

Stockhole Lane – Ground Investigation Interpretative Report

Client:

Fingal County Council

Client's Representative: Hayes Higgins

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The works were conducted in accordance with:

British Standards Institute (2015) BS 5930:2015, Code of practice for site investigations.

BS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing.

Geotechnical Society of Ireland (2016), Specification & Related Documents for Ground Investigation in Ireland

Laboratory testing was conducted in accordance with:

British Standards Institute BS 1377:1990 parts 2, 4, 5, 7 and 9



METHODS OF DESCRIBING SOILS AND ROCKS

Soil and rock descriptions are based on the guidance in BS5930:2015, The Code of Practice for Site Investigation.

Abbreviations used	on exploratory hole logs
U	Nominal 100mm diameter undisturbed open tube sample (thick walled sampler)
UT	Nominal 100mm diameter undisturbed open tube sample (thin walled sampler)
Р	Nominal 100mm diameter undisturbed piston sample
В	Bulk disturbed sample
LB	Large bulk disturbed sample
D	Small disturbed sample
С	Core sub-sample (displayed in the Field Records column on the logs)
L	Liner sample from dynamic sampled borehole
W	Water sample
ES / EW	Soil sample for environmental testing / Water sample for environmental testing
SPT (s)	Standard penetration test using a split spoon sampler (small disturbed sample obtained)
SPT (c)	Standard penetration test using 60 degree solid cone
x,x/x,x,x,x	Blows per increment during the standard penetration test. The initial two values relate to the seating drive (150mm) and the remaining four to the 75mm increments of the test length. The length achieved is stated (mm) for any test increment less than 75mm
N=X	SPT blow count 'N' given by the summation of the blows 'X' required to drive the full test length (300mm)
N=X/Z	Incomplete standard penetration test where the full test length was not achieved. The blows 'X' represent the total blows for the given test length 'Z' (mm)
V VR	Shear vane test (borehole)Hand vane test (trial pit)Shear strength stated in kPaV: undisturbed vane shearstrengthVR: remoulded vane shear strength
dd/mm/yy:1.0dd/mm/yy: dry	Date & water level at the borehole depth at the end of shift and the start of the following shift
\bigtriangledown	Water strike: initial depth of strike
▼	Water strike: depth water rose to
Abbreviations relating	to rock core – reference Clause 36.4.4 of BS 5930: 2015
TCR (%)	Total Core Recovery: Ratio of rock/soil core recovered (both solid and non-intact) to the total length of core run.
SCR (%)	Solid Core Recovery: Ratio of solid core to the total length of core run. Solid core has a full diameter, uninterrupted by natural discontinuities, but not necessarily a full circumference and is measured along the core axis between natural fractures.
RQD (%)	Rock Quality Designation: Ratio of total length of solid core pieces greater than 100mm to the total length of core run.
FI	Fracture Index: Number of natural discontinuities per metre over an indicated length of core of similar intensity of fracturing.
NI	Non Intact: Used where the rock material was recovered fragmented, for example as fine to coarse gravel size particles.
AZCL	Assessed zone of core loss: The estimated depth range where core was not recovered.
DIF	Drilling induced fracture: A fracture of non-geological origin brought about by the rock coring.
(xxx/xxx/xxx)	Spacing between discontinuities (minimum/average/maximum).





Stockhole Lane – Interpretative Report

1 AUTHORITY

On the instructions of Hayes Higgins Consulting Engineers, ("the Client's Representative"), acting on the behalf of Fingal County Council ("the Client"), a ground investigation was undertaken at the above location to provide geotechnical and environmental information for input to the design and construction of a proposed residential development.

This report details the work carried out both on site and in the geotechnical and chemical testing laboratories; it contains a description of the site and the works undertaken, the exploratory hole logs and the laboratory test results. A discussion on the recommendations for construction is also provided.

All information given in this report is based upon the ground conditions encountered during the site investigation works, and on the results of the laboratory and field tests performed. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations, and water conditions between or below exploratory holes. It should be noted that groundwater levels usually vary due to seasonal and/or other effects and may at times differ to those recorded during the investigation. No responsibility can be taken for conditions not encountered through the scope of work commissioned, for example between exploratory hole points, or beneath the termination depths achieved.

This report was prepared by Causeway Geotech Ltd for the use of the Client and the Client's Representative in response to a particular set of instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded.

2 SCOPE

The extent of the investigation, as instructed by the Client's Representative, included boreholes, trial pits, soil sampling, in-situ and laboratory testing, and the preparation of a report on the findings including recommendations for construction.

3 DESCRIPTION OF SITE

As shown on the site location plan in Appendix A, the works were conducted on a site off Stockhole lane in County Dublin, east of the M1 Airport Junction. The site is located immediately to the south of Baskin Lane housing estate and contains a wastewater treatment plan and percolation area for nearby residencies.





