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	4608	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	272.8	278.0	
Wt. Wet Soil & Pan (g)	279.4	284.5	
Wt. Dry Soil & Pan (g)	227.3	227.3	
Wt. Lost Moisture (g)	52.0	57.1	
Wt. of Pan Only (g)	6.5	6.5	
Wt. of Dry Soil (g)	220.8	220.8	
Moisture Content %	23.6	25.9	
Wet Density PCF	119.3	119.8	
Dry Density PCF	96.6	95.2	
Init. Diameter (in)	1.929	(cm)	4.900
Init. Area (sq in)	2.922	(sq cm)	18.856
Init. Height (in)	2.981	(cm)	7.572
Vol. Bef. Consol. (cu ft)	0.00504		
Vol. After Consol. (cu ft)	0.00511		
Porosity %	39.44		
Constant Head (PSI)	2.00	(cm)	140.79

Time	Time	Init.	Final	Head	Permeability
Min	Sec	Burette	Burette	Corr.	k
		CC	CC	CM	cm/sec
480.0	28800	47.4	28.8	23.9	2.1E-06
440.0	26400	46.4	30.8	23.3	1.9E-06
240.0	14400	47.8	39.9	17.6	1.7E-06
426.0	25560	47.6	34.0	20.9	1.7E-06
240.0	14400	46.7	39.3	18.5	1.6E-06
240.0	14400	39.3	32.1	26.5	1.7E-06

Average Temperature 21.1

Data entry by: DPM Date: 04/04/2014
 Checked by: KR Date: 4/5/14
 FileName: PBCH113A



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-13A
 DEPTH 36.0-36.5'
 SAMPLE NO. -
 SOIL DESCR. Clayey Sand
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 4608

SAMPLED 11/21/13 MWH
 TEST STARTED 02/08/14 DPM
 TEST FINISHED 02/19/14 DPM
 CELL NUMBER 27S
 SATURATED TEST Yes
 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	1.8	8.3		
50.0	48.0	9.1	9.9	8.8	0.88
60.0		9.4	9.4	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	9.40	0.00
0.25	0.50	14.25	-4.85
0.5	0.71	14.45	-5.05
1	1.00	14.60	-5.20
2	1.41	14.70	-5.30
4	2.00	14.85	-5.45
9	3.00	14.90	-5.50
16	4.00	15.00	-5.60
30	5.48	15.15	-5.75
60	7.75	15.30	-5.90
120	10.95	15.40	-6.00
240	15.49	15.60	-6.20
360	18.97	15.80	-6.40

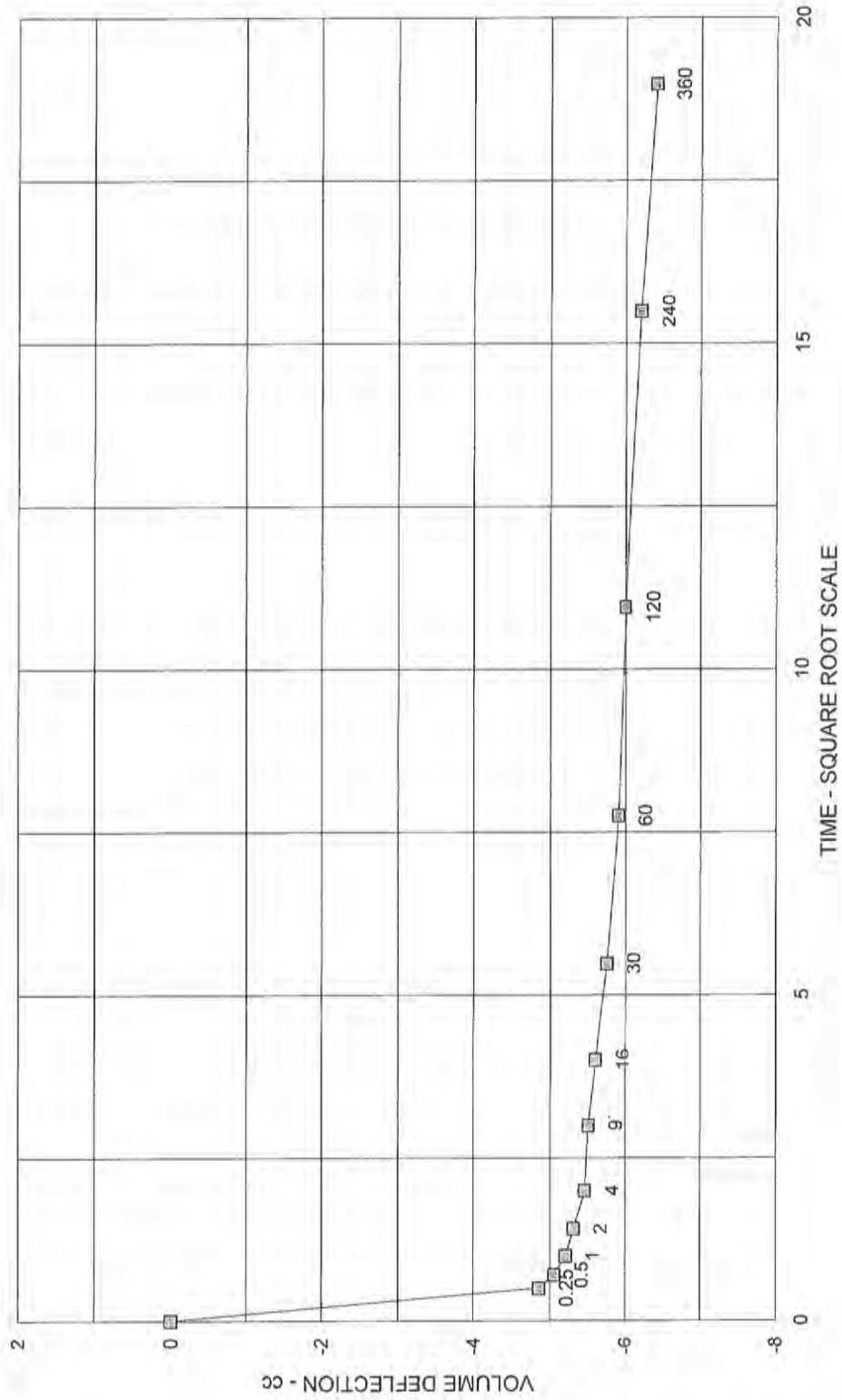
Initial Height (in)	2.981	Init. Vol. (CC)	142.79
Height Change (in)	0.052	Vol. Change (CC)	17.70
Ht. After Cons. (in)	2.929	Cell Exp. (CC)	19.72
Initial Area (sq in)	2.922	Net Change (CC)	-2.02
Area After Cons. (sq in)	3.017	Cons. Vol. (CC)	144.81

Data entry by: DPM Date: 04/04/2014
 Checked by: Date: 4/5/14
 FileName: PBCH113A



CONSOLIDATION DATA

TI-B1-13A, 36.0-36.5', -



Time in Minutes CONF. PRES. PSF 4608

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B1-11B	SAMPLED	11/21/13 MWH
DEPTH	30.5-31.0'	TEST STARTED	02/08/14 DPM
SAMPLE NO.	-	TEST FINISHED	02/20/14 DPM
SOIL DESCR.	Sand Tailings (v. fine)	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	249.8	243.4
Wt. Wet Soil & Pan (g)	256.2	249.9
Wt. Dry Soil & Pan (g)	191.2	191.2
Wt. Lost Moisture (g)	65.1	58.7
Wt. of Pan Only (g)	6.5	6.5
Wt. of Dry Soil (g)	184.7	184.7
Moisture Content %	35.2	31.8
Wet Density PCF	109.4	113.6
Dry Density PCF	80.9	86.2

Init. Diameter (in)	1.891	(cm)	4.803
Init. Area (sq in)	2.808	(sq cm)	18.120
Init. Height (in)	3.096	(cm)	7.864
Vol. Bef. Consol. (cu ft)	0.00503		
Vol. After Consol. (cu ft)	0.00472		
Porosity %	43.91		
Constant Head (PSI)	2.00	(cm)	140.79

Time	Time	Init.	Final	Head	Permeability
Min	Sec	Burette	Burette	Corr.	k
		CC	CC	CM	cm/sec
480.0	28800	47.5	43.3	15.9	4.9E-07
1440.0	86400	47.4	36.4	19.7	4.4E-07
1331.0	79860	46.7	40.0	18.1	2.9E-07
510.0	30600	40.0	37.5	23.2	2.9E-07
860.0	51600	37.5	33.3	26.8	3.0E-07
489.0	29340	33.3	31.0	30.4	3.0E-07

Note: The sample contains a facies change, Clayey Silt on the bottom with Sand on the top of the sample.

Average Temperature 20.7

Data entry by: DPM Date: 04/10/2014
Checked by: VR Date: 4/11/14
FileName: PBCH111B



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-11B
 DEPTH 30.5-31.0'
 SAMPLE NO. -
 SOIL DESCR. Sand Tailings (v. fine)
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 3600

SAMPLED 11/21/13 MWH
 TEST STARTED 02/08/14 DPM
 TEST FINISHED 02/20/14 DPM
 CELL NUMBER 26S
 SATURATED TEST Yes
 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	1.9 9.2			
50.0	48.0	10.1 11.1	38.7 48.1	9.4	0.94
60.0		10.8 10.7	48.2 58.0	9.8	0.98

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	10.70	0.00
0.25	0.50	15.40	-4.70
0.5	0.71	16.10	-5.40
1	1.00	16.90	-6.20
2	1.41	17.80	-7.10
4	2.00	18.80	-8.10
9	3.00	20.10	-9.40
16	4.00	20.70	-10.00
30	5.48	21.05	-10.35
60	7.75	21.30	-10.60
120	10.95	21.60	-10.90
240	15.49	21.85	-11.15
360	18.97	22.00	-11.30

Initial Height (in)	3.096	Init. Vol. (CC)	142.51
Height Change (in)	0.152	Vol. Change (CC)	27.00
Ht. After Cons. (in)	2.944	Cell Exp. (CC)	18.23
Initial Area (sq in)	2.808	Net Change (CC)	8.77
Area After Cons. (sq in)	2.772	Cons. Vol. (CC)	133.74

Data entry by: DPM Date: 04/10/2014
 Checked by: VP Date: 4/11/14
 FileName: PBCH111B



CONSOLIDATION DATA

TI-B1-11B, 30.5-31.0', -



■ Time in Minutes CONF. PRES. PSF 3600

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-14
DEPTH 40.0-41.0' (40-42.5')
SAMPLE NO. -
SOIL DESCR. Clayey Silt Tailings
LOCATION Tailings Impoundment
CONF. PRES. PSF 8352

SAMPLED 11/26/13 MWH
TEST STARTED 02/21/14 DPM
TEST FINISHED 03/04/14 DPM
CELL NUMBER 26S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	558.6	536.3
Wt. Wet Soil & Pan (g)	572.4	552.1
Wt. Dry Soil & Pan (g)	396.2	396.2
Wt. Lost Moisture (g)	176.2	155.9
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	380.4	380.4
Moisture Content %	46.3	41.0
Wet Density PCF	108.5	116.7
Dry Density PCF	74.2	82.7

Init. Diameter (in)	2.822	(cm)	7.168
Init. Area (sq in)	6.255	(sq cm)	40.355
Init. Height (in)	3.124	(cm)	7.935
Vol. Bef. Consol. (cu ft)	0.01131		
Vol. After Consol. (cu ft)	0.01014		
Porosity %	54.32		
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	47.2	44.8	15.3	4.4E-08
1440.0	86400	44.8	42.7	17.7	3.9E-08
1440.0	86400	42.7	41.1	19.7	3.1E-08
1590.0	95400	41.1	39.3	21.6	3.2E-08
2880.0	172800	39.3	36.5	24.1	2.8E-08
1440.0	86400	36.5	35.1	26.4	2.9E-08

Average Temperature 20.5

Data entry by: DPM Date: 04/10/2014
Checked by: VR Date: 4/11/14
FileName: PBCH1014



TRIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-14
 DEPTH 40.0-41.0' (40-42.5')
 SAMPLE NO. -
 SOIL DESCR. Clayey Silt Tailings
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 8352

SAMPLED 11/26/13 MWH
 TEST STARTED 02/21/14 DPM
 TEST FINISHED 03/04/14 DPM
 CELL NUMBER 26S
 SATURATED TEST Yes
 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	3.2	9.3				
50.0	48.0	9.6	10.4	38.4	47.6	9.2	0.92
60.0		10.8	10.8	48.3	58.0	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	7.80	-7.50
0.5	0.71	8.60	-8.30
1	1.00	9.60	-9.30
2	1.41	11.00	-10.70
4	2.00	12.90	-12.60
9	3.00	16.10	-15.80
16	4.00	19.20	-18.90
30	5.48	23.40	-23.10
60	7.75	29.00	-28.70
120	10.95	34.60	-34.30
240	15.49	38.60	-38.30
360	18.97	40.00	-39.70

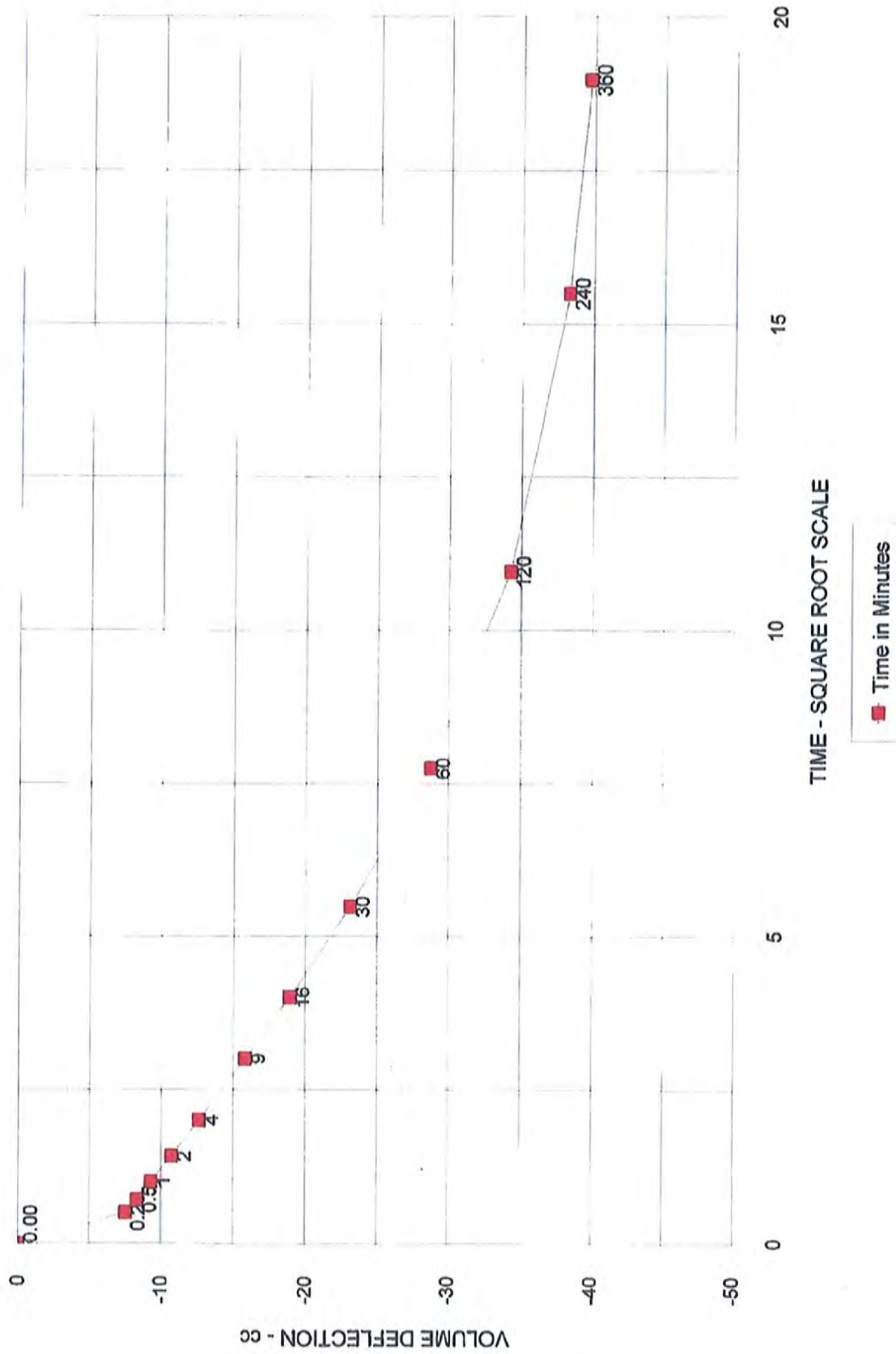
Initial Height (in)	3.124	Init. Vol. (CC)	320.25
Height Change (in)	0.144	Vol. Change (CC)	54.70
Ht. After Cons. (in)	2.980	Cell Exp. (CC)	21.51
Initial Area (sq in)	6.255	Net Change (CC)	33.19
Area After Cons. (sq in)	5.877	Cons. Vol. (CC)	287.07

Data entry by: VR DPM Date: 03/12/2014
 Checked by: VR Date: 4/11/14
 FileName: PBCH1014



CONSOLIDATION DATA

TI-B10-14, 40.0-41.0' (40-42.5'), -



PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B10-26	SAMPLED	11/27/13 MWH
DEPTH	106.9-107.3	TEST STARTED	02/27/14 DPM
SAMPLE NO.	-	TEST FINISHED	3/7/14 DPM
SOIL DESCR.	Weathered Sandstone	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	16560	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	803.5	811.5
Wt. Wet Soil & Pan (g)	819.3	827.3
Wt. Dry Soil & Pan (g)	719.3	719.3
Wt. Lost Moisture (g)	100.1	108.0
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	703.4	703.4
Moisture Content %	14.2	15.4
Wet Density PCF	124.6	131.6
Dry Density PCF	109.1	114.1

Init. Diameter (in)	3.040	(cm)	7.722
Init. Area (sq in)	7.258	(sq cm)	46.831
Init. Height (in)	3.384	(cm)	8.595
Vol. Bef. Consol. (cu ft)	0.01421		
Vol. After Consol. (cu ft)	0.01359		
Porosity %	28.06		
Constant Head (PSI)	2.00	(cm)	140.79

Time	Time	Init.	Final	Head	Permeability
Min	Sec	Burette	Burette	Corr.	k
		CC	CC	CM	cm/sec
244.0	14640	43.6	42.3	18.6	1.4E-07
240.0	14400	42.3	40.8	20.1	1.6E-07
916.0	54960	40.8	35.9	23.6	1.4E-07
420.0	25200	35.9	33.8	27.4	1.4E-07

Average Temperature 22.1

Data entry by: DPM Date: 04/10/2014
 Checked by: KE Date: 4/11/14
 FileName: PBCH1026



TRIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B10-26
 DEPTH 106.9-107.3
 SAMPLE NO. -
 SOIL DESCR. Weathered Sandstone
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 16560

SAMPLED 11/27/13 MWH
 TEST STARTED 02/27/14 DPM
 TEST FINISHED 3/7/14 DPM
 CELL NUMBER 27S
 SATURATED TEST Yes
 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	19.3				
50.0		21.6	22.0	38.6	48.2	9.6	0.96

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	16.10	-15.80
0.5	0.71	17.60	-17.30
1	1.00	19.45	-19.15
2	1.41	21.85	-21.55
4	2.00	24.40	-24.10
9	3.00	26.25	-25.95
16	4.00	26.70	-26.40
30	5.48	26.95	-26.65
60	7.75	27.20	-26.90
120	10.95	27.40	-27.10
240	15.49	27.80	-27.50
360	18.97	27.80	-27.50

Initial Height (in)	3.384	Init. Vol. (CC)	402.57
Height Change (in)	0.031	Vol. Change (CC)	45.50
Ht. After Cons. (in)	3.353	Cell Exp. (CC)	27.94
Initial Area (sq in)	7.258	Net Change (CC)	17.56
Area After Cons. (sq in)	7.006	Cons. Vol. (CC)	385.02

Data entry by: KA DPM Date: 03/12/2014
 Checked by: 4/10/14
 FileName: PBCH1026



CONSOLIDATION DATA

TI-B10-26, 106.9-107.3, -



TIME - SQUARE ROOT SCALE

■ Time in Minutes

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-09
DEPTH 27.0-27.5' (25-27.5')
SAMPLE NO. -
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
CONF. PRES. PSF 2016

SAMPLED 11/21/13 MWH
TEST STARTED 03/27/14 DPM
TEST FINISHED 04/17/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	669.8	794.1
Wt. Wet Soil & Pan (g)	685.6	809.8
Wt. Dry Soil & Pan (g)	659.6	659.6
Wt. Lost Moisture (g)	26.0	150.3
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	643.8	643.8
Moisture Content %	4.0	23.3
Wet Density PCF	101.6	122.1
Dry Density PCF	97.6	99.0

	BEFORE TEST	AFTER TEST	
Init. Diameter (in)	2.407	(cm)	6.114
Init. Area (sq in)	4.550	(sq cm)	29.359
Init. Height (in)	5.520	(cm)	14.021
Vol. Bef. Consol. (cu ft)	0.01454		
Vol. After Consol. (cu ft)	0.01434		
Porosity %	37.01		
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
0.5	30	47.1	26.6	25.2	2.8E-03
0.5	30	47.0	25.7	25.8	2.9E-03
0.5	30	47.7	26.8	24.8	2.9E-03
0.5	30	44.9	24.4	27.6	2.9E-03

Average Temperature 25.3

Data entry by: DPM/DAW Date: 05/20/2014
Checked by: DPM Date: 5/24/14
FileName: PBCHB109

TRIAxIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-09
 DEPTH 27.0-27.5' (25-27.5')
 SAMPLE NO. -
 SOIL DESCR. Sand Tailings
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 2016

SAMPLED 11/21/13 MWH
 TEST STARTED 03/27/14 DPM
 TEST FINISHED 04/17/14 DPM
 CELL NUMBER 25S
 SATURATED TEST Yes
 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	2.9 13.5			
50.0	48.0	14.6 15.5	37.9 44.5	6.6	0.66
60.0	58.0	15.7 16.8	48.6 57.0	8.4	0.84
70.0	68.0	16.1 17.0	58.0 66.8	8.8	0.88
80.0		19.9 19.7	67.4 77.4	10.0	1.00

CONSOLIDATION DATA

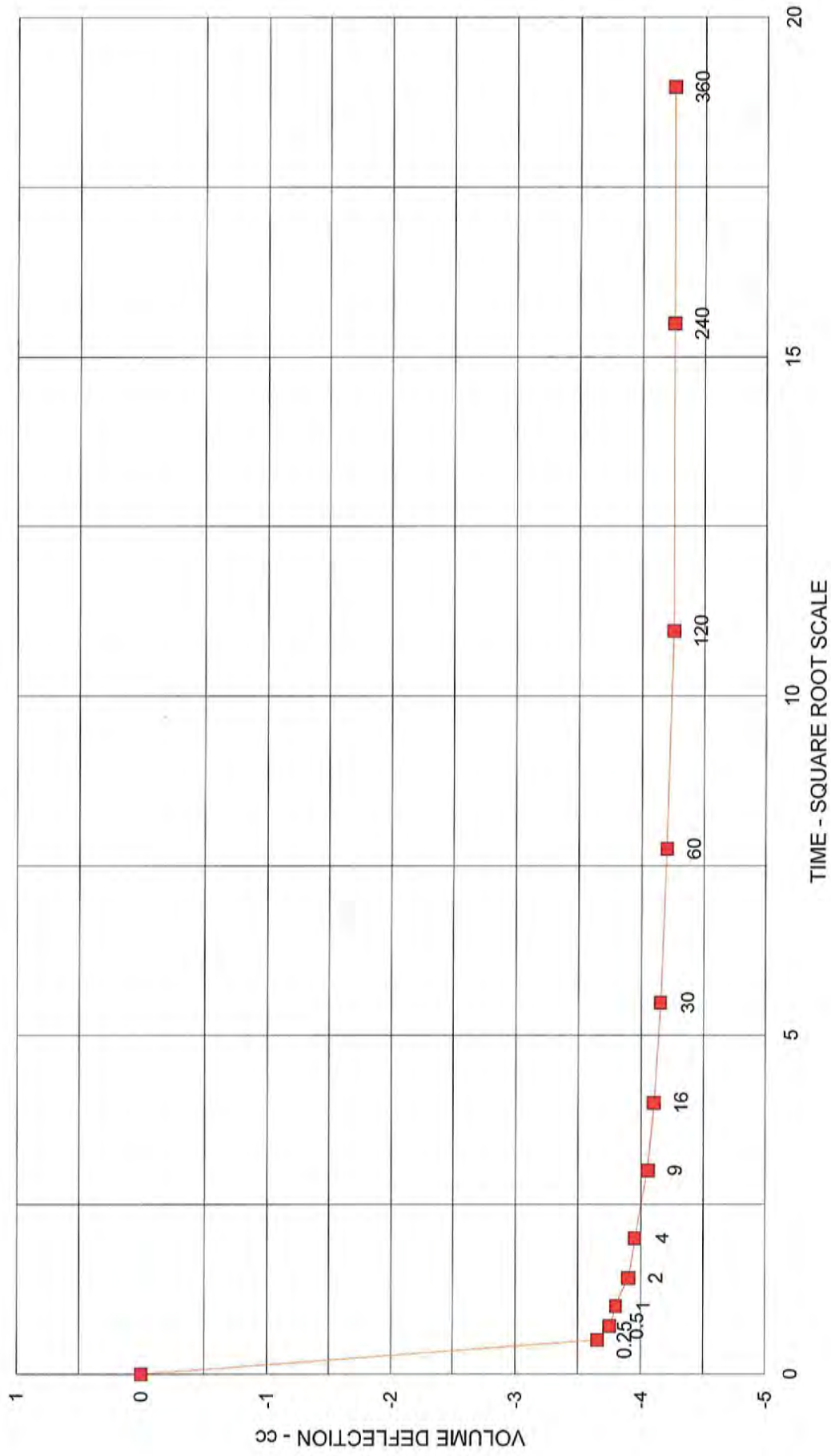
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	0.60	0.00
0.25	0.50	4.25	-3.65
0.5	0.71	4.35	-3.75
1	1.00	4.40	-3.80
2	1.41	4.50	-3.90
4	2.00	4.55	-3.95
9	3.00	4.65	-4.05
16	4.00	4.70	-4.10
30	5.48	4.75	-4.15
60	7.75	4.80	-4.20
120	10.95	4.85	-4.25
240	15.49	4.85	-4.25
360	18.97	4.85	-4.25

Initial Height (in)	5.520	Init. Vol. (CC)	411.68
Height Change (in)	0.040	Vol. Change (CC)	21.30
Ht. After Cons. (in)	5.480	Cell Exp. (CC)	15.68
Initial Area (sq in)	4.550	Net Change (CC)	5.62
Area After Cons. (sq in)	4.521	Cons. Vol. (CC)	406.06

Data entry by: DPM/DAW Date: 05/20/2014
 Checked by: DPM Date: 5/22/14
 FileName: PBCHB109

CONSOLIDATION DATA

TI-B1-09, 27.0-27.5' (25-27.5'), -



■ Time in Minutes ◆ CONF. PRES. PSF 2016

EFFECTIVE STRESS PATH ANALYSIS TEST DATA
ASTM D4767

CLIENT MWH
BORING NO. TI-B1-09
DEPTH 27.0-27.5' (25-27.5')
SAMPLE NO. A,B&C
PROJECT NO. --
LOCATION Tailings Impoundment

JOB NO. 2512-77
SAMPLED 11/21/13 MWH
SATURATED TEST
TEST TYPE TX/CUPP

				Peak Points			
				p'	q		
				PSF	PSF		
CONF. PRES. PSF	SAMPLE A	2016	PSF	SAMPLE A	1958	762	
	SAMPLE B	3168	PSF	SAMPLE B	3372	1888	
	SAMPLE C	4320	PSF	SAMPLE C	21139	12125	

SAMPLE A				SAMPLE B				SAMPLE C			
σ	σ	p'	q	σ	σ	p'	q	σ	σ	p'	q
3'	1'			3'	1'			3'	1'		
PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF
2016	2016	2016	0	3168	3168	3168	0	4320	4320	4320	0
1987	2370	2179	191	2650	4717	3683	1034	3686	7289	5488	1801
1786	2837	2311	526	2333	5055	3694	1361	3499	8206	5852	2353
1541	2878	2209	668	2146	5147	3646	1501	3384	8731	6057	2673
1354	2785	2069	715	2002	5093	3548	1546	3269	9071	6170	2901
1195	2720	1958	762	1901	5083	3492	1591	3197	9269	6233	3036
1080	2603	1842	762	1814	5087	3451	1636	3154	9404	6279	3125
994	2515	1754	761	1757	5026	3392	1635	3110	9630	6370	3260
922	2442	1682	760	1699	5059	3379	1680	3082	9686	6384	3302
850	2368	1609	759	1656	5012	3334	1678	3053	9834	6443	3390
806	2229	1518	711	1627	4980	3304	1676	3038	9904	6471	3433
763	2184	1474	710	1584	5027	3305	1721	3038	9988	6513	3475
720	2140	1430	710	1570	5009	3289	1720	3024	10058	6541	3517
691	2109	1400	709	1541	4977	3259	1718	3053	10346	6700	3647
662	2079	1371	708	1526	5051	3289	1763	3053	10514	6783	3730
634	2049	1341	708	1512	5034	3273	1761	3082	10800	6941	3859
619	2033	1326	707	1498	5016	3257	1759	3125	11009	7067	3942
590	2003	1297	706	1498	5105	3301	1803	3139	11188	7163	4024
590	2001	1296	706	1483	5087	3285	1802	3211	11604	7408	4196
576	1986	1281	705	1483	5175	3329	1846	3240	11805	7522	4282
562	1970	1266	704	1483	5172	3327	1844	3398	12637	8018	4619
				1483	5260	3372	1888	3600	13594	8597	4997
				1483	5259	3371	1888	3845	14763	9304	5459
								4090	15923	10006	5916
								4378	17115	10746	6369
								4982	19672	12327	7345
								5674	22443	14058	8385
								6379	25180	15779	9400
								7085	27700	17393	10308
								7790	30010	18900	11110
								9014	33264	21139	12125
								9864	33286	21575	11711

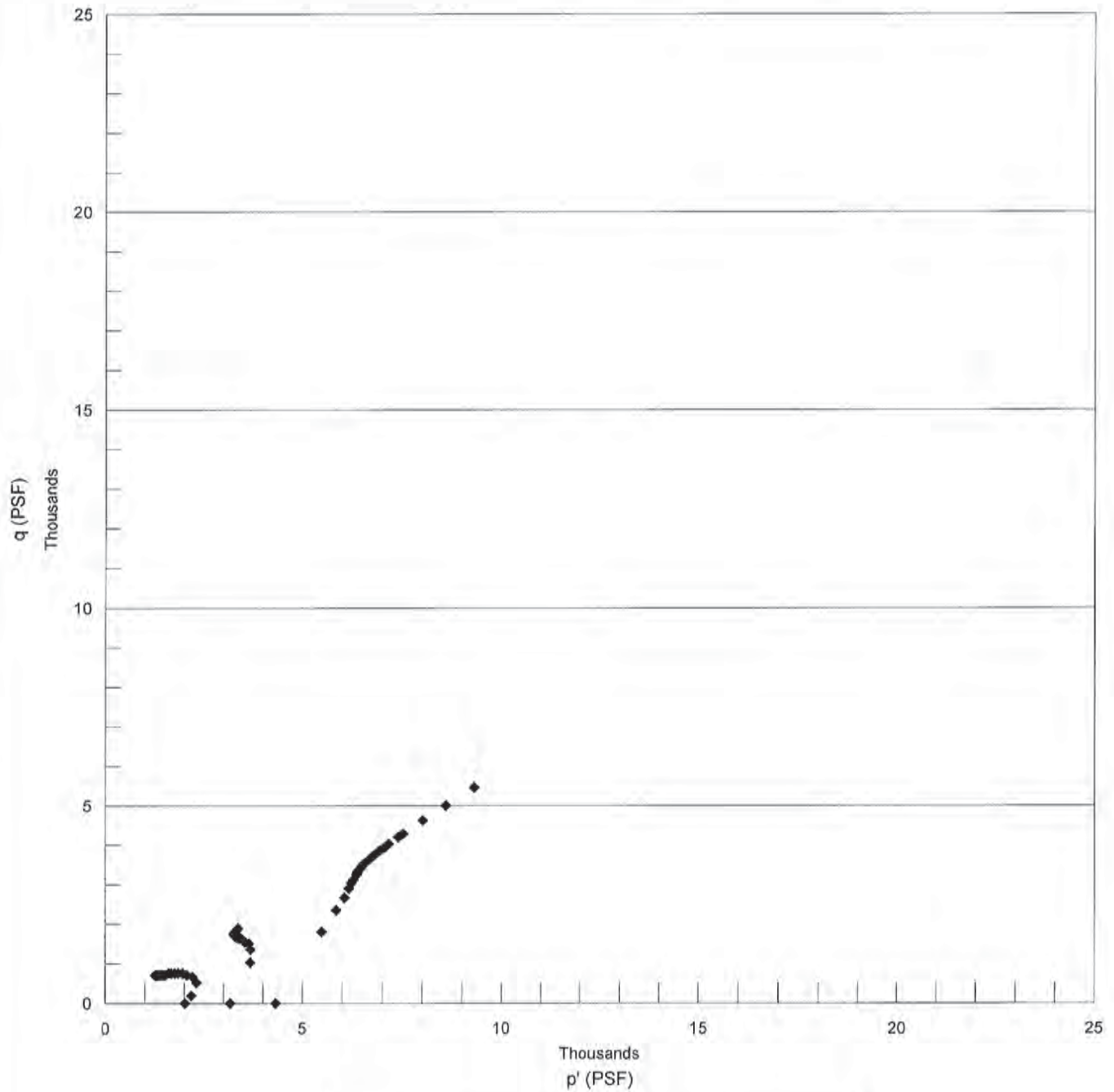
Data entry by: DAW
Data checked by: *DPW*
FileName: MWPQB109.WK4

Date: 05/22/2014
Date: *5/22/14*



Effective Stress Path Analysis - p' q Plots

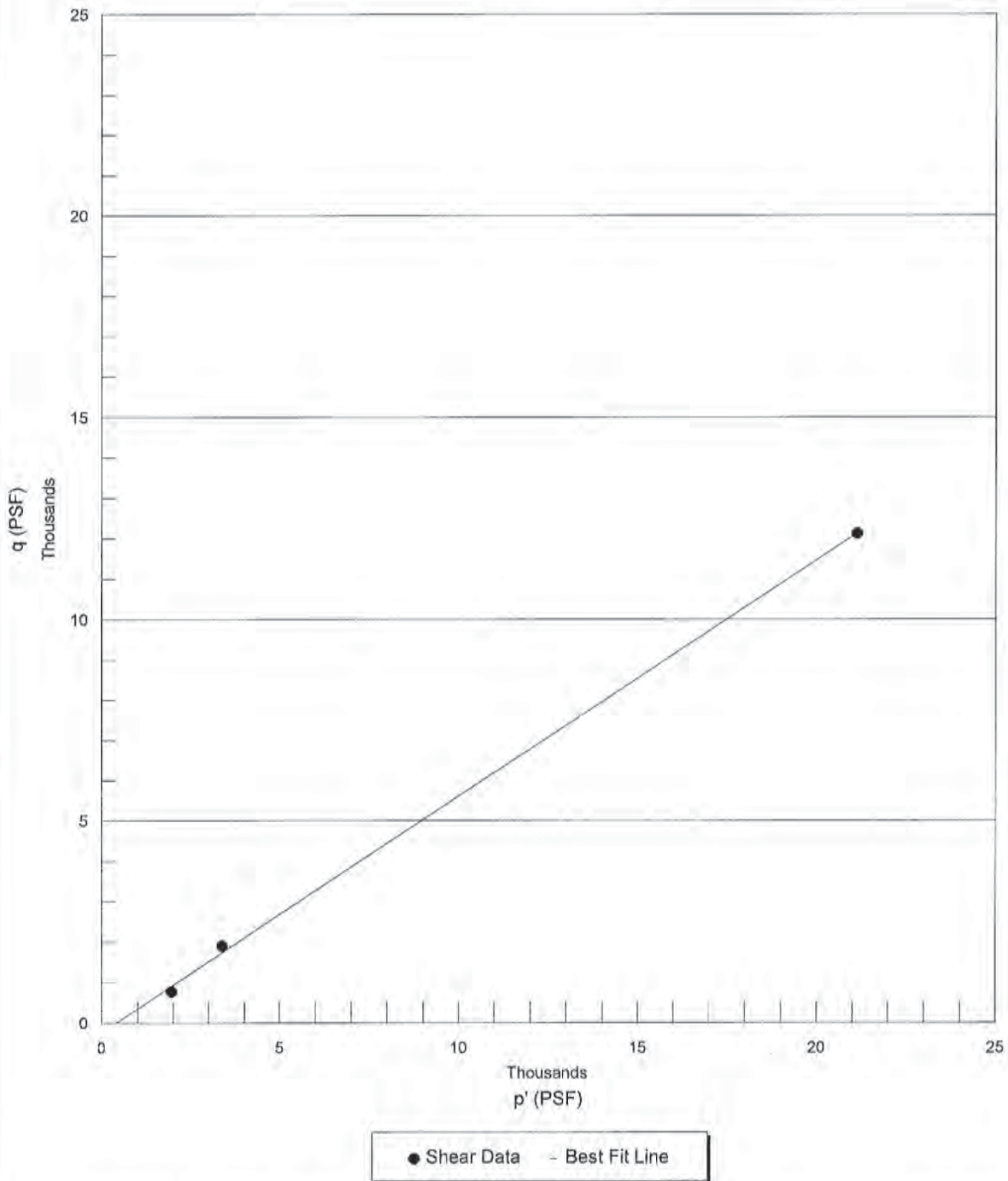
MWH, Tailings Impoundment, --, TI-B1-09, A, B & C, 27.0-27.5' (25-27.5')



◆ Stress Paths of Samples A, B & C

Effective Stress Path Analysis - p' - q Regression Plot

MWH, Tailings Impoundment, --, TI-B1-09, A, B&C, 27.0-27.5' (25-27.5')



NOTE: Peak points are plotted for visual verification only. Least squared regression analysis, yields a negative alpha (α) value; therefore no regression analysis has been provided.

TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-BI-09	SAMPLED	11/21/13 MWH
DEPTH	27.0-27.5' (25-27.5')	TEST STARTED	03/27/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/17/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	2016

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	669.8	794.1
Wt. Wet Soil & Pan (g)	685.6	809.8
Wt. Dry Soil & Pan (g)	659.6	659.6
Wt. Lost Moisture (g)	26.0	150.3
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	643.8	643.8
Moisture Content %	4.0	23.3
Wet Density PCF	101.6	122.4
Dry Density PCF	97.6	99.2
Init. Diameter (in)	2.407	
Init. Area (sq in)	4.550	
Init. Height (in)	5.520	
Vol. Bef. Consol. (cu ft)	0.01454	
Vol. After Consol. (cu ft)	0.01430	

Notes & Comments:

Data entry by: DAW
Data checked by: DPM
FileName: MWT0B109.WK4

Date: 05/20/2014
Date: 5/22/14



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-BI-09	SAMPLED	11/21/13 MWH
DEPTH	27.0-27.5' (25-27.5')	TEST STARTED	03/27/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/17/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/Cupp, Stage 1	CONF. PRES. PSF	2016

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	13.5				
50.0	48.0	14.6	15.5	37.9	44.5	6.6	0.66
60.0	58.0	15.7	16.8	48.6	57.0	8.4	0.84
70.0	68.0	16.1	17.0	58.0	66.8	8.8	0.88
80.0		19.9	19.7	67.4	77.4	10.0	1.00

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.60	0.00
0.25	0.5	4.25	-3.65
0.5	0.7	4.35	-3.75
1	1.0	4.40	-3.80
2	1.4	4.50	-3.90
4	2.0	4.55	-3.95
9	3.0	4.65	-4.05
16	4.0	4.70	-4.10
30	5.5	4.75	-4.15
60	7.7	4.80	-4.20
120	11.0	4.85	-4.25
240	15.5	4.85	-4.25
360	19.0	4.85	-4.25

Initial Height (in)	5.520	Init. Vol. (CC)	411.68
Height Change (in)	0.040	Vol. Change (CC)	22.10
Ht. After Cons. (in)	5.480	Cell Exp. (CC)	15.55
Initial Area (sq in)	4.550	Net Change (CC)	6.55
Area After Cons. (sq in)	4.511	Cons. Vol. (CC)	405.13

Data entry by: DAW
Data checked by: *OPM*
FileName: MWT0B109.WK4

Date: 05/20/2014
Date: *5/22/14*



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-BI-09	SAMPLED	11/21/13 MWH
DEPTH	27.0-27.5' (25-27.5')	TEST STARTED	03/27/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/17/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	2016

Init. Ht. (in)	5.520	Init. Area (sq in)	4.550
Consol. Ht. (in)	5.480	Consol. Area (sq in)	4.511
Back Pres. PSI	69.2	Strain Rate (in/min)	0.003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.511	0	69.2	0	2016	2016	1.00
12.0	383	0.005	0.10	4.515	383	69.4	29	1987	2370	1.19
33.0	1054	0.011	0.20	4.519	1051	70.8	230	1786	2837	1.59
42.0	1341	0.016	0.30	4.524	1337	72.5	475	1541	2878	1.87
45.0	1437	0.022	0.39	4.528	1431	73.8	662	1354	2785	2.06
48.0	1532	0.027	0.49	4.533	1525	74.9	821	1195	2720	2.28
48.0	1532	0.033	0.59	4.537	1523	75.7	936	1080	2603	2.41
48.0	1532	0.038	0.69	4.542	1522	76.3	1022	994	2515	2.53
48.0	1532	0.043	0.79	4.547	1520	76.8	1094	922	2442	2.65
48.0	1532	0.049	0.89	4.551	1519	77.3	1166	850	2368	2.79
45.0	1437	0.054	0.99	4.556	1422	77.6	1210	806	2229	2.76
45.0	1437	0.060	1.09	4.560	1421	77.9	1253	763	2184	2.86
45.0	1437	0.065	1.19	4.565	1420	78.2	1296	720	2140	2.97
45.0	1437	0.071	1.29	4.569	1418	78.4	1325	691	2109	3.05
45.0	1437	0.076	1.39	4.574	1417	78.6	1354	662	2079	3.14
45.0	1437	0.081	1.49	4.579	1415	78.8	1382	634	2049	3.23
45.0	1437	0.087	1.58	4.583	1414	78.9	1397	619	2033	3.28
45.0	1437	0.092	1.68	4.588	1412	79.1	1426	590	2003	3.39
45.0	1437	0.098	1.78	4.592	1411	79.1	1426	590	2001	3.39
45.0	1437	0.103	1.88	4.597	1410	79.2	1440	576	1986	3.45
45.0	1437	0.109	1.98	4.602	1408	79.3	1454	562	1970	3.51

Data entry by: DAW Date: 05/20/2014
 Data checked by: DPM Date: 5/22/14
 FileName: MWT0B109.WK4



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-BI-09
DEPTH 27.0-27.5' (25-27.5')
SAMPLE NO. --
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 2

SAMPLED 11/21/13 MWH
TEST STARTED 03/27/14 DPM
TEST FINISHED 04/17/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
CONF. PRES. PSF 3168

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	669.8	794.1
Wt. Wet Soil & Pan (g)	685.6	809.8
Wt. Dry Soil & Pan (g)	659.6	659.6
Wt. Lost Moisture (g)	26.0	150.3
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	643.8	643.8
Moisture Content %	4.0	23.3
Wet Density PCF	103.2	122.7
Dry Density PCF	99.2	99.5
Init. Diameter (in)	2.421	
Init. Area (sq in)	4.602	
Init. Height (in)	5.372	
Vol. Bef. Consol. (cu ft)	0.01430	
Vol. After Consol. (cu ft)	0.01427	

Notes & Comments:

Data entry by: DAW
Data checked by: DPM
FileName: MWT0B109.WK4

Date: 05/20/2014
Date: 5/22/14



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-BI-09
DEPTH 27.0-27.5' (25-27.5')
SAMPLE NO. --
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
TEST TYPE TX/Cupp, Stage 2

SAMPLED 11/21/13 MWH
TEST STARTED 03/27/14 DPM
TEST FINISHED 04/17/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
CONF. PRES. PSF 3168

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	9.40	0.00
0.25	0.5	10.80	-1.40
0.5	0.7	10.85	-1.45
1	1.0	10.90	-1.50
2	1.4	10.95	-1.55
4	2.0	10.95	-1.55
9	3.0	11.00	-1.60
16	4.0	11.05	-1.65
30	5.5	11.10	-1.70
60	7.7	11.15	-1.75
120	11.0	11.25	-1.85
240	15.5	11.25	-1.85
360	19.0	11.25	-1.85

Initial Height (in) 5.372
Height Change (in) 0.002
Ht. After Cons. (in) 5.370
Initial Area (sq in) 4.602
Area After Cons. (sq in) 4.593

Init. Vol. (CC) 405.13
Vol. Change (CC) 2.00
Cell Exp. (CC) 1.05
Net Change (CC) 0.95
Cons. Vol. (CC) 404.18

Data entry by: DAW
Data checked by: *DPM*
FileName: MWT0B109.WK4

Date: 05/20/2014
Date: *5/22/14*



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-BI-09	SAMPLED	11/21/13 MWH
DEPTH	27.0-27.5' (25-27.5')	TEST STARTED	03/27/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/17/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 2	CONF. PRES. PSF	3168
Init. Ht. (in)	5.372	Init. Area (sq in)	4.602
Consol. Ht. (in)	5.370	Consol. Area (sq in)	4.593
Back Pres. PSI	69.0	Strain Rate (in/min)	0.004

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.593	0	69.0	0	3168	3168	1.00
66.0	2069	0.005	0.10	4.597	2067	72.6	518	2650	4717	1.78
87.0	2728	0.011	0.20	4.602	2722	74.8	835	2333	5055	2.17
96.0	3010	0.016	0.30	4.606	3001	76.1	1022	2146	5147	2.40
99.0	3104	0.021	0.39	4.611	3092	77.1	1166	2002	5093	2.54
102.0	3198	0.027	0.49	4.615	3182	77.8	1267	1901	5083	2.67
105.0	3292	0.032	0.59	4.620	3273	78.4	1354	1814	5087	2.80
105.0	3292	0.037	0.69	4.625	3270	78.8	1411	1757	5026	2.86
108.0	3386	0.042	0.79	4.629	3360	79.2	1469	1699	5059	2.98
108.0	3386	0.048	0.89	4.634	3356	79.5	1512	1656	5012	3.03
108.0	3386	0.053	0.99	4.638	3353	79.7	1541	1627	4980	3.06
111.0	3480	0.058	1.09	4.643	3443	80.0	1584	1584	5027	3.17
111.0	3480	0.064	1.18	4.648	3439	80.1	1598	1570	5009	3.19
111.0	3480	0.069	1.28	4.652	3436	80.3	1627	1541	4977	3.23
114.0	3574	0.074	1.38	4.657	3525	80.4	1642	1526	5051	3.31
114.0	3574	0.080	1.48	4.662	3522	80.5	1656	1512	5034	3.33
114.0	3574	0.085	1.58	4.666	3518	80.6	1670	1498	5016	3.35
117.0	3669	0.090	1.68	4.671	3607	80.6	1670	1498	5105	3.41
117.0	3669	0.095	1.78	4.676	3603	80.7	1685	1483	5087	3.43
120.0	3763	0.101	1.88	4.680	3692	80.7	1685	1483	5175	3.49
120.0	3763	0.106	1.97	4.685	3688	80.7	1685	1483	5172	3.49
123.0	3857	0.111	2.07	4.690	3777	80.7	1685	1483	5260	3.55
123.0	3857	0.112	2.09	4.691	3776	80.7	1685	1483	5259	3.55

Data entry by: DAW Date: 05/20/2014
 Data checked by: *DPM* Date: *5/22/14*
 FileName: MWT0B109.WK4



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-BI-09	SAMPLED	11/21/13 MWH
DEPTH	27.0-27.5' (25-27.5')	TEST STARTED	03/27/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/17/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUp, Stage 3	CONF. PRES. PSF	4320

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	669.8	794.1
Wt. Wet Soil & Pan (g)	685.6	809.8
Wt. Dry Soil & Pan (g)	659.6	659.6
Wt. Lost Moisture (g)	26.0	150.3
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	643.8	643.8
Moisture Content %	4.0	23.3
Wet Density PCF	103.5	123.0
Dry Density PCF	99.5	99.7

Init. Diameter (in)	2.444
Init. Area (sq in)	4.691
Init. Height (in)	5.257
Vol. Bef. Consol. (cu ft)	0.01427
Vol. After Consol. (cu ft)	0.01423

Notes & Comments:

Data entry by: DAW
Data checked by: *DPM*
FileName: MWT0B109.WK4

Date: 05/20/2014
Date: *5/22/14*



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-BI-09
DEPTH 27.0-27.5' (25-27.5')
SAMPLE NO. --
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 3

SAMPLED 11/21/13 MWH
TEST STARTED 03/27/14 DPM
TEST FINISHED 04/17/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
CONF. PRES. PSF 4320

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	13.10	0.00
0.25	0.5	14.30	-1.20
0.5	0.7	14.35	-1.25
1	1.0	14.35	-1.25
2	1.4	14.40	-1.30
4	2.0	14.45	-1.35
9	3.0	14.50	-1.40
16	4.0	14.50	-1.40
30	5.5	14.55	-1.45
60	7.7	14.55	-1.45
120	11.0	14.55	-1.45
240	15.5	14.55	-1.45
360	19.0	14.55	-1.45

Initial Height (in) 5.257
Height Change (in) -0.006
Ht. After Cons. (in) 5.263
Initial Area (sq in) 4.691
Area After Cons. (sq in) 4.672

Init. Vol. (CC) 404.18
Vol. Change (CC) 2.20
Cell Exp. (CC) 1.05
Net Change (CC) 1.15
Cons. Vol. (CC) 403.03

Data entry by: DAW
Data checked by: DPM
FileName: MWT0B109.WK4

Date: 05/20/2014
Date: 5/20/14



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-BI-09	SAMPLED	11/21/13 MWH
DEPTH	27.0-27.5' (25-27.5')	TEST STARTED	03/27/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/17/14 DPM
SOIL DESCR.	Sand Tailings	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUp, Stage 3	CONF. PRES. PSF	4320
Init. Ht. (in)	5.257	Init. Area (sq in)	4.691
Consol. Ht. (in)	5.263	Consol. Area (sq in)	4.672
Back Pres. PSI	69.4	Strain Rate (in/min)	0.010

