Laboratory Determination of Water Content of Soil and Rock

ASTM D 2216-05

Project #:	09-1428-5007
Short Title:	Meadowbank Gold Project
Client	AEM
Location	Nunavut
Lab ID	41

Field Label	SWD110609-1		SWD110609-2			
Sample Number	194		195			
Sample Location	Sta. 10+565		Sta. 10+440			
Depth (m)						
Mass of Dry Soil (g)	4101.5		4229.3			
Water Content W (%)	**1.5**		**1.2**			

Field Label						
Sample Number						
Sample Location						
Depth (m)						
Mass of Dry Soil (g)						
Water Content W (%)						

Field Label						
Sample Number						
Sample Location						
Depth (m)						
Mass of Dry Soil (g)						
Water Content W (%)						

Field Label						
Sample Number						
Sample Location						
Depth (m)						
Mass of Dry Soil (g)						
Water Content W (%)						

PC	Mar 12-10	LP	March 15,2010
TESTED BY	DATE TESTED	CHECKED BY	DATE CHECKED

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Tel: +1 (604) 296 4200 Fax: +1 (604) 298 5253 www.golder.com

Laboratory Determination of Water Content of Soil and Rock

ASTM D 2216-05

Project #:	08-1429-0029
Short Title:	Meadowbank Gold Mine
Client	AEM
Location	Nunavut
Lab ID	Sheet No. 1

Field Label	SWD091909-1	SWD091909-2	SWD091909-4			
Sample Number	71	72	74			
Sample Location	SWD Sta. 10+380	SWD Sta. 10+360	SWD Sta. 10+430			
Material Spec.	Fine filter	Fine filter	Fine filter			
Depth (m)	-	-	-			
Mass of Dry Soil (g)	2984.6	2527.6	2312.9			
Water Content W (%)	**5.6**	**5.9**	**6.9**			

RB | September 22, 2009

TESTED BY | DATE TESTED | CHECKED BY | DATE CHECKED

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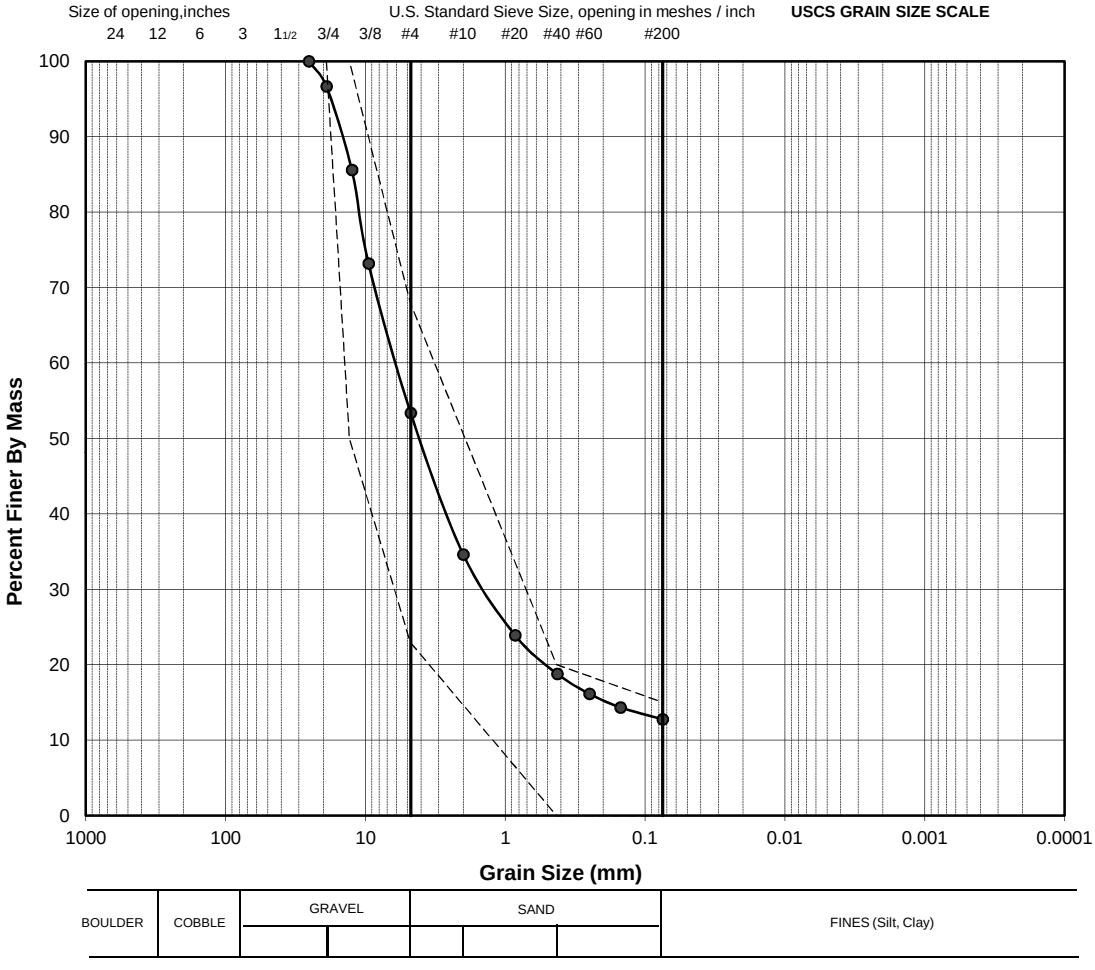
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029	**Sample No.:**	**28**
Client:	AEM	**Field Label:**	TSF090409-01
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA28
Remarks:	Water content = 1.3%	**Date Sampled:**	September 4, 2009
Sa. Location:	SWD Sta. 10+460 Bedding layer in place	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	September 5, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	96.7
1/2"	12.5	85.6
3/8"	9.5	73.2
#4	4.8	53.4
#10	2.0	34.6
#20	0.9	23.9
#40	0.4	18.8
#60	0.3	16.1
#100	0.2	14.3
#200	0.1	12.8



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TESTED BY	DATE	CHECKED BY	DATE
DE	September 5, 2009		

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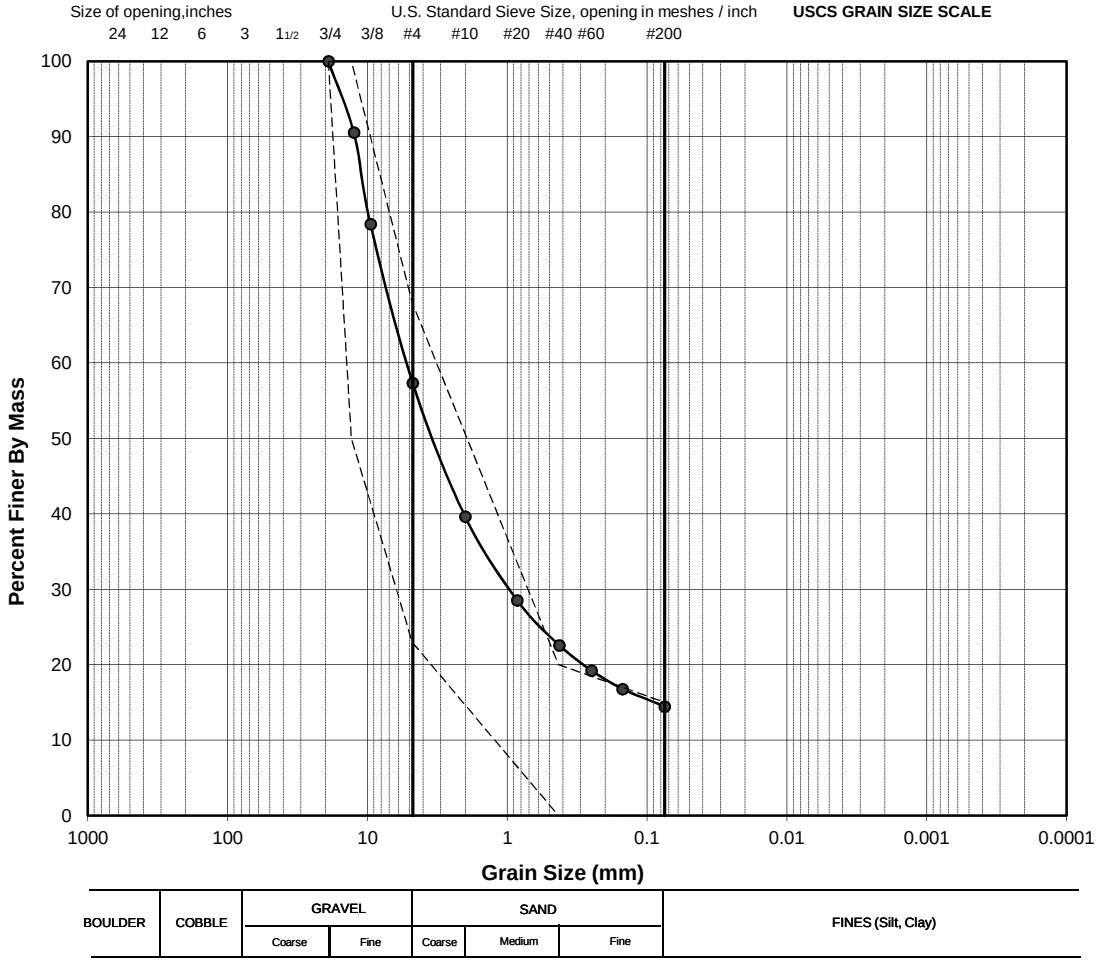
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029	**Sample No.:**	**38**
Client:	AEM	**Field Label:**	TSF090609-05
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA38
Remarks:	Water content= 1.4%	**Date Sampled:**	September 6, 2009
Sa. Location:	SWD Sta. 10+470 Bedding layer in place	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	September 8, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	100.0
1/2"	12.5	90.5
3/8"	9.5	78.4
#4	4.8	57.3
#10	2.0	39.6
#20	0.9	28.5
#40	0.4	22.6
#60	0.3	19.2
#100	0.2	16.8
#200	0.1	14.4



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TESTED BY	DATE	CHECKED BY	DATE
DE	September 8, 2009		

