

NGL PROJECT NO. NFS09711

GEOTECHNICAL INVESTIGATION
PROPOSED WASTE MANAGEMENT FACILITY
CENTRAL, NL

OCTOBER 2003

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03/10/28



NGL PROJECT NO. NFS09711

REPORT ON

**GEOTECHNICAL INVESTIGATION
PROPOSED WASTE MANAGEMENT FACILITY
CENTRAL, NL**

PREPARED FOR

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October 20, 2003



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1.0 INTRODUCTION

Acting at the authorization of Mr. Wayne Manuel, P.Eng., of the BAE Newplan Group Limited (BNG), Newfoundland Geosciences Limited (NGL) has carried out a geotechnical investigation for a proposed waste management facility in the Norris Arm North area, approximately 3.5 km west of Lewisport Junction, Newfoundland. The purpose of the investigation was to determine the general subsurface conditions across the proposed site, to determine the suitability of the site for the proposed development.

The scope of the work included:

- Test pit excavations and mapping bedrock outcrops across the site. The number and location points was determined based on a four to five day time limitation as specified by BNG.
- Compilation of geotechnical data and laboratory testing of soil samples.
- A factual geotechnical report detailing the findings of the investigation.

This report has been prepared specifically and solely for the project described above. It contains all of the findings of the investigation, including the Test Pit Records, laboratory test results and a site plan.

2.0 SITE DESCRIPTION AND GEOLOGY

The proposed site is located in the Norris Arm North area, between the Lewisport Junction road and the Norris Arm North access road, approximately 45 km west of the community of Gander, NL. The area investigated is an irregular, rectangular-like shaped block of approximately 1.1 x 3.4 km (approximately 3.7 km²); see figure NFS09711-GE-01.

The site is accessed by old logging roads and trails, from the Trans Canada Highway in the south, and the Norris Arm North access road in the west. The site is undeveloped and consists of wooded (approx. 80%) and boggy (approx. 20%) areas. The site is gently sloped towards the north-northwest, with a maximum elevation difference of approximately 60 m across the site (elevation data acquired by GPS, and may vary significantly from actual elevation).

Based on existing geological mapping and previous experience in the area, the principal overburden material beneath surficial organic soils consists of glacial till which overlies bedrock. Inferred bedrock geology in the area is comprise of Late Ordovician to Early Silurian sedimentary rocks of the Badger Group, consisting of purple, grey and orange-brown sandstone to siltstone, and grey conglomerate. No surface bedrock exposure was found within the investigation area.

3.0 PROCEDURE

NGL personnel contacted the Provincial Department of Government Services and Lands, and notified the department of our planned geotechnical investigation. The Department of Government Services and Lands granted permission to access the area with certain restrictions. No stream crossings or travel on bogs were permitted.

The field work for this investigation was completed during the period of September 25 - 29, 2003. A total of thirty-eight (38) test were completed at the locations shown on the site location plan (Drawing No. NFS09711-GE-01) located in Appendix C.

The test pits were completed using a Hitachi EX200LC excavator, supplied by A and B Construction Limited, to depths ranging from approximately 2.0 to 5.5 m below ground surface. The field work was conducted under the supervision of an engineering geologist from NGL who maintained detailed logs and obtained representative samples of the various strata encountered. All soil samples were stored in moisture proof containers where they will be stored for a period of three months, at which time they will be discarded, unless instructions to the contrary are received.

Test pit locations were selected and established in the field by NGL personnel, based on a maximum, evenly-spaced coverage for a four to five day work program. The locations and elevations were provided with the aid of a Garmin 12XL GPS, aerial photographs and topographic maps. The GPS elevation and coordinate information is referenced to North American Datum 1983 (NAD83), UTM Zone 21, and location information has a probable accuracy of ± 25 m. Elevation data provided on the Test Pit Records may vary significantly from actual elevations.

4.0 SUBSURFACE CONDITIONS

The overall subsurface conditions consist of a layer of organic soils and silty sands overlying sandy glacial till and bedrock. The subsurface conditions are described below, and in detail on the Test Pit Records located in Appendix B. Laboratory test results are presented in Figures 1 to 8 and on the Test Pit Records.

4.1 Organics/Sand/Silt

A thin layer of dark brown to black, soft compressible peat and rootmat was encountered at the surface at all test pit locations. This stratum ranged in thickness from 0.1 m (thin rootmat) to 1.2 m (peat/bog).

At most test pit locations a variable layer of silt, sand and organic material was encountered beneath surficial peat, rootmat and bog. This stratum was noted to vary in colour (orange-brown, brown, grey), and contain

occasional to some cobbles and boulders. The thickness of these materials ranged from 0.3 to 1.3 m at the test pit locations, and based on direct inspection was classed as loose to compact.

4.2 Till

A layer of silty sand to silty sand with gravel glacial till, with occasional cobbles and boulders was found at all test pit locations, and noted to extend to depths of 5.5 m. Based on direct inspection in the test pits the relative density of this stratum is classed as compact to dense, with occasional very dense sections.

Gradation analyses completed on ten (19) representative samples of the till material obtained during this investigation indicated the following average group percentages: 17.4% gravel (range 0.9 to 39.9%); 47.7% sand (range 32.8 to 59.4%); and 34.8% silt/clay (range 20.5 to 59.4%). Atterburg Limits determinations completed on five (4) samples indicate the fines portion of the material non-plastic (high silt content). The average moisture content of the samples tested was approximately 10.9%.

4.3 Bedrock

Inferred bedrock was found at 20 of the 38 test pit sites at depths ranging from 0.6 to 5.2 m below surface. Bedrock was inferred by excavation refusal; no coring of the bedrock was completed. The bedrock is comprised of sandstone, siltstone and conglomerate of the Badger Group. In general, excavation of small surficial pieces of bedrock was possible, however at test pit TP3, excavation of the bedrock was possible to approximately 1.8 m below the bedrock surface. Based on limited visual inspection within the test pit excavations, the bedrock was observed to be severely fractured to moderately jointed.

5.0 GROUNDWATER

Groundwater was encountered at 31 of the 38 test pit locations at depths ranging from 0.4 to 4.4 m below ground surface. Test pits were not left open long enough for groundwater to stabilize. Groundwater levels may fluctuate seasonally and in response to precipitation events.

6.0 CLOSURE

The purpose of this investigation was to determine the general site conditions necessary for assessing site suitability, and for preliminary planning. It is our understanding that geotechnical comments and recommendations are not required at this time. We would be pleased to provide additional assistance with this project as project planning and design proceeds.

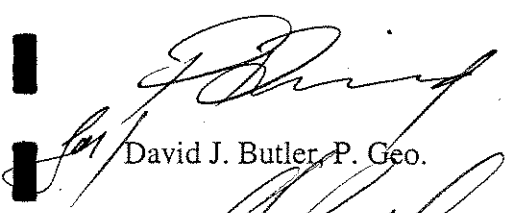


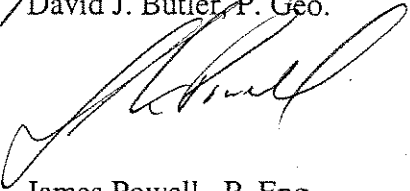
A subsurface investigation is a limited sampling of a site. Variations throughout the site may differ significantly from data collected at the sample locations. The extent of the limited area depends on the soil and groundwater conditions, as well as the history of the site reflecting natural, construction and other activities.

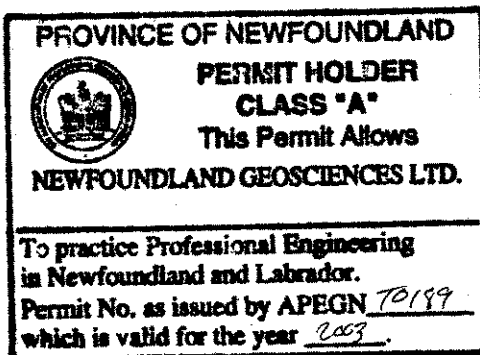
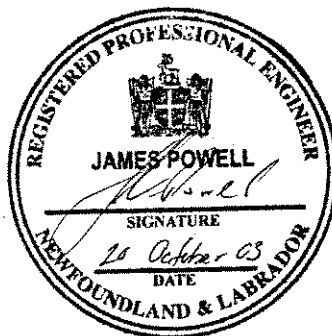
We trust that the report contains all of the information required at this time. If you have any questions please contact us at your convenience.

Yours truly,

NEWFOUNDLAND GEOSCIENCES LIMITED


David J. Butler, P. Geo.


James Powell, P. Eng.



APPENDIX A

Symbols and Terms Used on the Test Pit Records

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology Describing Common Soil Genesis

<i>Rootmat</i>	-	vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
<i>Topsoil</i>	-	mixture of soil and humus capable of supporting good vegetative growth
<i>Peat</i>	-	fibrous aggregate of visible and invisible fragments of decayed organic matter
<i>Loam</i>	-	silty sand or sand with silt mixed with organics matter
<i>Till</i>	-	unstratified glacial deposit which may range from clay to boulders
<i>Fill</i>	-	any materials below the surface identified as placed by humans (excluding buried services)

Terminology Describing Soil Structure

<i>Homogeneous</i>	-	same colour and appearance throughout
<i>Stratified</i>	-	composed of alternating successions of different soil types, e.g., silt and sand
<i>Lensed</i>	-	inclusion of small pockets of different soils
<i>Laminated</i>	-	alternating layers of varying material or colour with the layers less than 6 mm thick
<i>Layer</i>	-	thickness > 75 mm
<i>Seam</i>	-	thickness between 2 mm and 75 mm
<i>Parting</i>	-	thickness < 2 mm

Grain Size and Plasticity

Terminology describing soils on the basis of grain size and plasticity is based on the Unified Soil Classification System (USCS) (ASTM D-2487). The classification excludes particles larger than 76 mm (3 inches). This system provides a group symbol (e.g., SM) and group name (e.g., silty SAND) for identification. Note: terminology describing materials in the absence of laboratory analysis is based on the ASTM D-2488 visual method.