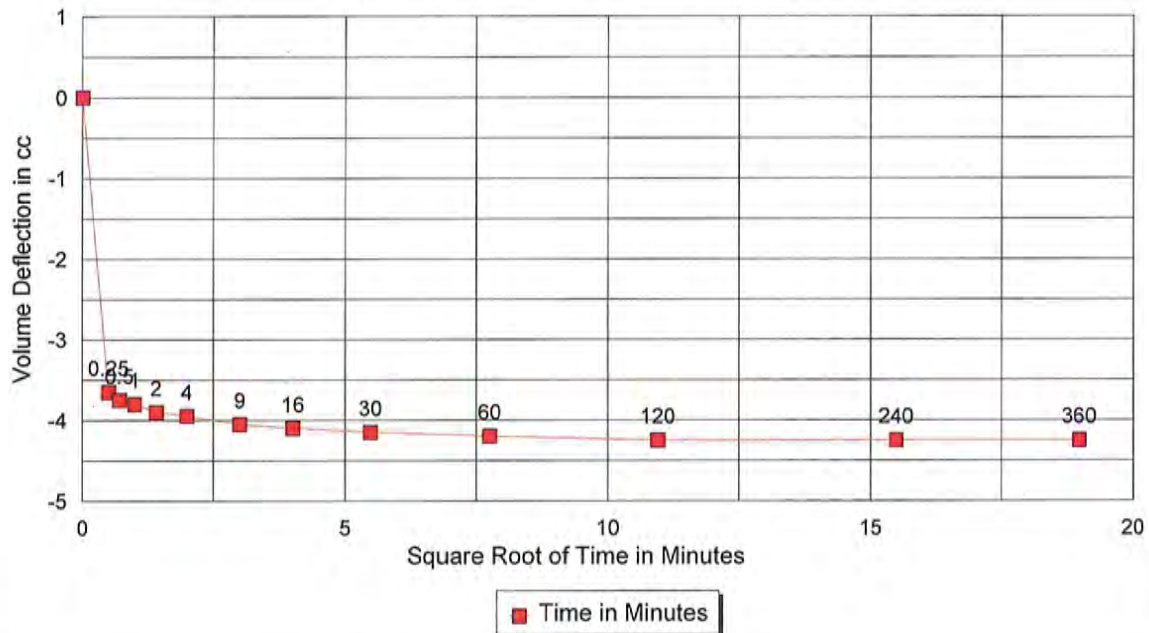
Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.672	0	69.4	0	4320	4320	1.00
117.0	3606	0.005	0.10	4.677	3603	73.8	634	3686	7289	1.98
153.0	4716	0.011	0.20	4.681	4706	75.1	821	3499	8206	2.34
174.0	5363	0.016	0.30	4.686	5347	75.9	936	3384	8731	2.58
189.0	5825	0.021	0.40	4.691	5802	76.7	1051	3269	9071	2.77
198.0	6103	0.026	0.50	4.695	6072	77.2	1123	3197	9269	2.90
204.0	6288	0.032	0.60	4.700	6250	77.5	1166	3154	9404	2.98
213.0	6565	0.037	0.70	4.705	6519	77.8	1210	3110	9630	3.10
216.0	6658	0.042	0.80	4.710	6604	78.0	1238	3082	9686	3.14
222.0	6842	0.047	0.90	4.714	6781	78.2	1267	3053	9834	3.22
225.0	6935	0.053	1.00	4.719	6866	78.3	1282	3038	9904	3.26
228.0	7027	0.058	1.10	4.724	6950	78.3	1282	3038	9988	3.29
231.0	7120	0.063	1.20	4.729	7034	78.4	1296	3024	10058	3.33
240.0	7397	0.074	1.40	4.738	7294	78.2	1267	3053	10346	3.39
246.0	7582	0.084	1.60	4.748	7461	78.2	1267	3053	10514	3.44
255.0	7860	0.095	1.80	4.758	7718	78.0	1238	3082	10800	3.50
261.0	8045	0.105	2.00	4.767	7884	77.7	1195	3125	11009	3.52
267.0	8229	0.116	2.20	4.777	8048	77.6	1181	3139	11188	3.56
279.0	8599	0.126	2.40	4.787	8393	77.1	1109	3211	11604	3.61
285.0	8784	0.132	2.50	4.792	8565	76.9	1080	3240	11805	3.64
309.0	9524	0.158	3.00	4.817	9238	75.8	922	3398	12637	3.72
336.0	10356	0.184	3.50	4.841	9994	74.4	720	3600	13594	3.78
369.0	11373	0.211	4.00	4.867	10918	72.7	475	3845	14763	3.84
402.0	12390	0.237	4.50	4.892	11833	71.0	230	4090	15923	3.89
435.0	13408	0.263	5.00	4.918	12737	69.0	-58	4378	17115	3.91
507.0	15627	0.316	6.00	4.970	14689	64.8	-662	4982	19672	3.95
585.0	18031	0.368	7.00	5.024	16769	60.0	-1354	5674	22443	3.96
663.0	20435	0.421	8.00	5.078	18800	55.1	-2059	6379	25180	3.95
735.0	22654	0.474	9.00	5.134	20616	50.2	-2765	7085	27700	3.91
801.0	24688	0.526	10.00	5.191	22220	45.3	-3470	7790	30010	3.85
894.0	27555	0.631	12.00	5.309	24249	36.8	-4694	9014	33264	3.69
894.0	27555	0.789	15.00	5.496	23422	30.9	-5544	9864	33286	3.37

Data entry by: DAW Date: 05/20/2014
 Data checked by: DPM Date: 5/22/14
 FileName: MWT0B109.WK4



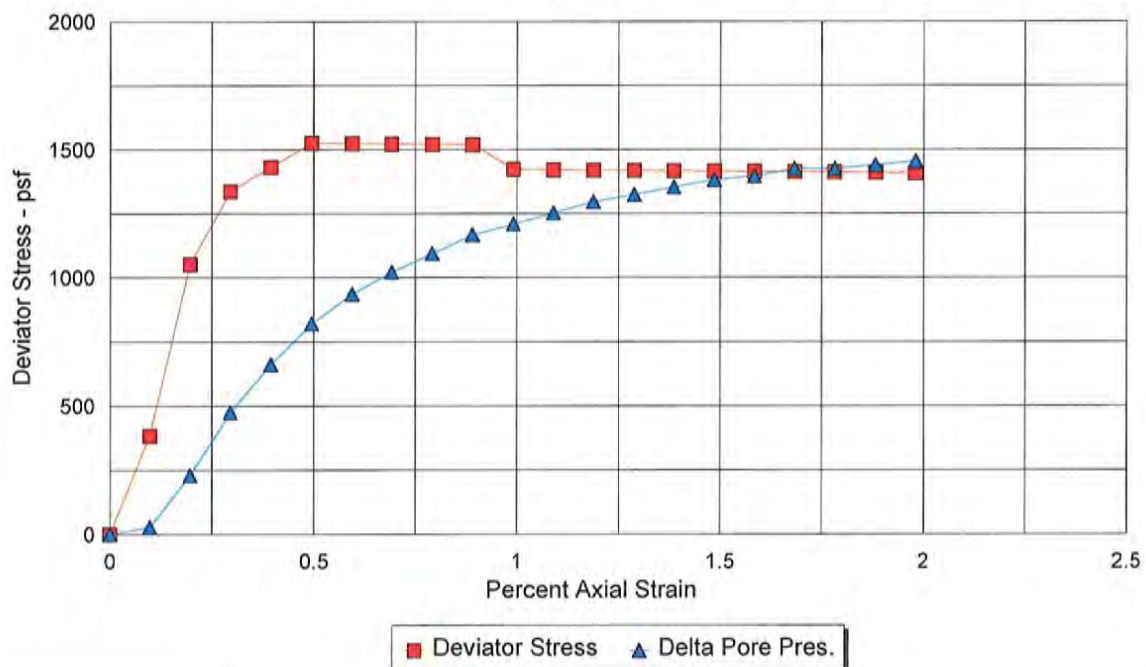
CONSOLIDATION DATA

TI-BI-09, 27.0-27.5' (25-27.5'), --, Stage 1



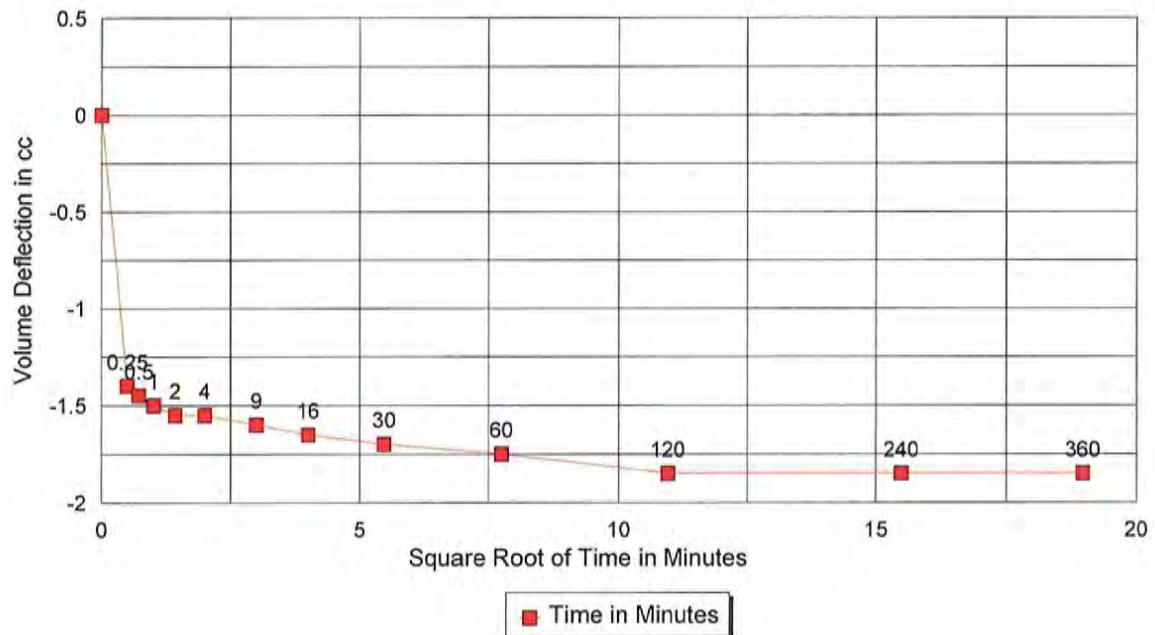
TRIAXIAL TEST - TX/CUpp

TI-BI-09, 27.0-27.5' (25-27.5'), --, Stage 1



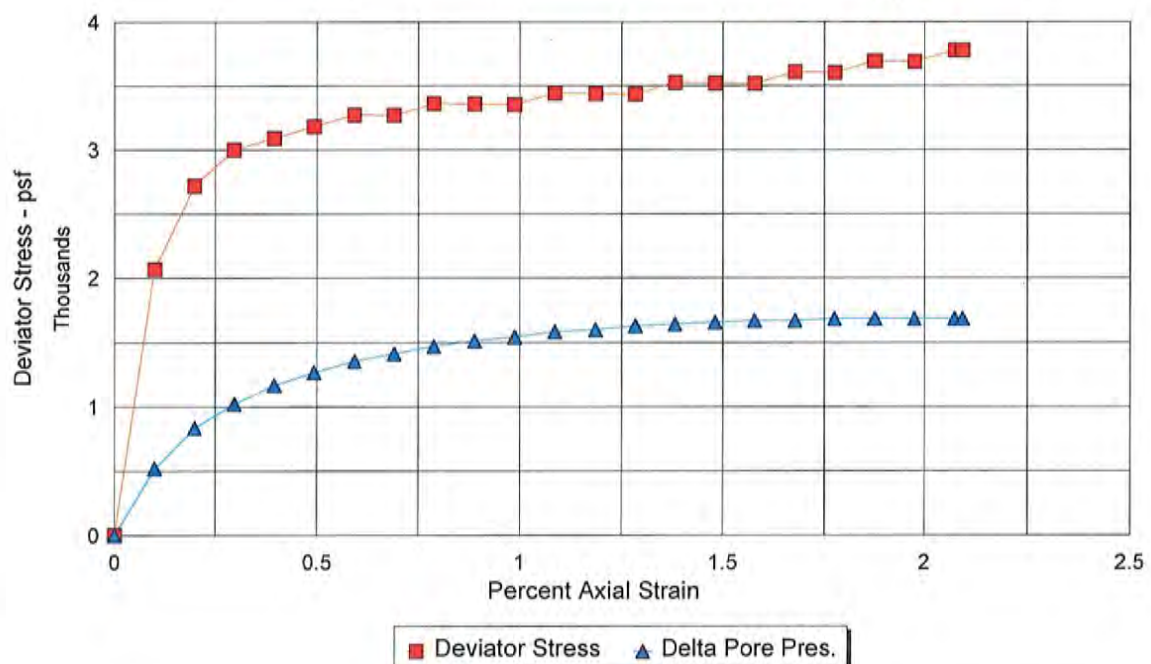
CONSOLIDATION DATA

TI-BI-09, 27.0-27.5' (25-27.5'), --, Stage 2



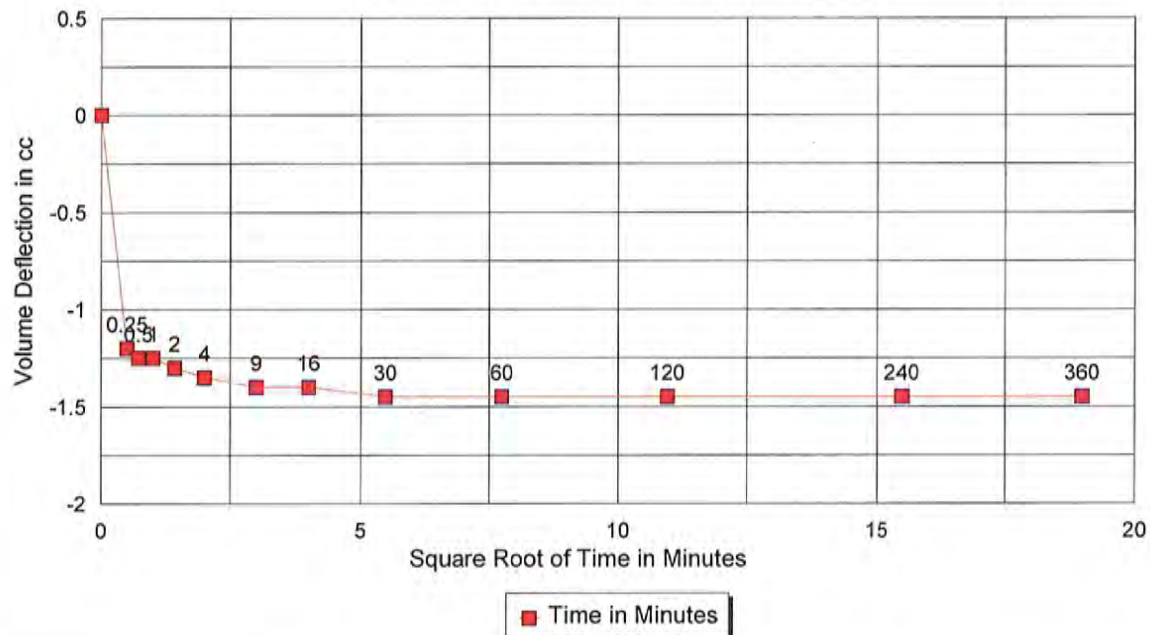
TRIAXIAL TEST - TX/CUpp

TI-BI-09, 27.0-27.5' (25-27.5'), --, Stage 2



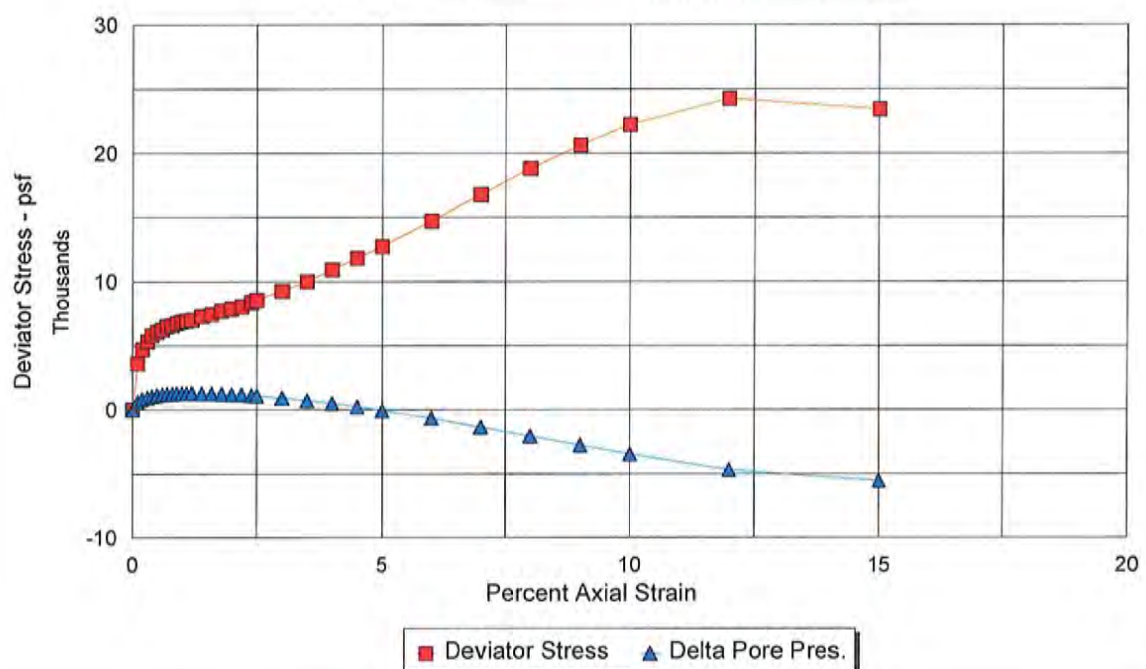
CONSOLIDATION DATA

TI-BI-09, 27.0-27.5' (25-27.5'), --, Stage 3



TRIAXIAL TEST - TX/CU_{pp}

TI-BI-09, 27.0-27.5' (25-27.5'), --, Stage 3



EFFECTIVE STRESS PATH ANALYSIS TEST DATA
ASTM D4767

CLIENT MWH
BORING NO. TI-B1-11A
DEPTH 31.0-31.5'
SAMPLE NO. A,B&C
PROJECT NO. --
LOCATION Tailings Impoundment

JOB NO. 2512-77
SAMPLED 11/21/13 MWH
SATURATED TEST
TEST TYPE TX/CUPP

				Peak Points		
				p'	q	
				PSF	PSF	
CONF. PRES. PSF	SAMPLE A	2736	PSF	SAMPLE A	2479	1212
	SAMPLE B	3888	PSF	SAMPLE B	3499	1872
	SAMPLE C	5040	PSF	SAMPLE C	4537	2607

SAMPLE A				SAMPLE B				SAMPLE C			
σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q
PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF
2736	2736	2736	0	3888	3888	3888	0	5040	5040	5040	0
2462	3235	2849	386	3456	4990	4223	767	4406	6363	5385	978
2290	3370	2830	540	3154	5146	4150	996	3960	6666	5313	1353
2102	3336	2719	617	2880	5177	4028	1148	3614	6769	5191	1577
1958	3345	2652	693	2678	5126	3902	1224	3355	6806	5081	1726
1858	3397	2627	770	2520	5118	3819	1299	3154	7051	5102	1949
1771	3463	2617	846	2376	5124	3750	1374	2995	7038	5017	2021
1699	3542	2621	922	2275	5173	3724	1449	2866	7054	4960	2094
1642	3483	2562	921	2189	5236	3712	1523	2750	7084	4917	2167
1584	3424	2504	920	2117	5161	3639	1522	2664	7142	4903	2239
1555	3546	2551	995	2045	5237	3641	1596	2520	7138	4829	2309
1512	3501	2506	994	2002	5191	3596	1595	2405	7162	4783	2379
1469	3609	2539	1070	1944	5282	3613	1669	2318	7066	4692	2374
1440	3578	2509	1069	1901	5235	3568	1667	2246	7132	4689	2443
1411	3547	2479	1068	1872	5203	3538	1666	2203	7227	4715	2512
1382	3516	2449	1067	1829	5308	3568	1740	2146	7159	4652	2507
1354	3637	2495	1142	1800	5275	3538	1738	2102	7105	4604	2501
1339	3620	2480	1141	1771	5243	3507	1736	2074	7066	4570	2496
1325	3604	2464	1139	1742	5362	3552	1810	2030	7153	4592	2561
1296	3573	2434	1138	1714	5329	3521	1808	1930	7144	4537	2607
1282	3556	2419	1137	1699	5311	3505	1806	1886	7051	4469	2582
1267	3691	2479	1212	1685	5293	3489	1804	1872	6987	4430	2558
1238	3659	2449	1210	1656	5261	3458	1802	1858	7064	4461	2603
1238	3657	2448	1209	1656	5257	3456	1800	1872	7027	4450	2578
1238	3657	2448	1209	1642	5239	3440	1799	1886	6991	4439	2552
				1627	5370	3499	1872	1901	6954	4427	2527
				1613	5352	3482	1870	1944	6946	4445	2501
				1598	5334	3466	1868	1987	6939	4463	2476
				1584	5316	3450	1866	2045	6680	4363	2318
				1570	5297	3434	1864	2030	6487	4258	2228
								2016	6166	4091	2075
								1987	6093	4040	2053

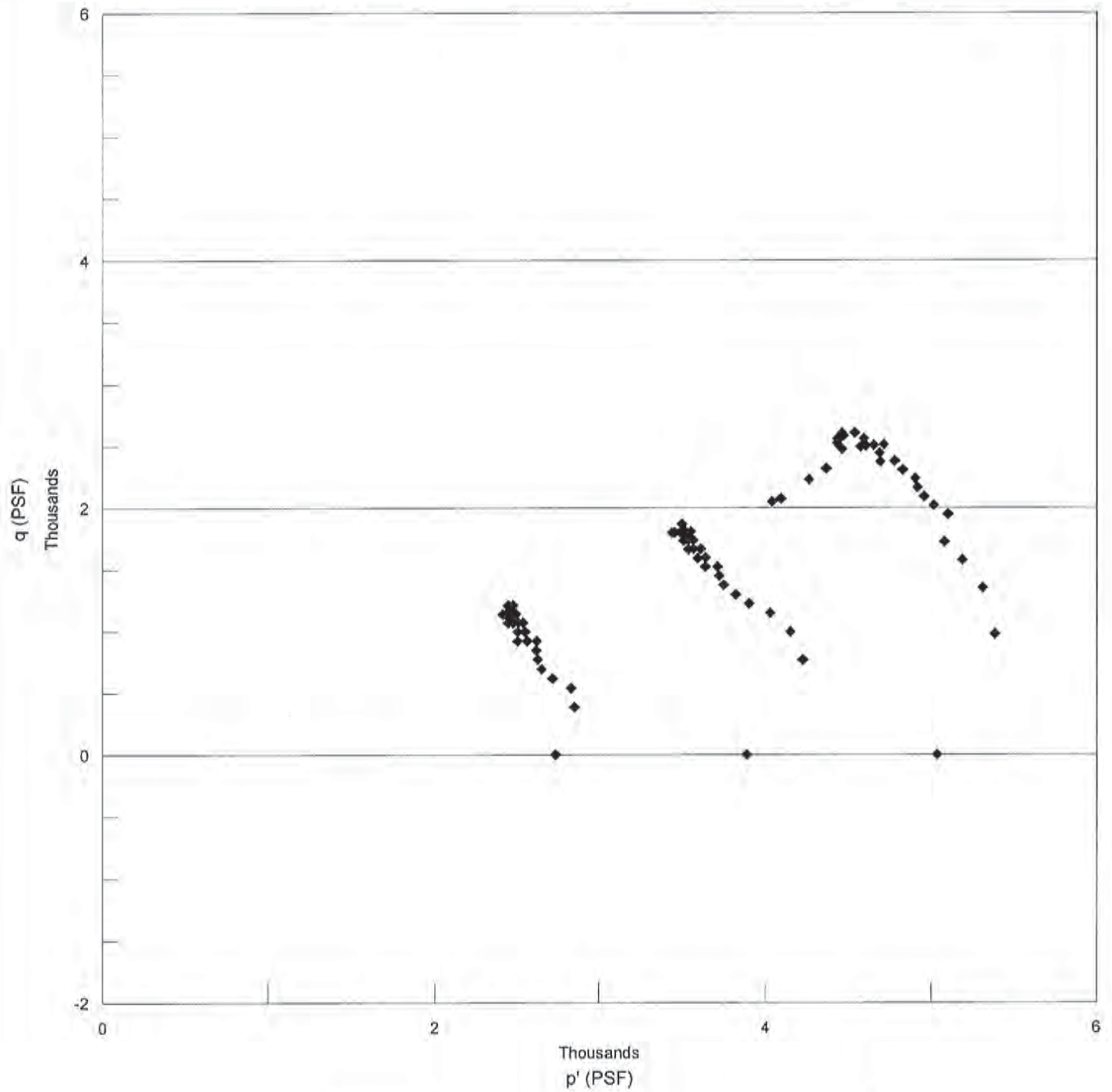
Data entry by: DAW
Data checked by: *DDM*
FileName: MWPQ111A.WK4

Date: 05/22/2014
Date: *5/22/14*



Effective Stress Path Analysis - p' q Plots

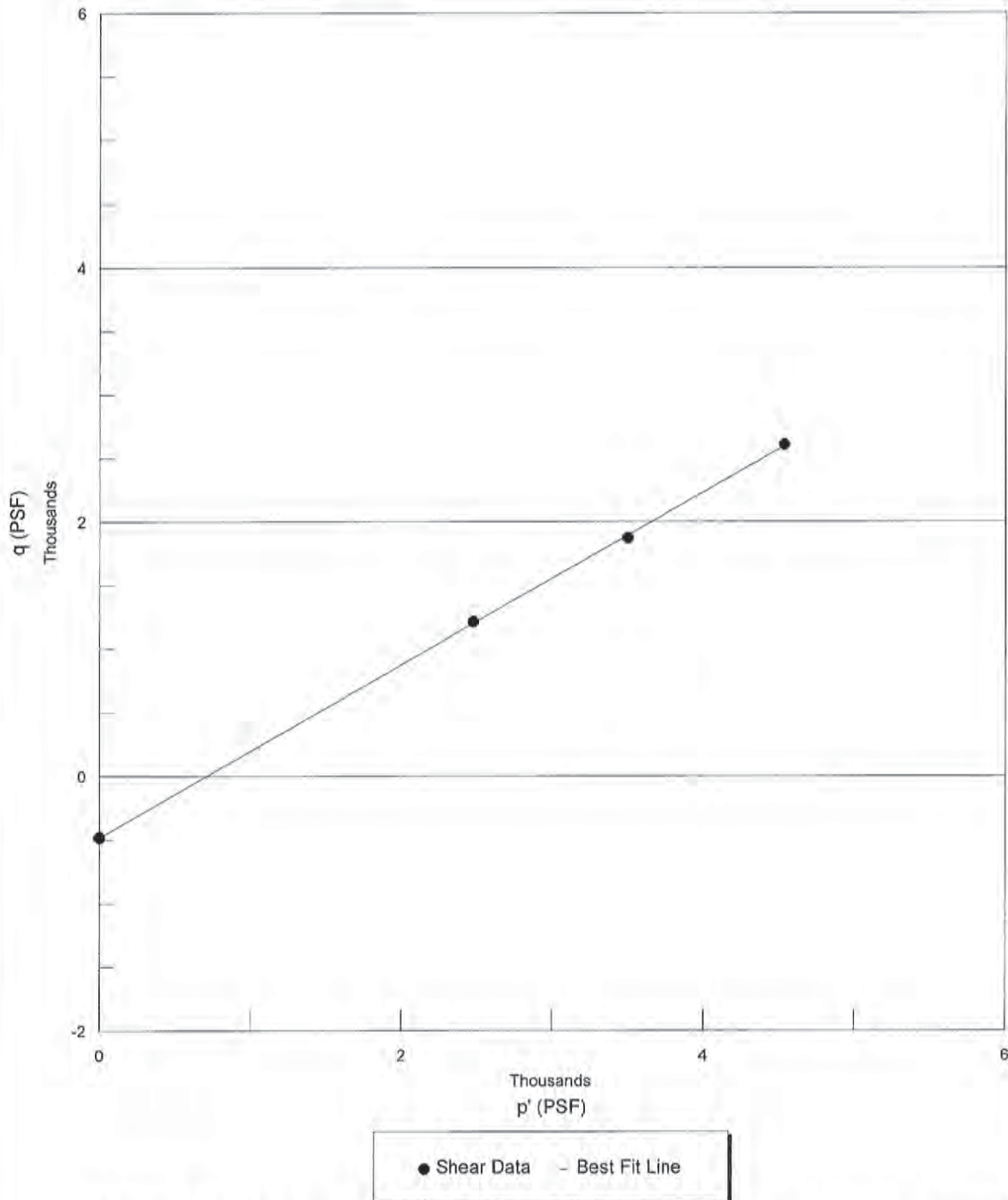
MWH, Tailings Impoundment, --, TI-B1-11A, A, B & C, 31.0-31.5'



◆ Stress Paths of Samples A, B & C

Effective Stress Path Analysis - p' - q Regression Plot

MWH, Tailings Impoundment, --, TI-B1-11A, A, B&C, 31.0-31.5'



NOTE: Peak points are plotted for visual verification only. Least squared regression analysis, yields a negative alpha (α) value; therefore no regression analysis has been provided.

TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B1-11A	SAMPLED	11/21/13 MWH
DEPTH	31.0-31.5'	TEST STARTED	04/21/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/30/14 DPM
SOIL DESCR.	Sand Tailings (V. Fine Clay)	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	2736

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	370.8	352.4
Wt. Wet Soil & Pan (g)	386.6	368.2
Wt. Dry Soil & Pan (g)	277.8	277.8
Wt. Lost Moisture (g)	108.9	90.5
Wt. of Pan Only (g)	15.9	15.9
Wt. of Dry Soil (g)	261.9	261.9
Moisture Content %	41.6	34.6
Wet Density PCF	108.3	107.6
Dry Density PCF	76.5	80.0
 Init. Diameter (in)	 1.902	
Init. Area (sq in)	2.841	
Init. Height (in)	4.591	
Vol. Bef. Consol. (cu ft)	0.00755	
Vol. After Consol. (cu ft)	0.00722	

Notes & Comments: Dried at 60 degrees C.

Data entry by: DAW
Data checked by: DPM
FileName: MWT0111A.WK4

Date: 05/22/2014
Date: 5/22/14



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-11A	SAMPLED	11/21/13 MWH
DEPTH	31.0-31.5'	TEST STARTED	04/21/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/30/14 DPM
SOIL DESCR.	Sand Tailings (V. Fine Clay)	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	2736

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	9.0				
50.0		10.3	10.4	39.0	48.7	9.7	0.97

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	10.40	0.00
0.25	0.5	13.80	-3.40
0.5	0.7	15.40	-5.00
1	1.0	16.40	-6.00
2	1.4	18.10	-7.70
4	2.0	20.20	-9.80
9	3.0	22.30	-11.90
16	4.0	24.40	-14.00
30	5.5	25.50	-15.10
60	7.7	26.10	-15.70
120	11.0	26.50	-16.10
240	15.5	26.80	-16.40
360	19.0	26.80	-16.40

Initial Height (in)	4.591	Init. Vol. (CC)	213.79
Height Change (in)	0.125	Vol. Change (CC)	25.90
Ht. After Cons. (in)	4.466	Cell Exp. (CC)	16.53
Initial Area (sq in)	2.841	Net Change (CC)	9.37
Area After Cons. (sq in)	2.793	Cons. Vol. (CC)	204.43

Data entry by: DAW
Data checked by: *DPM*
FileName: MWT0111A.WK4

Date: 05/22/2014
Date: *5/22/14*



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-11A	SAMPLED	11/21/13 MWH
DEPTH	31.0-31.5'	TEST STARTED	04/21/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/30/14 DPM
SOIL DESCR.	Sand Tailings (V. Fine Clay)	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUp, Stage 1	CONF. PRES. PSF	2736
Init. Ht. (in)	4.591	Init. Area (sq in)	2.841
Consol. Ht. (in)	4.466	Consol. Area (sq in)	2.793
Back Pres. PSI	38.9	Strain Rate (in/min)	0.001

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	2.793	0	38.9	0	2736	2736	1.00
15.0	773	0.004	0.10	2.796	773	40.8	274	2462	3235	1.31
21.0	1083	0.009	0.20	2.798	1081	42.0	446	2290	3370	1.47
24.0	1237	0.013	0.30	2.801	1234	43.3	634	2102	3336	1.59
27.0	1392	0.018	0.39	2.804	1387	44.3	778	1958	3345	1.71
30.0	1547	0.022	0.49	2.807	1539	45.0	878	1858	3397	1.83
33.0	1701	0.027	0.60	2.810	1691	45.6	965	1771	3463	1.95
36.0	1856	0.031	0.69	2.812	1843	46.1	1037	1699	3542	2.08
36.0	1856	0.035	0.79	2.815	1841	46.5	1094	1642	3483	2.12
36.0	1856	0.040	0.89	2.818	1840	46.9	1152	1584	3424	2.16
39.0	2011	0.044	0.99	2.821	1991	47.1	1181	1555	3546	2.28
39.0	2011	0.049	1.09	2.824	1989	47.4	1224	1512	3501	2.32
42.0	2166	0.053	1.19	2.826	2140	47.7	1267	1469	3609	2.46
42.0	2166	0.058	1.29	2.829	2138	47.9	1296	1440	3578	2.48
42.0	2166	0.062	1.39	2.832	2135	48.1	1325	1411	3547	2.51
42.0	2166	0.066	1.49	2.835	2133	48.3	1354	1382	3516	2.54
45.0	2320	0.071	1.59	2.838	2283	48.5	1382	1354	3637	2.69
45.0	2320	0.075	1.68	2.841	2281	48.6	1397	1339	3620	2.70
45.0	2320	0.080	1.78	2.844	2279	48.7	1411	1325	3604	2.72
45.0	2320	0.084	1.88	2.846	2277	48.9	1440	1296	3573	2.76
45.0	2320	0.088	1.98	2.849	2274	49.0	1454	1282	3556	2.77
48.0	2475	0.093	2.08	2.852	2423	49.1	1469	1267	3691	2.91
48.0	2475	0.097	2.18	2.855	2421	49.3	1498	1238	3659	2.95
48.0	2475	0.102	2.28	2.858	2419	49.3	1498	1238	3657	2.95
48.0	2475	0.102	2.28	2.858	2418	49.3	1498	1238	3657	2.95

Data entry by: DAW Date: 05/22/2014
 Data checked by: *OPM* Date: *5/22/14*
 FileName: MWT0111A.WK4



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B1-11A	SAMPLED	11/21/13 MWH
DEPTH	31.0-31.5'	TEST STARTED	04/21/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/30/14 DPM
SOIL DESCR.	Sand Tailings (V. Fine Clay)	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 2	CONF. PRES. PSF	3888

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	370.8	352.4
Wt. Wet Soil & Pan (g)	386.6	368.2
Wt. Dry Soil & Pan (g)	277.8	277.8
Wt. Lost Moisture (g)	108.9	90.5
Wt. of Pan Only (g)	15.9	15.9
Wt. of Dry Soil (g)	261.9	261.9
Moisture Content %	41.6	34.6
Wet Density PCF	113.2	109.5
Dry Density PCF	80.0	81.3
Init. Diameter (in)	1.908	
Init. Area (sq in)	2.858	
Init. Height (in)	4.364	
Vol. Bef. Consol. (cu ft)	0.00722	
Vol. After Consol. (cu ft)	0.00710	

Notes & Comments:

Data entry by: DAW
Data checked by: *DPM*
FileName: MWTD111A.WK4

Date: 05/22/2014
Date: *5/22/14*



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-11A
DEPTH 31.0-31.5'
SAMPLE NO. --
SOIL DESCR. Sand Tailings (V. Fine Clay)
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 2

SAMPLED 11/21/13 MWH
TEST STARTED 04/21/14 DPM
TEST FINISHED 04/30/14 DPM
CELL NUMBER 26S
SATURATED TEST Yes
CONF. PRES. PSF 3888

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.50	0.00
0.25	0.5	1.30	-0.80
0.5	0.7	1.40	-0.90
1	1.0	1.60	-1.10
2	1.4	1.85	-1.35
4	2.0	2.15	-1.65
9	3.0	2.50	-2.00
16	4.0	2.75	-2.25
30	5.5	2.90	-2.40
60	7.7	3.15	-2.65
120	11.0	3.25	-2.75
260	16.1	3.40	-2.90
360	19.0	3.40	-2.90

Initial Height (in)	4.364	Init. Vol. (CC)	204.43
Height Change (in)	0.004	Vol. Change (CC)	4.20
Ht. After Cons. (in)	4.360	Cell Exp. (CC)	0.80
Initial Area (sq in)	2.858	Net Change (CC)	3.40
Area After Cons. (sq in)	2.813	Cons. Vol. (CC)	201.03

Data entry by: DAW
Data checked by: DPM
FileName: MWT0111A.WK4

Date: 05/22/2014
Date: 5/22/14



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-11A	SAMPLED	11/21/13 MWH
DEPTH	31.0-31.5'	TEST STARTED	04/21/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/30/14 DPM
SOIL DESCR.	Sand Tailings (V. Fine Clay)	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 2	CONF. PRES. PSF	3888
Init. Ht. (in)	4.364	Init. Area (sq in)	2.858
Consol. Ht. (in)	4.360	Consol. Area (sq in)	2.813
Back Pres. PSI	39.2	Strain Rate (in/min)	0.002

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	2.813	0	39.2	0	3888	3888	1.00
30.0	1536	0.005	0.11	2.816	1534	42.2	432	3456	4990	1.44
39.0	1996	0.009	0.20	2.819	1992	44.3	734	3154	5146	1.63
45.0	2304	0.013	0.30	2.822	2297	46.2	1008	2880	5177	1.80
48.0	2457	0.017	0.40	2.824	2447	47.6	1210	2678	5126	1.91
51.0	2611	0.022	0.50	2.827	2598	48.7	1368	2520	5118	2.03
54.0	2764	0.026	0.60	2.830	2748	49.7	1512	2376	5124	2.16
57.0	2918	0.031	0.70	2.833	2897	50.4	1613	2275	5173	2.27
60.0	3071	0.035	0.80	2.836	3047	51.0	1699	2189	5236	2.39
60.0	3071	0.039	0.90	2.839	3044	51.5	1771	2117	5161	2.44
63.0	3225	0.044	1.00	2.842	3193	52.0	1843	2045	5237	2.56
63.0	3225	0.048	1.10	2.844	3189	52.3	1886	2002	5191	2.59
66.0	3378	0.052	1.20	2.847	3338	52.7	1944	1944	5282	2.72
66.0	3378	0.057	1.30	2.850	3335	53.0	1987	1901	5235	2.75
66.0	3378	0.061	1.40	2.853	3331	53.2	2016	1872	5203	2.78
69.0	3532	0.065	1.50	2.856	3479	53.5	2059	1829	5308	2.90
69.0	3532	0.070	1.60	2.859	3475	53.7	2088	1800	5275	2.93
69.0	3532	0.074	1.70	2.862	3472	53.9	2117	1771	5243	2.96
72.0	3686	0.079	1.80	2.865	3619	54.1	2146	1742	5362	3.08
72.0	3686	0.083	1.90	2.868	3616	54.3	2174	1714	5329	3.11
72.0	3686	0.087	2.00	2.871	3612	54.4	2189	1699	5311	3.13
72.0	3686	0.092	2.10	2.873	3608	54.5	2203	1685	5293	3.14
72.0	3686	0.096	2.20	2.876	3605	54.7	2232	1656	5261	3.18
72.0	3686	0.100	2.30	2.879	3601	54.7	2232	1656	5257	3.17
72.0	3686	0.105	2.40	2.882	3597	54.8	2246	1642	5239	3.19
75.0	3839	0.109	2.50	2.885	3743	54.9	2261	1627	5370	3.30
75.0	3839	0.113	2.60	2.888	3739	55.0	2275	1613	5352	3.32
75.0	3839	0.118	2.70	2.891	3736	55.1	2290	1598	5334	3.34
75.0	3839	0.122	2.80	2.894	3732	55.2	2304	1584	5316	3.36
75.0	3839	0.126	2.90	2.897	3728	55.3	2318	1570	5297	3.38

Data entry by: DAW Date: 05/22/2014
 Data checked by: DPM Date: 5/22/14
 FileName: MWT0111A.WK4



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-11A	SAMPLED	11/21/13 MWH
DEPTH	31.0-31.5'	TEST STARTED	04/21/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/30/14 DPM
SOIL DESCR.	Sand Tailings (V. Fine Clay)	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUp, Stage 3	CONF. PRES. PSF	5040

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	370.8	352.4
Wt. Wet Soil & Pan (g)	386.6	368.2
Wt. Dry Soil & Pan (g)	277.8	277.8
Wt. Lost Moisture (g)	108.9	90.5
Wt. of Pan Only (g)	15.9	15.9
Wt. of Dry Soil (g)	261.9	261.9
Moisture Content %	41.6	34.6
Wet Density PCF	115.2	110.6
Dry Density PCF	81.3	82.2
Init. Diameter (in)	1.921	
Init. Area (sq in)	2.897	
Init. Height (in)	4.234	
Vol. Bef. Consol. (cu ft)	0.00710	
Vol. After Consol. (cu ft)	0.00702	

Notes & Comments:

Data entry by: DAW
Data checked by: *DPM*
FileName: MWT0111A.WK4

Date: 05/22/2014
Date: *5/22/14*



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-11A
DEPTH 31.0-31.5'
SAMPLE NO. --
SOIL DESCR. Sand Tailings (V. Fine Clay)
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 3

SAMPLED 11/21/13 MWH
TEST STARTED 04/21/14 DPM
TEST FINISHED 04/30/14 DPM
CELL NUMBER 26S
SATURATED TEST Yes
CONF. PRES. PSF 5040

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	7.70	0.00
0.25	0.5	9.30	-1.60
0.5	0.7	9.40	-1.70
1	1.0	9.50	-1.80
2	1.4	9.60	-1.90
4	2.0	9.70	-2.00
9	3.0	9.90	-2.20
16	4.0	9.95	-2.25
30	5.5	10.00	-2.30
60	7.7	10.10	-2.40
120	11.0	10.15	-2.45
240	15.5	10.20	-2.50
360	19.0	10.30	-2.60

Initial Height (in)	4.234	Init. Vol. (CC)	201.03
Height Change (in)	0.001	Vol. Change (CC)	2.90
Ht. After Cons. (in)	4.233	Cell Exp. (CC)	0.80
Initial Area (sq in)	2.897	Net Change (CC)	2.10
Area After Cons. (sq in)	2.867	Cons. Vol. (CC)	198.92

Data entry by: DAW
Data checked by: DPM
FileName: MWT0111A.WK4

Date: 05/22/2014
Date: 5/22/14



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-11A	SAMPLED	11/21/13 MWH
DEPTH	31.0-31.5'	TEST STARTED	04/21/14 DPM
SAMPLE NO.	--	TEST FINISHED	04/30/14 DPM
SOIL DESCR.	Sand Tailings (V. Fine Clay)	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	5040

Init. Ht. (in)	4.234	Init. Area (sq in)	2.897
Consol. Ht. (in)	4.233	Consol. Area (sq in)	2.867
Back Pres. PSI	38.1	Strain Rate (in/min)	0.002

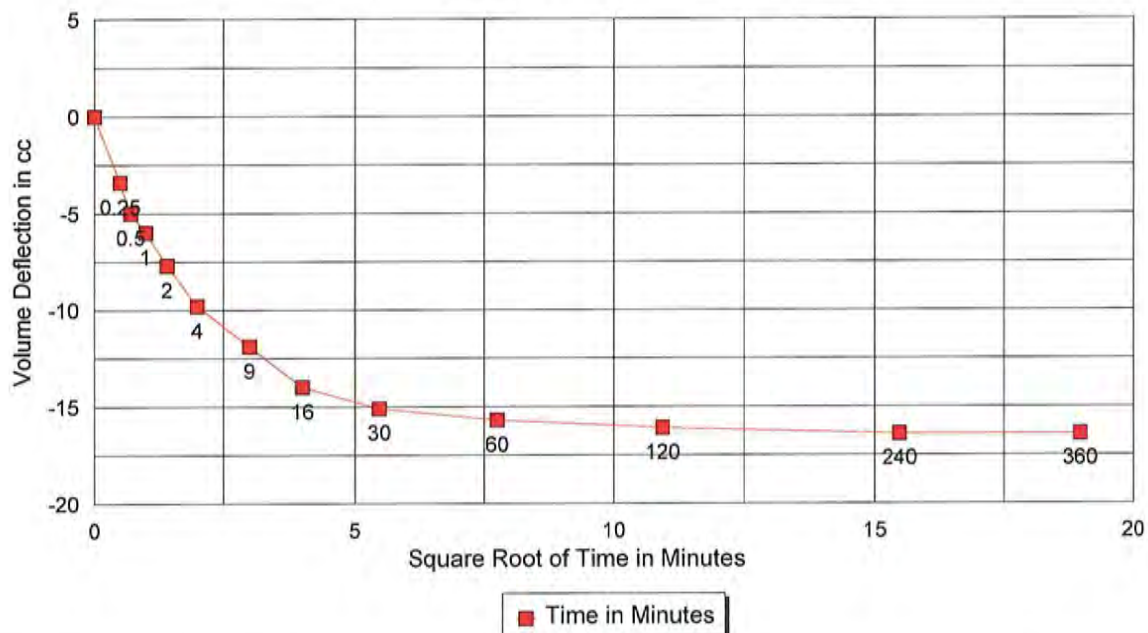
Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	2.867	0	38.1	0	5040	5040	1.00
39.0	1959	0.004	0.10	2.870	1957	42.5	634	4406	6363	1.44
54.0	2712	0.009	0.20	2.873	2706	45.6	1080	3960	6666	1.68
63.0	3164	0.013	0.30	2.876	3154	48.0	1426	3614	6769	1.87
69.0	3465	0.017	0.41	2.879	3451	49.8	1685	3355	6806	2.03
78.0	3917	0.022	0.51	2.882	3897	51.2	1886	3154	7051	2.24
81.0	4068	0.026	0.61	2.885	4043	52.3	2045	2995	7038	2.35
84.0	4218	0.030	0.71	2.888	4188	53.2	2174	2866	7054	2.46
87.0	4369	0.034	0.81	2.891	4334	54.0	2290	2750	7084	2.58
90.0	4520	0.039	0.91	2.894	4478	54.6	2376	2664	7142	2.68
93.0	4670	0.047	1.12	2.900	4618	55.6	2520	2520	7138	2.83
96.0	4821	0.056	1.32	2.906	4757	56.4	2635	2405	7162	2.98
96.0	4821	0.065	1.52	2.912	4748	57.0	2722	2318	7066	3.05
99.0	4972	0.073	1.73	2.918	4886	57.5	2794	2246	7132	3.17
102.0	5122	0.082	1.93	2.924	5023	57.8	2837	2203	7227	3.28
102.0	5122	0.090	2.13	2.930	5013	58.2	2894	2146	7159	3.34
102.0	5122	0.099	2.34	2.936	5003	58.5	2938	2102	7105	3.38
102.0	5122	0.108	2.54	2.942	4992	58.7	2966	2074	7066	3.41
105.0	5273	0.120	2.84	2.951	5123	59.0	3010	2030	7153	3.52
108.0	5424	0.163	3.86	2.983	5214	59.7	3110	1930	7144	3.70
108.0	5424	0.202	4.77	3.011	5165	60.0	3154	1886	7051	3.74
108.0	5424	0.241	5.69	3.040	5115	60.1	3168	1872	6987	3.73
111.0	5574	0.280	6.60	3.070	5206	60.2	3182	1858	7064	3.80
111.0	5574	0.318	7.52	3.101	5155	60.1	3168	1872	7027	3.75
111.0	5574	0.357	8.43	3.132	5104	60.0	3154	1886	6991	3.71
111.0	5574	0.396	9.35	3.163	5053	59.9	3139	1901	6954	3.66
111.0	5574	0.434	10.26	3.195	5002	59.6	3096	1944	6946	3.57
111.0	5574	0.473	11.18	3.228	4951	59.3	3053	1987	6939	3.49
105.0	5273	0.512	12.09	3.262	4635	58.9	2995	2045	6680	3.27
102.0	5122	0.550	13.00	3.296	4456	59.0	3010	2030	6487	3.19
96.0	4821	0.589	13.92	3.331	4150	59.1	3024	2016	6166	3.06
96.0	4821	0.628	14.83	3.367	4106	59.3	3053	1987	6093	3.07

Data entry by: DAW Date: 05/22/2014
 Data checked by: DPM Date: 5/24/14
 FileName: MWT0111A.WK4



