



1-800-363-1067

950, AVENUE PION, ST-HYACINTHE, QC J2S 8B1

BON DE CONNAISSANCEMENT

FOR-01

Bon de connaissance

70641

A. GénérateurNom: DEPARTEMENT OF INDIAN NORTHERN AFFAIRS
Adresse-Ville: PO Box 1228 QALUIT NU. X0A 0H0Téléphone: 514 940 1230
(obligatoire)
Code postal: X0A 0H0

N° Commande	N° Analyse	Pige 1 (cm)	Pige 2 (cm)	Dossier
	<u>TOTAL 88 BARILS</u>			<u>MD 1828</u>

MATIÈRES DANGEREUSES RÉSIDUELLES	CODE DES MATIÈRES DANGEREUSES (Annexe 4)	VOLUME	APPELLATION RÉGLEMENTAIRE (R.T.M.D.)	CLASSIFICATION (R.T.M.D.)	G.E. (R.T.M.D.)	ÉTAT PHYSIQUE (L.P.G.S.)	PLACARDS (N.I.P.)
Huile minérale	A01	<u>48 BARILS</u>	<u>GASOLINE</u>	<u>ED 3</u>	<u>NA II</u>	<u>L</u>	<u>NA 1203</u>
Filtres à l'huile	A05	<u>9 BARILS</u>	<u>DIESEL</u>	<u>0.0 3</u>	<u>NA III</u>	<u>L</u>	<u>NA 1202</u>
Solvants non-hal.	C02	<u>1 BARIL</u>	<u>PEINTURES</u>	<u>3.0 3</u>	<u>II III</u>	<u>45</u>	<u>UN1993 1263</u>
Glycol	D01	<u>1 BARIL</u>	<u>SODIUM CHLORIDE</u>		<u>NA</u>	<u>N/R</u>	<u>N/R</u>
<u>24 BARILS</u>	<u>MATIÈRES DANGEREUSES AU POINT DE VUE DE L'ENVIRONNEMENT LIQUIDE NSA</u>			<u>9</u>	<u>III</u>	<u>L</u>	<u>3082</u>
<u>1 BARIL</u>	<u>MATIÈRES DANGEREUSES AU POINT DE VUE ENVIRONNEMENT SOLIDE, NSA</u>			<u>9</u>	<u>III</u>	<u>S</u>	<u>3077</u>
<u>3 GLYCOL</u>			<u>GLYCOL</u>	<u>N/R</u>	<u>N/R</u>	<u>N/A</u>	<u>N/R</u>
<u>1 BARIL</u>			<u>ACCUMULATEURS, ÉLECTROLYTE ACIDE</u>	<u>8</u>	<u>II</u>	<u>S</u>	<u>2794</u>

Date d'expédition	Nom du responsable-client	Signature du client
<u>24-09-03</u>	<u>M. LAQUES DION</u>	<u>[Signature]</u>

B. Transporteur Écolocycle inc. ☒ ouNom: _____ Tél.: _____
Adresse: _____ Ville: _____

Immatriculation	Unit N°	Type de camion
L64394	95-11 35309	TRATEURY COBE S3'
Nom du chauffeur	Signature du chauffeur	
MICHAEL HARVEY		

C. Destinataire Écolocycle inc. ☒ ouNom: _____ Tél.: _____ Volume liquide: _____
Adresse: _____ Ville: _____ Volume solide: _____
N° du Conteneur: _____ Volume: _____

Arrivée	Nom du responsable-client	Signature du client
Heure du départ: _____ Heure d'arrivée: _____ Date: _____		

LE PRÉSENT BON DE CONNAISSANCEMENT EST ASSUJETTI AUX LOIS ET RÈGLEMENTS FÉDÉRAUX ET PROVINCIAUX DE L'ENVIRONNEMENT ET DU TRANSPORT

Signature du chauffeur

GÉNÉRATEUR

BON DE CONNAISSANCEMENT

70641

**List of drums
Shipped South for Disposal
September 2003**

RESOLUTION ISLAND PROJECT 2003

Code	Description	Proper shipping name	Class	UN	Marine pollutant	Weight (kg)
48	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
E 068	Paint solvent	Paint related materials	3	1263	no	250
A-100	Waste lead gasoline	GASOLINE	3	1203	yes	250
A101	Waste lead gasoline	GASOLINE	3	1203	yes	250
A-99	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
B-024-1	Waste fuel, metal	DIESEL	3	1202	no	250
B-029	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
B-030	Waste oil, metal	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
B-031	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
B-077	Waste ethanol	ETHANOL	3	1170	no	250
B-097	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-101	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-102	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-103	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-105	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-106	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-107	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-108	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-109	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-110	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-111	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-112	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-114	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-123	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-128	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-129	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-129-A	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-129-B	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-129-C	Waste lead gasoline	GASOLINE	3	1203	yes	250
B129-D	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-129-E	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-130	Waste lead gasoline	GASOLINE	3	1203	yes	250
B-228	Waste lead gasoline	GASOLINE	3	1203	yes	250
B308	Waste lead gasoline	GASOLINE	3	1203	yes	250
C-007	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
C-018	Waste Flammable liquid	FLAMMABLE LIQUID N O S	3	1993	no	250
C-044	Waste lead gasoline	GASOLINE	3	1203	yes	250
C-046	Waste lead gasoline	GASOLINE	3	1203	yes	250
C-047	Waste lead gasoline	GASOLINE	3	1203	yes	250
C-048	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
C-045	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
C-049	Waste lead gasoline	GASOLINE	3	1203	yes	250
C-050	Waste lead gasoline	GASOLINE	3	1203	yes	250
C-051	Waste lead gasoline	GASOLINE	3	1203	yes	250
C-063	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250