Terminology describing materials outside the USCS (e.g., particles larger than 76 mm, visible organic matter, construction debris) is based on the (visually estimated) proportion of these materials present:

<i>Trace, or occasional</i>	Less than approximately 10%
<i>Some</i>	approximately 10-20%
<i>Frequent</i>	Greater than approximately 20%

Standard Penetration Test 'N-Value'

The performance of the Standard Penetration Test provides an 'N-value'; the number of blows of a 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (51 mm) O.D. split spoon sampler one foot (305 mm) into the soil. For split spoon samples where insufficient penetration is achieved and 'N' values cannot be determined, the number of blows is reported over sampler penetration in millimetres (e.g., 50/75).

Density of Cohesionless Soils

The standard terminology to describe cohesionless soils includes the compactness (formerly "relative density"), as determined by laboratory test or by the Standard Penetration Test 'N- value'.

Density	N-Value	Compactness %
<i>Very Loose</i>	< 4	< 15
<i>Loose</i>	4-10	15-35
<i>Compact</i>	10-30	35-65
<i>Dense</i>	30-50	65-85
<i>Very Dense</i>	> 50	> 85

Consistency of Cohesive Soils

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, unconfined compression tests, or occasionally by standard penetration tests.

Consistency	Undrained Shear Strength		N-Value
	ksf	kPa	
<i>Very Soft</i>	< 0.25	< 12.5	< 2
<i>Soft</i>	0.25-0.5	12.5-25	2-4
<i>Firm</i>	0.5-1.0	25-50	4-8
<i>Stiff</i>	1.0-2.0	50-100	8-15
<i>Very Stiff</i>	2.0-4.0	100-200	15-30
<i>Hard</i>	> 4.0	> 200	> 30



ROCK DESCRIPTION

Rock Quality Designation (RQD)

The classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be due to close shearing, jointing, faulting, or weathering in the rock mass and are not counted. RQD was originally intended to be applied to NW core; however, it can be used on different core sizes if most of the fractures caused by drilling stresses are easily distinguishable from *in situ* fractures.

RQD (%)	Rock Quality
90-100	Excellent - intact, very sound
75-90	Good - moderately jointed, massive, sound
50-75	Fair - fractured, blocky and seamy
25-50	Poor - severely fractured, shattered and very seamy or blocky
0-25	Very poor - very severely fractured, crushed

Total Core Recovery (TCR)

Total core recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

Weathering State

Term	Description
Slight	Weathering limited to the surface of major discontinuities. Typically iron stained.
Moderate	Weathering extends throughout rock mass. Rock is not friable.
High	Weathering extends throughout rock mass. Rock is friable (crumbles naturally or broken between fingers).

Terminology Describing Rock Mass

Spacing (mm)	Bedding, Laminations, Bands	Discontinuity
2000-6000	Very Thick	Very wide
600-2000	Thick	Wide
200-600	Medium	Moderately close
60-200	Thin	Close
20-60	Very Thin	Very close
< 20	Laminated	Extremely close
< 6	Thinly Laminated	

RECORD SYMBOLS AND ABBREVIATIONS

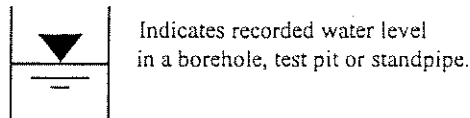
Sample Types

SS	Split spoon sample (obtained by performing the Standard Penetration Test)	WS	Wash sample	ST	Shelby tube or thin wall tube
		BS	Bulk sample	HQ, NQ, BQ, etc.	Rock core samples obtained using standard size diamond drilling bits.
		RC	Rock chip sample		

Laboratory Tests

S	Sieve analysis	H	Hydrometer analysis	A	Atterberg limits
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Water Level Measurement



Strata Plot

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:

Boulders Cobbles Gravel	Sand	Silt	Clay	Organics	Asphalt	Concrete	Fill	Igneous Bedrock	Meta- morphic Bedrock	Sedi- mentary Bedrock

Solid lines between strata indicate the boundary between different strata. Dashed lines between strata indicate the boundary between strata is inferred.

APPENDIX B

**Test Pit Records TP1 to TP38
Figures 1 to 8; Gradation Curves and Plasticity Charts**

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TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP1

PROJECT Proposed Waste Management Facility, Central Newfoundland





PROJECT No. NFS09711

LOCATION Norris Arm North N 5443175 E 635551

DATES (mm-dd-yy): DUG 9-28-03

WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★												
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS												
								20	40	60	80	10	20	30	40	50	60	70	80	
0	124.00																			
	123.7	Rootmat																		
	123.4	Loose to compact, orange - brown, silty SAND (SM); occasional cobbles																		
1		Compact to dense, grey to yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																		
2																				
3																				
	120.3																			
	120.2	Purple, sandstone/siltstone: BEDROCK				BS	1	S												
4		End of Test Pit																		
		Slow groundwater seepage observed at 2.1 m depth.																		
		Refusal on probable bedrock at 3.8 m depth.																		
5																				
6																				
7																				



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TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP2

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443450 E 635560

DATES (mm-dd-yy): DUG 9-27-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★				WATER CONTENT & ATTERBERG LIMITS					
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	W _p	W	W _L			
0	95.00																
	94.8	Rootmat															
		Loose to compact, orange - brown, silty SAND (SM); occasional cobbles															
	94.3																
1		Compact to dense, grey - brown, silty SAND (SM); occasional cobbles and minor boulders: TILL															
2																	
3				▼													
4																	
	90.7																
	90.6	Weathered, purple sandstone/siltstone, conglomerate: BEDROCK															
		End of Test Pit															
5		Slow groundwater seepage observed at 3.0 m depth.															
		Refusal on probable bedrock at 4.4 m depth.															
6																	
7																	



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TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP3

PROJECT Proposed Waste Management Facility, Central Newfoundland




PROJECT No. NFS09711

LOCATION Norris Arm North N 5443750 E 635596

DATUM UTM NAD83 Zone 21

DATES (mm-dd-yy): DUG 9-27-03

WATER LEVEL N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★				WATER CONTENT & ATTERBERG LIMITS						
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	W _p	W	W _L				
0	93.00																	
	92.8	Rootmat																
	92.4	Loose to compact, brown, silty SAND with gravel (SM); occasional cobbles: TILL																
1		Severely fractured, weathered, purple sandstone/siltstone: BEDROCK																
	90.6	End of Test Pit																
3		Moderate groundwater seepage observed at 0.6 m depth.																
		Refusal in bedrock at 2.4 m depth.																
4																		
5																		
6																		
7																		



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TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP4

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5444086 E 635543

DATES (mm-dd-yy): DUG 9-27-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★				WATER CONTENT & ATTERBERG LIMITS						
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	W _p	W	W _L				
0	65.00	Rootmat																
	64.7	Loose to compact, orange - brown, silty SAND (SM); occasional cobbles																
	64.3																	
1		Compact to dense, grey, silty SAND (SM); occasional cobbles and boulders: TILL																
	60.3	Purple, sandstone/siltstone: BEDROCK																
5	60.2																	
		End of Test Pit																
		No groundwater seepage observed.																
		Refusal on probable bedrock at 4.8 m depth.																
6																		
7																		



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TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP5

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5444144 E 635966

DATES (mm-dd-yy): DUG 9-27-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
									20	40	60	80							
									10	20	30	40	50	60	70	80	W _p	W	W _L
0	63.00	Rootmat; peat																	
	62.7	Loose to compact, yellow - brown to brown, silty SAND (SM); occasional cobbles and boulders																	
	62.2	Compact to dense, grey to yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																	
1																			
2																			
3																			
4																			
5	57.8	End of Test Pit				BS	1	S											
6		Slow groundwater seepage observed at 1.8 m depth.																	
		Bedrock not encountered.																	
7																			



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TEST PIT RECORD

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CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP6

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5444084 E 636289

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
									20	40	60	80							
0	66.00	Very loose/soft, black PEAT (PT)																	
	65.7																		
	65.5	Loose to compact, grey, SAND (SP); occasional cobbles																	
1	65.0	Compact to dense, orange - brown, silty SAND (SM); occasional cobbles																	
		Compact to dense, grey - yellow, silty SAND (SM); occasional cobbles and boulders: TILL																	
2																			
3																			
4																			
5																			
	60.5	End of Test Pit																	
6		Slow groundwater seepage observed at 0.4 m depth.																	
		Bedrock not encountered.																	
7																			



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TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP7

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5444135 E 636620

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80						
0	81.00																
	80.8	Rootmat															
	80.3	Loose to compact, brown to yellow - brown, silty SAND (SM); occasional cobbles and boulders															
1		Compact to dense, yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL															
2																	
3																	
4																	
						BS	1	S									
5	76.1	End of Test Pit															
		Slow groundwater seepage observed at 2.4 m and 4.6 m depth.															
		Bedrock not encountered.															
6																	
7																	



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TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP8