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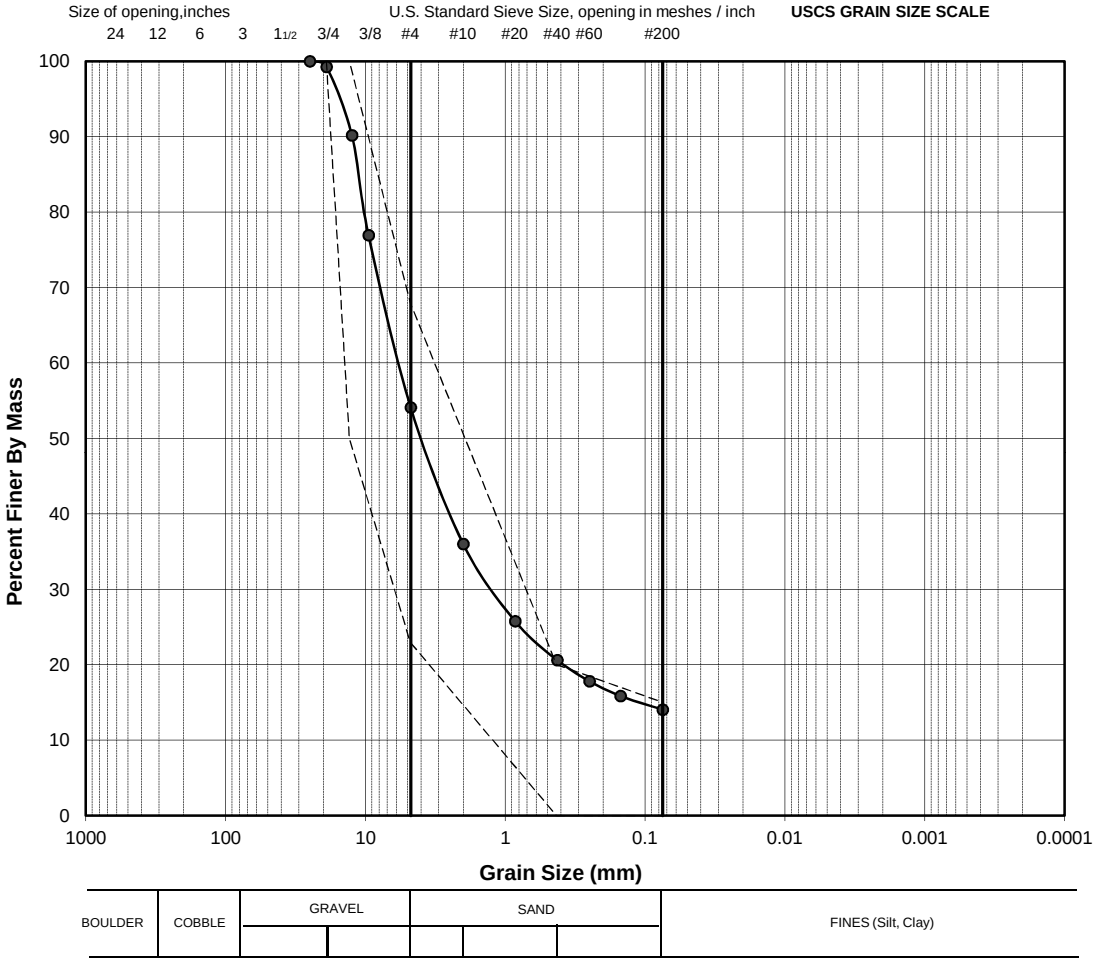
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029 (5000)	**Sample No.:**	**71**
Client:	AEM	**Field Label:**	SWD 091909-03
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA71
Remarks:	Water content=5.5%	**Date Sampled:**	September 19, 2009
Sa. Location:	SWD Sta. 10+380 Bedding layer in place	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	September 23, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	99.3
1/2"	12.5	90.2
3/8"	9.5	76.9
#4	4.8	54.1
#10	2.0	36.0
#20	0.9	25.8
#40	0.4	20.6
#60	0.3	17.8
#100	0.2	15.8
#200	0.1	14.0



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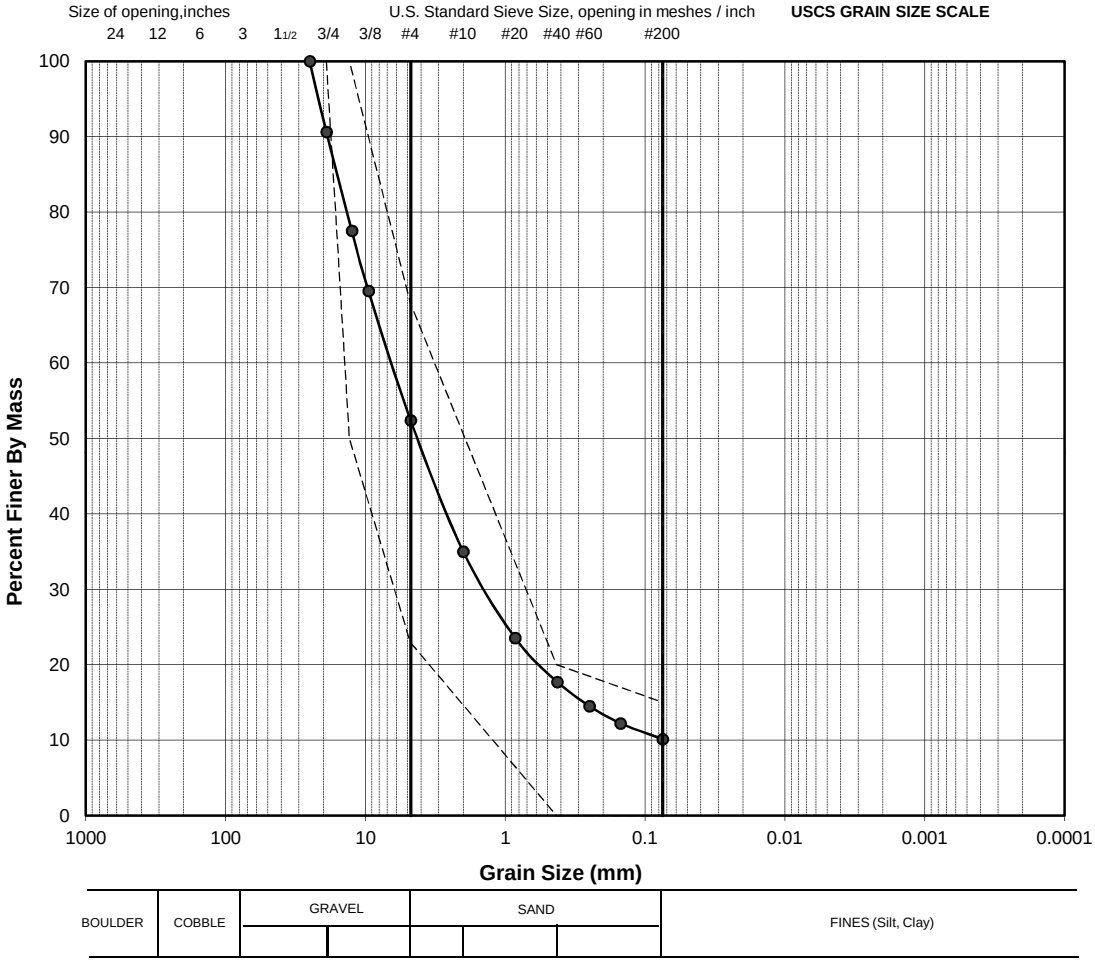
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029 (5000)	**Sample No.:**	**72**
Client:	AEM	**Field Label:**	SWD 091909-04
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA72
Remarks:	Water content=2.0%	**Date Sampled:**	September 19, 2009
Sa. Location:	SWD Sta. 10+360 Bedding layer in place	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	September 23, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	90.6
1/2"	12.5	77.5
3/8"	9.5	69.5
#4	4.8	52.4
#10	2.0	35.0
#20	0.9	23.5
#40	0.4	17.7
#60	0.3	14.5
#100	0.2	12.2
#200	0.1	10.1



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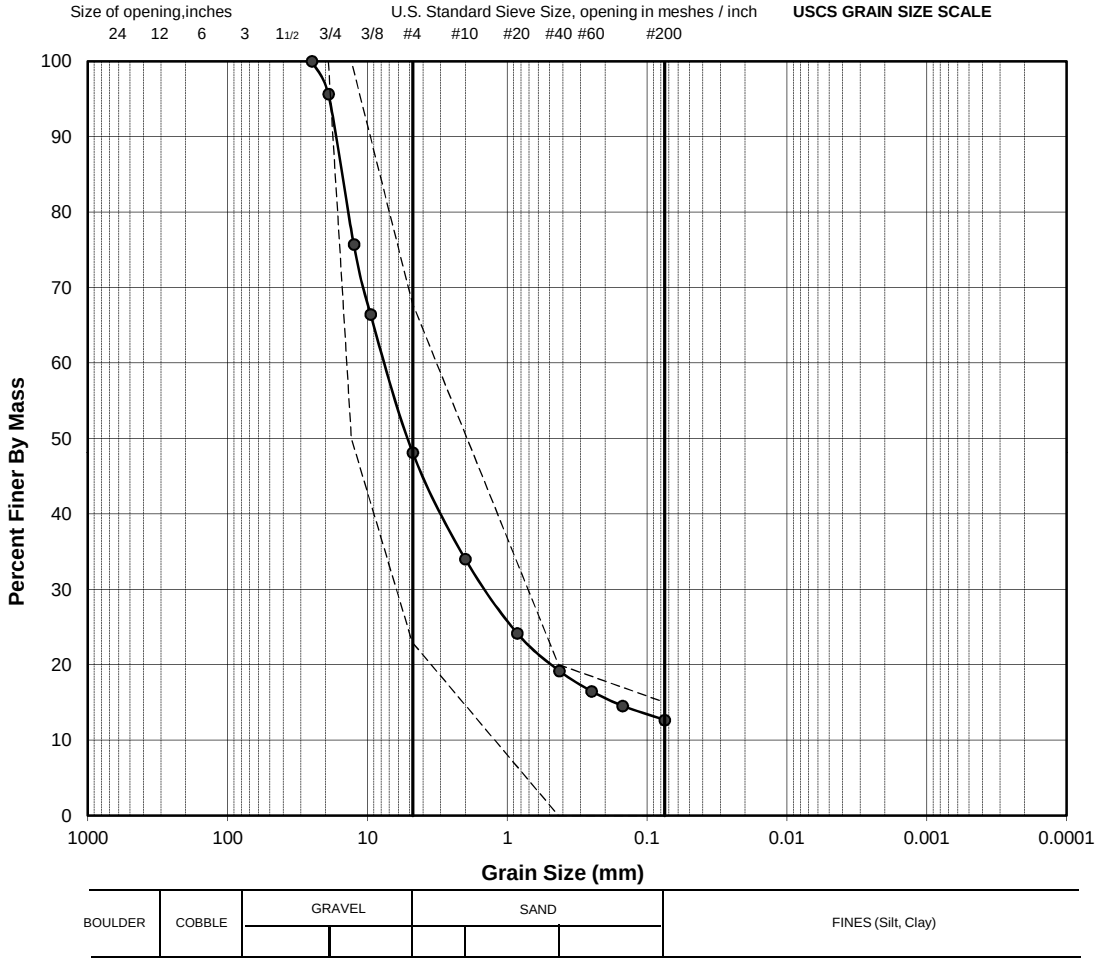
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029 (5000)	**Sample No.:**	**73**
Client:	AEM	**Field Label:**	SWD 091909-05
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA73
Remarks:	Water content=3.1%	**Date Sampled:**	September 19, 2009
Sa. Location:	SWD Sta. 10+310 Bedding layer in place	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	September 23, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	95.7
1/2"	12.5	75.7
3/8"	9.5	66.4
#4	4.8	48.1
#10	2.0	34.0
#20	0.9	24.2
#40	0.4	19.2
#60	0.3	16.5
#100	0.2	14.5
#200	0.1	12.7