**List of drums
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September 2003**

RESOLUTION ISLAND PROJECT 2003

Code	Description	Proper shipping name	Class	UN	Marine pollutant	Weight (kg)
C-065	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
C-070	Waste oil, PCB	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
C-071	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
C-076	Waste lead gasoline	GASOLINE	3	1203	yes	250
C-090	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
C-112	Waste lead gasoline	GASOLINE	3	1203	yes	250
C-136	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
C-148	Waste oil < 50 PPM	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
C-152	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
D-042	Waste lead gasoline	GASOLINE	3	1203	yes	250
D-110	Waste lead gasoline	GASOLINE	3	1203	yes	250
D-113	Waste lead gasoline	GASOLINE	3	1203	yes	250
D-115	Waste lead gasoline	GASOLINE	3	1203	yes	250
D-117	Waste lead gasoline	GASOLINE	3	1203	yes	250
D-43	Waste lead gasoline	GASOLINE	3	1203	yes	250
E-016	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
E-022	Waste oil < 50 PPM	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
E-022-1	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
E-023	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
E-024-2	Waste fuel, cadmium	DIESEL	3	1202	no	250
E-046	Paint solvent	Paint related materials	3	1263	no	250
E046-1	Waste fuel, cadmium	DIESEL	3	1202	no	250
E046-2	Waste fuel, cadmium	DIESEL	3	1202	no	250
E046-3	Waste fuel, cadmium	DIESEL	3	1202	no	250
E046-4	Waste fuel, cadmium	DIESEL	3	1202	no	250
E-056	Paint solvent	Paint related materials	3	1263	no	250
E-058	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
E-062-1	Glycol	NOT TDG REGULATED				
E-062-3	Glycol	NOT TDG REGULATED				
E-062-2	Glycol	NOT TDG REGULATED				
E-067	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
E-069	Waste oil, lead	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
E-069-2	Waste lead gasoline	GASOLINE	3	1203	yes	250
E069-3	Waste lead gasoline	GASOLINE	3	1203	yes	250
E069-4	Waste lead gasoline	GASOLINE	3	1203	yes	250
E-080	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
E-101	Charcoal	CHARCOAL	4.2	1362	no	300
E-108 A	Waste lead gasoline	GASOLINE	3	1203	yes	250
E-108 B	Charcoal	CHARCOAL	4.2	1362	no	300
E-111	Waste diesel, chorine	DIESEL	3	1202	yes	250
E-115	Waste fuel, lead	DIESEL	3	1202	no	250
E-119	Charcoal	CHARCOAL	4.2	1362	no	300
E-120	Waste lead gasoline	GASOLINE	3	1203	yes	250
E-123	Waste lead gasoline	GASOLINE	3	1203	yes	250
E-150	Paint solvent	Paint related materials	3	1263	no	250

**List of drums
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September 2003**

RESOLUTION ISLAND PROJECT 2003

Code	Description	Proper shipping name	Class	UN	Marine pollutant	Weight (kg)
Egg-1	Pellets of sodium Chloride	SODIUM CHLORIDE			no	300
F-081	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
F-1	Waste lead gasoline	GASOLINE	3	1203	yes	250
F-3	Waste lead gasoline	GASOLINE	3	1203	yes	250
F-35	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
F-6	Waste lead gasoline	GASOLINE	3	1203	yes	250
F-8	Waste lead gasoline	GASOLINE	3	1203	yes	250
Gr-01	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
Gr-02	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
Gr-03	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
Gr-04 A	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
Gr-04 B	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
Gr-05	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
Gr-06	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
Gr-07	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
Gr-08	Grease	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-1	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-10	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-12	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-14	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-15 A	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-15 B	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-16	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-17	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-18	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-19	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-9	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-2	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-21	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-22	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-13	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-23	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-24	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-25	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-26	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-27	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-28	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-29	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-3	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-30	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-4	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-5	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-6	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-7	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
I-8	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250

List of drums
Shipped South for Disposal
September 2003

RESOLUTION ISLAND PROJECT 2003

Code	Description	Proper shipping name	Class	UN	Marine pollutant	Weight (kg)
M-1	Waste lead gasoline	GASOLINE	3	1203	yes	250
M-1	Waste lead gasoline	GASOLINE	3	1203	yes	250
M-11	Waste lead gasoline	GASOLINE	3	1203	yes	250
M-4	Waste lead gasoline	GASOLINE	3	1203	yes	250
M-5	Waste lead gasoline	GASOLINE	3	1203	yes	250
M-8	Waste lead gasoline	GASOLINE	3	1203	yes	250
M-9	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-101	Waste fuel, metal	DIESEL	3	1202	no	250
R-104	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-112	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-114	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-115	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-116	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-122	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-126	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-137	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
R-224	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-225	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-228	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-229	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-230	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-53	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-55	Waste oil	ENVIRONMENTAL HAZARDOUS SUBSTANCE, SOLID, NOS	9	3077	yes	275
R-57	Waste Flammable liquid	FLAMMABLE LIQUID N O S	3	1993	no	250
R-58	Waste Flammable liquid	FLAMMABLE LIQUID N O S	3	1993	no	250
R-83	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-84	Waste lead gasoline	GASOLINE	3	1203	yes	250
R-87	Waste oil chlorine	ENVIRONMENTAL HAZARDOUS SUBSTANCE, LIQUID, NOS	9	3082	yes	250
SA-1	Charcoal	CHARCOAL	4.2	1362	no	300
SA-10	Paint solvent	Paint related materials	3	1263	no	250
SA-11	Paint solvent	Paint related materials	3	1263	no	250
WB-1	Solid with Ni-cad batt.	ENVIRONMENTAL HAZARDOUS SUBSTANCE, SOLID, NOS	9	3077	yes	325
WB-2	Lead batteries	BATTERIES, WET filled with acid	8	2794	no	325

TOTAL NUMBER OF DRUMS

168

Appendix 5

Grain Size Analysis vs Gradations Shear Strength and Salinity of Soil Samples

REPORT ON SOIL GRAIN SIZE DISTRIBUTIONS

Samples from Resolution Island test pits.

October 12, 2003

1. Test procedure

Ten samples of moist soil from Resolution Island were received. They were dried for 24 hours each at 50°C, and then ground lightly with a mortar and pestle. A set of six sieves was used with size opening varying from 19.0 mm down to 0.150 mm. Each sample was placed in the set of sieves and shaken for 10 minutes, after which the weight held on each sieve was measured. Calculations were then done of percent finer by weight versus grain size for each sample.