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5444089 E 637010

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★				WATER CONTENT & ATTERBERG LIMITS						
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	W _p	W	W _L				
0	84.00	Very loose/soft, black PEAT (PT)																
	83.6																	
	83.3	Loose to compact, brown, silty SAND (SM); occasional cobbles and boulders																
1		Compact to dense, grey, silty SAND (SM); occasional cobbles and boulders: TILL																
2																		
3																		
4																		
5	79.1	End of Test Pit																
		Slow groundwater seepage observed at 0.5 m depth.																
		Bedrock not encountered.																
6																		
7																		



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TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

LOCATION Norris Arm North N 5443962 E 637321

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

TEST PIT No. TP9

PROJECT No. NFS09711

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★												
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS												
								20	40	60	80	10	20	30	40	50	60	70	80	
0	87.00																			
	86.8	Rootmat																		
		Loose to compact, orange - brown, silty SAND (SM); occasional cobbles and boulders																		
	86.3																			
1		Compact to dense, grey to yellow - grey, silty SAND (SM); occasional cobbles and boulders: TILL																		
2																				
3																				
4																				
5	82.1	End of Test Pit																		
		No groundwater seepage observed.																		
		Bedrock not encountered.																		
6																				
7																				



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP10


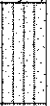
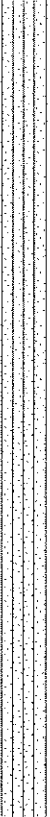
PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443661 E 637180

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★										
					TYPE	NUMBER	OTHER TESTS	20	40	60	80							
0	95.00																	
	94.7	Rootmat																
	94.2	Loose to compact, yellow - brown, silty SAND (SM); occasional cobbles and boulders																
1		Compact to dense, very dense at bottom of stratum, grey to yellow - grey, silty SAND (SM); occasional cobbles and boulders: TILL																
5	90.1	End of Test Pit No groundwater seepage observed. Bedrock not encountered.																
6																		
7																		



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP11

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443376 E 637043

DATES (mm-dd-yy): DUG 9-28-03

WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
									20	40	60	80							
0	102.00																		
	101.8	Rootmat																	
		Loose to compact, orange - brown, silty SAND (SM); occasional cobbles and boulders																	
	101.3																		
1		Compact to dense, grey - brown, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																	
2																			
3																			
	98.4					BS	1	S											
	98.3	Grey sandstone/siltstone: BEDROCK																	
4		End of Test Pit																	
		Very slow groundwater seepage observed at 2.1 m and 3.5 m depth.																	
		Refusal on probable bedrock at 3.7 m depth.																	
5																			
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP12

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443378 E 636679

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
								20	40	60	80	10	20	30	40	50	60	70	80
0	99.00	Rootmat, boggy																	
	98.7	Loose to compact, yellow - brown, silty SAND (SM); occasional cobbles and boulders																	
1	98.0	Compact to dense, very dense at bottom of stratum, grey to brown, silty SAND (SM); occasional cobbles and boulders: TILL																	
2																			
3																			
4																			
5	94.7	End of Test Pit Moderate groundwater seepage observed at 2.4 m and 3.3 m depth. Bedrock not encountered.																	
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

TEST PIT No. TP13

LOCATION Norris Arm North N 5443811 E 636766

PROJECT No. NFS09711

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★				WATER CONTENT & ATTERBERG LIMITS						
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	W _p	W	W _L				
0	98.00																	
	97.8	Rootmat																
	97.4	Loose to compact, brown to orange - brown, silty SAND (SM); occasional cobbles and boulders																
1		Compact to dense, grey to yellow - grey silty SAND (SM): TILL																
2																		
3																		
4																		
5																		
	92.8	End of Test Pit																
6		Moderate groundwater seepage observed at 2.7 m and 4.9 m depth.																
		Bedrock not encountered.																
7																		



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP14

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443426 E 636381

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★												
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS												
								20	40	60	80	10	20	30	40	50	60	70	80	
0	106.00																			
	105.8	Rootmat																		
	105.4	Loose to compact, orange - brown, silty SAND (SM); occasional cobbles and boulders																		
1		Compact to dense, very dense at bottom of stratum, grey to yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																		
3					BS	1	S													
4																				
5	101.4	End of Test Pit																		
5		Moderate groundwater seepage observed at 3.3 m depth. Bedrock not encountered.																		
6																				
7																				



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland


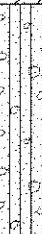
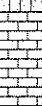
TEST PIT No. TP15

LOCATION Norris Arm North N 5443720 E 635970

PROJECT No. NFS09711

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
0	91.00																		
	90.7	Rootmat																	
		Loose to compact, grey - brown, silty SAND with gravel (SM); occasional cobbles: TILL																	
1																			
	89.5																		
	89.0	Severely fractured, weathered, clay altered, purple sandstone/siltstone to conglomerate: BEDROCK			BS	1	S												
2		End of Test Pit																	
		Slow to moderate groundwater seepage observed at 0.9 m depth.																	
		Refusal on probable bedrock at 2.0 m depth.																	
3																			
4																			
5																			
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP16

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443423 E 635929

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★												
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS												
								20	40	60	80	10	20	30	40	50	60	70	80	
0	101.00	Very loose/soft, black PEAT (PT)																		
	99.8	Loose to compact, grey, SAND (SP)		▼																
2	99.4	Compact to dense, yellow - brown to grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																		
	96.4	Grey conglomerate: BEDROCK																		
5	96.3	End of Test Pit																		
		Moderate groundwater seepage observed at 1.2 m depth.																		
		Refusal on probable bedrock at 4.6 m depth.																		
7																				



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP17

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443723 E 636236

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★				WATER CONTENT & ATTERBERG LIMITS						
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	W _p	W	W _L				
0	90.00	Rootmat																
	89.7	Loose to compact, brown, silty SAND (SM); occasional cobbles and boulders																
1	89.0	Compact to dense, very dense at bottom of stratum, grey to yellow - grey, silty SAND (SM); occasional cobbles and boulders: TILL																
2																		
3																		
4																		
	85.7	End of Test Pit																
5		Slow to moderate groundwater seepage observed at 1.8 m and 2.7 m depth.																
		Bedrock not encountered.																
6																		
7																		



TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

TEST PIT No. TP18

LOCATION Norris Arm North N 5443885 E 636947

PROJECT No. NFS09711

DATES (mm-dd-yy): DUG 9-28-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★				WATER CONTENT & ATTERBERG LIMITS							
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0	91.00	Rootmat																	
	90.7	Loose to compact, orange - brown, silty SAND (SM); occasional cobbles and boulders																	
1	90.2	Compact to dense, very dense at bottom of stratum, grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																	
4.3				▼	BS	1	S												
5	86.1	End of Test Pit																	
6		Moderate groundwater seepage observed at 4.3 m depth. Bedrock not encountered.																	
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP19

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5442747 E 633889

DATES (mm-dd-yy): DUG 9-26-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
0	84.00																		
	83.8	Very loose/soft, black PEAT (PT)																	
	83.6	Loose to compact, grey, silty SAND (SM); occasional cobbles																	
1		Compact to dense, yellow - grey, silty SAND (SM); occasional boulders: TILL																	
2																			
3																			
4																			
5	79.1	Grey to purple, sandstone/siltstone:																	
	79.0	BEDROCK																	
		End of Test Pit																	
6		Slow to moderate groundwater seepage at 0.9 m depth.																	
		Refusal on probable bedrock at 5.0 m depth.																	
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP20

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5442696 E 634211

DATES (mm-dd-yy): DUG 9-26-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★													
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS													
								20	40	60	80	10	20	30	40	50	60	70	80		
0	107.00	Very loose/soft, black PEAT (PT)																			
	106.5	Loose to compact, brown, silty SAND (SM); occasional cobbles and boulders Compact to dense, grey to grey - brown, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																			
	106.3																				
1																					
2																					
3																					
4																					
	102.7	End of Test Pit																			
5		Slow groundwater seepage at 2.7 m and 3.4 m depth. Bedrock not encountered. Refusal on possible boulders at 4.3 m depth.																			
6																					
7																					



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

TEST PIT No. TP21

LOCATION Norris Arm North N 5442708 E 634542

PROJECT No. NFS09711

DATES (mm-dd-yy): DUG 9-26-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★										
					TYPE	NUMBER	OTHER TESTS	20	40	60	80							
								WATER CONTENT & ATTERBERG LIMITS										
								10	20	30	40	50	60	70	80			
								W_p W W_L										
0	112.00																	
	111.8	Rootmat																
	111.4	Loose to compact, orange - brown, silty SAND (SM); occasional cobbles and boulders																
1		Compact to dense, grey to yellow - grey, silty SAND (SM); occasional cobbles and boulders: TILL																
					BS	1	S											
	108.6																	
	108.5	Grey, sandstone to siltstone: BEDROCK																
		End of Test Pit																
4		No groundwater seepage observed.																
		Refusal on probable bedrock at 3.5 m depth.																
5																		
6																		
7																		



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

TEST PIT No. TP22

LOCATION Norris Arm North N 5442728 E 634855

PROJECT No. NFS09711

DATES (mm-dd-yy): DUG 9-27-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
								20	40	60	80	10	20	30	40	50	60	70	80
0	115.00	Very loose/soft, black PEAT (PT)																	
	114.7																		
	114.5	Loose to compact, brown - grey, silty SAND (SM); occasional cobbles																	
1		Compact to dense, grey to brown - grey, silty SAND (SM); occasional cobbles and boulders: TILL																	
2	112.9																		
	112.8	Weathered, rusty orange to brown: BEDROCK																	
		End of Test Pit																	
3		Moderate groundwater seepage observed at 1.8 m depth.																	
		Refusal on probable bedrock at 2.2 m depth.																	
4																			
5																			
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

LOCATION Norris Arm North N 5442977 E 635203

DATES (mm-dd-yy): DUG 9-27-03

WATER LEVEL N/A

TEST PIT No. TP23

PROJECT No. NFS09711

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
0	122.00																		
	121.8	Rootmat, very loose/soft, black PEAT (PT)																	
	121.4	Loose to compact, brown, silty SAND (SM); occasional cobbles and boulders																	
1		Compact to dense, grey to yellow - grey, silty SAND (SM); occasional cobbles and boulders: TILL																	
	119.3																		
3	119.1	Weathered, yellow - brown: BEDROCK																	
		End of Test Pit																	
		Moderate groundwater seepage observed at 0.6 m and 2.1 m depth.																	
		Refusal on probable bedrock at 2.9 m depth.																	
4																			
5																			
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT

BAE - Newplan Group Ltd.