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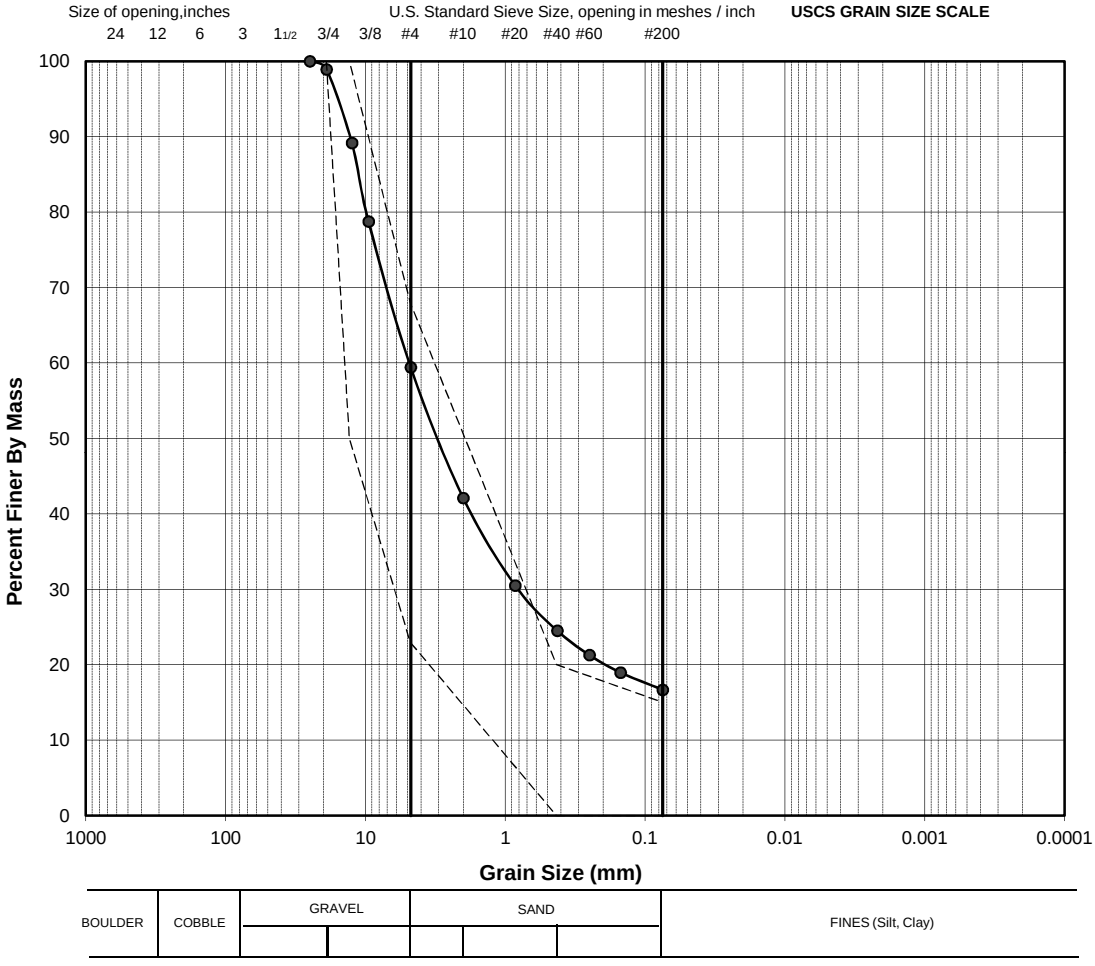
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029 (5000)	**Sample No.:**	**74**
Client:	AEM	**Field Label:**	SWD 091909-06
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA74
Remarks:	Water content=5.3%	**Date Sampled:**	September 19, 2009
Sa. Location:	SWD Sta. 10+430 Bedding layer in place	**Material Specification:**	Fine filter
		Method:	COMBINED, WASHED
		Date Tested:	September 23, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	98.9
1/2"	12.5	89.2
3/8"	9.5	78.8
#4	4.8	59.4
#10	2.0	42.1
#20	0.9	30.5
#40	0.4	24.5
#60	0.3	21.3
#100	0.2	19.0
#200	0.1	16.7



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TESTED BY	DATE	CHECKED BY	DATE
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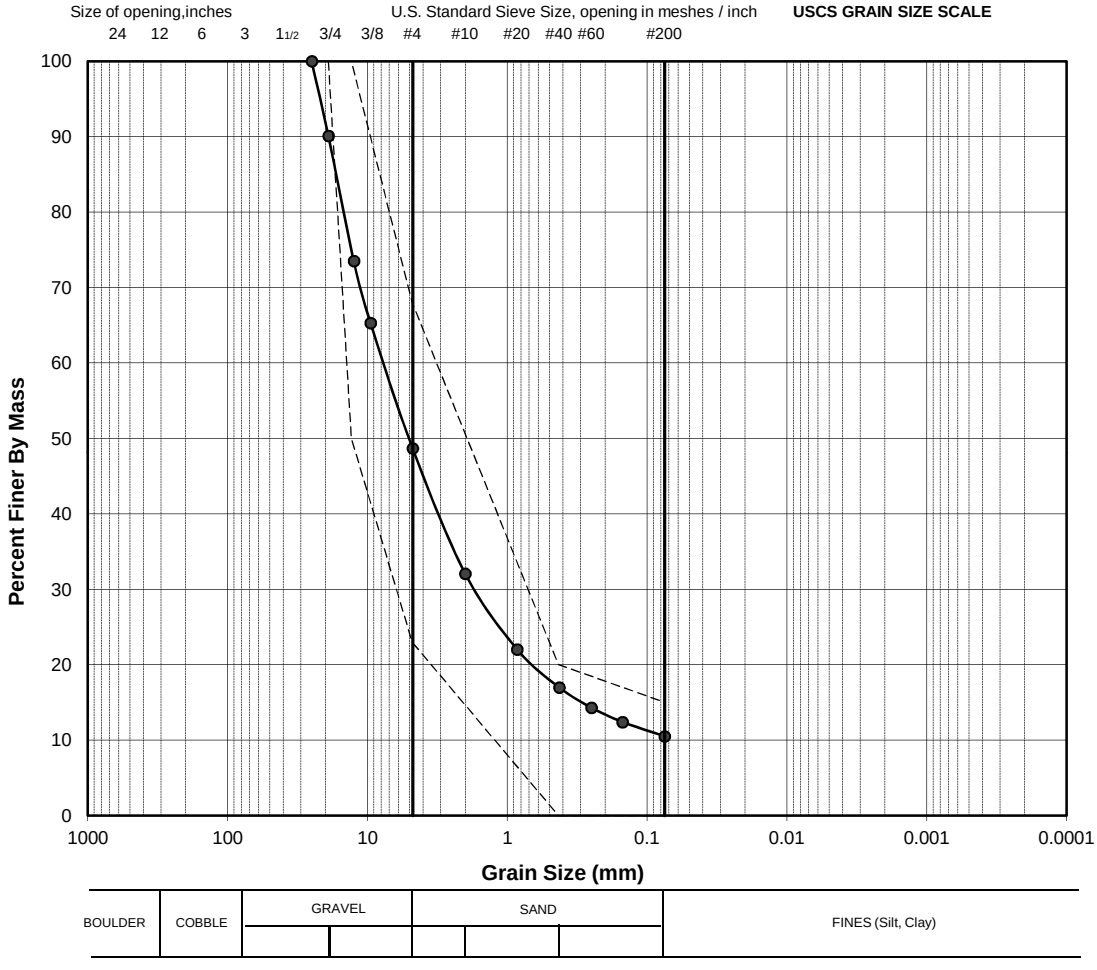
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029 (5000)	**Sample No.:**	**75**
Client:	AEM	**Field Label:**	SWD 091909-07
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA75
Remarks:	Water content= 1.6%	**Date Sampled:**	September 19, 2009
Sa. Location:	SWD Sta. 10+270 Bedding layer in place	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	September 23, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	90.1
1/2"	12.5	73.5
3/8"	9.5	65.3
#4	4.8	48.7
#10	2.0	32.1
#20	0.9	22.0
#40	0.4	17.0
#60	0.3	14.3
#100	0.2	12.4
#200	0.1	10.5



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TESTED BY	DATE	CHECKED BY	DATE
DE	September 23, 2009		