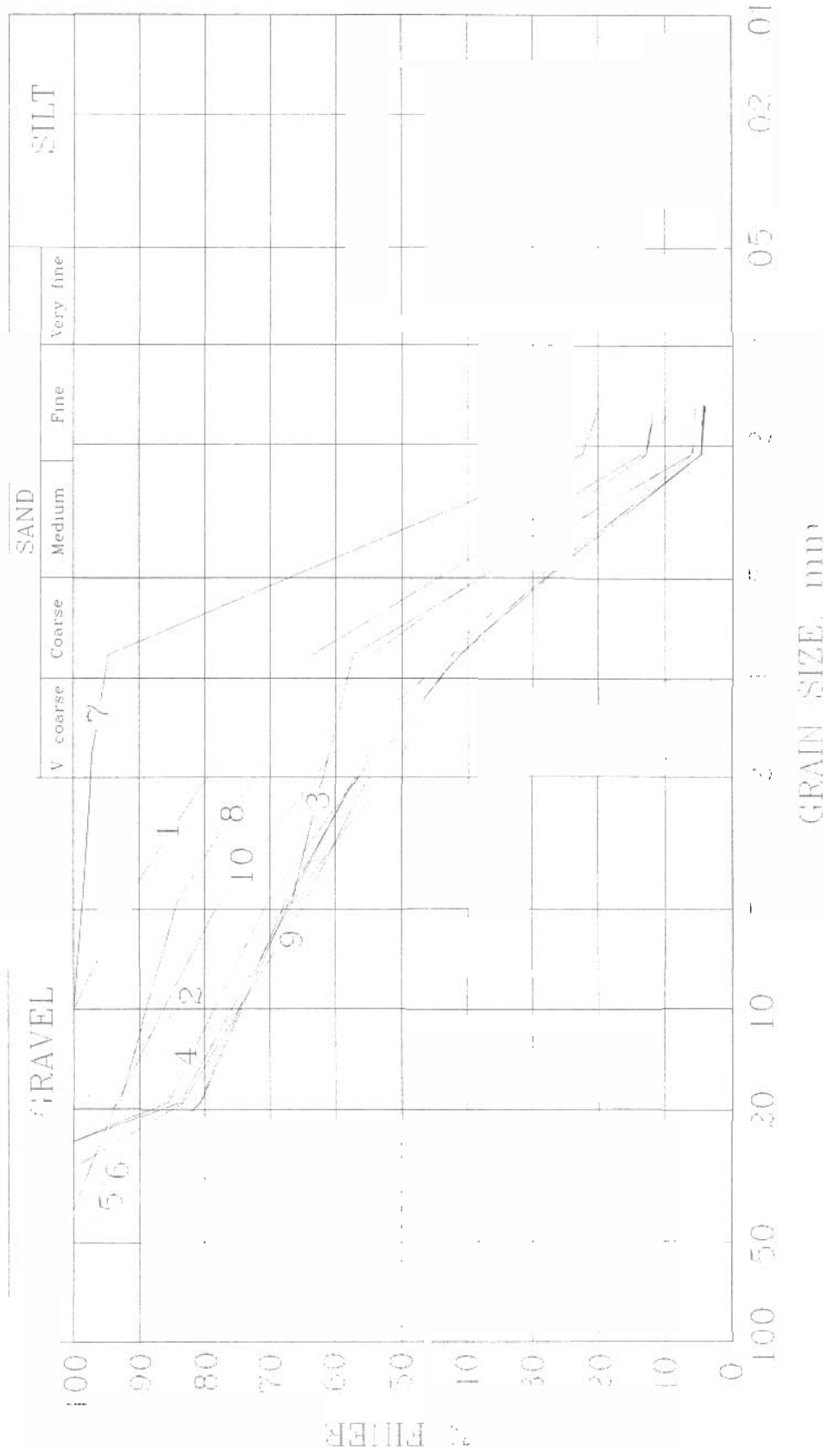
2. Results

The results for all samples are shown on the attached graph of percent finer by weight versus grain size in millimetres. It can be seen that the samples are almost all gravel and sand, with the percentage of gravel ranging from 2% to 48%. Samples No. 1, 7 and 8 have more sand than the others. The rest of the samples are quite close in grain size distribution with 38% to 48% gravel ranging between 20 mm and 50 mm in maximum size.

3. Compactibility

Most of the soils tested should have reasonable compactibility because they have fairly well graded grain sizes. The exception is sample No. 7 which is not well graded, but has 75% weight of particles between 0.2 mm and 0.8 mm.

DATE 2003-10-12 SAMPLE Resolution Island test pit.



SALINITY OF SOILS

Resolution Island test pits

October 14, 2003

1. Procedure

Ten bulk samples of sand and gravel were received from Resolution Island in October of 2003. Following a grain size analysis of these soils, representative samples were chosen of the different types. Samples No. 1, 7 and 8 were finer than the others, containing 72% to 98% (No. 7) sand. The remaining samples contained 52% to 63% sand. Thus samples No. 1 and 7 were selected from the finer soils, and No. 4, 8 and 9 from the coarser type.

All samples tested were oven dried at 50°C and passed through a nominal ¼ inch sieve with opening size 4.76 mm to remove large gravel particles. Testing of salts present in the soils was conducted in the Soil Science Laboratory, Faculty of Agricultural and Environmental Sciences, McGill University. 15 g of dry soil for each sample were mixed thoroughly with 15 ml (equals 15 g) of distilled water. Then the electrical conductivity of the paste was measured by a conductivity meter. Conversion to the amount of salt present in the soil, expressed as electrolytic equivalence, was effected by the United State Department of Agriculture handbook "Saline and Alkali Soils" (U.S. Government Printing Office, Washington DC, 1954). These quantities were then converted to an equivalent mass of sodium per unit mass of dry soil solids.

2. Results

The table below presents the results described above.

Sample No.	Classification	Total salt, meq/kg of dry soil	Total salt expressed as mass of sodium, mg/kg (dry soil), or parts per million
1	Fine	0.133	3.1
4	Coarse	0.075	1.7
7	Fine	0.316	7.3
8	Coarse	0.216	5.0
9	Coarse	0.064	1.5

While there are variations in the measured total salt content of the various samples tested, they are all very low. To give a comparison, these soils contain less than one tenth of the salt content of typical city treated drinking water.

SHEAR STRENGTH OF SOILS

Resolution Island test pits

October 13, 2003

1. Procedure

Ten bulk samples of sand and gravel were received from Resolution Island in October of 2003. Following a grain size analysis of these soils, representative samples were chosen of the different types. Samples No. 1, 7 and 8 were finer than the others, containing 72% to 98% (No. 7) sand. The remaining samples contained 52% to 63% sand. Thus samples No. 1 and 7 were selected from the finer soils, and No. 4, 8 and 9 from the coarser type.

All samples tested were oven dried at 50°C and passed through a nominal ¼ inch sieve with opening size 4.76 mm to remove large gravel particles. Each tested sample was placed in a square single ring shear box of dimensions 50.8 x 50.8 x 45 mm height, and tamped to seat the soil and the top loading piston. Then they were loaded with various vertical loads, and sheared at a deformation rate of 3 mm per minute until after shear failure occurred. The shear force was measured by a proving ring spring with a dial reading gauge of 0.0025 mm accuracy. The proving ring was calibrated over the relevant force range, and shear forces and stresses calculated for all readings.

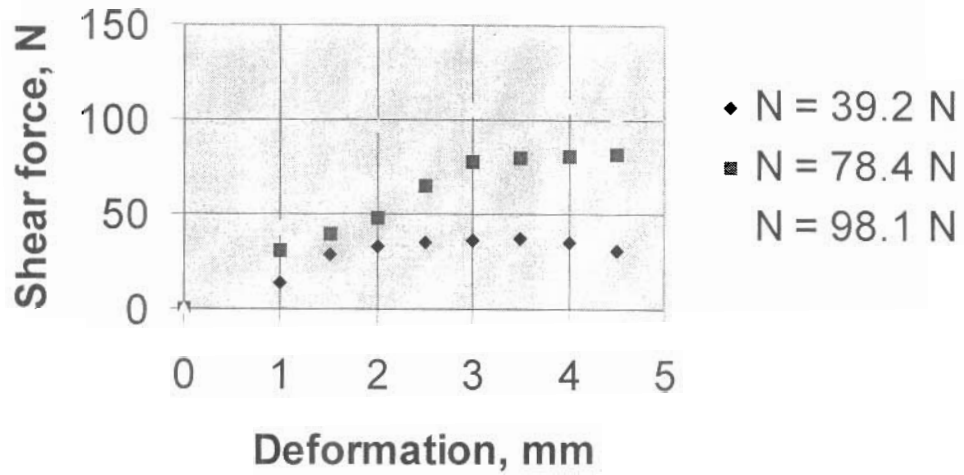
2. Results

On the following pages, the results of shear force versus shear deformation are shown in graphical form. The samples were all quite "stiff" relative to other sandy soils because they reached maximum shear force within 2.5 mm to 3.5 mm. The maximum shear force was taken as the shear strength of each sample, and maximum shear stress was calculated by dividing this force by the shear box cross-sectional area. These results are plotted in the last diagram versus the average vertical pressure applied for each test. A linear regression best fit of shear strength versus normal pressure was conducted to give the results of cohesion and angle of internal friction shown below.

