



AMEC EARTH & ENVIRONMENTAL  
ATTN: Leslie Hardy  
4810 - 93rd Street  
Edmonton AB T6E 5M4

Date Received: 25-OCT-13  
Report Date: 19-NOV-13 15:12 (MT)  
Version: FINAL REV. 2

Client Phone: 780-436-2152

## Certificate of Analysis

**Lab Work Order #:** L1384673  
**Project P.O. #:** NOT SUBMITTED  
**Job Reference:** VM00605E.2380  
**C of C Numbers:** 1  
**Legal Site Desc:**

**Comments:** Revised particle size distribution data can be found at the end of this attachment.

Selam Worku  
Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
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\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1384673-1 Sediment 07-SEP-13 12:00 SED-DC-1	L1384673-2 Sediment 08-SEP-13 12:00 SED-DC-2	L1384673-3 Sediment 09-SEP-13 12:00 SED-DC-3	L1384673-4 Sediment 10-SEP-13 12:00 SED-DC-4	L1384673-5 Sediment 11-SEP-13 12:00 SED-DC-5
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	19.8	22.3	20.5	20.7	20.0
	pH (1:2 soil:water) (pH)	7.66	7.14	7.75	7.70	7.40
<b>Particle Size</b>	MUST PSA % > 75um (%)	79.9	67.8	88.9	78.2	87.5
<b>Leachable Anions &amp; Nutrients</b>	Total Kjeldahl Nitrogen (%)	0.029	0.107	<0.020	0.034	0.021
	Sulfate (SO4) (mg/L)	46.0	56.6	44.4	43.4	46.1
<b>Anions and Nutrients</b>	Total Nitrogen by LECO (%)	0.054	0.126	0.021	0.043	0.027
<b>Cyanides</b>	Cyanide, Weak Acid Diss (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Cyanide, Total (mg/kg)	<0.050	0.107	<0.050	<0.050	<0.050
<b>Organic / Inorganic Carbon</b>	Total Carbon by Combustion (%)	0.5	2.2	0.4	0.6	0.4
	Total Organic Carbon (%)	0.49	2.11	0.33	0.59	0.36
<b>Metals</b>	Antimony (Sb) (mg/kg)	0.67	0.78	0.68	0.89	0.97
	Arsenic (As) (mg/kg)	14.9	15.2	12.0	34.8	15.0
	Barium (Ba) (mg/kg)	74.8	55.2	47.5	48.4	50.6
	Beryllium (Be) (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Cadmium (Cd) (mg/kg)	0.151	0.142	0.107	0.179	0.112
	Chromium (Cr) (mg/kg)	8.77	8.40	7.16	8.15	14.2
	Cobalt (Co) (mg/kg)	3.36	2.87	2.74	2.90	3.57
	Copper (Cu) (mg/kg)	4.11	4.58	2.81	3.51	4.81
	Lead (Pb) (mg/kg)	3.07	3.32	3.01	3.58	3.73
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Nickel (Ni) (mg/kg)	5.85	5.39	4.60	4.96	6.05
	Selenium (Se) (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Silver (Ag) (mg/kg)	<0.10	<0.10	<0.10	<0.10	<0.10
	Sulfur (S)-Total (mg/kg)	1800	1300	1800	1200	700
	Thallium (Tl) (mg/kg)	0.059	0.066	<0.050	<0.050	<0.050
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U) (mg/kg)	0.393	0.397	0.318	0.336	0.429
	Vanadium (V) (mg/kg)	20.5	19.7	19.6	20.0	48.8
	Zinc (Zn) (mg/kg)	43.0	41.7	30.8	42.0	29.3

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1384673-6 Sediment 12-SEP-13 12:00 SED-DC-6	L1384673-7 Sediment 13-SEP-13 12:00 SED-DC-7	L1384673-8 Sediment 14-SEP-13 12:00 SED-DC-8	L1384673-9 Sediment 15-SEP-13 12:00 SED-DC-9	L1384673-10 Sediment 16-SEP-13 12:00 SED-DC-10
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	23.5	17.6	19.0	19.3	21.6
	pH (1:2 soil:water) (pH)	6.59	8.41	7.44	7.88	7.90
<b>Particle Size</b>	MUST PSA % > 75um (%)	82.0	91.8	95.4	95.2	85.1
<b>Leachable Anions &amp; Nutrients</b>	Total Kjeldahl Nitrogen (%)	0.028	<0.020	<0.020	<0.020	<0.020
	Sulfate (SO4) (mg/L)	57.1	<0.50	47.0	29.2	37.1
<b>Anions and Nutrients</b>	Total Nitrogen by LECO (%)	0.036	<0.020	<0.020	0.033	0.021
<b>Cyanides</b>	Cyanide, Weak Acid Diss (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Cyanide, Total (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
<b>Organic / Inorganic Carbon</b>	Total Carbon by Combustion (%)	0.5	0.2	0.2	0.2	0.4
	Total Organic Carbon (%)	0.47	0.14	0.14	0.16	0.27
<b>Metals</b>	Antimony (Sb) (mg/kg)	0.59	0.25	0.42	0.43	0.50
	Arsenic (As) (mg/kg)	18.3	3.98	14.3	10.0	14.0
	Barium (Ba) (mg/kg)	57.2	60.1	40.6	41.7	48.1
	Beryllium (Be) (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Cadmium (Cd) (mg/kg)	0.115	0.061	0.059	0.057	0.094
	Chromium (Cr) (mg/kg)	10.2	17.9	8.54	7.25	9.79
	Cobalt (Co) (mg/kg)	3.14	4.09	2.76	2.39	3.19
	Copper (Cu) (mg/kg)	4.72	5.00	4.41	4.02	5.09
	Lead (Pb) (mg/kg)	3.26	2.36	2.80	2.64	5.75
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Nickel (Ni) (mg/kg)	6.14	6.74	4.87	4.50	6.25
	Selenium (Se) (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Silver (Ag) (mg/kg)	<0.10	<0.10	<0.10	<0.10	<0.10
	Sulfur (S)-Total (mg/kg)	700	600	600	<500	<500
	Thallium (Tl) (mg/kg)	0.053	<0.050	<0.050	<0.050	<0.050
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U) (mg/kg)	0.342	0.438	0.325	0.269	0.365
	Vanadium (V) (mg/kg)	23.0	66.8	25.7	18.0	23.6
	Zinc (Zn) (mg/kg)	37.3	21.2	23.2	21.9	29.1

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1384673-11 Sediment 17-SEP-13 12:00 SED-DC-11	L1384673-12 Sediment 18-SEP-13 12:00 SED-DC-12	L1384673-13 Sediment 19-SEP-13 12:00 SED-DC-13	L1384673-14 Sediment 20-SEP-13 12:00 SED-DC-14	L1384673-15 Sediment 21-SEP-13 12:00 SED-DC-15
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	56.9	56.5	12.4	13.5	15.7
	pH (1:2 soil:water) (pH)	7.87	7.69	7.96	7.26	8.00
<b>Particle Size</b>	MUST PSA % > 75um (%)	41.4	52.5	97.9	93.0	87.5
<b>Leachable Anions &amp; Nutrients</b>	Total Kjeldahl Nitrogen (%)	0.198	0.220	<0.020	<0.020	0.020
	Sulfate (SO4) (mg/L)	148	130	18.3	19.3	28.5
<b>Anions and Nutrients</b>	Total Nitrogen by LECO (%)	0.216	0.232	<0.020	0.025	0.027
<b>Cyanides</b>	Cyanide, Weak Acid Diss (mg/kg)	<0.10 <sup>DLM</sup>	<0.050	<0.050	<0.050	<0.050
	Cyanide, Total (mg/kg)	9.12	0.434	<0.050	0.224	0.071
<b>Organic / Inorganic Carbon</b>	Total Carbon by Combustion (%)	5.2	4.5	0.2	0.4	0.4
	Total Organic Carbon (%)	4.88	4.36	0.15	0.43	0.38
<b>Metals</b>	Antimony (Sb) (mg/kg)	2.91	2.16	0.58	0.98	3.24
	Arsenic (As) (mg/kg)	926	110	19.2	73.6	37.3
	Barium (Ba) (mg/kg)	228	120	51.4	41.4	46.1
	Beryllium (Be) (mg/kg)	<0.20	0.29	<0.20	<0.20	<0.20
	Cadmium (Cd) (mg/kg)	3.96	0.759	0.147	0.185	0.324
	Chromium (Cr) (mg/kg)	8.35	18.2	12.5	8.79	9.46
	Cobalt (Co) (mg/kg)	5.58	5.96	3.21	2.88	3.34
	Copper (Cu) (mg/kg)	41.5	22.0	6.03	8.93	9.05
	Lead (Pb) (mg/kg)	8.20	9.05	8.74	15.4	13.8
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	1.31	0.52	<0.50	<0.50	<0.50
	Nickel (Ni) (mg/kg)	6.95	12.4	5.47	4.77	5.80
	Selenium (Se) (mg/kg)	0.41	0.44	<0.20	<0.20	<0.20
	Silver (Ag) (mg/kg)	0.93	0.22	<0.10	0.10	<0.10
	Sulfur (S)-Total (mg/kg)	1400	1400	<500	600	<500
	Thallium (Tl) (mg/kg)	0.055	0.113	<0.050	<0.050	<0.050
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U) (mg/kg)	0.889	0.727	0.387	0.291	0.345
	Vanadium (V) (mg/kg)	28.0	40.4	48.9	35.2	30.6
	Zinc (Zn) (mg/kg)	91.7	91.1	27.7	40.5	49.7

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1384673-16 Sediment 22-SEP-13 12:00 SED-DC-16	L1384673-17 Sediment 23-SEP-13 12:00 SED-DC-17	L1384673-18 Sediment 24-SEP-13 12:00 SED-DC-18	L1384673-19 Sediment 25-SEP-13 12:00 SED-DC-19	L1384673-20 Sediment 26-SEP-13 12:00 SED-DC-20
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	19.6	25.9	19.1	11.5	26.4
	pH (1:2 soil:water) (pH)	7.95	7.58	7.06	7.20	7.38
<b>Particle Size</b>	MUST PSA % > 75um (%)	79.7	81.3	91.0	92.6	30.6
<b>Leachable Anions &amp; Nutrients</b>	Total Kjeldahl Nitrogen (%)	0.059	0.050	0.025	<0.020	0.339
	Sulfate (SO4) (mg/L)	37.0	52.7	21.3	27.3	80.1
<b>Anions and Nutrients</b>	Total Nitrogen by LECO (%)	0.072	0.058	0.032	0.028	0.321
<b>Cyanides</b>	Cyanide, Weak Acid Diss (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Cyanide, Total (mg/kg)	0.122	0.059	<0.050	0.053	0.146
<b>Organic / Inorganic Carbon</b>	Total Carbon by Combustion (%)	1.4	1.0	0.6	0.5	6.7
	Total Organic Carbon (%)	1.33	0.95	0.55	0.45	6.59
<b>Metals</b>	Antimony (Sb) (mg/kg)	3.58	1.31	1.02	1.26	2.76
	Arsenic (As) (mg/kg)	156	32.4	29.5	27.8	210
	Barium (Ba) (mg/kg)	71.5	59.5	53.0	40.3	88.8
	Beryllium (Be) (mg/kg)	<0.20	<0.20	<0.20	<0.20	0.21
	Cadmium (Cd) (mg/kg)	0.292	0.275	0.145	0.211	0.650
	Chromium (Cr) (mg/kg)	10.2	11.3	11.0	17.3	17.6
	Cobalt (Co) (mg/kg)	3.54	3.58	2.88	3.47	4.94
	Copper (Cu) (mg/kg)	8.04	8.02	7.04	7.77	13.4
	Lead (Pb) (mg/kg)	246	6.70	7.04	4.43	12.2
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Nickel (Ni) (mg/kg)	6.61	6.85	5.35	6.14	9.02
	Selenium (Se) (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Silver (Ag) (mg/kg)	0.30	<0.10	<0.10	<0.10	0.20
	Sulfur (S)-Total (mg/kg)	600	500	<500	<500	1900
	Thallium (Tl) (mg/kg)	0.059	0.098	<0.050	<0.050	0.070
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U) (mg/kg)	0.332	0.383	0.294	0.407	0.503
	Vanadium (V) (mg/kg)	37.5	36.7	40.8	69.0	49.6
	Zinc (Zn) (mg/kg)	58.9	46.8	35.9	34.8	83.8

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## Reference Information

### Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>C-TOT-LECO-SK</b>	Soil	Total Carbon by combustion method	SSSA (1996) P. 973-974
The sample is ignited in a combustion analyzer where carbon in the reduced CO <sub>2</sub> gas is determined using a thermal conductivity detector.			
<b>C-TOT-ORG-LECO-SK</b>	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973
Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)			
Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.			
Reference for Total C: Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5			
Reference for Inorganic C: Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5			
<b>CN-T-NAOH-CFA-VA</b>	Soil	Total Cyanide in soil by CFA	ONMOE CN-E3015/ISO 14403:2002
This analysis is carried out using procedures adapted from the Ontario Ministry of Environment CN-E3015 and ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by rotary extraction of the soil with 0.04M Sodium Hydroxide, followed by in-line UV digestion along with sample distillation and final determination by colourimetric analysis.			
<b>CN-WAD-NAOH-CFA-VA</b>	Soil	Weak Acid Diss. Cyanide in soil by CFA	ONMOE CN-E3015/APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from the Ontario Ministry of Environment CN-E3015 and APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by rotary extraction of the soil with 0.04M Sodium Hydroxide, followed by in-line sample distillation with final determination by colourimetric analysis.			
<b>HG-200.2-CVAF-VA</b>	Soil	Mercury in Soil by CVAFS	EPA 200.2/245.7
This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve (this sieve step is omitted for international soil samples), and a representative subsample of the dry material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
<b>MET-200.2-CCMS-VA</b>	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A
This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve (this sieve step is omitted for international soil samples), and a representative subsample of the dry material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis of the digested extract is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
<b>MOISTURE-VA</b>	Soil	Moisture content	ASTM D2974-00 Method A
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.			
<b>N-TOT-LECO-SK</b>	Soil	Total Nitrogen by combustion method	SSSA (1996) P. 973-974
The sample is ignited in a combustion analyzer where nitrogen in the reduced nitrous oxide gas is determined using a thermal conductivity detector.			
<b>N-TOTKJ-COL-SK</b>	Soil	Total Kjeldahl Nitrogen	CSSS (1993) 22.2.3
The soil is digested with sulfuric acid in the presence of CuSO <sub>4</sub> and K <sub>2</sub> SO <sub>4</sub> catalysts. Ammonia in the soil extract is determined colorimetrically at 660 nm.			
<b>PH-1:2-VA</b>	Soil	pH in Soil (1:2 Soil:Water Extraction)	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

## Reference Information

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

**PSA-MUST-SK**                      Soil                      % Particles > 75um (Coarse/Fine)                      ASTM D422-63-SIEVE

An air-dried sample is reduced to < 2 mm size and mixed with a dispersing agent (Calgon solution). The sample is washed through a 200 mesh (75 µm) sieve. The retained mass of sample is used to determine % sand fraction.