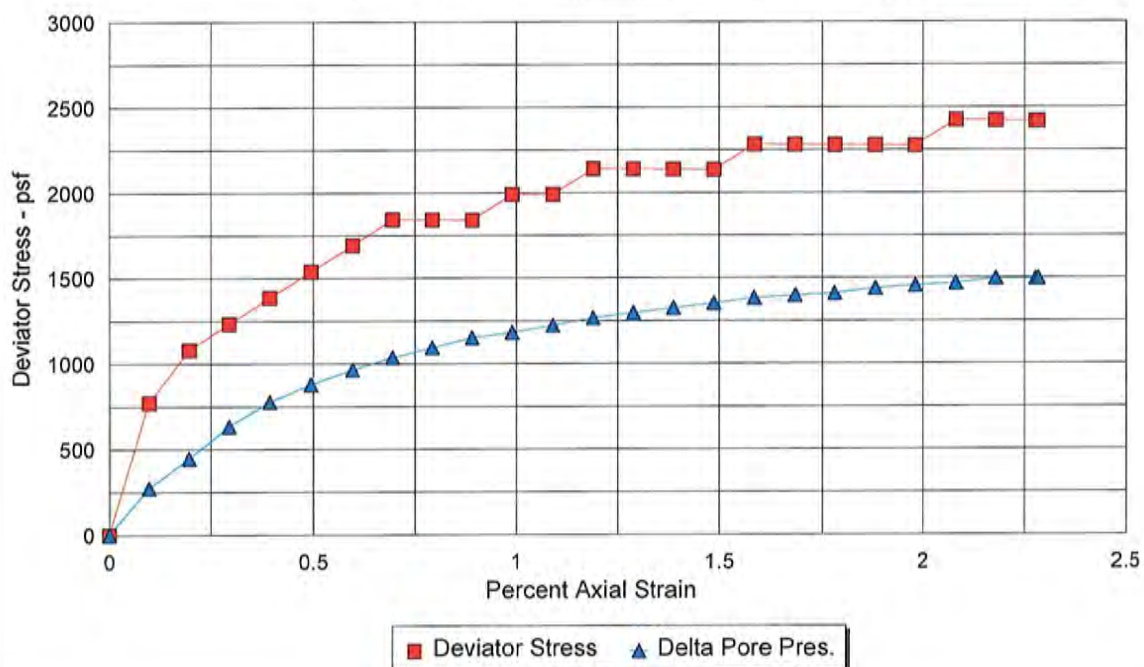
CONSOLIDATION DATA

TI-B1-11A, 31.0-31.5', --, Stage 1



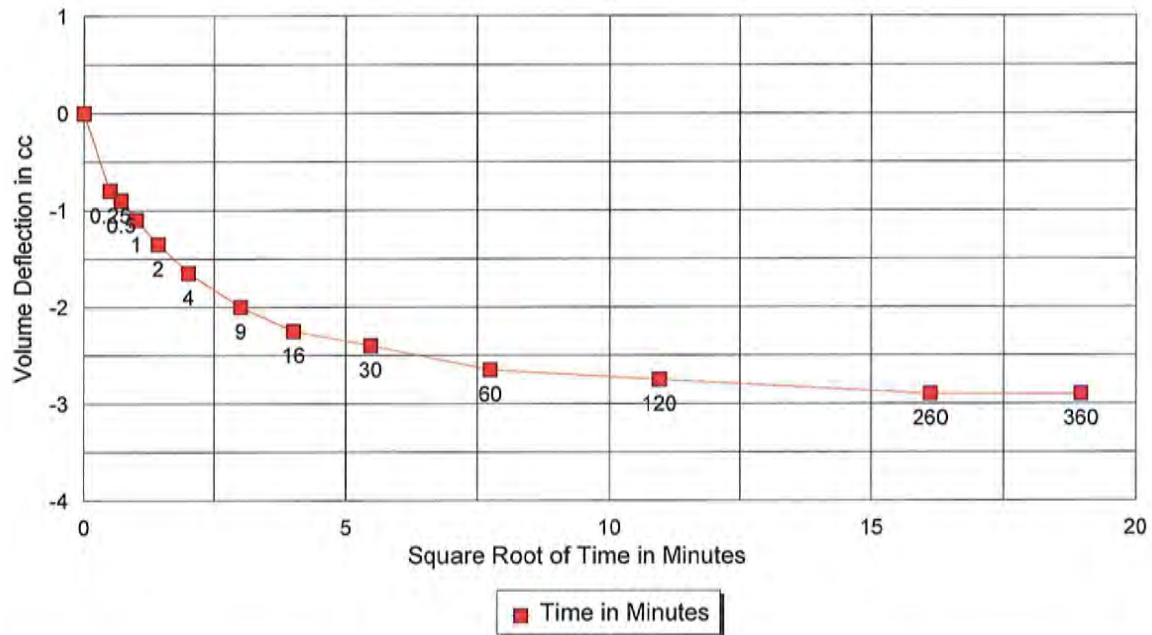
TRIAXIAL TEST - TX/CUpp

TI-B1-11A, 31.0-31.5', --, Stage 1



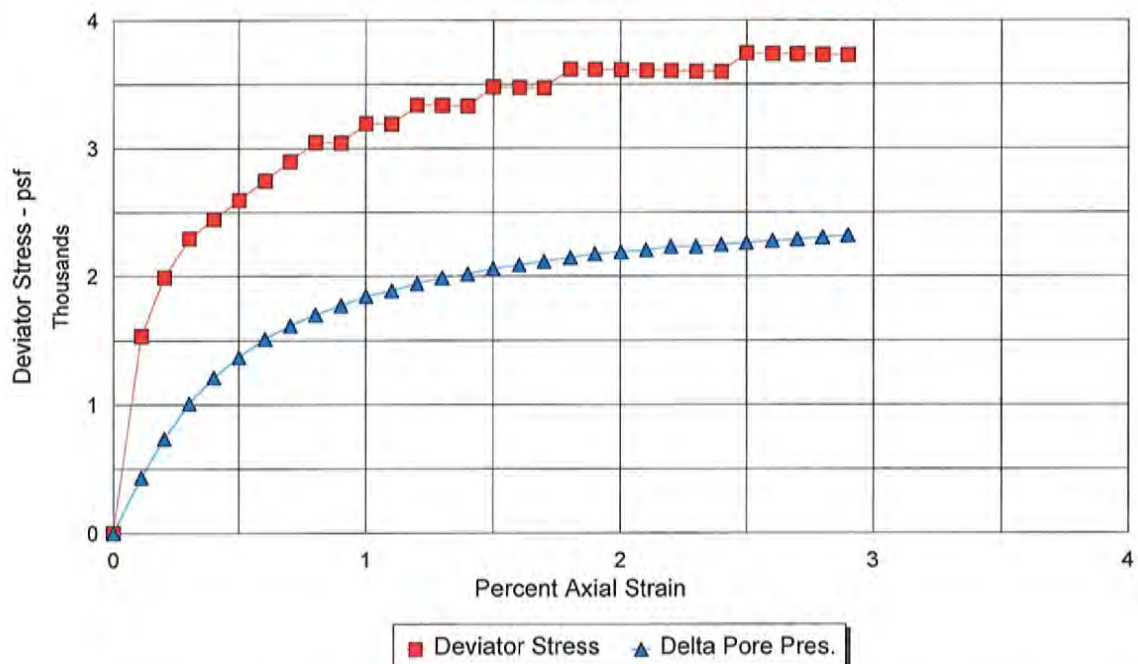
CONSOLIDATION DATA

TI-B1-11A, 31.0-31.5', --, Stage 2



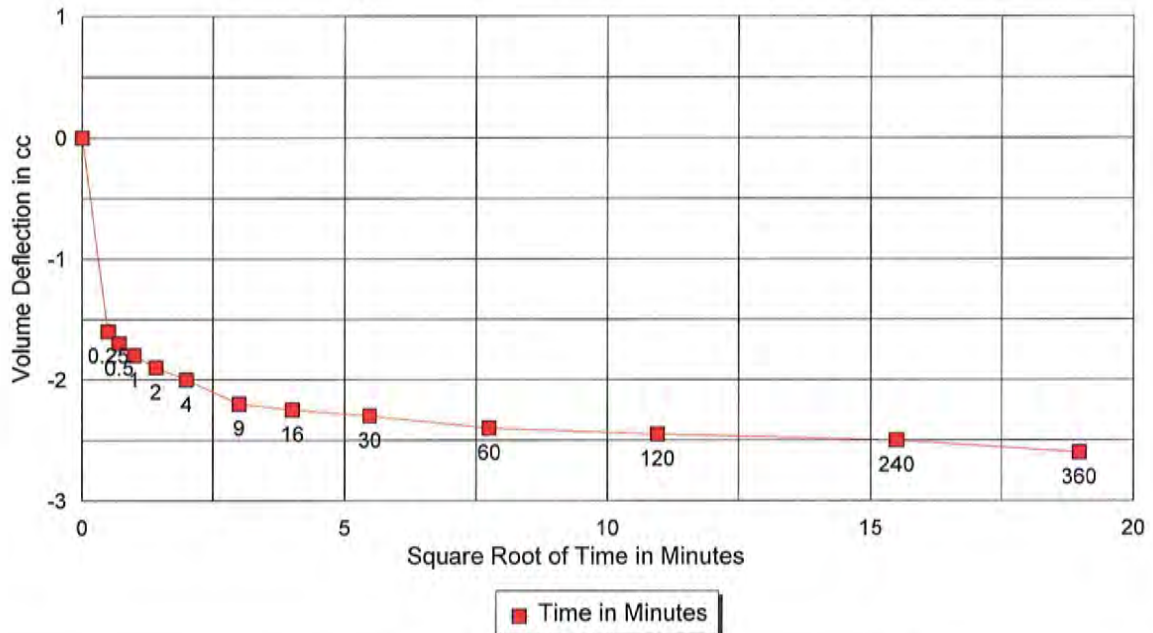
TRIAXIAL TEST - TX/CUpp

TI-B1-11A, 31.0-31.5', --, Stage 2



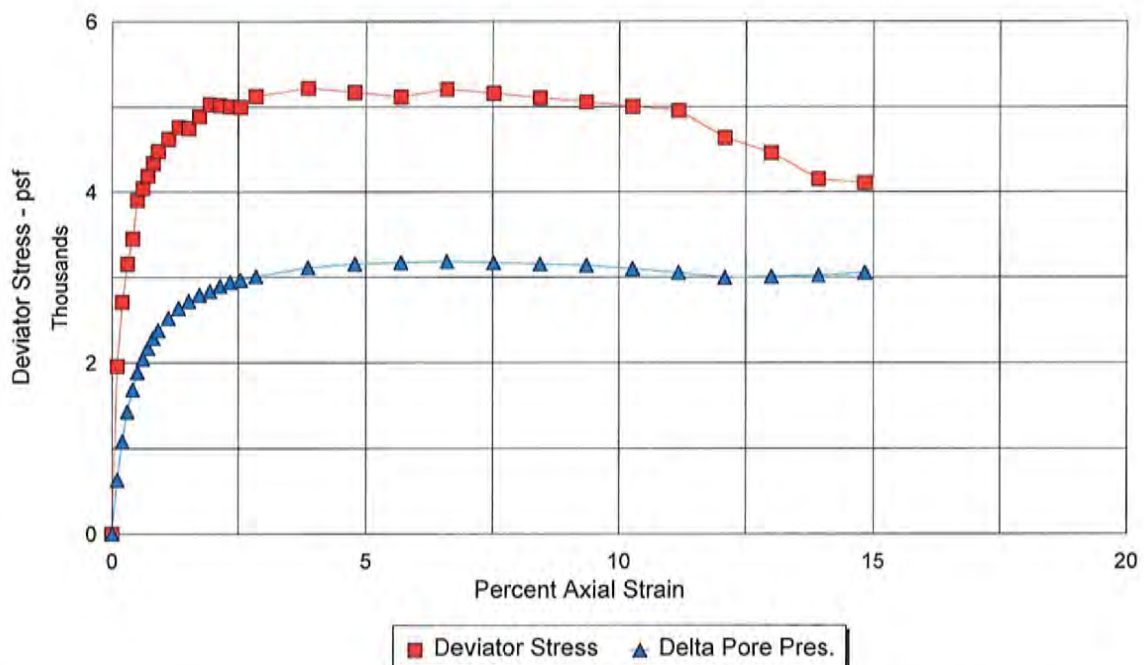
CONSOLIDATION DATA

TI-B1-11A, 31.0-31.5', --, Stage 3



TRIAXIAL TEST - TX/CUpp

TI-B1-11A, 31.0-31.5', --, Stage 3



EFFECTIVE STRESS PATH ANALYSIS TEST DATA
ASTM D4767

CLIENT MWH
BORING NO. TI-B1-17
DEPTH 45-46' (45-47.5')
SAMPLE NO. A,B&C
PROJECT NO. --
LOCATION Tailings Impoundment

JOB NO. 2512-77
SAMPLED 11/21/13 MWH
SATURATED TEST
TEST TYPE TX/CUPP

				Peak Points	
				p'	q
				PSF	PSF
CONF. PRES. PSF	SAMPLE A	4608	PSF	SAMPLE A	3317
	SAMPLE B	5706	PSF	SAMPLE B	6663
	SAMPLE C	6912	PSF	SAMPLE C	12621
					7163

SAMPLE A				SAMPLE B				SAMPLE C			
σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q
PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF
4608	4608	4608	0	5760	5760	5760	0	6912	6912	6912	0
4277	5232	4754	478	5443	6946	6195	752	5962	10091	8026	2065
3629	5442	4535	906	4810	8470	6640	1830	5501	12010	8755	3254
3125	5317	4221	1096	4378	8972	6675	2297	5213	12997	9105	3892
2750	5226	3988	1238	4075	9226	6651	2576	4997	13597	9297	4300
2506	5074	3790	1284	3830	9351	6591	2760	4838	13978	9408	4570
2318	4979	3649	1330	3658	9453	6555	2897	4723	14219	9471	4748
2160	4913	3537	1377	3499	9475	6487	2988	4622	14382	9502	4880
2045	4890	3467	1423	3384	9447	6415	3031	4550	14573	9562	5011
1958	4895	3427	1469	3298	9541	6419	3122	4493	14596	9545	5052
1886	4820	3353	1467	3226	9555	6391	3165	4378	14893	9635	5258
1829	4854	3342	1513	3168	9584	6376	3208	4291	15124	9708	5417
1771	4794	3282	1511	3110	9613	6362	3251	4291	15439	9865	5574
1728	4842	3285	1557	3067	9656	6362	3294	4306	15676	9991	5685
1699	4810	3255	1555	3038	9713	6376	3337	4334	15925	10130	5795
1670	4872	3271	1601	3010	9770	6390	3380	4378	16186	10282	5904
1642	4934	3288	1646	2981	9827	6404	3423	4493	16906	10699	6207
1627	4916	3272	1645	2966	9805	6386	3419	4637	17468	11053	6416
1613	4992	3303	1690	2952	9876	6414	3462	4781	18108	11445	6664
1584	4960	3272	1688	2938	9947	6442	3505	4853	18295	11574	6721
1584	5050	3317	1733	2938	10032	6485	3547	4925	18652	11788	6864
1584	5047	3315	1731	2923	10010	6467	3543	5098	19216	12157	7059
1584	4857	3221	1637	2923	10095	6509	3586	5270	19433	12352	7081
				2923	10179	6551	3628	5357	19645	12501	7144
				2923	10263	6593	3670	5458	19784	12621	7163
				2909	10333	6621	3712	5515	19794	12655	7139
				2909	10417	6663	3754	5573	19803	12688	7115
				2923	10423	6673	3750	5616	19796	12706	7090
				2923	10327	6625	3702	5645	19694	12669	7024
								5659	19497	12578	6919
								5645	19401	12523	6878
								5630	19289	12460	6829

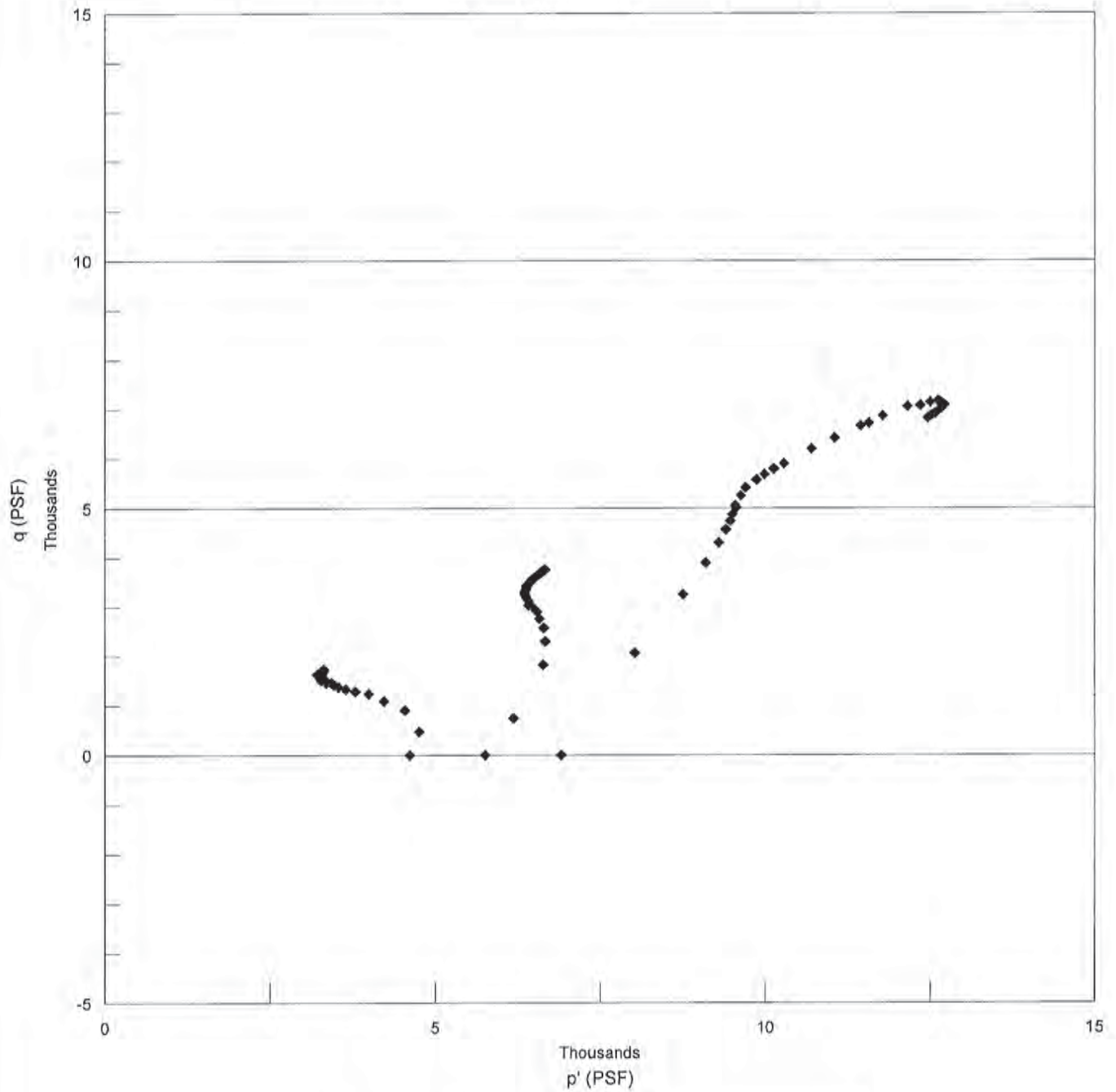
Data entry by: DAW
Data checked by: *DPM*
FileName: MWPQB117.WK4

Date: 05/22/2014
Date: *5/22/14*



Effective Stress Path Analysis - p' q Plots

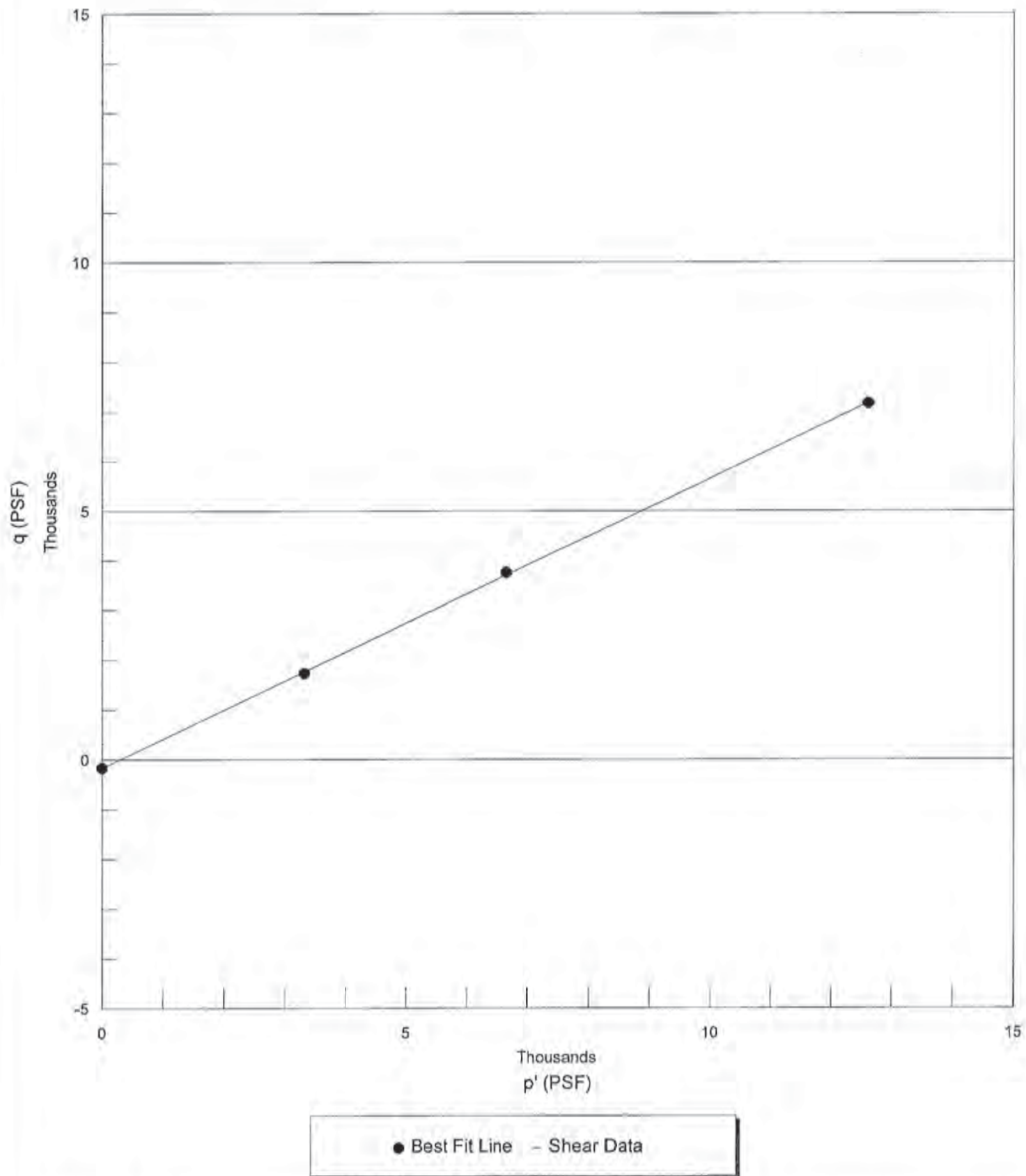
MWH, Tailings Impoundment, --, TI-B1-17, A, B & C, 45-46' (45-47.5')



◆ Stress Paths of Samples A, B & C

Effective Stress Path Analysis - p' - q Regression Plot

MWH, Tailings Impoundment, --, TI-B1-17, A, B&C, 45-46' (45-47.5')



NOTE: Peak points are plotted for visual verification only. Least squared regression analysis, yields a negative alpha (α) value; therefore no regression analysis has been provided.

TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-17	SAMPLED	11/21/13 MWH
DEPTH	45-46' (45-47.5')	TEST STARTED	04/18/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUp, Stage 1	CONF. PRES. PSF	4608

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	787.6	776.7
Wt. Wet Soil & Pan (g)	803.4	792.4
Wt. Dry Soil & Pan (g)	665.7	665.7
Wt. Lost Moisture (g)	137.7	126.7
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	650.0	650.0
Moisture Content %	21.2	19.5
Wet Density PCF	125.9	126.9
Dry Density PCF	103.9	106.2
Init. Diameter (in)	2.404	
Init. Area (sq in)	4.539	
Init. Height (in)	5.252	
Vol. Bef. Consol. (cu ft)	0.01380	
Vol. After Consol. (cu ft)	0.01349	

Notes & Comments: The sample consolidated approximately 0.33" during sub-sampling.
The sample was dried at 60 degrees C.

Data entry by: DPM/DAW Date: 05/22/2014
Data checked by: *DPM* Date: *5/22/14*
FileName: MWT0B117



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-17	SAMPLED	11/21/13 MWH
DEPTH	45-46' (45-47.5')	TEST STARTED	04/18/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	4608

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.5	11.8				
50.0	48.0	13.7	14.6	38.4	47.7	9.3	0.93
60.0		15.1	15.1	48.0	57.9	9.9	0.99

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.30	0.00
0.25	0.5	9.30	-9.00
0.5	0.7	10.90	-10.60
1	1.0	12.30	-12.00
2	1.4	13.25	-12.95
4	2.0	13.80	-13.50
9	3.0	14.15	-13.85
16	4.0	14.35	-14.05
30	5.5	14.50	-14.20
60	7.7	14.70	-14.40
120	11.0	14.90	-14.60
240	15.5	15.00	-14.70
360	19.0	15.00	-14.70

Initial Height (in)	5.252	Init. Vol. (CC)	390.72
Height Change (in)	0.092	Vol. Change (CC)	28.20
Ht. After Cons. (in)	5.160	Cell Exp. (CC)	19.61
Initial Area (sq in)	4.539	Net Change (CC)	8.59
Area After Cons. (sq in)	4.518	Cons. Vol. (CC)	382.13

Data entry by: DPM/DAW Date: 05/22/2014
 Data checked by: *DPM* Date: *5/22/14*
 FileName: MWT0B117



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-17	SAMPLED	11/21/13 MWH
DEPTH	45-46' (45-47.5')	TEST STARTED	04/18/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	4608

Init. Ht. (in)	5.252	Init. Area (sq in)	4.539
Consol. Ht. (in)	5.160	Consol. Area (sq in)	4.518
Back Pres. PSI	48.4	Strain Rate (in/min)	0.006

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.518	0	48.4	0	4608	4608	1.00
30.0	956	0.005	0.10	4.523	955	50.7	331	4277	5232	1.22
57.0	1817	0.010	0.20	4.527	1813	55.2	979	3629	5442	1.50
69.0	2199	0.016	0.30	4.532	2192	58.7	1483	3125	5317	1.70
78.0	2486	0.021	0.40	4.537	2476	61.3	1858	2750	5226	1.90
81.0	2581	0.026	0.50	4.541	2568	63.0	2102	2506	5074	2.03
84.0	2677	0.031	0.60	4.546	2661	64.3	2290	2318	4979	2.15
87.0	2773	0.036	0.71	4.550	2753	65.4	2448	2160	4913	2.27
90.0	2868	0.042	0.81	4.555	2845	66.2	2563	2045	4890	2.39
93.0	2964	0.047	0.91	4.560	2937	66.8	2650	1958	4895	2.50
93.0	2964	0.052	1.01	4.564	2934	67.3	2722	1886	4820	2.56
96.0	3060	0.057	1.11	4.569	3026	67.7	2779	1829	4854	2.65
96.0	3060	0.062	1.21	4.574	3023	68.1	2837	1771	4794	2.71
99.0	3155	0.068	1.31	4.578	3114	68.4	2880	1728	4842	2.80
99.0	3155	0.073	1.41	4.583	3111	68.6	2909	1699	4810	2.83
102.0	3251	0.078	1.51	4.588	3202	68.8	2938	1670	4872	2.92
105.0	3346	0.083	1.61	4.592	3292	69.0	2966	1642	4934	3.01
105.0	3346	0.088	1.71	4.597	3289	69.1	2981	1627	4916	3.02
108.0	3442	0.094	1.81	4.602	3380	69.2	2995	1613	4992	3.10
108.0	3442	0.099	1.91	4.607	3376	69.4	3024	1584	4960	3.13
111.0	3538	0.104	2.02	4.611	3466	69.4	3024	1584	5050	3.19
111.0	3538	0.109	2.12	4.616	3463	69.4	3024	1584	5047	3.19
105.0	3346	0.112	2.18	4.619	3273	69.4	3024	1584	4857	3.07

Data entry by: DPM/DAW Date: 05/22/2014
 Data checked by: DPM Date: 5/22/14
 FileName: MWT0B117



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-17
DEPTH 45-46' (45-47.5')
SAMPLE NO. -
SOIL DESCR. Clayey Sand
LOCATION Tailings Impoundment
TEST TYPE TX/CUp, Stage 2

SAMPLED 11/21/13 MWH
TEST STARTED 04/18/14 DPM
TEST FINISHED 04/23/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
CONF. PRES. PSF 5760

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	787.6	776.7
Wt. Wet Soil & Pan (g)	803.4	792.4
Wt. Dry Soil & Pan (g)	665.7	665.7
Wt. Lost Moisture (g)	137.7	126.7
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	650.0	650.0
Moisture Content %	21.2	19.5
Wet Density PCF	128.7	127.5
Dry Density PCF	106.2	106.7
Init. Diameter (in)	2.425	
Init. Area (sq in)	4.619	
Init. Height (in)	5.048	
Vol. Bef. Consol. (cu ft)	0.01349	
Vol. After Consol. (cu ft)	0.01343	

Notes & Comments:

Data entry by: DPM/DAW Date: 05/22/2014
Data checked by: DPM Date: 5/22/14
FileName: MWT0B117



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-17
DEPTH 45-46' (45-47.5')
SAMPLE NO. -
SOIL DESCR. Clayey Sand
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 2

SAMPLED 11/21/13 MWH
TEST STARTED 04/18/14 DPM
TEST FINISHED 04/23/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
CONF. PRES. PSF 5760

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.80	0.00
0.25	0.5	1.70	-0.90
0.5	0.7	1.80	-1.00
1	1.0	1.90	-1.10
2	1.4	2.00	-1.20
4	2.0	2.05	-1.25
9	3.0	2.10	-1.30
16	4.0	2.20	-1.40
30	5.5	2.25	-1.45
60	7.7	2.35	-1.55
120	11.0	2.40	-1.60
240	15.5	2.40	-1.60
360	19.0	2.40	-1.60

Initial Height (in) 5.048
Height Change (in) -0.005
Ht. After Cons. (in) 5.053
Initial Area (sq in) 4.619
Area After Cons. (sq in) 4.594

Init. Vol. (CC) 382.13
Vol. Change (CC) 2.60
Cell Exp. (CC) 0.90
Net Change (CC) 1.70
Cons. Vol. (CC) 380.43

Data entry by: DPM/DAW Date: 05/22/2014
Data checked by: *[Signature]* Date: *5/22/14*
FileName: MWT0B117



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-17	SAMPLED	11/21/13 MWH
DEPTH	45-46' (45-47.5')	TEST STARTED	04/18/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/Cupp, Stage 2	CONF. PRES. PSF	5760

Init. Ht. (in)	5.048	Init. Area (sq in)	4.619
Consol. Ht. (in)	5.053	Consol. Area (sq in)	4.594
Back Pres. PSI	48.7	Strain Rate (in/min)	0.009

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.594	0	48.7	0	5760	5760	1.00
48.0	1505	0.005	0.10	4.599	1503	50.9	317	5443	6946	1.28
117.0	3667	0.010	0.20	4.603	3660	55.3	950	4810	8470	1.76
147.0	4608	0.015	0.30	4.608	4594	58.3	1382	4378	8972	2.05
165.0	5172	0.020	0.40	4.612	5151	60.4	1685	4075	9226	2.26
177.0	5548	0.026	0.50	4.617	5520	62.1	1930	3830	9351	2.44
186.0	5830	0.031	0.61	4.622	5795	63.3	2102	3658	9453	2.58
192.0	6018	0.036	0.71	4.627	5976	64.4	2261	3499	9475	2.71
195.0	6112	0.041	0.81	4.631	6063	65.2	2376	3384	9447	2.79
201.0	6301	0.046	0.91	4.636	6243	65.8	2462	3298	9541	2.89
204.0	6395	0.051	1.01	4.641	6330	66.3	2534	3226	9555	2.96
207.0	6489	0.056	1.11	4.646	6416	66.7	2592	3168	9584	3.03
210.0	6583	0.062	1.22	4.650	6503	67.1	2650	3110	9613	3.09
213.0	6677	0.067	1.32	4.655	6589	67.4	2693	3067	9656	3.15
216.0	6771	0.072	1.42	4.660	6675	67.6	2722	3038	9713	3.20
219.0	6865	0.077	1.52	4.665	6760	67.8	2750	3010	9770	3.25
222.0	6959	0.082	1.62	4.670	6846	68.0	2779	2981	9827	3.30
222.0	6959	0.087	1.73	4.675	6839	68.1	2794	2966	9805	3.31
225.0	7053	0.092	1.83	4.679	6924	68.2	2808	2952	9876	3.35
228.0	7147	0.097	1.93	4.684	7009	68.3	2822	2938	9947	3.39
231.0	7241	0.103	2.03	4.689	7094	68.3	2822	2938	10032	3.41
231.0	7241	0.108	2.13	4.694	7087	68.4	2837	2923	10010	3.42
234.0	7335	0.113	2.23	4.699	7171	68.4	2837	2923	10095	3.45
237.0	7429	0.118	2.33	4.704	7256	68.4	2837	2923	10179	3.48
240.0	7523	0.123	2.43	4.708	7340	68.4	2837	2923	10263	3.51
243.0	7617	0.128	2.54	4.713	7424	68.5	2851	2909	10333	3.55
246.0	7711	0.133	2.64	4.718	7508	68.5	2851	2909	10417	3.58
246.0	7711	0.138	2.74	4.723	7500	68.4	2837	2923	10423	3.57
243.0	7617	0.141	2.79	4.726	7404	68.4	2837	2923	10327	3.53

Data entry by: DPM/DAW Date: 05/22/2014
 Data checked by: *DPM* Date: 5/22/14
 FileName: MWT0B117



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-17	SAMPLED	11/21/13 MWH
DEPTH	45-46' (45-47.5')	TEST STARTED	04/18/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUp, Stage 3	CONF. PRES. PSF	6912

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	787.6	776.7
Wt. Wet Soil & Pan (g)	803.4	792.4
Wt. Dry Soil & Pan (g)	665.7	665.7
Wt. Lost Moisture (g)	137.7	126.7
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	650.0	650.0
Moisture Content %	21.2	19.5
Wet Density PCF	129.3	127.8
Dry Density PCF	106.7	107.0
Init. Diameter (in)	2.453	
Init. Area (sq in)	4.726	
Init. Height (in)	4.911	
Vol. Bef. Consol. (cu ft)	0.01343	
Vol. After Consol. (cu ft)	0.01339	

Notes & Comments:

Data entry by: DPM/DAW Date: 05/22/2014
Data checked by: DPM Date: 5/22/14
FileName: MWT0B117



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B1-17
DEPTH 45-46' (45-47.5')
SAMPLE NO. -
SOIL DESCR. Clayey Sand
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 3

SAMPLED 11/21/13 MWH
TEST STARTED 04/18/14 DPM
TEST FINISHED 04/23/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
CONF. PRES. PSF 6912

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	5.90	0.00
0.25	0.5	6.70	-0.80
0.5	0.7	6.80	-0.90
1	1.0	6.85	-0.95
2	1.4	6.90	-1.00
4	2.0	6.95	-1.05
9	3.0	7.00	-1.10
16	4.0	7.05	-1.15
30	5.5	7.15	-1.25
60	7.7	7.15	-1.25
120	11.0	7.15	-1.25
240	15.5	7.15	-1.25
360	19.0	7.15	-1.25

Initial Height (in) 4.911
Height Change (in) -0.010
Ht. After Cons. (in) 4.921
Initial Area (sq in) 4.726
Area After Cons. (sq in) 4.703

Init. Vol. (CC) 380.43
Vol. Change (CC) 2.00
Cell Exp. (CC) 0.90
Net Change (CC) 1.10
Cons. Vol. (CC) 379.33

Data entry by: DPM/DAW Date: 05/22/2014
Data checked by: DPM Date: 5/22/14
FileName: MWT0B117



TRIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B1-17	SAMPLED	11/21/13 MWH
DEPTH	45-46' (45-47.5')	TEST STARTED	04/18/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Clayey Sand	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	6912

Init. Ht. (in)	4.911	Init. Area (sq in)	4.726
Consol. Ht. (in)	4.921	Consol. Area (sq in)	4.703
Back Pres. PSI	48.6	Strain Rate (in/min)	0.002

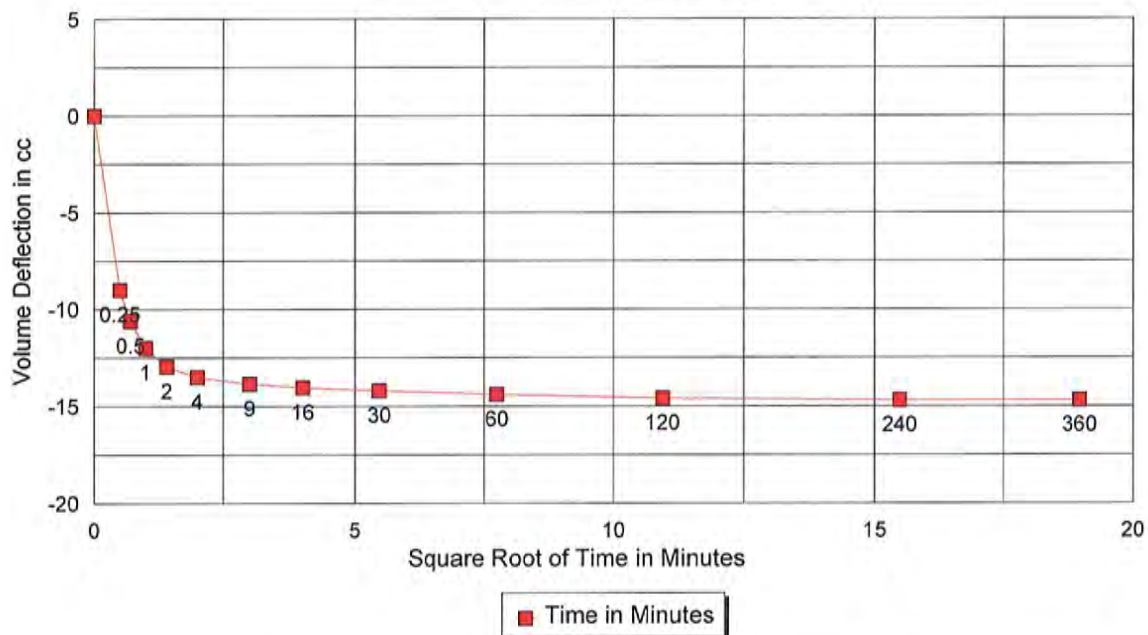
Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.703	0	48.6	0	6912	6912	1.00
135.0	4134	0.005	0.10	4.707	4130	55.2	950	5962	10091	1.69
213.0	6522	0.010	0.20	4.712	6509	58.4	1411	5501	12010	2.18
255.0	7808	0.015	0.30	4.717	7784	60.4	1699	5213	12997	2.49
282.0	8635	0.020	0.41	4.722	8600	61.9	1915	4997	13597	2.72
300.0	9186	0.025	0.51	4.727	9140	63.0	2074	4838	13978	2.89
312.0	9554	0.030	0.61	4.732	9495	63.8	2189	4723	14219	3.01
321.0	9829	0.035	0.71	4.736	9759	64.5	2290	4622	14382	3.11
330.0	10105	0.040	0.81	4.741	10023	65.0	2362	4550	14573	3.20
333.0	10197	0.045	0.91	4.746	10103	65.4	2419	4493	14596	3.25
348.0	10656	0.065	1.32	4.766	10515	66.2	2534	4378	14893	3.40
360.0	11023	0.085	1.73	4.785	10833	66.8	2621	4291	15124	3.52
372.0	11391	0.105	2.13	4.805	11148	66.8	2621	4291	15439	3.60
381.0	11666	0.125	2.54	4.825	11370	66.7	2606	4306	15676	3.64
390.0	11942	0.145	2.95	4.845	11590	66.5	2578	4334	15925	3.67
399.0	12218	0.165	3.35	4.866	11808	66.2	2534	4378	16186	3.70
423.0	12953	0.205	4.17	4.907	12413	65.4	2419	4493	16906	3.76
441.0	13504	0.245	4.98	4.949	12831	64.4	2275	4637	17468	3.77
462.0	14147	0.285	5.79	4.992	13327	63.4	2131	4781	18108	3.79
468.0	14330	0.305	6.20	5.013	13442	62.9	2059	4853	18295	3.77
480.0	14698	0.325	6.60	5.035	13727	62.4	1987	4925	18652	3.79
498.0	15249	0.365	7.42	5.079	14118	61.2	1814	5098	19216	3.77
504.0	15433	0.405	8.23	5.124	14163	60.0	1642	5270	19433	3.69
513.0	15708	0.445	9.04	5.170	14288	59.4	1555	5357	19645	3.67
519.0	15892	0.485	9.85	5.217	14326	58.7	1454	5458	19784	3.62
522.0	15984	0.525	10.67	5.264	14279	58.3	1397	5515	19794	3.59
525.0	16076	0.565	11.48	5.313	14230	57.9	1339	5573	19803	3.55
528.0	16168	0.605	12.29	5.362	14180	57.6	1296	5616	19796	3.52
528.0	16168	0.645	13.11	5.412	14049	57.4	1267	5645	19694	3.49
525.0	16076	0.685	13.92	5.463	13838	57.3	1253	5659	19497	3.45
525.0	16076	0.710	14.43	5.496	13757	57.4	1267	5645	19401	3.44
525.0	16076	0.740	15.04	5.535	13659	57.5	1282	5630	19289	3.43

Data entry by: DPM/DAW Date: 05/22/2014
 Data checked by: DPM Date: 5/22/14
 FileName: MWT0B117



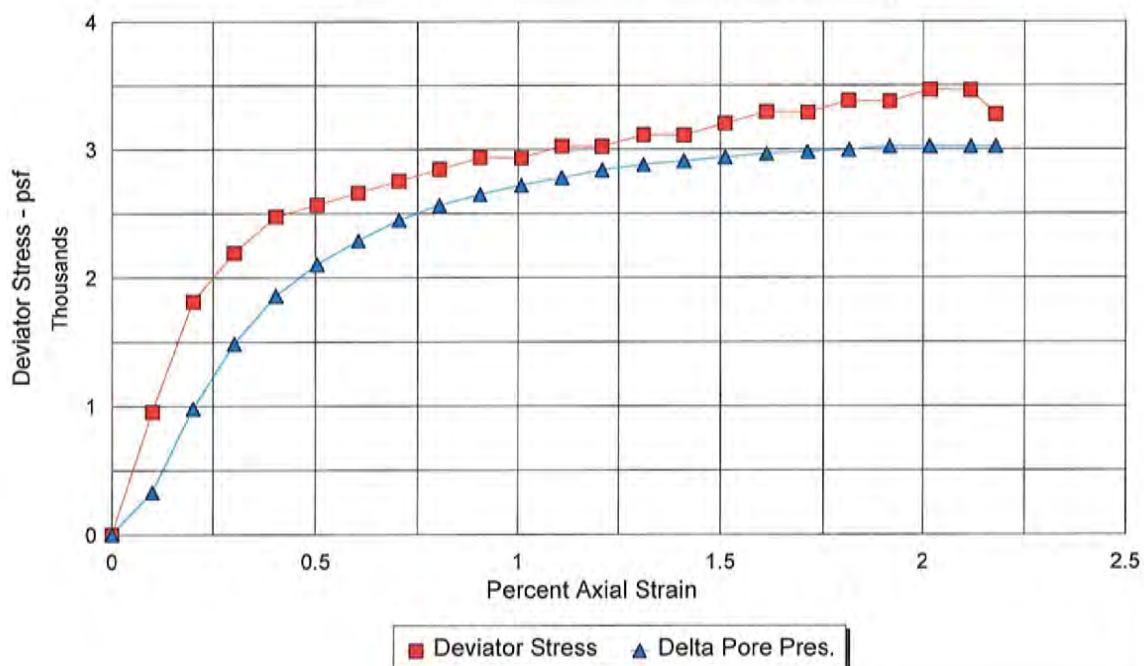
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TI-B1-17, 45-46' (45-47.5'), -, Stage 1



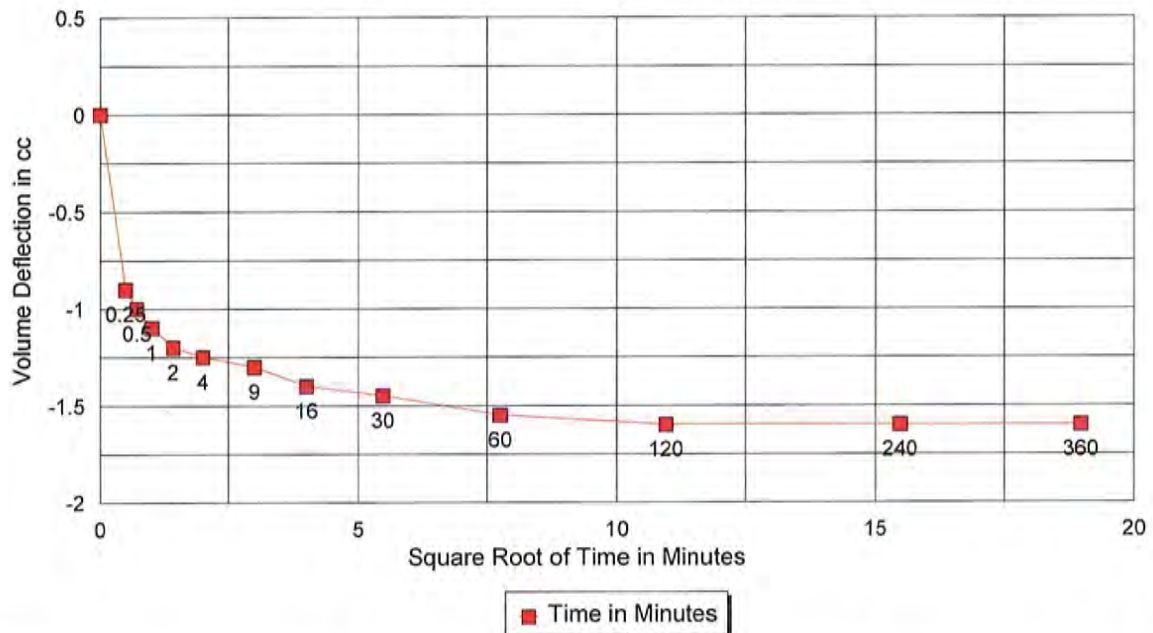
TRIAXIAL TEST - TX/CUpp

TI-B1-17, 45-46' (45-47.5'), -, Stage 1



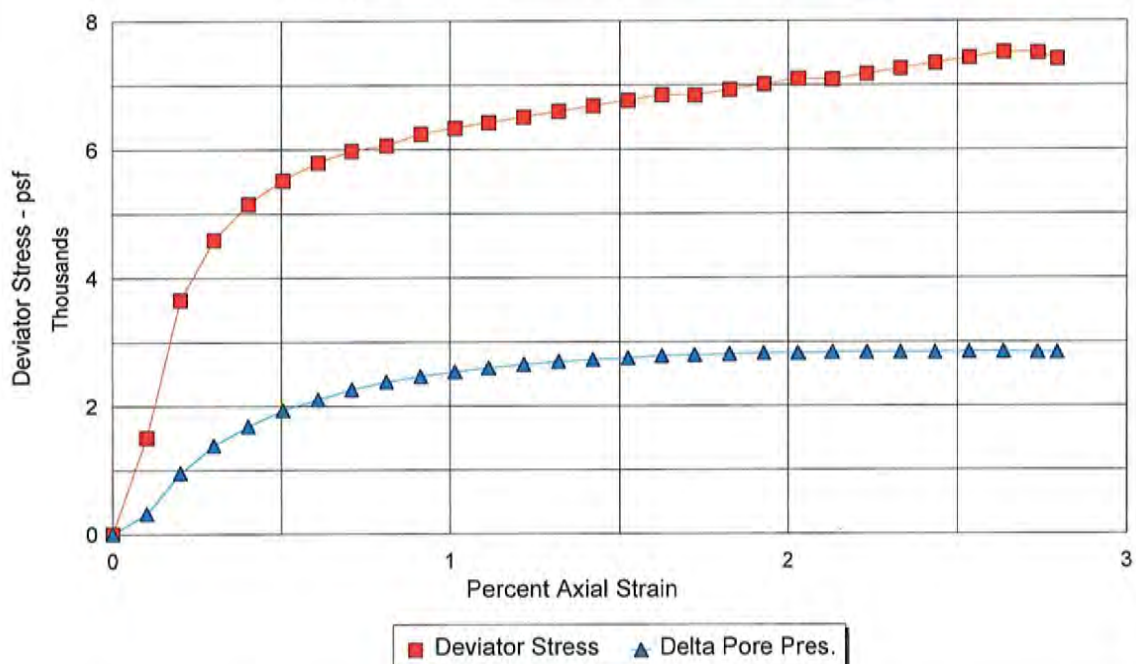
CONSOLIDATION DATA

TI-B1-17, 45-46' (45-47.5'), -, Stage 2



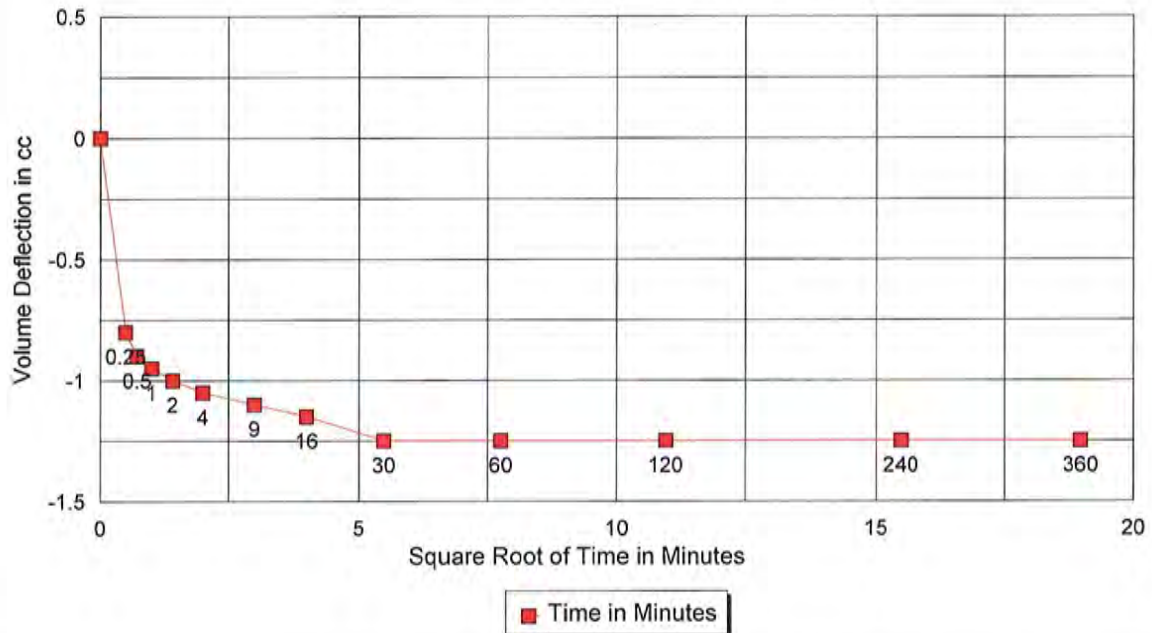
TRIAXIAL TEST - TX/CUpp

TI-B1-17, 45-46' (45-47.5'), -, Stage 2



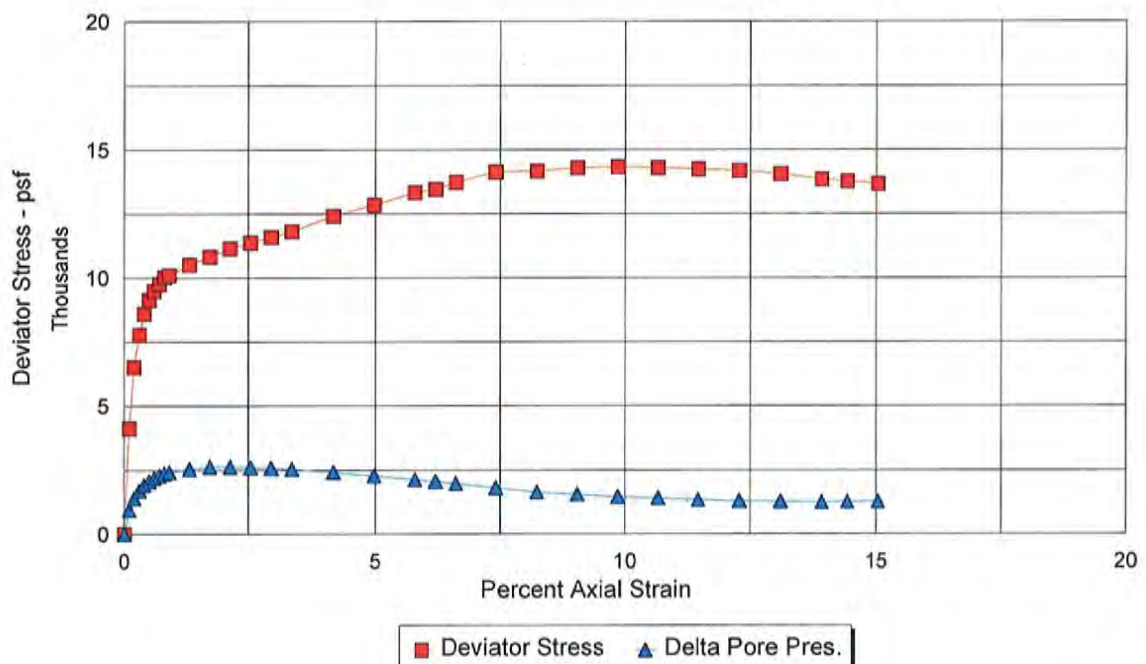
CONSOLIDATION DATA

TI-B1-17, 45-46' (45-47.5'), -, Stage 3



TRIAXIAL TEST - TX/CUpp

TI-B1-17, 45-46' (45-47.5'), -, Stage 3



EFFECTIVE STRESS PATH ANALYSIS TEST DATA
ASTM D4767

CLIENT MWH
BORING NO. TI-B3-10
DEPTH 56-57' (55-57')
SAMPLE NO. A,B&C
PROJECT NO. --
LOCATION Tailings Impoundment