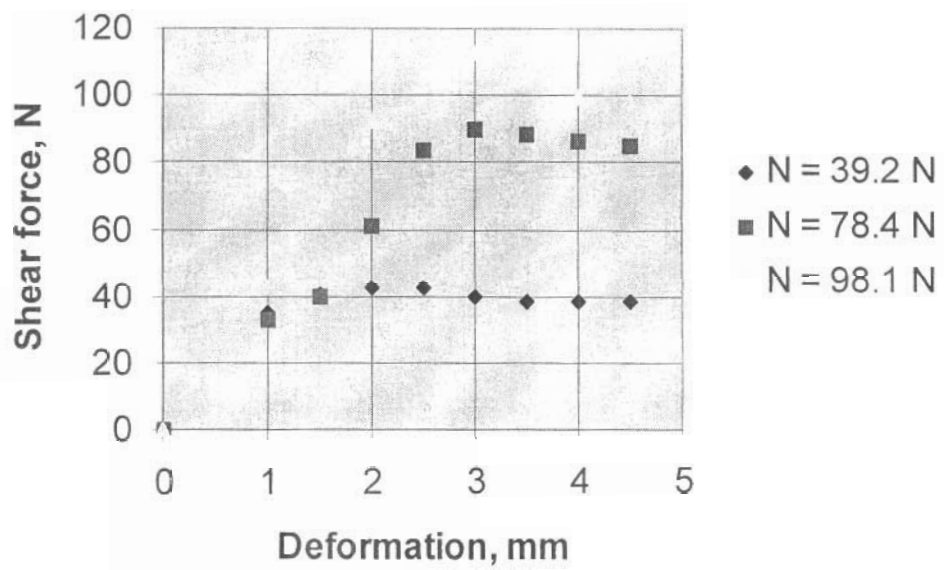
Sample No.	Classification	Cohesion, kPa	Friction angle, degrees
1	Fine	-2.65	47.8
4	Coarse	-0.87	49.0
7	Fine	2.09	42.8
8	Coarse	-1.58	46.6
9	Coarse	-1.94	47.4

The cohesion values are very small, as would be expected for sand and gravel mixtures. Apparent negative values can be ignored. The finest soil, sample No. 7, with 98% sand and poor particle size gradation, also had the lowest friction angle. The other samples were similar to each other, with an average friction angle of 47.7°.