Reference: ASTM D422-63

**S-TOT-LECO-SK**                      Soil                      Total Sulphur by combustion method                      ISO 15178:2000

The sample is ignited in a combustion analyzer where sulfur in the reduced SO<sub>2</sub> gas is determined using a thermal conductivity detector.

**SO4-SHKFLSK-TURB-VA**      Soil                      Sulfate by Turbidimetric (SHAKEFLASK)                      BC MINISTRY OF ENERGY AND MINES

This analysis is based upon the extraction procedure outlined in "Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia" BC Ministry of Energy and Mines, (Dr. William A. Price, 1997). In summary, the sample is extracted at a 3:1 liquid to solids ratio for 24 hours using deionized water. The extract is then allowed to settle and subsequently filtered through a 0.45 micron membrane filter and analysed using procedures adapted from APHA Method 4500-SO<sub>4</sub> "Sulfate". Sulfate is determined using the turbidimetric method."

**SPECIAL REQUEST-SK**      Misc.                      Special Request Sask Lab                      SEE SUBLET LAB RESULTS

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

### Chain of Custody Numbers:

1

### GLOSSARY OF REPORT TERMS

*Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.*

*mg/kg - milligrams per kilogram based on dry weight of sample.*

*mg/kg ww - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



## Quality Control Report

Workorder: L1384673

Report Date: 19-NOV-13

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>CN-T-NAOH-CFA-VA Soil</b>								
Batch	R2734300							
<b>WG1781368-2</b>	<b>LCS</b>							
Cyanide, Total			94.1		%		80-120	05-NOV-13
<b>WG1781404-2</b>	<b>LCS</b>							
Cyanide, Total			95.6		%		80-120	05-NOV-13
<b>WG1781368-1</b>	<b>MB</b>							
Cyanide, Total			<0.050		mg/kg		0.05	05-NOV-13
<b>WG1781404-1</b>	<b>MB</b>							
Cyanide, Total			<0.050		mg/kg		0.05	05-NOV-13
<b>CN-WAD-NAOH-CFA-VA Soil</b>								
Batch	R2734301							
<b>WG1781368-2</b>	<b>LCS</b>							
Cyanide, Weak Acid Diss			97.4		%		80-120	05-NOV-13
<b>WG1781404-2</b>	<b>LCS</b>							
Cyanide, Weak Acid Diss			96.2		%		80-120	05-NOV-13
<b>WG1781368-1</b>	<b>MB</b>							
Cyanide, Weak Acid Diss			<0.050		mg/kg		0.05	05-NOV-13
<b>WG1781404-1</b>	<b>MB</b>							
Cyanide, Weak Acid Diss			<0.050		mg/kg		0.05	05-NOV-13
<b>HG-200.2-CVAF-VA Soil</b>								
Batch	R2736134							
<b>WG1783049-3</b>	<b>CRM</b>	<b>VA-CANMET-TILL1</b>						
Mercury (Hg)			109.6		%		70-130	06-NOV-13
<b>WG1783049-4</b>	<b>CRM</b>	<b>VA-NRC-STSD1</b>						
Mercury (Hg)			116.7		%		70-130	06-NOV-13
<b>WG1783049-2</b>	<b>DUP</b>	<b>L1384673-1</b>						
Mercury (Hg)		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	06-NOV-13
<b>WG1783049-1</b>	<b>MB</b>							
Mercury (Hg)			<0.0050		mg/kg		0.005	06-NOV-13
<b>MET-200.2-CCMS-VA Soil</b>								
Batch	R2736097							
<b>WG1783049-3</b>	<b>CRM</b>	<b>VA-CANMET-TILL1</b>						
Antimony (Sb)			107.3		%		70-130	06-NOV-13
Arsenic (As)			113.0		%		70-130	06-NOV-13
Barium (Ba)			104.2		%		70-130	06-NOV-13
Beryllium (Be)			0.58		mg/kg		0.34-0.74	06-NOV-13
Cadmium (Cd)			101.5		%		70-130	06-NOV-13
Chromium (Cr)			117.7		%		70-130	06-NOV-13

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>		<b>Soil</b>						
<b>Batch</b>	<b>R2736097</b>							
<b>WG1783049-3</b>	<b>CRM</b>	<b>VA-CANMET-TILL1</b>						
Cobalt (Co)			109.2		%		70-130	06-NOV-13
Copper (Cu)			102.8		%		70-130	06-NOV-13
Lead (Pb)			99.0		%		70-130	06-NOV-13
Molybdenum (Mo)			0.77		mg/kg		0.24-1.24	06-NOV-13
Nickel (Ni)			110.2		%		70-130	06-NOV-13
Selenium (Se)			0.35		mg/kg		0.12-0.52	06-NOV-13
Silver (Ag)			0.24		mg/kg		0.12-0.32	06-NOV-13
Thallium (Tl)			0.132		mg/kg		0.075-0.175	06-NOV-13
Tin (Sn)			1.1		mg/kg		0-3	06-NOV-13
Uranium (U)			114.1		%		70-130	06-NOV-13
Vanadium (V)			117.4		%		70-130	06-NOV-13
Zinc (Zn)			107.9		%		70-130	06-NOV-13
<b>WG1783049-4</b>	<b>CRM</b>	<b>VA-NRC-STSD1</b>						
Antimony (Sb)			103.4		%		70-130	06-NOV-13
Arsenic (As)			100.9		%		70-130	06-NOV-13
Barium (Ba)			104.5		%		70-130	06-NOV-13
Beryllium (Be)			103.7		%		70-130	06-NOV-13
Cadmium (Cd)			96.8		%		70-130	06-NOV-13
Chromium (Cr)			106.4		%		70-130	06-NOV-13
Cobalt (Co)			103.8		%		70-130	06-NOV-13
Copper (Cu)			99.5		%		70-130	06-NOV-13
Lead (Pb)			98.6		%		70-130	06-NOV-13
Molybdenum (Mo)			107.2		%		70-130	06-NOV-13
Nickel (Ni)			102.5		%		70-130	06-NOV-13
Selenium (Se)			103.1		%		70-130	06-NOV-13
Silver (Ag)			114.3		%		70-130	06-NOV-13
Thallium (Tl)			98.2		%		70-130	06-NOV-13
Tin (Sn)			98.3		%		70-130	06-NOV-13
Vanadium (V)			106.9		%		70-130	06-NOV-13
Zinc (Zn)			103.4		%		70-130	06-NOV-13
<b>WG1783049-2</b>	<b>DUP</b>	<b>L1384673-1</b>						
Antimony (Sb)		0.67	0.70		mg/kg	5.1	30	06-NOV-13
Arsenic (As)		14.9	13.1		mg/kg	13	30	06-NOV-13
Barium (Ba)		74.8	50.5		mg/kg	39	40	06-NOV-13
Beryllium (Be)		<0.20	<0.20	RPD-NA	mg/kg	N/A	30	06-NOV-13

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-VA</b>		<b>Soil</b>						
<b>Batch</b>	<b>R2736097</b>							
<b>WG1783049-2</b>	<b>DUP</b>	<b>L1384673-1</b>						
Cadmium (Cd)		0.151	0.103	J	mg/kg	0.048	0.1	06-NOV-13
Chromium (Cr)		8.77	8.57		mg/kg	2.3	30	06-NOV-13
Cobalt (Co)		3.36	2.99		mg/kg	12	30	06-NOV-13
Copper (Cu)		4.11	3.99		mg/kg	3.0	30	06-NOV-13
Lead (Pb)		3.07	3.08		mg/kg	0.3	40	06-NOV-13
Molybdenum (Mo)		<0.50	<0.50	RPD-NA	mg/kg	N/A	40	06-NOV-13
Nickel (Ni)		5.85	5.46		mg/kg	6.8	30	06-NOV-13
Selenium (Se)		<0.20	<0.20	RPD-NA	mg/kg	N/A	30	06-NOV-13
Silver (Ag)		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	06-NOV-13
Thallium (Tl)		0.059	0.063		mg/kg	6.4	30	06-NOV-13
Tin (Sn)		<2.0	<2.0	RPD-NA	mg/kg	N/A	40	06-NOV-13
Uranium (U)		0.393	0.405		mg/kg	2.9	30	06-NOV-13
Vanadium (V)		20.5	20.3		mg/kg	1.0	30	06-NOV-13
Zinc (Zn)		43.0	37.7		mg/kg	13	30	06-NOV-13
<b>WG1783049-1</b>	<b>MB</b>							
Antimony (Sb)			<0.10		mg/kg		0.1	06-NOV-13
Arsenic (As)			<0.050		mg/kg		0.05	06-NOV-13
Barium (Ba)			<0.50		mg/kg		0.5	06-NOV-13
Beryllium (Be)			<0.20		mg/kg		0.2	06-NOV-13
Cadmium (Cd)			<0.050		mg/kg		0.05	06-NOV-13
Chromium (Cr)			<0.50		mg/kg		0.5	06-NOV-13
Cobalt (Co)			<0.10		mg/kg		0.1	06-NOV-13
Copper (Cu)			<0.50		mg/kg		0.5	06-NOV-13
Lead (Pb)			<0.50		mg/kg		0.5	06-NOV-13
Molybdenum (Mo)			<0.50		mg/kg		0.5	06-NOV-13
Nickel (Ni)			<0.50		mg/kg		0.5	06-NOV-13
Selenium (Se)			<0.20		mg/kg		0.2	06-NOV-13
Silver (Ag)			<0.10		mg/kg		0.1	06-NOV-13
Thallium (Tl)			<0.050		mg/kg		0.05	06-NOV-13
Tin (Sn)			<2.0		mg/kg		2	06-NOV-13
Uranium (U)			<0.050		mg/kg		0.05	06-NOV-13
Vanadium (V)			<0.20		mg/kg		0.2	06-NOV-13
Zinc (Zn)			<1.0		mg/kg		1	06-NOV-13

**MOISTURE-VA**

**Soil**

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MOISTURE-VA</b>								
<b>Soil</b>								
Batch	R2734435							
<b>WG1783000-3</b>	<b>DUP</b>	<b>L1384673-10</b>						
Moisture		21.6	21.8		%	0.7	20	05-NOV-13
<b>WG1783000-2</b>	<b>LCS</b>							
Moisture			100.4		%		70-130	05-NOV-13
<b>WG1783000-1</b>	<b>MB</b>							
Moisture			<0.25		%		0.25	05-NOV-13
<b>N-TOT-LECO-SK</b>								
<b>Soil</b>								
Batch	R2735978							
<b>WG1782911-1</b>	<b>DUP</b>	<b>L1384673-10</b>						
Total Nitrogen by LECO		0.021	<0.020	RPD-NA	%	N/A	20	06-NOV-13
<b>WG1782911-2</b>	<b>IRM</b>	<b>08-109_SOIL</b>						
Total Nitrogen by LECO			0.110		%		0.085-0.135	06-NOV-13
<b>WG1782911-6</b>	<b>IRM</b>	<b>08-109_SOIL</b>						
Total Nitrogen by LECO			0.110		%		0.085-0.135	06-NOV-13
<b>WG1782911-4</b>	<b>MB</b>							
Total Nitrogen by LECO			<0.020		%		0.02	06-NOV-13
<b>WG1782911-8</b>	<b>MB</b>							
Total Nitrogen by LECO			<0.020		%		0.02	06-NOV-13
<b>N-TOTKJ-COL-SK</b>								
<b>Soil</b>								
Batch	R2737715							
<b>WG1782940-1</b>	<b>DUP</b>	<b>L1384673-10</b>						
Total Kjeldahl Nitrogen		<0.020	<0.020	RPD-NA	%	N/A	20	08-NOV-13
<b>WG1782940-2</b>	<b>IRM</b>	<b>07-114_SOIL</b>						
Total Kjeldahl Nitrogen			86.6		%		70-130	08-NOV-13
<b>WG1782940-3</b>	<b>MB</b>							
Total Kjeldahl Nitrogen			<0.020		%		0.02	08-NOV-13
<b>WG1782940-4</b>	<b>RB</b>							
Total Kjeldahl Nitrogen			<0.020		%			08-NOV-13
<b>PH-1:2-VA</b>								
<b>Soil</b>								
Batch	R2735582							
<b>WG1783049-2</b>	<b>DUP</b>	<b>L1384673-1</b>						
pH (1:2 soil:water)		7.66	7.77	J	pH	0.11	0.3	06-NOV-13
<b>PSA-MUST-SK</b>								
<b>Soil</b>								
Batch	R2737012							
<b>WG1782852-1</b>	<b>DUP</b>	<b>L1384673-8</b>						
MUST PSA % > 75um		95.4	97.4	J	%	1.96	5	06-NOV-13



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>S-TOT-LECO-SK</b>								
<b>Soil</b>								
<b>Batch</b>	<b>R2735978</b>							
<b>WG1782911-1</b>	<b>DUP</b>	<b>L1384673-10</b>						
Sulfur (S)-Total		<500	<500	RPD-NA	mg/kg	N/A	30	06-NOV-13
<b>WG1782911-3</b>	<b>IRM</b>	<b>1646A_SOIL</b>						
Sulfur (S)-Total			3100		mg/kg		2500-4600	06-NOV-13
<b>WG1782911-7</b>	<b>IRM</b>	<b>1646A_SOIL</b>						
Sulfur (S)-Total			3600		mg/kg		2500-4600	06-NOV-13
<b>WG1782911-4</b>	<b>MB</b>							
Sulfur (S)-Total			<500		mg/kg		500	06-NOV-13
<b>WG1782911-8</b>	<b>MB</b>							
Sulfur (S)-Total			<500		mg/kg		500	06-NOV-13
<b>SO4-SHKFLSK-TURB-VA</b>								
<b>Soil</b>								
<b>Batch</b>	<b>R2737254</b>							
<b>WG1782533-2</b>	<b>DUP</b>	<b>L1384673-20</b>						
Sulfate (SO4)		80.1	74.9		mg/L	6.8	25	08-NOV-13
<b>WG1782533-1</b>	<b>MB</b>							
Sulfate (SO4)			<0.50		mg/L		0.5	08-NOV-13
<b>WG1785074-1</b>	<b>MB</b>							
Sulfate (SO4)			<0.50		mg/L		0.5	08-NOV-13
<b>WG1785074-5</b>	<b>MB</b>							
Sulfate (SO4)			<0.50		mg/L		0.5	08-NOV-13

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## Legend:

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Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

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Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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# Quality Control Report