4 SITE OPERATIONS

4.1 Summary of site works

Site operations, which were conducted between 10th and 11th December 2018, comprised:

- six boreholes by dynamic (windowless) sampling methods;
- seven machine dug trial pits;
- an infiltration test performed in three trial pits;
- indirect CBR tests at three locations.

The exploratory holes and in-situ tests were located as instructed by the Client's Representative, as shown on the exploratory hole location plan in Appendix A.

4.2 Boreholes

Six boreholes (BH01-BH06) were put down to completion by light percussion boring techniques using a Dando Terrier dynamic sampling rig. The boreholes were put down initially in 150mm diameter, reducing in diameter with depth as required, down to 50mm by use of the smallest sampler.

Hand dug inspection pits were carried out between ground level and 1.20m depth to ensure boreholes were put down clear of services or subsurface obstructions. The boreholes were taken to depths ranging between 2.90m and 5.35m where they were terminated at their scheduled depths, or else they were terminated in very stiff or very dense deposits.

Standard penetration tests were carried out in accordance with BS EN 22476-3: 2005 at standard depth intervals using the split spoon sampler (SPT(s)) or solid cone attachment (SPT(c)). The penetrations are stated for those tests for which the full 150mm seating drive or 300mm test drive was not possible. The N-values provided on the borehole logs are uncorrected and no allowance has been made for energy ratio corrections. The SPT hammer energy measurement report is provided in Appendix I.

Disturbed (bulk and small bag) samples were taken within the encountered strata. Environmental samples were taken at standard intervals of 0.50m and 1.00m.

Any water strikes encountered during boring were recorded along with any changes in their levels as the borehole proceeded. Details of the water strikes are presented on the individual borehole logs.

Appendix B presents the borehole logs.





4.3 Trial Pits

Seven trial pits (TP01–TP07) were excavated using a 13t tracked excavator fitted with a 600mm wide bucket, to depths of 3.10 – 4.00m.

Environmental samples were taken at depths of 0.50 and 1.00m in each trial pit.

Disturbed (small jar and bulk bag) samples were taken at standard depth intervals and at change of strata.

Any water strikes encountered during excavation were recorded along with any changes in their levels as the excavation proceeded. The stability of the trial pit walls was noted on completion.

Appendix C presents the trial pit logs with photographs of the pits and arising provided in Appendix D.

4.4 Infiltration tests

An infiltration/soakaway test was carried out at three locations (SA01- SA03) in accordance with BRE Digest 365 - Soakaways (BRE, 2016). The tests were conducted in similarly numbered trial pits.

Appendix E presents the results and analysis of the infiltration test. The absence of the outflow from the pits precluded calculation of infiltration coefficients.

4.5 Indirect CBR tests

An indirect CBR test was conducted at xxx locations (CBR01 – CBR03) using a Dynamic Cone Penetrometer (DCP). The equipment was developed in conjunction with the UK Transport Research Laboratory, is used widely throughout the world, and is referred to in the UK Highway Agency Interim Advice Note 73/06.

The test results are presented in Appendix F in the form of plots of the variation with depth of the penetration per blow. Straight lines have been fitted to the plots and the CBR for each depth range estimated using the following relationship, which is derived from Kleyn & Van Heerden (1983):

Log CBR = 2.48-1.057 Log (mm/blow)

The frequently elevated CBR values are a consequence of the coarse-grained content of the penetrated soils and are often not representative of the soil matrix.

4.6 Surveying

The as-built exploratory hole positions were surveyed following completion of site operations by a Site Engineer from Causeway Geotech. Surveying was carried out using a Trimble R6 GPS system employing VRS and real time kinetic (RTK) techniques.





The plan coordinates (Irish National Grid) and ground elevation (mOD Malin) at each location are recorded on the individual exploratory hole logs. The exploratory hole plan presented in Appendix A shows these asbuilt positions.

5 LABORATORY WORK

Upon their receipt in the laboratory, all disturbed samples were carefully examined and accurately described, and their descriptions incorporated into the borehole logs.

5.1 Geotechnical laboratory testing of soils

Laboratory testing of soils comprised:

- **soil classification:** moisture content measurement, Atterberg Limit tests and particle size distribution analysis.
- compaction related: Moisture Condition Value,
- soil chemistry: pH and water-soluble sulphate content and total sulphate content

Laboratory testing of soils samples was carried out in accordance with British Standards Institute: *BS 1377, Methods of test for soils for civil engineering purposes; Part 1 (2016), and Parts 2-9 (1990).*

The test results are presented in Appendix G.

5.2 Environmental laboratory testing of soils

Environmental testing was conducted on selected environmental soil samples by Chemtest at its laboratory in Newmarket, Suffolk.

Testing was carried out according to Engineer's Ireland Specification for Ground Investigation (2016) Suite I which tested for a range of determinants, including:

- Metals
- Speciated total petroleum hydrocarbons (TPH)
- Speciated polycyclic aromatic hydrocarbons (PAH)
- Cyanides
- Asbestos screen
- pH.