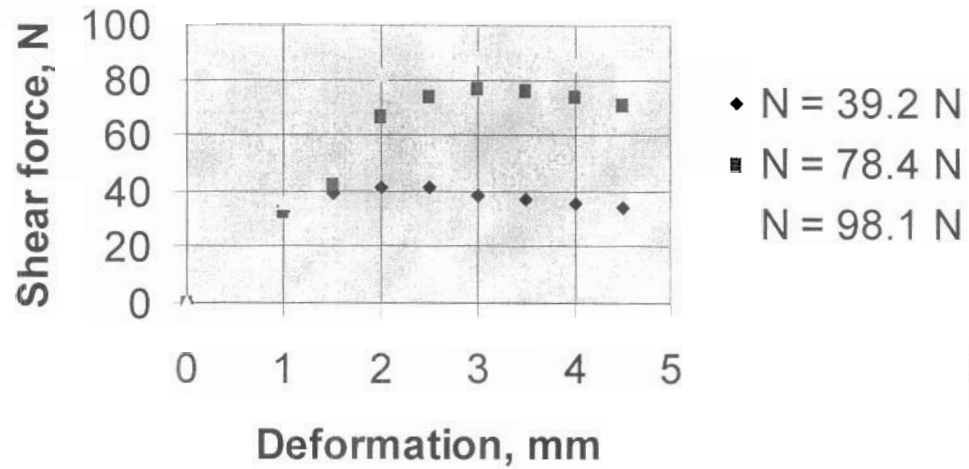
SAMPLE 1



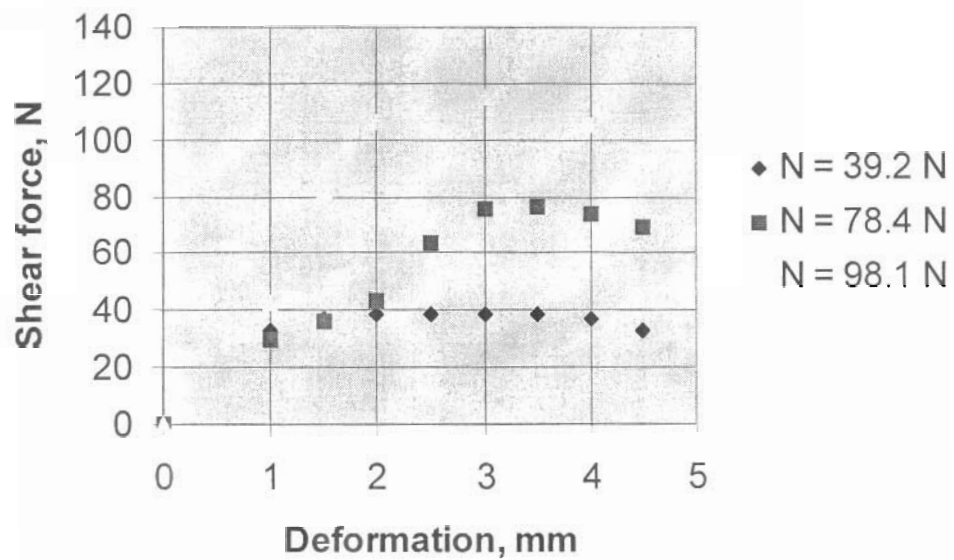
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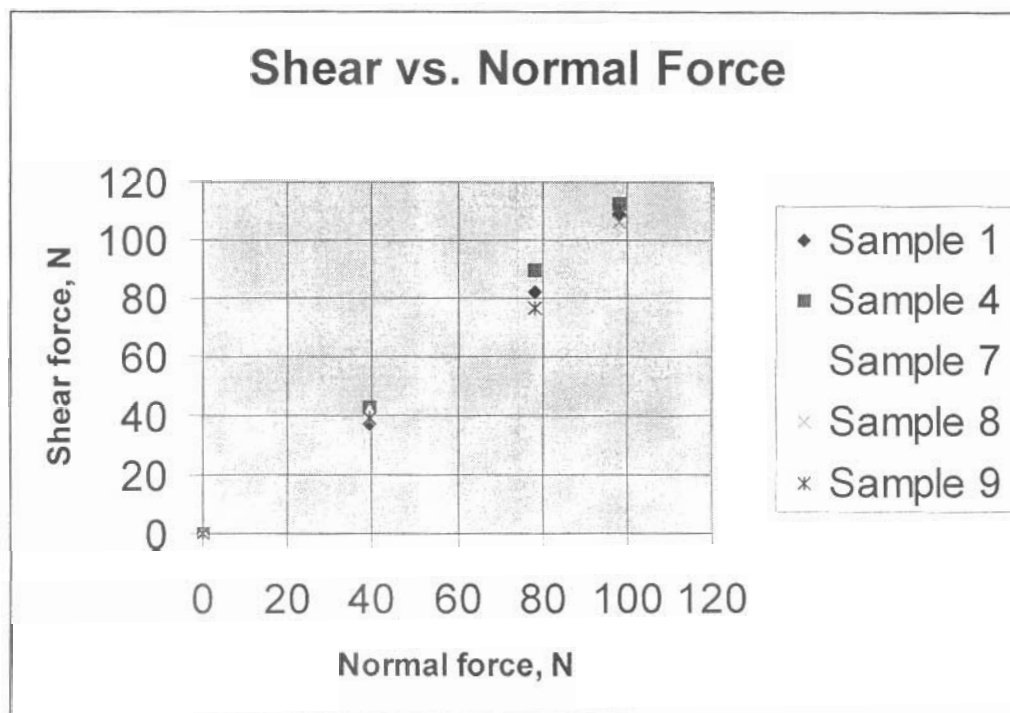
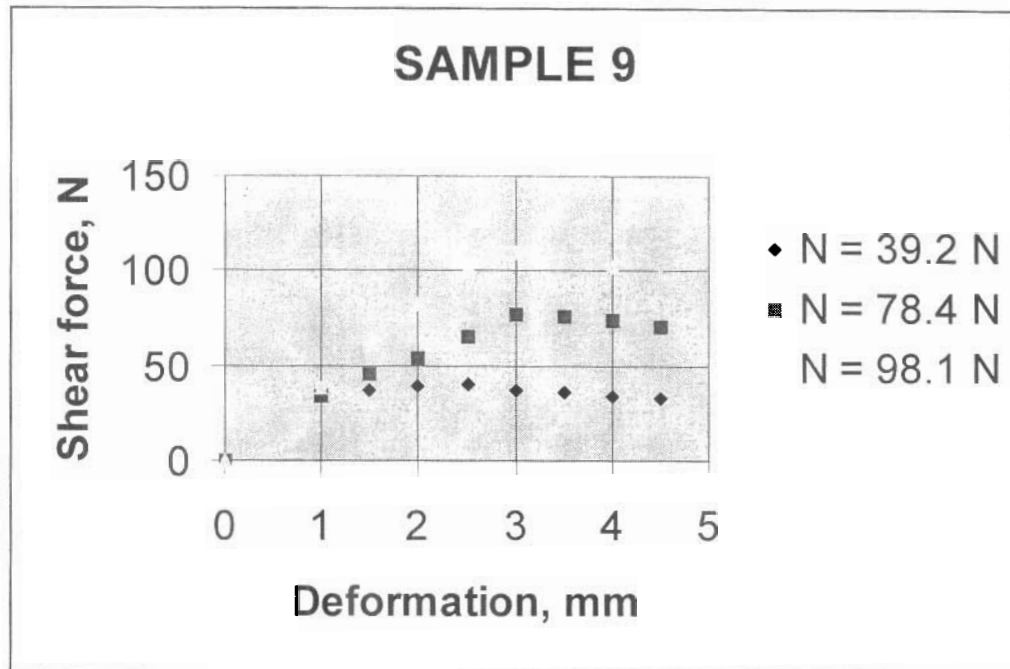


SAMPLE 7



SAMPLE 8





Results of Grain Size Analysis of Test Pits at Resolution Island

Test Pit Locations and Depths

Sample Number	Location	Pit Name	Depth (cm)	Code	Estimated Volume	Notes
1	Airstrip terrace	West	100-150	W 100-150	UMA-EBA estimate (2002): 26,500 m ³ ; potentially more due to observed depth: 35,000 m ³	Needs to be drained
2	Airstrip terrace	Centre	0-75	C 0-75		Large stones present only at the surface
3	Airstrip terrace	East	50-100	E 50-100		
4	Airstrip terrace	West	0-50	W 0-50		
5	Airstrip terrace	East	0-50	E 0-50		
6	Airstrip terrace	Centre	75-150	C 75-150		
7	Freshwater Lake	Sand to west	0-150	W 0-150	2,500 m ³	Needs to be drained
8	Freshwater Lake	South east base of slope	0-250	SE B 0-250		Soil is dry
9	Freshwater Lake	South east top of slope	0-250	SE T 0-250	6,000 m ³	Large stones present only at the surface
10	Freshwater Lake	East middle of slope	0-150	E M 0-150		