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## Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
<b>Physical Tests</b>							
Moisture content							
	1	07-SEP-13 12:00	05-NOV-13 00:23	14	59	days	EHTR
	2	08-SEP-13 12:00	05-NOV-13 00:23	14	58	days	EHTR
	3	09-SEP-13 12:00	05-NOV-13 00:23	14	57	days	EHTR
	4	10-SEP-13 12:00	05-NOV-13 00:23	14	56	days	EHTR
	5	11-SEP-13 12:00	05-NOV-13 00:23	14	55	days	EHTR
	6	12-SEP-13 12:00	05-NOV-13 00:23	14	54	days	EHTR
	7	13-SEP-13 12:00	05-NOV-13 00:23	14	53	days	EHTR
	8	14-SEP-13 12:00	05-NOV-13 00:23	14	52	days	EHTR
	9	15-SEP-13 12:00	05-NOV-13 00:23	14	51	days	EHTR
	10	16-SEP-13 12:00	05-NOV-13 00:23	14	50	days	EHTR
	11	17-SEP-13 12:00	05-NOV-13 00:23	14	49	days	EHTR
	12	18-SEP-13 12:00	05-NOV-13 00:23	14	48	days	EHTR
	13	19-SEP-13 12:00	05-NOV-13 00:23	14	47	days	EHTR
	14	20-SEP-13 12:00	05-NOV-13 00:23	14	46	days	EHTR
	15	21-SEP-13 12:00	05-NOV-13 00:23	14	45	days	EHTR
	16	22-SEP-13 12:00	05-NOV-13 00:23	14	44	days	EHTR
	17	23-SEP-13 12:00	05-NOV-13 00:23	14	43	days	EHTR
	18	24-SEP-13 12:00	05-NOV-13 00:23	14	42	days	EHTR
	19	25-SEP-13 12:00	05-NOV-13 00:23	14	41	days	EHTR
	20	26-SEP-13 12:00	05-NOV-13 00:23	14	40	days	EHTR

## Leachable Anions & Nutrients

Total Nitrogen by combustion method

	1	07-SEP-13 12:00	06-NOV-13 00:00	28	60	days	EHTR
	2	08-SEP-13 12:00	06-NOV-13 00:00	28	59	days	EHTR
	3	09-SEP-13 12:00	06-NOV-13 00:00	28	58	days	EHTR
	4	10-SEP-13 12:00	06-NOV-13 00:00	28	57	days	EHTR
	5	11-SEP-13 12:00	06-NOV-13 00:00	28	56	days	EHTR
	6	12-SEP-13 12:00	06-NOV-13 00:00	28	55	days	EHTR
	7	13-SEP-13 12:00	06-NOV-13 00:00	28	54	days	EHTR
	8	14-SEP-13 12:00	06-NOV-13 00:00	28	53	days	EHTR
	9	15-SEP-13 12:00	06-NOV-13 00:00	28	52	days	EHTR
	10	16-SEP-13 12:00	06-NOV-13 00:00	28	51	days	EHTR
	11	17-SEP-13 12:00	06-NOV-13 00:00	28	50	days	EHTR
	12	18-SEP-13 12:00	06-NOV-13 00:00	28	49	days	EHTR
	13	19-SEP-13 12:00	06-NOV-13 00:00	28	48	days	EHTR
	14	20-SEP-13 12:00	06-NOV-13 00:00	28	47	days	EHTR
	15	21-SEP-13 12:00	06-NOV-13 00:00	28	46	days	EHTR
	16	22-SEP-13 12:00	06-NOV-13 00:00	28	45	days	EHTR
	17	23-SEP-13 12:00	06-NOV-13 00:00	28	44	days	EHTR
	18	24-SEP-13 12:00	06-NOV-13 00:00	28	43	days	EHTR
	19	25-SEP-13 12:00	06-NOV-13 00:00	28	42	days	EHTR
	20	26-SEP-13 12:00	06-NOV-13 00:00	28	41	days	EHTR

## Cyanides

Total Cyanide in soil by CFA

	1	07-SEP-13 12:00	03-NOV-13 13:33	14	57	days	EHTR
	2	08-SEP-13 12:00	03-NOV-13 13:33	14	56	days	EHTR
	3	09-SEP-13 12:00	03-NOV-13 13:33	14	55	days	EHTR
	4	10-SEP-13 12:00	03-NOV-13 13:33	14	54	days	EHTR
	5	11-SEP-13 12:00	03-NOV-13 13:33	14	53	days	EHTR
	6	12-SEP-13 12:00	03-NOV-13 13:33	14	52	days	EHTR
	7	13-SEP-13 12:00	03-NOV-13 13:33	14	51	days	EHTR
	8	14-SEP-13 12:00	03-NOV-13 13:33	14	50	days	EHTR
	9	15-SEP-13 12:00	03-NOV-13 13:33	14	49	days	EHTR
	10	16-SEP-13 12:00	03-NOV-13 13:33	14	48	days	EHTR
	11	17-SEP-13 12:00	03-NOV-13 13:33	14	47	days	EHTR
	12	18-SEP-13 12:00	03-NOV-13 13:33	14	46	days	EHTR

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## Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
<b>Cyanides</b>							
Total Cyanide in soil by CFA							
	13	19-SEP-13 12:00	03-NOV-13 13:33	14	45	days	EHTR
	14	20-SEP-13 12:00	03-NOV-13 13:33	14	44	days	EHTR
	15	21-SEP-13 12:00	03-NOV-13 13:33	14	43	days	EHTR
	16	22-SEP-13 12:00	03-NOV-13 15:23	14	42	days	EHTR
	17	23-SEP-13 12:00	03-NOV-13 15:23	14	41	days	EHTR
	18	24-SEP-13 12:00	03-NOV-13 15:23	14	40	days	EHTR
	19	25-SEP-13 12:00	03-NOV-13 15:23	14	39	days	EHTR
	20	26-SEP-13 12:00	03-NOV-13 15:23	14	38	days	EHTR
Weak Acid Diss. Cyanide in soil by CFA							
	1	07-SEP-13 12:00	03-NOV-13 13:33	14	57	days	EHTR
	2	08-SEP-13 12:00	03-NOV-13 13:33	14	56	days	EHTR
	3	09-SEP-13 12:00	03-NOV-13 13:33	14	55	days	EHTR
	4	10-SEP-13 12:00	03-NOV-13 13:33	14	54	days	EHTR
	5	11-SEP-13 12:00	03-NOV-13 13:33	14	53	days	EHTR
	6	12-SEP-13 12:00	03-NOV-13 13:33	14	52	days	EHTR
	7	13-SEP-13 12:00	03-NOV-13 13:33	14	51	days	EHTR
	8	14-SEP-13 12:00	03-NOV-13 13:33	14	50	days	EHTR
	9	15-SEP-13 12:00	03-NOV-13 13:33	14	49	days	EHTR
	10	16-SEP-13 12:00	03-NOV-13 13:33	14	48	days	EHTR
	11	17-SEP-13 12:00	03-NOV-13 13:33	14	47	days	EHTR
	12	18-SEP-13 12:00	03-NOV-13 13:33	14	46	days	EHTR
	13	19-SEP-13 12:00	03-NOV-13 13:33	14	45	days	EHTR
	14	20-SEP-13 12:00	03-NOV-13 13:33	14	44	days	EHTR
	15	21-SEP-13 12:00	03-NOV-13 13:33	14	43	days	EHTR
	16	22-SEP-13 12:00	03-NOV-13 15:23	14	42	days	EHTR
	17	23-SEP-13 12:00	03-NOV-13 15:23	14	41	days	EHTR
	18	24-SEP-13 12:00	03-NOV-13 15:23	14	40	days	EHTR
	19	25-SEP-13 12:00	03-NOV-13 15:23	14	39	days	EHTR
	20	26-SEP-13 12:00	03-NOV-13 15:23	14	38	days	EHTR
<b>Organic / Inorganic Carbon</b>							
Organic Carbon by combustion method							
	1	07-SEP-13 12:00	06-NOV-13 00:00	28	60	days	EHTR
	2	08-SEP-13 12:00	06-NOV-13 00:00	28	59	days	EHTR
	3	09-SEP-13 12:00	06-NOV-13 00:00	28	58	days	EHTR
	4	10-SEP-13 12:00	06-NOV-13 00:00	28	57	days	EHTR
	5	11-SEP-13 12:00	06-NOV-13 00:00	28	56	days	EHTR
	6	12-SEP-13 12:00	06-NOV-13 00:00	28	55	days	EHTR
	7	13-SEP-13 12:00	06-NOV-13 00:00	28	54	days	EHTR
	8	14-SEP-13 12:00	06-NOV-13 00:00	28	53	days	EHTR
	9	15-SEP-13 12:00	06-NOV-13 00:00	28	52	days	EHTR
	10	16-SEP-13 12:00	06-NOV-13 00:00	28	51	days	EHTR
	11	17-SEP-13 12:00	06-NOV-13 00:00	28	50	days	EHTR
	12	18-SEP-13 12:00	06-NOV-13 00:00	28	49	days	EHTR
	13	19-SEP-13 12:00	06-NOV-13 00:00	28	48	days	EHTR
	14	20-SEP-13 12:00	06-NOV-13 00:00	28	47	days	EHTR
	15	21-SEP-13 12:00	06-NOV-13 00:00	28	46	days	EHTR
	16	22-SEP-13 12:00	06-NOV-13 00:00	28	45	days	EHTR
	17	23-SEP-13 12:00	06-NOV-13 00:00	28	44	days	EHTR
	18	24-SEP-13 12:00	06-NOV-13 00:00	28	43	days	EHTR
	19	25-SEP-13 12:00	06-NOV-13 00:00	28	42	days	EHTR
	20	26-SEP-13 12:00	06-NOV-13 00:00	28	41	days	EHTR
Total Carbon by combustion method							
	1	07-SEP-13 12:00	06-NOV-13 00:00	28	60	days	EHTR
	2	08-SEP-13 12:00	06-NOV-13 00:00	28	59	days	EHTR
	3	09-SEP-13 12:00	06-NOV-13 00:00	28	58	days	EHTR
	4	10-SEP-13 12:00	06-NOV-13 00:00	28	57	days	EHTR

# Quality Control Report

Workorder: L1384673

Report Date: 19-NOV-13

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## Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
<b>Organic / Inorganic Carbon</b>							
Total Carbon by combustion method							
	5	11-SEP-13 12:00	06-NOV-13 00:00	28	56	days	EHTR
	6	12-SEP-13 12:00	06-NOV-13 00:00	28	55	days	EHTR
	7	13-SEP-13 12:00	06-NOV-13 00:00	28	54	days	EHTR
	8	14-SEP-13 12:00	06-NOV-13 00:00	28	53	days	EHTR
	9	15-SEP-13 12:00	06-NOV-13 00:00	28	52	days	EHTR
	10	16-SEP-13 12:00	06-NOV-13 00:00	28	51	days	EHTR
	11	17-SEP-13 12:00	06-NOV-13 00:00	28	50	days	EHTR
	12	18-SEP-13 12:00	06-NOV-13 00:00	28	49	days	EHTR
	13	19-SEP-13 12:00	06-NOV-13 00:00	28	48	days	EHTR
	14	20-SEP-13 12:00	06-NOV-13 00:00	28	47	days	EHTR
	15	21-SEP-13 12:00	06-NOV-13 00:00	28	46	days	EHTR
	16	22-SEP-13 12:00	06-NOV-13 00:00	28	45	days	EHTR
	17	23-SEP-13 12:00	06-NOV-13 00:00	28	44	days	EHTR
	18	24-SEP-13 12:00	06-NOV-13 00:00	28	43	days	EHTR
	19	25-SEP-13 12:00	06-NOV-13 00:00	28	42	days	EHTR
	20	26-SEP-13 12:00	06-NOV-13 00:00	28	41	days	EHTR

## Metals

Mercury in Soil by CVAFS

	1	07-SEP-13 12:00	05-NOV-13 10:47	28	59	days	EHTR
	2	08-SEP-13 12:00	05-NOV-13 10:47	28	58	days	EHTR
	3	09-SEP-13 12:00	05-NOV-13 10:47	28	57	days	EHTR
	4	10-SEP-13 12:00	05-NOV-13 10:47	28	56	days	EHTR
	5	11-SEP-13 12:00	05-NOV-13 10:47	28	55	days	EHTR
	6	12-SEP-13 12:00	05-NOV-13 10:47	28	54	days	EHTR
	7	13-SEP-13 12:00	05-NOV-13 10:47	28	53	days	EHTR
	8	14-SEP-13 12:00	05-NOV-13 10:47	28	52	days	EHTR
	9	15-SEP-13 12:00	05-NOV-13 10:47	28	51	days	EHTR
	10	16-SEP-13 12:00	05-NOV-13 10:47	28	50	days	EHTR
	11	17-SEP-13 12:00	05-NOV-13 10:47	28	49	days	EHTR
	12	18-SEP-13 12:00	05-NOV-13 10:47	28	48	days	EHTR
	13	19-SEP-13 12:00	05-NOV-13 10:47	28	47	days	EHTR
	14	20-SEP-13 12:00	05-NOV-13 10:47	28	46	days	EHTR
	15	21-SEP-13 12:00	05-NOV-13 10:47	28	45	days	EHTR
	16	22-SEP-13 12:00	05-NOV-13 10:47	28	44	days	EHTR
	17	23-SEP-13 12:00	05-NOV-13 10:47	28	43	days	EHTR
	18	24-SEP-13 12:00	05-NOV-13 10:47	28	42	days	EHTR
	19	25-SEP-13 12:00	05-NOV-13 10:47	28	41	days	EHTR
	20	26-SEP-13 12:00	05-NOV-13 10:47	28	40	days	EHTR

## Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

## Notes\*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.

Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1384673 were received on 25-OCT-13 13:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

