



CAUSEWAY
— GEOTECH

APPENDIX E

VARIABLE HEAD TEST RESULTS



VARIABLE HEAD PERMEABILITY TEST (STANDPIPE)

Project Name: Galway Historical Landfills - Gort
 Project No.: 19-1465B
 Date: 13/07/2020

Borehole No.: GW01
 Test No.: 1

TYPE OF TEST: **Falling** HEAD

Diameter of standpipe: 0.05 (m)
 Depth to top of filter below ground level: 3.00 (m)
 Depth to bottom of filter below ground level: 9.50 (m)
 Length of test section of filter (L): 6.50 (m)
 Diameter of filter (D): 0.20 (m)
 Standing ground water level (SWL) below ground level: 2.00 (m)

TIME ELAPSED (mins)	WATER LEVEL* (m)	HEAD H (m)	HEAD RATIO H/Ho
0	1.30	0.70	1.00
1	1.50	0.50	0.71
2	1.80	0.20	0.29
4	1.90	0.10	0.14
6	1.92	0.08	0.11
8	1.93	0.07	0.10
10	1.94	0.06	0.09
12	1.95	0.05	0.07
14	1.96	0.04	0.06
16	1.97	0.03	0.04
18	1.98	0.02	0.03
20	1.99	0.01	0.01
25	2.00	0.00	0.00
30	2.00	0.00	0.00
45	2.00	0.00	0.00
60	2.00	0.00	0.00

CALCULATION OF PERMEABILITY OF SOIL:

Employing Horslev Method (1951)

$$k = \frac{2.3A}{F(t_2 - t_1)} \log \frac{h_1}{h_2}$$

where:

- k is the permeability of soil
- A is the cross-section area of borehole
- F is the shape factor (see below)
- h_1 and h_2 are the hydraulic heads measured respectively at the times t_1 and t_2

Values for the shape factor (F) are given for various conditions (cases A-E) in Annex B of BS EN ISO 22282-1:2012

$$L/D = 32.5$$

Assumed condition: Case = **E**

$$\text{hence } F = (2 * \pi * L) / (\ln(2 * (L/D)))$$

$$F = 9.78$$

$$\text{and } A = 0.03 \text{ (m}^2\text{)}$$

$$\text{and } h_1 = 2.00 \text{ (m)}$$

$$\text{and } h_2 = 0.20 \text{ (m)}$$

$$\text{and } t_1 = 0 \text{ (s)}$$

$$\text{and } t_2 = 120 \text{ (s)}$$

hence, k = 6.151E-05 m/s



VARIABLE HEAD PERMEABILITY TEST (STANDPIPE)

Project Name: Galway Historical Landfills - Gort
 Project No.: 19-1465B
 Date: 13/07/2020

Borehole No.: GW02
 Test No.: 1

TYPE OF TEST: **Falling** HEAD

Diameter of standpipe: 0.05 (m)
 Depth to top of filter below ground level: 4.00 (m)
 Depth to bottom of filter below ground level: 10.00 (m)
 Length of test section of filter (L): 6.00 (m)
 Diameter of filter (D): 0.20 (m)
 Standing ground water level (SWL) below ground level: 2.07 (m)

TIME ELAPSED (mins)	WATER LEVEL* (m)	HEAD H (m)	HEAD RATIO H/Ho
0	0.00	2.07	1.00
1	1.80	0.27	0.13
2	1.90	0.17	0.08
4	1.98	0.09	0.04
6	1.99	0.08	0.04
8	2.00	0.07	0.03
10	2.02	0.05	0.02
12	2.04	0.03	0.01
14	2.05	0.02	0.01
16	2.06	0.01	0.00
18	2.07	0.00	0.00
20	2.07	0.00	0.00
25	2.07	0.00	0.00
30	2.07	0.00	0.00
45	2.07	0.00	0.00
60	2.07	0.00	0.00

CALCULATION OF PERMEABILITY OF SOIL:

Employing Horslev Method (1951)

$$k = \frac{2.3A}{F(t_2 - t_1)} \log \frac{h_1}{h_2}$$

where:

- k is the permeability of soil
- A is the cross-section area of borehole
- F is the shape factor (see below)
- h_1 and h_2 are the hydraulic heads measured respectively at the times t_1 and t_2

Values for the shape factor (F) are given for various conditions (cases A-E) in Annex B of BS EN ISO 22282-1:2012

$$L/D = 30$$

Assumed condition: Case = **E**

$$\text{hence } F = (2 * \pi * L) / (\ln(2 * (L/D)))$$

$$F = 9.21$$

$$\text{and } A = 0.03 \text{ (m}^2\text{)}$$

$$\text{and } h_1 = 2.07 \text{ (m)}$$

$$\text{and } h_2 = 0.27 \text{ (m)}$$

$$\text{and } t_1 = 0 \text{ (s)}$$

$$\text{and } t_2 = 90 \text{ (s)}$$

hence, k = 7.708E-05 m/s



VARIABLE HEAD PERMEABILITY TEST (STANDPIPE)

Project Name: Galway Historical Landfills - Gort
 Project No.: 19-1465B
 Date: 13/07/2020

Borehole No.: LH01
 Test No.: 1

TYPE OF TEST: **Falling** HEAD

Diameter of standpipe: 0.05 (m)
 Depth to top of filter below ground level: 1.00 (m)
 Depth to bottom of filter below ground level: 4.00 (m)
 Length of test section of filter (L): 3.00 (m)
 Diameter of filter (D): 0.20 (m)
 Standing ground water level (SWL) below ground level: 3.45 (m)