JOB NO. 2512-77
SAMPLED 11/19/13 MWH
SATURATED TEST
TEST TYPE TX/CUPP
Peak Points

					p'	q
					PSF	PSF
CONF. PRES. PSF	SAMPLE A	6048	PSF	SAMPLE A	6409	2867
	SAMPLE B	7200	PSF	SAMPLE B	8918	3849
	SAMPLE C	8352	PSF	SAMPLE C	11550	4810

SAMPLE A				SAMPLE B				SAMPLE C			
σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q
PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF
6048	6048	6048	0	7200	7200	7200	0	8352	8352	8352	0
5674	6529	6101	428	6408	8700	7554	1146	7243	10214	8729	1485
5256	6775	6016	760	6034	9423	7728	1695	6869	11095	8982	2113
4982	6880	5931	949	5818	10027	7922	2105	6667	11788	9228	2560
4795	6975	5885	1090	5645	10582	8113	2468	6552	12386	9469	2917
4637	7004	5820	1183	5515	10995	8255	2740	6466	12921	9693	3228
4507	7061	5784	1277	5414	11345	8380	2965	6422	13409	9916	3493
4392	7132	5762	1370	5342	11541	8442	3099	6336	13763	10050	3714
4306	7137	5721	1416	5270	11736	8503	3233	6307	14085	10196	3889
4219	7237	5728	1509	5227	11868	8548	3320	6278	14316	10297	4019
4133	7241	5687	1554	5198	11923	8561	3362	6250	14717	10483	4234
4075	7275	5675	1600	5170	12069	8620	3450	6250	15047	10648	4399
3960	7435	5697	1737	5126	12110	8618	3492	6221	15089	10655	4434
3830	7486	5658	1828	5098	12165	8631	3534	6235	15254	10744	4509
3758	7594	5676	1918	5098	12248	8673	3575	6235	15324	10779	4544
3701	7715	5708	2007	5098	12331	8715	3617	6235	15384	10810	4574
3658	7850	5754	2096	5083	12310	8697	3613	6250	15380	10815	4565
3629	7906	5767	2138	5098	12407	8752	3655	6278	15556	10917	4639
3600	8054	5827	2227	5083	12475	8779	3696	6293	15610	10952	4659
3542	8172	5857	2315	5083	12558	8821	3737	6394	15837	11115	4722
3542	8255	5899	2356	5083	12551	8817	3734	6466	15946	11206	4740
3514	8401	5957	2444	5083	12633	8858	3775	6566	16084	11325	4759
3485	8455	5970	2485	5098	12640	8869	3771	6624	16177	11401	4777
3499	8643	6071	2572	5069	12693	8881	3812	6710	16298	11504	4794
3514	8830	6172	2658	5069	12685	8877	3808	6739	16360	11550	4810
3514	8910	6212	2698	5069	12767	8918	3849	6782	16352	11567	4785
3528	9011	6269	2741	5069	12759	8914	3845	6826	16343	11585	4759
3542	9111	6327	2784	5083	12766	8924	3841	6869	16335	11602	4733
3557	9119	6338	2781	5098	12778	8938	3840	6941	16356	11649	4708
3542	9190	6366	2824					6984	16348	11666	4682
3542	9276	6409	2867					7027	16269	11648	4621
3571	9298	6435	2864					7027	16065	11546	4519

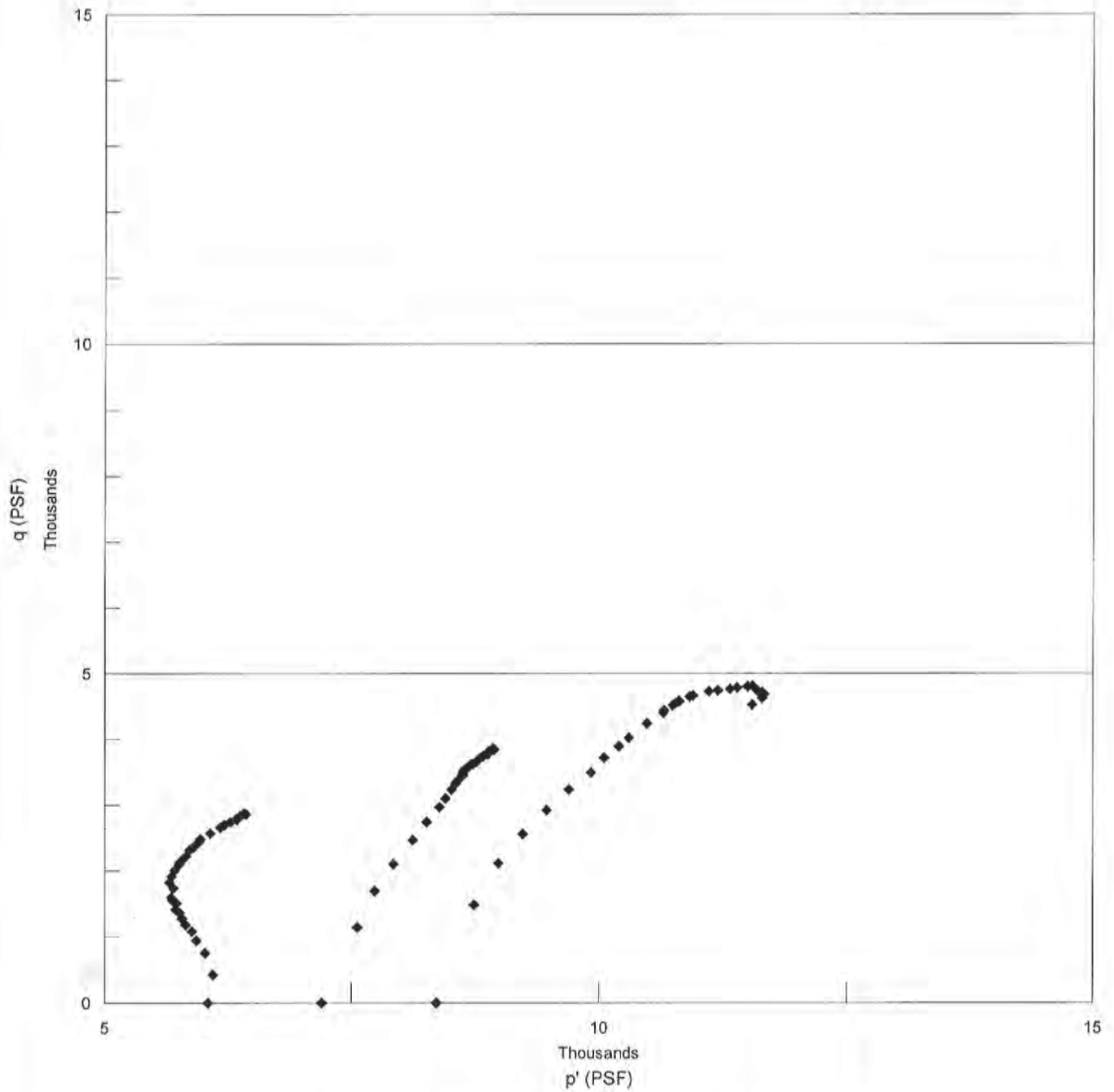
Data entry by: DAW
Data checked by: *DDM*
FileName: MWPQB310.WK4

Date: 05/22/2014
Date: *5/22/14*



Effective Stress Path Analysis - p' q Plots

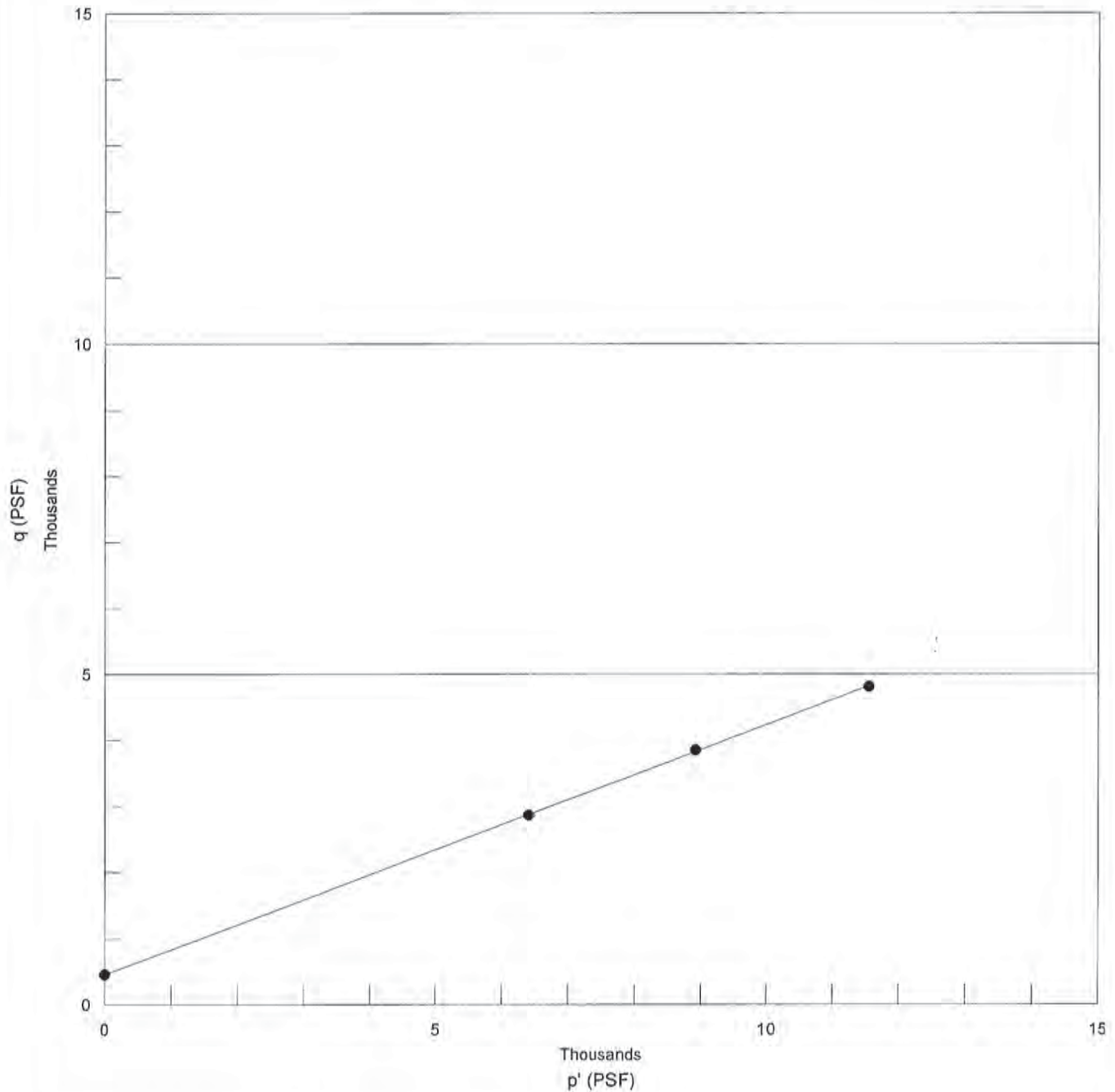
MWH, Tailings Impoundment, --, TI-B3-10, A, B & C, 56-57' (55-57')



◆ Stress Paths of Samples A, B & C

Effective Stress Path Analysis - p'-q Regression Plot

MWH, Tailings Impoundment, --, TI-B3-10, A, B&C, 56-57' (55-57')



● Shear Data

- Best Fit Line

psi = 20.7 degrees

a = 455.3 PSF

TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-10
DEPTH 56-57' (55-57')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 1

SAMPLED 11/19/13 MWH
TEST STARTED 04/25/14 DPM
TEST FINISHED 05/05/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
CONF. PRES. PSF 6048

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	816.0	800.3
Wt. Wet Soil & Pan (g)	831.8	816.1
Wt. Dry Soil & Pan (g)	689.3	689.3
Wt. Lost Moisture (g)	142.5	126.7
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	673.5	673.5
Moisture Content %	21.1	18.8
Wet Density PCF	128.6	129.7
Dry Density PCF	106.2	109.2
Init. Diameter (in)	2.411	
Init. Area (sq in)	4.564	
Init. Height (in)	5.296	
Vol. Bef. Consol. (cu ft)	0.01399	
Vol. After Consol. (cu ft)	0.01360	

Notes & Comments: Dried at 60 degrees C.

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: DPM Date: 5/21/14
FileName: MWT0B310



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-10	SAMPLED	11/19/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/05/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	6048

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	3.6	13.0				
50.0		7.7	8.1	38.0	47.7	9.7	0.97

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.50	0.00
0.25	0.5	5.80	-5.30
0.5	0.7	6.30	-5.80
1	1.0	6.90	-6.40
2	1.4	7.60	-7.10
4	2.0	8.60	-8.10
9	3.0	10.30	-9.80
16	4.0	11.90	-11.40
30	5.5	14.15	-13.65
60	7.7	17.30	-16.80
120	11.0	20.85	-20.35
240	15.5	23.80	-23.30
360	19.0	24.85	-24.35

Initial Height (in)	5.296	Init. Vol. (CC)	396.12
Height Change (in)	0.121	Vol. Change (CC)	30.60
Ht. After Cons. (in)	5.175	Cell Exp. (CC)	19.61
Initial Area (sq in)	4.564	Net Change (CC)	10.99
Area After Cons. (sq in)	4.541	Cons. Vol. (CC)	385.13

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: DPM Date: 5/21/14
 FileName: MWT0B310



TRIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-10	SAMPLED	11/19/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/05/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	6048

Init. Ht. (in)	5.296	Init. Area (sq in)	4.564
Consol. Ht. (in)	5.175	Consol. Area (sq in)	4.541
Back Pres. PSI	38.2	Strain Rate (in/min)	0.0003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.541	0	38.2	0	6048	6048	1.00
27.0	856	0.005	0.10	4.545	855	40.8	374	5674	6529	1.15
48.0	1522	0.010	0.20	4.550	1519	43.7	792	5256	6775	1.29
60.0	1903	0.015	0.30	4.554	1897	45.6	1066	4982	6880	1.38
69.0	2188	0.021	0.40	4.559	2180	46.9	1253	4795	6975	1.45
75.0	2378	0.026	0.49	4.563	2367	48.0	1411	4637	7004	1.51
81.0	2569	0.031	0.59	4.568	2554	48.9	1541	4507	7061	1.57
87.0	2759	0.036	0.69	4.572	2740	49.7	1656	4392	7132	1.62
90.0	2854	0.041	0.79	4.577	2832	50.3	1742	4306	7137	1.66
96.0	3044	0.046	0.89	4.581	3017	50.9	1829	4219	7237	1.72
99.0	3140	0.051	0.99	4.586	3109	51.5	1915	4133	7241	1.75
102.0	3235	0.056	1.09	4.591	3200	51.9	1973	4075	7275	1.79
111.0	3520	0.066	1.28	4.600	3475	52.7	2088	3960	7435	1.88
117.0	3710	0.077	1.48	4.609	3655	53.6	2218	3830	7486	1.95
123.0	3901	0.087	1.68	4.618	3835	54.1	2290	3758	7594	2.02
129.0	4091	0.097	1.88	4.628	4014	54.5	2347	3701	7715	2.08
135.0	4281	0.108	2.08	4.637	4192	54.8	2390	3658	7850	2.15
138.0	4376	0.118	2.28	4.646	4277	55.0	2419	3629	7906	2.18
144.0	4567	0.128	2.48	4.656	4454	55.2	2448	3600	8054	2.24
150.0	4757	0.138	2.67	4.665	4630	55.6	2506	3542	8172	2.31
153.0	4852	0.149	2.87	4.675	4713	55.6	2506	3542	8255	2.33
159.0	5042	0.159	3.07	4.684	4888	55.8	2534	3514	8401	2.39
162.0	5138	0.169	3.26	4.694	4970	56.0	2563	3485	8455	2.43
168.0	5328	0.179	3.46	4.703	5143	55.9	2549	3499	8643	2.47
174.0	5518	0.189	3.66	4.713	5316	55.8	2534	3514	8830	2.51
177.0	5613	0.200	3.86	4.723	5397	55.8	2534	3514	8910	2.54
180.0	5708	0.205	3.95	4.728	5483	55.7	2520	3528	9011	2.55
183.0	5804	0.210	4.05	4.732	5568	55.6	2506	3542	9111	2.57
183.0	5804	0.215	4.15	4.737	5563	55.5	2491	3557	9119	2.56
186.0	5899	0.220	4.25	4.742	5648	55.6	2506	3542	9190	2.59
189.0	5994	0.225	4.35	4.747	5733	55.6	2506	3542	9276	2.62
189.0	5994	0.230	4.45	4.752	5727	55.4	2477	3571	9298	2.60

Data entry by: DPM/DAW Date: 05/21/2014
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 FileName: MWT0B310



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-10	SAMPLED	11/19/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/05/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 2	CONF. PRES. PSF	7200

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	816.0	800.3
Wt. Wet Soil & Pan (g)	831.8	816.1
Wt. Dry Soil & Pan (g)	689.3	689.3
Wt. Lost Moisture (g)	142.5	126.7
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	673.5	673.5
Moisture Content %	21.1	18.8
Wet Density PCF	132.3	130.5
Dry Density PCF	109.2	109.9
Init. Diameter (in)	2.460	
Init. Area (sq in)	4.752	
Init. Height (in)	4.945	
Vol. Bef. Consol. (cu ft)	0.01360	
Vol. After Consol. (cu ft)	0.01352	

Notes & Comments:

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: DPM Date: 5/21/14
FileName: MWT0B310



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-10
DEPTH 56-57' (55-57")
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 2

SAMPLED 11/19/13 MWH
TEST STARTED 04/25/14 DPM
TEST FINISHED 05/05/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
CONF. PRES. PSF 7200

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.90	0.00
0.25	0.5	1.50	-0.60
0.5	0.7	1.55	-0.65
1	1.0	1.55	-0.65
2	1.4	1.60	-0.70
4	2.0	1.60	-0.70
9	3.0	1.70	-0.80
16	4.0	1.80	-0.90
30	5.5	1.95	-1.05
60	7.7	2.20	-1.30
120	11.0	2.60	-1.70
240	15.5	3.10	-2.20
360	19.0	3.30	-2.40

Initial Height (in) 4.945
Height Change (in) -0.018
Ht. After Cons. (in) 4.963
Initial Area (sq in) 4.752
Area After Cons. (sq in) 4.706

Init. Vol. (CC) 385.13
Vol. Change (CC) 3.20
Cell Exp. (CC) 0.90
Net Change (CC) 2.30
Cons. Vol. (CC) 382.83

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: DPM Date: 5/21/14
FileName: MWT0B310



TRIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-10	SAMPLED	11/19/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/05/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 2	CONF. PRES. PSF	7200
Init. Ht. (in)	4.945	Init. Area (sq in)	4.752
Consol. Ht. (in)	4.963	Consol. Area (sq in)	4.706
Back Pres. PSI	38.3	Strain Rate (in/min)	0.0003

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.706	0	38.3	0	7200	7200	1.00
75.0	2295	0.005	0.10	4.711	2292	43.8	792	6408	8700	1.36
111.0	3396	0.010	0.20	4.716	3389	46.4	1166	6034	9423	1.56
138.0	4222	0.015	0.30	4.720	4210	47.9	1382	5818	10027	1.72
162.0	4957	0.020	0.39	4.725	4937	49.1	1555	5645	10582	1.87
180.0	5507	0.025	0.49	4.730	5480	50.0	1685	5515	10995	1.99
195.0	5966	0.030	0.59	4.735	5931	50.7	1786	5414	11345	2.10
204.0	6242	0.034	0.69	4.739	6198	51.2	1858	5342	11541	2.16
213.0	6517	0.039	0.79	4.744	6465	51.7	1930	5270	11736	2.23
219.0	6701	0.044	0.89	4.749	6641	52.0	1973	5227	11868	2.27
222.0	6792	0.049	0.99	4.754	6725	52.2	2002	5198	11923	2.29
228.0	6976	0.054	1.09	4.758	6900	52.4	2030	5170	12069	2.33
231.0	7068	0.059	1.19	4.763	6984	52.7	2074	5126	12110	2.36
234.0	7159	0.064	1.29	4.768	7067	52.9	2102	5098	12165	2.39
237.0	7251	0.069	1.39	4.773	7151	52.9	2102	5098	12248	2.40
240.0	7343	0.074	1.49	4.778	7234	52.9	2102	5098	12331	2.42
240.0	7343	0.079	1.59	4.782	7227	53.0	2117	5083	12310	2.42
243.0	7435	0.084	1.69	4.787	7309	52.9	2102	5098	12407	2.43
246.0	7527	0.089	1.79	4.792	7392	53.0	2117	5083	12475	2.45
249.0	7618	0.094	1.88	4.797	7475	53.0	2117	5083	12558	2.47
249.0	7618	0.098	1.98	4.802	7467	53.0	2117	5083	12551	2.47
252.0	7710	0.103	2.08	4.807	7550	53.0	2117	5083	12633	2.49
252.0	7710	0.108	2.18	4.811	7542	52.9	2102	5098	12640	2.48
255.0	7802	0.113	2.28	4.816	7624	53.1	2131	5069	12693	2.50
255.0	7802	0.118	2.38	4.821	7616	53.1	2131	5069	12685	2.50
258.0	7894	0.123	2.48	4.826	7698	53.1	2131	5069	12767	2.52
258.0	7894	0.128	2.58	4.831	7690	53.1	2131	5069	12759	2.52
258.0	7894	0.133	2.68	4.836	7683	53.0	2117	5083	12766	2.51
258.0	7894	0.134	2.71	4.837	7680	52.9	2102	5098	12778	2.51

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: *DPM* Date: *5/21/14*
 FileName: MWT0B310



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B3-10	SAMPLED	11/19/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/05/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	8352

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	816.0	800.3
Wt. Wet Soil & Pan (g)	831.8	816.1
Wt. Dry Soil & Pan (g)	689.3	689.3
Wt. Lost Moisture (g)	142.5	126.7
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	673.5	673.5
Moisture Content %	21.1	18.8
Wet Density PCF	133.1	131.0
Dry Density PCF	109.9	110.2
Init. Diameter (in)	2.482	
Init. Area (sq in)	4.837	
Init. Height (in)	4.829	
Vol. Bef. Consol. (cu ft)	0.01352	
Vol. After Consol. (cu ft)	0.01347	

Notes & Comments:

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: *DPM* Date: *5/21/14*
FileName: MWT0B310



TRIAxIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-10	SAMPLED	11/19/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/05/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	8352

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	5.70	0.00
0.25	0.5	6.25	-0.55
0.5	0.7	6.30	-0.60
1	1.0	6.30	-0.60
2	1.4	6.30	-0.60
4	2.0	6.30	-0.60
9	3.0	6.40	-0.70
16	4.0	6.40	-0.70
30	5.5	6.50	-0.80
60	7.7	6.65	-0.95
120	11.0	6.85	-1.15
240	15.5	7.00	-1.30
360	19.0	7.10	-1.40

Initial Height (in)	4.829	Init. Vol. (CC)	382.83
Height Change (in)	-0.027	Vol. Change (CC)	2.20
Ht. After Cons. (in)	4.856	Cell Exp. (CC)	0.90
Initial Area (sq in)	4.837	Net Change (CC)	1.30
Area After Cons. (sq in)	4.794	Cons. Vol. (CC)	381.54

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: DPM Date: 5/21/14
 FileName: MWT0B310



TRIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-10	SAMPLED	11/19/13 MWH
DEPTH	56-57' (55-57')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/05/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	27S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	8352

Init. Ht. (in)	4.829	Init. Area (sq in)	4.837
Consol. Ht. (in)	4.856	Consol. Area (sq in)	4.794
Back Pres. PSI	38.3	Strain Rate (in/min)	0.0003

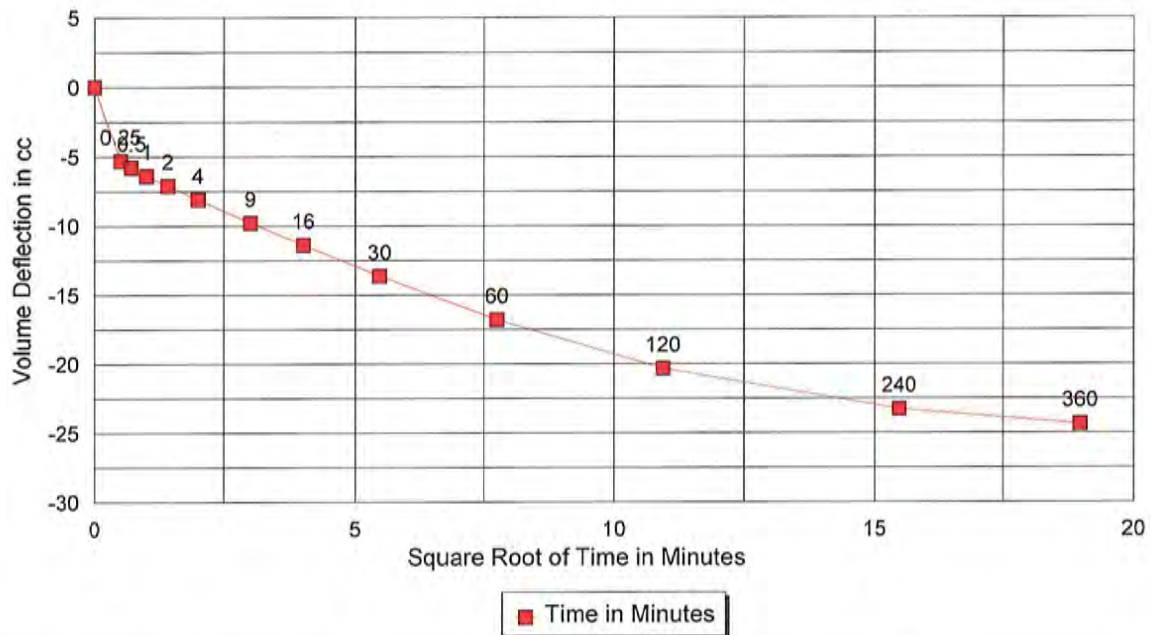
Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.794	0	38.3	0	8352	8352	1.00
99.0	2974	0.005	0.10	4.799	2971	46.0	1109	7243	10214	1.41
141.0	4235	0.010	0.20	4.804	4227	48.6	1483	6869	11095	1.62
171.0	5136	0.014	0.30	4.809	5121	50.0	1685	6667	11788	1.77
195.0	5857	0.019	0.40	4.813	5834	50.8	1800	6552	12386	1.89
216.0	6488	0.024	0.49	4.818	6456	51.4	1886	6466	12921	2.00
234.0	7028	0.029	0.59	4.823	6987	51.7	1930	6422	13409	2.09
249.0	7479	0.034	0.69	4.828	7427	52.3	2016	6336	13763	2.17
261.0	7839	0.038	0.79	4.832	7777	52.5	2045	6307	14085	2.23
270.0	8110	0.043	0.89	4.837	8038	52.7	2074	6278	14316	2.28
285.0	8560	0.053	1.09	4.847	8467	52.9	2102	6250	14717	2.35
297.0	8921	0.067	1.38	4.862	8797	52.9	2102	6250	15047	2.41
300.0	9011	0.077	1.58	4.871	8868	53.1	2131	6221	15089	2.43
306.0	9191	0.091	1.88	4.886	9018	53.0	2117	6235	15254	2.45
309.0	9281	0.101	2.08	4.896	9088	53.0	2117	6235	15324	2.46
312.0	9371	0.115	2.37	4.911	9149	53.0	2117	6235	15384	2.47
312.0	9371	0.125	2.57	4.921	9130	52.9	2102	6250	15380	2.46
318.0	9551	0.139	2.87	4.936	9278	52.7	2074	6278	15556	2.48
321.0	9642	0.163	3.36	4.961	9317	52.6	2059	6293	15610	2.48
327.0	9822	0.187	3.86	4.987	9443	51.9	1958	6394	15837	2.48
330.0	9912	0.211	4.35	5.012	9481	51.4	1886	6466	15946	2.47
333.0	10002	0.235	4.84	5.038	9517	50.7	1786	6566	16084	2.45
336.0	10092	0.259	5.34	5.065	9553	50.3	1728	6624	16177	2.44
339.0	10182	0.284	5.84	5.092	9587	49.7	1642	6710	16298	2.43
342.0	10272	0.308	6.34	5.119	9621	49.5	1613	6739	16360	2.43
342.0	10272	0.332	6.84	5.146	9569	49.2	1570	6782	16352	2.41
342.0	10272	0.357	7.34	5.174	9518	48.9	1526	6826	16343	2.39
342.0	10272	0.381	7.84	5.202	9467	48.6	1483	6869	16335	2.38
342.0	10272	0.405	8.34	5.231	9415	48.1	1411	6941	16356	2.36
342.0	10272	0.429	8.84	5.259	9364	47.8	1368	6984	16348	2.34
339.0	10182	0.449	9.24	5.282	9241	47.5	1325	7027	16269	2.32
333.0	10002	0.468	9.64	5.306	9038	47.5	1325	7027	16065	2.29

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: DPM Date: 5/21/14
 FileName: MWTOB310



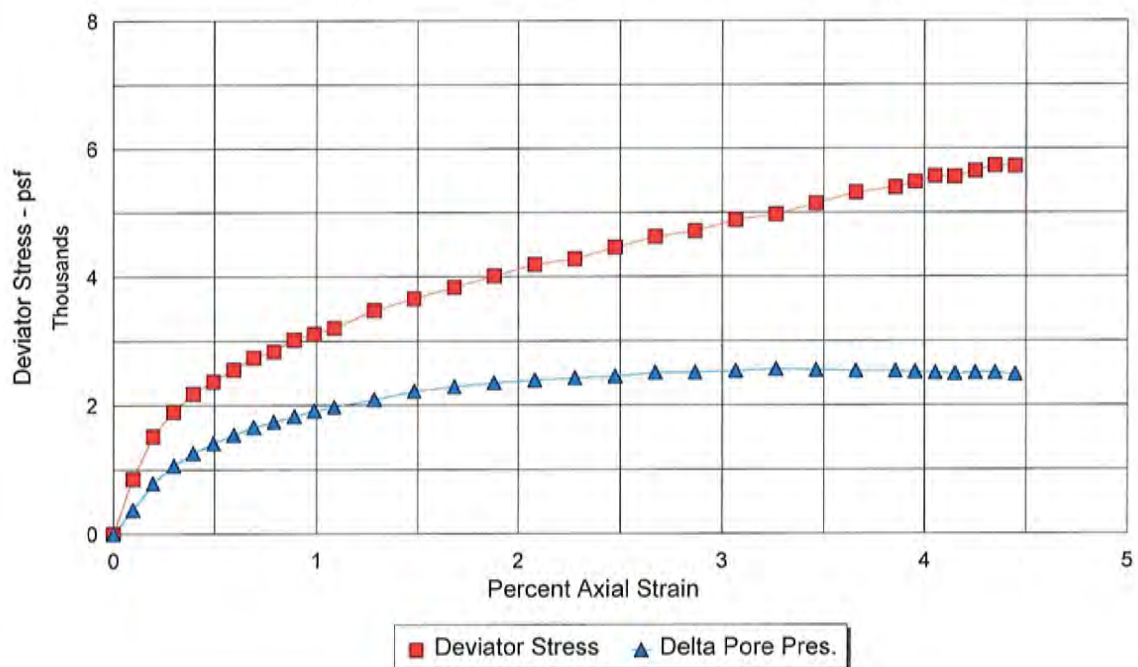
CONSOLIDATION DATA

TI-B3-10, 56-57' (55-57'), -, Stage 1



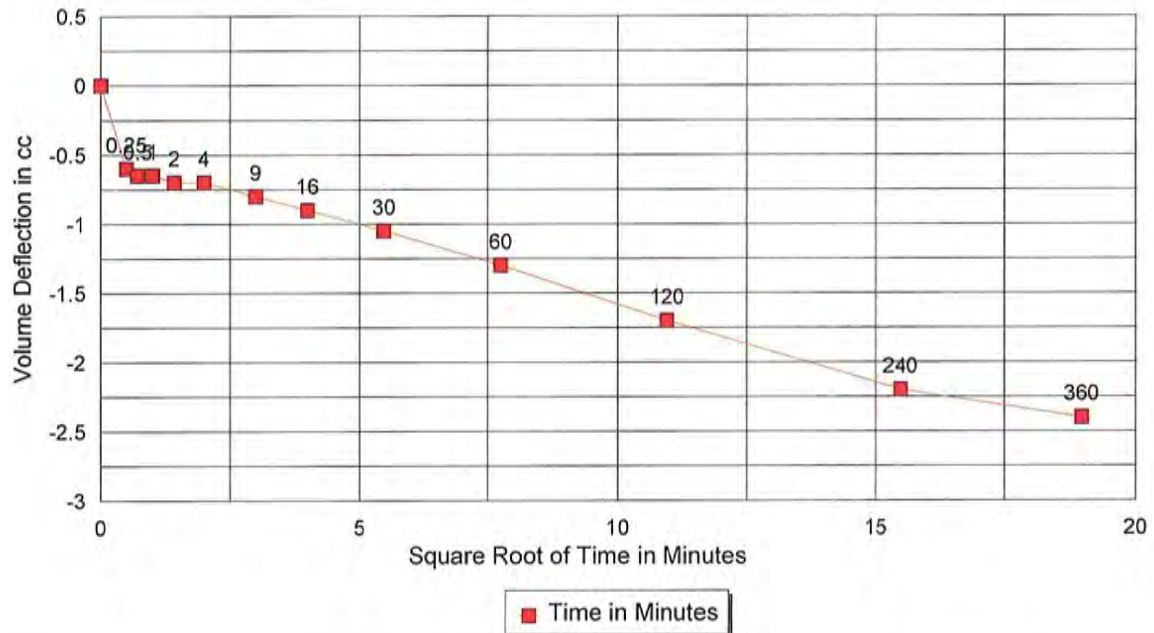
TRIAXIAL TEST - TX/CUpp

TI-B3-10, 56-57' (55-57'), -, Stage 1



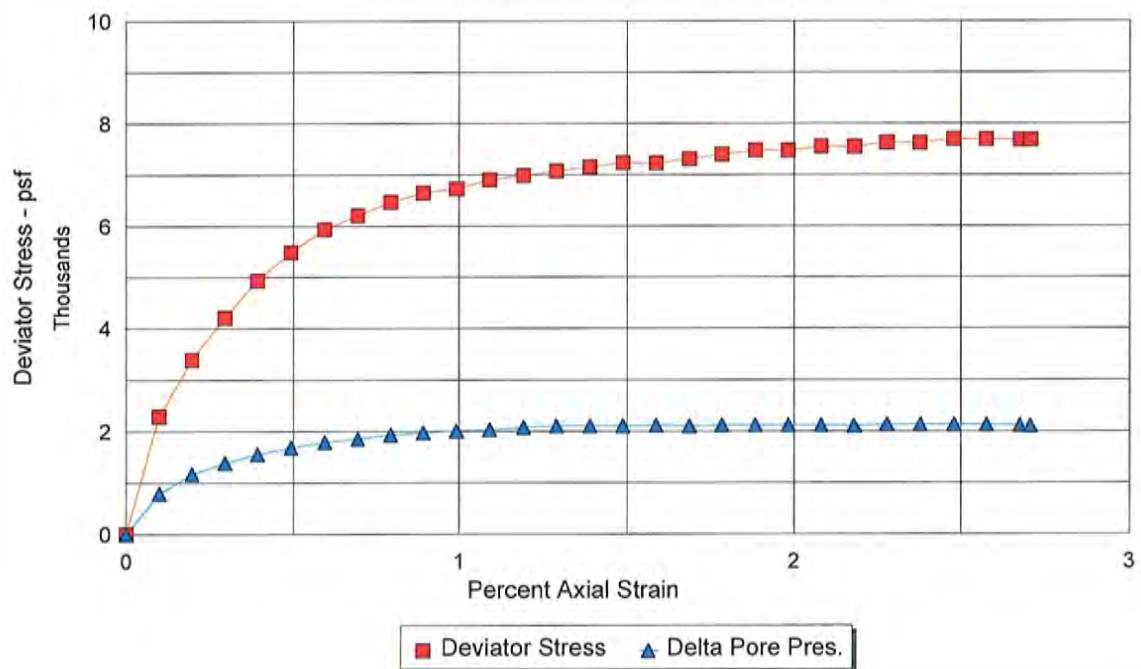
CONSOLIDATION DATA

TI-B3-10, 56-57' (55-57'), -, Stage 2



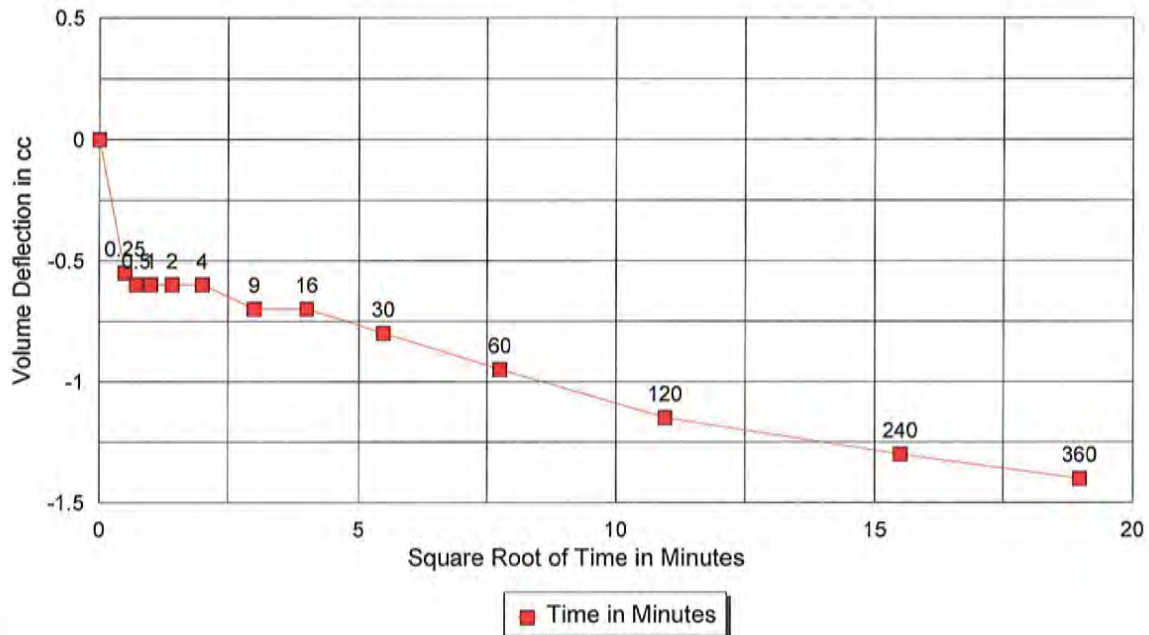
TRIAXIAL TEST - TX/CUpp

TI-B3-10, 56-57' (55-57'), -, Stage 2



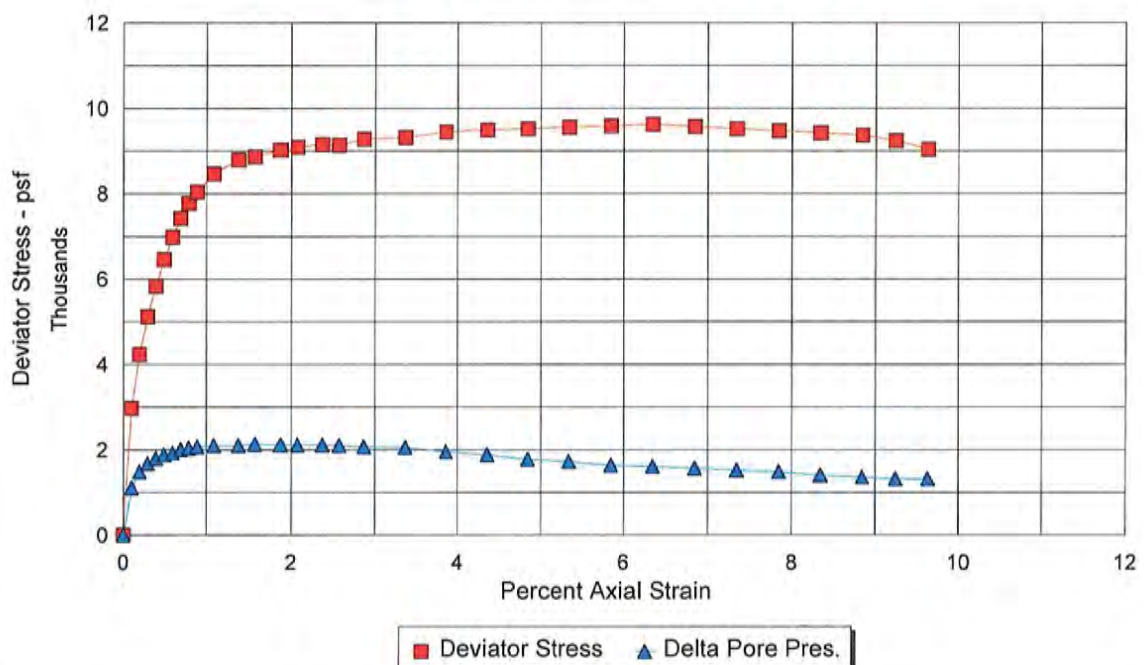
CONSOLIDATION DATA

TI-B3-10, 56-57' (55-57'), -, Stage 3



TRIAXIAL TEST - TX/CUpp

TI-B3-10, 56-57' (55-57'), -, Stage 3



EFFECTIVE STRESS PATH ANALYSIS TEST DATA
ASTM D4767

CLIENT MWH
BORING NO. TI-B3-08B
DEPTH 45.5-46.0'
SAMPLE NO. A,B&C
PROJECT NO. --
LOCATION Tailings Impoundment

JOB NO. 2512-77
SAMPLED 11/19/13 MWH
SATURATED TEST
TEST TYPE TX/CUPP

				Peak Points		
				p'	q	
				PSF	PSF	
CONF. PRES. PSF	SAMPLE A	4752	PSF	SAMPLE A	4304	2345
	SAMPLE B	5904	PSF	SAMPLE B	6742	3574
	SAMPLE C	7056	PSF	SAMPLE C	9941	5103

SAMPLE A				SAMPLE B				SAMPLE C			
σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q
PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF
4752	4752	4752	0	5904	5904	5904	0	7056	7056	7056	0
4291	5654	4973	681	4997	8797	6897	1900	6106	9678	7892	1786
3830	5948	4889	1059	4450	9705	7077	2628	5602	11026	8314	2712
3499	6069	4784	1285	4219	9470	6844	2625	5285	11844	8564	3280
3240	6109	4674	1434	4003	9540	6772	2768	5040	12448	8744	3704
3053	6070	4561	1508	3845	9667	6756	2911	4896	12723	8810	3914
2894	6059	4477	1582	3715	9823	6769	3054	4766	13012	8889	4123
2779	6091	4435	1656	3614	9861	6738	3123	4680	13202	8941	4261
2678	6137	4408	1729	3542	9928	6735	3193	4608	13263	8935	4327
2578	6183	4380	1803	3470	9994	6732	3262	4550	13338	8944	4394
2506	6108	4307	1801	3427	10090	6758	3331	4421	13456	8938	4517
2419	6167	4293	1874	3384	10040	6712	3328	4349	13488	8918	4570
2362	6256	4309	1947	3355	10149	6752	3397	4320	13563	8941	4621
2318	6209	4263	1945	3312	10099	6705	3393	4291	13496	8894	4602
2275	6161	4218	1943	3298	10077	6688	3390	4277	13583	8930	4653
2232	6264	4248	2016	3269	10042	6655	3386	4277	13545	8911	4634
2189	6216	4203	2014	3254	10164	6709	3455	4291	13758	9025	4734
2160	6332	4246	2086	3240	10143	6692	3452	4291	13816	9054	4763
2131	6299	4215	2084	3226	10122	6674	3448	4320	13805	9063	4743
2117	6281	4199	2082	3211	10244	6727	3516	4320	13901	9110	4790
2074	6377	4226	2152	3197	10222	6710	3513	4378	14012	9195	4817
2030	6325	4178	2148	3197	10215	6706	3509	4406	14091	9249	4842
2016	6450	4233	2217	3182	10194	6688	3506	4450	14313	9381	4932
1987	6412	4200	2213	3168	10315	6742	3574	4478	14386	9432	4954
1973	6536	4254	2282	3168	10308	6738	3570	4522	14342	9432	4910
1958	6512	4235	2277	3168	10301	6734	3566	4565	14554	9560	4995
1958	6649	4304	2345	3168	10293	6731	3563	4608	14635	9622	5014
1958	6644	4301	2343	3168	10286	6727	3559	4666	14728	9697	5031
1944	6625	4284	2340					4709	14804	9757	5048
1944	6620	4282	2338					4752	14879	9815	5063
1944	6615	4280	2336					4795	14951	9873	5078
1944	6610	4277	2333					4838	15044	9941	5103

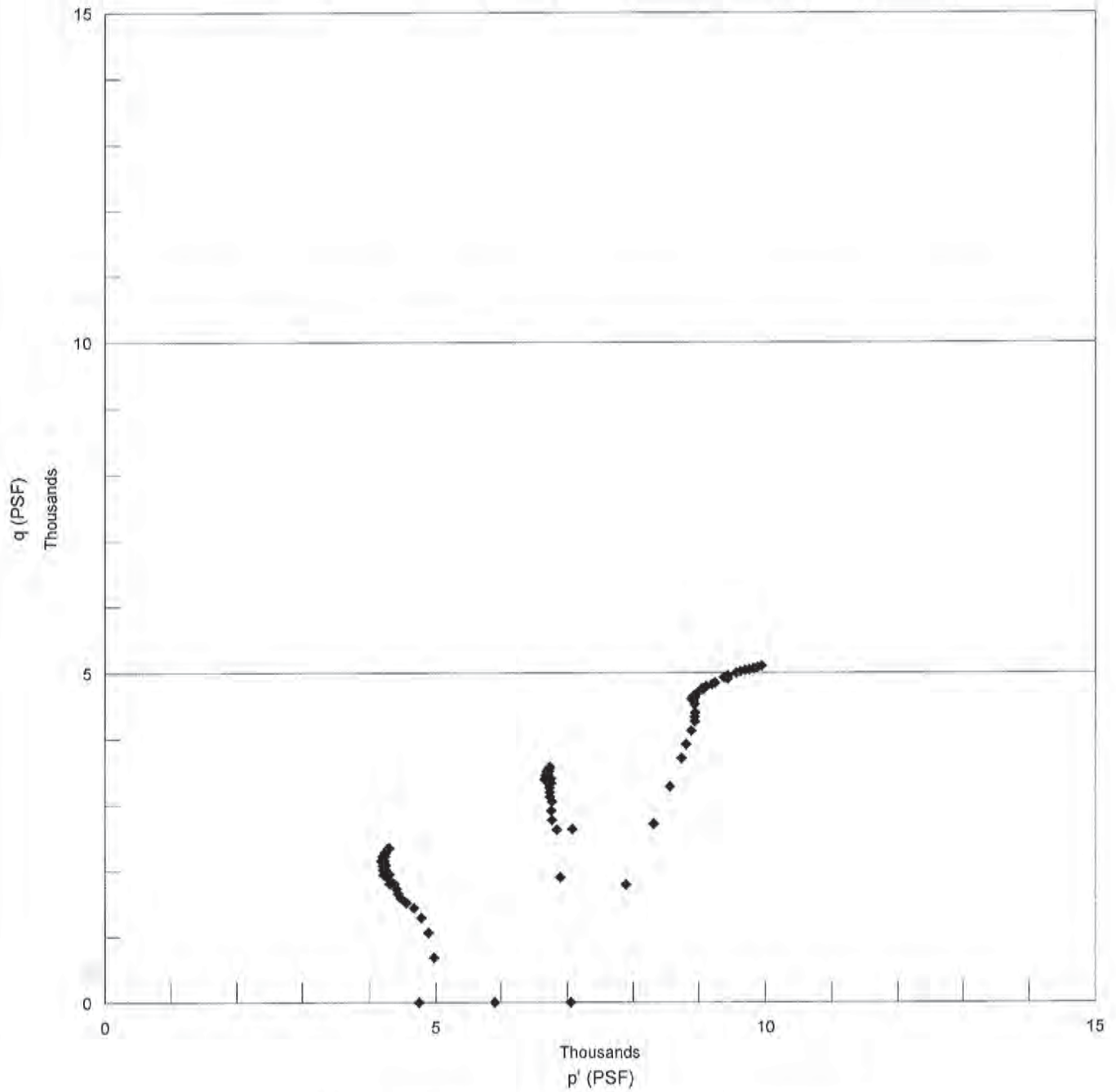
Data entry by: DAW
Data checked by: *plm*
FileName: MWPQB308.WK4

Date: 05/22/2014
Date: *5/22/14*



Effective Stress Path Analysis - p' q Plots

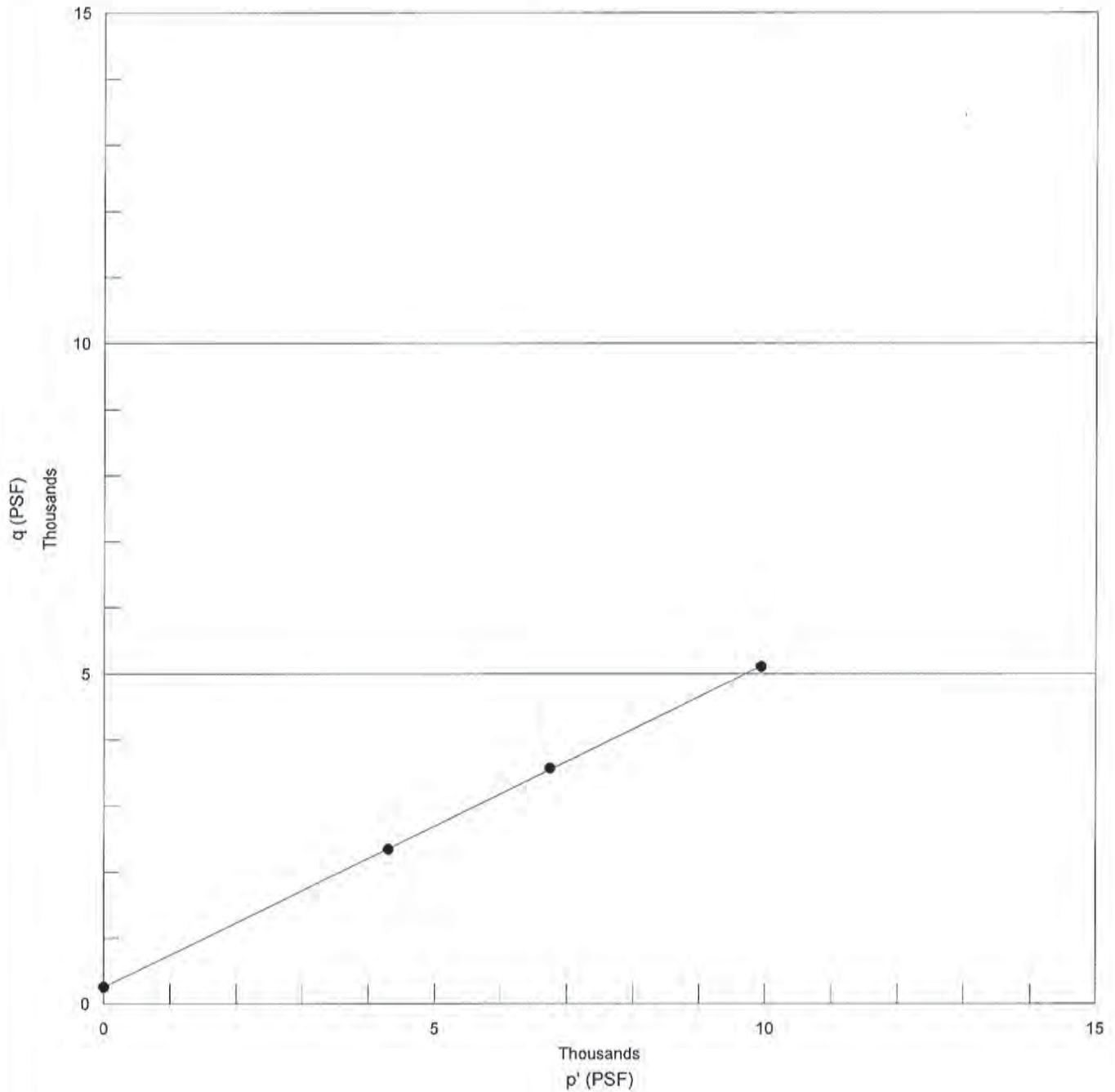
MWH, Tailings Impoundment, --, TI-B3-08B,A,B&C, 45.5-46.0'



◆ Stress Paths of Samples A, B & C

Effective Stress Path Analysis - p' - q Regression Plot

MWH, Tailings Impoundment, --, TI-B3-08B, A, B&C, 45.5-46.0'



● Shear Data

— Best Fit Line

$\psi = 26.0$ degrees

$a = 256.1$ PSF

TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-08B
DEPTH 45.5-46.0
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/Cupp, Stage 1

SAMPLED 11/19/13 MWH
TEST STARTED 05/01/14 DPM
TEST FINISHED 05/08/14 DPM
CELL NUMBER 26S
SATURATED TEST Yes
CONF. PRES. PSF 4752

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	405.8	401.2
Wt. Wet Soil & Pan (g)	441.5	436.9
Wt. Dry Soil & Pan (g)	380.5	380.5
Wt. Lost Moisture (g)	61.0	56.4
Wt. of Pan Only (g)	35.7	35.7
Wt. of Dry Soil (g)	344.8	344.8
Moisture Content %	17.7	16.3
Wet Density PCF	128.8	127.4
Dry Density PCF	109.4	109.5
Init. Diameter (in)	1.892	
Init. Area (sq in)	2.811	
Init. Height (in)	4.270	
Vol. Bef. Consol. (cu ft)	0.00695	
Vol. After Consol. (cu ft)	0.00694	

Notes & Comments: Dried at 60 degrees C.