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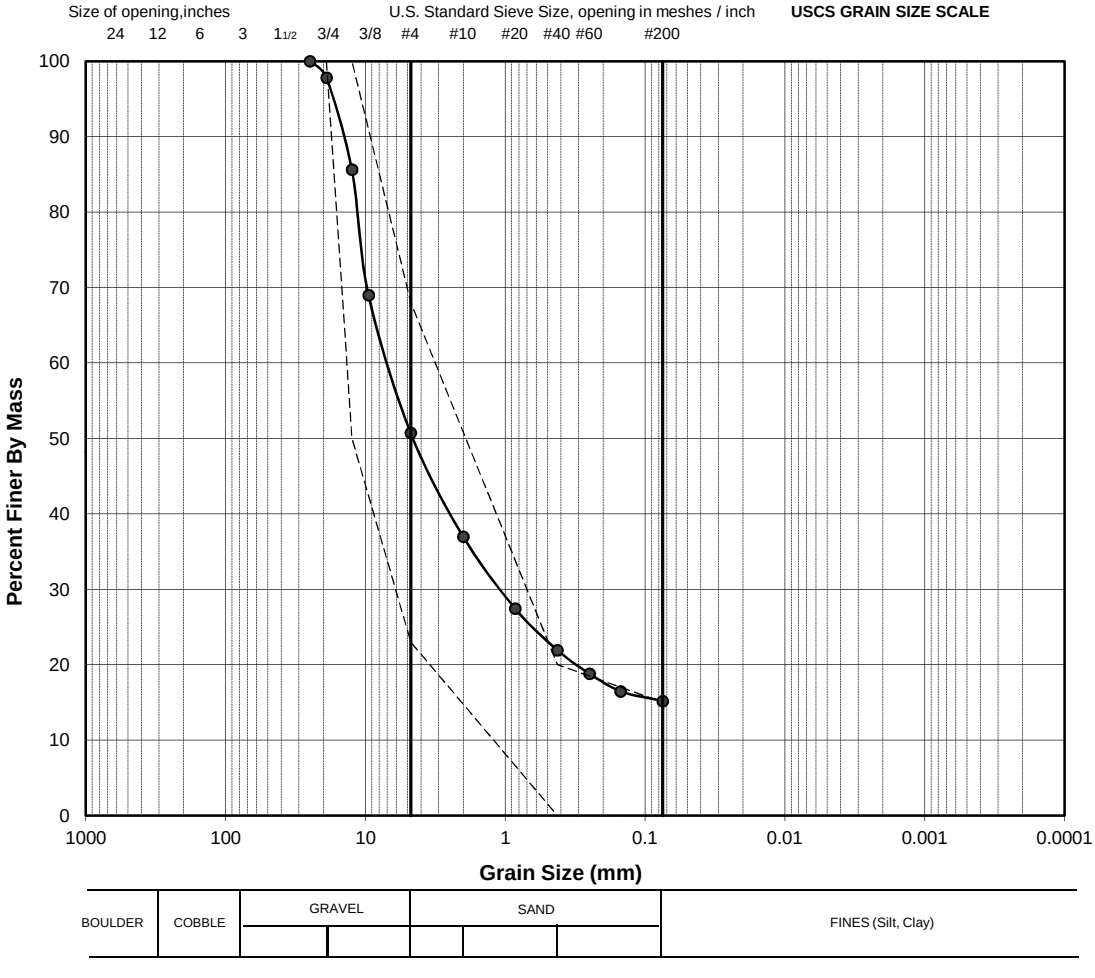
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029 (5000)	**Sample No.:**	**76**
Client:	AEM	**Field Label:**	SWD-091909-0
Project:	Meadowbank Gold Project	**Depth (m):**	N/A
Location:	Nunavut	**Lab ID No:**	SA-76
Remarks:	Water content = 5,3%	**Sampling Date:**	September 19, 2009
Sa. Location:	SWD Sta. 10+430 Bedding layer in place	**Material Specification:**	Fine Filter
		Method:	SPLIT, WASHED
		Date Tested:	September 20, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	97.8
1/2"	12.5	85.6
3/8"	9.5	69.0
#4	4.8	50.7
#10	2.0	37.0
#20	0.9	27.4
#40	0.4	21.9
#60	0.3	18.8
#100	0.2	16.5
#200	0.1	15.2



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TESTED BY	DATE	CHECKED BY	DATE
OM	September 20, 2009		

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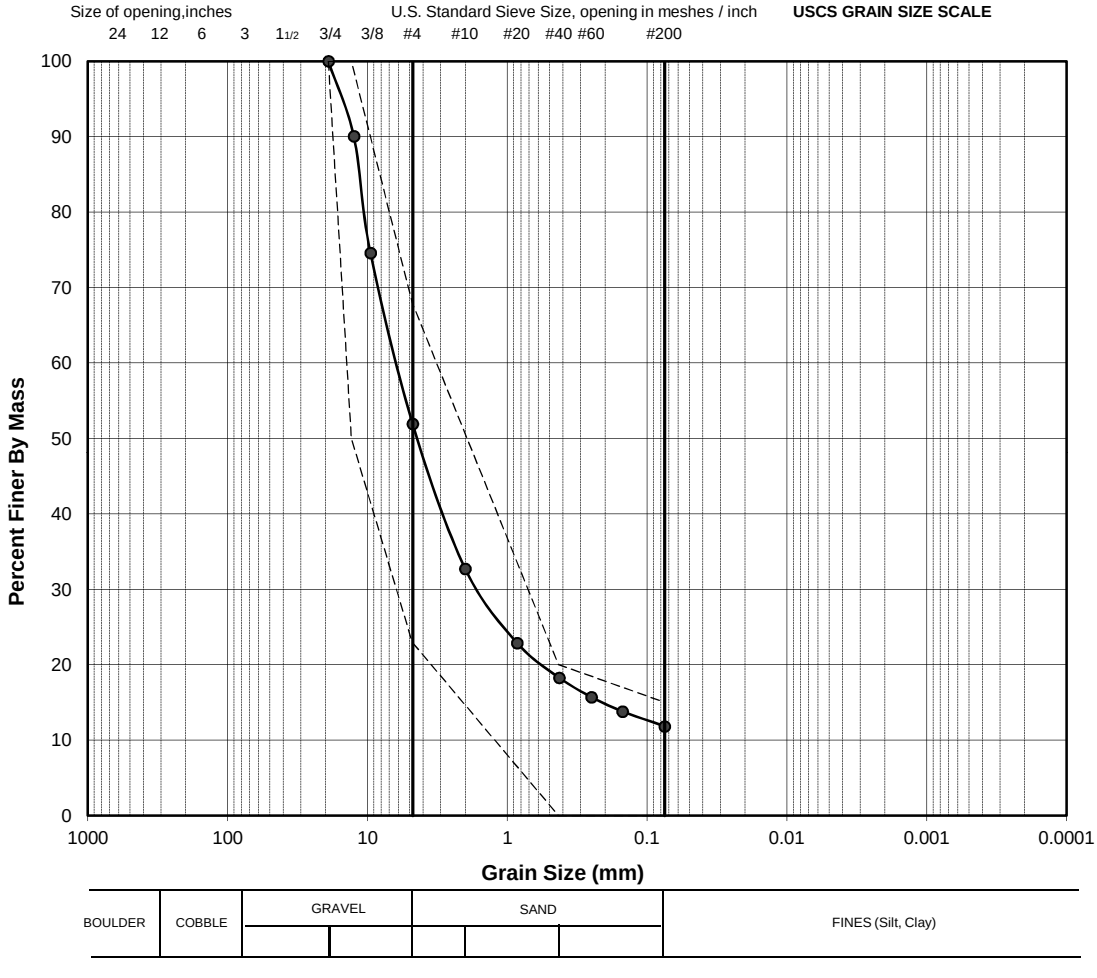
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029 (5000)	**Sample No.:**	**80**
Client:	AEM	**Field Label:**	SWD 092109-01
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA80
Remarks:	Water content=5.8%	**Date Sampled:**	September 21, 2009
Sa. Location:	SWD Sta. 10+810 Bedding layer in place	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	September 23, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	100.0
1/2"	12.5	90.1
3/8"	9.5	74.6
#4	4.8	51.9
#10	2.0	32.7
#20	0.9	22.9
#40	0.4	18.3
#60	0.3	15.7
#100	0.2	13.8
#200	0.1	11.8



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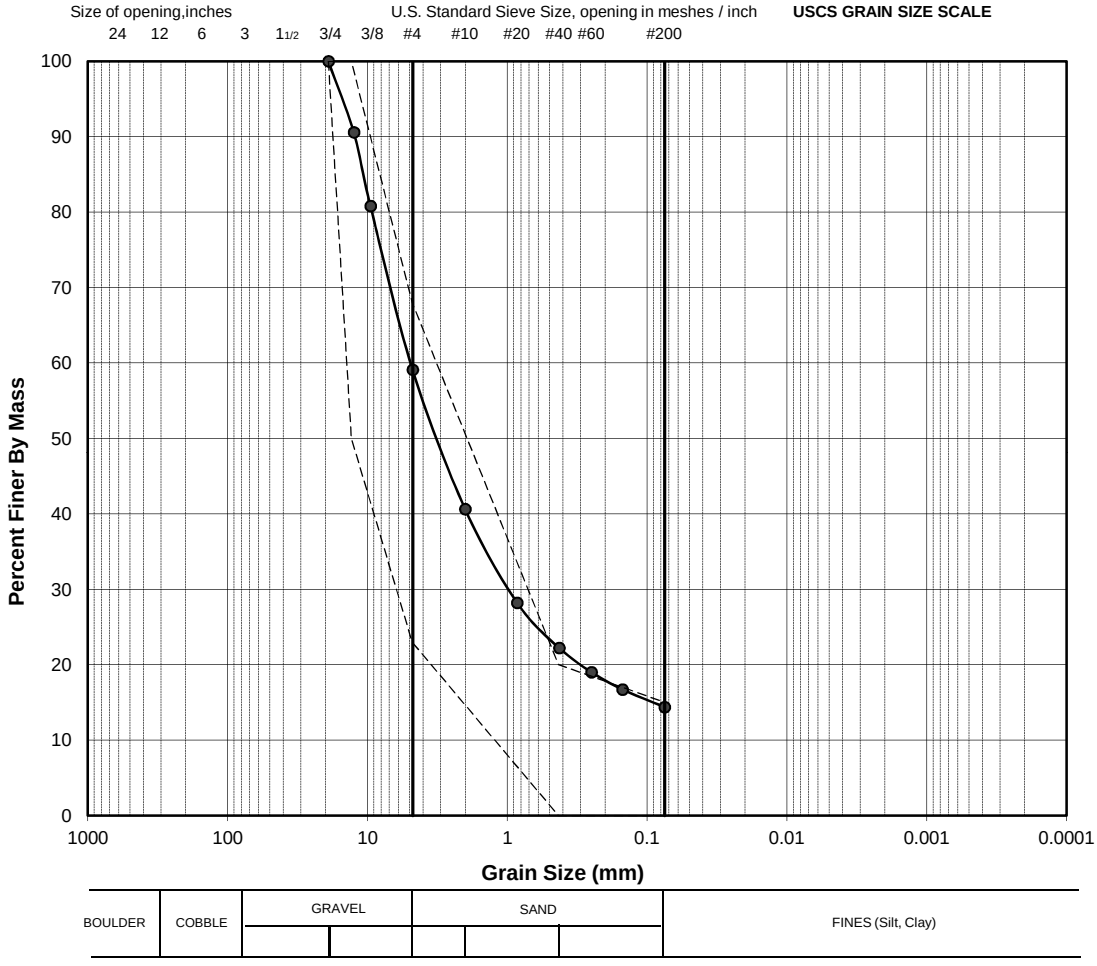
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	08-1428-0029 (5000)	**Sample No.:**	**81**
Client:	AEM	**Field Label:**	SWD 092109-02
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA81
Remarks:	Water content=5.7%	**Date Sampled:**	September 21, 2009
Sa. Location:	SWD Sta. 10+835 Bedding layer in place	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	September 23, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	100.0
1/2"	12.5	90.6
3/8"	9.5	80.8
#4	4.8	59.1
#10	2.0	40.6
#20	0.9	28.2
#40	0.4	22.2
#60	0.3	19.0
#100	0.2	16.7
#200	0.1	14.4