TIME ELAPSED (mins)	WATER LEVEL* (m)	HEAD H (m)	HEAD RATIO H/Ho
0	1.90	1.55	1.00
1	2.70	0.75	0.48
2	2.95	0.50	0.32
4	3.08	0.37	0.24
6	3.16	0.29	0.19
8	3.18	0.27	0.17
10	3.20	0.25	0.16
12	3.22	0.23	0.15
14	3.24	0.21	0.14
16	3.26	0.19	0.12
18	3.28	0.17	0.11
20	3.30	0.15	0.10
25	3.31	0.14	0.09
30	3.32	0.13	0.08
45	3.35	0.10	0.06
60	3.40	0.05	0.03
75	3.45	0.00	0.00

CALCULATION OF PERMEABILITY OF SOIL:

Employing Horslev Method (1951)

$$k = \frac{2.3A}{F(t_2 - t_1)} \log \frac{h_1}{h_2}$$

where:

- k is the permeability of soil
- A is the cross-section area of borehole
- F is the shape factor (see below)
- h_1 and h_2 are the hydraulic heads measured respectively at the times t_1 and t_2

Values for the shape factor (F) are given for various conditions (cases A-E) in Annex B of BS EN ISO 22282-1:2012

$$L/D = 15$$

Assumed condition: Case = **E**

$$\text{hence } F = (2 * \pi * L) / (\ln(2 * (L/D)))$$

$$F = 5.54$$

$$\text{and } A = 0.03 \text{ (m}^2\text{)}$$

$$\text{and } h_1 = 1.55 \text{ (m)}$$

$$\text{and } h_2 = 0.16 \text{ (m)}$$

$$\text{and } t_1 = 0 \text{ (s)}$$

$$\text{and } t_2 = 1200 \text{ (s)}$$

hence, k = 1.086E-05 m/s





CAUSEWAY
— GEOTECH

APPENDIX F
GEOTECHNICAL LABORATORY TEST RESULTS





**SOIL AND ROCK SAMPLE ANALYSIS
LABORATORY TEST REPORT**

6 August 2020

Project Name:	Galway Historic Landfills - Gort
Project No.:	19-1465B
Client:	Galway County Council
Engineer:	Feehily Timoney

We are pleased to attach the results of laboratory testing carried out for the above project. This memo and its attachments constitute a report of the results of tests as detailed in the Contents page(s).

The attached results complete the testing requested and we would therefore wish to confirm that samples will be retained without charge for a period of 28 days from the above date after which they will be appropriately disposed of unless we receive written instructions to the contrary prior to that date.

We trust our report meets with your approval but if you have any queries or require additional information, please do not hesitate to contact the undersigned.

Stephen Watson

Laboratory Manager

Signed for and on behalf of Causeway Geotech Ltd



Project Name: Galway Historic Landfills - Gort

Report Reference: Schedule 1

The table below details the tests carried out, the specifications used, and the number of tests included in this report.

Tests marked with* in this report are not United Kingdom Accreditation Service (UKAS) accredited and are not included in Causeway Geotech Limited's scope of UKAS Accreditation Schedule of Tests. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.


Material tested	Type of test/Properties measured/Range of measurement	Standard specifications	No. of results included in the report
SOIL	Moisture Content of Soil	BS 1377-2: 1990: Cl 3.2	2
SOIL	Liquid and Plastic Limits of soil-1 point cone penetrometer method	BS 1377-2: 1990: Cl 4.4, 5.3 & 5.4	2
SOIL	Particle size distribution - wet sieving	BS 1377-2: 1990: Cl 9.2	2
SOIL	Particle size distribution - sedimentation hydrometer method	BS 1377-2: 1990: Cl 9.5	2
SOIL	Moisture Condition Value / Moisture Content Relationship	BS 1377-4: 1990: Cl 5.5	2
SOIL	Undrained shear strength – triaxial compression without measurement of pore pressure (loads from 0.12 to 24 kN)	BS 1377-7: 1990: Cl 8	2

Summary of Classification Test Results

Project No. 19-1465B	Project Name Galway Historic Landfills - Gort
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Hole No.	Sample				Soil Description	Density		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Casagrande Classification
	Ref	Top	Base	Type		bulk Mg/m3	dry							
TP05	1	0.50		B	Brown sandy gravelly SILT.			13.0	48	54 -1pt	44	10		MH
TP08	1	0.50		B	Brown sandy gravelly SILT.			16.0	56	46 -1pt	39	7		MI

All tests performed in accordance with BS1377:1990 unless specified otherwise LAB 01R Version 4

Key Density test Liquid Limit Particle density Linear measurement unless : 4pt cone unless : sp - small pyknometer wd - water displacement cas - Casagrande method gj - gas jar wi - immersion in water 1pt - single point test	Date Printed 08/05/2020 00:00	Approved By Stephen.Watson	
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PARTICLE SIZE DISTRIBUTION