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: *DPM* Date: *5/21/14*
FileName: MWT0B308



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-08B	SAMPLED	11/19/13 MWH
DEPTH	45.5-46.0	TEST STARTED	05/01/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/08/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	4752

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	9.1				
50.0	48.0	9.4	10.1	38.3	47.6	9.3	0.93
60.0		10.5	10.6	48.2	57.9	9.7	0.97

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.30	0.00
0.25	0.5	4.30	-4.00
0.5	0.7	4.85	-4.55
1	1.0	5.40	-5.10
2	1.4	6.15	-5.85
4	2.0	7.00	-6.70
9	3.0	8.10	-7.80
16	4.0	8.70	-8.40
30	5.5	9.25	-8.95
60	7.7	9.55	-9.25
120	11.0	9.70	-9.40
240	15.5	9.80	-9.50
360	19.0	9.90	-9.60

Initial Height (in)	4.270	Init. Vol. (CC)	196.76
Height Change (in)	0.060	Vol. Change (CC)	19.05
Ht. After Cons. (in)	4.210	Cell Exp. (CC)	18.92
Initial Area (sq in)	2.811	Net Change (CC)	0.13
Area After Cons. (sq in)	2.850	Cons. Vol. (CC)	196.64

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: *DPM* Date: *5/21/14*
 FileName: MWT0B308



TRIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-08B	SAMPLED	11/19/13 MWH
DEPTH	45.5-46.0	TEST STARTED	05/01/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/08/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	4752

Init. Ht. (in)	4.270	Init. Area (sq in)	2.811
Consol. Ht. (in)	4.210	Consol. Area (sq in)	2.850
Back Pres. PSI	48.1	Strain Rate (in/min)	0.002

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	2.850	0	48.1	0	4752	4752	1.00
27.0	1364	0.004	0.10	2.853	1363	51.3	461	4291	5654	1.32
42.0	2122	0.008	0.20	2.855	2118	54.5	922	3830	5948	1.55
51.0	2577	0.013	0.30	2.858	2569	56.8	1253	3499	6069	1.73
57.0	2880	0.017	0.40	2.861	2869	58.6	1512	3240	6109	1.89
60.0	3032	0.021	0.50	2.864	3017	59.9	1699	3053	6070	1.99
63.0	3183	0.025	0.60	2.867	3164	61.0	1858	2894	6059	2.09
66.0	3335	0.029	0.70	2.870	3312	61.8	1973	2779	6091	2.19
69.0	3487	0.034	0.80	2.873	3459	62.5	2074	2678	6137	2.29
72.0	3638	0.038	0.90	2.876	3606	63.2	2174	2578	6183	2.40
72.0	3638	0.042	1.00	2.878	3602	63.7	2246	2506	6108	2.44
75.0	3790	0.046	1.10	2.881	3748	64.3	2333	2419	6167	2.55
78.0	3941	0.051	1.20	2.884	3894	64.7	2390	2362	6256	2.65
78.0	3941	0.055	1.30	2.887	3890	65.0	2434	2318	6209	2.68
78.0	3941	0.059	1.40	2.890	3886	65.3	2477	2275	6161	2.71
81.0	4093	0.063	1.50	2.893	4032	65.6	2520	2232	6264	2.81
81.0	4093	0.068	1.60	2.896	4027	65.9	2563	2189	6216	2.84
84.0	4245	0.072	1.70	2.899	4172	66.1	2592	2160	6332	2.93
84.0	4245	0.076	1.80	2.902	4168	66.3	2621	2131	6299	2.96
84.0	4245	0.080	1.90	2.905	4164	66.4	2635	2117	6281	2.97
87.0	4396	0.089	2.10	2.911	4304	66.7	2678	2074	6377	3.08
87.0	4396	0.097	2.30	2.917	4295	67.0	2722	2030	6325	3.12
90.0	4548	0.105	2.50	2.923	4434	67.1	2736	2016	6450	3.20
90.0	4548	0.114	2.70	2.929	4425	67.3	2765	1987	6412	3.23
93.0	4699	0.122	2.90	2.935	4563	67.4	2779	1973	6536	3.31
93.0	4699	0.131	3.10	2.941	4554	67.5	2794	1958	6512	3.33
96.0	4851	0.139	3.30	2.947	4691	67.5	2794	1958	6649	3.40
96.0	4851	0.143	3.40	2.950	4686	67.5	2794	1958	6644	3.39
96.0	4851	0.148	3.51	2.953	4681	67.6	2808	1944	6625	3.41
96.0	4851	0.152	3.61	2.956	4676	67.6	2808	1944	6620	3.41
96.0	4851	0.156	3.71	2.960	4671	67.6	2808	1944	6615	3.40
96.0	4851	0.161	3.81	2.963	4666	67.6	2808	1944	6610	3.40

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: *DPM* Date: *5/21/14*
 FileName: MWT0B308



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-08B
DEPTH 45.5-46.0
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 2

SAMPLED 11/19/13 MWH
TEST STARTED 05/01/14 DPM
TEST FINISHED 05/08/14 DPM
CELL NUMBER 26S
SATURATED TEST Yes
CONF. PRES. PSF 5904

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	405.8	401.2
Wt. Wet Soil & Pan (g)	441.5	436.9
Wt. Dry Soil & Pan (g)	380.5	380.5
Wt. Lost Moisture (g)	61.0	56.4
Wt. of Pan Only (g)	35.7	35.7
Wt. of Dry Soil (g)	344.8	344.8
Moisture Content %	17.7	16.3
Wet Density PCF	128.9	127.8
Dry Density PCF	109.5	109.8
Init. Diameter (in)	1.942	
Init. Area (sq in)	2.963	
Init. Height (in)	4.050	
Vol. Bef. Consol. (cu ft)	0.00694	
Vol. After Consol. (cu ft)	0.00692	

Notes & Comments:

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: DPM Date: 5/21/14
FileName: MWT0B308



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-08B	SAMPLED	11/19/13 MWH
DEPTH	45.5-46.0	TEST STARTED	05/01/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/08/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 2	CONF. PRES. PSF	5904

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	12.80	0.00
0.25	0.5	13.35	-0.55
0.5	0.7	13.40	-0.60
1	1.0	13.40	-0.60
2	1.4	13.45	-0.65
4	2.0	13.50	-0.70
9	3.0	13.60	-0.80
16	4.0	13.65	-0.85
30	5.5	13.70	-0.90
60	7.7	13.80	-1.00
120	11.0	13.90	-1.10
240	15.5	13.90	-1.10
360	19.0	13.90	-1.10

Initial Height (in)	4.050	Init. Vol. (CC)	196.64
Height Change (in)	-0.001	Vol. Change (CC)	1.40
Ht. After Cons. (in)	4.051	Cell Exp. (CC)	0.80
Initial Area (sq in)	2.963	Net Change (CC)	0.60
Area After Cons. (sq in)	2.953	Cons. Vol. (CC)	196.03

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: DPM Date: 5/21/14
 FileName: MWT0B308



TRIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-08B	SAMPLED	11/19/13 MWH
DEPTH	45.5-46.0	TEST STARTED	05/01/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/08/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 2	CONF. PRES. PSF	5904

Init. Ht. (in)	4.050	Init. Area (sq in)	2.963
Consol. Ht. (in)	4.051	Consol. Area (sq in)	2.953
Back Pres. PSI	48.1	Strain Rate (in/min)	0.001

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	2.953	0	48.1	0	5904	5904	1.00
78.0	3804	0.004	0.11	2.956	3800	54.4	907	4997	8797	1.76
108.0	5267	0.009	0.21	2.959	5256	58.2	1454	4450	9705	2.18
108.0	5267	0.013	0.31	2.962	5251	59.8	1685	4219	9470	2.24
114.0	5559	0.017	0.41	2.965	5537	61.3	1901	4003	9540	2.38
120.0	5852	0.021	0.51	2.968	5822	62.4	2059	3845	9667	2.51
126.0	6145	0.025	0.60	2.971	6107	63.3	2189	3715	9823	2.64
129.0	6291	0.029	0.70	2.974	6247	64.0	2290	3614	9861	2.73
132.0	6437	0.033	0.80	2.977	6386	64.5	2362	3542	9928	2.80
135.0	6583	0.037	0.90	2.980	6524	65.0	2434	3470	9994	2.88
138.0	6730	0.041	1.00	2.983	6662	65.3	2477	3427	10090	2.94
138.0	6730	0.045	1.10	2.986	6656	65.6	2520	3384	10040	2.97
141.0	6876	0.049	1.20	2.989	6793	65.8	2549	3355	10149	3.02
141.0	6876	0.053	1.30	2.992	6787	66.1	2592	3312	10099	3.05
141.0	6876	0.057	1.40	2.995	6780	66.2	2606	3298	10077	3.06
141.0	6876	0.061	1.50	2.998	6773	66.4	2635	3269	10042	3.07
144.0	7022	0.065	1.60	3.001	6910	66.5	2650	3254	10164	3.12
144.0	7022	0.069	1.70	3.004	6903	66.6	2664	3240	10143	3.13
144.0	7022	0.073	1.80	3.007	6896	66.7	2678	3226	10122	3.14
147.0	7169	0.077	1.90	3.010	7033	66.8	2693	3211	10244	3.19
147.0	7169	0.081	2.00	3.013	7026	66.9	2707	3197	10222	3.20
147.0	7169	0.085	2.10	3.016	7018	66.9	2707	3197	10215	3.20
147.0	7169	0.089	2.19	3.019	7011	67.0	2722	3182	10194	3.20
150.0	7315	0.093	2.30	3.022	7147	67.1	2736	3168	10315	3.26
150.0	7315	0.097	2.39	3.025	7140	67.1	2736	3168	10308	3.25
150.0	7315	0.101	2.49	3.028	7133	67.1	2736	3168	10301	3.25
150.0	7315	0.105	2.59	3.032	7125	67.1	2736	3168	10293	3.25
150.0	7315	0.109	2.69	3.035	7118	67.1	2736	3168	10286	3.25

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: *DPM* Date: *5/21/14*
 FileName: MWT0B308



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B3-08B	SAMPLED	11/19/13 MWH
DEPTH	45.5-46.0	TEST STARTED	05/01/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/08/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	7056

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	405.8	401.2
Wt. Wet Soil & Pan (g)	441.5	436.9
Wt. Dry Soil & Pan (g)	380.5	380.5
Wt. Lost Moisture (g)	61.0	56.4
Wt. of Pan Only (g)	35.7	35.7
Wt. of Dry Soil (g)	344.8	344.8
Moisture Content %	17.7	16.3
Wet Density PCF	129.3	128.4
Dry Density PCF	109.8	110.3
 Init. Diameter (in)	 1.966	
Init. Area (sq in)	3.035	
Init. Height (in)	3.941	
Vol. Bef. Consol. (cu ft)	0.00692	
Vol. After Consol. (cu ft)	0.00689	

Notes & Comments:

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: DPM Date: 5/21/14
FileName: MWT0B308



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-08B
DEPTH 45.5-46.0
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 3

SAMPLED 11/19/13 MWH
TEST STARTED 05/01/14 DPM
TEST FINISHED 05/08/14 DPM
CELL NUMBER 26S
SATURATED TEST Yes
CONF. PRES. PSF 7056

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	15.70	0.00
0.25	0.5	16.25	-0.55
0.5	0.7	16.25	-0.55
1	1.0	16.25	-0.55
2	1.4	16.30	-0.60
4	2.0	16.30	-0.60
9	3.0	16.35	-0.65
16	4.0	16.40	-0.70
30	5.5	16.45	-0.75
60	7.7	16.50	-0.80
120	11.0	16.60	-0.90
240	15.5	16.80	-1.10
360	19.0	16.90	-1.20

Initial Height (in) 3.941
Height Change (in) 0.000
Ht. After Cons. (in) 3.941
Initial Area (sq in) 3.035
Area After Cons. (sq in) 3.021

Init. Vol. (CC) 196.03
Vol. Change (CC) 1.70
Cell Exp. (CC) 0.80
Net Change (CC) 0.90
Cons. Vol. (CC) 195.13

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: DPM Date: 5/21/14
FileName: MWT0B308



TRIAXIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3-08B	SAMPLED	11/19/13 MWH
DEPTH	45.5-46.0	TEST STARTED	05/01/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/08/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	7056

Init. Ht. (in)	3.941	Init. Area (sq in)	3.035
Consol. Ht. (in)	3.941	Consol. Area (sq in)	3.021
Back Pres. PSI	48.5	Strain Rate (in/min)	0.001

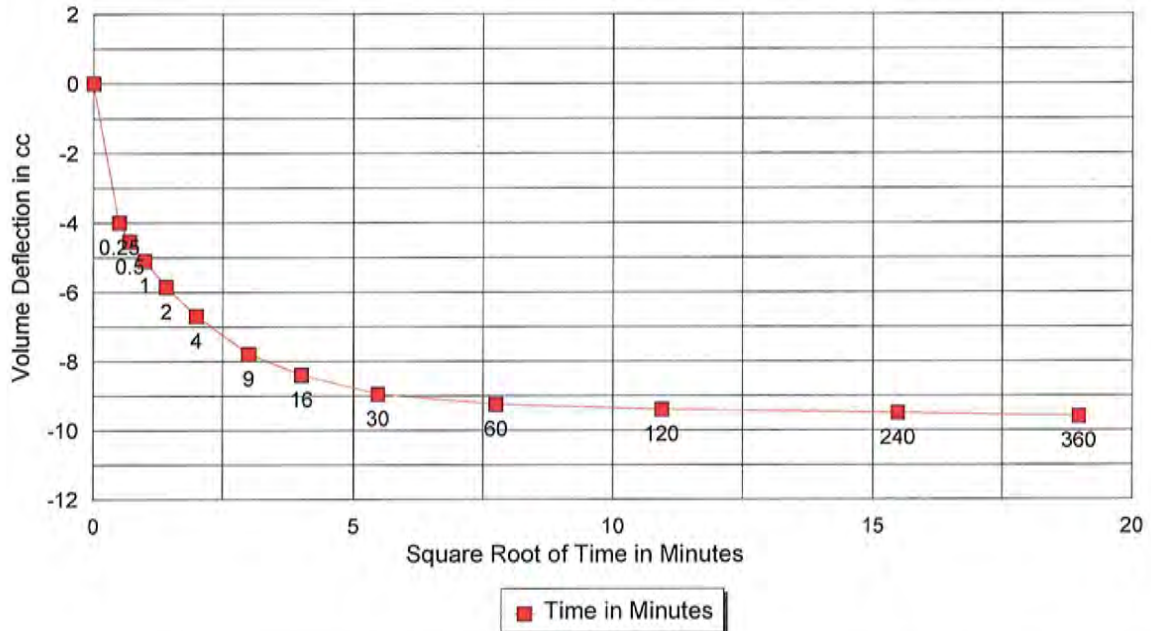
Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	3.021	0	48.5	0	7056	7056	1.00
75.0	3575	0.004	0.10	3.024	3572	55.1	950	6106	9678	1.59
114.0	5435	0.008	0.20	3.027	5424	58.6	1454	5602	11026	1.97
138.0	6579	0.012	0.30	3.030	6559	60.8	1771	5285	11844	2.24
156.0	7437	0.016	0.40	3.033	7408	62.5	2016	5040	12448	2.47
165.0	7866	0.020	0.49	3.036	7827	63.5	2160	4896	12723	2.60
174.0	8295	0.023	0.59	3.039	8246	64.4	2290	4766	13012	2.73
180.0	8581	0.027	0.69	3.042	8522	65.0	2376	4680	13202	2.82
183.0	8724	0.031	0.79	3.045	8655	65.5	2448	4608	13263	2.88
186.0	8867	0.035	0.89	3.048	8788	65.9	2506	4550	13338	2.93
192.0	9153	0.051	1.29	3.060	9035	66.8	2635	4421	13456	3.04
195.0	9296	0.067	1.69	3.072	9139	67.3	2707	4349	13488	3.10
198.0	9439	0.082	2.08	3.085	9243	67.5	2736	4320	13563	3.14
198.0	9439	0.098	2.48	3.097	9205	67.7	2765	4291	13496	3.15
201.0	9582	0.113	2.88	3.110	9307	67.8	2779	4277	13583	3.18
201.0	9582	0.129	3.27	3.123	9269	67.8	2779	4277	13545	3.17
207.0	9868	0.160	4.06	3.149	9467	67.7	2765	4291	13758	3.21
210.0	10011	0.191	4.86	3.175	9525	67.7	2765	4291	13816	3.22
210.0	10011	0.207	5.25	3.188	9485	67.5	2736	4320	13805	3.20
213.0	10154	0.223	5.65	3.201	9581	67.5	2736	4320	13901	3.22
216.0	10297	0.254	6.44	3.228	9634	67.1	2678	4378	14012	3.20
219.0	10440	0.285	7.24	3.256	9684	66.9	2650	4406	14091	3.20
225.0	10726	0.317	8.04	3.285	9864	66.6	2606	4450	14313	3.22
228.0	10869	0.349	8.84	3.314	9908	66.4	2578	4478	14386	3.21
228.0	10869	0.380	9.65	3.343	9821	66.1	2534	4522	14342	3.17
234.0	11155	0.412	10.45	3.373	9990	65.8	2491	4565	14554	3.19
237.0	11298	0.443	11.25	3.403	10027	65.5	2448	4608	14635	3.18
240.0	11441	0.475	12.05	3.435	10062	65.1	2390	4666	14728	3.16
243.0	11584	0.507	12.85	3.466	10095	64.8	2347	4709	14804	3.14
246.0	11727	0.538	13.65	3.498	10127	64.5	2304	4752	14879	3.13
249.0	11870	0.570	14.45	3.531	10155	64.2	2261	4795	14951	3.12
252.0	12014	0.593	15.05	3.556	10206	63.9	2218	4838	15044	3.11

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: DPM Date: 5/21/14
 FileName: MWT0B308



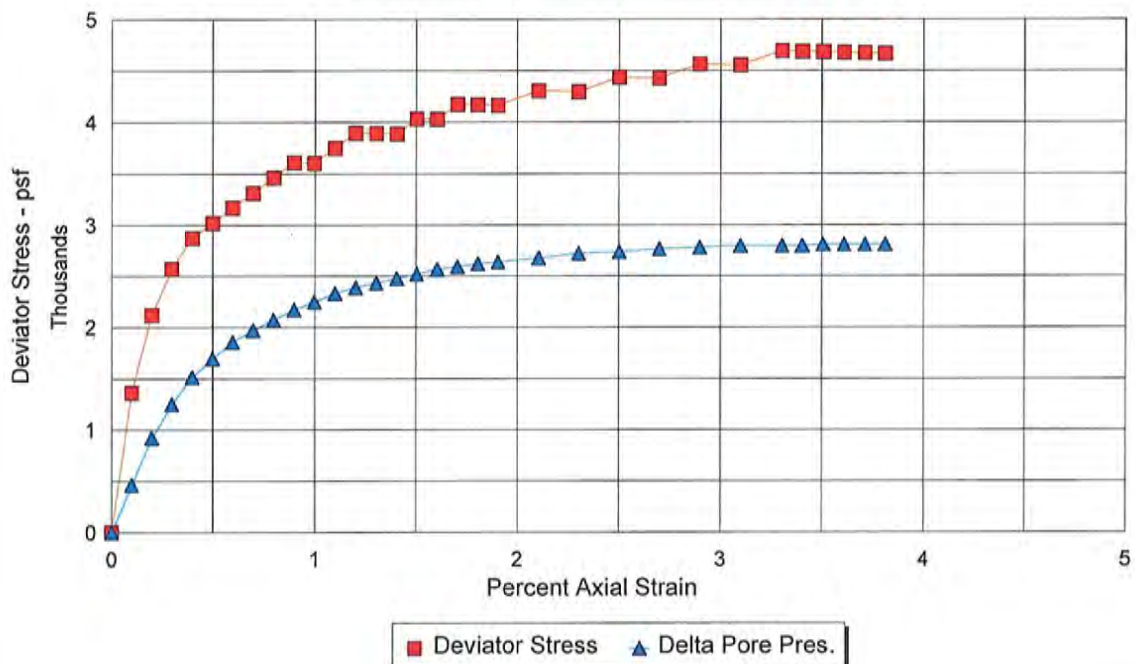
CONSOLIDATION DATA

TI-B3-08B, 45.5-46.0, -, Stage 1



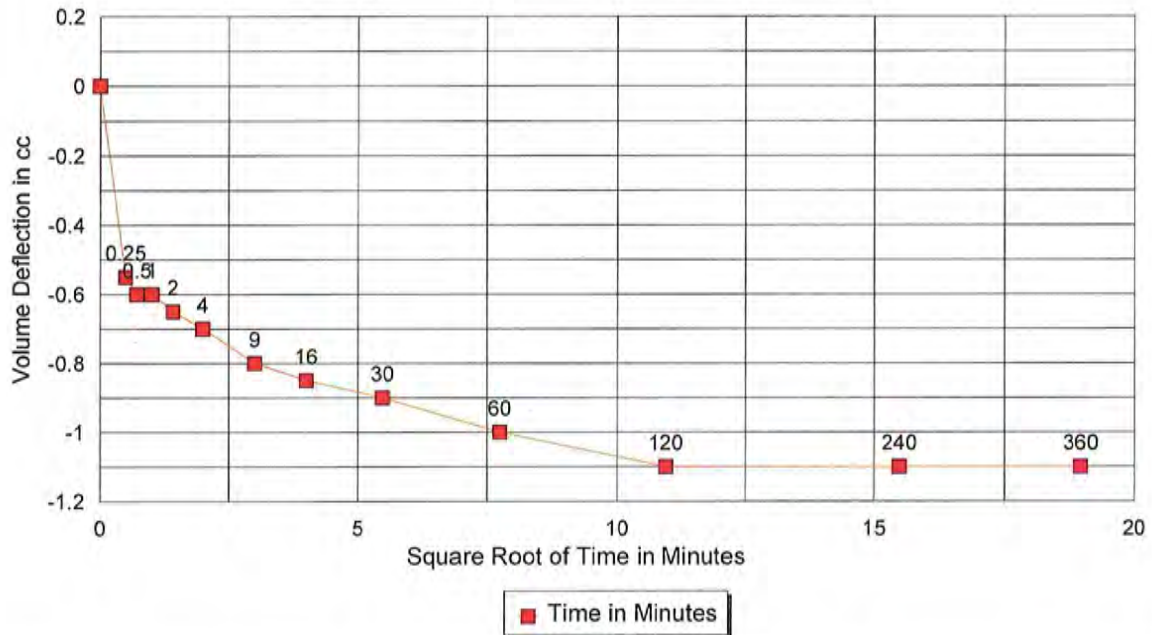
TRIAXIAL TEST - TX/CUpp

TI-B3-08B, 45.5-46.0, -, Stage 1



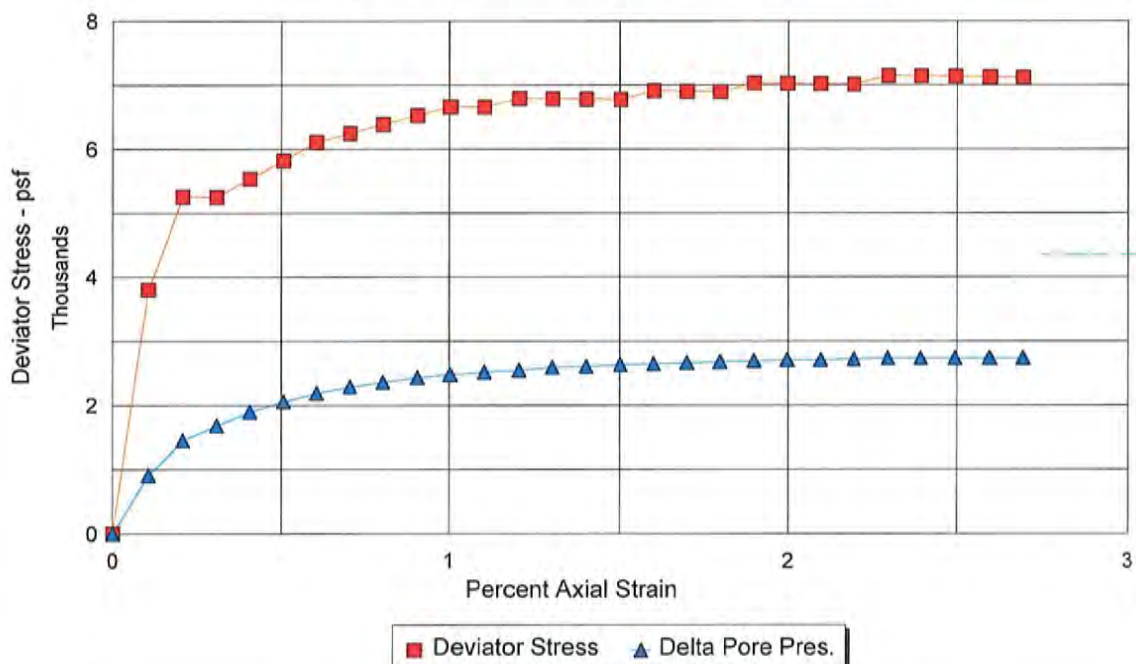
CONSOLIDATION DATA

TI-B3-08B, 45.5-46.0, -, Stage 2



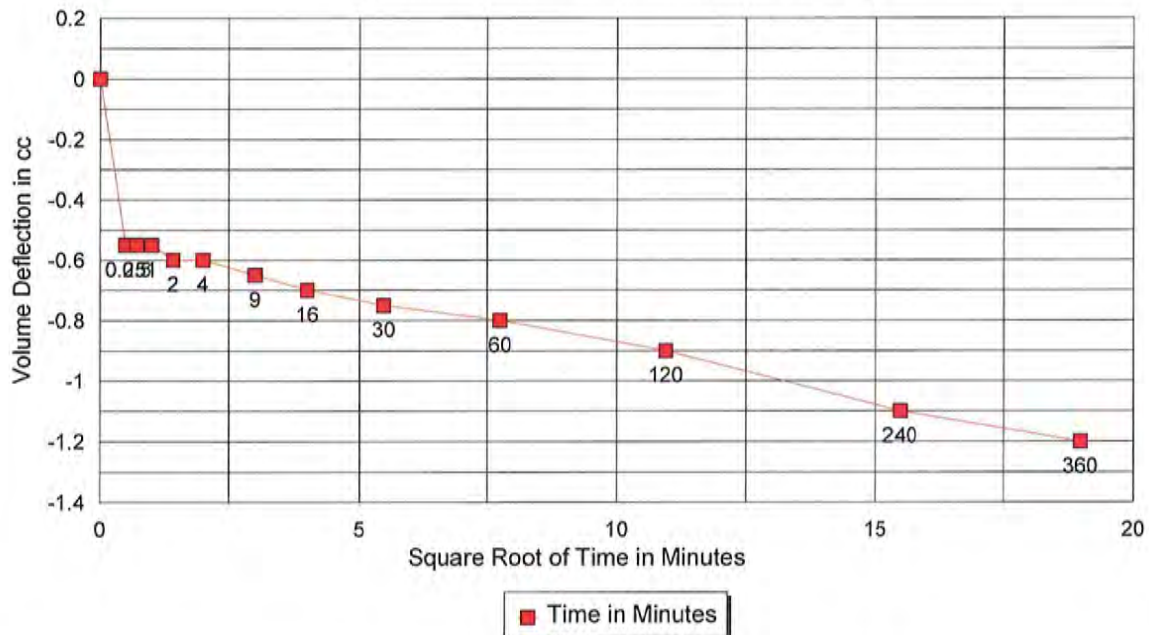
TRIAXIAL TEST - TX/CUpp

TI-B3-08B, 45.5-46.0, -, Stage 2



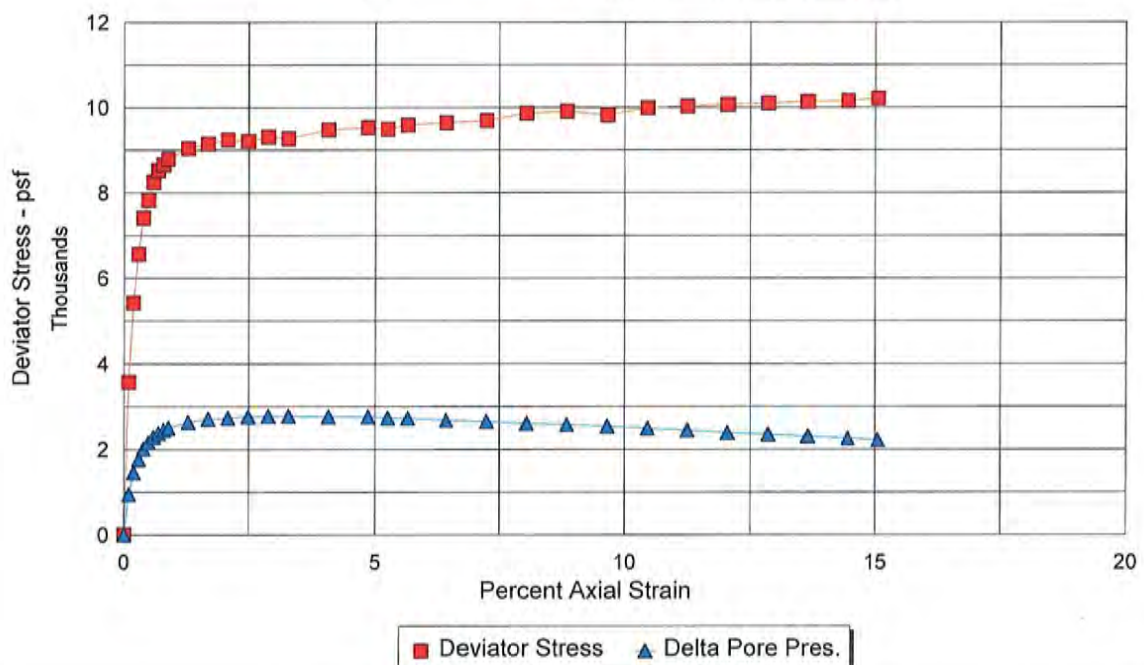
CONSOLIDATION DATA

TI-B3-08B, 45.5-46.0, -, Stage 3



TRIAXIAL TEST - TX/CUpp

TI-B3-08B, 45.5-46.0, -, Stage 3



EFFECTIVE STRESS PATH ANALYSIS TEST DATA
ASTM D4767

CLIENT MWH
BORING NO. TI-B3 06
DEPTH 35-36' (35-37.3')
SAMPLE NO. A,B&C
PROJECT NO. --
LOCATION Tailings Impoundment

JOB NO. 2512-77
SAMPLED 11/19/13 MWH
SATURATED TEST
TEST TYPE TX/CUPP

				Peak Points		
				p'	q	
				PSF	PSF	
CONF. PRES. PSF	SAMPLE A	3456	PSF	SAMPLE A	1924	1118
	SAMPLE B	4608	PSF	SAMPLE B	6117	3583
	SAMPLE C	5760	PSF	SAMPLE C	19533	10922

SAMPLE A				SAMPLE B				SAMPLE C			
σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q
PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF
3456	3456	3456	0	4608	4608	4608	0	5760	5760	5760	0
3053	3914	3484	431	3744	6346	5045	1301	5083	7868	6476	1392
2549	3887	3218	669	3240	6644	4942	1702	4781	9448	7114	2333
2146	3674	2910	764	2952	6847	4899	1947	4493	11665	8079	3586
1858	3384	2621	763	2765	6934	4849	2084	4421	12482	8451	4031
1670	3291	2481	810	2621	7063	4842	2221	4349	13028	8688	4340
1512	3226	2369	857	2520	7050	4785	2265	4306	13513	8909	4604
1397	3109	2253	856	2434	7144	4789	2355	4277	13921	9099	4822
1282	2992	2137	855	2390	7189	4789	2399	4248	14150	9199	4951
1282	2991	2136	855	2347	7233	4790	2443	4234	14394	9314	5080
1080	2788	1934	854	2304	7277	4790	2486	4234	14651	9442	5208
1080	2881	1980	900	2261	7407	4834	2573	4262	15014	9638	5376
1051	2850	1951	899	2261	7494	4877	2617	4320	15571	9945	5625
1008	2805	1907	899	2246	7566	4906	2660	4522	16573	10547	6026
965	2760	1862	898	2218	7623	4920	2703	4738	17577	11158	6420
950	2744	1847	897	2218	7795	5006	2789	4968	18670	11819	6851
922	2807	1865	943	2232	7804	5018	2786	5227	19692	12460	7233
907	2791	1849	942	2232	7889	5061	2829	5515	20731	13123	7608
893	2775	1834	941	2246	7989	5118	2871	5818	21856	13837	8019
864	2836	1850	986	2275	8188	5232	2957	6106	22951	14528	8423
850	2820	1835	985	2290	8288	5289	2999	6408	23963	15185	8777
850	2818	1834	984	2290	8372	5331	3041	6725	25061	15893	9168
835	2895	1865	1030	2304	8471	5387	3083	7013	26033	16523	9510
835	2893	1864	1029	2347	8683	5515	3168	7301	26911	17106	9805
821	2876	1849	1028	2362	8781	5571	3210	7603	27874	17739	10135
806	2860	1833	1027	2376	8879	5628	3252	7877	28634	18256	10379
806	2951	1879	1072	2405	8991	5698	3293	8122	29356	18739	10617
806	3042	1924	1118	2448	9201	5825	3377	8366	29988	19177	10811
806	3040	1923	1117	2448	9284	5866	3418	8611	30455	19533	10922
806	3038	1922	1116	2462	9381	5922	3459	8798	30467	19633	10834
821	3050	1935	1115	2506	9589	6048	3542	8842	30284	19563	10721
821	3049	1935	1114	2534	9700	6117	3583	8914	29977	19445	10532

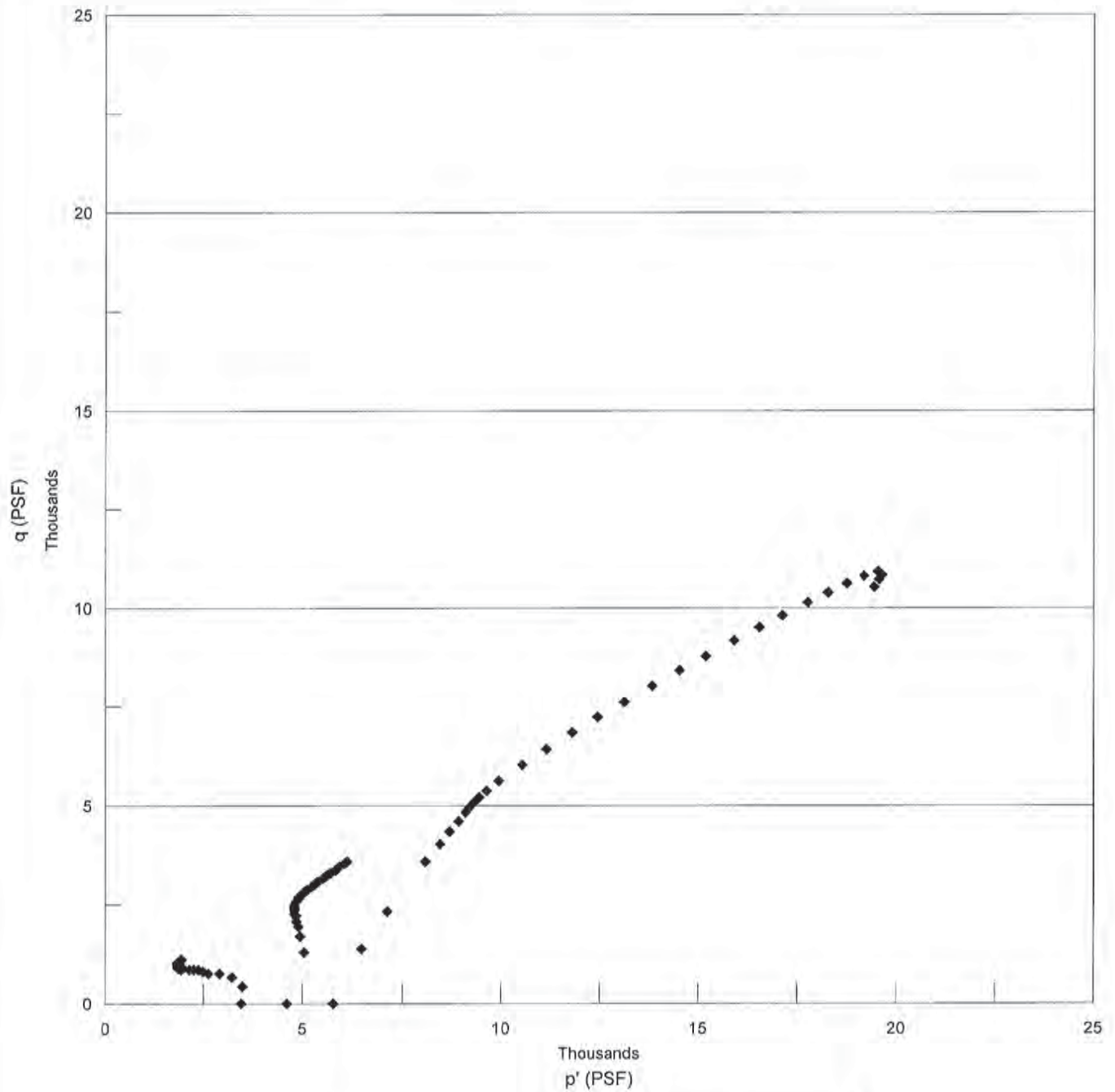
Data entry by: DAW
Data checked by: *DPm*
FileName: MWPQB306.WK4

Date: 05/22/2014
Date: *5/22/14*



Effective Stress Path Analysis - p' q Plots

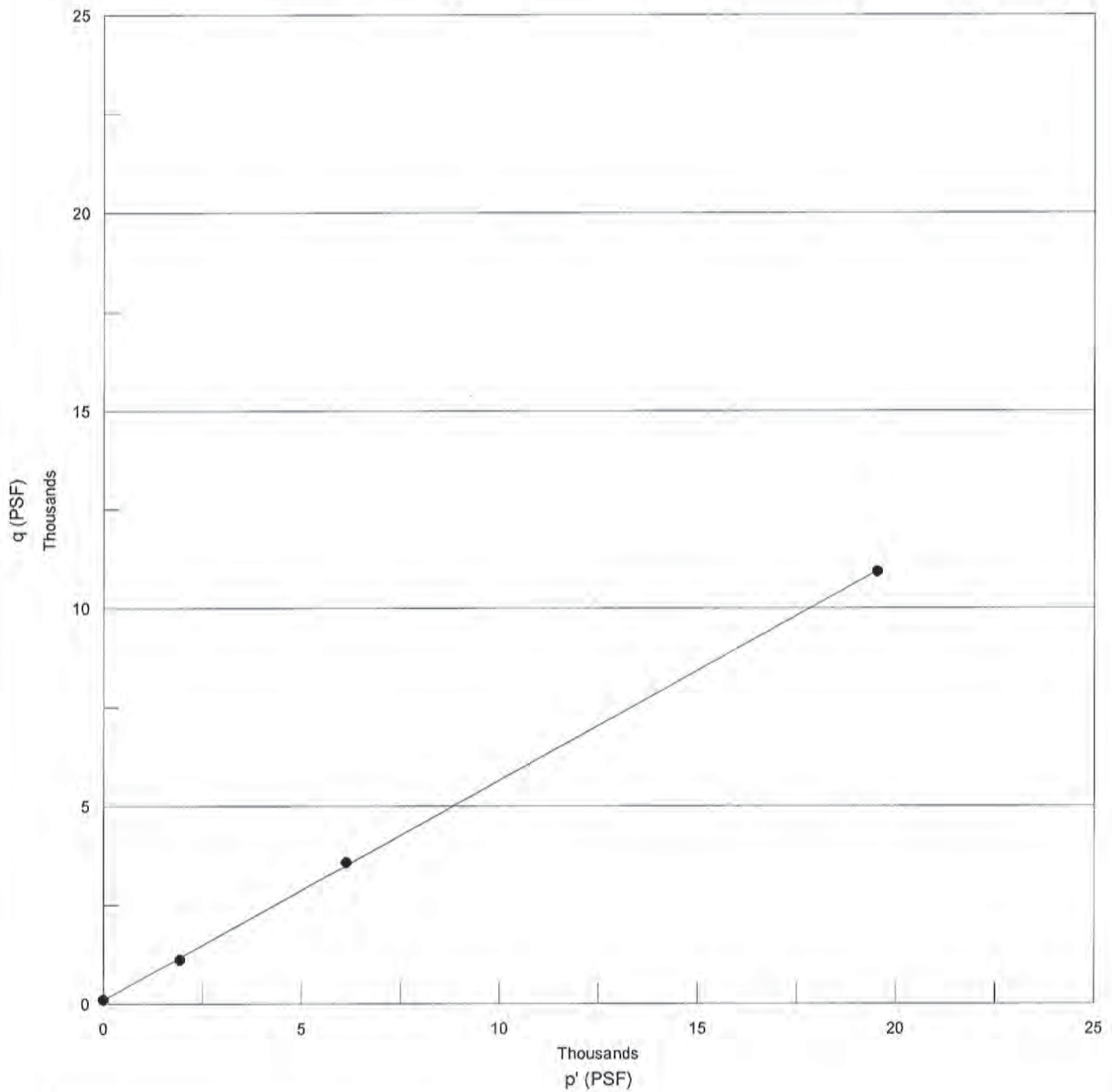
MWH, Tailings Impoundment, --, TI-B3 06, A, B & C, 35-36' (35-37.3')



◆ Stress Paths of Samples A, B & C

Effective Stress Path Analysis - p'-q Regression Plot

MWH, Tailings Impoundment, --, TI-B3 06, A, B&C, 35-36' (35-37.3')



● Shear Data

- Best Fit Line

psi = 29.0 degrees

a = 111.8 PSF

TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3 06
DEPTH 35-36' (35-37.3')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 1

SAMPLED 11/19/13 MWH
TEST STARTED 04/25/14 DPM
TEST FINISHED 05/04/14 DPM
CELL NUMBER 25s
SATURATED TEST Yes
CONF. PRES. PSF 3456

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	688.2	758.3
Wt. Wet Soil & Pan (g)	704.1	774.1
Wt. Dry Soil & Pan (g)	640.3	640.3
Wt. Lost Moisture (g)	63.8	133.8
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	624.5	624.5
Moisture Content %	10.2	21.4
Wet Density PCF	109.2	123.4
Dry Density PCF	99.1	101.7
Init. Diameter (in)	2.402	
Init. Area (sq in)	4.531	
Init. Height (in)	5.300	
Vol. Bef. Consol. (cu ft)	0.01390	
Vol. After Consol. (cu ft)	0.01354	

Notes & Comments: Dried at 60 degrees C.