PROJECT

Proposed Waste Management Facility, Central Newfoundland

LOCATION

Norris Arm North

N

5443362

E

635270

TEST PIT No.

TP24

PROJECT No.

NFS09711

DATES (mm-dd-yy): DUG

9-27-03

WATER LEVEL

N/A

DATUM

UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
0	103.00																		
	102.8	Very loose/soft, black PEAT (PT)																	
	102.6	Loose to compact, brown, silty SAND (SM); occasional cobbles and boulders																	
1		Compact to dense, grey to yellow - grey, sandy SILT (ML); occasional cobbles and boulders: TILL																	
3					BS	1	SA												
	99.6																		
	99.5	Grey, siltstone/sandstone: BEDROCK																	
		End of Test Pit																	
4		Slow to moderate groundwater seepage observed at 0.9m, 2.4 m and 3.0 m depth.																	
		Refusal on probable bedrock at 3.5 m depth.																	
5																			
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

TEST PIT No. TP25

LOCATION Norris Arm North N 5443677 E 635304

PROJECT No. NFS09711

DATES (mm-dd-yy): DUG 9-27-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
0	97.00																		
	96.8	Rootmat																	
	96.5	Loose to compact, orange - brown, silty SAND (SM); occasional cobbles and boulders																	
1		Compact to dense, grey, silty SAND (SM); occasional cobbles and boulders: TILL																	
2																			
3																			
4																			
						BS	1	S											
	92.7																		
	92.6	Grey to purple, sandstone/siltstone: BEDROCK																	
		End of Test Pit																	
5		Slow groundwater seepage observed at 3.7 m depth.																	
		Refusal on probable bedrock at 4.4 m depth..																	
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT **BAE - Newplan Group Ltd.**

PROJECT **Proposed Waste Management Facility, Central Newfoundland**

TEST PIT No. **TP26**

LOCATION **Norris Arm North** N **5444022** E **635254**

PROJECT No. **NFS09711**

DATES (mm-dd-yy): DUG **9-27-03** WATER LEVEL **N/A**

DATUM **UTM NAD83 Zone 21**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★								WATER CONTENT & ATTERBERG LIMITS					
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	W _p	W	W _L							
0	68.00	Very loose/soft, black PEAT (PT)																			
	67.6																				
	67.4	Loose to compact, brown to orange - brown, silty SAND (SM); occasional cobbles and boulders																			
1		Compact to dense, grey to grey - brown, silty SAND (SM); occasional cobbles and boulders; TILL																			
2																					
3																					
						BS	I	S	A												
4																					
	63.3																				
	63.2	Grey, siltstone: BEDROCK																			
5		End of Test Pit																			
		Slow groundwater seepage observed at 3.0 m and 4.3 m depth.																			
		Refusal on probable bedrock at 4.7 m depth..																			
6																					
7																					



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

LOCATION Norris Arm North N 5443412 E 634846

DATES (mm-dd-yy): DUG 9-27-03

WATER LEVEL N/A

TEST PIT No. TP27

PROJECT No. NFS09711

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
0		Rootmat																	
		Loose to compact, yellow - brown, silty SAND (SM); occasional cobbles and boulders																	
1		Compact to dense, yellow - grey to grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																	
2																			
3																			
						BS	1	S											
4		Purple to grey, sandstone to siltstone: BEDROCK																	
		End of Test Pit																	
		Slow groundwater seepage observed at 3.5 m depth																	
		Refusal on probable bedrock at 3.8 m depth.																	
5																			
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd. TEST PIT No. TP28
 PROJECT Proposed Waste Management Facility, Central Newfoundland PROJECT No. NFS09711
 LOCATION Norris Arm North N 5443739 E 634889 DATUM UTM NAD83 Zone 21
 DATES (mm-dd-yy): DUG 9-27-03 WATER LEVEL N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★												
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS												
0	71.00																			
	70.9	Rootmat																		
		Loose to compact, yellow - brown, silty SAND (SM); occasional cobbles and boulders																		
	70.2																			
1		Compact to dense, grey to yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																		
2																				
3																				
4																				
	66.4																			
	66.3	Purple, sandstone to siltstone: BEDROCK																		
5		End of Test Pit																		
		Slow groundwater seepage observed at 4.4 m depth																		
		Refusal on probable bedrock at 4.7 m depth.																		
6																				
7																				



NEWFOUNDLAND
GEOSCIENCES

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP29

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443976 E 634902

DATUM UTM NAD83 Zone 21

DATES (mm-dd-yy): DUG 9-27-03 WATER LEVEL N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★								
					TYPE	NUMBER	OTHER TESTS	20	40	60	80					
									WATER CONTENT & ATTERBERG LIMITS							
									W _p	W	W _L					
0	66.00								10	20	30	40	50	60	70	80
	65.9	Rootmat Loose to compact, grey - brown, silty SAND (SM); occasional cobbles and boulders														
1																
	64.7	Compact to dense, very dense at bottom of stratum, grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL														
2																
3																
4																
5	61.3	End of Test Pit Slow groundwater seepage observed at 0.9 m and 2.7 m depth. Bedrock not encountered. Refusal on very compact, very dense till.														
6																
7																



NEWFOUNDLAND
GEOSCIENCES

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP30

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443843 E 634529

DATUM UTM NAD83 Zone 21

DATES (mm-dd-yy): DUG 9-27-03 WATER LEVEL N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★								
					TYPE	NUMBER	OTHER TESTS	20	40	60	80					
									WATER CONTENT & ATTERBERG LIMITS							
									W _p	W	W _L					
									10	20	30	40	50	60	70	80
0	65.00															
	64.8	Rootmat														
	64.5	Loose to compact, orange - brown, silty SAND (SM); occasional to frequent cobbles and boulders														
1		Compact to dense, yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL														
2																
3																
4																
						BS	1	S								
5																
	59.8															
	59.7	Purple, sandstone to siltstone: BEDROCK														
		End of Test Pit														
6		Slow groundwater seepage observed at 3.0 m depth.														
		Refusal on probable bedrock at 5.3 m depth.														
7																



NEWFOUNDLAND
GEOSCIENCES

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

LOCATION Norris Arm North N 5443558 E 634228

DATES (mm-dd-yy): DUG 9-25-03

WATER LEVEL N/A

TEST PIT No. TP31

PROJECT No. NFS09711

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80						
0	71.00	Rootmat															
	70.7	Loose to compact, yellow - brown to orange - brown, silty SAND (SM); occasional cobbles and boulders; occasional roots Compact to dense, very dense at bottom of stratum, yellow - grey, silty SAND (SM); occasional to frequent cobbles and boulders: TILL															
	70.3																
4	66.9	End of Test Pit			BS	1	S										
		No groundwater seepage observed.															
		Bedrock not encountered.															



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland



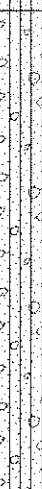
LOCATION Norris Arm North N 5443396 E 633849

DATES (mm-dd-yy): DUG 9-25-03 WATER LEVEL N/A

TEST PIT No. TP32

PROJECT No. NFS09711

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★				WATER CONTENT & ATTERBERG LIMITS					
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	W _p	W	W _L			
0	81.00																
	80.8	Rootmat															
		Loose to compact, yellow to brown, fine silty SAND (SM); occasional cobbles and boulders															
1	80.1	Compact to dense, very dense at bottom of stratum, yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL															
	77.7	End of Test Pit			BS	1	SA	○									
4		No groundwater seepage observed. Bedrock not encountered. Refusal at 3.3 m depth.															
5																	
6																	
7																	



TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

LOCATION Norris Arm North N 5443066 E 633854

DATES (mm-dd-yy): DUG 9-26-03

WATER LEVEL N/A

TEST PIT No. TP33

PROJECT No. NFS09711

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
								20	40	60	80	10	20	30	40	50	60	70	80
0	62.00	Rootmat																	
	61.7	Loose to compact, yellow - brown, silty SAND (SM); occasional cobbles and boulders																	
1	61.2	Compact to dense, yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																	
4.4	57.7	Grey, fine grained sandstone or siltstone: BEDROCK																	
5	57.6	End of Test Pit																	
5		Slow groundwater seepage observed at 1.1 m depth																	
5		Refusal on probable bedrock at 4.4 m depth.																	