Job Ref **19-1465B**

Borehole/Pit No. **TP05**

Site Name **Galway Historic Landfills - Gort**

Sample No. **1**

Soil Description **Brown sandy gravelly SILT.**

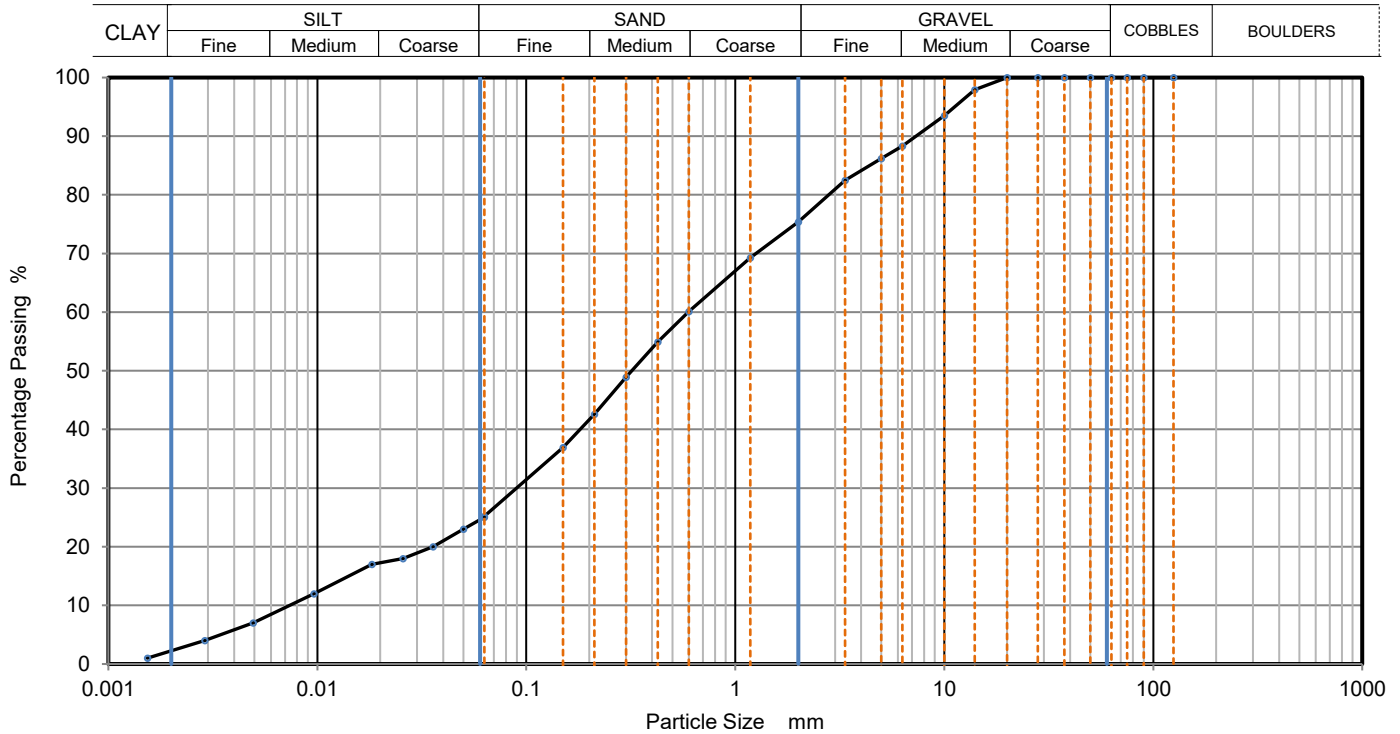
Depth, m **0.50**

Specimen Reference **8** Specimen Depth **0.5** m

Sample Type **B**

Test Method **BS1377:Part 2:1990, clauses 9.2 and 9.5**

KeyLAB ID **Caus2020070660**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	25
90	100	0.05003	23
75	100	0.03582	20
63	100	0.02564	18
50	100	0.01824	17
37.5	100	0.00964	12
28	100	0.00493	7
20	100	0.00289	4
14	98	0.00154	1
10	94		
6.3	88		
5	86		
3.35	83		
2	75		
1.18	69		
0.6	60		
0.425	55	Particle density (assumed) 2.65 Mg/m3	
0.3	49		
0.212	43		
0.15	37		
0.063	25		

Dry Mass of sample, g **503**

Sample Proportions	% dry mass
Cobbles	0
Gravel	25
Sand	50
Silt	23
Clay	2

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	82
Curvature Coefficient	1.9