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: DPM Date: 5/21/14
FileName: MWT0B306



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3 06
DEPTH 35-36' (35-37.3')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 1

SAMPLED 11/19/13 MWH
TEST STARTED 04/25/14 DPM
TEST FINISHED 05/04/14 DPM
CELL NUMBER 25s
SATURATED TEST Yes
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	3.8	14.0				
50.0	48.0	15.1	16.0	38.1	47.1	9.0	0.90
60.0		17.0	17.1	47.7	57.6	9.9	0.99

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.30	0.00
0.25	0.5	8.90	-8.60
0.5	0.7	9.25	-8.95
1	1.0	9.60	-9.30
2	1.4	9.90	-9.60
4	2.0	10.10	-9.80
9	3.0	10.40	-10.10
16	4.0	10.50	-10.20
30	5.5	10.65	-10.35
60	7.7	10.70	-10.40
120	11.0	10.80	-10.50
240	15.5	10.90	-10.60
360	19.0	10.95	-10.65

Initial Height (in)	5.300	Init. Vol. (CC)	393.63
Height Change (in)	0.110	Vol. Change (CC)	24.30
Ht. After Cons. (in)	5.190	Cell Exp. (CC)	14.24
Initial Area (sq in)	4.531	Net Change (CC)	10.06
Area After Cons. (sq in)	4.509	Cons. Vol. (CC)	383.57

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: DPM Date: 5/21/14
FileName: MWT0B306



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3 06	SAMPLED	11/19/13 MWH
DEPTH	35-36' (35-37.3')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/04/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25s
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	3456

Init. Ht. (in)	5.300	Init. Area (sq in)	4.531
Consol. Ht. (in)	5.190	Consol. Area (sq in)	4.509
Back Pres. PSI	48.3	Strain Rate (in/min)	0.002

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.509	0	48.3	0	3456	3456	1.00
27.0	862	0.005	0.10	4.514	861	51.1	403	3053	3914	1.28
42.0	1341	0.010	0.20	4.518	1339	54.6	907	2549	3887	1.53
48.0	1533	0.015	0.30	4.523	1528	57.4	1310	2146	3674	1.71
48.0	1533	0.021	0.39	4.527	1527	59.4	1598	1858	3384	1.82
51.0	1629	0.026	0.49	4.532	1621	60.7	1786	1670	3291	1.97
54.0	1724	0.031	0.59	4.536	1714	61.8	1944	1512	3226	2.13
54.0	1724	0.036	0.69	4.540	1713	62.6	2059	1397	3109	2.23
54.0	1724	0.041	0.79	4.545	1711	63.4	2174	1282	2992	2.33
54.0	1724	0.046	0.89	4.549	1709	63.4	2174	1282	2991	2.33
54.0	1724	0.051	0.98	4.554	1708	64.8	2376	1080	2788	2.58
57.0	1820	0.056	1.08	4.559	1801	64.8	2376	1080	2881	2.67
57.0	1820	0.061	1.18	4.563	1799	65.0	2405	1051	2850	2.71
57.0	1820	0.066	1.28	4.568	1797	65.3	2448	1008	2805	2.78
57.0	1820	0.072	1.38	4.572	1795	65.6	2491	965	2760	2.86
57.0	1820	0.077	1.48	4.577	1793	65.7	2506	950	2744	2.89
60.0	1916	0.082	1.58	4.581	1886	65.9	2534	922	2807	3.05
60.0	1916	0.087	1.68	4.586	1884	66.0	2549	907	2791	3.08
60.0	1916	0.092	1.77	4.591	1882	66.1	2563	893	2775	3.11
63.0	2012	0.102	1.97	4.600	1972	66.3	2592	864	2836	3.28
63.0	2012	0.108	2.07	4.605	1970	66.4	2606	850	2820	3.32
63.0	2012	0.113	2.17	4.609	1968	66.4	2606	850	2818	3.32
66.0	2108	0.118	2.27	4.614	2060	66.5	2621	835	2895	3.47
66.0	2108	0.123	2.37	4.619	2058	66.5	2621	835	2893	3.46
66.0	2108	0.128	2.47	4.623	2056	66.6	2635	821	2876	3.50
66.0	2108	0.133	2.57	4.628	2054	66.7	2650	806	2860	3.55
69.0	2204	0.138	2.66	4.633	2145	66.7	2650	806	2951	3.66
72.0	2299	0.143	2.76	4.637	2236	66.7	2650	806	3042	3.77
72.0	2299	0.149	2.86	4.642	2234	66.7	2650	806	3040	3.77
72.0	2299	0.154	2.96	4.647	2231	66.7	2650	806	3038	3.77
72.0	2299	0.159	3.06	4.651	2229	66.6	2635	821	3050	3.72
72.0	2299	0.160	3.07	4.652	2229	66.6	2635	821	3049	3.72

Data entry by: DPM/DA Date: 05/21/2014
 Data checked by: DPM Date: 5/21/14
 FileName: MWT0B306



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3 06	SAMPLED	11/19/13 MWH
DEPTH	35-36' (35-37.3')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/04/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25s
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUp, Stage 2	CONF. PRES. PSF	4608

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	688.2	758.3
Wt. Wet Soil & Pan (g)	704.1	774.1
Wt. Dry Soil & Pan (g)	640.3	640.3
Wt. Lost Moisture (g)	63.8	133.8
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	624.5	624.5
Moisture Content %	10.2	21.4
Wet Density PCF	112.0	123.6
Dry Density PCF	101.7	101.8
Init. Diameter (in)	2.434	
Init. Area (sq in)	4.652	
Init. Height (in)	5.031	
Vol. Bef. Consol. (cu ft)	0.01354	
Vol. After Consol. (cu ft)	0.01352	

Notes & Comments:

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: *DPM* Date: *5/21/14*
FileName: MWT0B306



TRIAxIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3 06
DEPTH 35-36' (35-37.3')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 2

SAMPLED 11/19/13 MWH
TEST STARTED 04/25/14 DPM
TEST FINISHED 05/04/14 DPM
CELL NUMBER 25s
SATURATED TEST Yes
CONF. PRES. PSF 4608

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	14.70	0.00
0.25	0.5	15.70	-1.00
0.5	0.7	15.75	-1.05
1	1.0	15.80	-1.10
2	1.4	15.85	-1.15
4	2.0	15.90	-1.20
9	3.0	15.95	-1.25
16	4.0	16.00	-1.30
30	5.5	16.00	-1.30
60	7.7	16.05	-1.35
120	11.0	16.20	-1.50
240	15.5	16.30	-1.60
360	19.0	16.30	-1.60

Initial Height (in) 5.031
Height Change (in) -0.001
Ht. After Cons. (in) 5.032
Initial Area (sq in) 4.652
Area After Cons. (sq in) 4.645

Init. Vol. (CC) 383.57
Vol. Change (CC) 1.60
Cell Exp. (CC) 1.05
Net Change (CC) 0.55
Cons. Vol. (CC) 383.02

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: *DPM* Date: *05/21/14*
FileName: MWT0B306



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3 06	SAMPLED	11/19/13 MWH
DEPTH	35-36' (35-37.3')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/04/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25s
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 2	CONF. PRES. PSF	4608

Init. Ht. (in)	5.031	Init. Area (sq in)	4.652
Consol. Ht. (in)	5.032	Consol. Area (sq in)	4.645
Back Pres. PSI	48.8	Strain Rate (in/min)	0.001

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.645	0	48.8	0	4608	4608	1.00
84.0	2604	0.005	0.10	4.649	2602	54.8	864	3744	6346	1.69
110.0	3410	0.010	0.20	4.654	3404	58.3	1368	3240	6644	2.05
126.0	3907	0.015	0.30	4.658	3895	60.3	1656	2952	6847	2.32
135.0	4186	0.020	0.40	4.663	4169	61.6	1843	2765	6934	2.51
144.0	4465	0.025	0.50	4.668	4442	62.6	1987	2621	7063	2.70
147.0	4558	0.030	0.60	4.672	4530	63.3	2088	2520	7050	2.80
153.0	4744	0.035	0.70	4.677	4711	63.9	2174	2434	7144	2.94
156.0	4837	0.040	0.80	4.682	4798	64.2	2218	2390	7189	3.01
159.0	4930	0.045	0.90	4.687	4885	64.5	2261	2347	7233	3.08
162.0	5023	0.050	1.00	4.691	4973	64.8	2304	2304	7277	3.16
168.0	5209	0.060	1.19	4.701	5146	65.1	2347	2261	7407	3.28
171.0	5302	0.065	1.29	4.705	5233	65.1	2347	2261	7494	3.31
174.0	5395	0.070	1.40	4.710	5319	65.2	2362	2246	7566	3.37
177.0	5488	0.075	1.49	4.715	5406	65.4	2390	2218	7623	3.44
183.0	5674	0.085	1.70	4.725	5578	65.4	2390	2218	7795	3.52
183.0	5674	0.090	1.79	4.729	5572	65.3	2376	2232	7804	3.50
186.0	5767	0.095	1.90	4.734	5657	65.3	2376	2232	7889	3.53
189.0	5860	0.100	2.00	4.739	5743	65.2	2362	2246	7989	3.56
195.0	6046	0.111	2.20	4.749	5913	65.0	2333	2275	8188	3.60
198.0	6139	0.116	2.30	4.754	5998	64.9	2318	2290	8288	3.62
201.0	6232	0.121	2.40	4.759	6082	64.9	2318	2290	8372	3.66
204.0	6325	0.126	2.50	4.763	6167	64.8	2304	2304	8471	3.68
210.0	6511	0.136	2.70	4.773	6335	64.5	2261	2347	8683	3.70
213.0	6604	0.141	2.79	4.778	6419	64.4	2246	2362	8781	3.72
216.0	6697	0.146	2.89	4.783	6503	64.3	2232	2376	8879	3.74
219.0	6790	0.151	2.99	4.788	6587	64.1	2203	2405	8991	3.74
225.0	6976	0.161	3.19	4.798	6753	63.8	2160	2448	9201	3.76
228.0	7069	0.166	3.30	4.803	6836	63.8	2160	2448	9284	3.79
231.0	7162	0.171	3.39	4.808	6919	63.7	2146	2462	9381	3.81
237.0	7348	0.181	3.60	4.818	7084	63.4	2102	2506	9589	3.83
240.0	7441	0.186	3.69	4.823	7166	63.2	2074	2534	9700	3.83

Data entry by: DPM/DA Date: 05/21/2014
 Data checked by: DPM Date: 5/21/14
 FileName: MWT0B306



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3 06	SAMPLED	11/19/13 MWH
DEPTH	35-36' (35-37.3')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/04/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25s
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	5760

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	688.2	758.3
Wt. Wet Soil & Pan (g)	704.1	774.1
Wt. Dry Soil & Pan (g)	640.3	640.3
Wt. Lost Moisture (g)	63.8	133.8
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	624.5	624.5
Moisture Content %	10.2	21.4
Wet Density PCF	112.2	123.8
Dry Density PCF	101.8	101.9
Init. Diameter (in)	2.478	
Init. Area (sq in)	4.823	
Init. Height (in)	4.846	
Vol. Bef. Consol. (cu ft)	0.01352	
Vol. After Consol. (cu ft)	0.01351	

Notes & Comments:

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: DPM Date: 5/21/14
FileName: MWT0B306



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3 06
DEPTH 35-36' (35-37.3')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 3

SAMPLED 11/19/13 MWH
TEST STARTED 04/25/14 DPM
TEST FINISHED 05/04/14 DPM
CELL NUMBER 25s
SATURATED TEST Yes
CONF. PRES. PSF 5760

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.70	0.00
0.25	0.5	1.65	-0.95
0.5	0.7	1.65	-0.95
1	1.0	1.70	-1.00
2	1.4	1.70	-1.00
4	2.0	1.75	-1.05
9	3.0	1.80	-1.10
16	4.0	1.80	-1.10
30	5.5	1.85	-1.15
60	7.7	1.90	-1.20
120	11.0	1.90	-1.20
240	15.5	1.90	-1.20
360	19.0	1.90	-1.20

Initial Height (in) 4.846
Height Change (in) -0.013
Ht. After Cons. (in) 4.859
Initial Area (sq in) 4.823
Area After Cons. (sq in) 4.804

Init. Vol. (CC) 383.02
Vol. Change (CC) 1.50
Cell Exp. (CC) 1.05
Net Change (CC) 0.45
Cons. Vol. (CC) 382.57

Data entry by: DPM/DAW Date: 05/21/2014
Data checked by: *DPM* Date: *5/21/14*
FileName: MWT0B306



TRIAxIAL COMPRESSION TEST DATA

CLIENT	MWH	JOB NO.	2512-77
BORING NO.	TI-B3 06	SAMPLED	11/19/13 MWH
DEPTH	35-36' (35-37.3')	TEST STARTED	04/25/14 DPM
SAMPLE NO.	-	TEST FINISHED	05/04/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25s
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUp, Stage 3	CONF. PRES. PSF	5760

Init. Ht. (in)	4.846	Init. Area (sq in)	4.823
Consol. Ht. (in)	4.859	Consol. Area (sq in)	4.804
Back Pres. PSI	48.8	Strain Rate (in/min)	0.001

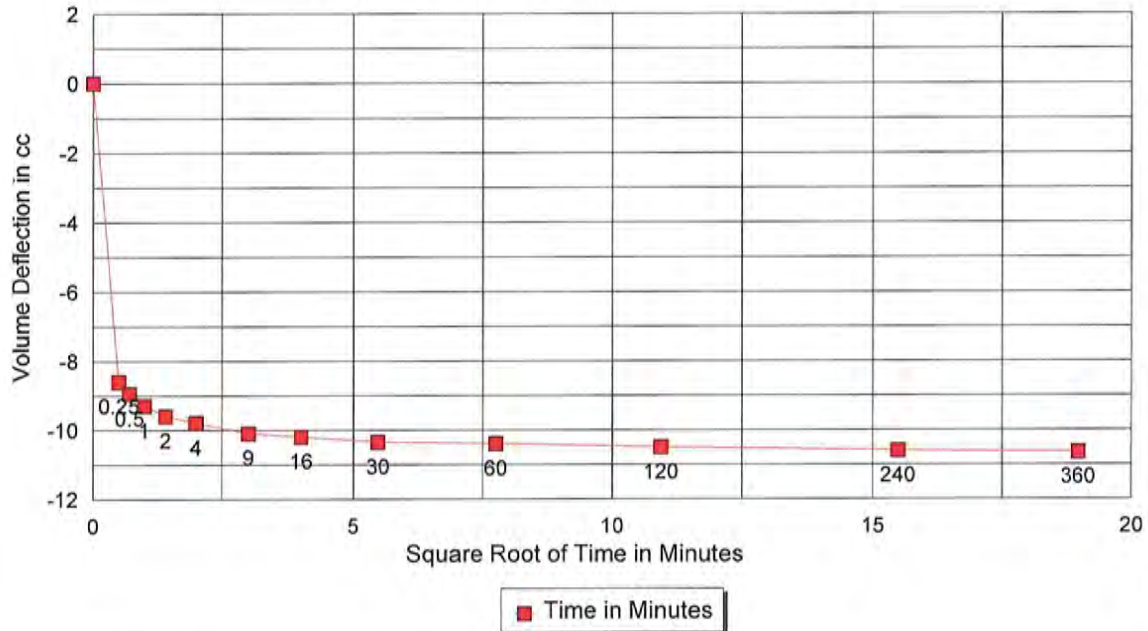
Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.804	0	48.8	0	5760	5760	1.00
93.0	2788	0.005	0.10	4.809	2785	53.5	677	5083	7868	1.55
156.0	4676	0.010	0.20	4.814	4667	55.6	979	4781	9448	1.98
240.0	7194	0.014	0.30	4.818	7172	57.6	1267	4493	11665	2.60
270.0	8093	0.019	0.40	4.823	8061	58.1	1339	4421	12482	2.82
291.0	8722	0.024	0.49	4.828	8679	58.6	1411	4349	13028	3.00
309.0	9262	0.029	0.59	4.833	9207	58.9	1454	4306	13513	3.14
324.0	9712	0.034	0.69	4.838	9644	59.1	1483	4277	13921	3.26
333.0	9981	0.038	0.79	4.842	9902	59.3	1512	4248	14150	3.33
342.0	10251	0.043	0.89	4.847	10160	59.4	1526	4234	14394	3.40
351.0	10521	0.048	0.99	4.852	10417	59.4	1526	4234	14651	3.46
363.0	10881	0.058	1.19	4.862	10752	59.2	1498	4262	15014	3.52
381.0	11420	0.072	1.48	4.876	11251	58.8	1440	4320	15571	3.60
411.0	12319	0.106	2.17	4.911	12052	57.4	1238	4522	16573	3.67
441.0	13219	0.139	2.87	4.946	12840	55.9	1022	4738	17577	3.71
474.0	14208	0.173	3.56	4.981	13702	54.3	792	4968	18670	3.76
504.0	15107	0.206	4.25	5.017	14465	52.5	533	5227	19692	3.77
534.0	16006	0.240	4.94	5.054	15216	50.5	245	5515	20731	3.76
567.0	16995	0.274	5.63	5.091	16038	48.4	-58	5818	21856	3.76
600.0	17984	0.308	6.34	5.129	16845	46.4	-346	6106	22951	3.76
630.0	18884	0.342	7.04	5.168	17555	44.3	-648	6408	23963	3.74
663.0	19873	0.376	7.73	5.207	18336	42.1	-965	6725	25061	3.73
693.0	20772	0.410	8.43	5.247	19020	40.1	-1253	7013	26033	3.71
720.0	21581	0.444	9.13	5.287	19610	38.1	-1541	7301	26911	3.69
750.0	22481	0.478	9.83	5.328	20271	36.0	-1843	7603	27874	3.67
774.0	23200	0.512	10.53	5.369	20758	34.1	-2117	7877	28634	3.64
798.0	23919	0.545	11.23	5.412	21234	32.4	-2362	8122	29356	3.61
819.0	24549	0.579	11.92	5.454	21622	30.7	-2606	8366	29988	3.58
834.0	24998	0.613	12.62	5.498	21844	29.0	-2851	8611	30455	3.54
834.0	24998	0.647	13.32	5.542	21669	27.7	-3038	8798	30467	3.46
831.0	24908	0.676	13.92	5.581	21442	27.4	-3082	8842	30284	3.43
822.0	24639	0.705	14.51	5.620	21063	26.9	-3154	8914	29977	3.36

Data entry by: DPM/DAW Date: 05/21/2014
 Data checked by: DPM Date: 5/21/14
 FileName: MWT0B306



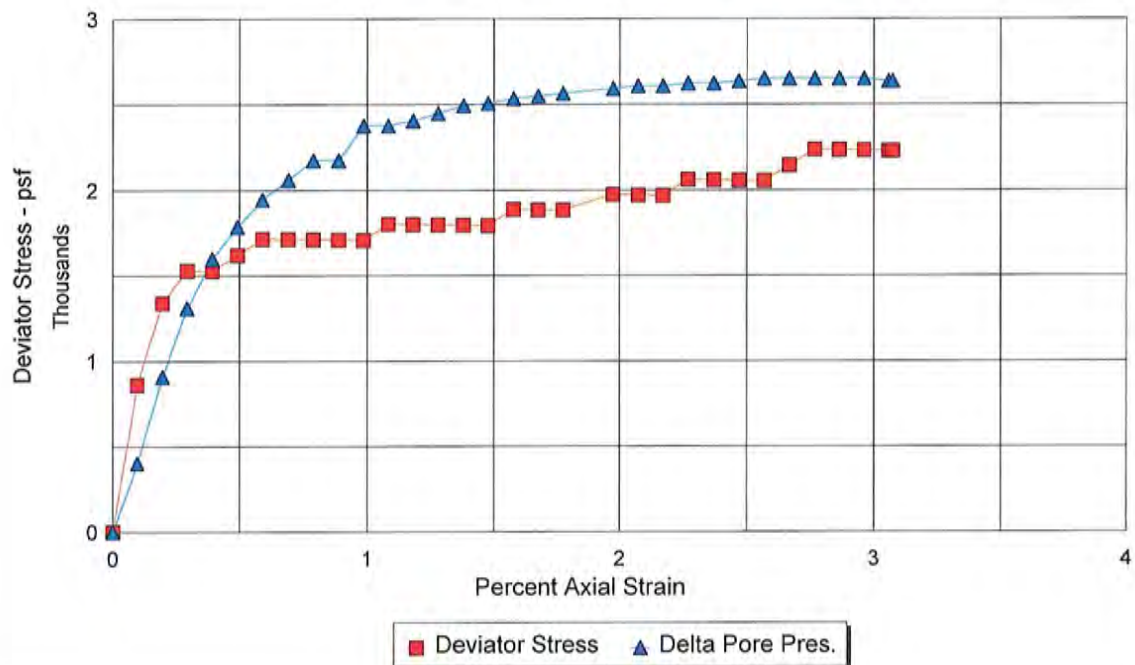
CONSOLIDATION DATA

TI-B3 06, 35-36' (35-37.3'), -, Stage 1



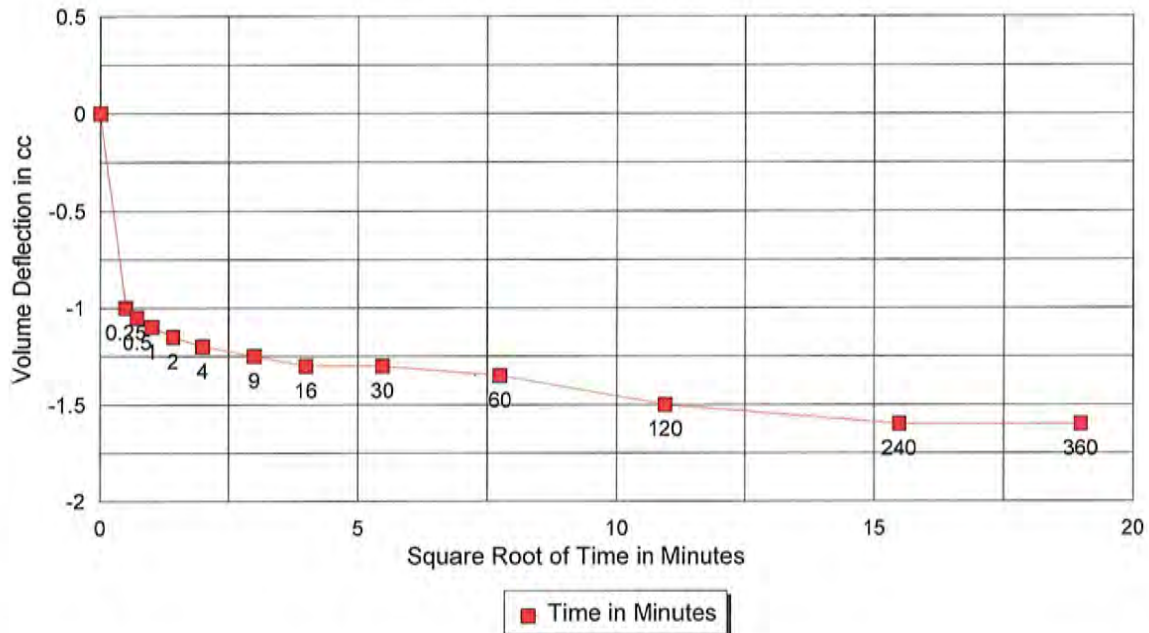
TRIAXIAL TEST - TX/CUpp

TI-B3 06, 35-36' (35-37.3'), -, Stage 1



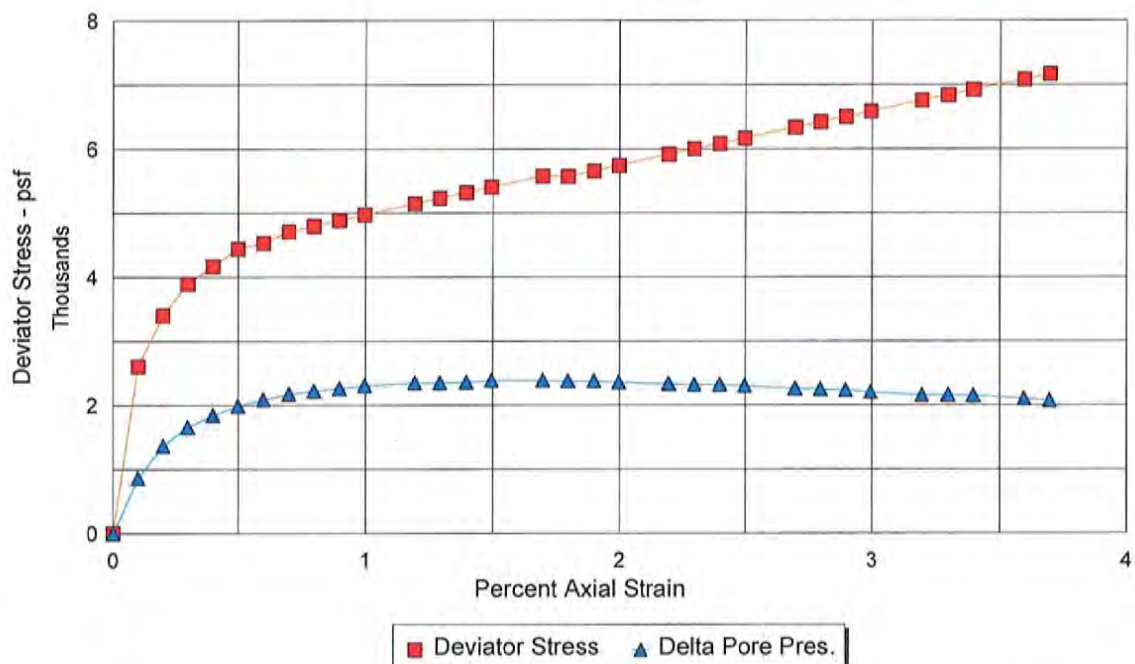
CONSOLIDATION DATA

TI-B3 06, 35-36' (35-37.3'), -, Stage 2



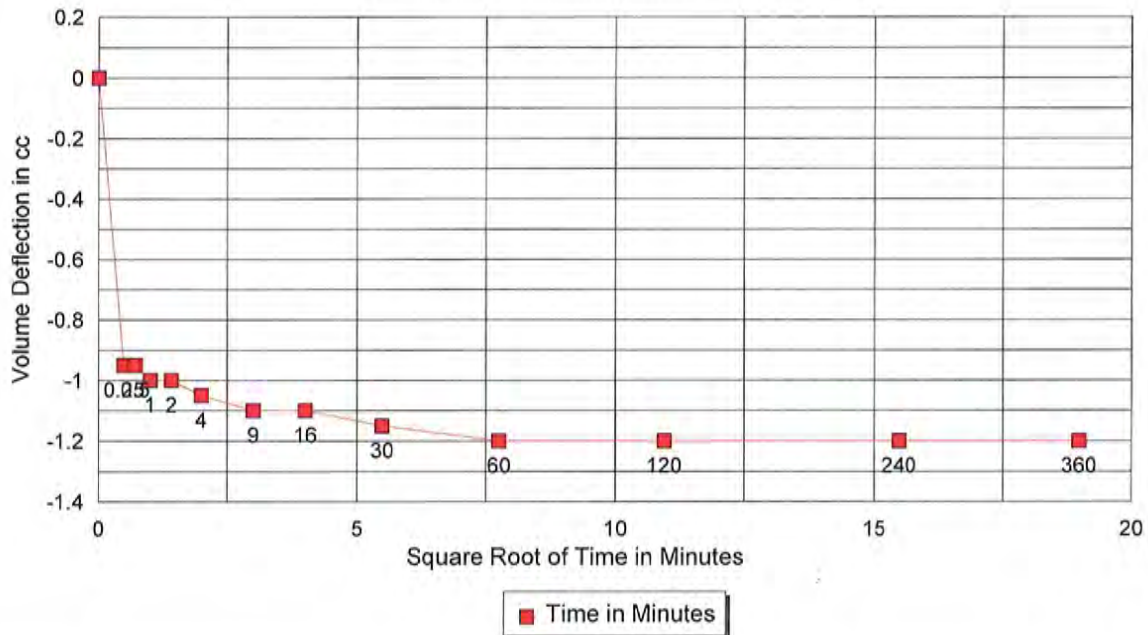
TRIAXIAL TEST - TX/CUpp

TI-B3 06, 35-36' (35-37.3'), -, Stage 2



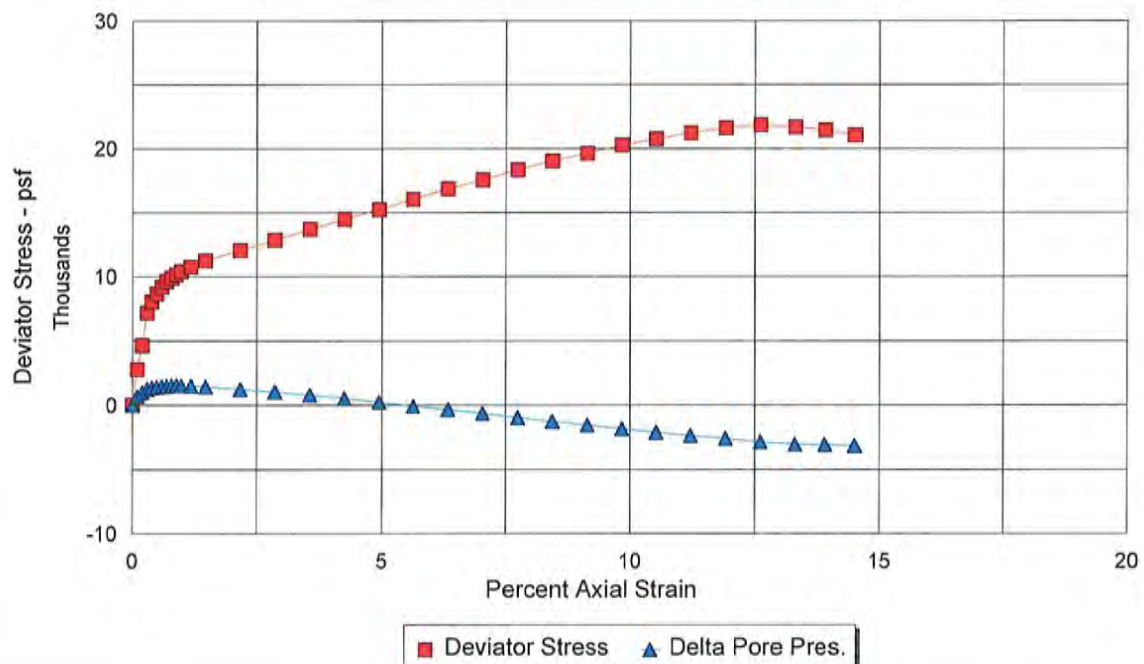
CONSOLIDATION DATA

TI-B3 06, 35-36' (35-37.3'), -, Stage 3



TRIAXIAL TEST - TX/CUpp

TI-B3 06, 35-36' (35-37.3'), -, Stage 3



EFFECTIVE STRESS PATH ANALYSIS TEST DATA
ASTM D4767

CLIENT MWH
BORING NO. TI-B3-03
DEPTH 21.0-22.0' (20-22.4')
SAMPLE NO. A,B&C
PROJECT NO. Church Rock
LOCATION Tailings Impoundment

JOB NO. 2512-77
SAMPLED 11/19/13 MWH
SATURATED TEST
TEST TYPE TX/CUPP
Peak Points

					p'	q
					PSF	PSF
CONF. PRES. PSF	SAMPLE A	1584	PSF	SAMPLE A	2176	1298
	SAMPLE B	2736	PSF	SAMPLE B	4225	2469
	SAMPLE C	3888	PSF	SAMPLE C	8006	4406

SAMPLE A				SAMPLE B				SAMPLE C			
σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q	σ 3'	σ 1'	p'	q
PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF	PSF
1584	1584	1584	0	2736	2736	2736	0	3888	3888	3888	0
1382	2227	1805	422	2347	4209	3278	931	3269	6395	4832	1563
1210	2429	1819	610	2117	4999	3558	1441	3082	7490	5286	2204
1094	2500	1797	703	1973	5410	3691	1718	2966	8288	5627	2661
1022	2614	1818	796	1930	5642	3786	1856	2909	8684	5796	2887
965	2648	1806	842	1843	5737	3790	1947	2851	8895	5873	3022
936	2805	1870	934	1800	5875	3838	2038	2822	9043	5933	3110
907	2867	1887	980	1771	5935	3853	2082	2794	9190	5992	3198
893	2944	1919	1026	1757	6009	3883	2126	2779	9261	6020	3241
878	3021	1950	1071	1742	5990	3866	2124	2765	9331	6048	3283
878	3112	1995	1117	1742	6078	3910	2168	2765	9415	6090	3325
864	3188	2026	1162	1742	6166	3954	2212	2765	9493	6129	3364
878	3293	2086	1207	1742	6254	3998	2256	2765	9660	6213	3448
864	3369	2117	1253	1742	6341	4042	2299	2765	9646	6205	3441
878	3474	2176	1298	1757	6351	4054	2297	2765	9722	6244	3479
893	3486	2189	1297	1757	6438	4098	2341	2779	9812	6296	3517
907	3498	2202	1295	1757	6525	4141	2384	2808	9984	6396	3588
				1757	6521	4139	2382	2851	10258	6555	3703
				1757	6607	4182	2425	2880	10425	6653	3773
				1757	6694	4225	2469	2938	10620	6779	3841
				1771	6706	4239	2468	2981	10798	6890	3909
								3024	10975	6999	3975
								3082	11164	7123	4041
								3125	11250	7187	4063
								3168	11421	7295	4127
								3211	11591	7401	4190
								3298	11755	7526	4229
								3384	11999	7691	4307
								3456	12140	7798	4342
								3542	12292	7917	4375
								3600	12411	8006	4406
								3658	12447	8052	4395

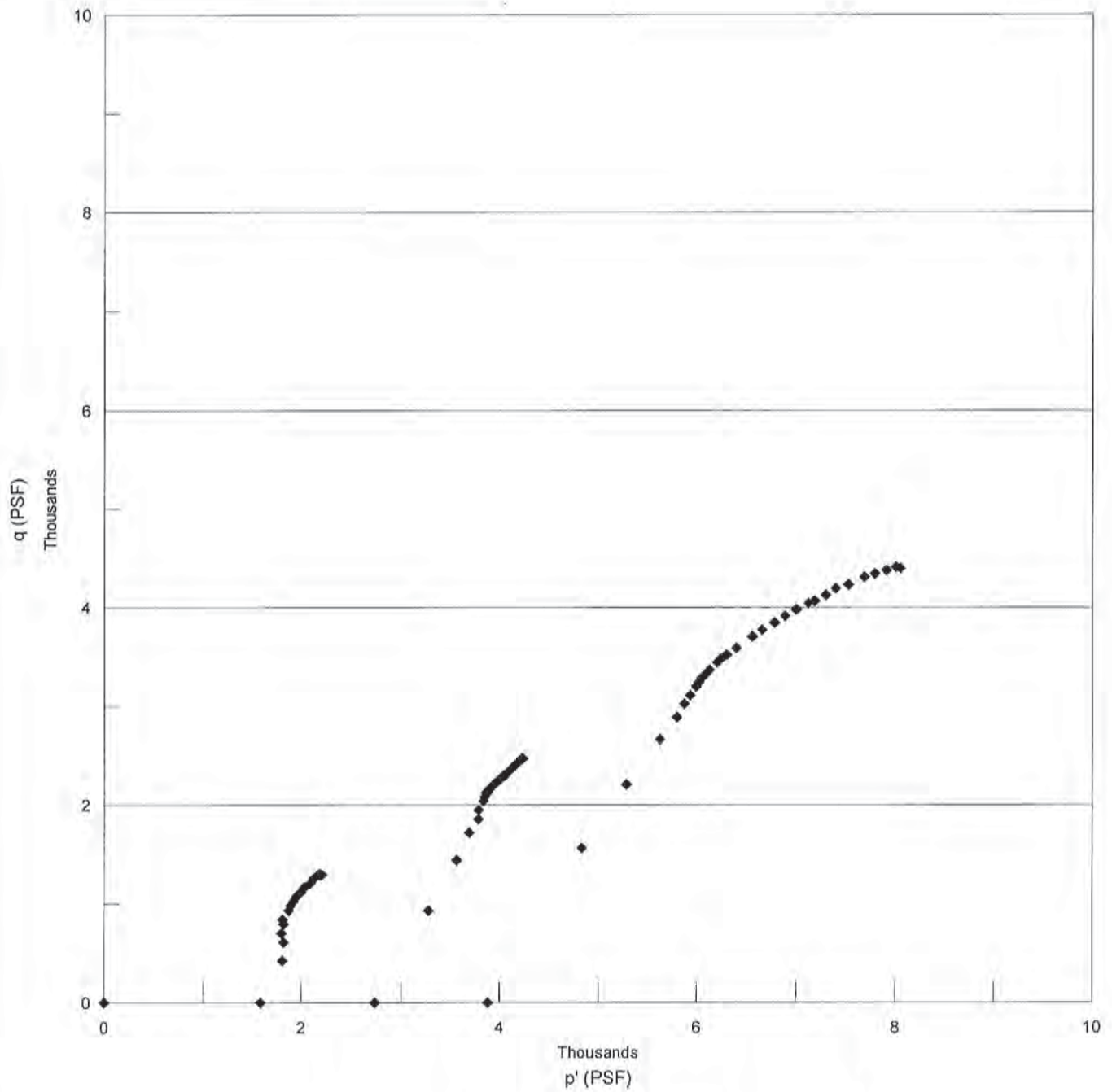
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Data checked by: KR
FileName: MWPQB303

Date: 05/27/2014
Date: 5/27/14



Effective Stress Path Analysis - p' q Plots

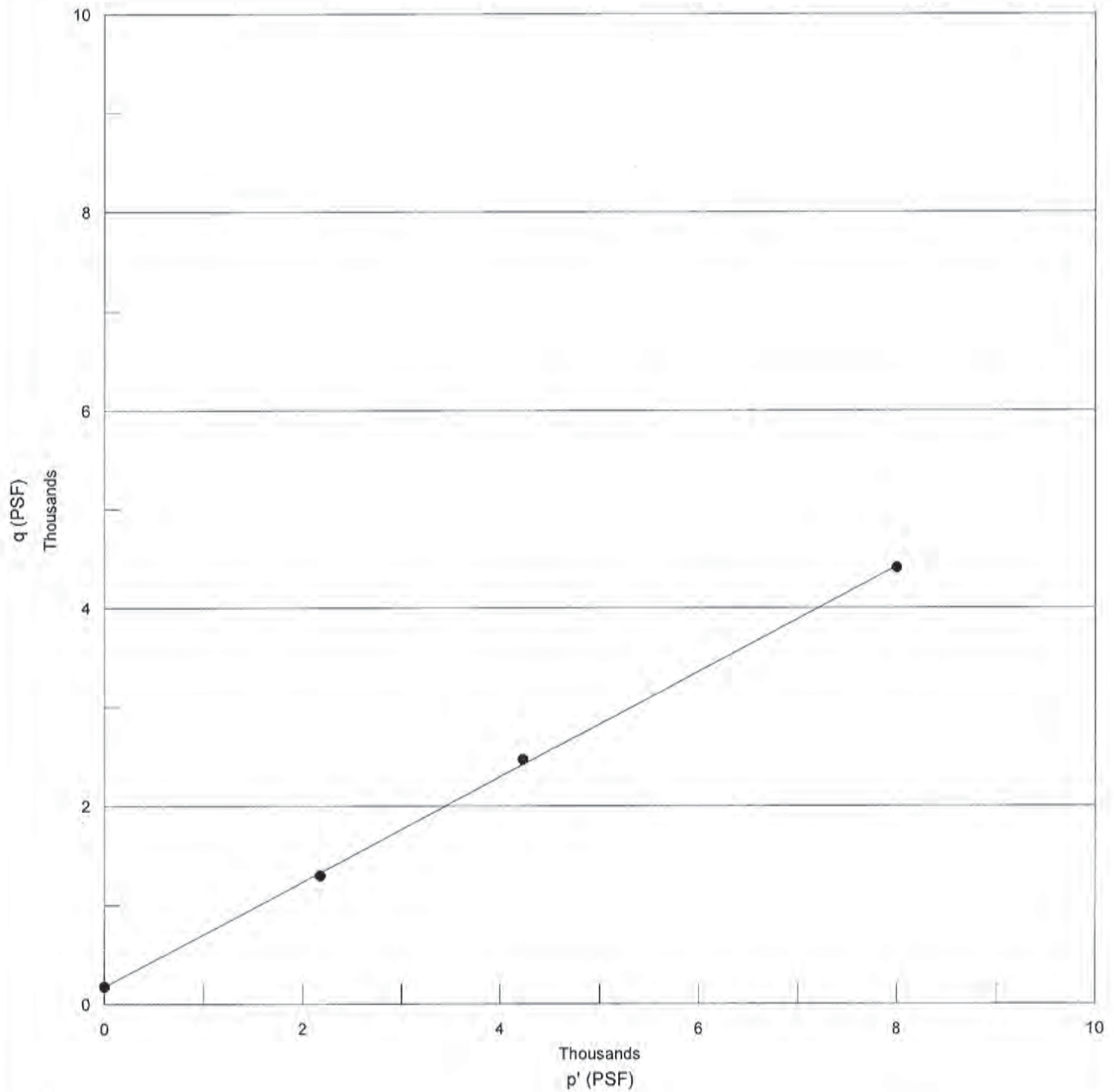
MWH, Tailings Impoundment, Church Rock, TI-B3-03, A, B & C, 21.0-22.0' (20-22.4')



◆ Stress Paths of Samples A, B & C

Effective Stress Path Analysis - p' - q Regression Plot

MWH, Tailings Impoundment, Church Rock, TI-B3-03, A, B&C, 21.0-22.0' (20-22.4')



● Shear Data

— Best Fit Line

$\psi = 27.9$ degrees

$a = 176.1$ PSF

TRIAxIAL COMPRESSION TEST DATA
ASTM D 4767

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	04/17/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	1584

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	771.1	808.0
Wt. Wet Soil & Pan (g)	786.8	823.8
Wt. Dry Soil & Pan (g)	698.3	698.3
Wt. Lost Moisture (g)	88.6	125.6
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	682.5	682.5
Moisture Content %	13.0	18.4
Wet Density PCF	123.3	128.9
Dry Density PCF	109.1	108.9
 Init. Diameter (in)	 2.407	
Init. Area (sq in)	4.550	
Init. Height (in)	5.237	
Vol. Bef. Consol. (cu ft)	0.01379	
Vol. After Consol. (cu ft)	0.01382	

Notes & Comments:

Data entry by: DPM
Data checked by:
FileName: MWT0B303

Date: 05/27/2014
Date: 5/27/14



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-03
DEPTH 21.0-22.0' (20-22.4')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUp, Stage 1

SAMPLED 11/19/13 MWH
TEST STARTED 04/17/14 DPM
TEST FINISHED 04/23/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
CONF. PRES. PSF 1584

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	9.3				
50.0	48.0	7.6	8.7	38.1	46.2	8.1	0.81
60.0	58.0	8.0	9.0	47.6	55.9	8.3	0.83
70.0	68.0	10.0	10.7	57.7	66.0	8.3	0.83
80.0		11.2	11.1	67.3	76.9	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	0.80	0.00
0.25	0.5	3.45	-2.65
0.5	0.7	4.10	-3.30
1	1.0	4.70	-3.90
2	1.4	5.05	-4.25
4	2.0	5.30	-4.50
9	3.0	5.45	-4.65
16	4.0	5.55	-4.75
30	5.5	5.70	-4.90
60	7.7	5.80	-5.00
120	11.0	6.00	-5.20
240	15.5	6.10	-5.30
360	19.0	6.10	-5.30

Initial Height (in)	5.237	Init. Vol. (CC)	390.57
Height Change (in)	0.042	Vol. Change (CC)	14.30
Ht. After Cons. (in)	5.195	Cell Exp. (CC)	15.15
Initial Area (sq in)	4.550	Net Change (CC)	-0.85
Area After Cons. (sq in)	4.597	Cons. Vol. (CC)	391.43

Data entry by: DPM
Data checked by:
FileName: MWT0B303

Date: 05/27/2014
Date: 5/27/14



TRIAXIAL COMPRESSION TEST DATA

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	04/17/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 1	CONF. PRES. PSF	1584

Init. Ht. (in)	5.237	Init. Area (sq in)	4.550
Consol. Ht. (in)	5.195	Consol. Area (sq in)	4.597
Back Pres. PSI	68.7	Strain Rate (in/min)	0.006

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.597	0	68.7	0	1584	1584	1.00
27.0	846	0.005	0.10	4.602	845	70.1	202	1382	2227	1.61
39.0	1222	0.010	0.19	4.606	1219	71.3	374	1210	2429	2.01
45.0	1410	0.015	0.29	4.610	1406	72.1	490	1094	2500	2.28
51.0	1598	0.020	0.38	4.615	1591	72.6	562	1022	2614	2.56
54.0	1691	0.025	0.48	4.619	1683	73.0	619	965	2648	2.74
60.0	1879	0.030	0.58	4.624	1869	73.2	648	936	2805	3.00
63.0	1973	0.035	0.68	4.628	1960	73.4	677	907	2867	3.16
66.0	2067	0.040	0.77	4.633	2051	73.5	691	893	2944	3.30
69.0	2161	0.045	0.87	4.637	2143	73.6	706	878	3021	3.44
72.0	2255	0.050	0.96	4.642	2234	73.6	706	878	3112	3.54
75.0	2349	0.055	1.06	4.646	2324	73.7	720	864	3188	3.69
78.0	2443	0.060	1.16	4.651	2415	73.6	706	878	3293	3.75
81.0	2537	0.065	1.25	4.655	2505	73.7	720	864	3369	3.90
84.0	2631	0.070	1.35	4.660	2596	73.6	706	878	3474	3.95
84.0	2631	0.075	1.45	4.665	2593	73.5	691	893	3486	3.90
84.0	2631	0.080	1.54	4.669	2591	73.4	677	907	3498	3.86

Data entry by: DPM Date: 05/27/2014
 Data checked by: Date: 5/27/14
 FileName: MWT0B303



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-03
DEPTH 21.0-22.0' (20-22.4')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 2

SAMPLED 11/19/13 MWH
TEST STARTED 04/17/14 DPM
TEST FINISHED 04/23/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
CONF. PRES. PSF 2736

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	771.1	808.0
Wt. Wet Soil & Pan (g)	786.8	823.8
Wt. Dry Soil & Pan (g)	698.3	698.3
Wt. Lost Moisture (g)	88.6	125.6
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	682.5	682.5
Moisture Content %	13.0	18.4
Wet Density PCF	123.0	129.7
Dry Density PCF	108.9	109.6
Init. Diameter (in)	2.438	
Init. Area (sq in)	4.669	
Init. Height (in)	5.115	
Vol. Bef. Consol. (cu ft)	0.01382	
Vol. After Consol. (cu ft)	0.01373	

Notes & Comments:

Data entry by: DPM
Data checked by:
FileName: MWT0B303

Date: 05/27/2014
Date: 5/27/14



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-03
DEPTH 21.0-22.0' (20-22.4')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 2

SAMPLED 11/19/13 MWH
TEST STARTED 04/17/14 DPM
TEST FINISHED 04/23/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
CONF. PRES. PSF 2736

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	7.50	0.00
0.25	0.5	8.70	-1.20
0.5	0.7	8.95	-1.45
1	1.0	9.20	-1.70
2	1.4	9.50	-2.00
4	2.0	9.70	-2.20
9	3.0	9.80	-2.30
16	4.0	9.90	-2.40
30	5.5	9.95	-2.45
60	7.7	10.00	-2.50
120	11.0	10.05	-2.55
240	15.5	10.05	-2.55
360	19.0	10.05	-2.55

Initial Height (in)
Height Change (in)
Ht. After Cons. (in)
Initial Area (sq in)
Area After Cons. (sq in)

5.115
-0.002
5.117
4.669
4.637

Init. Vol. (CC)
Vol. Change (CC)
Cell Exp. (CC)
Net Change (CC)
Cons. Vol. (CC)

391.43
3.60
1.05
2.55
388.88

Data entry by: PA DPM
Data checked by: PA
FileName: MWT0B303

Date: 05/27/2014
Date: 5/27/14



TRIAxIAL COMPRESSION TEST DATA

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	04/17/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 2	CONF. PRES. PSF	2736

Init. Ht. (in)	5.115	Init. Area (sq in)	4.669
Consol. Ht. (in)	5.117	Consol. Area (sq in)	4.637
Back Pres. PSI	68.4	Strain Rate (in/min)	0.005

Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.637	0	68.4	0	2736	2736	1.00
60.0	1863	0.005	0.10	4.642	1861	71.1	389	2347	4209	1.79
93.0	2888	0.010	0.20	4.646	2882	72.7	619	2117	4999	2.36
111.0	3447	0.015	0.29	4.651	3437	73.7	763	1973	5410	2.74
120.0	3727	0.020	0.39	4.655	3712	74.0	806	1930	5642	2.92
126.0	3913	0.025	0.49	4.660	3894	74.6	893	1843	5737	3.11
132.0	4099	0.030	0.59	4.664	4075	74.9	936	1800	5875	3.26
135.0	4192	0.035	0.69	4.669	4164	75.1	965	1771	5935	3.35
138.0	4286	0.040	0.78	4.674	4252	75.2	979	1757	6009	3.42
138.0	4286	0.045	0.88	4.678	4248	75.3	994	1742	5990	3.44
141.0	4379	0.050	0.98	4.683	4336	75.3	994	1742	6078	3.49
144.0	4472	0.055	1.08	4.687	4424	75.3	994	1742	6166	3.54
147.0	4565	0.060	1.17	4.692	4511	75.3	994	1742	6254	3.59
150.0	4658	0.065	1.27	4.697	4599	75.3	994	1742	6341	3.64
150.0	4658	0.070	1.37	4.701	4594	75.2	979	1757	6351	3.62
153.0	4751	0.075	1.47	4.706	4682	75.2	979	1757	6438	3.66
156.0	4845	0.080	1.57	4.711	4769	75.2	979	1757	6525	3.71
156.0	4845	0.085	1.67	4.716	4764	75.2	979	1757	6521	3.71
159.0	4938	0.090	1.76	4.720	4851	75.2	979	1757	6607	3.76
162.0	5031	0.095	1.86	4.725	4937	75.2	979	1757	6694	3.81
162.0	5031	0.097	1.90	4.727	4935	75.1	965	1771	6706	3.79

Data entry by: DPM Date: 05/27/2014
 Data checked by: Date: 5/27/14
 FileName: MWT0B303



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

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	04/17/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	3888

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	771.1	808.0
Wt. Wet Soil & Pan (g)	786.8	823.8
Wt. Dry Soil & Pan (g)	698.3	698.3
Wt. Lost Moisture (g)	88.6	125.6
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	682.5	682.5
Moisture Content %	13.0	18.4
Wet Density PCF	123.8	130.4
Dry Density PCF	109.6	110.1
Init. Diameter (in)	2.453	
Init. Area (sq in)	4.727	
Init. Height (in)	5.020	
Vol. Bef. Consol. (cu ft)	0.01373	
Vol. After Consol. (cu ft)	0.01366	

Notes & Comments:

Data entry by: M DPM
Data checked by: M
FileName: MWT0B303

Date: 05/27/2014
Date: 5/27/14



TRIAXIAL COMPRESSION TEST DATA
ASTM D 4767

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B3-03
DEPTH 21.0-22.0' (20-22.4')
SAMPLE NO. -
SOIL DESCR. Silty Clay
LOCATION Tailings Impoundment
TEST TYPE TX/CUpp, Stage 3

SAMPLED 11/19/13 MWH
TEST STARTED 04/17/14 DPM
TEST FINISHED 04/23/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
CONF. PRES. PSF 3888

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT TIME (Min)	Burette Reading (CC)	Vol. Defl. (CC)
0.00	0.0	12.00	0.00
0.25	0.5	12.90	-0.90
0.5	0.7	13.05	-1.05
1	1.0	13.25	-1.25
2	1.4	13.40	-1.40
4	2.0	13.60	-1.60
9	3.0	13.80	-1.80
16	4.0	13.90	-1.90
30	5.5	13.90	-1.90
60	7.7	14.00	-2.00
120	11.0	14.00	-2.00
240	15.5	14.00	-2.00
360	19.0	14.00	-2.00

Initial Height (in) 5.020
Height Change (in) -0.010
Ht. After Cons. (in) 5.030
Initial Area (sq in) 4.727
Area After Cons. (sq in) 4.694

Init. Vol. (CC) 388.88
Vol. Change (CC) 3.00
Cell Exp. (CC) 1.05
Net Change (CC) 1.95
Cons. Vol. (CC) 386.93

Data entry by: DPM
Data checked by:
FileName: MWT0B303

Date: 05/27/2014
Date: 5/27/14



TRIAxIAL COMPRESSION TEST DATA

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	04/17/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/23/14 DPM
SOIL DESCR.	Silty Clay	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
TEST TYPE	TX/CUpp, Stage 3	CONF. PRES. PSF	3888

Init. Ht. (in)	5.020	Init. Area (sq in)	4.727
Consol. Ht. (in)	5.030	Consol. Area (sq in)	4.694
Back Pres. PSI	68.7	Strain Rate (in/min)	0.003