# Quality Control Report

Workorder: L1384673

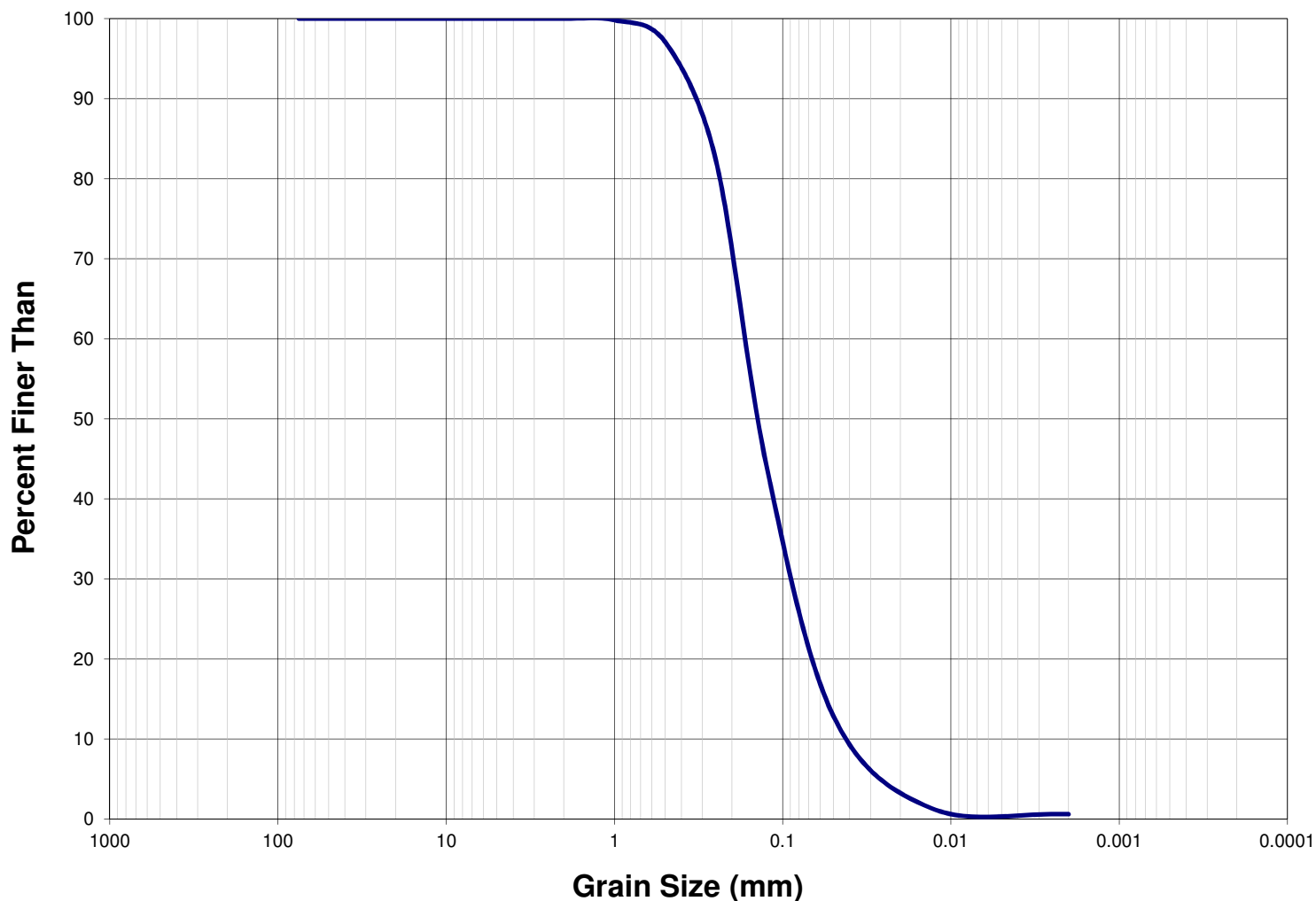
Report Date: 19-NOV-13

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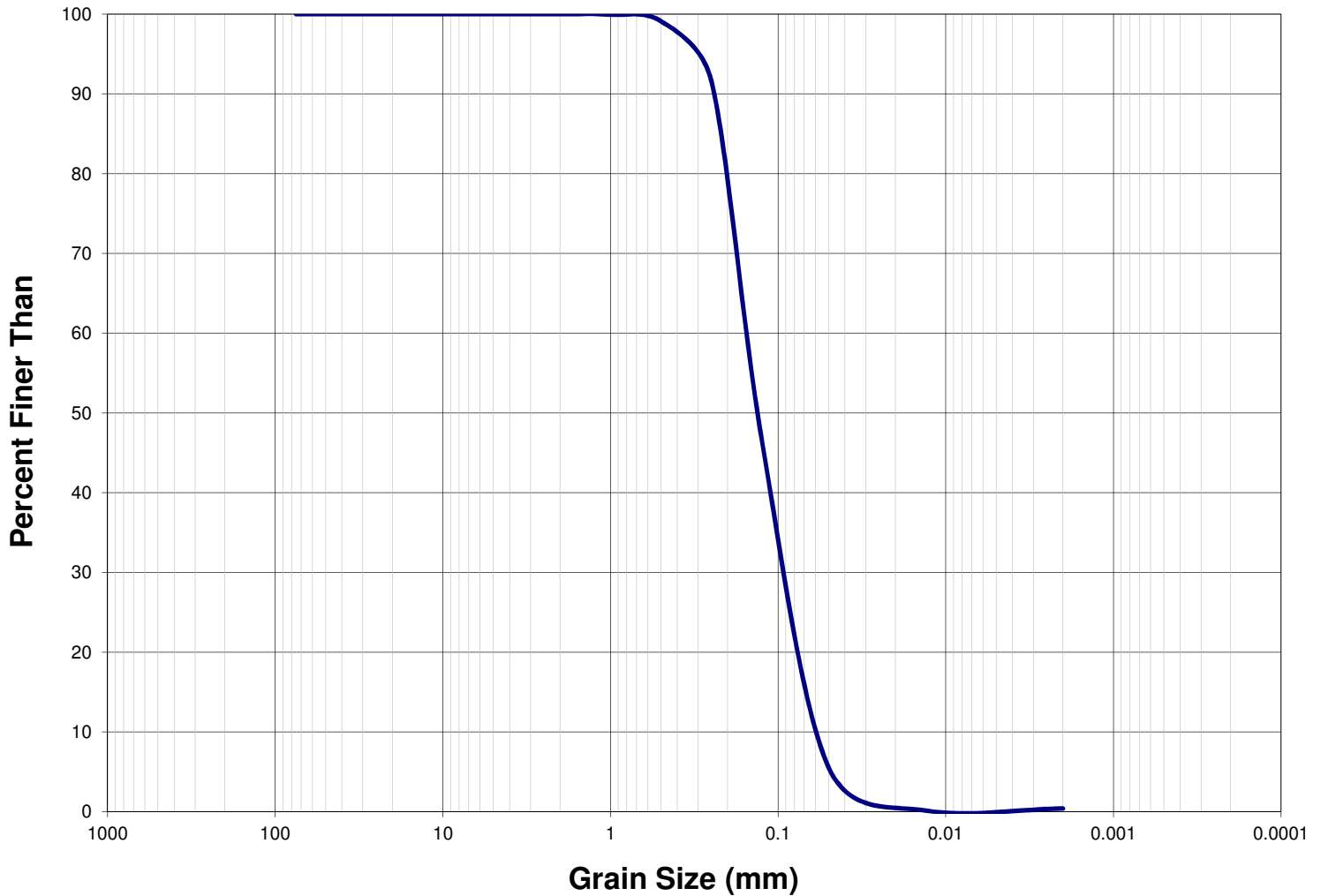
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

## Particle Size Distribution Curve



## Particle Size Distribution Curve



### Particle Size Distribution

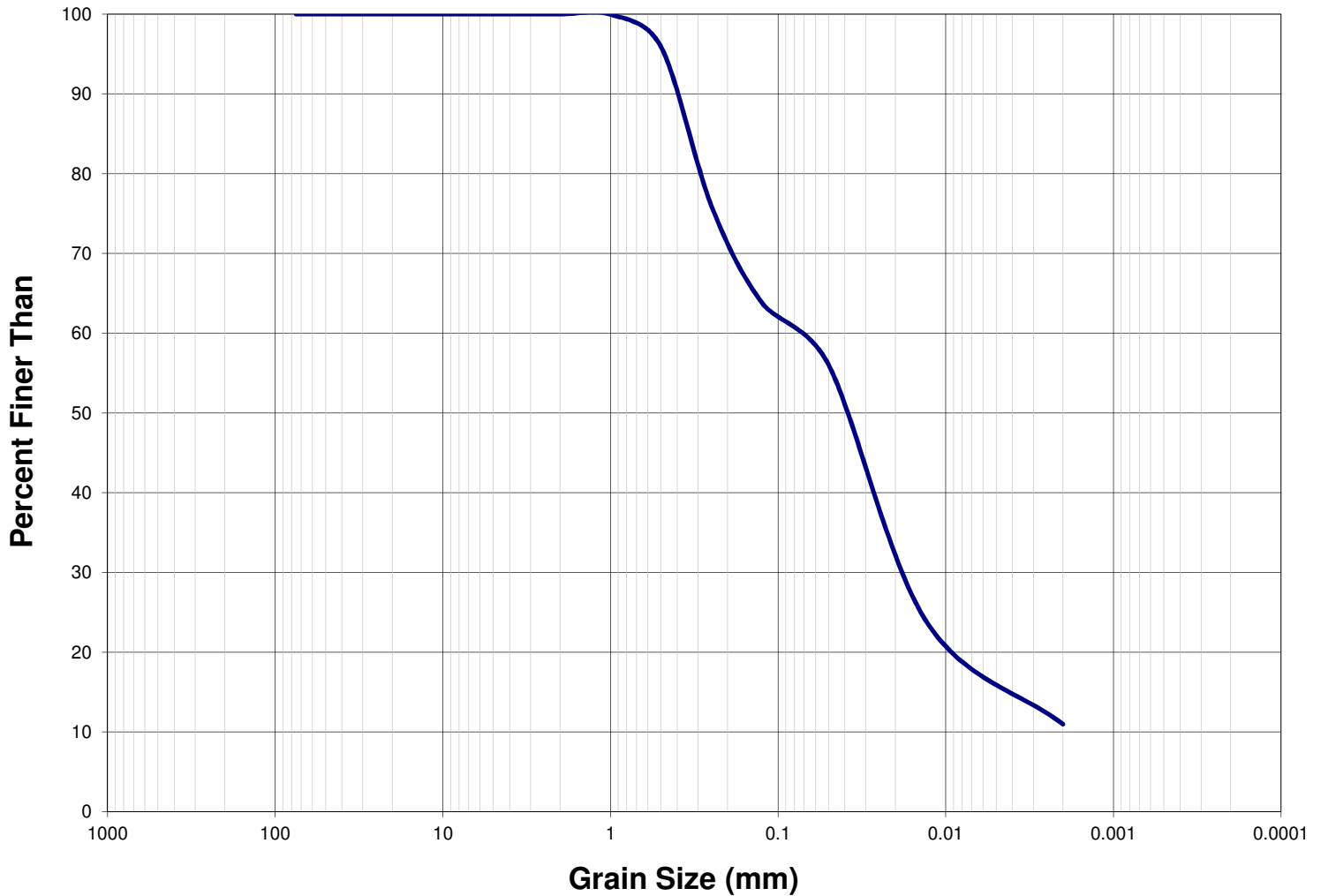
Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	0.00
9.5 - 4.75	0.00
4.75 - 2.36	0.00
2.36 - 1.18	0.05
1.18 - 0.6	0.68
0.6 - 0.3	6.16
0.3 - 0.15	37.55
0.15 - 0.075	36.34
<0.075	19.22

Range (mm)	Wt. (%)

Texture: Sand



## Particle Size Distribution Curve



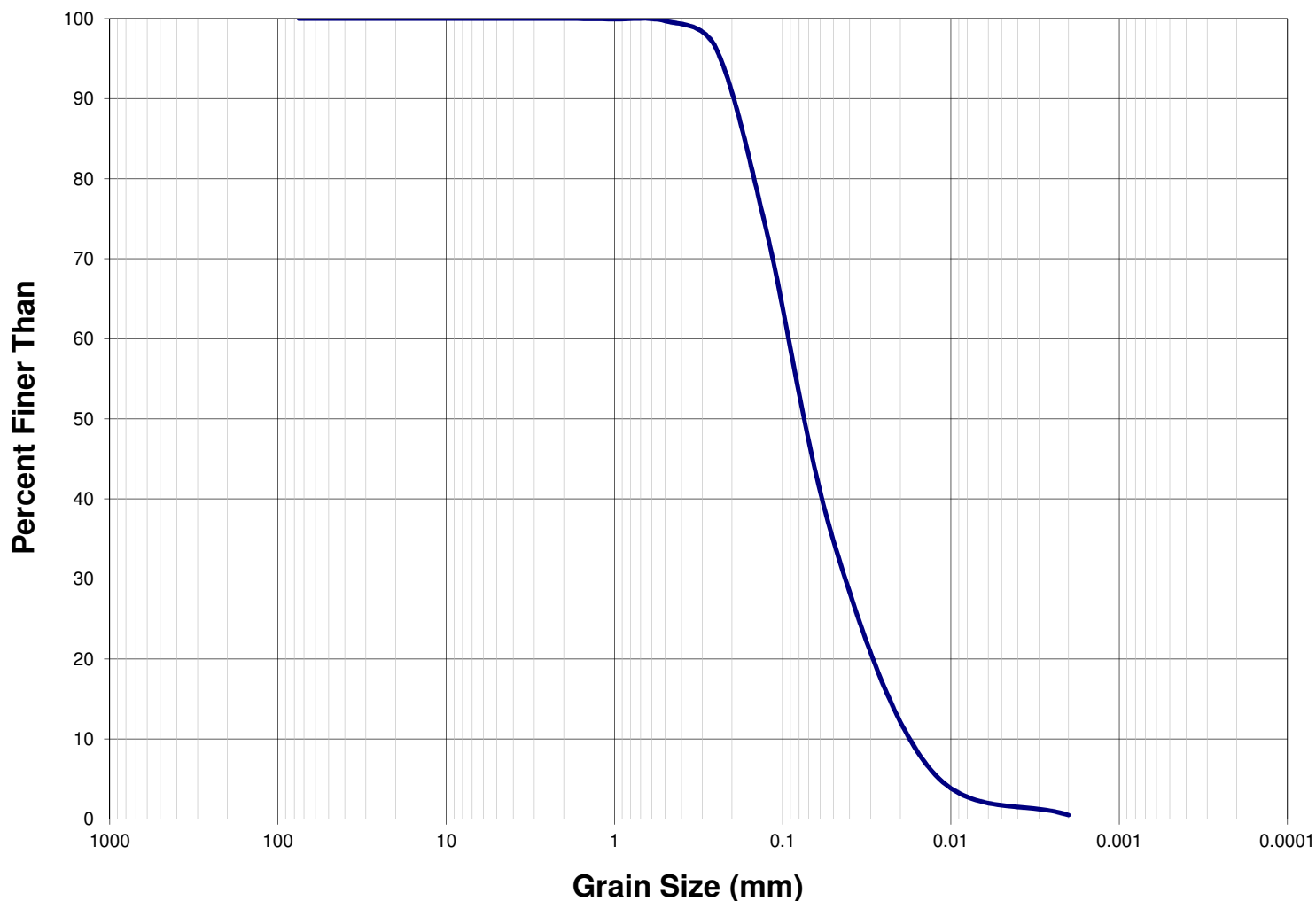
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	0.00
9.5 - 4.75	0.00
4.75 - 2.36	0.00
2.36 - 1.18	0.04
1.18 - 0.6	3.23
0.6 - 0.3	16.76
0.3 - 0.15	13.70
0.15 - 0.075	7.63
<0.075	58.63

Range (mm)	Wt. (%)