Resolution Island pit samples, 2003-10-12

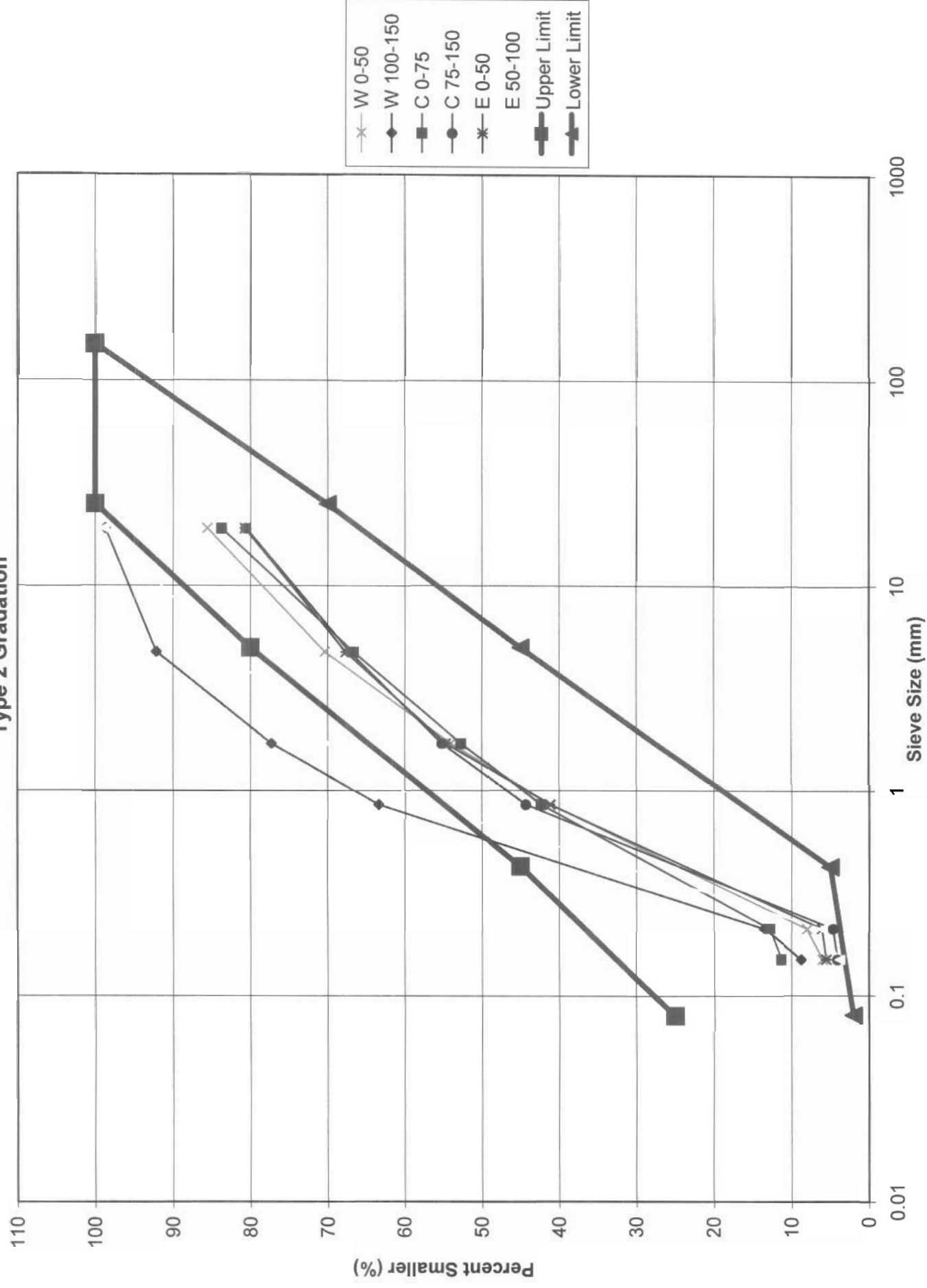
Sample No.	1	2	3	4	5	6	7	8	9	10
Sample Code	W 100-150	C 0-75	E 50-100	W 0-50	E 0-50	C 75-150	W 0-150	SE B 0-250	SE T 0-250	EM 0-150
Sieve size	d, mm	% Finer	% Finer	% Finer	% Finer	% Finer	% Finer	% Finer	% Finer	% Finer
Largest	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
0.75"	98.70	83.71	98.84	85.57	80.70	80.56	100.00	92.95	83.45	93.48
0.25"	4.76	66.62	82.98	70.37	67.65	67.11	98.72	84.23	64.67	78.59
12	77.28	52.70	69.75	54.03	54.66	55.17	97.24	70.16	53.17	60.44
20	63.42	42.33	57.34	41.09	41.17	44.30	94.61	54.48	41.52	42.30
70	13.51	12.82	6.06	8.00	6.05	4.62	22.32	12.84	4.74	4.70
100	8.74	11.34	3.77	5.95	5.52	4.07	19.73	11.65	4.34	4.20

Specified Gradations Given by EBA

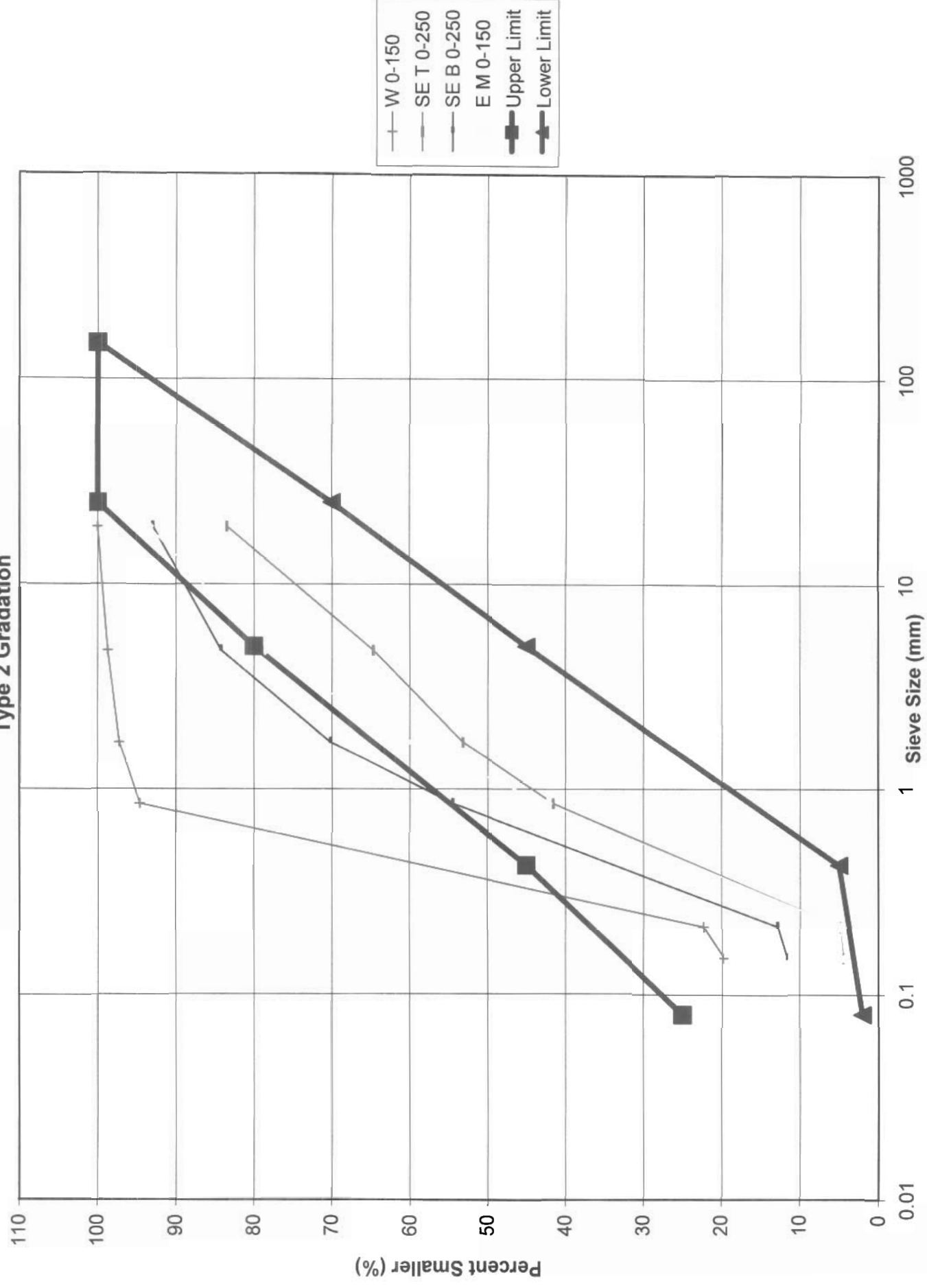
Sieve Size	Type 2		Type 3		Type 4	
	% Passing Upper	% Passing Lower	Sieve Size	% Passing Upper	Sieve Size	% Passing Lower
150	100	100	75	100	50	100
25	100	70	12.5	100	12.5	80
5	80	45	5	95	5	65
0.425	45	5	2	90	2	50
0.08	25	2	0.425	70	0.425	20
			0.08	40	0.08	5