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TESTED BY	DATE	CHECKED BY	DATE
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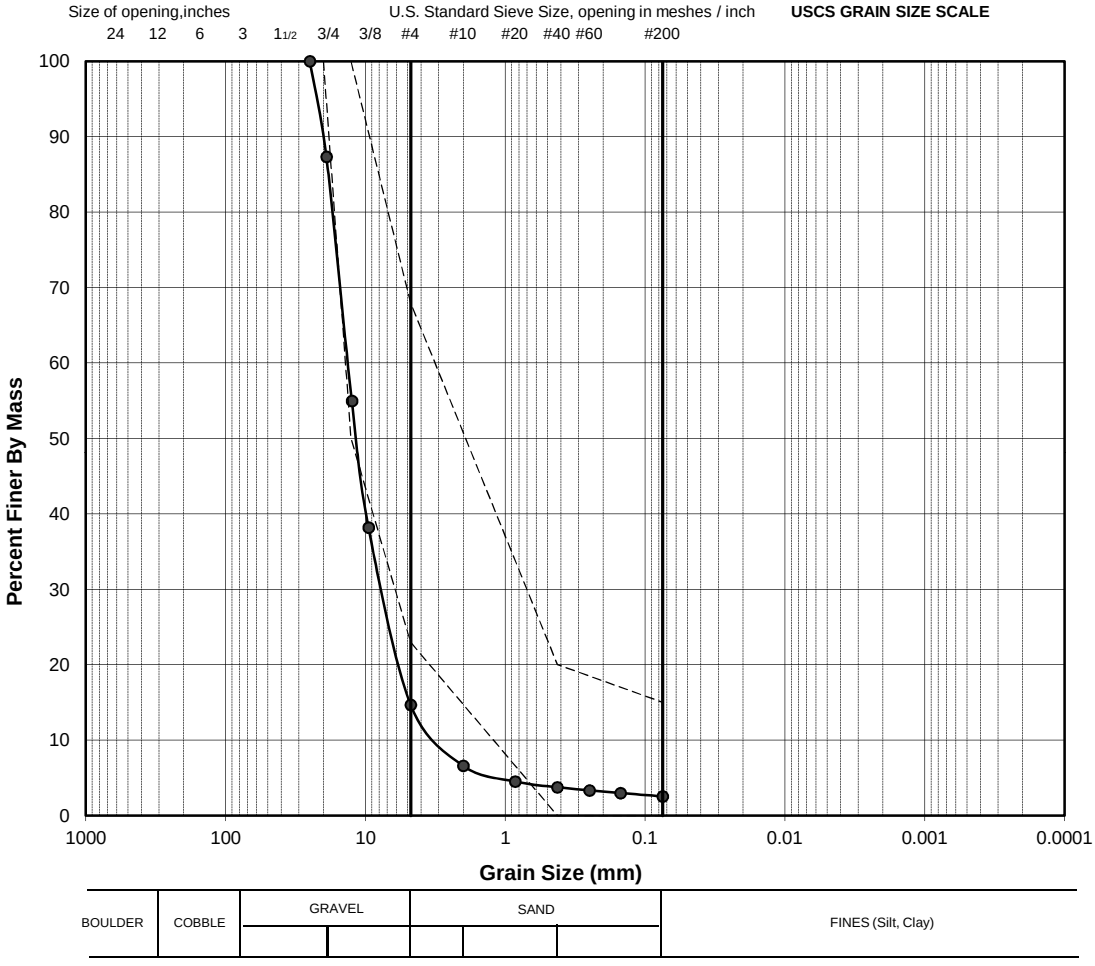
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	09-1428-5007 (2000)	**Sample No.:**	**179**
Client:	AEM	**Field Label:**	SWD 102409-02
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA179
Remarks:	Water content=0.8%	**Date Sampled:**	October 24, 2009
Sa. Location:	SWD Sta. 10+640 Bedding layer in place El. 135.5m	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	October 31, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	87.3
1/2"	12.5	55.0
3/8"	9.5	38.2
#4	4.8	14.7
#10	2.0	6.6
#20	0.9	4.5
#40	0.4	3.7
#60	0.3	3.3
#100	0.2	3.0
#200	0.1	2.5



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Damian Edwards	October 31, 2009	Glen Rutherford	November 9, 2009
TESTED BY	DATE	CHECKED BY	DATE

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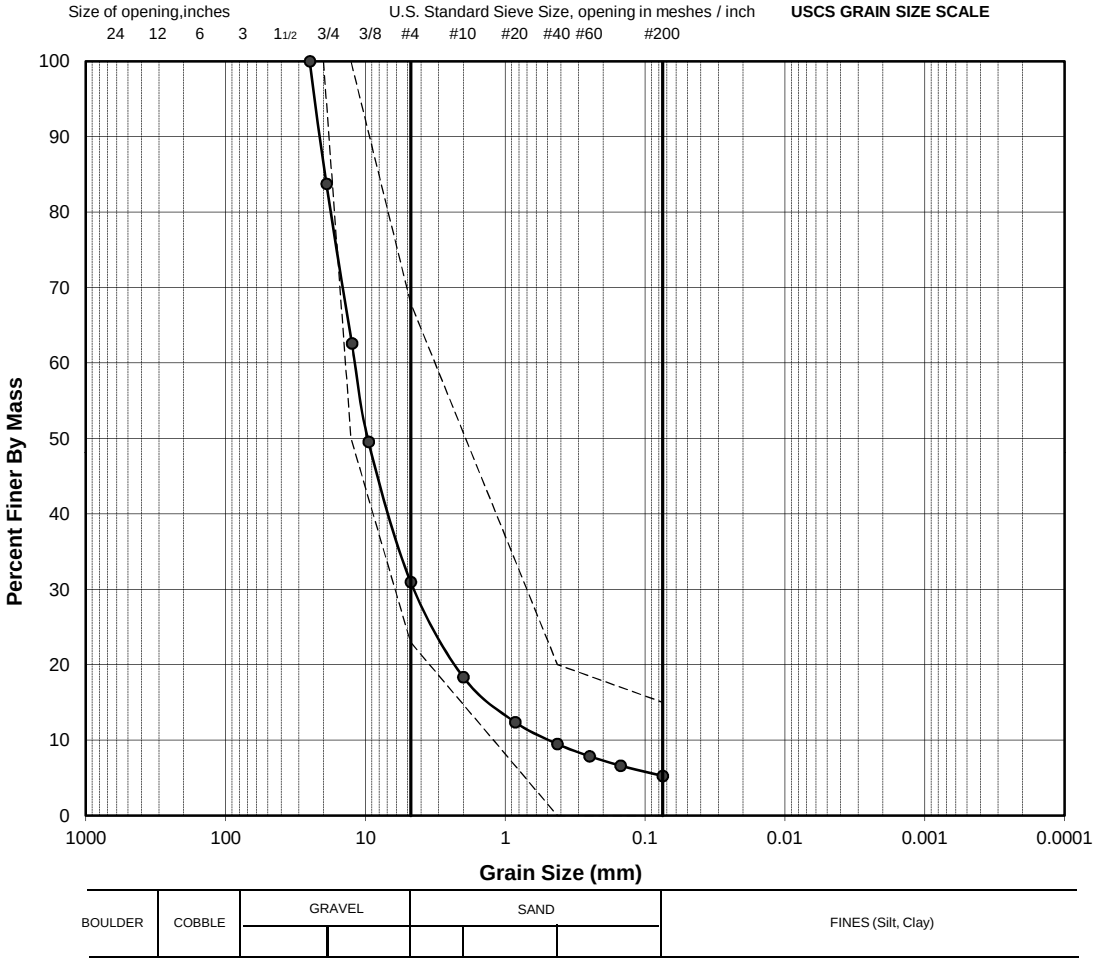
PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	09-1428-5007 (2000)	**Sample No.:**	**180**
Client:	AEM	**Field Label:**	SWD 102409-02
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA180
Remarks:	Water content= 1.6%	**Date Sampled:**	October 24, 2009
Sa. Location:	SWD Sta. 10+640 Bedding layer in place El. 133.5m	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	October 31, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	83.8
1/2"	12.5	62.6
3/8"	9.5	49.6
#4	4.8	31.0
#10	2.0	18.4
#20	0.9	12.4
#40	0.4	9.5
#60	0.3	7.9
#100	0.2	6.6
#200	0.1	5.3



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Damian Edwards	October 31, 2009	Glen Rutherford	November 9, 2009
TESTED BY	DATE	CHECKED BY	DATE