Texture: Loam

## Particle Size Distribution Curve



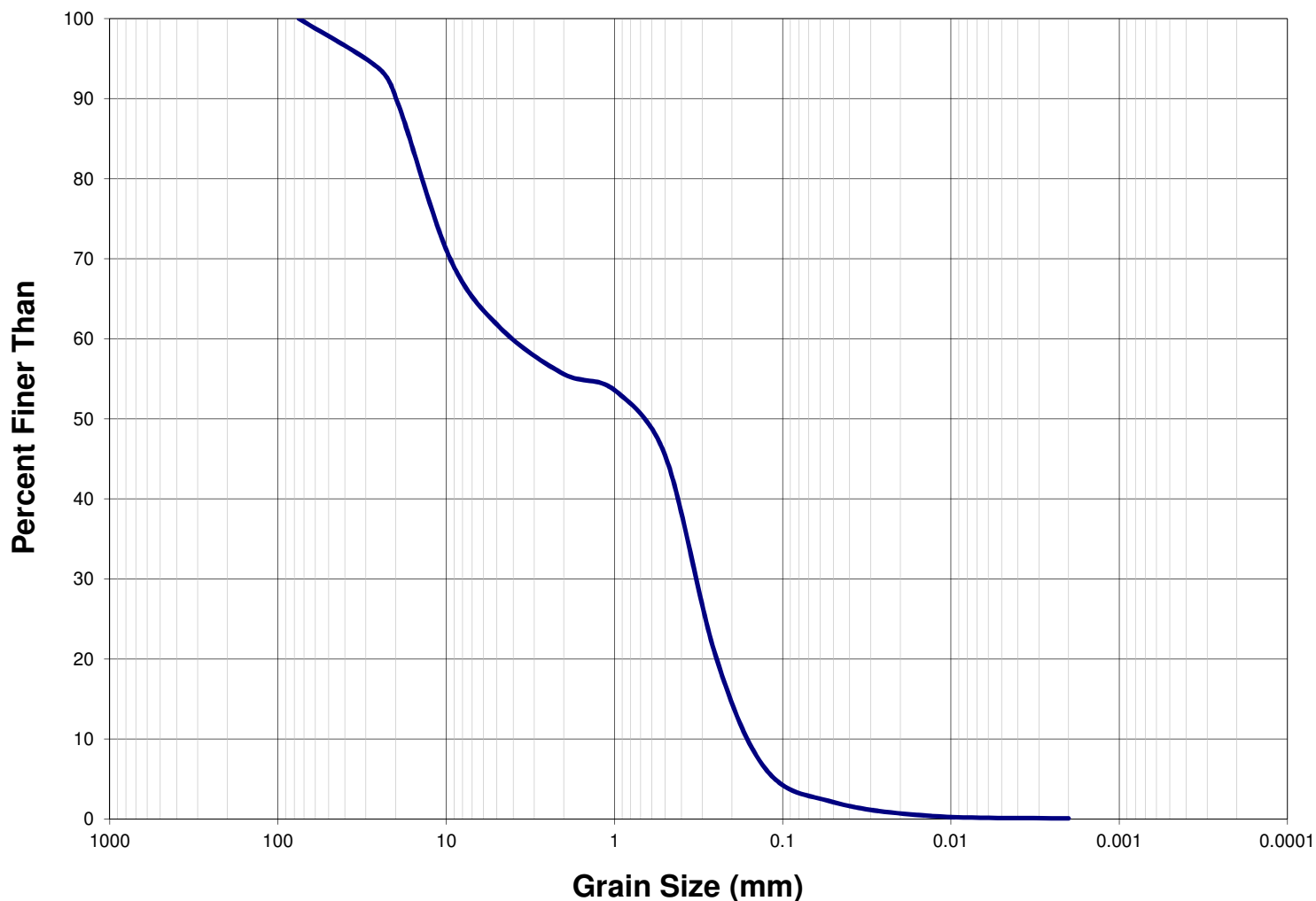
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	0.00
9.5 - 4.75	0.00
4.75 - 2.36	0.00
2.36 - 1.18	0.06
1.18 - 0.6	0.19
0.6 - 0.3	2.73
0.3 - 0.15	18.91
0.15 - 0.075	30.39
<0.075	47.73

Range (mm)	Wt. (%)

Texture: Sandy loam

## Particle Size Distribution Curve



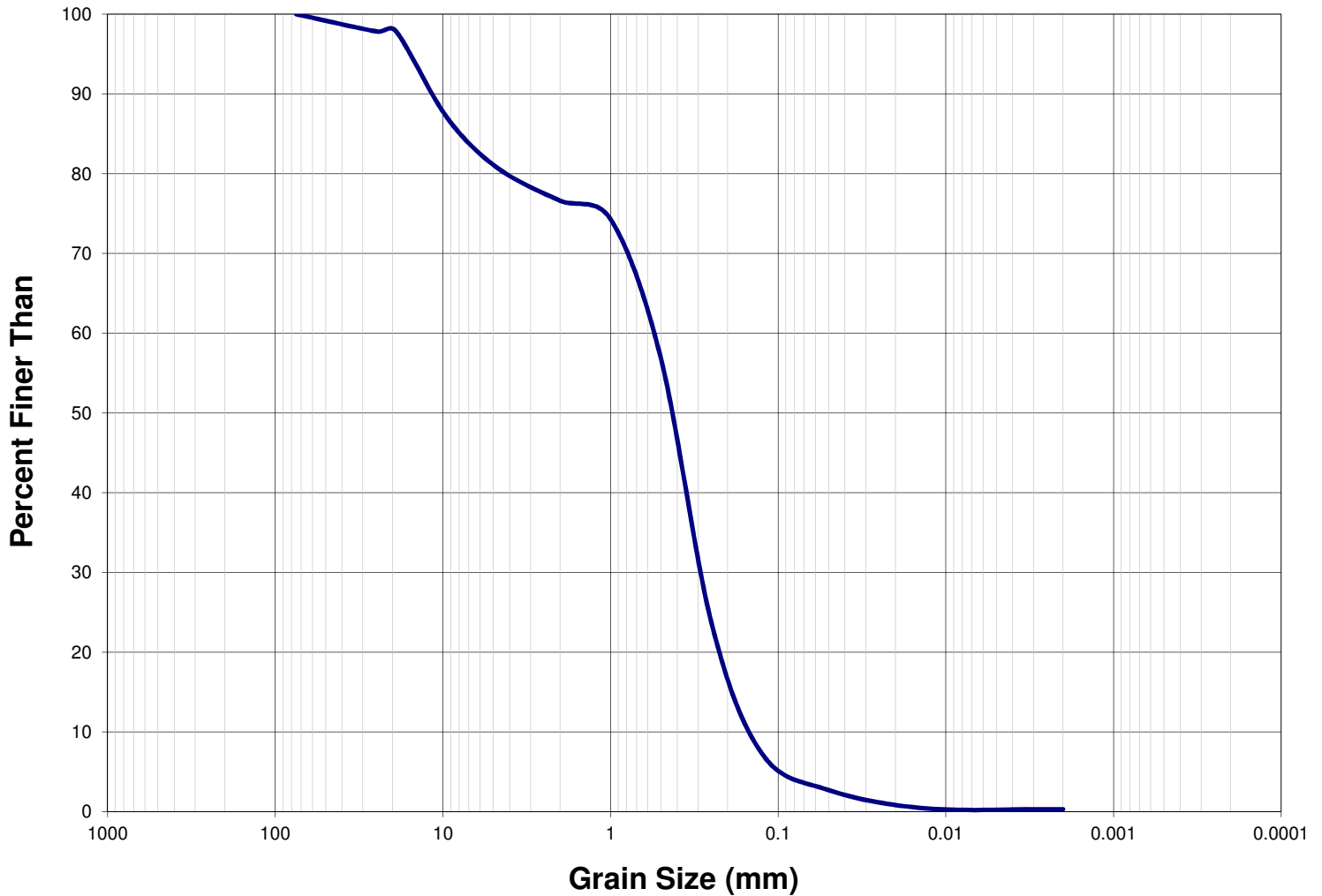
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	6.37
19 - 9.5	18.87
9.5 - 4.75	8.73
4.75 - 2.36	4.97
2.36 - 1.18	2.39
1.18 - 0.6	6.89
0.6 - 0.3	21.68
0.3 - 0.15	16.40
0.15 - 0.075	5.53
<0.075	3.45

Range (mm)	Wt. (%)

Texture: Sand

## Particle Size Distribution Curve



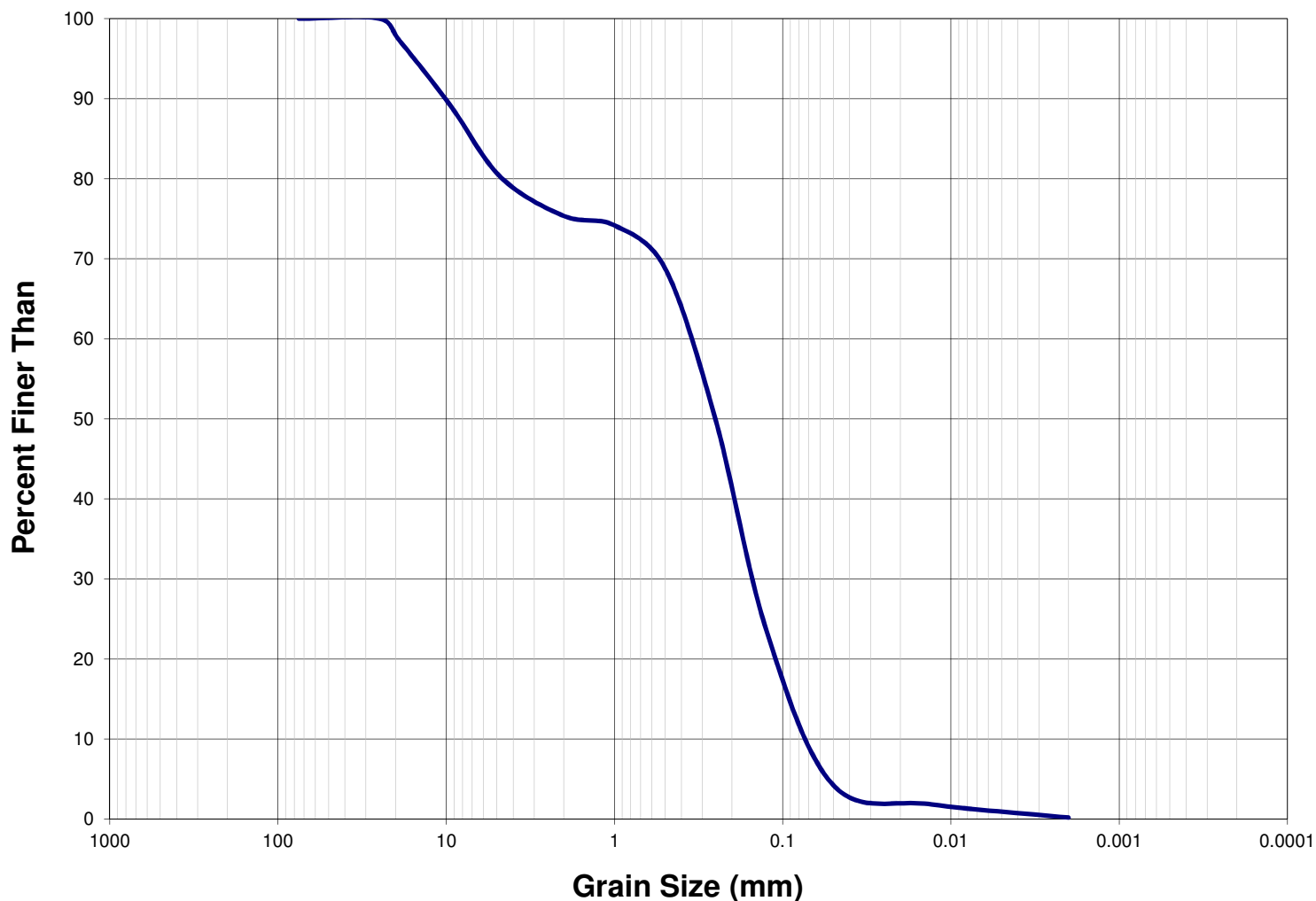
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.54
19 - 9.5	10.73
9.5 - 4.75	6.36
4.75 - 2.36	3.59
2.36 - 1.18	2.45
1.18 - 0.6	14.43
0.6 - 0.3	29.99
0.3 - 0.15	19.73
0.15 - 0.075	6.32
<0.075	4.24

Range (mm)	Wt. (%)

Texture: Sand

## Particle Size Distribution Curve



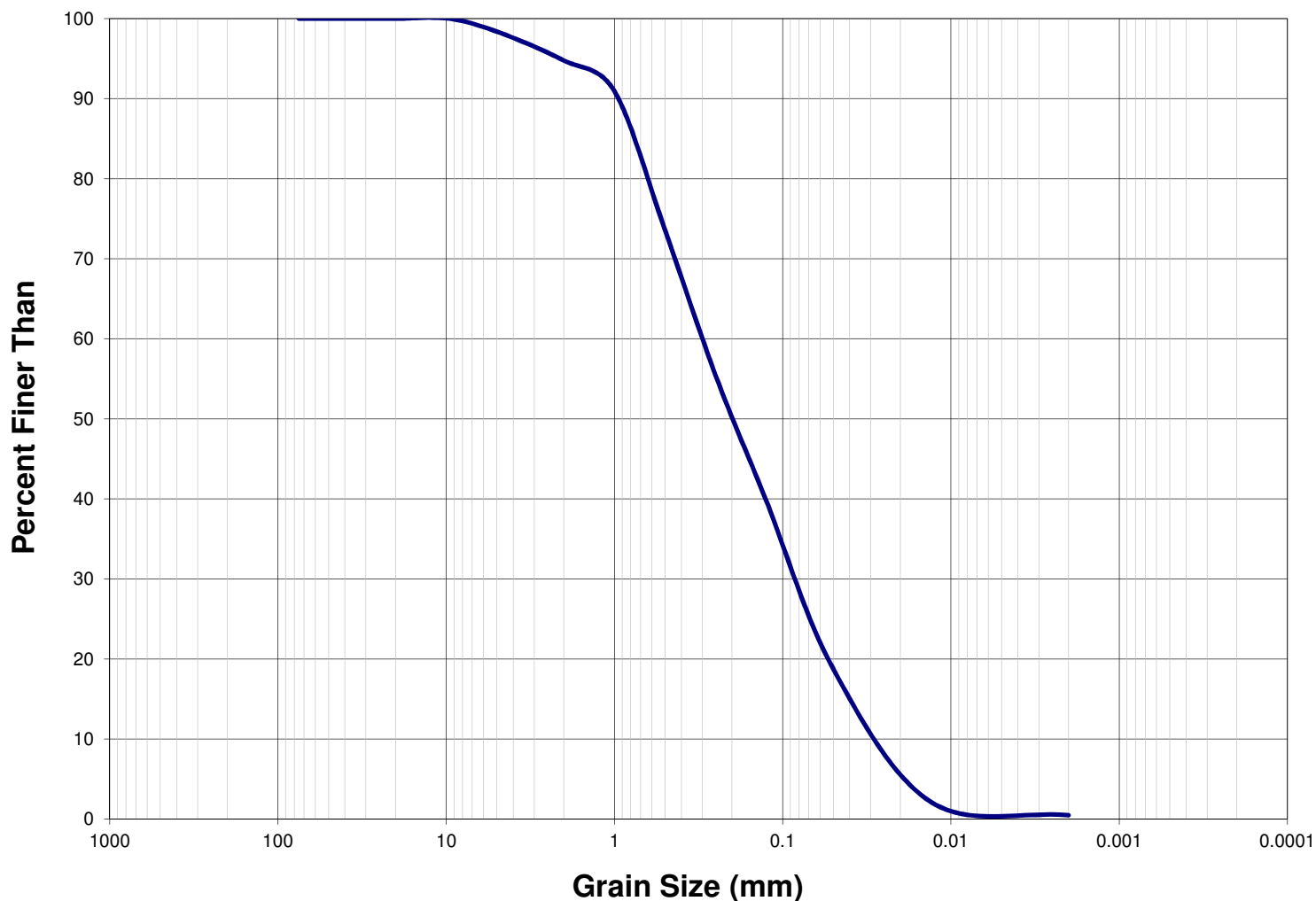
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	2.71
19 - 9.5	8.07
9.5 - 4.75	9.03
4.75 - 2.36	4.21
2.36 - 1.18	1.60
1.18 - 0.6	4.51
0.6 - 0.3	16.27
0.3 - 0.15	24.78
0.15 - 0.075	18.16
<0.075	10.68