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

TEST PIT No. TP34

PROJECT Proposed Waste Management Facility, Central Newfoundland

PROJECT No. NFS09711

LOCATION Norris Arm North N 5443110 E 634204

DATES (mm-dd-yy): DUG 9-26-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS	
					TYPE	NUMBER	OTHER TESTS	20	40	60	80
0	91.00										
	90.8	Rootmat									
		Loose to compact, orange - brown to yellow - brown, silty SAND (SM); occasional gravel and cobbles; some boulders									
1											
	89.5	Compact to dense, grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL									
2											
3					BS	1	S				
4											
5	86.1	End of Test Pit									
		Slow groundwater seepage observed at 4.3 m depth									
		Bedrock not encountered.									
6											
7											



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

LOCATION Norris Arm North N 5443316 E 634197

DATES (mm-dd-yy): DUG 9-25-03 WATER LEVEL N/A

TEST PIT No. TP35

PROJECT No. NFS09711

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	20	40	60	80								
									WATER CONTENT & ATTERBERG LIMITS				W _p	W	W _L				
									10	20	30	40	50	60	70	80			
0	81.00	Rootmat, peat																	
	80.7																		
	80.6	Loose to compact, orange - brown, silty SAND (SM); occasional cobbles and boulders																	
1		Compact to dense, grey to yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders; very dense till at base of test pit: TILL																	
2																			
3																			
4	76.9	End of Test Pit			BS	1													
		No groundwater seepage observed.																	
		Bedrock not encountered.																	
5																			
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

TEST PIT No. TP36

LOCATION Norris Arm North N 5443045 E 634546

PROJECT No. NFS09711

DATES (mm-dd-yy): DUG 9-26-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★										
					TYPE	NUMBER	OTHER TESTS	20	40	60	80							
0	99.00																	
	98.8	Rootmat																
	98.4	Loose to compact, orange - brown, silty SAND (SM); occasional cobbles and boulders																
1		Compact to dense, grey to yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																
	95.6																	
	95.5	Fine grained purple to grey, sandstone to siltstone: BEDROCK End of Test Pit																
4		Moderate groundwater seepage observed at 1.8 m depth																
		Refusal on probable bedrock at 3.5 m depth.																
5																		
6																		
7																		



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT BAE - Newplan Group Ltd.

PROJECT Proposed Waste Management Facility, Central Newfoundland

TEST PIT No. TP37

LOCATION Norris Arm North N 5443406 E 634584

PROJECT No. NFS09711

DATES (mm-dd-yy): DUG 9-27-03 WATER LEVEL N/A

DATUM UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★				WATER CONTENT & ATTERBERG LIMITS							
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0	84.00																		
	83.9	Rootmat																	
		Loose to compact, yellow - brown, silty SAND with gravel (SM); occasional cobbles and boulders																	
1	82.9																		
		Compact to dense, yellow - grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																	
2																			
3																			
4																			
	79.7																		
	79.5	Purple sandstone: BEDROCK																	
		End of Test Pit																	
5		Moderate groundwater seepage observed at 4.0 m depth																	
		Refusal on probable bedrock at 4.5 m depth.																	
6																			
7																			



**NEWFOUNDLAND
GEOSCIENCES**

TEST PIT RECORD

LIMITED

CLIENT

BAE - Newplan Group Ltd.

PROJECT

Proposed Waste Management Facility, Central Newfoundland

LOCATION

Norris Arm North

N

5443083

E

634942

DATES (mm-dd-yy): DUG

9-27-03

WATER LEVEL

N/A

TEST PIT No.

TP38

PROJECT No.

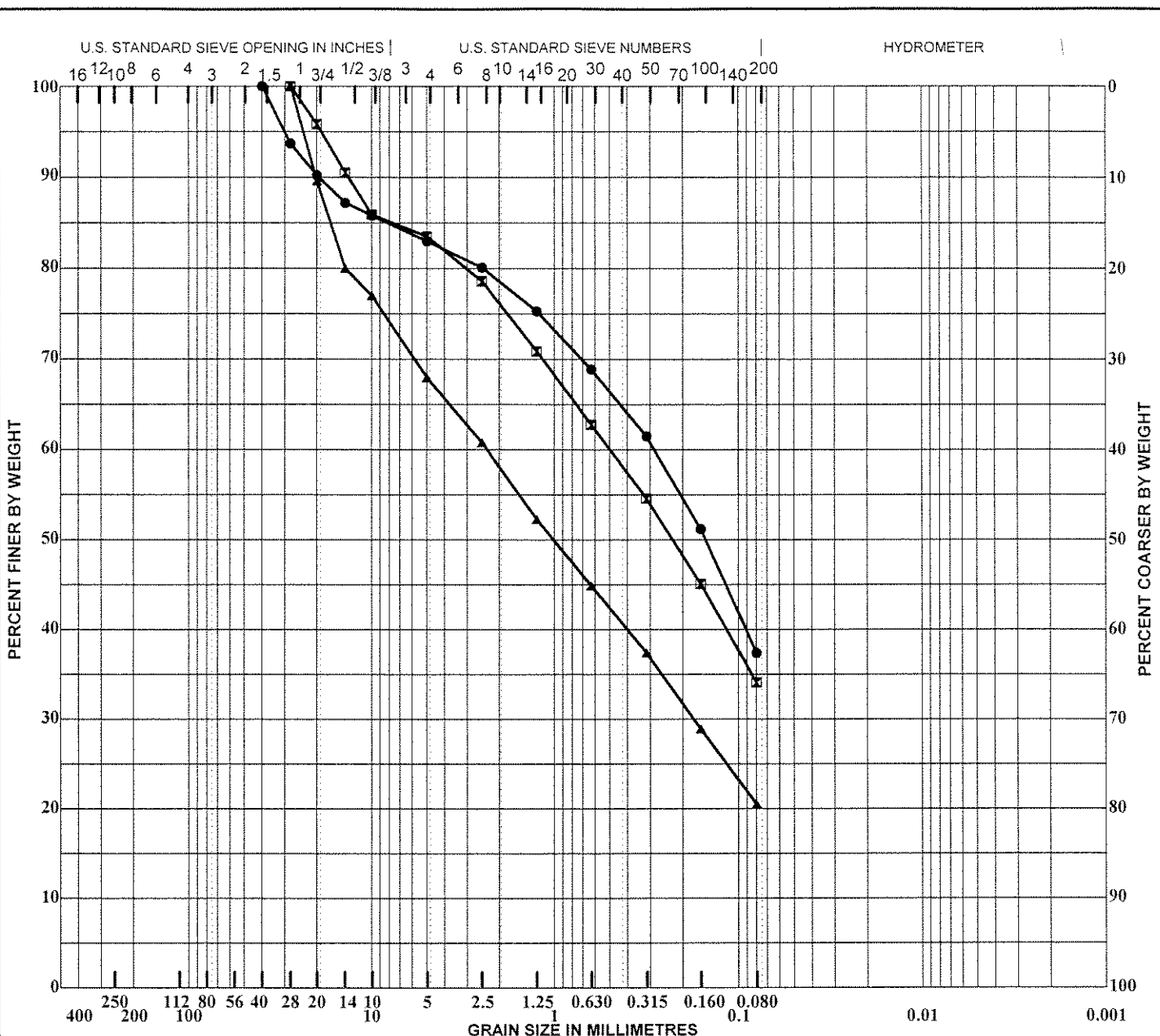
NFS09711

DATUM

UTM NAD83 Zone 21

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★											
					TYPE	NUMBER	OTHER TESTS	WATER CONTENT & ATTERBERG LIMITS											
0	106.00																		
	105.7	Very loose/soft, black PEAT (PT)																	
	105.2	Loose to compact, yellow - brown, silty SAND (SM); occasional cobbles																	
1		Compact to dense, grey, silty SAND with gravel (SM); occasional cobbles and boulders: TILL																	
	103.1																		
3	103.0	Purple, sandstone to siltstone: BEDROCK																	
		End of Test Pit																	
4		Slow groundwater seepage observed at 1.8 m and 2.6 m depth.																	
		Refusal on probable bedrock at 3.0 m depth..																	
5																			
6																			
7																			