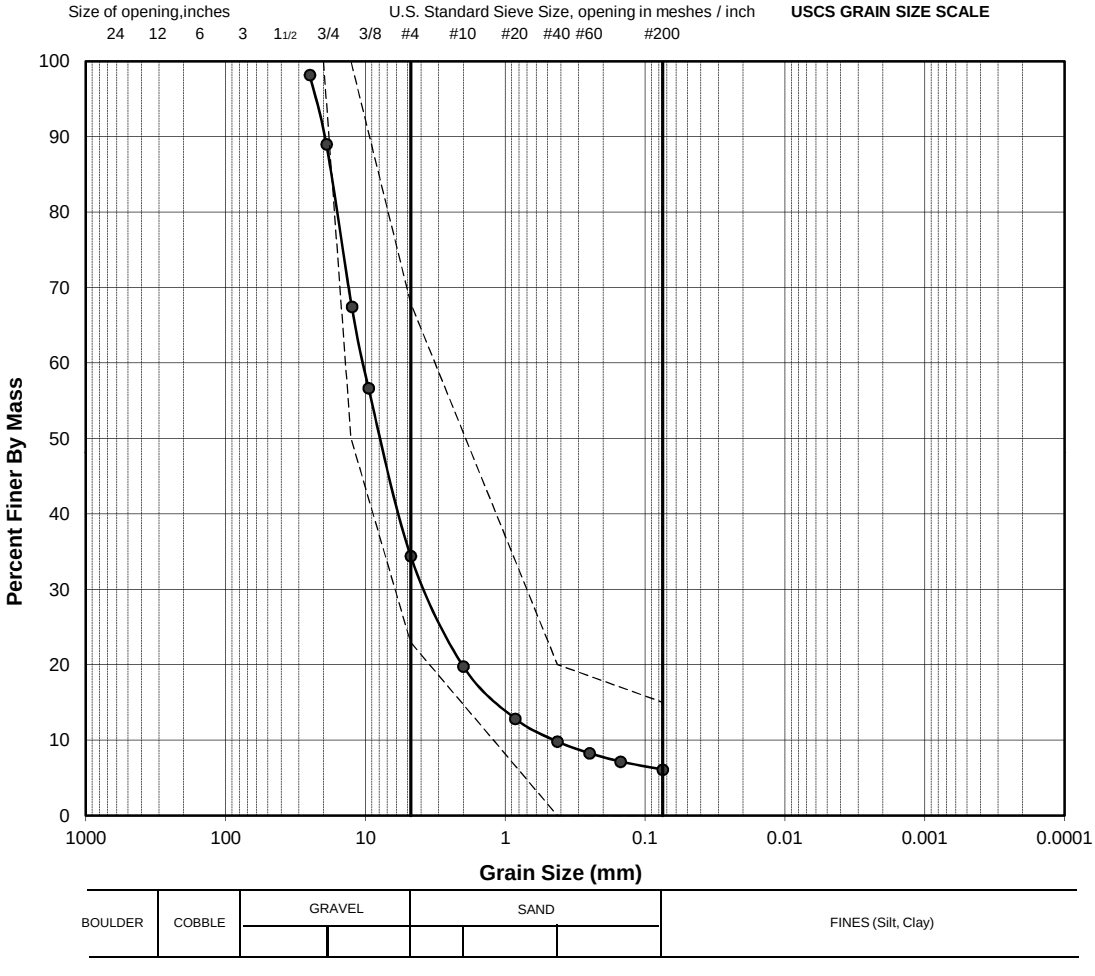
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	09-1428-5007 (2000)	**Sample No.:**	**190**
Client:	AEM	**Field Label:**	SWD 110309-01
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA190
Remarks:	Water content=1.5%	**Date Sampled:**	November 3, 2009
Sa. Location:	SWD Sta. 10+810 Bedding layer in place El. 138 m	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	November 4, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	98.2
3/4"	19.0	89.0
1/2"	12.5	67.5
3/8"	9.5	56.7
#4	4.8	34.4
#10	2.0	19.8
#20	0.9	12.8
#40	0.4	9.8
#60	0.3	8.3
#100	0.2	7.1
#200	0.1	6.1



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

Damian Edwards	November 4, 2009	Glen Rutherford	November 9, 2009
TESTED BY	DATE	CHECKED BY	DATE

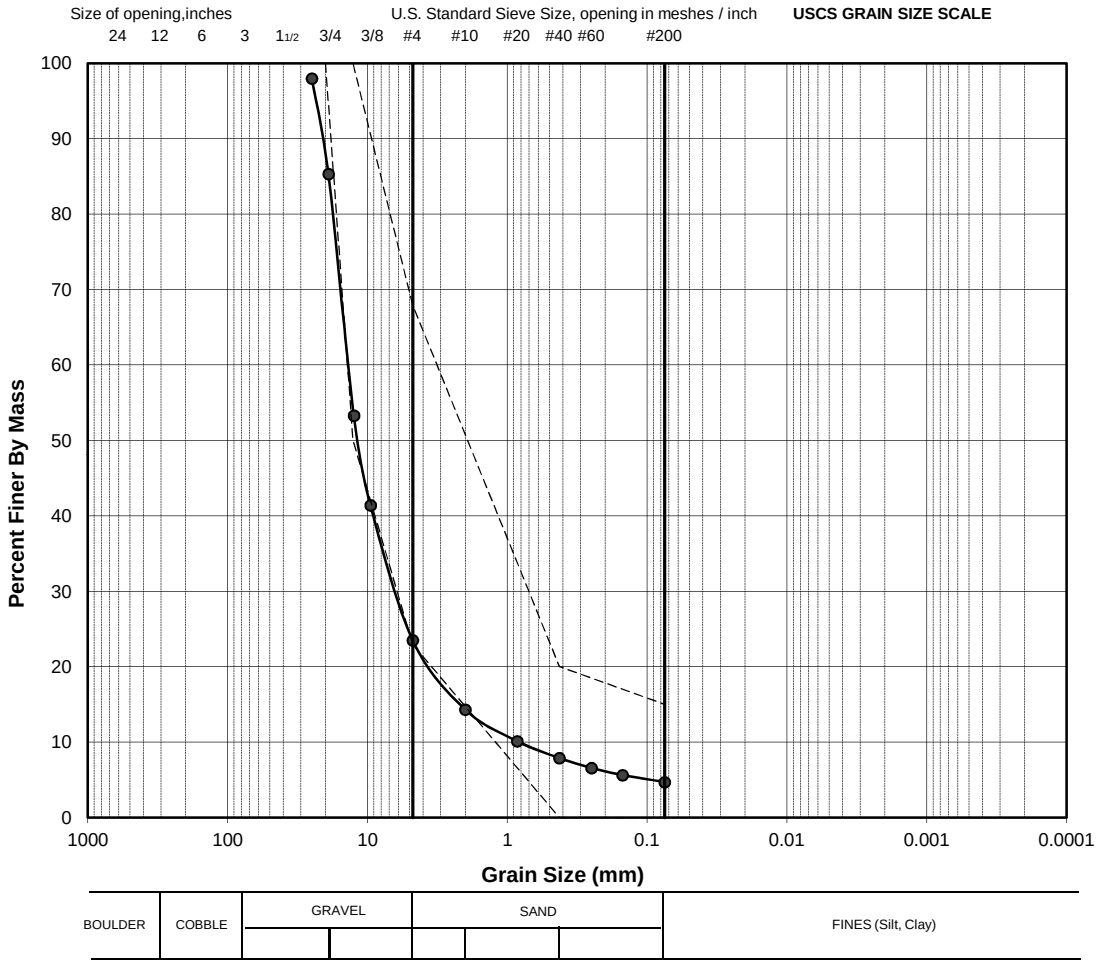
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	09-1428-5007 (2000)	**Sample No.:**	**191**
Client:	AEM	**Field Label:**	SWD 110309-02
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	SA191
Remarks:	Water content=0.7%	**Date Sampled:**	November 3, 2009
Sa. Location:	SWD Sta. 10+770 Bedding layer in place El 137 m	**Material Specification:**	Fine Filter
		Method:	COMBINED, WASHED
		Date Tested:	November 4, 2009

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	98.0
3/4"	19.0	85.3
1/2"	12.5	53.3
3/8"	9.5	41.4
#4	4.8	23.5
#10	2.0	14.3
#20	0.9	10.1
#40	0.4	7.9
#60	0.3	6.6
#100	0.2	5.6
#200	0.1	4.7



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Damian Edwards	November 4, 2009	Glen Rutherford	November 9, 2009
TESTED BY	DATE	CHECKED BY	DATE

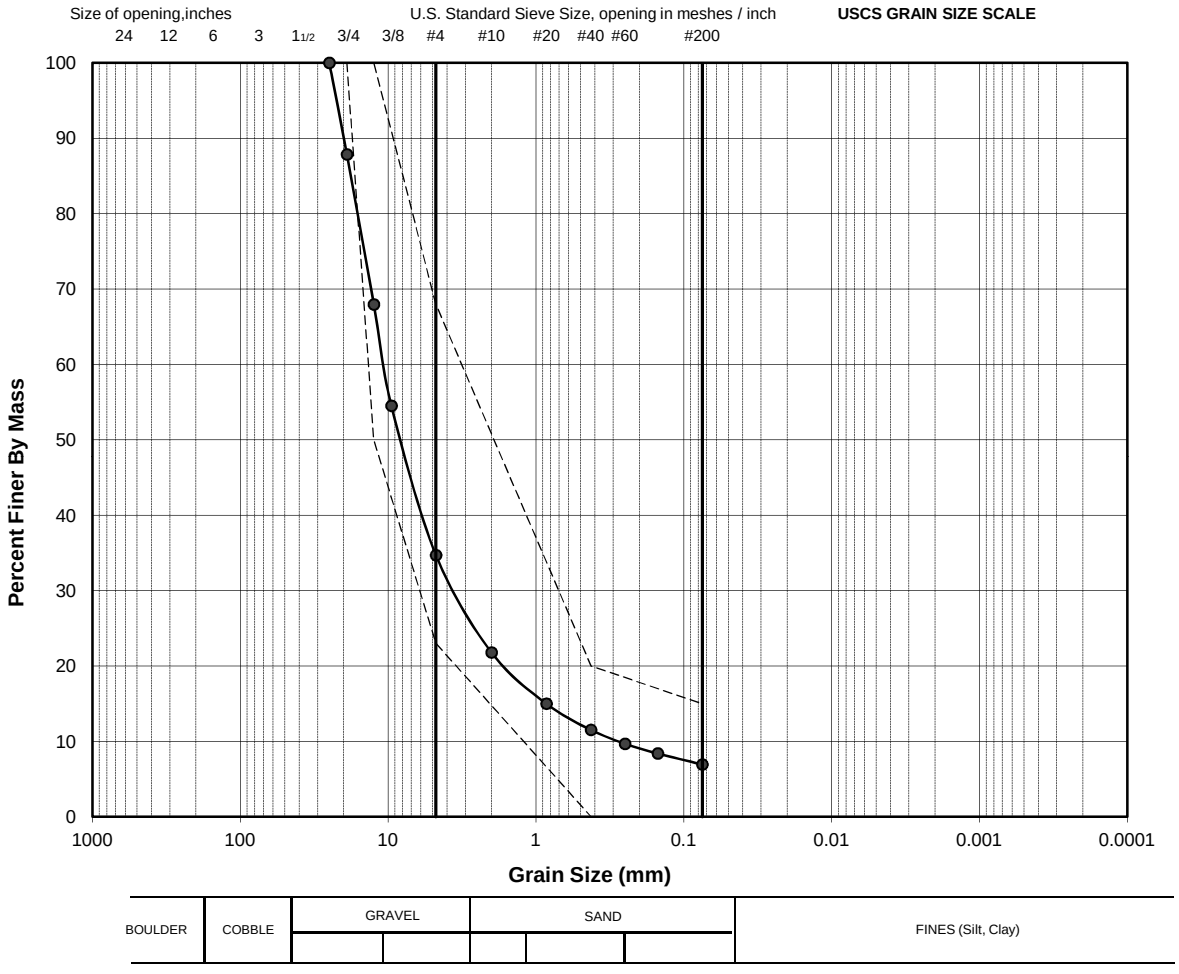
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	09-1428-5007	**Sample No.:**	**194**
Client:	AEM	**Field Label**	SWD110609-1
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	41
Remarks:		**Date Sampled:**	November 6, 2009
Sa. Location:	SWD Sta. 10+565 Bedding layer in place El. 139 m	**Material Specification:**	Fine Filter
		Method:	SPLIT, WASHED
		Date Tested:	March 12, 2010