Range (mm)	Wt. (%)

Texture: Sand

## Particle Size Distribution Curve



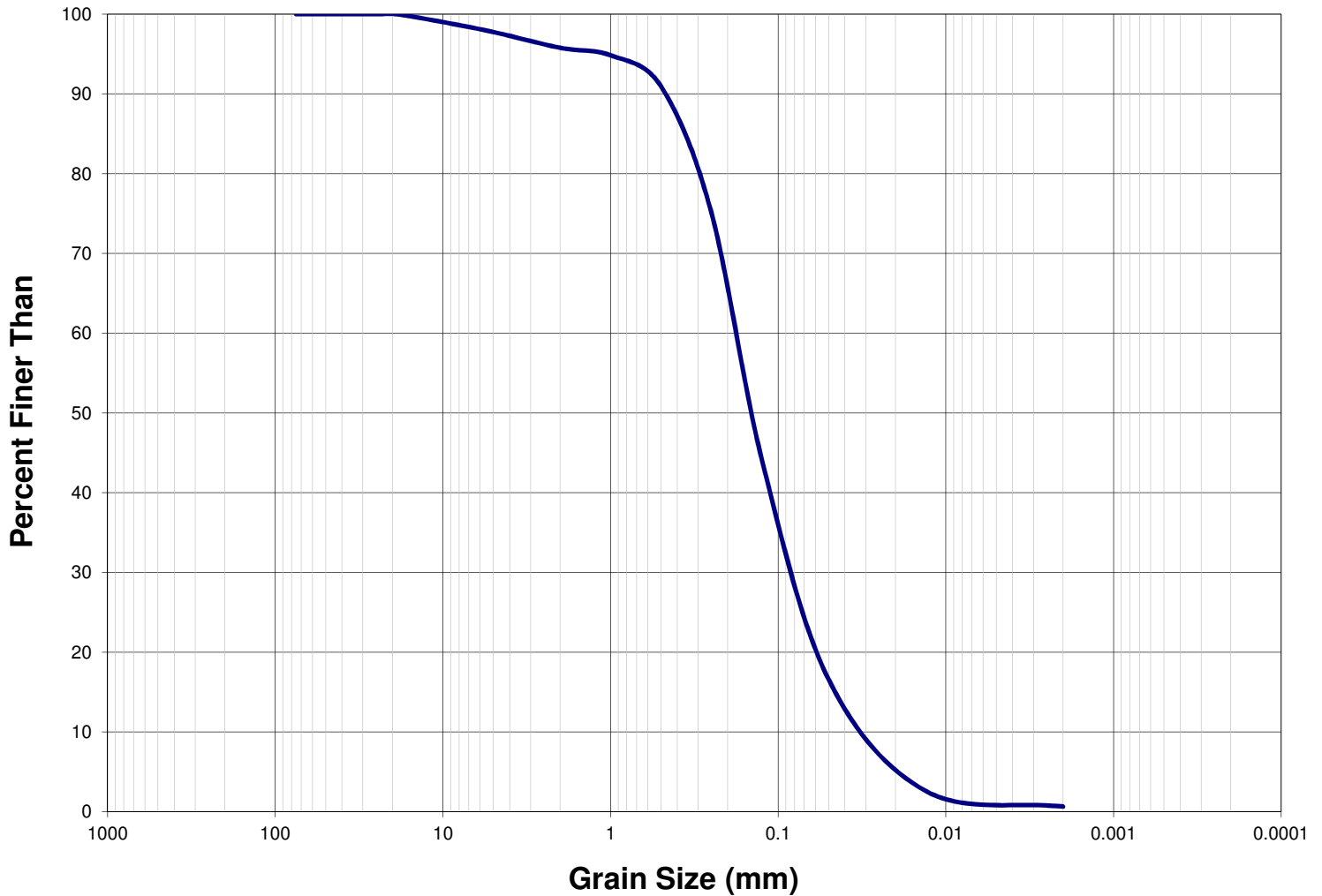
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	0.00
9.5 - 4.75	1.80
4.75 - 2.36	2.98
2.36 - 1.18	3.59
1.18 - 0.6	14.60
0.6 - 0.3	18.00
0.3 - 0.15	16.17
0.15 - 0.075	17.13
<0.075	25.72

Range (mm)	Wt. (%)

Texture: Loamy sand

## Particle Size Distribution Curve



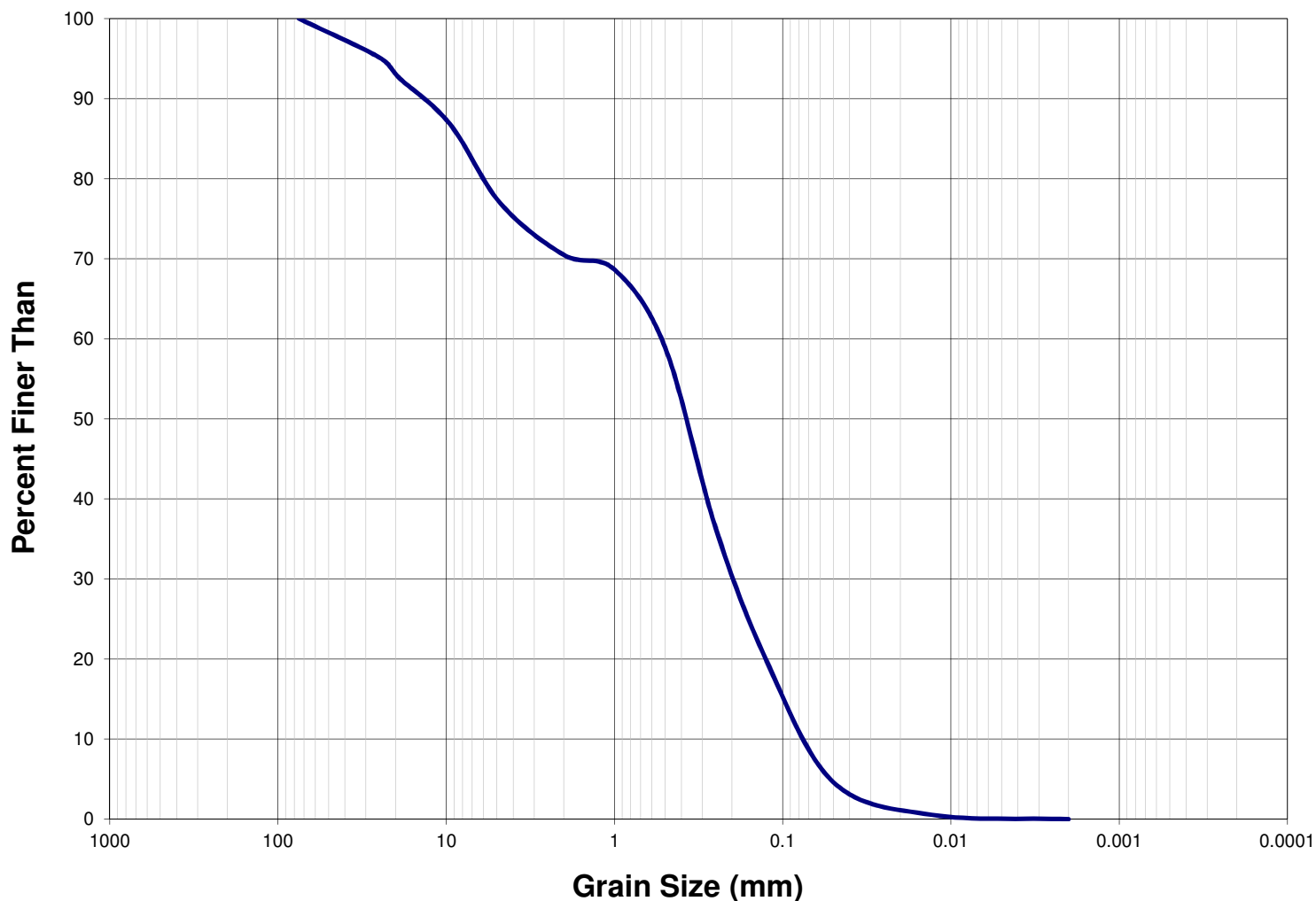
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	1.08
9.5 - 4.75	1.28
4.75 - 2.36	1.62
2.36 - 1.18	1.02
1.18 - 0.6	3.29
0.6 - 0.3	13.48
0.3 - 0.15	27.93
0.15 - 0.075	24.56
<0.075	25.75

Range (mm)	Wt. (%)

Texture: Loamy sand

## Particle Size Distribution Curve



### Particle Size Distribution

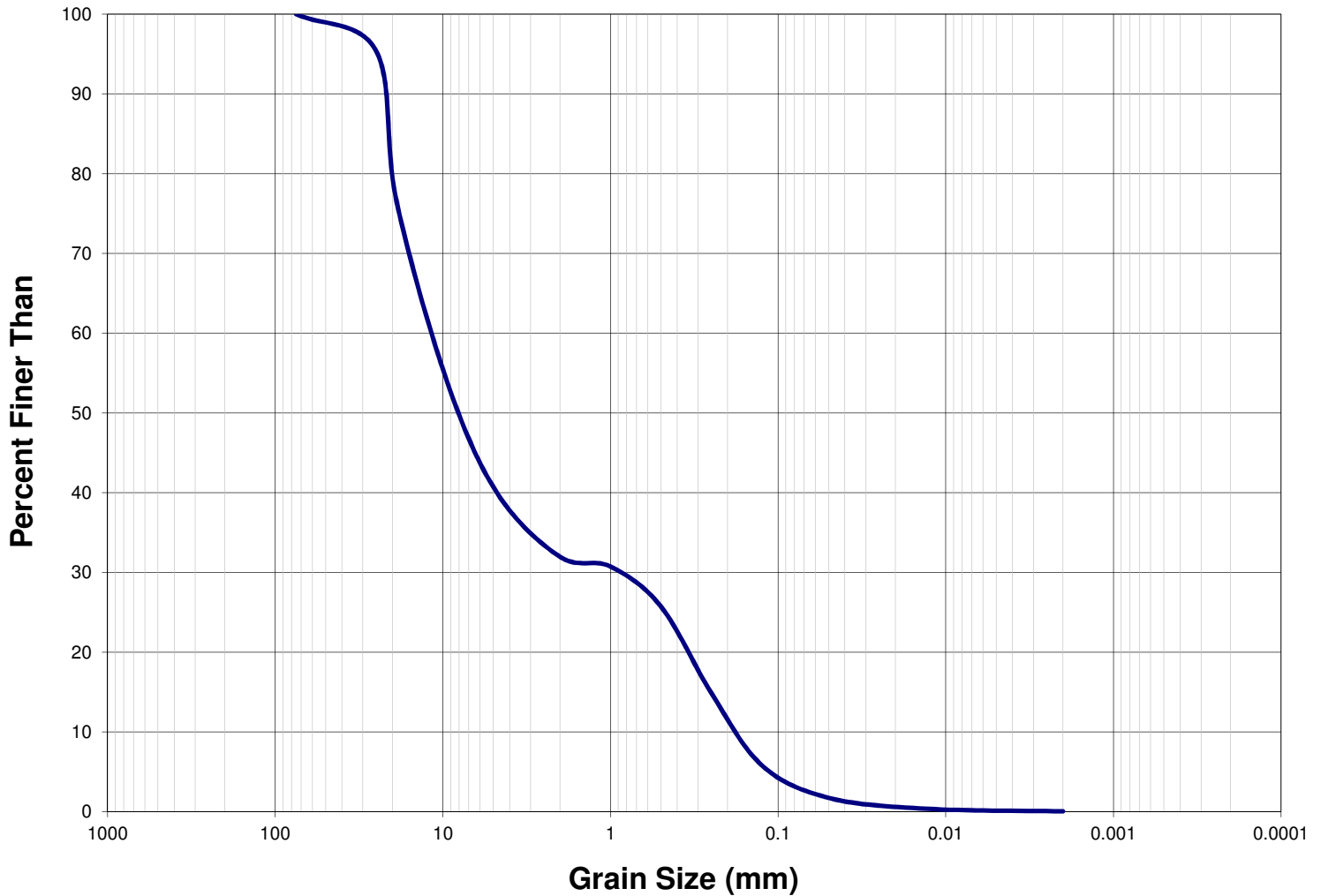
Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	3.79
19 - 9.5	5.75
9.5 - 4.75	9.94
4.75 - 2.36	5.57
2.36 - 1.18	2.35
1.18 - 0.6	8.11
0.6 - 0.3	20.03
0.3 - 0.15	17.72
0.15 - 0.075	13.44
<0.075	9.68

Range (mm)	Wt. (%)