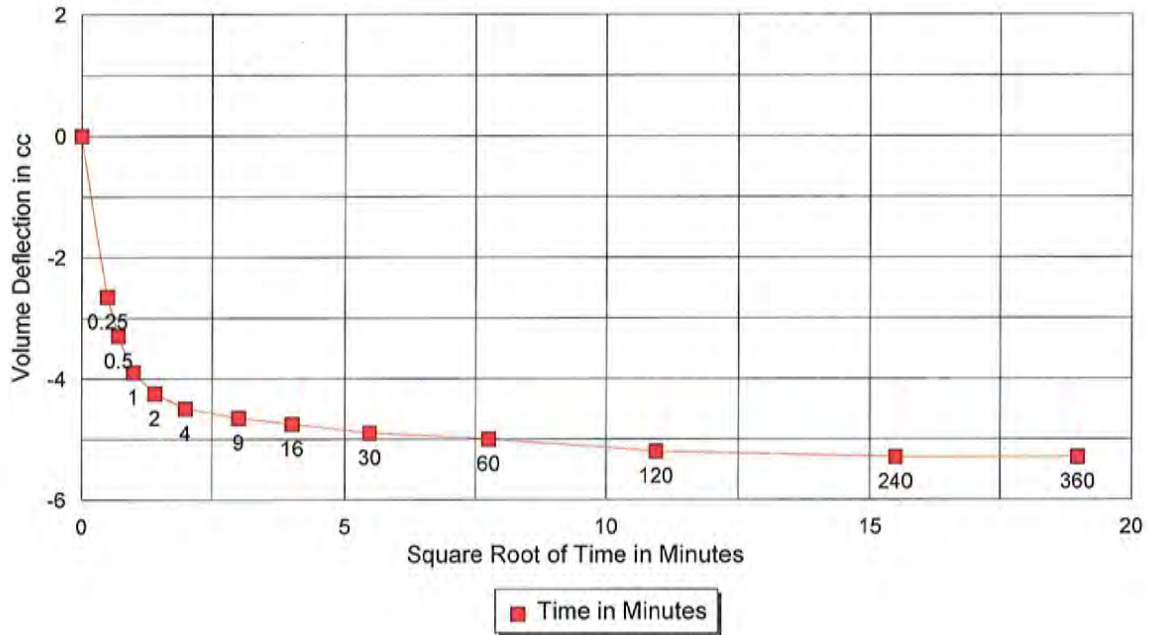
Axial Load Lbs.	Axial Load PSF	Delta Ht. In.	Axial % Strain	Area Final Sq In.	Dev. Stress PSF	Pore Pres. PSI	Delta Pres. PSF	Sigma 3' PSF	Sigma 1' PSF	Prin. Stress Ratio
0.0	0	0.000	0.00	4.694	0	68.7	0	3888	3888	1.00
102.0	3129	0.005	0.10	4.699	3126	73.0	619	3269	6395	1.96
144.0	4418	0.010	0.20	4.703	4409	74.3	806	3082	7490	2.43
174.0	5338	0.015	0.30	4.708	5322	75.1	922	2966	8288	2.79
189.0	5798	0.020	0.41	4.713	5775	75.5	979	2909	8684	2.99
198.0	6074	0.026	0.51	4.718	6044	75.9	1037	2851	8895	3.12
204.0	6258	0.031	0.61	4.723	6220	76.1	1066	2822	9043	3.20
210.0	6443	0.036	0.71	4.727	6397	76.3	1094	2794	9190	3.29
213.0	6535	0.041	0.81	4.732	6482	76.4	1109	2779	9261	3.33
216.0	6627	0.046	0.91	4.737	6566	76.5	1123	2765	9331	3.37
219.0	6719	0.051	1.01	4.742	6651	76.5	1123	2765	9415	3.41
222.0	6811	0.061	1.22	4.752	6728	76.5	1123	2765	9493	3.43
228.0	6995	0.071	1.42	4.761	6895	76.5	1123	2765	9660	3.49
228.0	6995	0.082	1.62	4.771	6881	76.5	1123	2765	9646	3.49
231.0	7087	0.092	1.83	4.781	6957	76.5	1123	2765	9722	3.52
234.0	7179	0.102	2.03	4.791	7033	76.4	1109	2779	9812	3.53
240.0	7363	0.128	2.54	4.816	7176	76.2	1080	2808	9984	3.56
249.0	7639	0.153	3.04	4.841	7407	75.9	1037	2851	10258	3.60
255.0	7823	0.179	3.55	4.867	7545	75.7	1008	2880	10425	3.62
261.0	8007	0.204	4.06	4.892	7682	75.3	950	2938	10620	3.62
267.0	8191	0.230	4.56	4.918	7817	75.0	907	2981	10798	3.62
273.0	8375	0.255	5.07	4.944	7951	74.7	864	3024	10975	3.63
279.0	8559	0.281	5.58	4.971	8082	74.3	806	3082	11164	3.62
282.0	8651	0.306	6.08	4.998	8125	74.0	763	3125	11250	3.60
288.0	8835	0.332	6.59	5.025	8253	73.7	720	3168	11421	3.61
294.0	9020	0.357	7.10	5.052	8379	73.4	677	3211	11591	3.61
300.0	9204	0.408	8.11	5.108	8457	72.8	590	3298	11755	3.56
309.0	9480	0.459	9.13	5.165	8615	72.2	504	3384	11999	3.55
315.0	9664	0.510	10.14	5.223	8684	71.7	432	3456	12140	3.51
321.0	9848	0.561	11.15	5.283	8749	71.1	346	3542	12292	3.47
327.0	10032	0.612	12.17	5.344	8811	70.7	288	3600	12411	3.45
330.0	10124	0.663	13.18	5.406	8789	70.3	230	3658	12447	3.40

Data entry by: DPM Date: 05/27/2014
 Data checked by: Date: 5/27/14
 FileName: MWT0B303



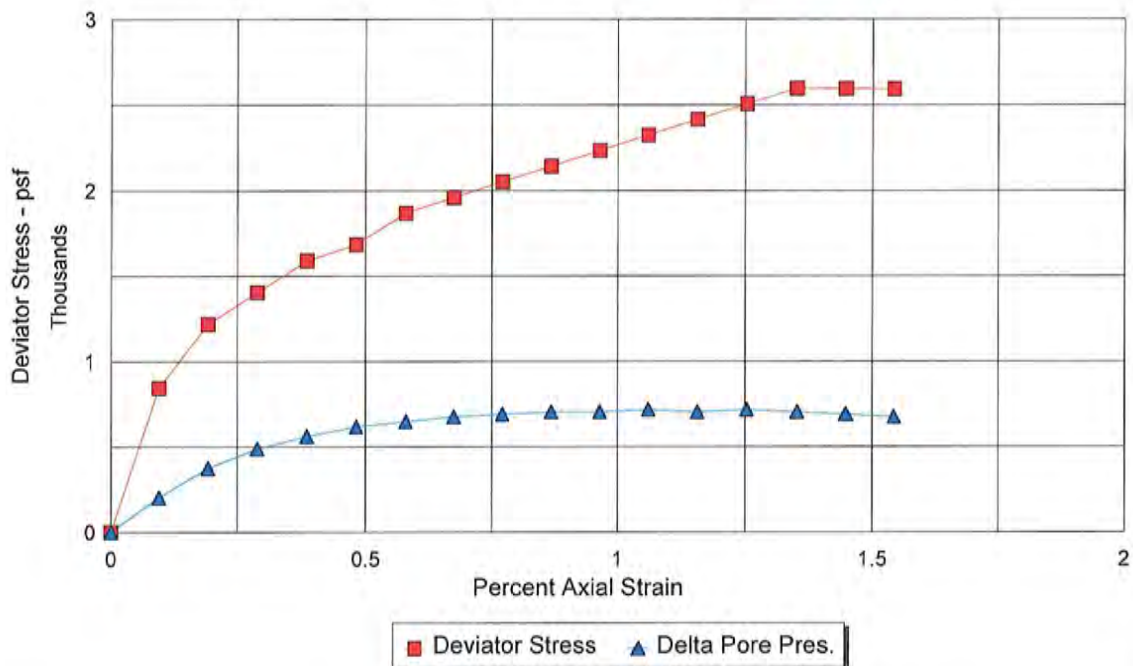
CONSOLIDATION DATA

TI-B3-03, 21.0-22.0' (20-22.4'), -, Stage 1



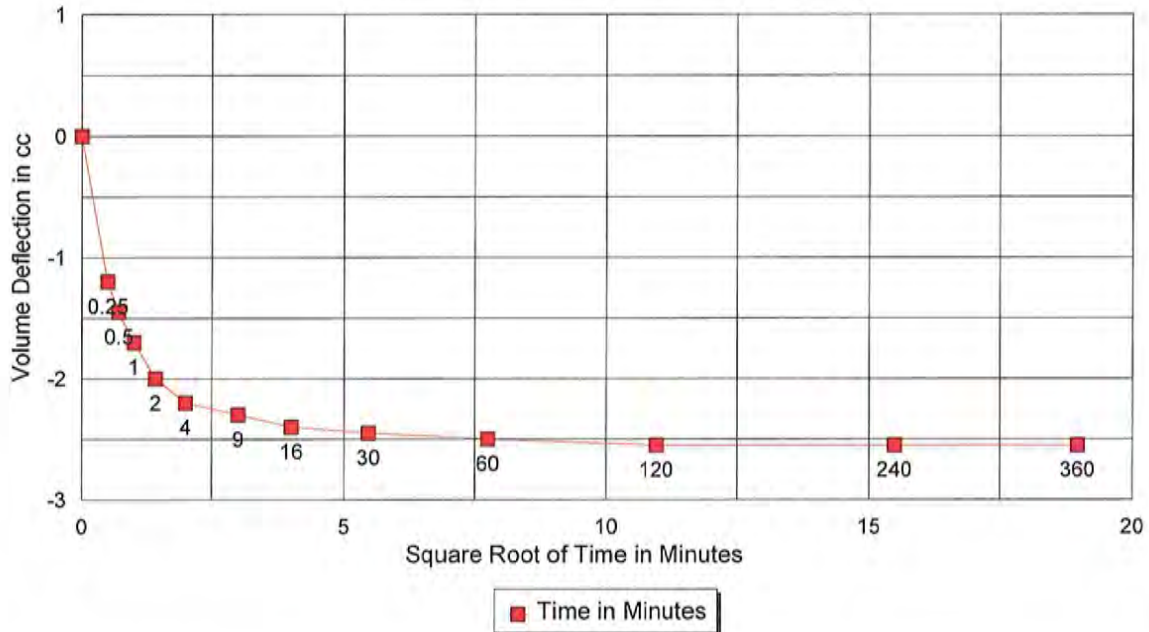
TRIAXIAL TEST - TX/CUpp

TI-B3-03, 21.0-22.0' (20-22.4'), -, Stage 1



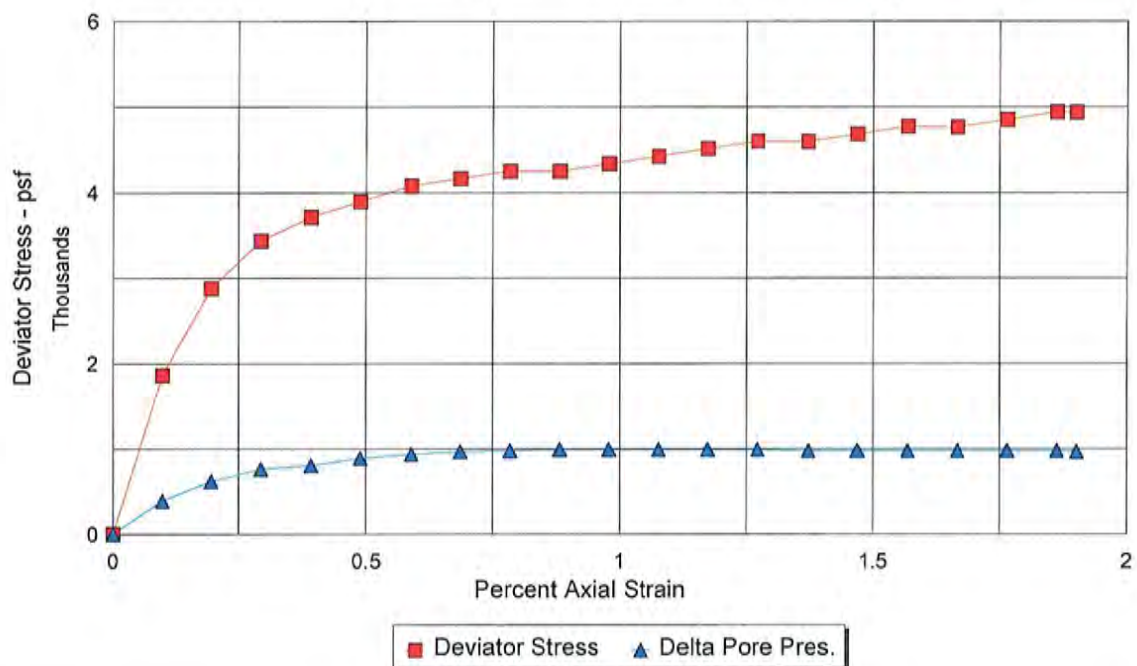
CONSOLIDATION DATA

TI-B3-03, 21.0-22.0' (20-22.4'), -, Stage 2



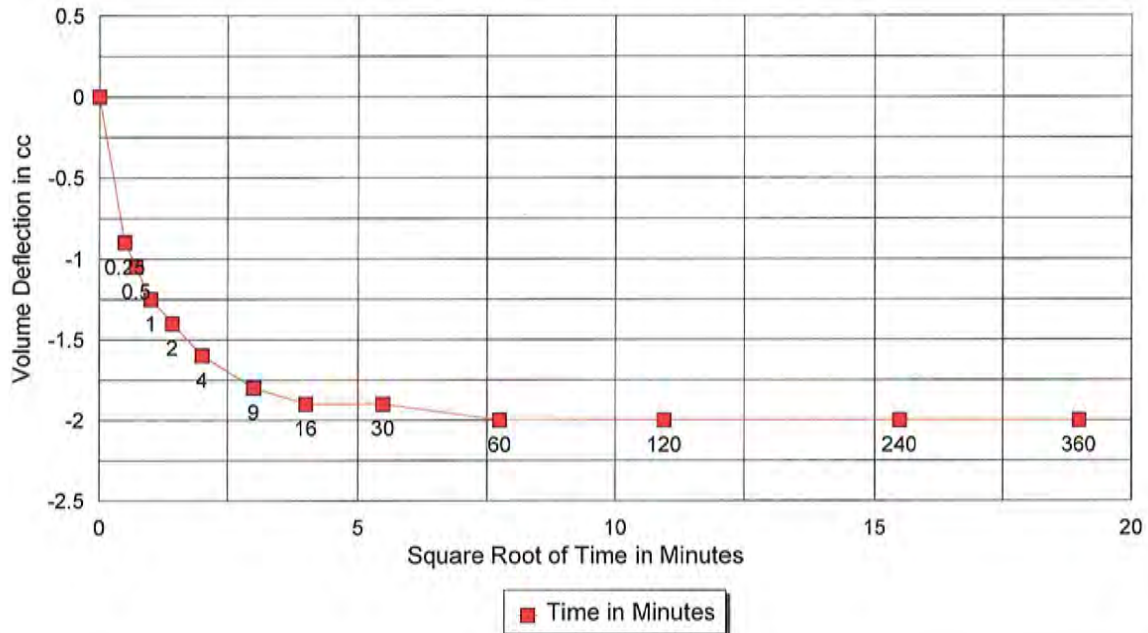
TRIAXIAL TEST - TX/CUpp

TI-B3-03, 21.0-22.0' (20-22.4'), -, Stage 2



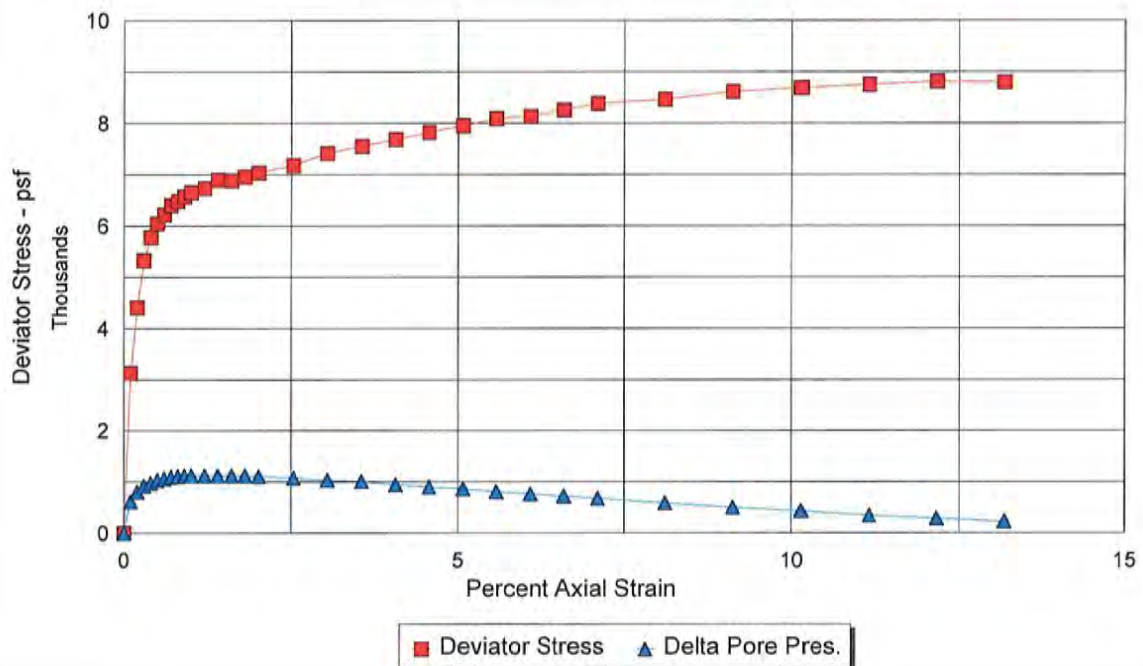
CONSOLIDATION DATA

TI-B3-03, 21.0-22.0' (20-22.4'), -, Stage 3



TRIAXIAL TEST - TX/CUpp

TI-B3-03, 21.0-22.0' (20-22.4'), -, Stage 3



PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B23-10A
DEPTH 45.2-45.7'
SAMPLE NO. -
SOIL DESCR. Sandstone
LOCATION Tailings Impoundment
CONF. PRES. PSF 6192

SAMPLED 12/06/13 MWH
TEST STARTED 04/10/14 DPM
TEST FINISHED 04/17/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	287.5	298.2
Wt. Wet Soil & Pan (g)	293.9	304.7
Wt. Dry Soil & Pan (g)	259.2	259.2
Wt. Lost Moisture (g)	34.8	45.5
Wt. of Pan Only (g)	6.5	6.5
Wt. of Dry Soil (g)	252.7	252.7
Moisture Content %	13.8	18.0
Wet Density PCF	123.6	129.3
Dry Density PCF	108.7	109.6

Init. Diameter (in)	1.915	(cm)	4.864
Init. Area (sq in)	2.880	(sq cm)	18.583
Init. Height (in)	3.076	(cm)	7.813
Vol. Bef. Consol. (cu ft)	0.00513		
Vol. After Consol. (cu ft)	0.00509		
Porosity %	31.61		
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
340.0	20400	46.8	44.4	15.7	3.8E-007
900.0	54000	44.4	40.5	19.1	2.4E-007
524.0	31440	40.5	38.3	22.5	2.4E-007
890.0	53400	38.3	34.7	25.6	2.4E-007
1440.0	86400	34.7	29.4	30.5	2.3E-007
587.0	35220	29.4	27.2	34.6	2.4E-007

Average Temperature 21.6

Data entry by: DPM Date: 05/23/2014
Checked by: ka Date: 5/23/14
FileName: PBCH2310



TRIAxIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B23-10A
 DEPTH 45.2-45.7'
 SAMPLE NO. -
 SOIL DESCR. Sandstone
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 6192

SAMPLED 12/06/13 MWH
 TEST STARTED 04/10/14 DPM
 TEST FINISHED 04/17/14 DPM
 CELL NUMBER 27S
 SATURATED TEST Yes
 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	2.5	9.5				
50.0	48.0	11.8	12.9	38.5	47.0	8.5	0.85
60.0	58.0	12.7	13.7	48.1	57.2	9.1	0.91
70.0	68.0	14.7	15.7	58.7	67.8	9.1	0.91
80.0		16.3	16.3	67.4	77.1	9.7	0.97

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	16.30	0.00
0.25	0.50	21.90	-5.60
0.5	0.71	22.30	-6.00
1	1.00	22.70	-6.40
2	1.41	23.20	-6.90
4	2.00	23.70	-7.40
9	3.00	24.20	-7.90
16	4.00	24.40	-8.10
30	5.48	24.50	-8.20
60	7.75	24.60	-8.30
120	10.95	24.65	-8.35
240	15.49	24.70	-8.40
360	18.97	24.80	-8.50

Initial Height (in)	3.076	Init. Vol. (CC)	145.21
Height Change (in)	0.056	Vol. Change (CC)	24.40
Ht. After Cons. (in)	3.020	Cell Exp. (CC)	23.21
Initial Area (sq in)	2.880	Net Change (CC)	1.19
Area After Cons. (sq in)	2.910	Cons. Vol. (CC)	144.02

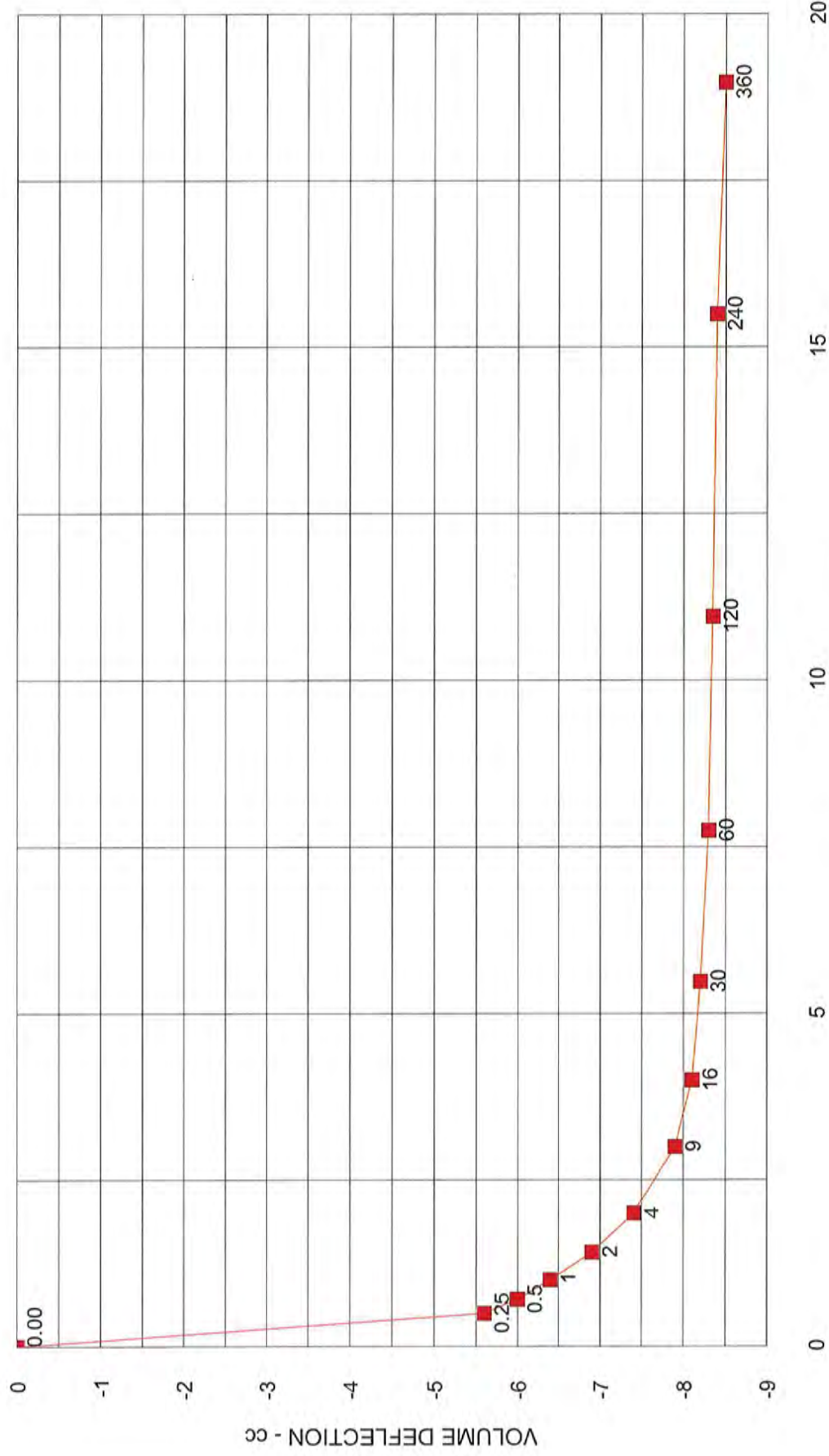
Data entry by: KE DPM
 Checked by: KE
 FileName: PBCH2310

Date: 05/23/2014
 Date: 5/23/14



CONSOLIDATION DATA

TI-B23-10A, 45.2-45.7', -



TIME - SQUARE ROOT SCALE

Time in Minutes

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B23-13A	SAMPLED	12/06/13 MWH
DEPTH	65.5-66.0'	TEST STARTED	03/26/14 DPM
SAMPLE NO.	-	TEST FINISHED	04/20/14 DPM
SOIL DESCR.	Clay Shale	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	8928	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	226.3	238.0
Wt. Wet Soil & Pan (g)	232.9	244.6
Wt. Dry Soil & Pan (g)	211.9	211.9
Wt. Lost Moisture (g)	21.0	32.7
Wt. of Pan Only (g)	6.6	6.6
Wt. of Dry Soil (g)	205.3	205.3
Moisture Content %	10.2	15.9
Wet Density PCF	113.5	134.4
Dry Density PCF	103.0	115.9

Init. Diameter (in)	1.912	(cm)	4.856
Init. Area (sq in)	2.871	(sq cm)	18.525
Init. Height (in)	2.645	(cm)	6.718
Vol. Bef. Consol. (cu ft)	0.00439		
Vol. After Consol. (cu ft)	0.00390		
Porosity %	29.56		
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
660.0	39600	47.8	47.6	13.4	1.3E-08
1564.0	93840	47.4	46.8	14.1	1.8E-08
1500.0	90000	46.8	46.0	14.9	2.2E-08
1500.0	90000	46.0	45.2	15.7	2.4E-08
1440.0	86400	45.2	44.2	16.7	3.2E-08
1453.0	87180	44.2	43.0	17.9	3.8E-08
1440.0	86400	43.0	41.7	19.2	4.2E-08
1440.0	86400	41.7	40.0	20.9	5.5E-08
1440.0	86400	40.0	38.0	22.9	6.6E-08
1440.0	86400	38.0	35.3	25.5	9.2E-08
1440.0	86400	35.3	32.4	28.5	1.0E-07
1440.0	86400	32.4	29.7	31.6	9.7E-08

Average Temperature 22.0

Note: There were multiple horizontal cracks in the sample.

Data entry by: DPM Date: 05/01/2014
 Checked by: Date: 5/23/14
 FileName: PBCH2313



TRIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B23-13A
 DEPTH 65.5-66.0'
 SAMPLE NO. -
 SOIL DESCR. Clay Shale
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 8928

SAMPLED 12/06/13 MWH
 TEST STARTED 03/26/14 DPM
 TEST FINISHED 04/20/14 DPM
 CELL NUMBER 26S
 SATURATED TEST Yes
 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	2.9	13.3		
50.0	48.0	12.5	13.2	38.4	47.3 8.9 0.89
60.0		13.7	14.0	48.0	57.5 9.5 0.95

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	8.00	-7.40
0.5	0.71	8.70	-8.10
1	1.00	9.70	-9.10
2	1.41	10.80	-10.20
4	2.00	12.10	-11.50
9	3.00	14.00	-13.40
16	4.00	15.30	-14.70
30	5.48	16.70	-16.10
60	7.75	18.30	-17.70
120	10.95	19.50	-18.90
240	15.49	20.40	-19.80
360	18.97	20.80	-20.20

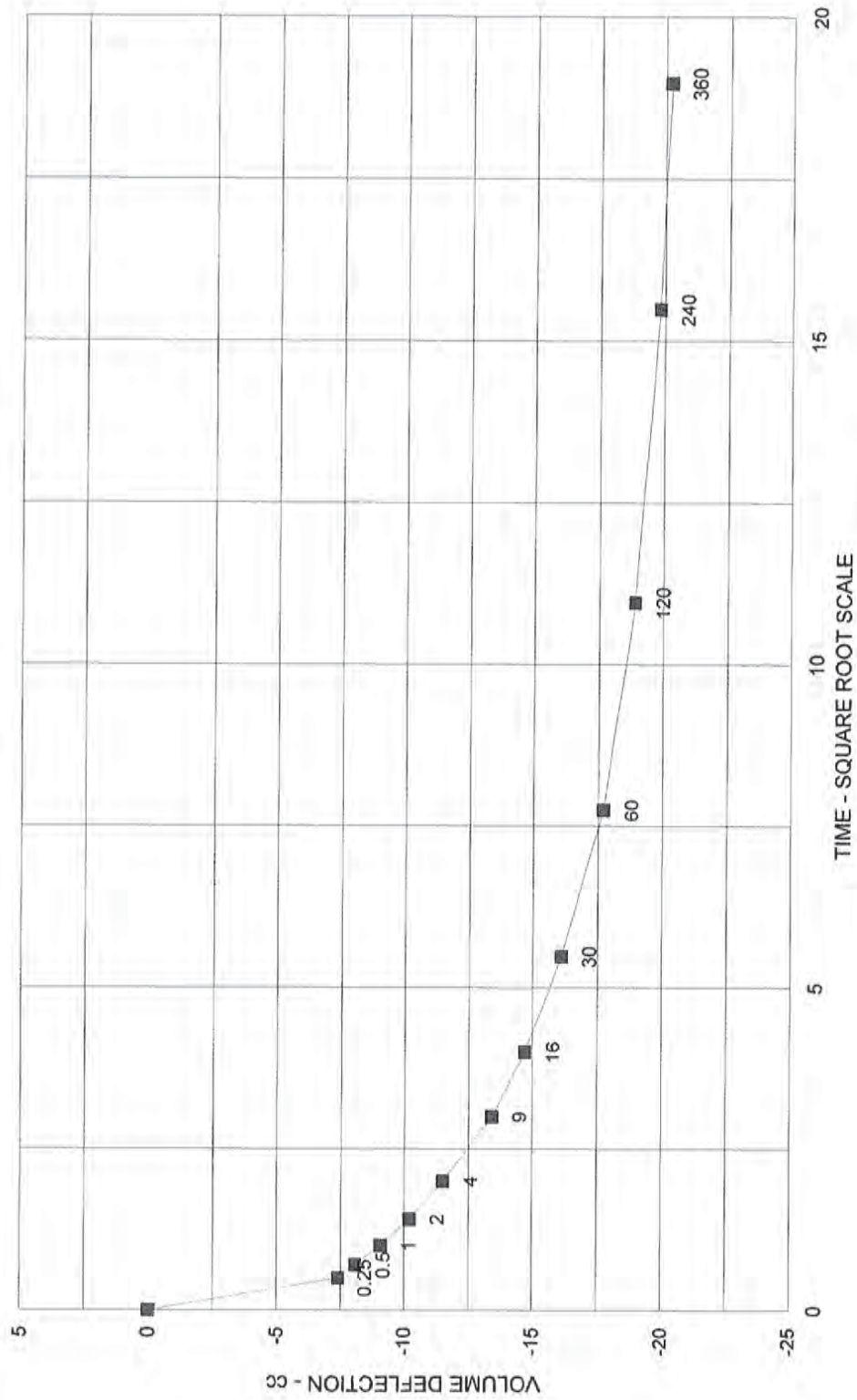
Initial Height (in)	2.645	Init. Vol. (CC)	124.47
Height Change (in)	0.239	Vol. Change (CC)	35.80
Ht. After Cons. (in)	2.406	Cell Exp. (CC)	21.91
Initial Area (sq in)	2.871	Net Change (CC)	13.89
Area After Cons. (sq in)	2.804	Cons. Vol. (CC)	110.58

Data entry by: KE DPM Date: 05/01/2014
 Checked by: KE Date: 5/23/14
 FileName: PBCH2313



CONSOLIDATION DATA

TI-B23-13A, 65.5-66.0', -



■ Time in Minutes CONF. PRES. PSF 8928

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-06
DEPTH 30.5-31.5 (30-31.7')
SAMPLE NO. -
SOIL DESCR. Sandy Clay
LOCATION Tailings Impoundment
CONF. PRES. PSF 7344

SAMPLED 12/02/13 MWH
TEST STARTED 03/18/14 DPM
TEST FINISHED 03/28/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	465.5	478.1
Wt. Wet Soil & Pan (g)	481.4	494.0
Wt. Dry Soil & Pan (g)	425.3	425.3
Wt. Lost Moisture (g)	56.1	68.7
Wt. of Pan Only (g)	15.9	15.9
Wt. of Dry Soil (g)	409.4	409.4
Moisture Content %	13.7	16.8
Wet Density PCF	127.8	136.8
Dry Density PCF	112.4	117.2

Init. Diameter (in)	2.405	(cm)	6.109
Init. Area (sq in)	4.543	(sq cm)	29.310
Init. Height (in)	3.054	(cm)	7.757
Vol. Bef. Consol. (cu ft)	0.00803		
Vol. After Consol. (cu ft)	0.00770		
Porosity %	31.48		
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
360.0	21600	47.5	38.9	18.3	8.7E-07
810.0	48600	47.7	28.2	24.0	9.2E-07
1420.0	85200	47.2	15.9	31.0	8.9E-07
625.0	37500	46.2	31.3	23.2	9.0E-07

Average Temperature 21.4

Data entry by: VR DPM Date: 04/07/2014
Checked by: VR Date: 4/7/14
FileName: PBCH1106



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-06
 DEPTH 30.5-31.5 (30-31.7')
 SAMPLE NO. -
 SOIL DESCR. Sandy Clay
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 7344

SAMPLED 12/02/13 MWH
 TEST STARTED 03/18/14 DPM
 TEST FINISHED 03/28/14 DPM
 CELL NUMBER 27S
 SATURATED TEST Yes
 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	3.3	11.7		
50.0	48.0	13.7	14.6	9.0	0.90
60.0		15.3	15.6	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	1.20	0.00
0.25	0.50	9.10	-7.90
0.5	0.71	10.40	-9.20
1	1.00	11.60	-10.40
2	1.41	12.30	-11.10
4	2.00	12.75	-11.55
9	3.00	13.00	-11.80
16	4.00	13.20	-12.00
30	5.48	13.40	-12.20
60	7.75	13.60	-12.40
120	10.95	13.90	-12.70
240	15.49	14.15	-12.95
360	18.97	14.30	-13.10

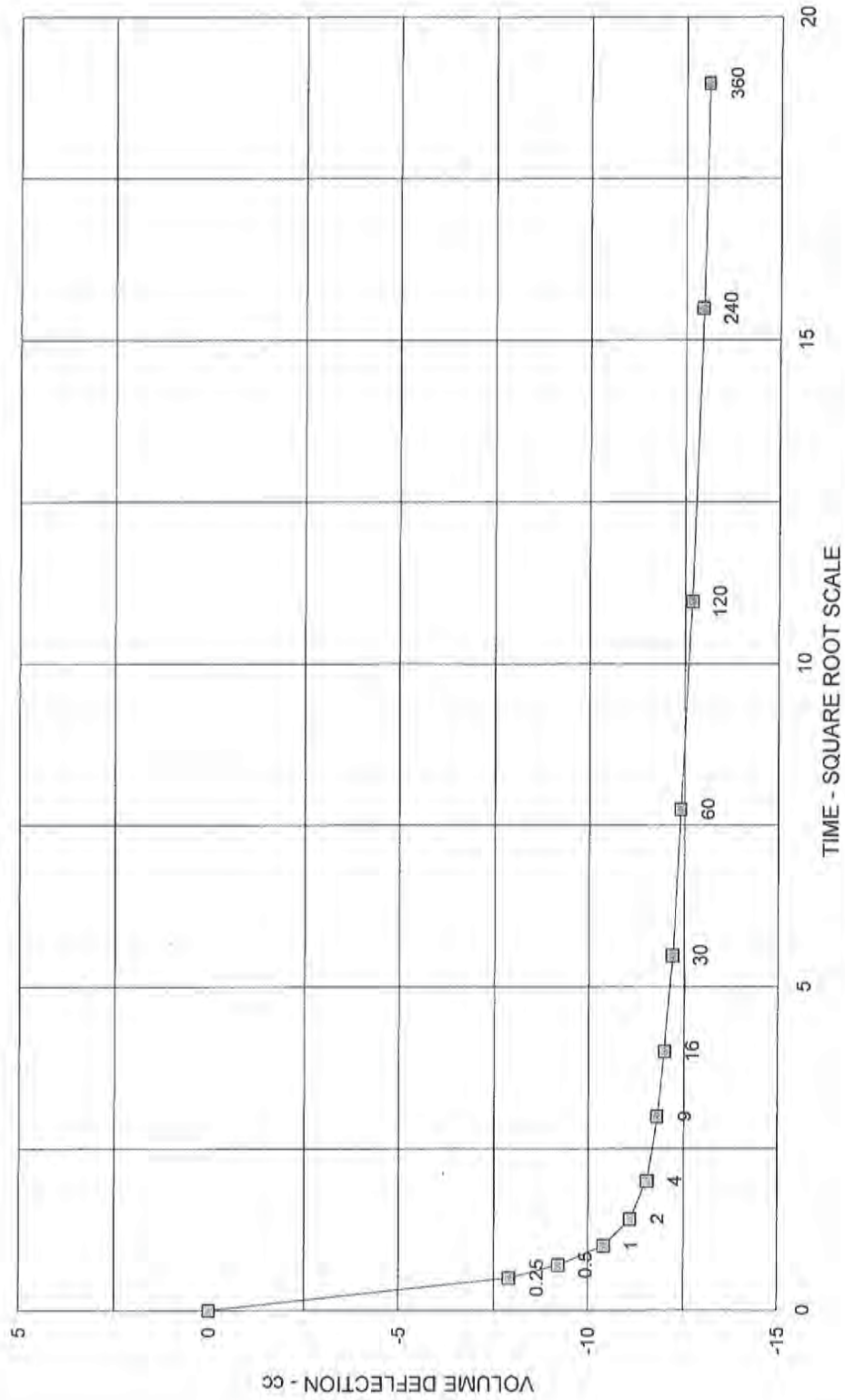
Initial Height (in)	3.054	Init. Vol. (CC)	227.39
Height Change (in)	0.052	Vol. Change (CC)	31.10
Ht. After Cons. (in)	3.002	Cell Exp. (CC)	21.86
Initial Area (sq in)	4.543	Net Change (CC)	9.24
Area After Cons. (sq in)	4.434	Cons. Vol. (CC)	218.15

Data entry by: DPM Date: 04/07/2014
 Checked by: KL Date: 4/7/14
 FileName: PBCH1106



CONSOLIDATION DATA

TI-B11-06, 30.5-31.5 (30-31.7'), -



Time in Minutes CONF. PRES. PSF 7344

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B11-20A	SAMPLED	12/03/13 MWH
DEPTH	100.0-100.2	TEST STARTED	03/06/14 DPM
SAMPLE NO.	-	TEST FINISHED	03/13/14 DPM
SOIL DESCR.	Weathered Sandstone	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	16128	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	288.8	289.3
Wt. Wet Soil & Pan (g)	298.0	298.5
Wt. Dry Soil & Pan (g)	247.7	247.7
Wt. Lost Moisture (g)	50.3	50.8
Wt. of Pan Only (g)	9.2	9.2
Wt. of Dry Soil (g)	238.4	238.4
Moisture Content %	21.1	21.3
Wet Density PCF	125.8	123.3
Dry Density PCF	103.9	101.6
Init. Diameter (in)	1.893	(cm) 4.808
Init. Area (sq in)	2.814	(sq cm) 18.159
Init. Height (in)	3.106	(cm) 7.889
Vol. Bef. Consol. (cu ft)	0.00506	
Vol. After Consol. (cu ft)	0.00517	
Porosity %	34.70	
Constant Head (PSI)	2.00	(cm) 140.79

Time	Time	Init.	Final	Head	Permeability
Min	Sec	Burette	Burette	Corr.	k
		CC	CC	CM	cm/sec
60.0	3600	46.0	32.6	22.6	1.3E-05
138.0	8280	47.0	22.0	27.8	1.1E-05
60.0	3600	46.1	33.5	22.0	1.2E-05
61.0	3660	46.0	32.9	22.4	1.3E-05

Average Temperature 22.1

Data entry by: DPM Date: 04/07/2014
 Checked by: KL Date: 4/7/14
 FileName: PBCH1120



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-20A
 DEPTH 100.0-100.2
 SAMPLE NO. -
 SOIL DESCR. Weathered Sandstone
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 16128

SAMPLED 12/03/13 MWH
 TEST STARTED 03/06/14 DPM
 TEST FINISHED 03/13/14 DPM
 CELL NUMBER 26S
 SATURATED TEST Yes
 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	2.2	9.8		
50.0	48.0	10.1	10.9	8.0	0.80
60.0		11.9	12.0	9.6	0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	2.60	0.00
0.25	0.50	14.10	-11.50
0.5	0.71	14.20	-11.60
1	1.00	14.30	-11.70
2	1.41	14.40	-11.80
4	2.00	14.50	-11.90
9	3.00	14.65	-12.05
16	4.00	14.75	-12.15
30	5.48	14.85	-12.25
60	7.75	14.95	-12.35
133	11.53	15.10	-12.50
240	15.49	15.20	-12.60
360	18.97	15.30	-12.70

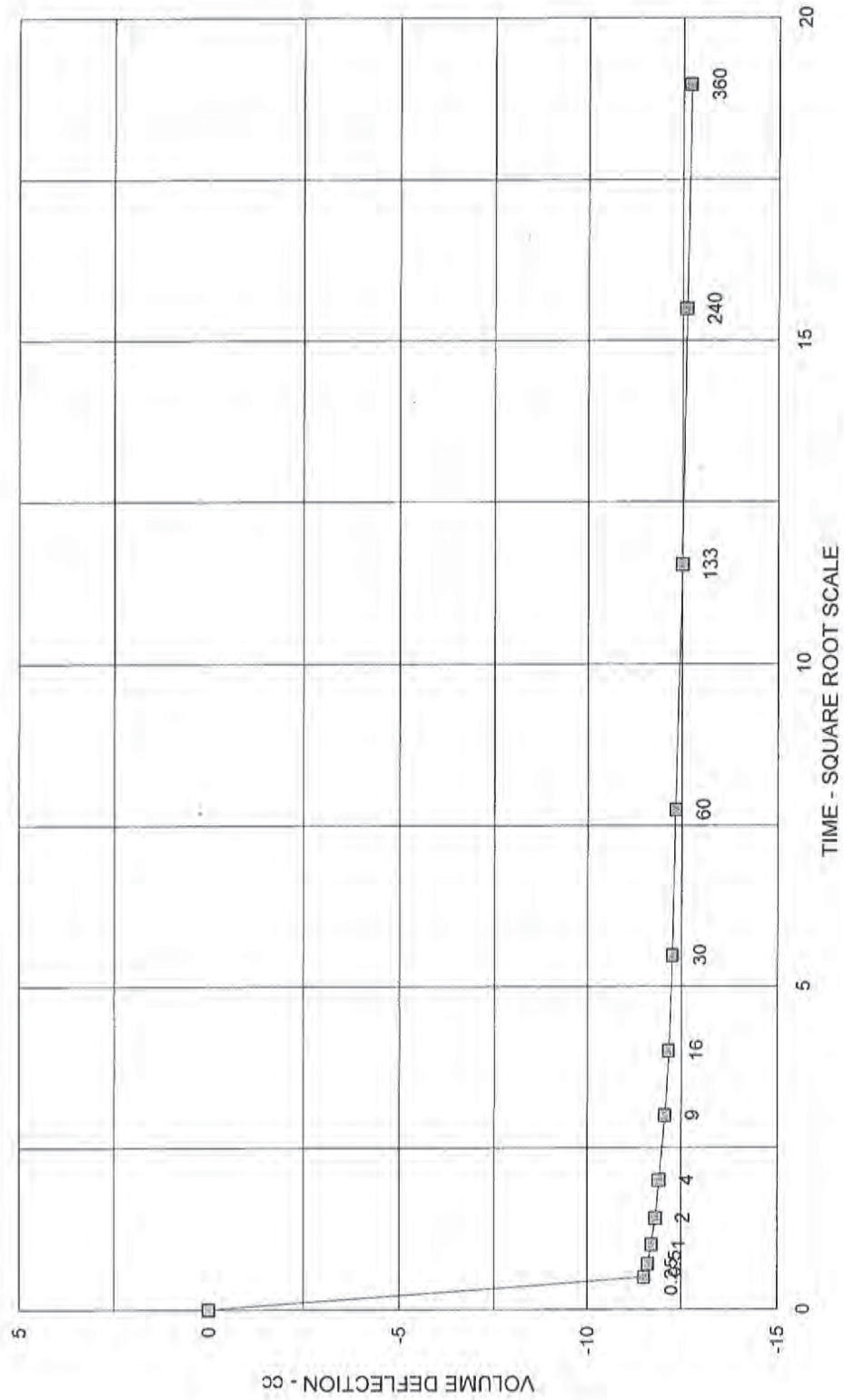
Initial Height (in)	3.106	Init. Vol. (CC)	143.28
Height Change (in)	0.038	Vol. Change (CC)	23.70
Ht. After Cons. (in)	3.068	Cell Exp. (CC)	26.89
Initial Area (sq in)	2.814	Net Change (CC)	-3.19
Area After Cons. (sq in)	2.913	Cons. Vol. (CC)	146.47

Data entry by: KL DPM Date: 04/07/2014
 Checked by: KL Date: 4/7/14
 FileName: PBCH1120



CONSOLIDATION DATA

TI-B11-20A, 100.0-100.2, -



Time in Minutes CONF. PRES. PSF 16128

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B8-02A&B	SAMPLED	12/03/13 MWH
DEPTH	25.5-26.5'	TEST STARTED	03/17/14 DPM
SAMPLE NO.	Composite Remold	TEST FINISHED	03/25/14 DPM
SOIL DESCR.	Sand Tailings & Clayey Silt	CELL NUMBER	26S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	6624	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	249.5	278.1
Wt. Wet Soil & Pan (g)	256.1	284.7
Wt. Dry Soil & Pan (g)	230.2	230.2
Wt. Lost Moisture (g)	25.9	54.5
Wt. of Pan Only (g)	6.6	6.6
Wt. of Dry Soil (g)	223.6	223.6
Moisture Content %	11.6	24.4
Wet Density PCF	108.0	122.6
Dry Density PCF	96.8	98.5

Init. Diameter (in)	1.915	(cm)	4.864
Init. Area (sq in)	2.880	(sq cm)	18.583
Init. Height (in)	3.056	(cm)	7.762
Vol. Bef. Consol. (cu ft)	0.00509		
Vol. After Consol. (cu ft)	0.00500		
Porosity %	38.47		
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
4.0	240	46.9	23.8	26.9	3.5E-04
4.0	240	47.6	24.1	26.3	3.5E-04
4.0	240	48.6	25.0	25.3	3.5E-04
4.0	240	48.7	24.7	25.4	3.6E-04

Average Temperature 21.0

Data entry by: VR DPM Date: 04/10/2014
 Checked by: VR Date: 4/11/14
 FileName: PBCHB802



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-02A&B
 DEPTH 25.5-26.5'
 SAMPLE NO. Composite Remold
 SOIL DESCR. Sand Tailings & Clayey Silt
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 6624

SAMPLED 12/03/13 MWH
 TEST STARTED 03/17/14 DPM
 TEST FINISHED 03/25/14 DPM
 CELL NUMBER 26S
 SATURATED TEST Yes
 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	2.1	11.0		
50.0	48.0	11.6	12.6	38.4	46.5
60.0	58.0	12.8	13.6	48.6	57.8
70.0		13.5	13.6	58.3	67.8
				8.1	0.81
				9.2	0.92
				9.5	0.95

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	1.60	0.00
0.25	0.50	9.10	-7.50
0.5	0.71	9.30	-7.70
1	1.00	9.40	-7.80
2	1.41	9.50	-7.90
4	2.00	9.70	-8.10
9	3.00	9.85	-8.25
16	4.00	9.95	-8.35
30	5.48	10.10	-8.50
60	7.75	10.30	-8.70
120	10.95	10.50	-8.90
240	15.49	10.70	-9.10
360	18.97	10.70	-9.10

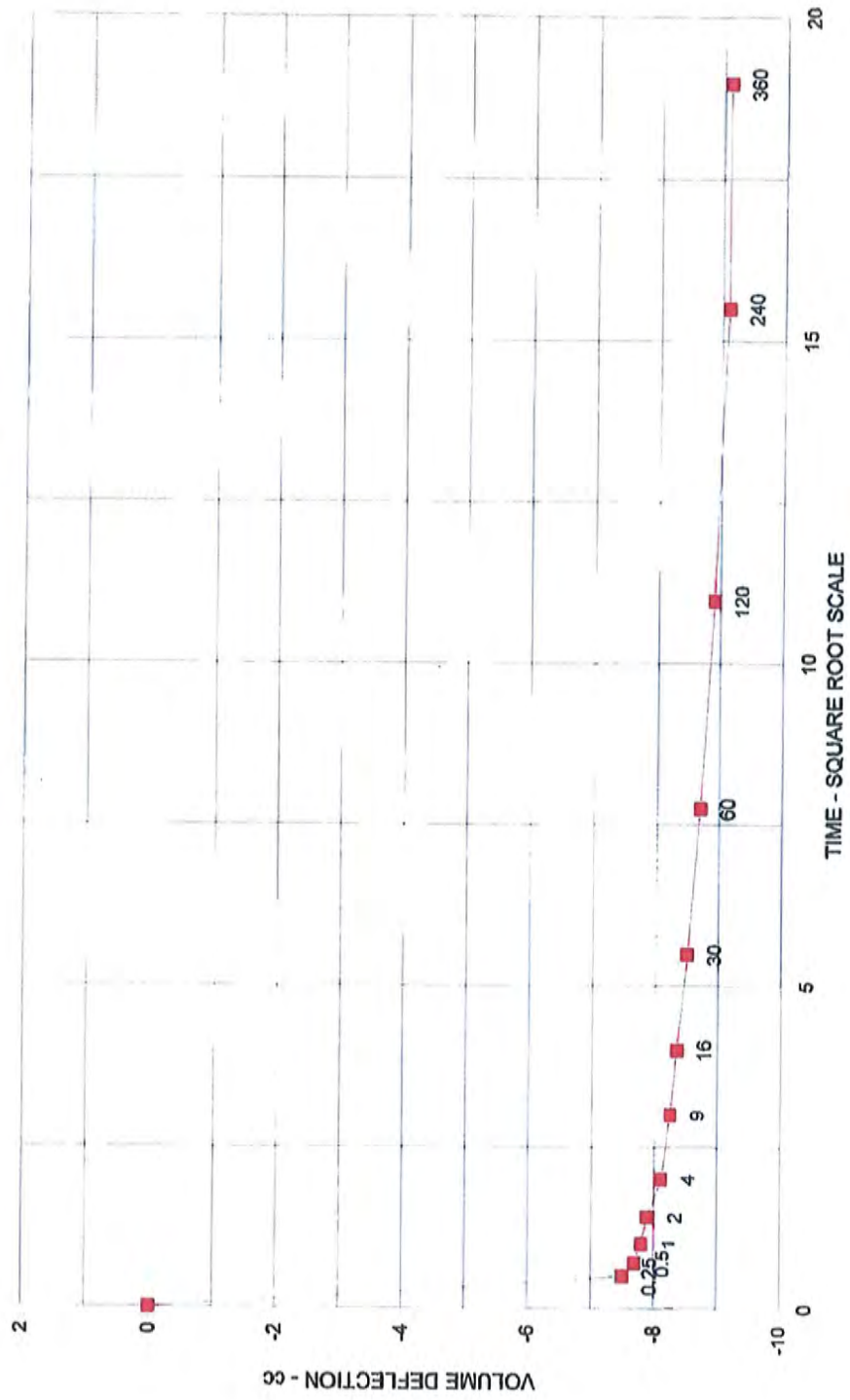
Initial Height (in)	3.056	Init. Vol. (CC)	144.26
Height Change (in)	0.046	Vol. Change (CC)	23.90
Ht. After Cons. (in)	3.010	Cell Exp. (CC)	21.32
Initial Area (sq in)	2.880	Net Change (CC)	2.58
Area After Cons. (sq in)	2.872	Cons. Vol. (CC)	141.68