Remarks

Preparation and testing in accordance with BS1377-2 :1990 unless noted below

Approved

Stephen.Watson





PARTICLE SIZE DISTRIBUTION

Job Ref **19-1465B**

Borehole/Pit No. **TP08**

Site Name **Galway Historic Landfills - Gort**

Sample No. **1**

Soil Description **Brown sandy gravelly SILT.**

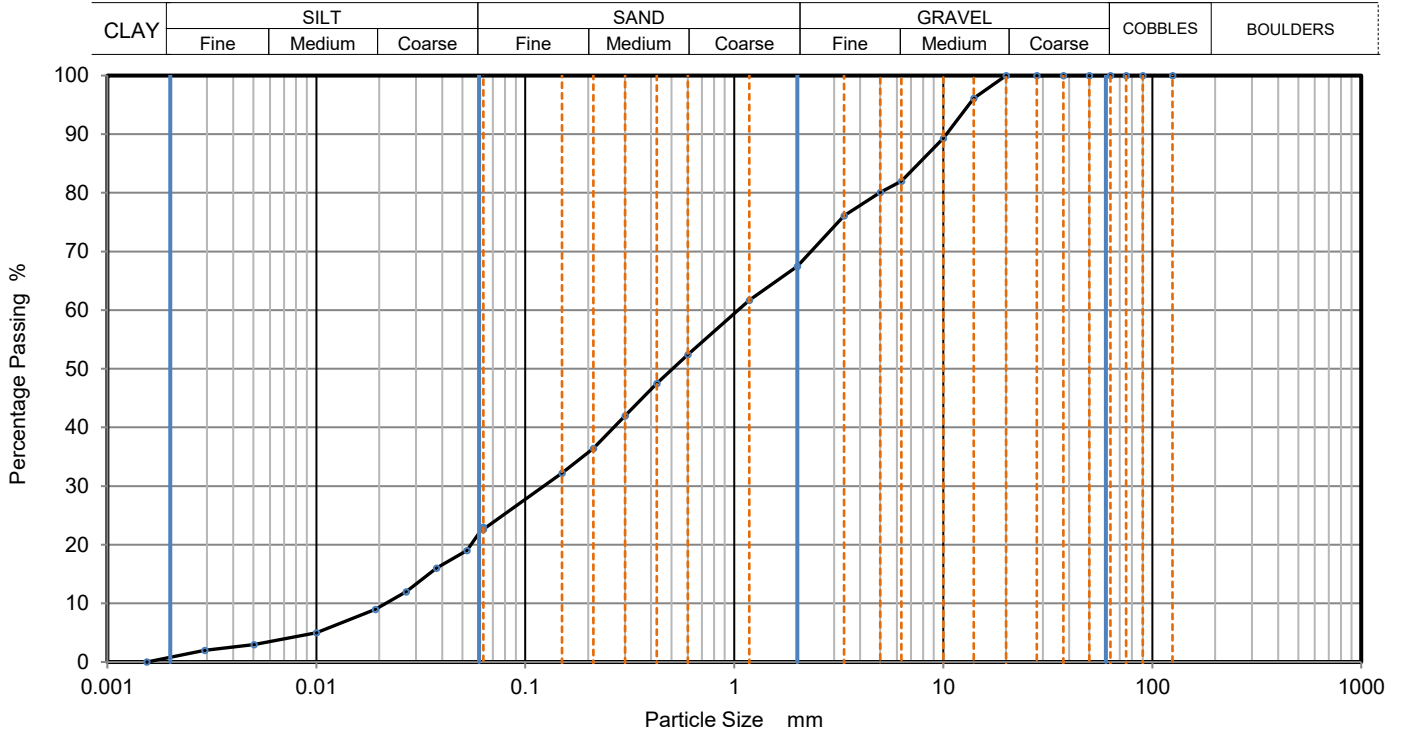
Depth, m **0.50**

Specimen Reference **8** Specimen Depth **0.5** m

Sample Type **B**

Test Method **BS1377:Part 2:1990, clauses 9.2 and 9.5**

KeyLAB ID **Caus2020070661**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	23
90	100	0.05249	19
75	100	0.03754	16
63	100	0.02684	12
50	100	0.01918	9
37.5	100	0.01001	5
28	100	0.00503	3
20	100	0.00292	2
14	96	0.00154	0
10	89		
6.3	82		
5	80		
3.35	76		
2	68		
1.18	62		
0.6	52		
0.425	48	Particle density (assumed)	
0.3	42	2.65 Mg/m3	
0.212	36		
0.15	32		
0.063	23		

Dry Mass of sample, g **503**

Sample Proportions	% dry mass
Cobbles	0
Gravel	33
Sand	45
Silt	22
Clay	1

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	48
Curvature Coefficient	0.67

Remarks
Preparation and testing in accordance with BS1377-2 :1990 unless noted below

Approved

Stephen.Watson





Moisture Condition Value / Moisture Content Relationship

Job Ref	19-1465B
Borehole/Pit No.	TP05
Sample No.	1
Depth	0.5
Sample Type	B
KeyLAB ID	Caus2020070660
Date started	04/03/2020

Site Name	Galway Historic Landfills - Gort		
Soil Description	Brown sandy gravelly SILT.		
Specimen Reference	9	Specimen Depth	0.5 m
Specimen Description	Brown sandy gravelly SILT.		
Test Method	BS1377:Part4:1990:clause 5.5		

Sample preparation

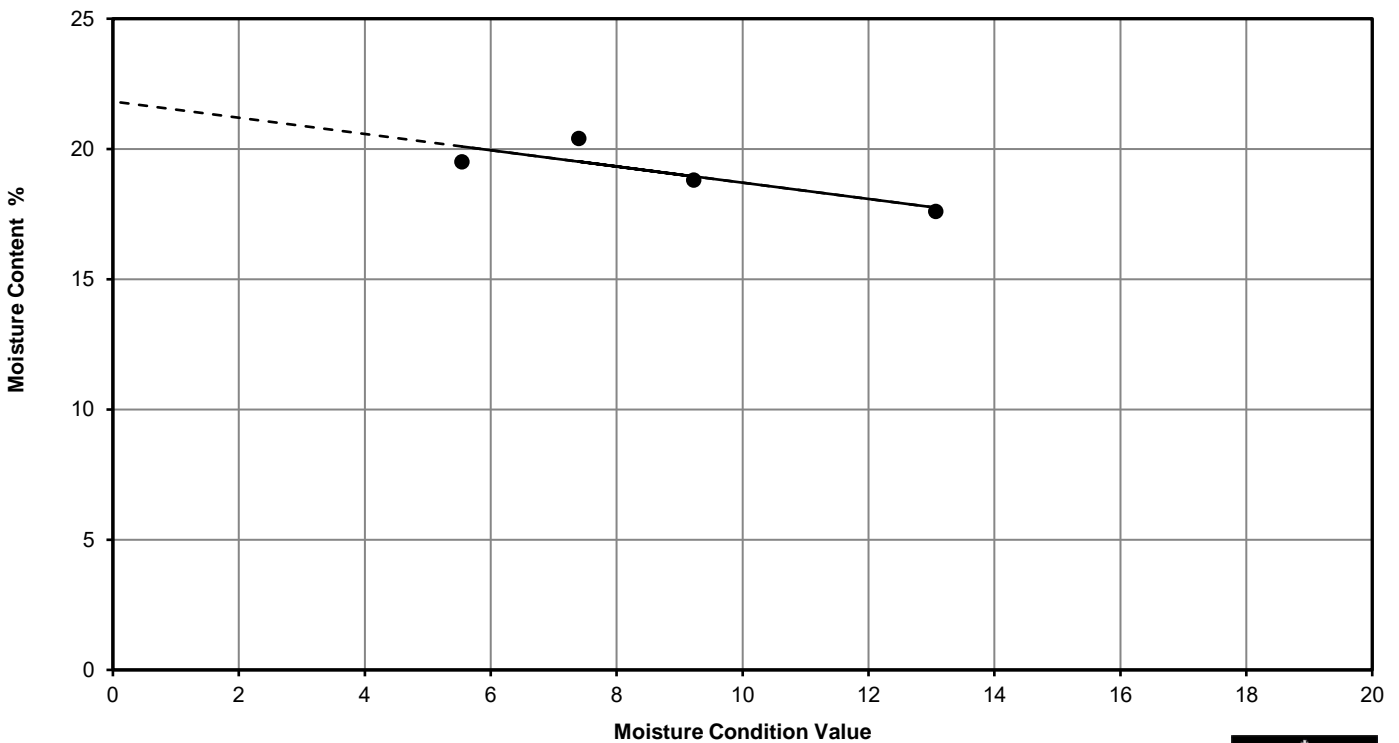
Amount of material larger than 20mm sieve removed 0 %
 Natural Moisture Content of sample 17.5 %
 Initial Moisture Content of test sample below 20mm 17.6 %
 Separate specimens tested