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	87.9
1/2"	12.5	68.0
3/8"	9.5	54.5
#4	4.8	34.7
#10	2.0	21.8
#20	0.9	15.0
#40	0.4	11.5
#60	0.3	9.7
#100	0.2	8.4
#200	0.1	7.0



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

PC	March 12, 2010	LP	March 15,2010
TESTED BY	DATE	CHECKED BY	DATE

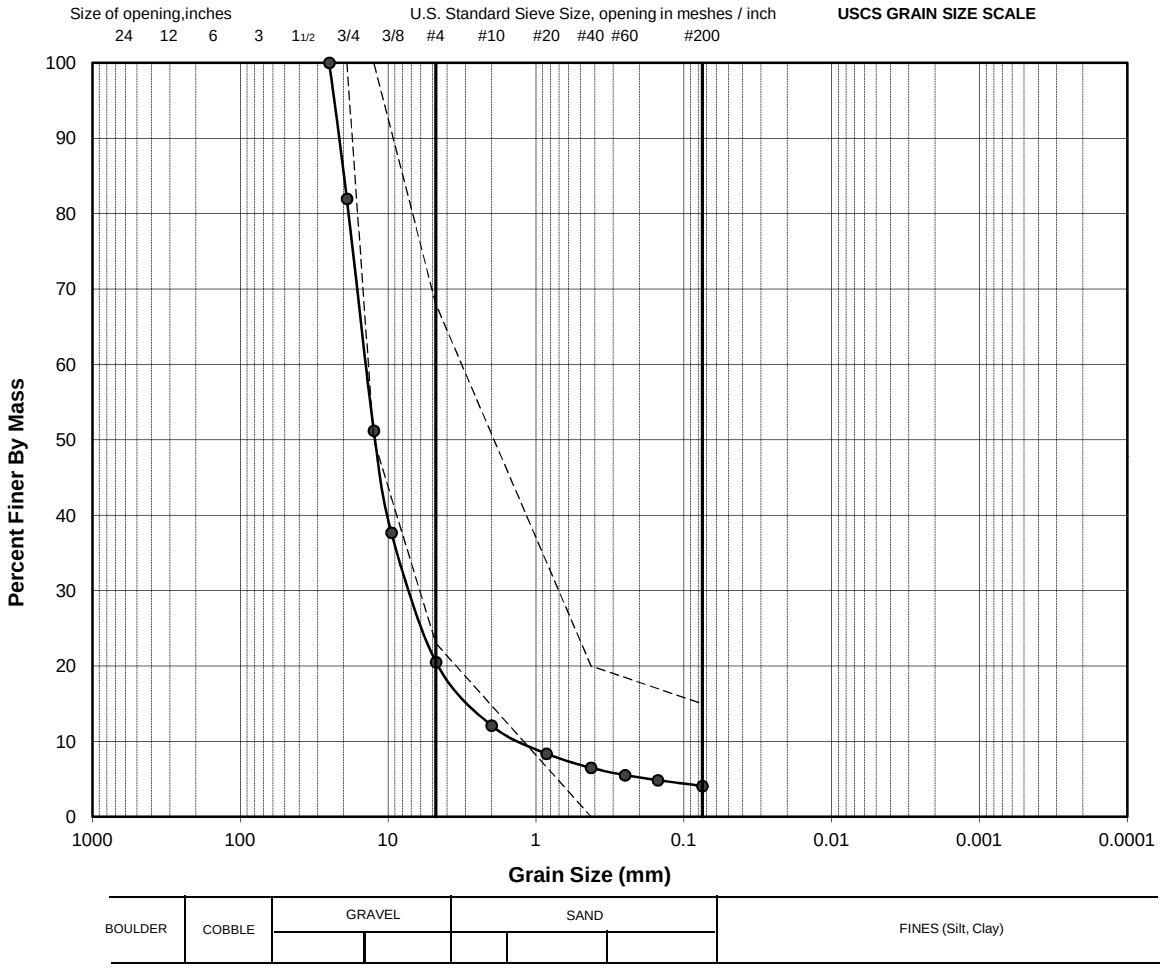
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	09-1428-5007	**Sample No.:**	**195**
Client:	AEM	**Field Label:**	SWD110609-2
Project:	Meadowbank Gold Project	**Depth (m):**	NA
Location:	Nunavut	**Lab ID No:**	41
Remarks:		**Date Sampled:**	November 6, 2009
Sa. Location:	SWD Sta. 10+440 Bedding layer in place El. 138 m	**Material Specification:**	Fine Filter
		Method:	SPLIT, WASHED
		Date Tested:	March 12, 2010

Sieve Size (USS)	(mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	82.0
1/2"	12.5	51.2
3/8"	9.5	37.7
#4	4.8	20.5
#10	2.0	12.1
#20	0.9	8.4
#40	0.4	6.5
#60	0.3	5.5
#100	0.2	4.9
#200	0.1	4.1



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PC	March 12, 2010	LP	March 15,2010
TESTED BY	DATE	CHECKED BY	DATE

GroupeCTTGroup
Division SAGEOS
Geosynthetics Géosynthétiques

ANALYSIS REPORT
SCC Accreditation No.: 40

Mrs Fiona Esford
Golder Associates Ltd

Date: December 14, 2009
Report: S785-003-39772A

IDENTIFICATION: Bituminous membrane: Roll AA9XR Panel 273
Project name: Meadowbank Gold
Project #: 09-1428-5007
Received: December 7, 2009

STANDARD:

TEST: Nominal Thickness of Geosynthetics — ASTM D5199-01 (2006)

TEST CONDITIONS: Conditioned sample(s) (21 °C, 65 % R.H.);
Dimension of the test specimens: minimum diameter of 75 mm;
Apparatus: Mitutoyo - measuring unit: inch (has precedence on the values in mm) ;
Diameter of the presser foot: 6.35 mm ;
Pressure applied: 20 kPa; Loading time interval: 5 sec. ;
Tested December 11, 2009

RESULTS:	Individual Data					Avg.	S.D.	% CV
Thickness (mils):	187	193	180	180	179	**180**	7	**4.1**
	187	173	174	175	170			
Thickness (mm):	4.75	4.89	4.56	4.56	4.55	**4.56**	0.19	**4.1**
	4.75	4.38	4.42	4.43	4.31			

Prepared by:
Nancy Fontaine, Tech.
Technician

Approved by:
Eric Blond, Eng., M.Sc.A.
Vice-President
Date: December 14, 2009

For any information concerning this report, please contact Eric Blond

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GroupeCTTGroup
Division SAGEOS
Geosynthetics Géosynthétiques

ANALYSIS REPORT
SCC Accreditation No.: 40

Mrs Fiona Esford
Golder Associates Ltd

Date: December 14, 2009
Report: S785-003-39772A

IDENTIFICATION:	Bituminous membrane: Roll AA9XR Panel 273 Project name: Meadowbank Gold Project #: 09-1428-5007 Received: December 7, 2009
STANDARD:	
TEST:	Density and Specific Gravity (Relative Density) of Plastics by Displacement — ASTM D792 - 08 Method A
TEST CONDITIONS:	Conditioned sample(s) (21°C, 65% R.H.); Test method A; Temperature of water (°C): 21.1 Tested December 11 and 14, 2009

RESULTS:	Individual Data		Avg.	S.D.	% CV
Density (g/cm³):	1.268	1.271	**1.270**	0.002	**0.2**

Prepared by:
Nancy Fontaine, Tech.
Technician

Approved by:
Eric Blond, Eng., M.Sc.A.
Vice-President
Date: December 14, 2009

For any information concerning this report, please contact Eric Blond*

The reports are identified by an alphanumeric code, the last character refers to the number of revision(s), this is emitted in ascending order. The samples in relation to this test are retained for a period of 30 days following the expedition day of the written report, unless other instructions are received. The fees for all services after the tests are 125.00 $ per hour and for appraisal in Court, 195.00$ per hour. The above reported results refer exclusively to the samples submitted for evaluation. This analysis report cannot be partly used or reproduced, unless in whole, without CTT Group prior written consent.

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GroupeCTTGroup
Division SAGEOS
Geosynthetics Géosynthétiques

ANALYSIS REPORT
SCC Accreditation No.: 40

Mrs Fiona Esford
Golder Associates Ltd

Date: December 11, 2009
Report: S785-003-39773A

IDENTIFICATION: Bituminous membrane seam: DT Panel 217/218, DT Panel 224/225, DT Panel 238/239, DT Panel 241/242, DT Panel 253/254, DT Panel 284/285
Project name: Meadowbank Gold
Project #: 09-1428-5007
Received: December 7, 2009

STANDARD:

TEST: Determining the Tensile Shear Strength of Pre-Fabricated Bituminous Geomembrane Seams — ASTM D7056 - 07

TEST CONDITIONS: Apparatus used: Dynamometer with a Constant Rate of Extension (CRE);
Speed: 50 mm/min.;
5 test specimens per product;
Conditioned sample(s) 24 hours at 21 ± 2°C, 30 à 50% R.H.) ;
Tested December 9, 2009

RESULTS:	Individual Data					Avg.	S.D.	% CV
DT Panel 217/218								
Width of seam, in the direction of the test (mm):	95.0	92.0	118.0	100.0	114.0			
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.5	50.5	50.5	50.5			
Maximum load value (N):	61.5	77.6	150.6	696.9	1214.1	**440.1**	505.9	**114.9**
Seam strength (kN/m):	1.23	1.55	3.01	13.94	24.28	**8.80**	10.12	**114.9**
DT Panel 224/225								
Width of seam, in the direction of the test (mm):	120.0	123.0	121.0					
Width of specimen, perpendicular to the direction of the test (mm):	49.5	50.5	50.5					
Maximum load value (N):	1133	1126	1137			**1 132**	6	**0.5**
Seam strength (kN/m):	22.7	22.5	22.7			**22.6**	0.1	**0.5**

Prepared by:
Catherine Groleau Rivard
Catherine Groleau Rivard, Tech.
Technician

Approved by:
Eric Blond, Eng., M.Sc.A.
Vice-President
Date: December 11, 2009

For any information concerning this report, please contact Eric Blond

GroupeCTTGroup
Division SAGEOS
Geosynthetics Géosynthétiques

ANALYSIS REPORT
SCC Accreditation No.: 40

Mrs Fiona Esford
Golder Associates Ltd

Date: December 11, 2009
Report: S785-003-39773A

IDENTIFICATION: Bituminous membrane seam: DT Panel 217/218, DT Panel 224/225, DT Panel 238/239, DT Panel 241/242, DT Panel 253/254, DT Panel 284/285
Project name: Meadowbank Gold
Project #: 09-1428-5007
Received: December 7, 2009