Sample Number	Location	Pit Name	Depth (cm)
1	Airstrip terrace	West	100-150
2	Airstrip terrace	Centre	0-75
3	Airstrip terrace	East	50-100
4	Airstrip terrace	West	0-50
5	Airstrip terrace	East	0-50
6	Airstrip terrace	Centre	75-150
7	Freshwater Lake	Sand to west	0-150
8	Freshwater Lake	South east base of slope	0-250
9	Freshwater Lake	South east top of slope	0-250
10	Freshwater Lake	East middle of slope	0-150

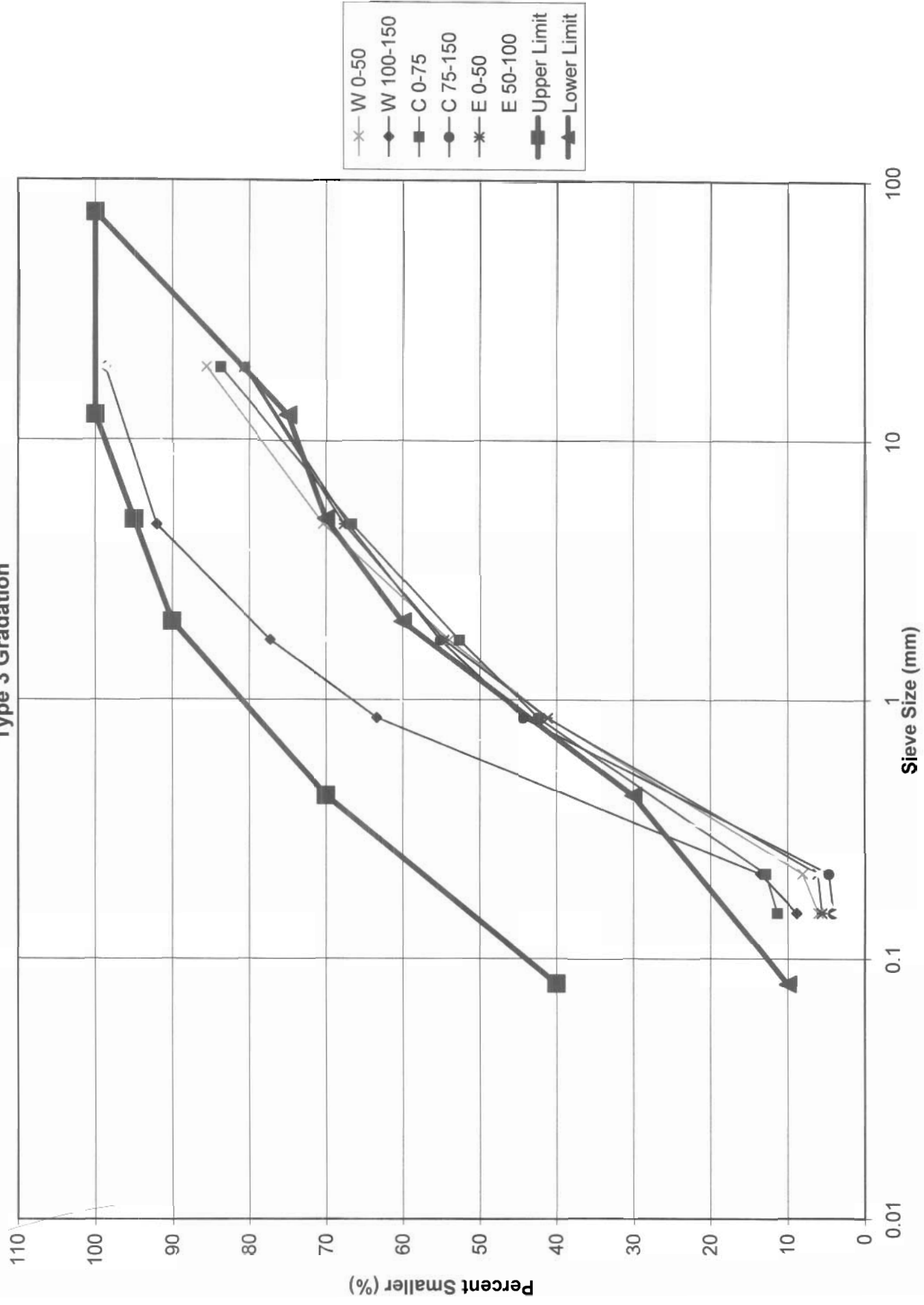
Grain Size Analysis Resolution island Airstrip Terrace Test Pits Type 2 Gradation