General remarks

Table of results

MCV Test Number	1	2	3	4	
Moisture Content, %	17.6	20.4	18.8	19.5	
Moisture Condition Value	13.1	7.4	9.2	5.5	
MCV report	13.1	7.4	9.2	5.5	
Effective / Valid data point	YES	YES	YES	YES	
Specimen remarks					

● valid points × invalid points - - - - extended regression — linear regression



Approved
 Stephen.Watson
 LAB 11R Version 4





Moisture Condition Value / Moisture Content Relationship

Job Ref	19-1465B
Borehole/Pit No.	TP08
Sample No.	1
Depth	0.5
Sample Type	B
KeyLAB ID	Caus2020070661
Date started	04/03/2020

Site Name	Galway Historic Landfills - Gort		
Soil Description	Brown sandy gravelly SILT.		
Specimen Reference	9	Specimen Depth	0.5 m
Specimen Description	Brown sandy gravelly SILT.		
Test Method	BS1377:Part4:1990:clause 5.5		

Sample preparation

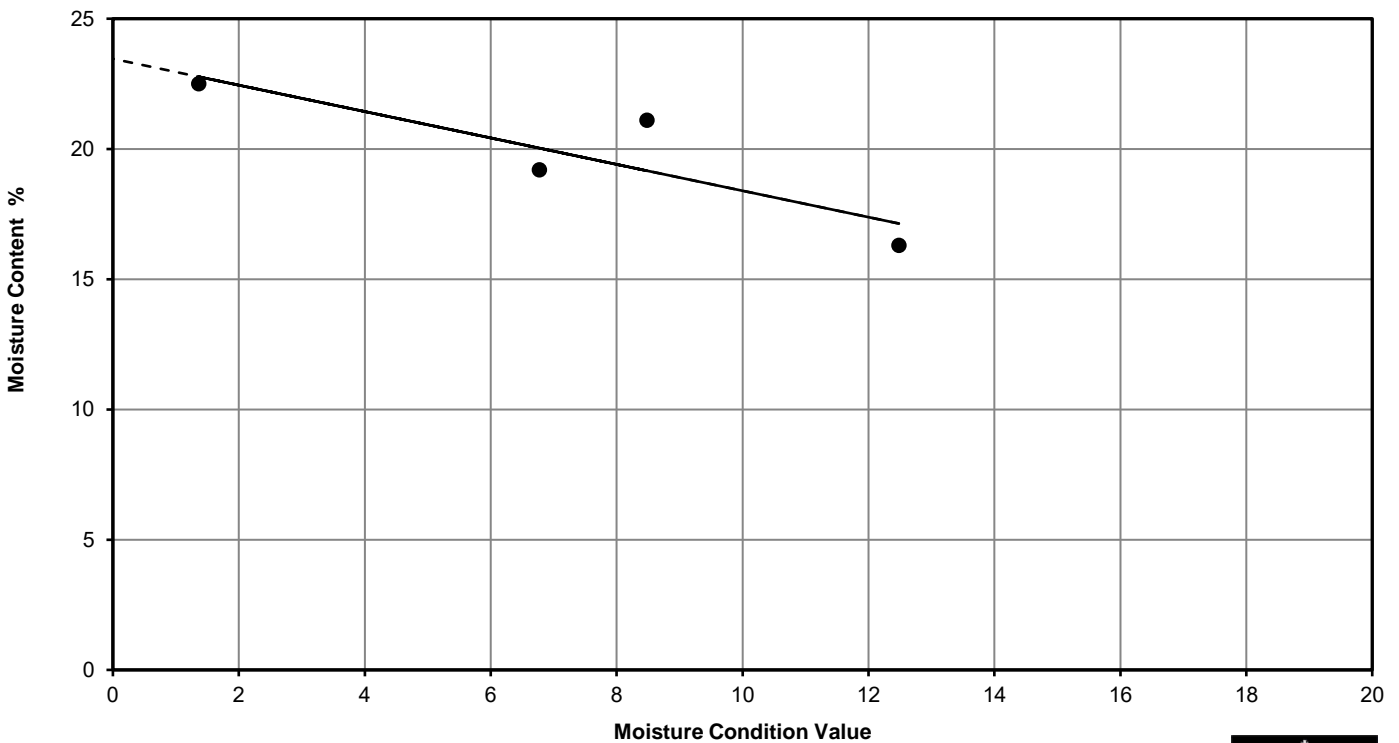
Amount of material larger than 20mm sieve removed	8	%
Natural Moisture Content of sample	14.7	%
Initial Moisture Content of test sample below 20mm	16.3	%
Separate specimens tested		