Texture: #N/A



## Particle Size Distribution Curve



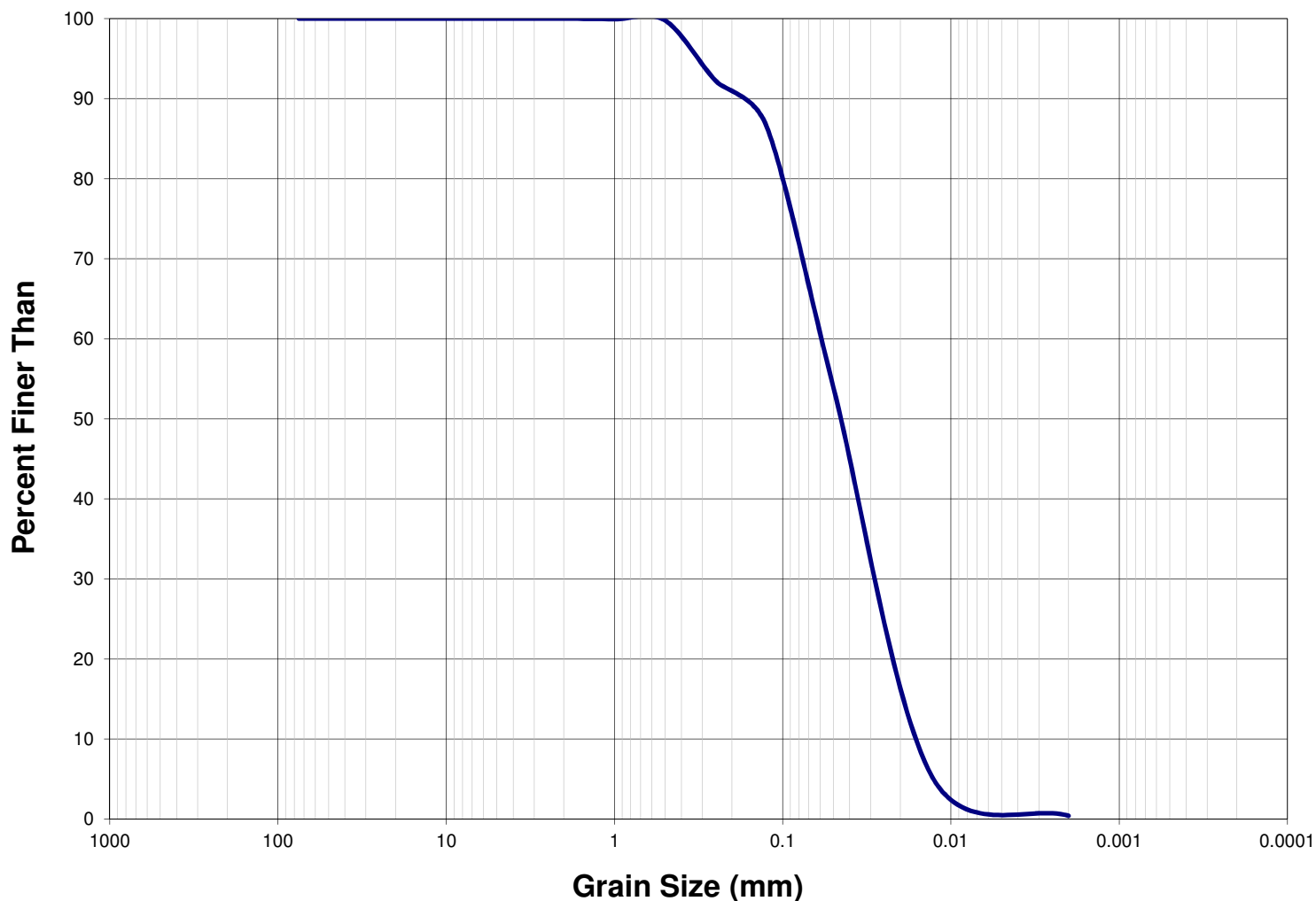
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	19.73
19 - 9.5	22.70
9.5 - 4.75	14.15
4.75 - 2.36	6.96
2.36 - 1.18	2.05
1.18 - 0.6	4.23
0.6 - 0.3	9.69
0.3 - 0.15	9.42
0.15 - 0.075	4.52
<0.075	3.10

Range (mm)	Wt. (%)

Texture: Sand

## Particle Size Distribution Curve



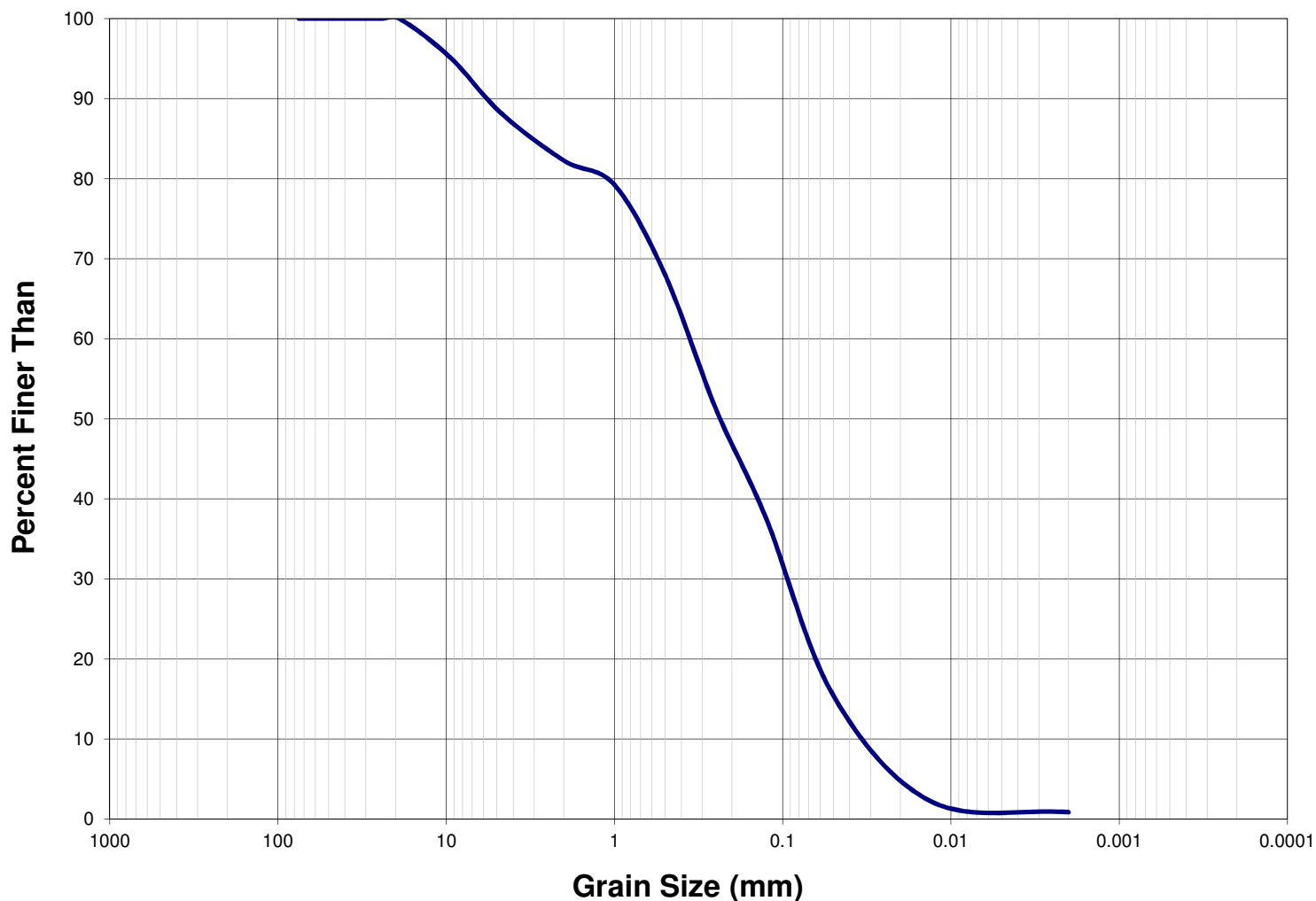
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	0.00
9.5 - 4.75	0.00
4.75 - 2.36	0.00
2.36 - 1.18	0.06
1.18 - 0.6	0.13
0.6 - 0.3	6.08
0.3 - 0.15	6.01
0.15 - 0.075	22.87
<0.075	64.84

Range (mm)	Wt. (%)

Texture: Silt loam

## Particle Size Distribution Curve



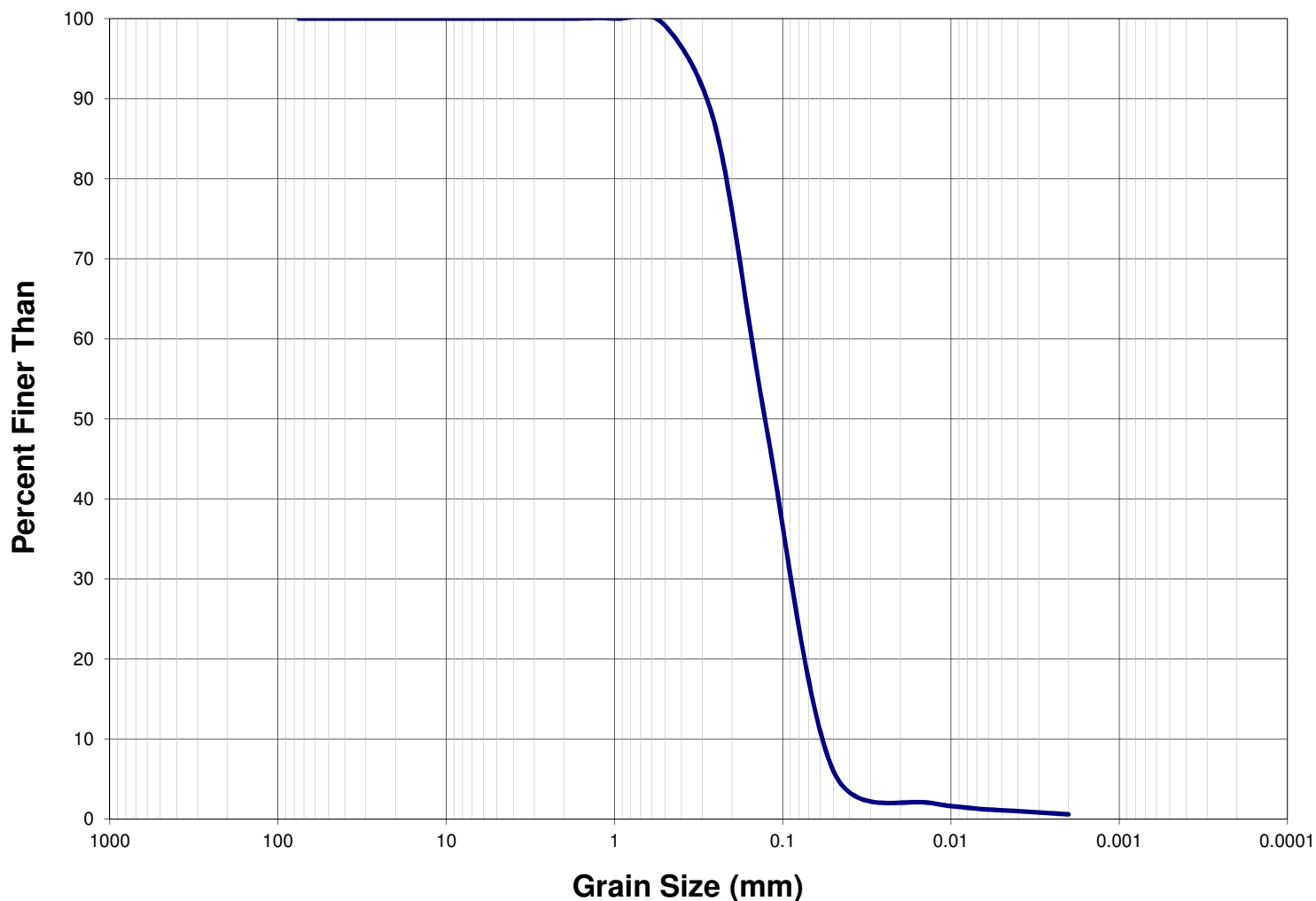
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	4.82
9.5 - 4.75	6.94
4.75 - 2.36	5.19
2.36 - 1.18	3.29
1.18 - 0.6	9.53
0.6 - 0.3	15.61
0.3 - 0.15	14.39
0.15 - 0.075	17.47
<0.075	22.77

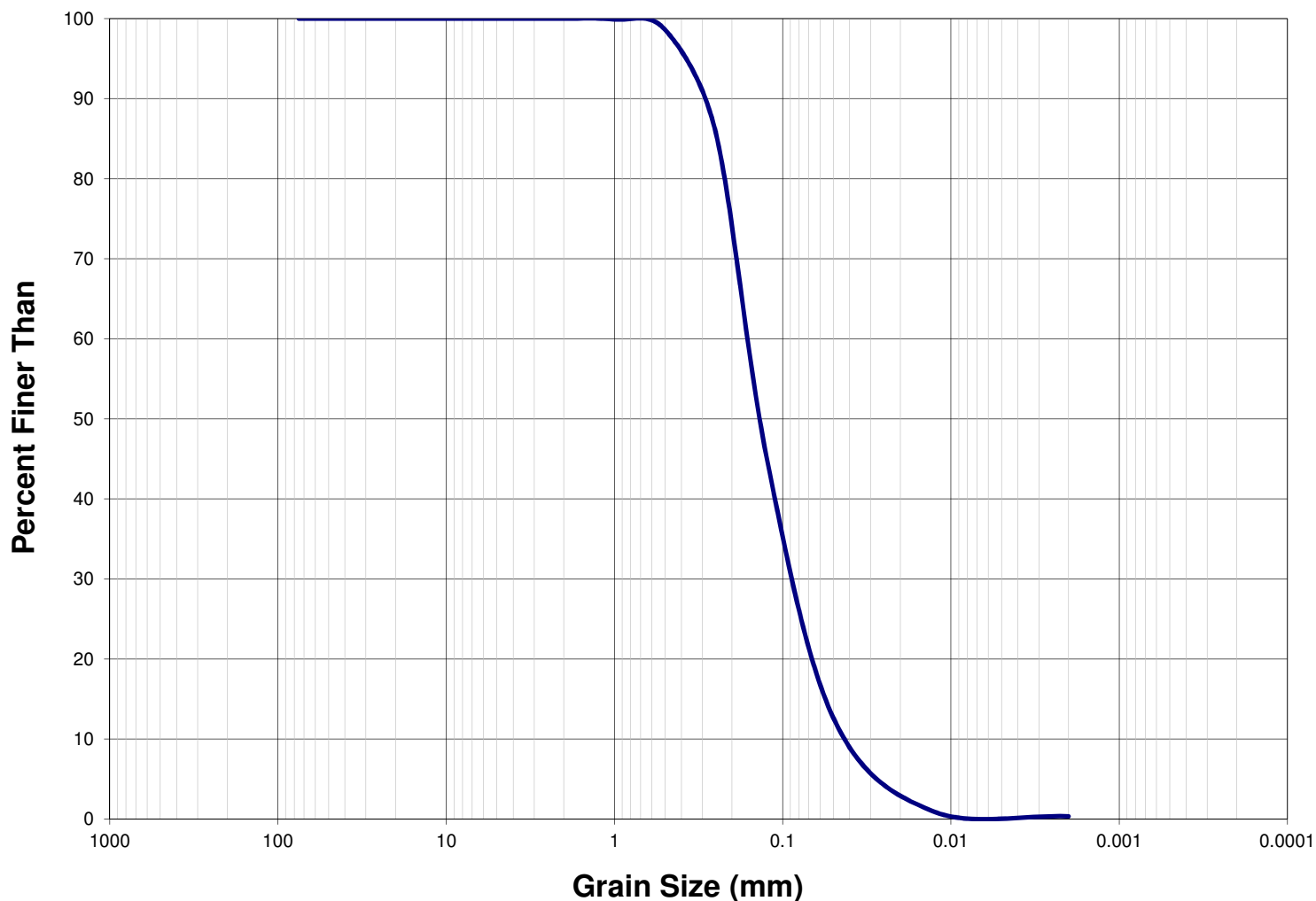
Range (mm)	Wt. (%)