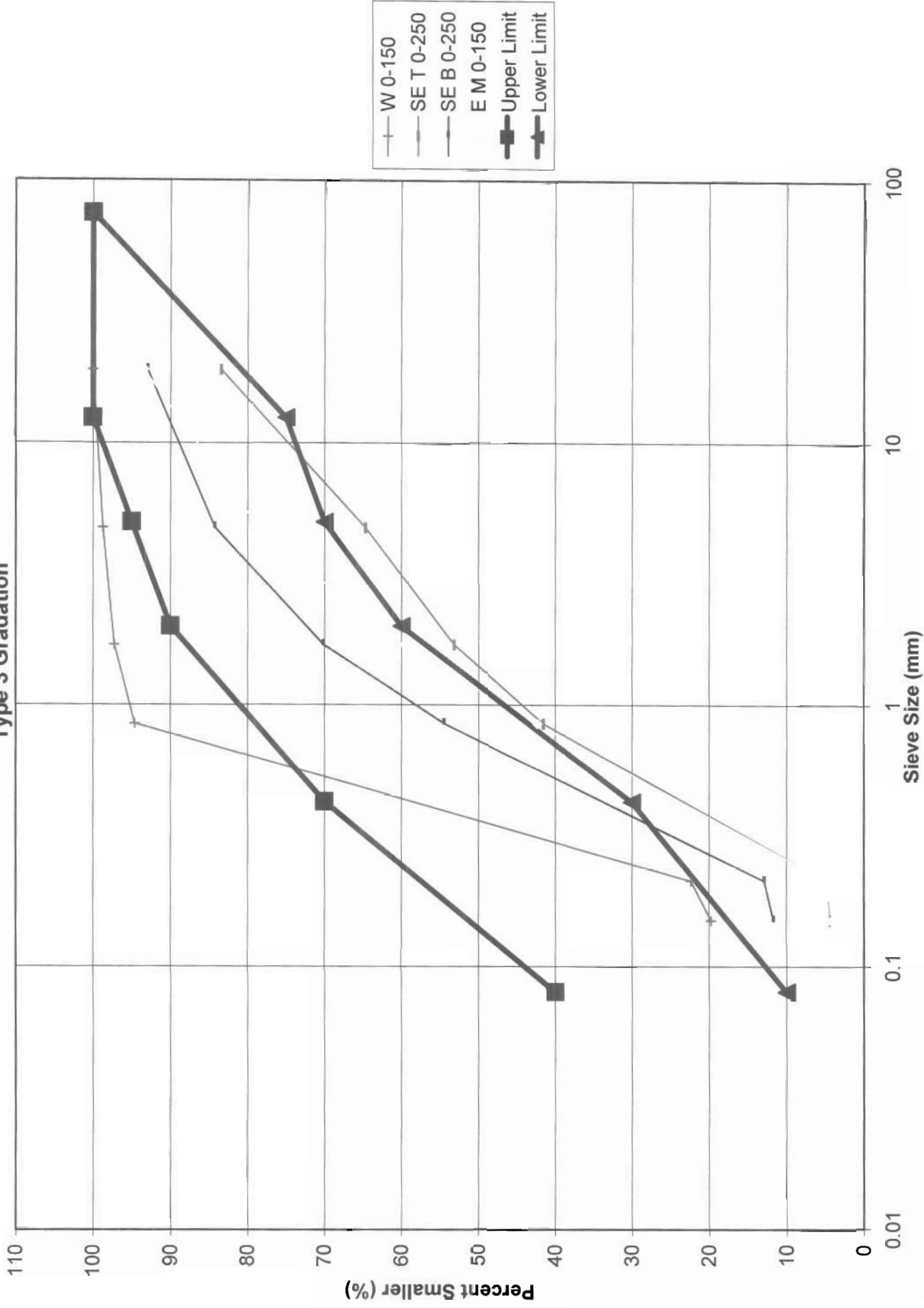
Grain Size Analysis Resolution Island Fresh Water Lake Test Pits Type 2 Gradation



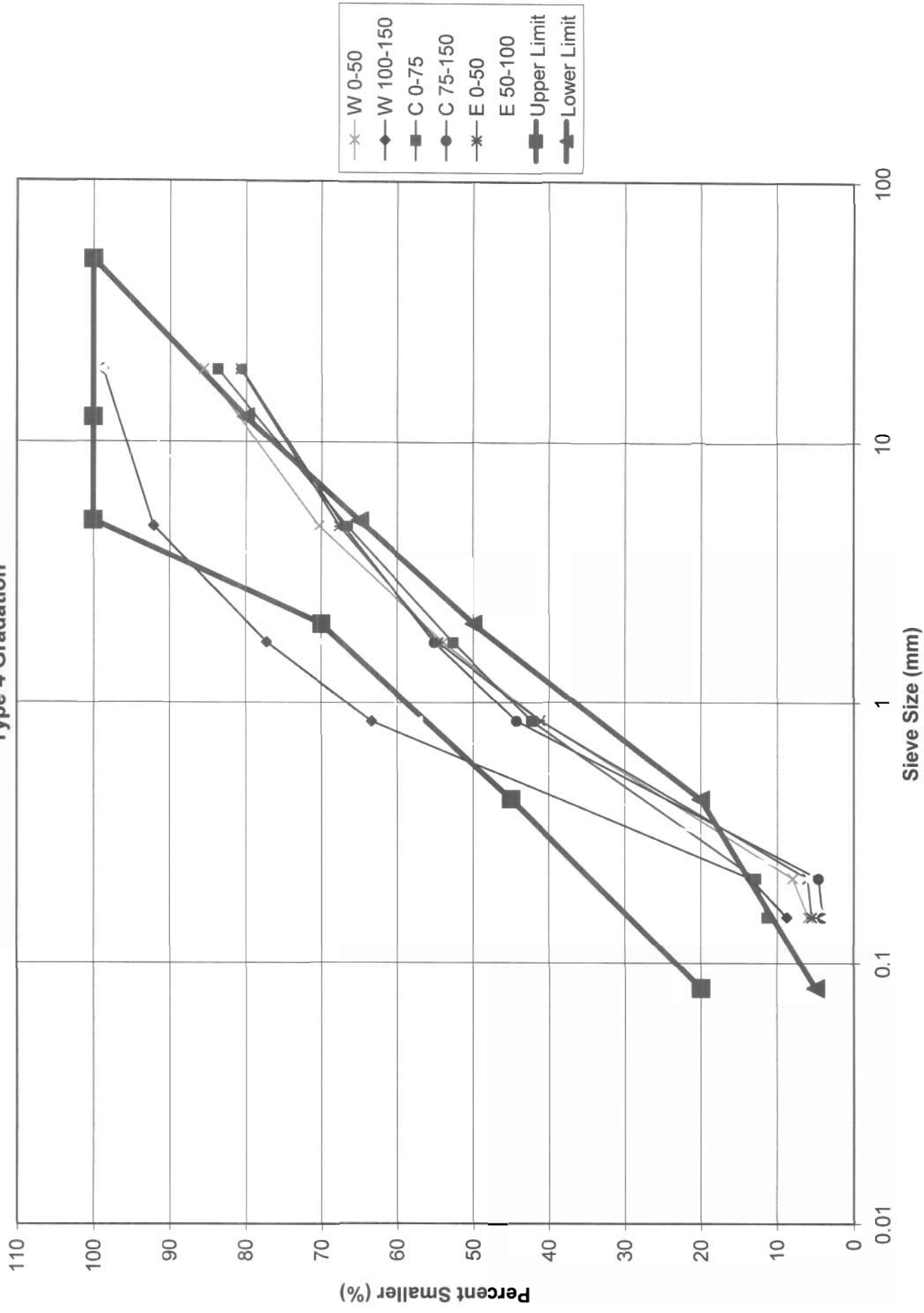
Grain Size Analysis Resolution Island Airstrip Terrace Test Pits Type 3 Gradation



Grain Size Analysis Resolution Island Fresh Water Lake Test Pits Type 3 Gradation



Grain Size Analysis Resolution Island Airstrip Terrace Test Pits Type 4 Gradation



Grain Size Analysis Resolution Island Fresh Water Lake Test Pits Type 4 Gradation