General remarks

Table of results

MCV Test Number	1	2	3	4	
Moisture Content, %	16.3	22.5	19.2	21.1	
Moisture Condition Value	12.5	1.4	6.8	8.5	
MCV report	12.5	1.4	6.8	8.5	
Effective / Valid data point	YES	YES	YES	YES	
Specimen remarks					

● valid points × invalid points - - - - extended regression — linear regression



Approved
Stephen.Watson

LAB 11R Version 4





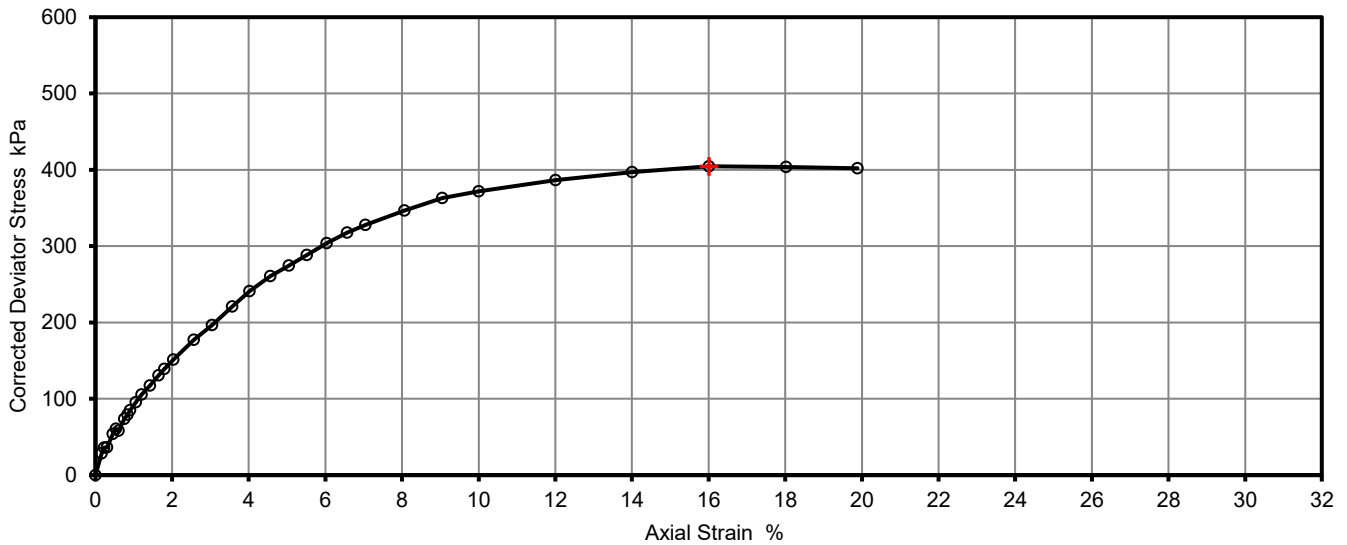
**Unconsolidated Undrained Triaxial
Compression Test without measurement
of pore pressure - single specimen**

Job Ref	19-1465B
Borehole/Pit No.	TP05
Sample No.	1
Depth	0.50
Sample Type	B
KeyLAB ID	Caus2020070660
Date of test	10/07/2020

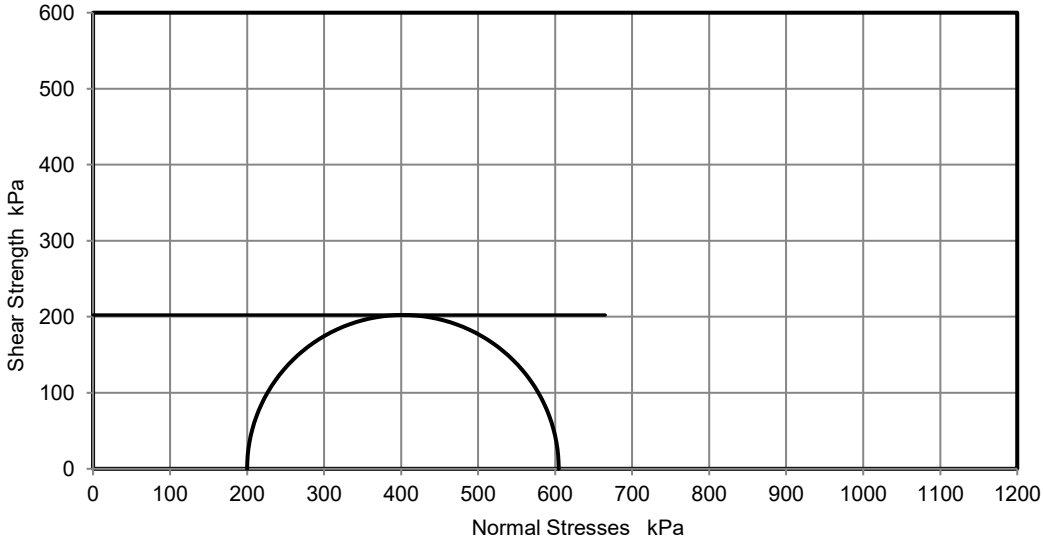
Site Name	Galway Historic Landfills - Gort		
Soil Description	Brown sandy gravelly SILT.		
Specimen Reference	10	Specimen Depth	0.50 m
Specimen Description	Stiff brown sandy gravelly SILT.		
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen		