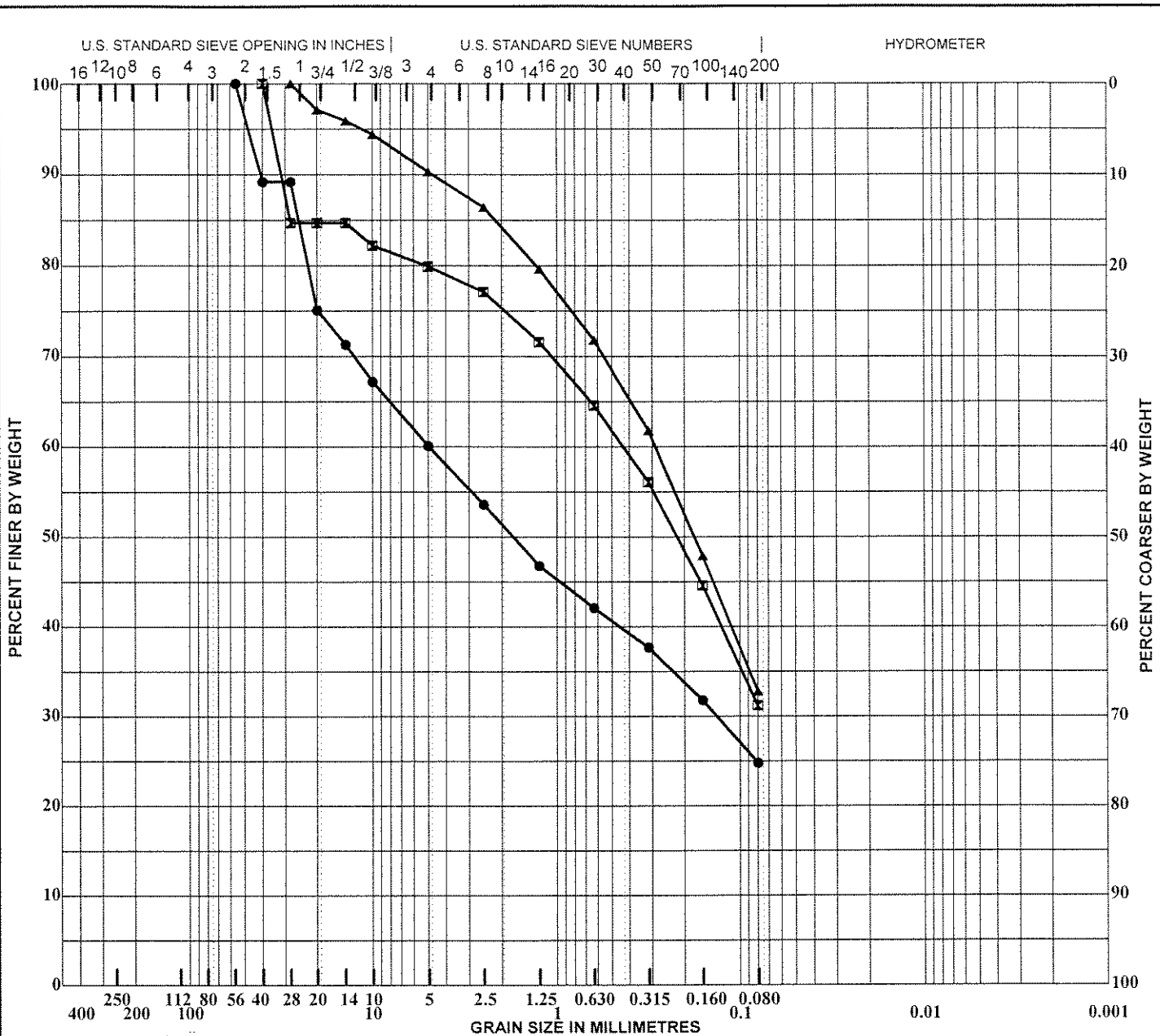
COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

Sample	Depth (m)	Description	W%	W _L	W _P	I _p
● TP1-BS1	3.60	Silty SAND with gravel (SM)	10.9			
▣ TP11-BS1	3.50	Silty SAND with gravel (SM)	11.9			
▲ TP14-BS1	3.00	Silty SAND with gravel (SM)	9.7			

Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP1-BS1	3.60	40.00	0.29			17.0	45.6	37.4	
▣ TP11-BS1	3.50	28.00	0.50			16.5	49.4	34.1	
▲ TP14-BS1	3.00	28.00	2.34	0.175		32.0	47.5	20.5	

REMARKS:

 NEWFOUNDLAND GEOSCIENCES LIMITED	Client: BAE - Newplan Group Ltd.	
	Project: Proposed Waste Management Facility, Central Newfoundland	
	Project No.: NFS09711	FIGURE 1 GRADATION CURVES
	Location: Norris Arm North	




COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

Sample	Depth (m)	Description	W%	W _L	W _p	I _p
● TP15-BS1	1.70	Silty GRAVEL with sand (GM)	10.7			
▣ TP18-BS1	4.60	Silty SAND with gravel (SM)	10.0			
▲ TP19-BS1	2.40	Silty SAND (SM)	9.4			

Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP15-BS1	1.70	56.00	4.95	0.134		39.9	35.3	24.8	
▣ TP18-BS1	4.60	40.00	0.43			20.1	48.7	31.2	
▲ TP19-BS1	2.40	28.00	0.29			9.7	57.5	32.8	

REMARKS:


 NEWFOUNDLAND GEOSCIENCES LIMITED	Client: BAE - Newplan Group Ltd.		FIGURE 2 GRADATION CURVES
	Project: Proposed Waste Management Facility, Central Newfoundland		
	Project No.: NFS09711		
	Location: Norris Arm North		

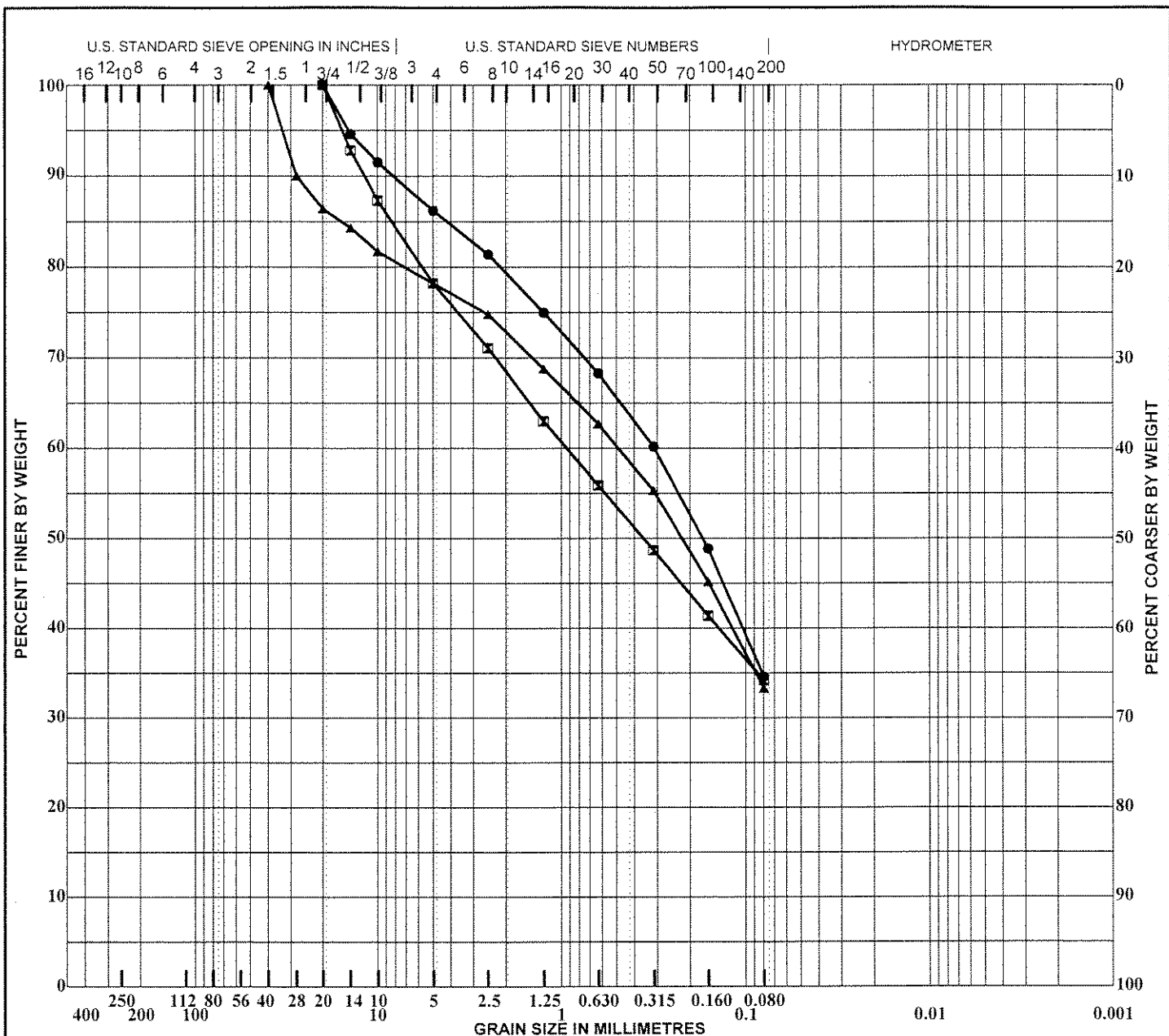


COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

Sample	Depth (m)	Description	W%	W _L	W _p	I _p			
● TP26-BS1	3.40	Silty SAND (SM)	12.3	NP	NP	NP			
■ TP27-BS1	3.00	Silty SAND with gravel (SM)	10.4						
▲ TP30-BS1	3.70	Silty SAND with gravel (SM)	9.0						
Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP26-BS1	3.40	20.00	0.13			5.5	45.7	48.8	
■ TP27-BS1	3.00	40.00	0.53			26.8	32.8	40.4	
▲ TP30-BS1	3.70	40.00	0.51			20.0	47.1	32.9	

REMARKS:

 NEWFOUNDLAND GEOSCIENCES LIMITED	Client: BAE - Newplan Group Ltd.	
	Project: Proposed Waste Management Facility, Central Newfoundland	
	Project No.: NFS09711	FIGURE 4 GRADATION CURVES
	Location: Norris Arm North	