Texture: Loamy sand

## Particle Size Distribution Curve



## Particle Size Distribution Curve



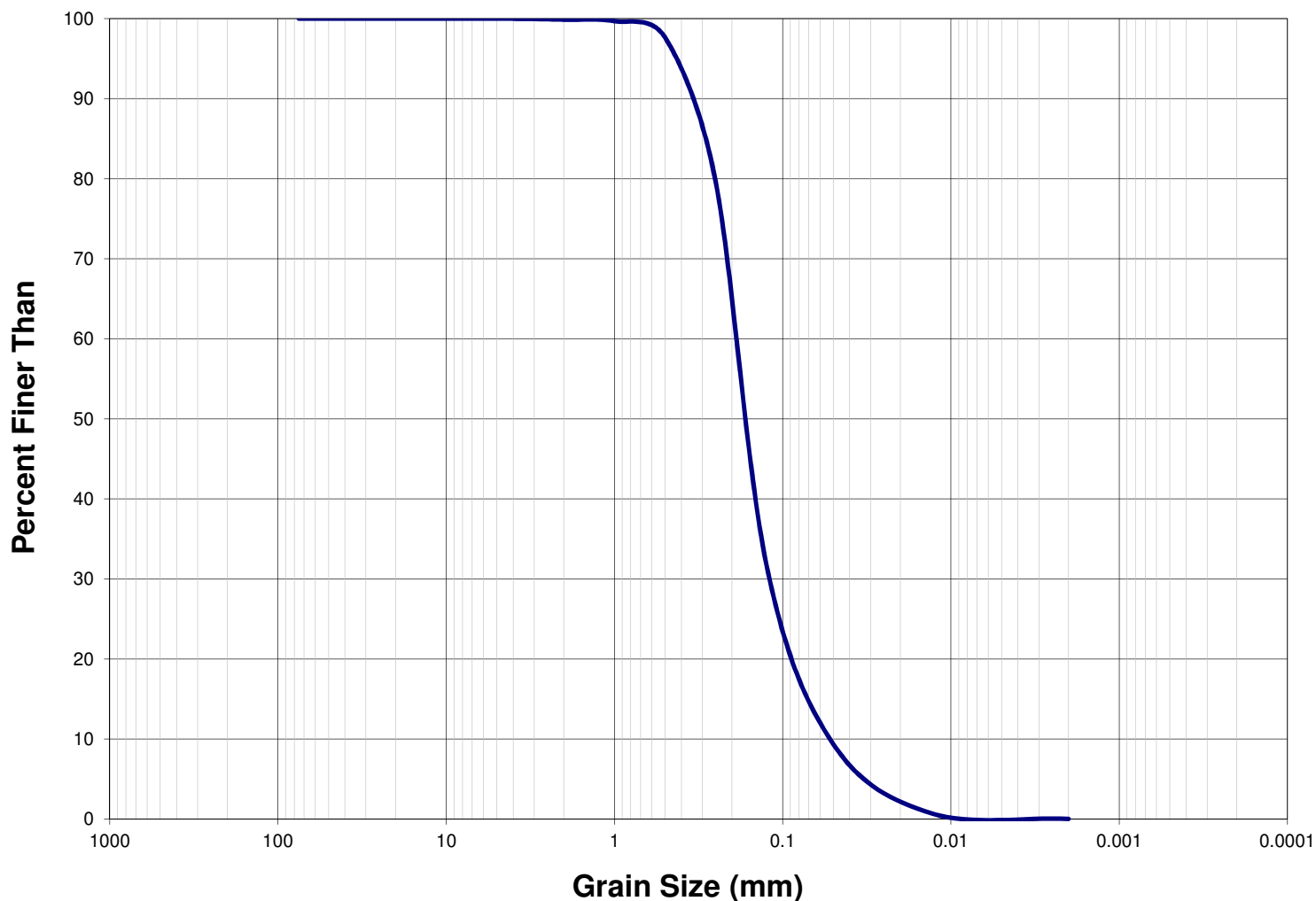
### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	0.00
9.5 - 4.75	0.00
4.75 - 2.36	0.00
2.36 - 1.18	0.08
1.18 - 0.6	1.06
0.6 - 0.3	10.54
0.3 - 0.15	34.89
0.15 - 0.075	29.89
<0.075	23.54

Range (mm)	Wt. (%)

Texture: Sand

## Particle Size Distribution Curve



### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	0.00
9.5 - 4.75	0.00
4.75 - 2.36	0.11
2.36 - 1.18	0.18
1.18 - 0.6	1.67
0.6 - 0.3	14.85
0.3 - 0.15	41.83
0.15 - 0.075	24.53
<0.075	16.84

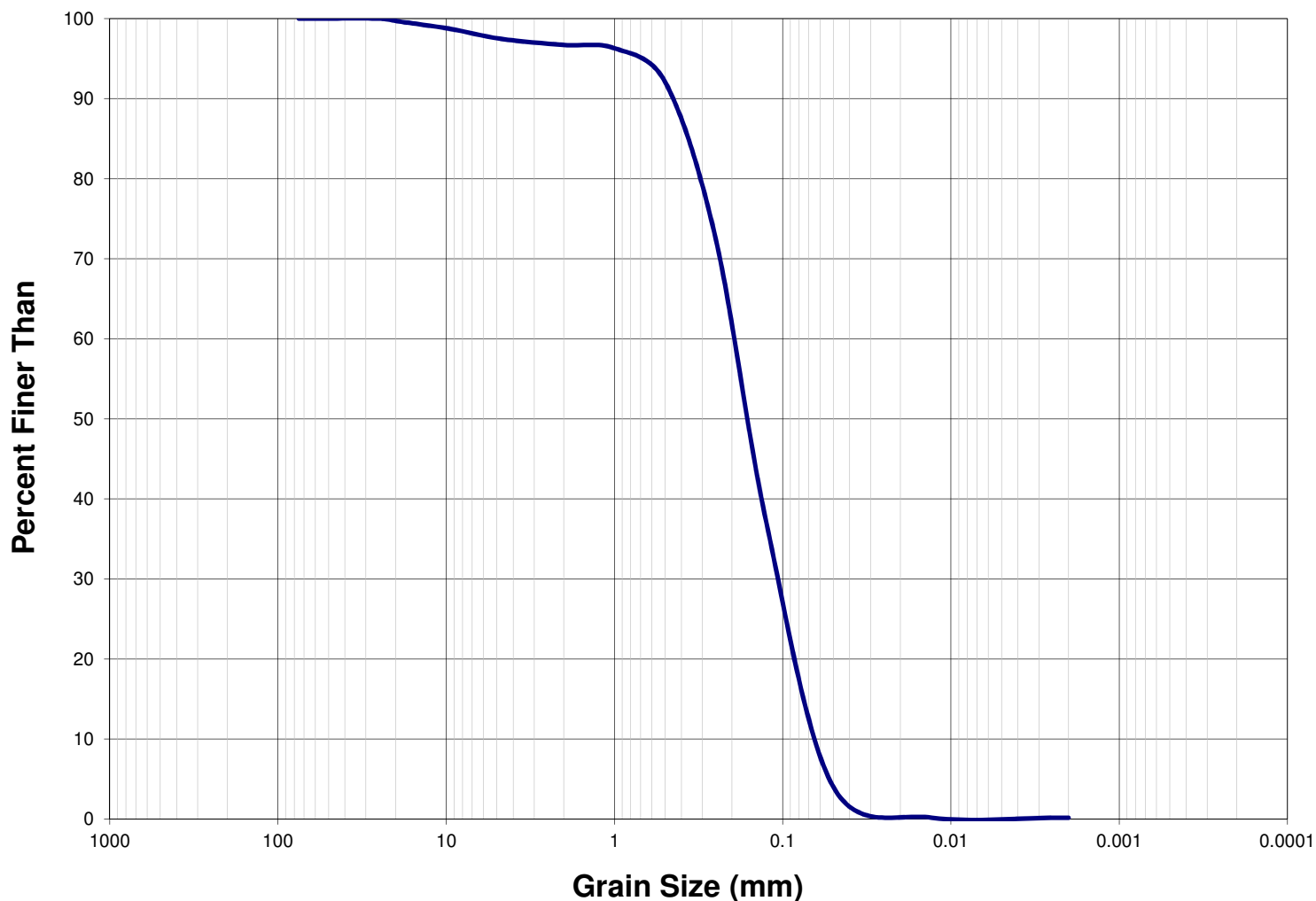
Range (mm)	Wt. (%)

Texture: Sand



**Lab ID: L1384673-6**

## Particle Size Distribution Curve



### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.36
19 - 9.5	0.91
9.5 - 4.75	1.25
4.75 - 2.36	0.67
2.36 - 1.18	0.44
1.18 - 0.6	3.44
0.6 - 0.3	16.54
0.3 - 0.15	32.27
0.15 - 0.075	29.10
<0.075	15.02

Range (mm)	Wt. (%)

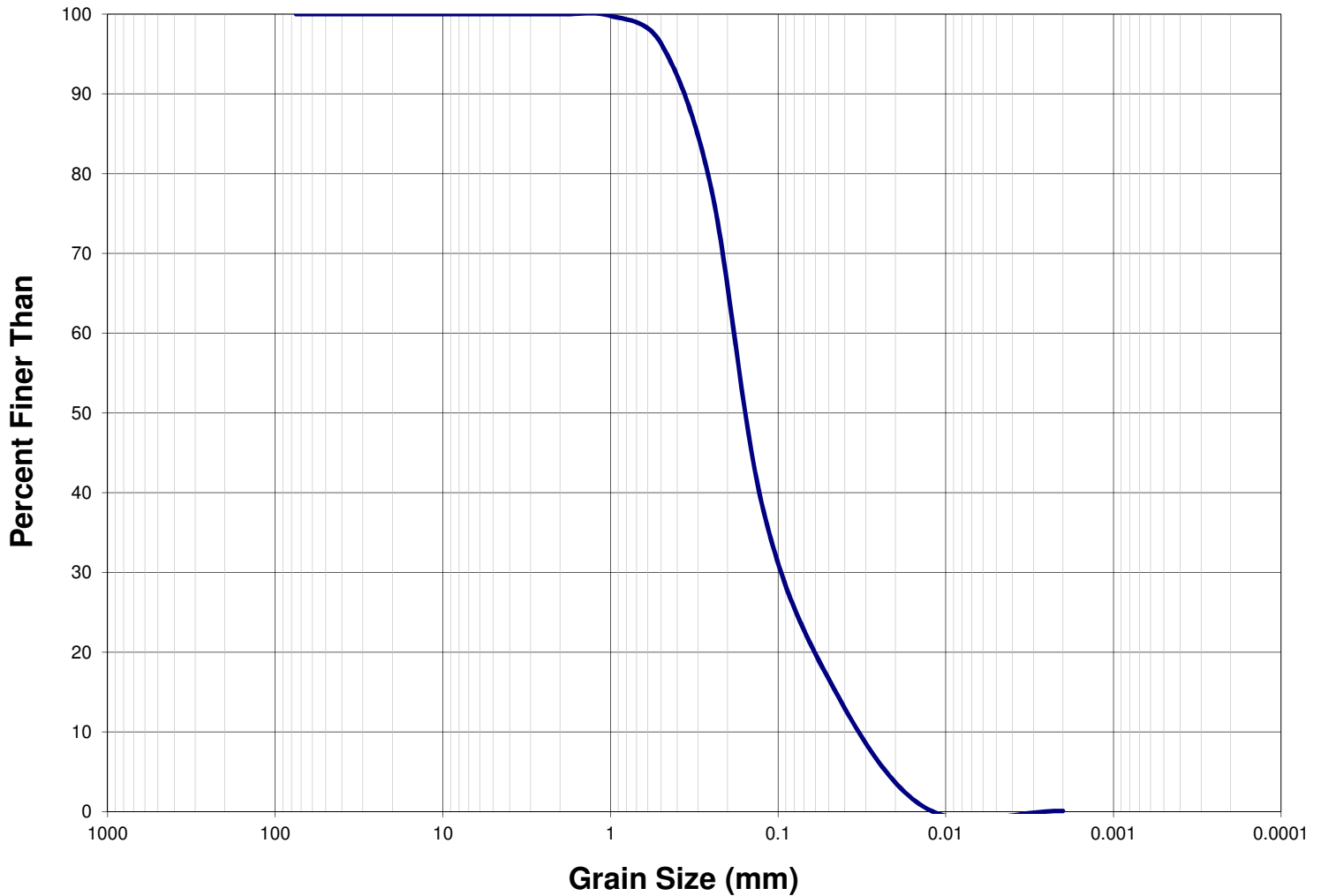
Texture: Sand





**Lab ID: L1384673-8**

## Particle Size Distribution Curve



### Particle Size Distribution

Range (mm)	Wt. (%)
> 37.5	0
37.5 - 19	0.00
19 - 9.5	0.00
9.5 - 4.75	0.00
4.75 - 2.36	0.00
2.36 - 1.18	0.18
1.18 - 0.6	2.80
0.6 - 0.3	15.33
0.3 - 0.15	35.23
0.15 - 0.075	22.50
<0.075	23.96

Range (mm)	Wt. (%)

Texture: Loamy sand



ALS Environmental

Chain of Custody / Analytical Request Form  
Canada Toll Free: 1 800 668 9878  
www.alsglobal.com

COC #

Page of

Report To				Report Format / Distribution				Service Requested (rush for routine analysis subject to availability)							
Company: AMEC				<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other				<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)							
Contact: Leslie Hardy				<input checked="" type="checkbox"/> PDF <input type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax				<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT							
Address: 5681-70 St				Email 1: leslie.hardy@amec.com				<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT							
Edmonton, AB, T6B 3P6				Email 2:				<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT							
Phone: 780-436-2152				Fax:				Analysis Request							
Invoice To: Same as Report?				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Please indicate below Filled, Preserved or both (F, P, F/P)							
Hardcopy of invoice with Report?				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No											
Company:				Client / Project Information											
Address:				Job #: VM00605E 2380											
Phone:				PO / A/E:											
Fax:				LSD:											
Quote #:				ALS Contract:											
Lab Work Order #				Dean Watt											
(lab use only)				Date											
Sample Identification				Date				Time				Sample Type			
(This description will appear on the report)				(dd-mm-yy)				(hh-mm)				CM			
SED-DC-1				07-Sep-13								Sediment			
SED-DC-2				08-Sep-13								Sediment			
SED-DC-3				09-Sep-13								Sediment			
SED-DC-4				10-Sep-13								Sediment			
SED-DC-5				11-Sep-13								Sediment			
SED-DC-6				12-Sep-13								Sediment			
SED-DC-7				13-Sep-13								Sediment			
SED-DC-8				14-Sep-13								Sediment			
SED-DC-9				15-Sep-13								Sediment			
SED-DC-10				16-Sep-13								Sediment			
SED-DC-11				17-Sep-13								Sediment			
SED-DC-12				18-Sep-13								Sediment			
SED-DC-13				19-Sep-13								Sediment			
SED-DC-14				20-Sep-13								Sediment			
SED-DC-15				21-Sep-13								Sediment			
SED-DC-16				22-Sep-13								Sediment			
SED-DC-17				23-Sep-13								Sediment			
SED-DC-18				24-Sep-13								Sediment			
SED-DC-19				25-Sep-13								Sediment			
SED-DC-20				26-Sep-13								Sediment			

L1384673-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/FIC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Grain size distribution to (more or less) follow ASTM C136 and C117.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)	SHIPMENT RECEPTION (lab use only)	SHIPMENT VERIFICATION (lab use only)						
Date (dd-mm-yy)	Time (hh-mm)	Date	Time	Temperature	Verified by	Date	Time	Observations: Yes / No ? If Yes add SIF
25-09-13	12:00	1.5	0C					