Test Number	1	
Length	210.5	mm
Diameter	105.0	mm
Bulk Density	2.07	Mg/m ³
Moisture Content	18.0	%
Dry Density	1.75	Mg/m ³
Rate of Strain	1.0	%/min
Cell Pressure	200	kPa
At failure	16.0	%
Axial Strain	405	kPa
Deviator Stress, (σ ₁ - σ ₃) _f	202	kPa ½(σ ₁ - σ ₃) _f
Undrained Shear Strength, c _u		
Mode of Failure	Plastic	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects based on Fig 11 BS1377-7:1990

Mohr circles and their interpretation is not covered by BS1377-7. This is provided for information only.

Remarks

Recompacted from bulk sample using 4.5kg rammer

Approved

Stephen.Watson

Printed

05/08/2020 16:42





**Unconsolidated Undrained Triaxial
Compression Test without measurement
of pore pressure - single specimen**

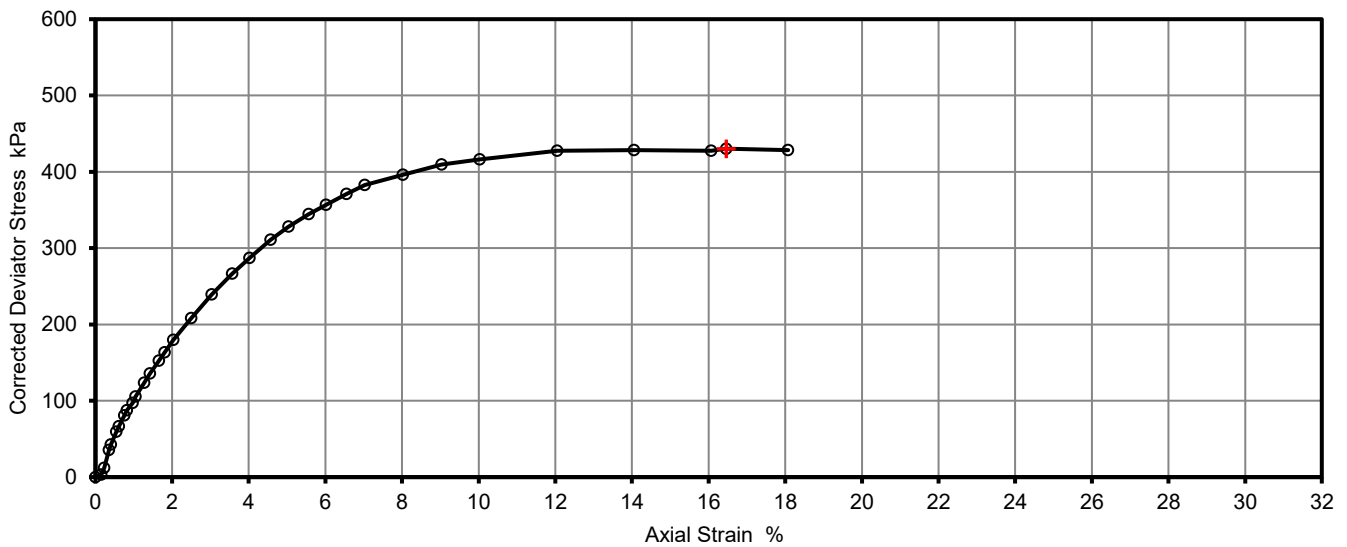
Job Ref	19-1465B
Borehole/Pit No.	TP08
Sample No.	1
Depth	0.50
Sample Type	B
KeyLAB ID	Caus2020070661
Date of test	10/07/2020

Site Name	Galway Historic Landfills - Gort		
Soil Description	Brown sandy gravelly SILT.		
Specimen Reference	10	Specimen Depth	0.50 m
Specimen Description	Stiff brown sandy gravelly SILT.		
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen		

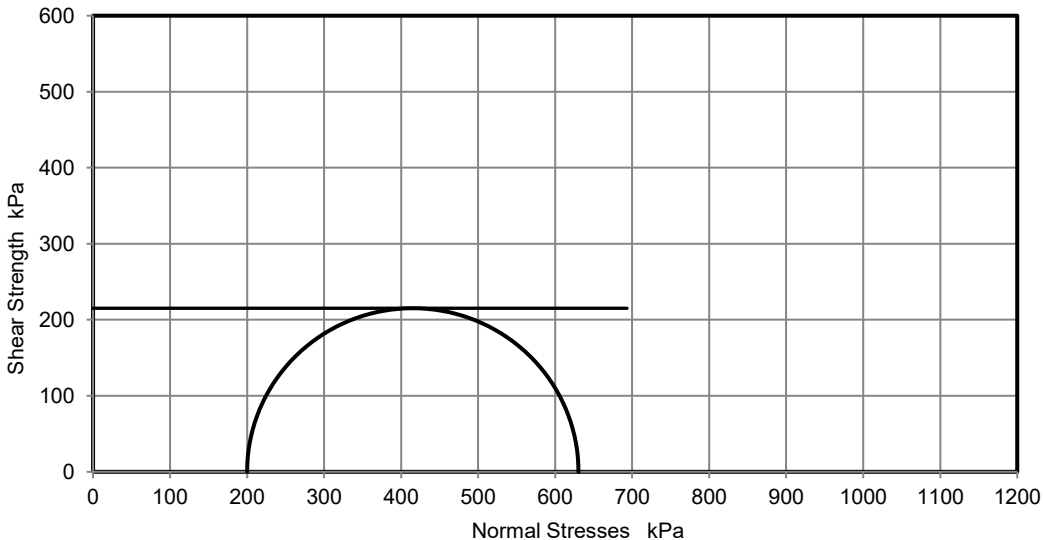
Test Number	1	
Length	210.6	mm
Diameter	105.1	mm
Bulk Density	2.04	Mg/m ³
Moisture Content	17.4	%
Dry Density	1.73	Mg/m ³