STANDARD:

TEST: Determining the Tensile Shear Strength of Pre-Fabricated Bituminous Geomembrane Seams — ASTM D7056 - 07

RESULTS (CONT):	Individual Data					Avg.	S.D.	% CV
DT Panel 238/239								
Width of seam, in the direction of the test (mm):	110.0	97.0	110.0	113.0				
Width of specimen, perpendicular to the direction of the test (mm):	49.5	50.5	50.5	50.5				
Maximum load value (N):	1042	1139	1058	1059		**1 075**	44	**4.1**
Seam strength (kN/m):	20.9	22.8	21.2	21.2		**21.5**	0.9	**4.0**
DT Panel 241/242								
Width of seam, in the direction of the test (mm):	107.0	117.0	113.0	108.0	109.0			
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.5	50.0	50.0	50.5			
Maximum load value (N):	1227	1237	1312	1205	1236	**1 243**	40	**3.3**
Seam strength (kN/m):	24.5	24.7	26.2	24.1	24.7	**24.8**	0.8	**3.2**
DT Panel 253/254								
Width of seam, in the direction of the test (mm):	136.0	131.0	128.0	141.0	130.0			
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.5	50.5	50.5	50.0			
Maximum load value (N):	1291	1173	970	1188	1174	**1 159**	117	**10.1**
Seam strength (kN/m):	25.8	23.5	19.4	23.8	23.5	**23.2**	2.3	**10.0**

Prepared by:
Catherine Groleau Rivard
Catherine Groleau Rivard, Tech.
Technician

Approved by:
Eric Blond, Eng., M.Sc.A.
Vice-President
Date: December 11, 2009

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GroupeCTTGroup
Division SAGEOS
Geosynthetics Géosynthétiques

ANALYSIS REPORT
SCC Accreditation No.: 40

Mrs Fiona Esford
Golder Associates Ltd

Date: December 11, 2009
Report: S785-003-39773A

IDENTIFICATION: Bituminous membrane seam: DT Panel 217/218, DT Panel 224/225, DT Panel 238/239, DT Panel 241/242, DT Panel 253/254, DT Panel 284/285
Project name: Meadowbank Gold
Project #: 09-1428-5007
Received: December 7, 2009

STANDARD:

TEST: Determining the Tensile Shear Strength of Pre-Fabricated Bituminous Geomembrane Seams — ASTM D7056 - 07

RESULTS (CONT):

	Individual Data					Avg.	S.D.	% CV
DT Panel 284/285								
Width of seam, in the direction of the test (mm):	117.0	121.0	125.0	110.0	115.0			
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.0	50.5	50.5	50.5			
Maximum load value (N):	1125	1111	1234	1105	1150	**1 145**	53	**4.6**
Seam strength (kN/m):	22.5	22.2	24.7	22.1	23.0	**22.9**	1.1	**4.7**

REMARKS: DT Panel 224/225 and DT Panel 238/239: The size of the samples received was not sufficient to conduct the number of specimens required by the test method.

Prepared by:
Catherine Groleau Rivard
Catherine Groleau Rivard, Tech.
Technician

Approved by:
Eric Blond, Eng., M.Sc.A.
Vice-President
Date: December 11, 2009

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GroupeCTTGroup
Geosynthetics Division SAGEOS Géosynthétiques

ANALYSIS REPORT
SCC Accreditation No.: 40

Mrs Fiona Esford
Golder Associates Ltd

Date: December 11, 2009
Report: S785-003-39819A

IDENTIFICATION: Bituminous membrane seam: DT Panel 270/271, DT Panel 275/276, DT Panel 279/280, DT Panel 296/297
Project name: Meadowbank Gold
Project #: 09-1428-5007
Received: December 9, 2009

STANDARD:

TEST: Determining the Tensile Shear Strength of Pre-Fabricated Bituminous Geomembrane Seams — ASTM D7056 - 07

TEST CONDITIONS: Apparatus used: Dynamometer with a Constant Rate of Extension (CRE);
Speed: 50 mm/min.;
5 test specimens per product;
Conditioned sample(s) 24 hours at 21 ± 2°C, 30 à 50% R.H.) ;
Tested December 11, 2009

RESULTS:	Individual Data					Avg.	S.D.	% CV
DT Panel 270/271								
Width of seam, in the direction of the test (mm):	91.0	78.0	80.0	78.0	84.0			
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.5	50.5	50.5	50.5			
Maximum load value (N):	1088	908	1012	1013	1192	**1 043**	105	**10.1**
Seam strength (kN/m):	21.8	18.2	20.2	20.3	23.8	**20.9**	2.1	**10.0**
DT Panel 275/276								
Width of seam, in the direction of the test (mm):	68.0	70.0	90.0	98.0	114.0			
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.5	50.5	50.5	50.5			
Maximum load value (N):	1226	1139	1061	1175	1186	**1 157**	62	**5.4**
Seam strength (kN/m):	24.5	22.8	21.2	23.5	23.7	**23.1**	1.2	**5.4**

Prepared by:
Catherine Groleau Rivard
Catherine Groleau Rivard, Tech.
Technician

Approved by:
Eric Blond, Eng., M.Sc.A.
Vice-President
Date: December 11, 2009

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GroupeCTTGroup
Geosynthetics Division SAGEOS Géosynthétiques

ANALYSIS REPORT
SCC Accreditation No.: 40

Mrs Fiona Esford
Golder Associates Ltd

Date: December 11, 2009
Report: S785-003-39819A

IDENTIFICATION: Bituminous membrane seam: DT Panel 270/271, DT Panel 275/276, DT Panel 279/280, DT Panel 296/297
Project name: Meadowbank Gold
Project #: 09-1428-5007
Received: December 9, 2009

STANDARD:

TEST: Determining the Tensile Shear Strength of Pre-Fabricated Bituminous Geomembrane Seams — ASTM D7056 - 07

RESULTS (CONT):

	Individual Data					Avg.	S.D.	% CV
DT Panel 279/280								
Width of seam, in the direction of the test (mm):	94.0	93.0	98.0	100.0	90.0			
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.5	50.5	50.5	50.5			
Maximum load value (N):	1225	1175	1142	1201	1066	**1 162**	62	**5.3**
Seam strength (kN/m):	24.5	23.5	22.8	24.0	21.3	**23.2**	1.2	**5.4**
DT Panel 296/297								
Width of seam, in the direction of the test (mm):	170.0	168.0	171.0	173.0	165.0			
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.5	50.5	50.5	50.5			
Maximum load value (N):	1152	1288	1115	1250	1224	**1 206**	71	**5.9**
Seam strength (kN/m):	23.1	25.8	22.3	25.0	24.5	**24.1**	1.4	**5.9**

Prepared by:
Catherine Groleau Rivard
Catherine Groleau Rivard, Tech.
Technician

Approved by:
Eric Blond, Eng., M.Sc.A.
Vice-President
Date: December 11, 2009

For any information concerning this report, please contact Eric Blond*

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Division SAGEOS
Geosynthetics Géosynthétiques

ANALYSIS REPORT
SCC Accreditation No.: 40

Mrs Fiona Esford
Golder Associates Ltd

Date: January 25, 2010
Report: S785-003-40733A

IDENTIFICATION: Bituminous membrane seam: DT Panel 228/229, DT Panel 246/247, DT Panel 258/259, DT Panel 267/268
Project name: Meadowbank Gold
Project #: 09-1428-5007
Received: January 21, 2010

STANDARD:

TEST: Determining the Tensile Shear Strength of Pre-Fabricated Bituminous Geomembrane Seams — ASTM D7056 - 07

TEST CONDITIONS: Apparatus used: Dynamometer with a Constant Rate of Extension (CRE);
Speed: 50 mm/min.;
5 test specimens per product;
Conditioned sample(s) 48 hours at 21 ± 2°C, 55 à 70% R.H.) ;
Tested January 25, 2010

RESULTS:	Individual Data					Avg.	S.D.	% CV
DT Panel 228/229								
Width of seam, in the direction of the test (mm):	85.0	88.0	90.0					
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.5	50.5					
Maximum load value (N):	1155	1140	1226			**1 174**	46	**3.9**
Seam strength (kN/m):	23.1	22.8	24.5			**23.5**	0.9	**3.9**
DT Panel 246/247								
Width of seam, in the direction of the test (mm):	106.0	112.0	113.0	112.0	109.0			
Width of specimen, perpendicular to the direction of the test (mm):	49.5	50.5	50.5	50.5	50.0			
Maximum load value (N):	1258	1162	1241	1235	1180	**1 215**	42	**3.4**
Seam strength (kN/m):	25.2	23.2	24.8	24.7	23.6	**24.3**	0.9	**3.5**

Prepared by:
Catherine Groleau Rivard
Catherine Groleau Rivard, Tech.
Technician

Approved by:
Eric Blond, Eng., M.Sc.A.
Vice-President
Date: January 25, 2010

For any information concerning this report, please contact Eric Blond*

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GroupeCTTGroup
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Geosynthetics Géosynthétiques

ANALYSIS REPORT
SCC Accreditation No.: 40

Mrs Fiona Esford
Golder Associates Ltd

Date: January 25, 2010
Report: S785-003-40733A

IDENTIFICATION: Bituminous membrane seam: DT Panel 228/229, DT Panel 246/247, DT Panel 258/259, DT Panel 267/268
Project name: Meadowbank Gold
Project #: 09-1428-5007
Received: January 21, 2010

STANDARD:

TEST: Determining the Tensile Shear Strength of Pre-Fabricated Bituminous Geomembrane Seams — ASTM D7056 - 07

RESULTS (CONT):

	Individual Data					Avg.	S.D.	% CV
DT Panel 258/259								
Width of seam, in the direction of the test (mm):	147.0	147.0	105.0	125.0	148.0			
Width of specimen, perpendicular to the direction of the test (mm):	49.5	50.5	50.0	50.0	50.0			
Maximum load value (N):	1092	1078	975	1101	1182	**1 086**	74	**6.8**
Seam strength (kN/m):	21.8	21.6	19.5	22.0	23.6	**21.7**	1.5	**6.7**
DT Panel 267/268								
Width of seam, in the direction of the test (mm):	70.0	75.0	91.0	100.0				
Width of specimen, perpendicular to the direction of the test (mm):	50.5	50.0	50.5	50.5				
Maximum load value (N):	594	488	1148	1192		**856**	366	**42.8**
Seam strength (kN/m):	11.9	9.8	23.0	23.8		**17.1**	7.3	**42.6**

REMARKS: DT Panel 228/229 and DT Panel 267/268: The size of the samples received was not sufficient to conduct the number of specimens required by the test method.

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