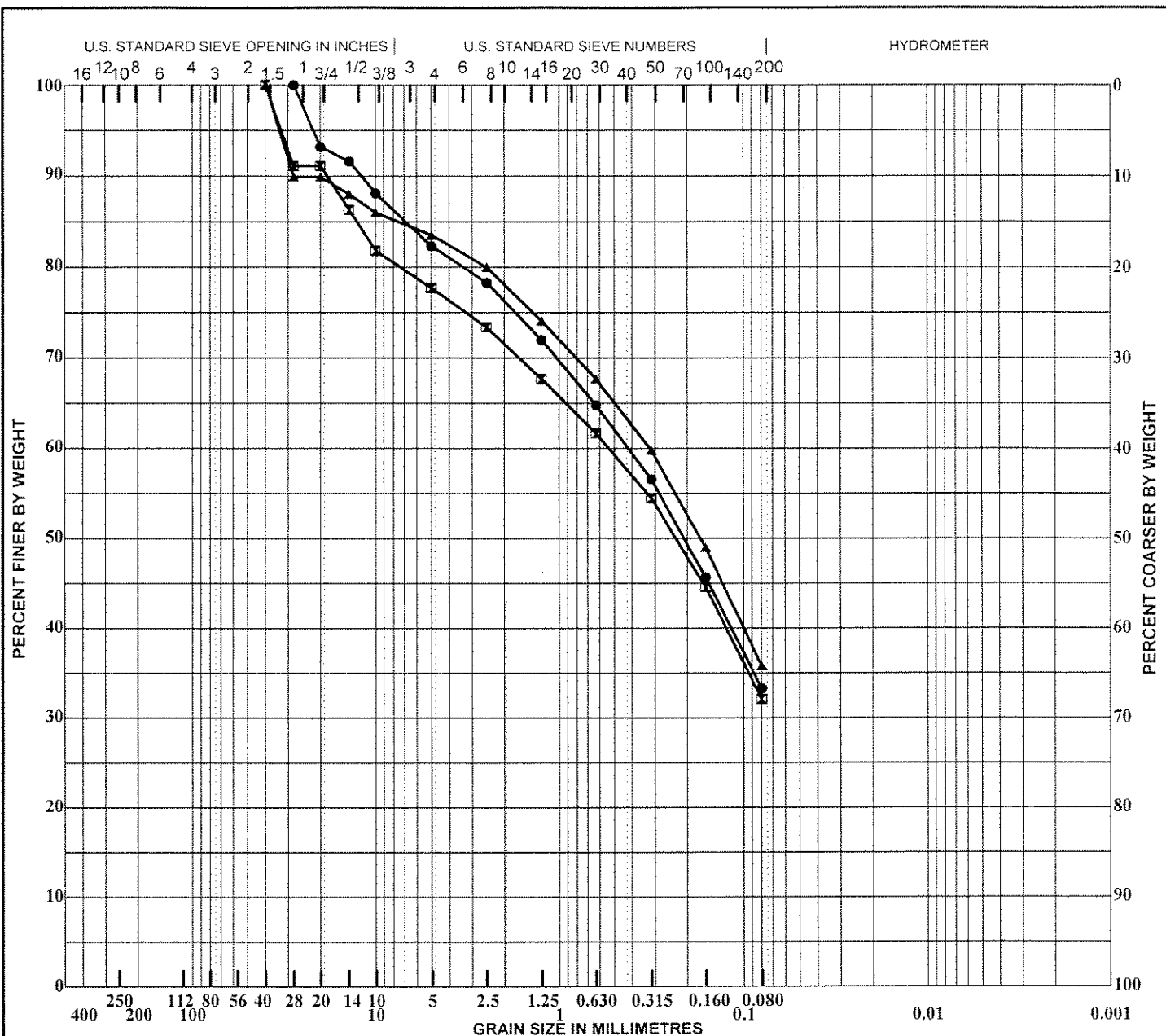
COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

Sample	Depth (m)	Description	W%	W _L	W _p	I _p
● TP31-BS1	4.00	Silty SAND (SM)	11.1			
▣ TP32-BS1	3.20	Silty SAND with gravel (SM)	9.9	NP	NP	NP
▲ TP34-BS1	3.00	Silty SAND with gravel (SM)	10.6			

Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP31-BS1	4.00	20.00	0.31			13.8	51.6	34.6	
▣ TP32-BS1	3.20	20.00	0.94			21.8	44.0	34.2	
▲ TP34-BS1	3.00	40.00	0.49			21.8	44.9	33.3	

REMARKS:


 NEWFOUNDLAND GEOSCIENCES LIMITED	Client: BAE - Newplan Group Ltd.	
	Project: Proposed Waste Management Facility, Central Newfoundland	
	Project No.: NFS09711	FIGURE 5 GRADATION CURVES
	Location: Norris Arm North	

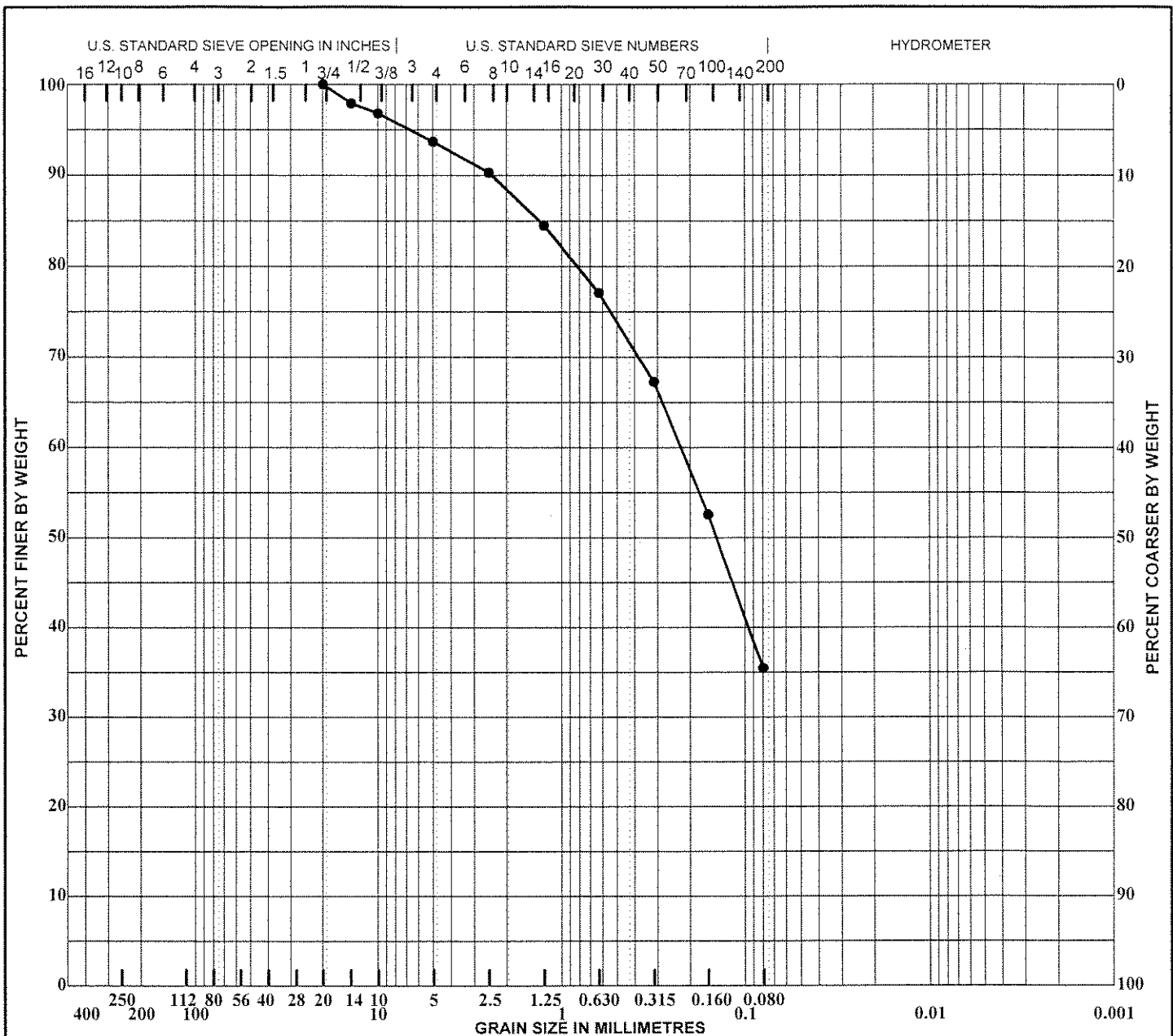


COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

Sample	Depth (m)	Description	W%	W _L	W _P	I _p			
● TP38-BS1	2.40	Silty SAND with gravel (SM)	10.7						
■ TP5-BS1	5.10	Silty SAND with gravel (SM)	9.3						
▲ TP7-BS1	3.70	Silty SAND with gravel (SM)	11.0						
Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP38-BS1	2.40	28.00	0.42			17.7	49.0	33.3	
■ TP5-BS1	5.10	40.00	0.53			22.3	45.6	32.1	
▲ TP7-BS1	3.70	40.00	0.32			16.5	47.7	35.8	

REMARKS:


 NEWFOUNDLAND GEOSCIENCES LIMITED	Client: BAE - Newplan Group Ltd.	
	Project: Proposed Waste Management Facility, Central Newfoundland	
	Project No.: NFS09711	FIGURE 6 GRADATION CURVES
	Location: Norris Arm North	