Rate of Strain	1.0	%/min
Cell Pressure	200	kPa
At failure	16.5	%
Axial Strain	430	kPa
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	215	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)$
Undrained Shear Strength, c_u		
Mode of Failure	Plastic	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects based on Fig 11 BS1377-7:1990

Mohr circles and their interpretation is not covered by BS1377-7. This is provided for information only.

Remarks

Recompacted from bulk sample using 4.5kg rammer

Approved

Stephen.Watson

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05/08/2020 16:42





CAUSEWAY
— GEOTECH

APPENDIX G

ENVIRONMENTAL LABORATORY TEST RESULTS





Final Report

Report No.: 20-16731-1
Initial Date of Issue: 21-Jul-2020
Client: Causeway Geotech Ltd
Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL
Contact(s): Carin Cornwall
Colm Hurley
Darren O'Mahony
Fernando Alfonso
Gabiella Horan
Joe Gervin
John Cameron
Lucy Newland
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Sean Ross
Stephen Franey
Stephen McCracken
Stephen Watson
Stuart Abraham
Project: 19-1465B Historic Landfills Galway Site
2 Gort

Quotation No.:		Date Received:	01-Jul-2020
Order No.:		Date Instructed:	15-Jul-2020
No. of Samples:	2		
Turnaround (Wkdays):	5	Results Due:	21-Jul-2020
Date Approved:	21-Jul-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Single Stage WAC

Project: 19-1465B Historic Landfills Galway Site 2 Gort

Chemtest Job No: 20-16731 Chemtest Sample ID: 1025127 Sample Ref: Sample ID: Sample Location: TP03 Top Depth(m): 2.00 Bottom Depth(m): Sampling Date: 26-Jun-2020				Landfill Waste Acceptance Criteria Limits			
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	4.4	3	5	6
Loss On Ignition	2610	M	%	11	--	--	10
Total BTEX	2760	M	mg/kg	[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	[B] < 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.011	--	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate mg/l	10:1 Eluate mg/kg	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.072	0.72	20	100	300
Cadmium	1450	U	< 0.00010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.050	0.5	10	70
Copper	1450	U	< 0.0010	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.049	0.49	0.5	10	30
Nickel	1450	U	0.0048	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	0.0012	0.012	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0092	< 0.50	4	50	200
Chloride	1220	U	1.9	19	800	15000	25000
Fluoride	1220	U	0.16	1.6	10	150	500
Sulphate	1220	U	340	3400	1000	20000	50000
Total Dissolved Solids	1020	N	620	6100	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	9.9	99	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	21

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 19-1465B Historic Landfills Galway Site 2 Gort

Chemtest Job No: 20-16731				Landfill Waste Acceptance Criteria Limits			
Chemtest Sample ID: 1025130							
Sample Ref:							
Sample ID:							
Sample Location: TP06							
Top Depth(m): 2.50				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Bottom Depth(m):							
Sampling Date: 26-Jun-2020							
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	M	%	7.8	3	5	6
Loss On Ignition	2610	M	%	33	--	--	10
Total BTEX	2760	M	mg/kg	[B] 0.030	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg	[B] 260	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0	100	--	--
pH	2010	M		8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate mg/l	10:1 Eluate mg/kg	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	0.0032	< 0.050	0.5	2	25
Barium	1450	U	0.060	0.60	20	100	300
Cadmium	1450	U	0.00015	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.050	0.5	10	70
Copper	1450	U	< 0.0010	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.082	0.82	0.5	10	30
Nickel	1450	U	0.016	0.16	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	0.0036	0.036	0.06	0.7	5
Selenium	1450	U	0.0084	0.084	0.1	0.5	7
Zinc	1450	U	0.017	< 0.50	4	50	200
Chloride	1220	U	81	810	800	15000	25000
Fluoride	1220	U	0.19	1.9	10	150	500
Sulphate	1220	U	650	6500	1000	20000	50000
Total Dissolved Solids	1020	N	1200	12000	4000	60000	100000
Phenol Index	1920	U	0.030	0.30	1	-	-
Dissolved Organic Carbon	1610	U	70	700	500	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1025127			TP03	26-Jun-2020	B	Amber Glass 250ml
1025127			TP03	26-Jun-2020	B	Amber Glass 60ml
1025127			TP03	26-Jun-2020	B	Plastic Tub 500g
1025130			TP06	26-Jun-2020	B	Amber Glass 250ml
1025130			TP06	26-Jun-2020	B	Amber Glass 60ml
1025130			TP06	26-Jun-2020	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com