Data entry by: DPM Date: 04/10/2014
 Checked by: KE Date: 4/11/14
 FileName: PBCHB802



CONSOLIDATION DATA

TI-B8-02A&B, 25.5-26.5', Composite Remold



■ Time in Minutes CONF. PRES. PSF 6624

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO.	TI-B11-03	SAMPLED	12/02/13 MWH
DEPTH	15-16'	TEST STARTED	02/27/14DPM
SAMPLE NO.	-	TEST FINISHED	3/5/14 DPM
SOIL DESCR.	Sand	CELL NUMBER	25S
LOCATION	Tailings Impoundment	SATURATED TEST	Yes
CONF. PRES. PSF	5472	TEST TYPE	TX/Pbp/Tap Water

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Soil + Moisture (g)	626.9	673.5	
Wt. Wet Soil & Pan (g)	642.7	689.3	
Wt. Dry Soil & Pan (g)	595.1	595.1	
Wt. Lost Moisture (g)	47.6	94.2	
Wt. of Pan Only (g)	15.8	15.8	
Wt. of Dry Soil (g)	579.3	579.3	
Moisture Content %	8.2	16.3	
Wet Density PCF	119.5	135.6	
Dry Density PCF	110.4	116.6	
Init. Diameter (in)	2.862	(cm)	7.269
Init. Area (sq in)	6.433	(sq cm)	41.507
Init. Height (in)	3.107	(cm)	7.892
Vol. Bef. Consol. (cu ft)	0.01157		
Vol. After Consol. (cu ft)	0.01095		
Porosity %	30.38		
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
15.0	900	45.0	31.2	23.9	2.4E-05
15.0	900	46.7	33.5	21.7	2.3E-05
15.0	900	44.3	30.5	24.8	2.5E-05
15.0	900	45.6	31.4	23.4	2.5E-05

Average Temperature 20.3

Data entry by: DPM Date: 04/10/2014
Checked by: KE Date: 4/11/14
FileName: PBCH1103



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-03
 DEPTH 15-16'
 SAMPLE NO. -
 SOIL DESCR. Sand
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 5472

SAMPLED 12/02/13 MWH
 TEST STARTED 02/27/14DPM
 TEST FINISHED 3/5/14 DPM
 CELL NUMBER 25S
 SATURATED TEST Yes
 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	4.4	18.8		
50.0	48.0	19.6	20.8	38.0	46.2
60.0	58.0	21.0	22.0	47.7	56.6
70.0	68.0	21.9	22.8	58.5	67.9
80.0		23.0	23.0	67.8	77.6
				8.2	0.82
				8.9	0.89
				9.4	0.94
				9.8	0.98

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	1.20	0.00
0.25	0.50	15.40	-14.20
0.5	0.71	15.90	-14.70
1	1.00	16.40	-15.20
2	1.41	16.80	-15.60
4	2.00	17.10	-15.90
9	3.00	17.45	-16.25
16	4.00	17.70	-16.50
30	5.48	17.80	-16.60
60	7.75	18.00	-16.80
120	10.95	18.20	-17.00
240	15.49	18.40	-17.20
360	18.97	18.50	-17.30

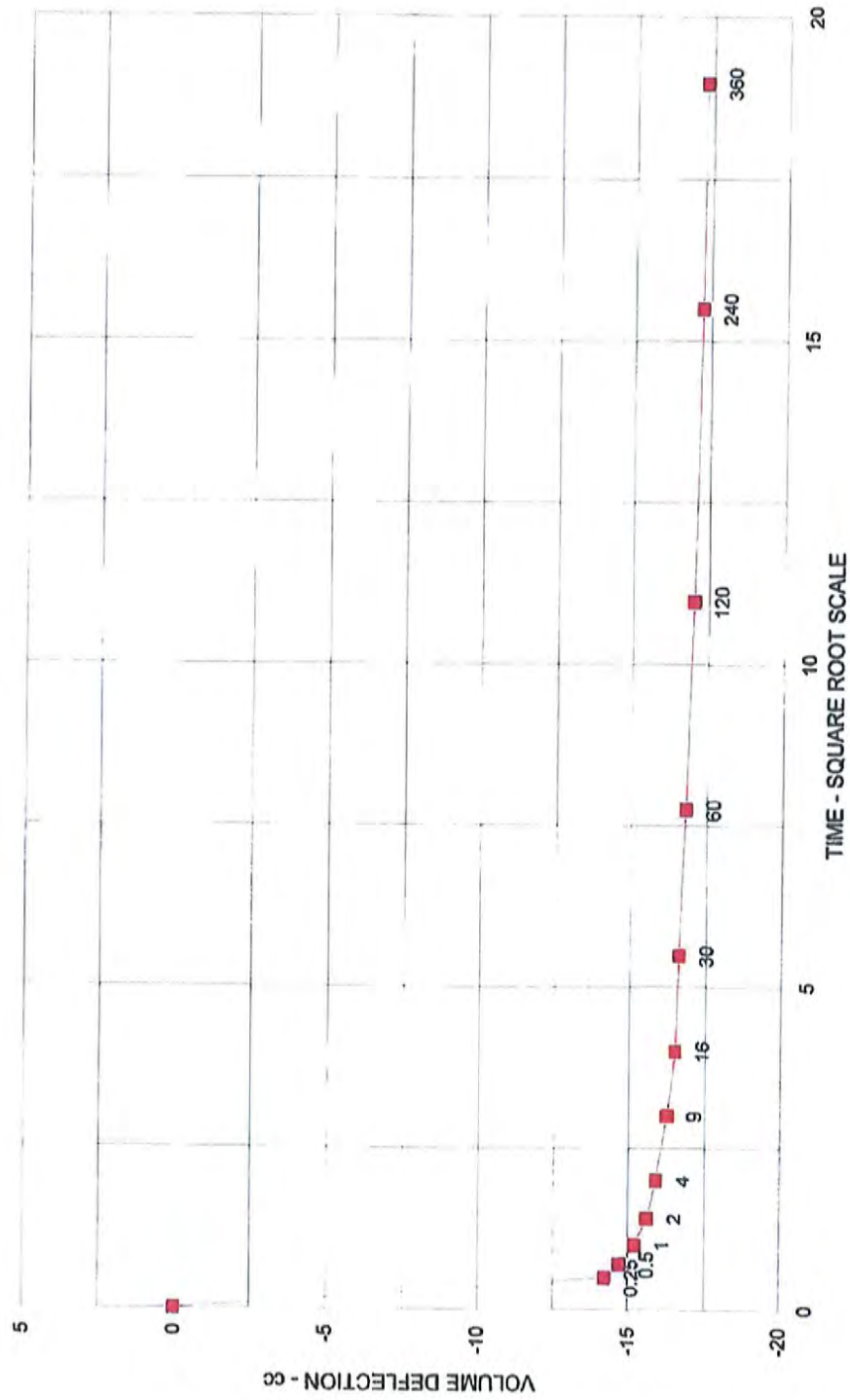
Initial Height (in)	3.107	Init. Vol. (CC)	327.60
Height Change (in)	0.112	Vol. Change (CC)	38.30
Ht. After Cons. (in)	2.995	Cell Exp. (CC)	18.82
Initial Area (sq in)	6.433	Net Change (CC)	17.48
Area After Cons. (sq in)	6.318	Cons. Vol. (CC)	310.13

Data entry by: DPM Date: 04/10/2014
 Checked by: KE Date: 4/11/14
 FileName: PBCH1103



CONSOLIDATION DATA

TL-B11-03, 15-16', -



■ Time in Minutes CONF. PRES. PSF 5472

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B15-05
DEPTH 15.5-16.0' (15-17.5')
SAMPLE NO. -
SOIL DESCR. Sand Tailings
LOCATION Tailings Impoundment
CONF. PRES. PSF 5472

SAMPLED 12/05/13 MWH
TEST STARTED 03/19/14 DPM
TEST FINISHED 03/26/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	494.4	569.4
Wt. Wet Soil & Pan (g)	510.3	585.2
Wt. Dry Soil & Pan (g)	476.6	476.6
Wt. Lost Moisture (g)	33.6	108.5
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	460.8	460.8
Moisture Content %	7.3	23.6
Wet Density PCF	101.2	124.0
Dry Density PCF	94.3	100.4

Init. Diameter (in)	2.837	(cm)	7.206
Init. Area (sq in)	6.321	(sq cm)	40.785
Init. Height (in)	2.944	(cm)	7.478
Vol. Bef. Consol. (cu ft)	0.01077		
Vol. After Consol. (cu ft)	0.01012		
Porosity %	37.86		
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
1.00	60	46.8	17.1	30.6	8.2E-04
0.75	45	46.6	24.6	26.6	7.8E-04
0.75	45	47.6	25.2	25.7	7.9E-04
0.75	45	47.7	25.9	25.3	7.7E-04
0.75	45	47.0	23.6	26.9	8.3E-04

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.

Average Temperature 23.0

Data entry by: KR Date: 04/07/2014
Checked by: KR Date: 4/7/14
FileName: PBCH1505



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B15-05
 DEPTH 15.5-16.0' (15-17.5')
 SAMPLE NO. -
 SOIL DESCR. Sand Tailings
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 5472

SAMPLED 12/05/13 MWH
 TEST STARTED 03/19/14 DPM
 TEST FINISHED 03/26/14 DPM
 CELL NUMBER 25S
 SATURATED TEST Yes
 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	5.9	22.8		
50.0	48.0	23.8	24.9	38.8	46.9
60.0	58.0	24.8	25.7	48.0	56.9
70.0		27.4	27.5	58.3	67.9
				8.1	8.9
				9.6	0.81
					0.89
					0.96

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	1.20	0.00
0.25	0.50	13.40	-12.20
0.5	0.71	13.70	-12.50
1	1.00	13.90	-12.70
2	1.41	14.05	-12.85
4	2.00	14.15	-12.95
9	3.00	14.30	-13.10
16	4.00	14.40	-13.20
30	5.48	14.50	-13.30
60	7.75	14.65	-13.45
120	10.95	14.75	-13.55
240	15.49	14.80	-13.60
360	18.97	14.80	-13.60

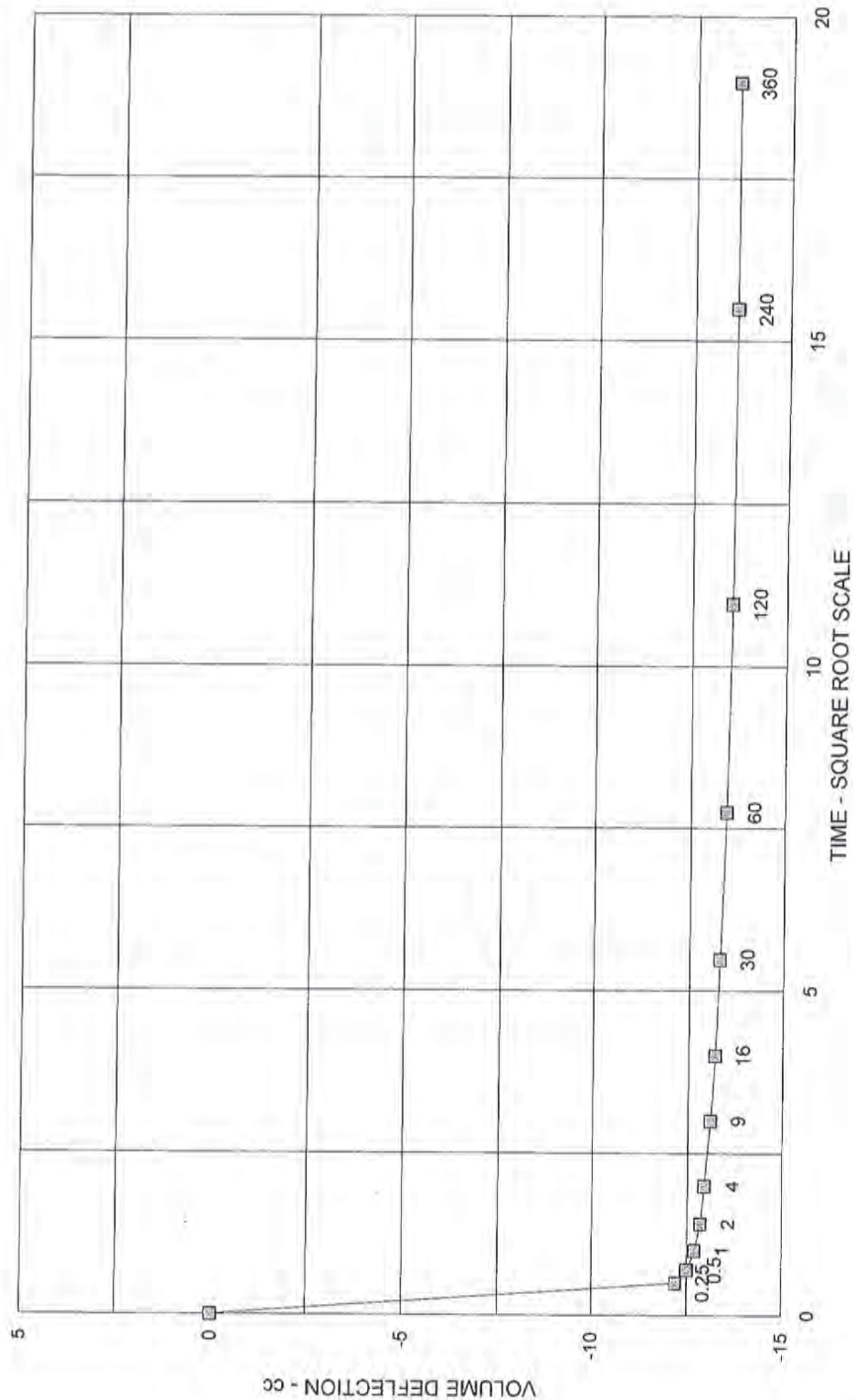
Initial Height (in)	2.944	Init. Vol. (CC)	305.02
Height Change (in)	0.097	Vol. Change (CC)	35.10
Ht. After Cons. (in)	2.847	Cell Exp. (CC)	16.73
Initial Area (sq in)	6.321	Net Change (CC)	18.37
Area After Cons. (sq in)	6.143	Cons. Vol. (CC)	286.65

Data entry by: KR DPM Date: 04/07/2014
 Checked by: 4/7/14
 FileName: PBCH1505



CONSOLIDATION DATA

TI-B15-05, 15.5-16.0' (15-17.5'), -



Time in Minutes CONF. PRES. PSF 5472

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-09
DEPTH 43.5-44.5' (42.5-45.0')
SAMPLE NO. Remolded
SOIL DESCR. Clayey Silt
LOCATION Tailings Impoundment
CONF. PRES. PSF 8784

SAMPLED 12/04/13 MWH
TEST STARTED 02/19/14 DPM
TEST FINISHED 02/26/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	379.8	337.3
Wt. Wet Soil & Pan (g)	386.5	344.0
Wt. Dry Soil & Pan (g)	267.5	267.5
Wt. Lost Moisture (g)	119.0	76.5
Wt. of Pan Only (g)	6.7	6.7
Wt. of Dry Soil (g)	260.9	260.9
Moisture Content %	45.6	29.3
Wet Density PCF	107.2	121.2
Dry Density PCF	73.6	93.7

Init. Diameter (in)	2.406	(cm)	6.111
Init. Area (sq in)	4.547	(sq cm)	29.334
Init. Height (in)	2.969	(cm)	7.541
Vol. Bef. Consol. (cu ft)	0.00781		
Vol. After Consol. (cu ft)	0.00613		
Porosity %	44.01		
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
1500.0	90000	45.8	44.3	16.3	3.4E-08
2880.0	172800	44.3	41.9	18.4	2.9E-08
1440.0	86400	41.9	40.7	20.4	2.9E-08
1440.0	86400	40.7	39.5	21.7	3.0E-08

Note: Could not achieve target density.

Average Temperature 21.1

Data entry by: ve DPM Date: 04/04/2014
Checked by: ve Date: 4/5/14
FileName: PBCHB809



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-09
 DEPTH 43.5-44.5' (42.5-45.0')
 SAMPLE NO. Remolded
 SOIL DESCR. Clayey Silt
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 8784

SAMPLED 12/04/13 MWH
 TEST STARTED 02/19/14 DPM
 TEST FINISHED 02/26/14 DPM
 CELL NUMBER 25S
 SATURATED TEST Yes
 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	2.9	17.4		
50.0		20.9	21.0	38.6	48.4
				9.8	0.98

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	7.40	-7.10
0.5	0.71	8.20	-7.90
1	1.00	9.20	-8.90
2	1.41	10.60	-10.30
4	2.00	12.45	-12.15
9	3.00	15.55	-15.25
16	4.00	18.70	-18.40
30	5.48	23.20	-22.90
60	7.75	30.00	-29.70
120	10.95	37.80	-37.50
240	15.49	43.00	-42.70
360	18.97	44.20	-43.90

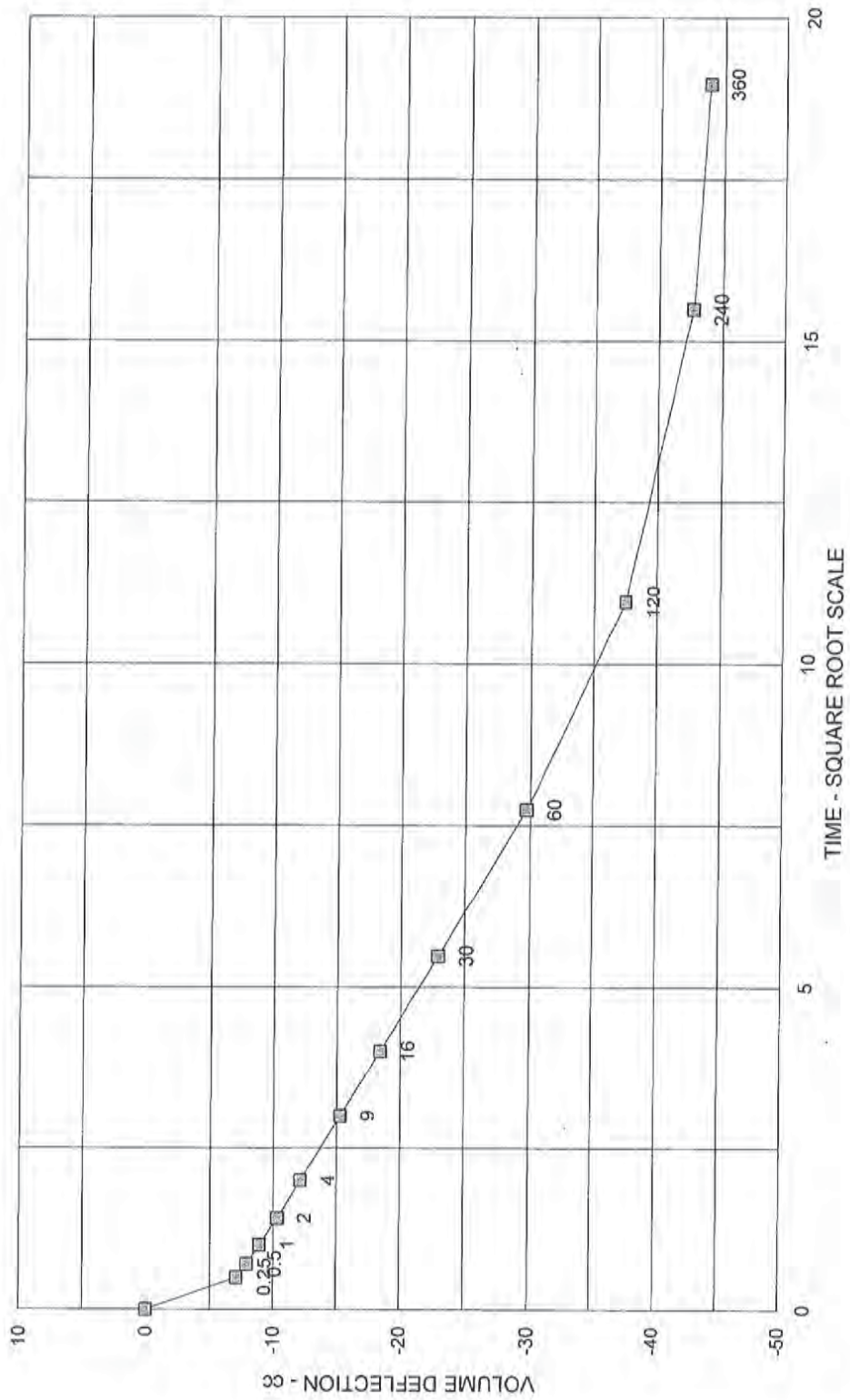
Initial Height (in)	2.969	Init. Vol. (CC)	221.24
Height Change (in)	0.346	Vol. Change (CC)	65.40
Ht. After Cons. (in)	2.623	Cell Exp. (CC)	17.91
Initial Area (sq in)	4.547	Net Change (CC)	47.49
Area After Cons. (sq in)	4.042	Cons. Vol. (CC)	173.75

Data entry by: DPM Date: 04/04/2014
 Checked by: Date: 4/5/14
 FileName: PBCHB809



CONSOLIDATION DATA

T1-B8-09, 43.5-44.5' (42.5-45.0'), Remolded



Time in Minutes CONF. PRES. PSF 8784

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-08
DEPTH 41-42' (40-42.5')
SAMPLE NO. -
SOIL DESCR. Clayey Silt
LOCATION Tailings Impoundment
CONF. PRES. PSF 7632

SAMPLED 12/04/13 MWH
TEST STARTED 01/21/14 DPM
TEST FINISHED 2/8/14 DPM
CELL NUMBER 27S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	284.1	284.1
Wt. Wet Soil & Pan (g)	300.0	299.9
Wt. Dry Soil & Pan (g)	244.9	244.9
Wt. Lost Moisture (g)	55.1	55.0
Wt. of Pan Only (g)	15.9	15.9
Wt. of Dry Soil (g)	229.0	229.0
Moisture Content %	24.1	24.0
Wet Density PCF	119.1	125.1
Dry Density PCF	96.0	100.8

Init. Diameter (in)	1.933	(cm)	4.910
Init. Area (sq in)	2.935	(sq cm)	18.934
Init. Height (in)	3.096	(cm)	7.864
Vol. Bef. Consol. (cu ft)	0.00526		
Vol. After Consol. (cu ft)	0.00501		
Porosity %	38.81		
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
1442.0	86520	47.2	42.9	16.3	1.6E-07
1440.0	86400	44.8	41.0	18.6	1.4E-07
5760.0	345600	48.6	35.0	19.8	1.3E-07
1440.0	86400	35.0	31.8	29.0	1.3E-07
1440.0	86400	31.8	29.0	32.3	1.2E-07
1440.0	86400	29.0	26.4	35.2	1.1E-07
1322.0	79320	46.4	43.1	16.6	1.3E-07

Note: Could not reach 59psi confining pressure due to saturation pressure and air compressor limitations.

Average Temperature 19.2

Data entry by: 12 DPM Date: 04/04/2014
Checked by: 4/6/14 Date: 4/6/14
FileName: PBCHB808



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-08
 DEPTH 41-42' (40-42.5')
 SAMPLE NO. -
 SOIL DESCR. Clayey Silt
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 7632

SAMPLED 12/04/13 MWH
 TEST STARTED 01/21/14 DPM
 TEST FINISHED 2/8/14 DPM
 CELL NUMBER 27S
 SATURATED TEST Yes
 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	2.4	11.7		
50.0	48.0	13.0	38.5	8.8	0.88
60.0	58.0	14.3	48.0	9.1	0.91
70.0		15.9	57.7	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	7.30	-7.00
0.5	0.71	8.00	-7.70
1	1.00	8.70	-8.40
2	1.41	9.50	-9.20
4	2.00	10.30	-10.00
9	3.00	11.30	-11.00
16	4.00	11.70	-11.40
30	5.48	12.05	-11.75
60	7.75	12.25	-11.95
120	10.95	12.55	-12.25
240	15.49	12.90	-12.60
360	18.97	12.90	-12.60

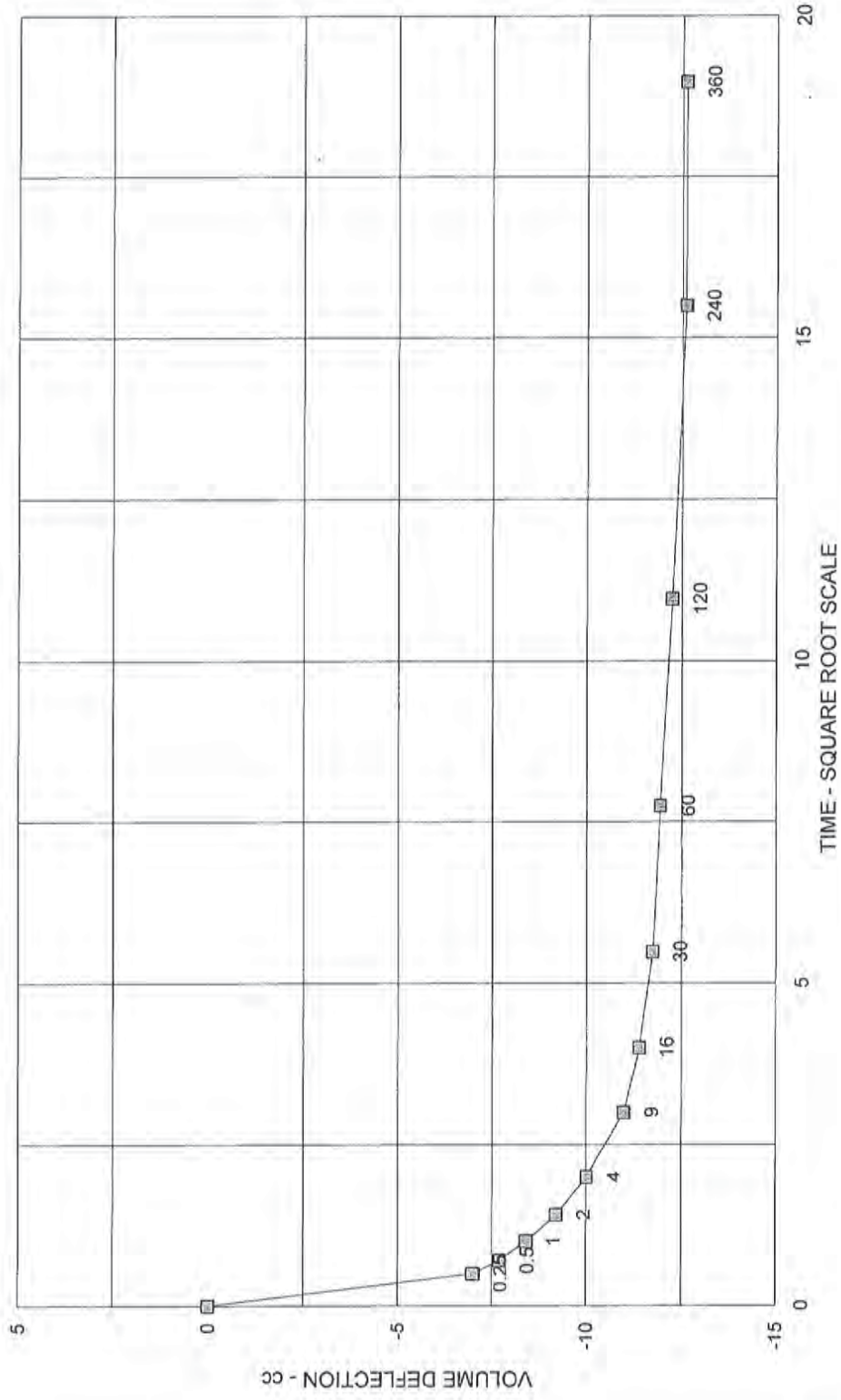
Initial Height (in)	3.096	Init. Vol. (CC)	148.91
Height Change (in)	0.122	Vol. Change (CC)	30.30
Ht. After Cons. (in)	2.974	Cell Exp. (CC)	23.21
Initial Area (sq in)	2.935	Net Change (CC)	7.09
Area After Cons. (sq in)	2.910	Cons. Vol. (CC)	141.83

Data entry by: AK DPM Date: 04/04/2014
 Checked by: 4/6/14 Date: 4/6/14
 FileName: PBCHB808



CONSOLIDATION DATA

TI-B8-08, 41-42' (40-42.5'), -



Time in Minutes CONF. PRES. PSF 7632

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B8-06
DEPTH 35-36' (35-37.5')
SAMPLE NO. -
SOIL DESCR. Clayey Silt/Sand
LOCATION Tailings Impoundment
CONF. PRES. PSF 6192

SAMPLED 12/04/13 MWH
TEST STARTED 01/22/14 DPM
TEST FINISHED 01/30/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	244.1	265.9
Wt. Wet Soil & Pan (g)	259.9	281.8
Wt. Dry Soil & Pan (g)	225.4	225.4
Wt. Lost Moisture (g)	34.5	56.4
Wt. of Pan Only (g)	15.8	15.8
Wt. of Dry Soil (g)	209.6	209.6
Moisture Content %	16.5	26.9
Wet Density PCF	104.3	125.3
Dry Density PCF	89.6	98.7

Init. Diameter (in)	1.927	(cm)	4.895
Init. Area (sq in)	2.916	(sq cm)	18.817
Init. Height (in)	3.056	(cm)	7.762
Vol. Bef. Consol. (cu ft)	0.00516		
Vol. After Consol. (cu ft)	0.00468		
Porosity %	42.52		
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
60.0	3600	47.0	18.6	29.6	3.0E-05
60.0	3600	47.4	25.2	25.8	2.3E-05
61.0	3660	46.2	33.6	21.9	1.2E-05
60.0	3600	33.6	26.4	32.7	7.8E-06
60.0	3600	46.1	23.4	27.5	2.3E-05
90.0	5400	45.0	23.4	28.1	1.5E-05
60.0	3600	47.7	27.8	24.3	2.0E-05
60.0	3600	44.2	28.4	25.8	1.6E-05

Average Temperature 19.3

Note: Could not reach the requested confining pressure due to Saturation pressure and air compressor limitations.

Data entry by: DPM Date: 04/04/2014
Checked by: PR Date: 4/5/14
FileName: PBBCH806



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. T1-B8-06
 DEPTH 35-36' (35-37.5')
 SAMPLE NO. -
 SOIL DESCR. Clayey Silt/Sand
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 6192

SAMPLED 12/04/13 MWH
 TEST STARTED 01/22/14 DPM
 TEST FINISHED 01/30/14 DPM
 CELL NUMBER 25S
 SATURATED TEST Yes
 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	7.8	17.5		
50.0	48.0	19.5	20.7	38.1	44.8
60.0	58.0	21.3	22.3	48.0	56.1
70.0	68.0	24.1	24.9	58.1	67.4
80.0		25.6	25.7	67.5	77.3
				6.7	0.67
				8.1	0.81
				9.3	0.93
				9.8	0.98

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (CC)
0.00	0.00	0.70	0.00
0.25	0.50	8.30	-7.60
0.5	0.71	8.55	-7.85
1	1.00	8.65	-7.95
2	1.41	8.80	-8.10
4	2.00	8.90	-8.20
9	3.00	9.05	-8.35
16	4.00	9.20	-8.50
30	5.48	9.40	-8.70
60	7.75	9.60	-8.90
120	10.95	9.90	-9.20
240	15.49	10.30	-9.60
360	18.97	10.50	-9.80

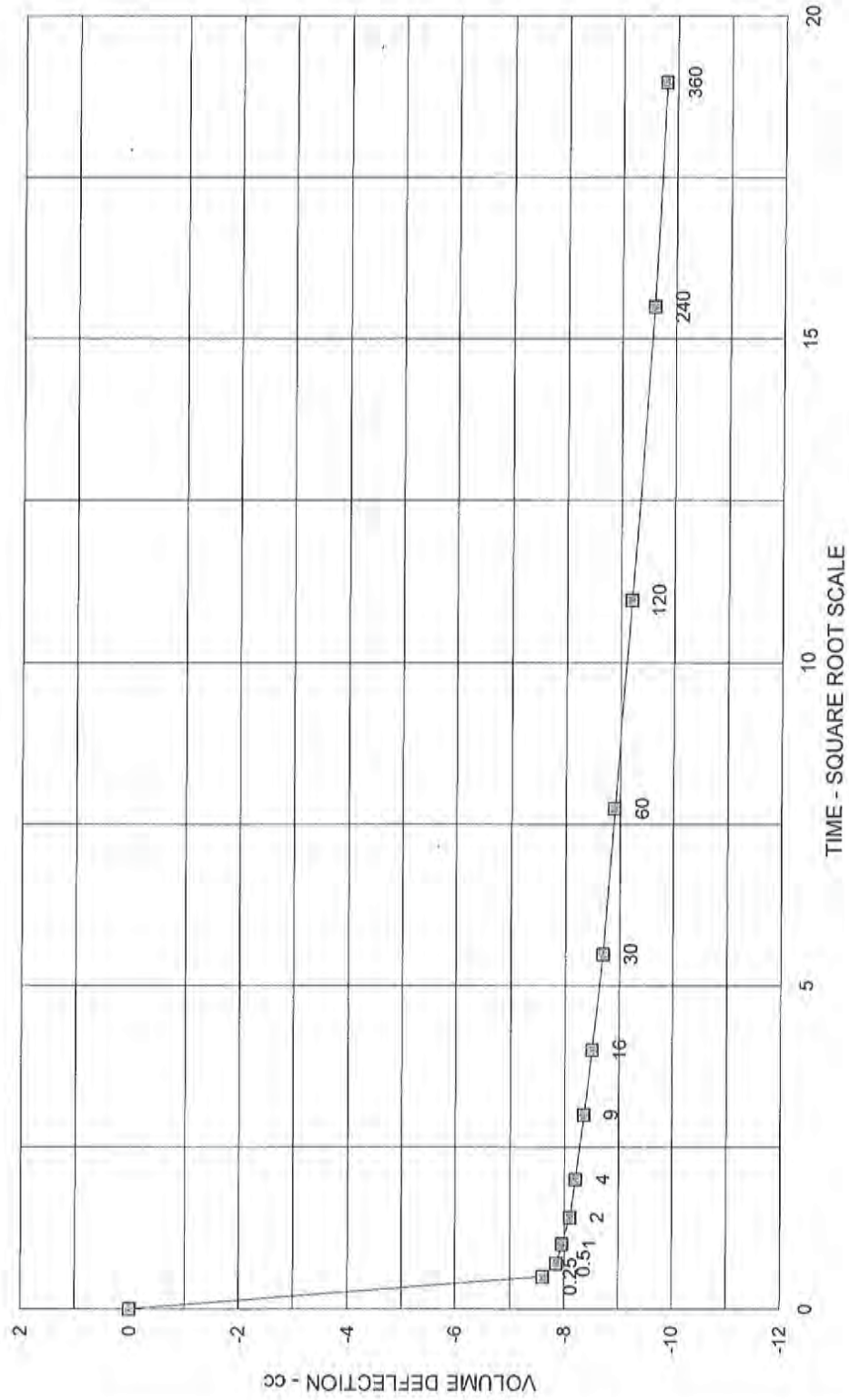
Initial Height (in)	3.056	Init. Vol. (CC)	146.08
Height Change (in)	0.115	Vol. Change (CC)	33.00
Ht. After Cons. (in)	2.941	Cell Exp. (CC)	19.48
Initial Area (sq in)	2.916	Net Change (CC)	13.52
Area After Cons. (sq in)	2.750	Cons. Vol. (CC)	132.56

Data entry by: DPM Date: 04/04/2014
 Checked by: KL Date: 4/5/14
 FileName: PBBCHB806



CONSOLIDATION DATA

TI-B8-06, 35-36' (35-37.5'), -



Time in Minutes CONF. PRES. PSF 6192

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-10
DEPTH 56-57' (55-57')
SAMPLE NO. -
SOIL DESCR. Silty Sand
LOCATION Tailings Impoundment
CONF. PRES. PSF 10368

SAMPLED 12/02/13 MWH
TEST STARTED 01/21/14 DPM
TEST FINISHED 02/08/14 DPM
CELL NUMBER 26S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	499.4	571.9
Wt. Wet Soil & Pan (g)	515.3	587.8
Wt. Dry Soil & Pan (g)	459.8	459.8
Wt. Lost Moisture (g)	55.5	128.0
Wt. of Pan Only (g)	15.9	15.9
Wt. of Dry Soil (g)	443.9	443.9
Moisture Content %	12.5	28.8
Wet Density PCF	99.7	118.6
Dry Density PCF	88.6	92.1

Init. Diameter (in)	2.822	(cm)	7.168
Init. Area (sq in)	6.255	(sq cm)	40.355
Init. Height (in)	3.050	(cm)	7.747
Vol. Bef. Consol. (cu ft)	0.01104		
Vol. After Consol. (cu ft)	0.01063		
Porosity %	42.51		
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
1.0	60	45.0	24.7	27.4	5.8E-04
1.0	60	48.4	28.8	23.3	5.4E-04
1.0	60	47.9	29.5	23.2	5.1E-04
1.0	60	47.9	27.9	24.1	5.6E-04

Average Temperature 19.4

Data entry by: DPM Date: 04/04/2014
Checked by: KE Date: 4/6/14
FileName: PBCH1110



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-10
 DEPTH 56-57' (55-57')
 SAMPLE NO. -
 SOIL DESCR. Silty Sand
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 10368

SAMPLED 12/02/13 MWH
 TEST STARTED 01/21/14 DPM
 TEST FINISHED 02/08/14 DPM
 CELL NUMBER 26S
 SATURATED TEST Yes
 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	4.0 16.9			
50.0	48.0	20.4 21.4	38.8 45.5	6.7	0.67
60.0	58.0	21.7 22.5	47.9 55.7	7.8	0.78
70.0	68.0	23.0 23.8	57.8 66.4	8.6	0.86
80.0		25.2 25.2	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	2.70	0.00
0.25	0.50	14.40	-11.70
0.5	0.71	14.60	-11.90
1	1.00	14.80	-12.10
2	1.41	14.95	-12.25
4	2.00	15.10	-12.40
9	3.00	15.30	-12.60
16	4.00	15.40	-12.70
30	5.48	15.60	-12.90
60	7.75	15.80	-13.10
120	10.95	16.10	-13.40
240	15.49	16.50	-13.80
360	18.97	16.70	-14.00

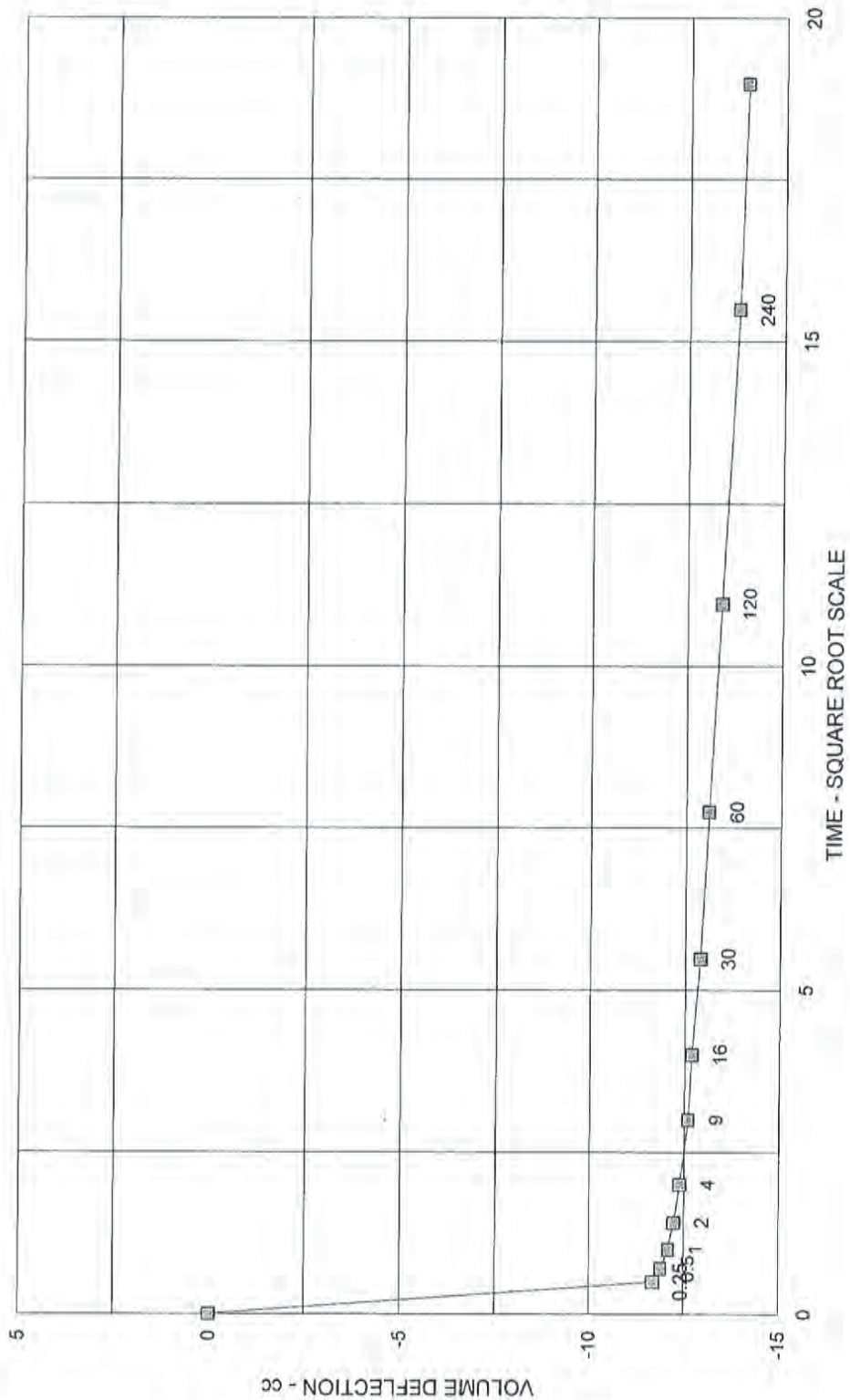
Initial Height (in)	3.050	Init. Vol. (CC)	312.67
Height Change (in)	0.037	Vol. Change (CC)	36.50
Ht. After Cons. (in)	3.013	Cell Exp. (CC)	24.90
Initial Area (sq in)	6.255	Net Change (CC)	11.60
Area After Cons. (sq in)	6.097	Cons. Vol. (CC)	301.07

Data entry by: 142 DPM Date: 9/6/14 04/04/2014
 Checked by: 142 Date: 9/6/14
 FileName: PBCH1110



CONSOLIDATION DATA

TI-B11-10, 56-57' (55-57'), -



Time in Minutes CONF. PRES. PSF 10368

PERMEABILITY TEST - BACK PRESSURE CONSTANT HEAD
ASTM D 5084

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-08
DEPTH 51.5-52.5' (50-52.5')
SAMPLE NO. -
SOIL DESCR. Fine Tailings
LOCATION Tailings Impoundment
CONF. PRES. PSF 9648

SAMPLED 12/02/13 MWH
TEST STARTED 03/05/14 DPM
TEST FINISHED 03/18/14 DPM
CELL NUMBER 25S
SATURATED TEST Yes
TEST TYPE TX/Pbp/Tap Water

MOISTURE/DENSITY
DATA

BEFORE
TEST

AFTER
TEST

Wt. Soil + Moisture (g)	362.2	334.6
Wt. Wet Soil & Pan (g)	368.7	341.1
Wt. Dry Soil & Pan (g)	225.8	225.8
Wt. Lost Moisture (g)	142.9	115.3
Wt. of Pan Only (g)	6.6	6.6
Wt. of Dry Soil (g)	219.2	219.2
Moisture Content %	65.2	52.6
Wet Density PCF	99.8	111.5
Dry Density PCF	60.4	73.0

Init. Diameter (in)	2.412	(cm)	6.126
Init. Area (sq in)	4.569	(sq cm)	29.481
Init. Height (in)	3.026	(cm)	7.686
Vol. Bef. Consol. (cu ft)	0.00800		
Vol. After Consol. (cu ft)	0.00662		
Porosity %	61.54		
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
1480.0	88800	45.2	43.3	17.2	4.5E-08
1440.0	86400	43.3	41.8	19.0	3.7E-08
1450.0	87000	41.8	40.6	20.5	3.0E-08
2880.0	172800	40.6	38.5	22.3	2.7E-08
1440.0	86400	38.5	37.3	24.1	3.1E-08

Average Temperature 21.2

Data entry by: KV DPM Date: 04/04/2014
Checked by: 9/6/14 Date: 9/6/14
FileName: PBCH1108



RIAXIAL COMPRESSION TEST DATA

CLIENT MWH

JOB NO. 2512-77

BORING NO. TI-B11-08
 DEPTH 51.5-52.5' (50-52.5')
 SAMPLE NO. -
 SOIL DESCR. Fine Tailings
 LOCATION Tailings Impoundment
 CONF. PRES. PSF 9648

SAMPLED 12/02/13 MWH
 TEST STARTED 03/05/14 DPM
 TEST FINISHED 03/18/14 DPM
 CELL NUMBER 25S
 SATURATED TEST Yes
 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	1.2 9.4			
50.0	48.0	10.3 11.4	38.0 47.1	9.1	0.91
60.0		11.8 12.0	48.2 57.8	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	7.80	-7.20
0.5	0.71	8.50	-7.90
1	1.00	9.60	-9.00
2	1.41	11.00	-10.40
4	2.00	13.00	-12.40
9	3.00	16.30	-15.70
16	4.00	19.50	-18.90
30	5.48	23.70	-23.10
60	7.75	29.50	-28.90
137	11.70	36.70	-36.10
240	15.49	40.50	-39.90
360	18.97	42.30	-41.70

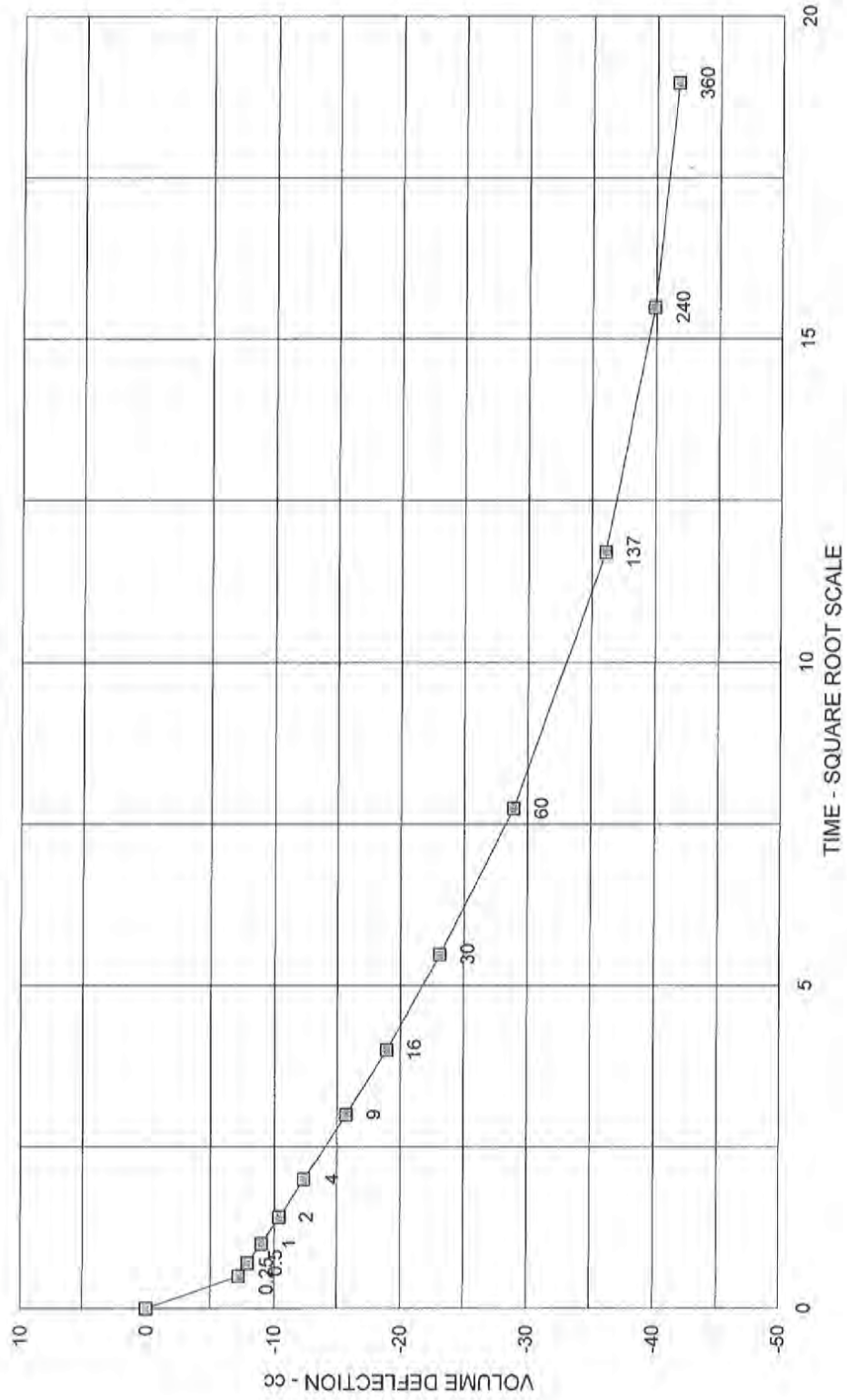
Initial Height (in)	3.026	Init. Vol. (CC)	226.62
Height Change (in)	0.265	Vol. Change (CC)	59.20
Ht. After Cons. (in)	2.761	Cell Exp. (CC)	20.00
Initial Area (sq in)	4.569	Net Change (CC)	39.20
Area After Cons. (sq in)	4.142	Cons. Vol. (CC)	187.42

Data entry by: DPM Date: 04/04/2014
 Checked by: kr Date: 4/6/14
 FileName: PBCH1108



CONSOLIDATION DATA

TI-B11-08, 51.5-52.5' (50-52.5'), -



Time in Minutes CONF. PRES. PSF 9648