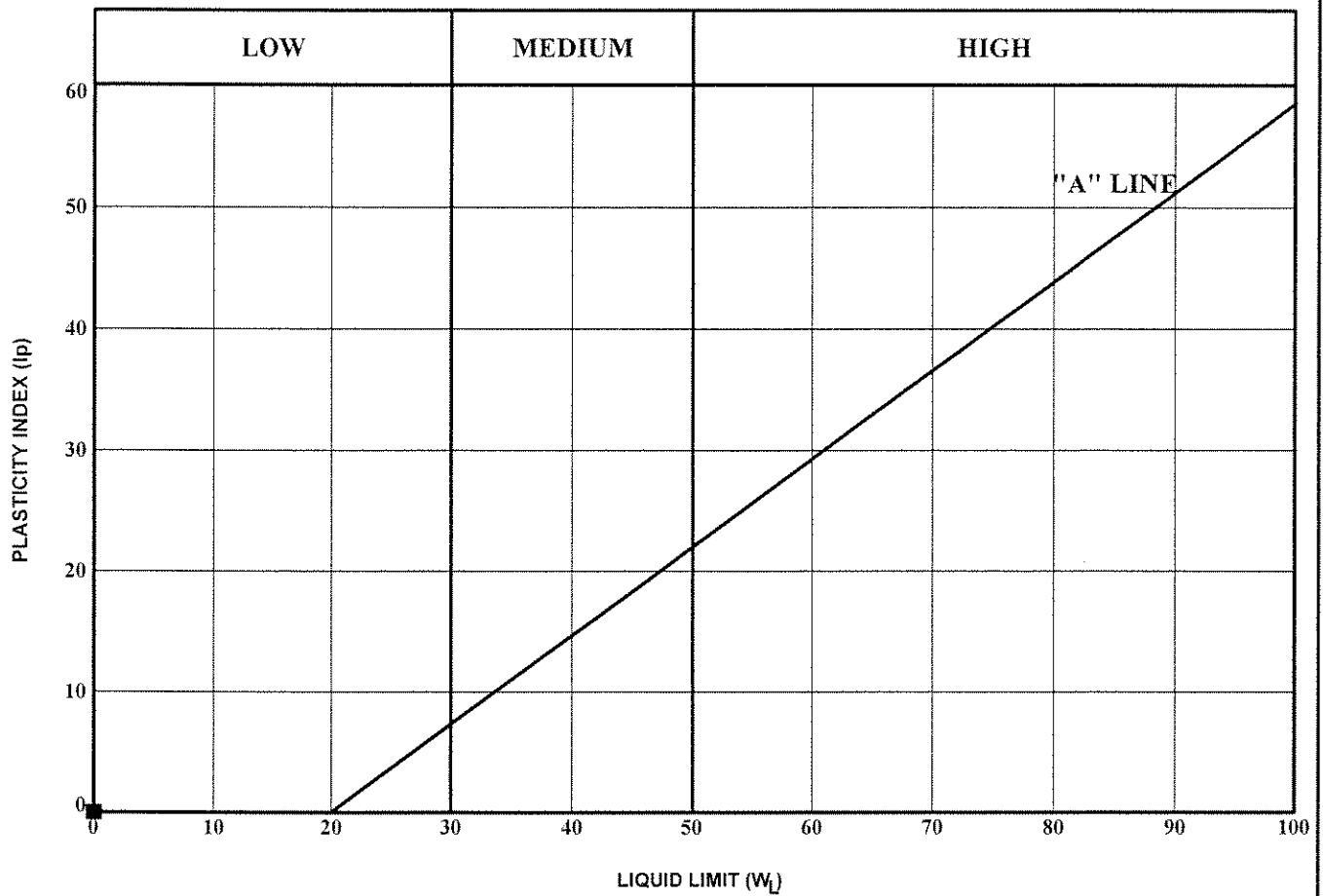


COBBLE	GRAVEL		SAND			SILT and CLAY
	coarse	fine	coarse	medium	fine	

Sample	Depth (m)	Description	W%	W _L	W _p	I _p			
● TP9-BS1	4.50	Silty SAND (SM)	13.0	NP	NP	NP			
Sample	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP9-BS1	4.50	20.00	0.23			6.3	58.2	35.5	

REMARKS:

 NEWFOUNDLAND GEOSCIENCES LIMITED	Client: BAE - Newplan Group Ltd.	
	Project: Proposed Waste Management Facility, Central Newfoundland	
	Project No.: NFS09711	
	Location: Norris Arm North	
		FIGURE 7 GRADATION CURVES



Sample	Depth (m)	Description	W%	W_L	W_P	I_p
● TP24-BS1	3.00	Sandy SILT (ML)	16.0	N/A	N/A	0
☒ TP26-BS1	3.40	Silty SAND (SM)	12.3	N/A	N/A	0
▲ TP32-BS1	3.20	Silty SAND with gravel (SM)	9.9	N/A	N/A	0
★ TP9-BS1	4.50	Silty SAND (SM)	13.0	N/A	N/A	0

REMARKS: Atterburg Limits tests indicate the fines content to be Non-Plastic.



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LIMITED

Client: BAE - Newplan Group Ltd.

Project: Proposed Waste Management Facility, Central Newfoundland

Project No.: NFS09711

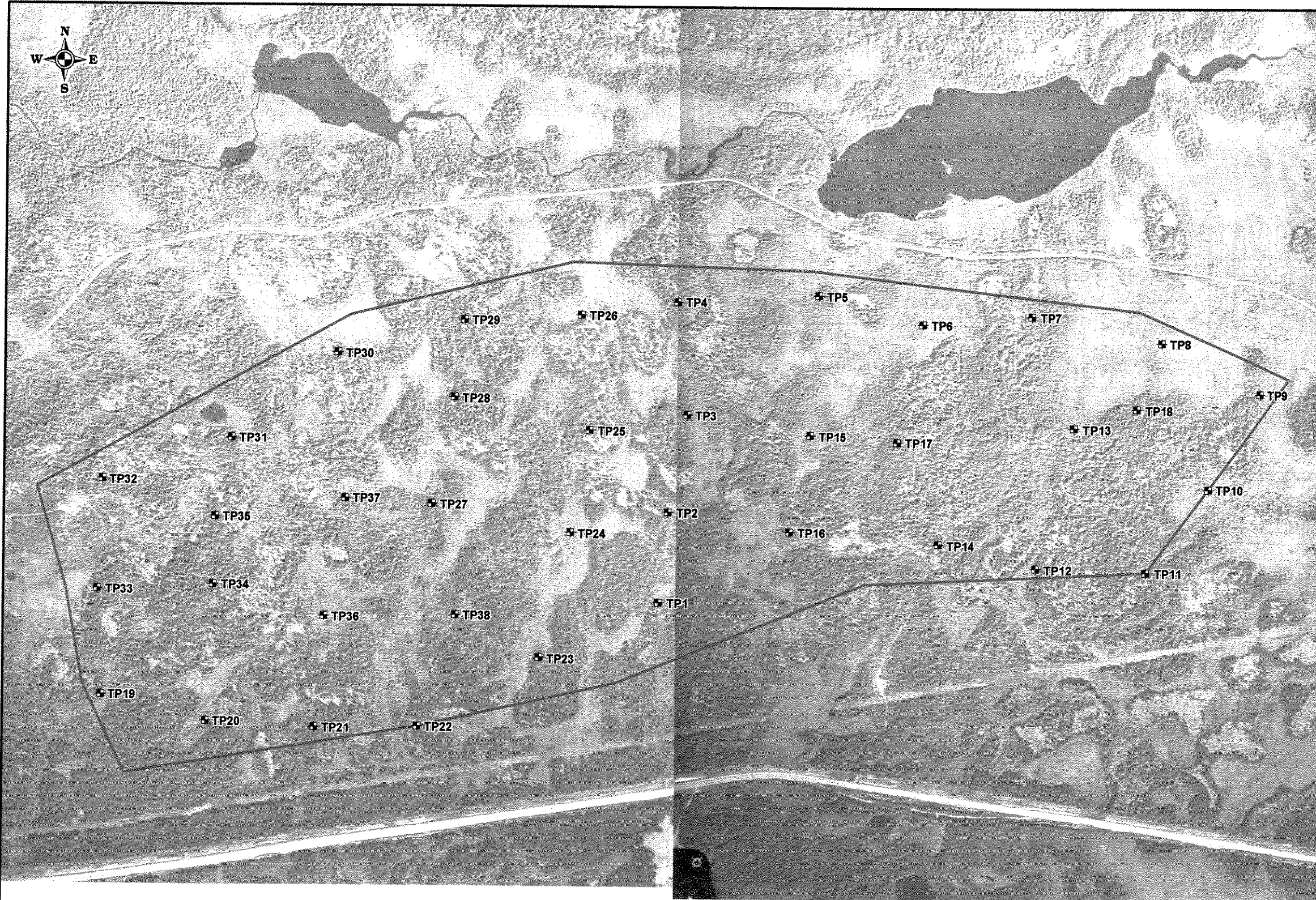
Location: Norris Arm North

**FIGURE
8**

PLASTICITY CHART

APPENDIX C

Drawing No. NFS09711-GE-01, Site Location Plan



LEGEND

☒ TEST PIT

NOTE:

1. BASED ON DRAWINGS AND AIRPHOTOS PROVIDED BY BAE NEWPLAN GROUP LTD.
2. TEST PIT LOCATIONS PROVIDED BY NGL, AT AN APPROXIMATE 350 X 350 M GRID SPACING
3. AIRPHOTO MAY NOT BE TO SCALE; DO NOT SCALE FROM DRAWING

BAE NEWPLAN GROUP LTD.

**PROPOSED WASTE MANAGEMENT FACILITY
CENTRAL NEWFOUNDLAND**

TEST PIT LOCATION PLAN

Newfoundland Geosciences Limited
CONSULTING ENGINEERS

DATE:	SCALE:	DRAWN BY:
17OCT03	AS SHOWN	D.J.B.

	CHECKED BY:
	DRAWING No. NFS09711-GE-01

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