Waste acceptance criteria (WAC) testing was also carried out on twenty samples.





Results of environmental laboratory testing are presented in Appendix H.

6 GROUND CONDITIONS

6.1 General geology of the area

Published geological mapping indicate the superficial deposits underlying the site comprise Glacial Till. These deposits are underlain by limestones and shales of the Tober Colleen Formation

6.2 Ground types encountered during investigation of the site

A summary of the ground types encountered in the exploratory holes is listed below, in approximate stratigraphic order:

- **Topsoil:** a thin layer of topsoil (50 100mm) was encountered in all trial pits except TP02 on the access road.
- **Made Ground (granular fill):** TP02 and BH encountered dark grey gravel up to 450mm thick along the access road and in the vicinity of the pump house.
- **Made Ground (cohesive fill):** reworked sandy gravelly clay/silt fill encountered in all boreholes except BH04 to a maximum depth of 2.50mbgl in BH06. Encountered in all trial pits except TP01 a maximum depth of 1.90mbgl in TP03.
- **Glacial Till:** sandy gravelly clay, frequently with low cobble content, typically firm or stiff in upper horizons, becoming very stiff with increasing depth.

6.3 Groundwater

Groundwater was encountered during trial pit excavation as groundwater strikes as shown in Table 1 below:

GI Ref.	Water Level (mbgl)	Comments
TP01	0.80	Seepage
TP06	1.60	Seepage
BH02	4.00	
BH04	2.00	Rose to 1.5mbgl after 20 mins

Table 1: Groundwater strikes encountered during the ground investigation





Details of the individual groundwater strikes, along with any relative changes in levels as works proceeded, are presented on the exploratory hole logs for each location.

Groundwater was not noted during excavation of any of the other trial pits. However, the possibility of encountering groundwater during excavation works should not be ruled out, due to seasonal variation in groundwater levels which should be factored into design considerations.

7 **DISCUSSION**

7.1 Proposed construction

It is proposed to construct a new residential development.

No further details were available to Causeway Geotech at the time of preparing this report and any designs based on the recommendations or conclusions within this report should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory holes. Causeway Geotech were commissioned to provide a geotechnical report, and it is outwith our remit to advise on structure design.

7.2 Recommendations for construction

7.2.1 Summary

Based on the presence of stiff glacial till at relatively shallow depths across the footprint of the proposed building, the implementation of traditional shallow (spread) foundations (strip/pad) are considered suitable.

7.2.2 Soil strength parameters

When estimating the shear strength of fine soils (silt/clay), reference is made to the results of Standard Penetration Tests (SPT's) carried out within the boreholes. The undrained shear strength of fine soils can be estimated using the correlation developed by Stroud & Butler:

 $C_u = f_1 \times N$

where f1 is typically in the range 4 to 6. A median f1 value of 5 is adopted for this report.

For granular soils (sand/gravel), a graphical relationship between SPT "N" value and angle of shearing resistance, φ , has been developed by Peck, Hanson and Thorburn. This is published in *Foundation Design and Construction* (Tomlinson, 2001) and is referenced in this report when deriving angles of shearing resistance for the gravel soils.





7.2.3 Bearing resistance

The ultimate bearing resistance for conventional strip or pad foundations can be obtained from Brinch Hansen's general equation:

$$q_n = cN_c s_c d_c l_c b_c + p_o N_q s_q d_q l_q b_q + \frac{1}{2} \gamma B N_\gamma s_\gamma d_\gamma l_\gamma b_\gamma$$
(Equation 1)

where:

 q_n = ultimate bearing resistance c = undrained cohesion of soil B = foundation width p_o = effective overburden pressure at foundation level Nc, Nq, Ny = bearing capacity factors s_c , s_q , s_y = shape factors d_c , d_q , d_y = depth factors l_c , l_q , l_y = load inclination factors b_c , b_q , b_y = base inclination factors

For conventional strip and pad foundations constructed on fine soils, the general equation has been simplified by Terzaghi to:

Net ultimate bearing resistance = cN_c (Equation 2)

where:

c = undrained cohesion N_c = bearing capacity factor

For cohesionless soils (sand/gravel, c=0), the calculation of ultimate bearing resistance is generally required only for loose sands. This is because coarser gravel soils would not be expected to suffer a bearing capacity failure. However, limits are placed on the allowable bearing resistance in order to control settlement. For shallow conventional pad foundations on granular soils, Terzaghi's simplified equation can be used as follows:

$$q_n = p_o(N_q-1) + 0.4BN+p$$

(Equation 3)

where:

p = total overburden pressure





It is obvious from the equations 1 to 3 that some knowledge of the foundation width and depth is required before the ultimate bearing resistance can be calculated.

Table 2 provides an indication of minimum founding depth at each borehole location. Also shown are approximate soil strengths based on the Stroud and Butler (1975) correlations with SPT N-values and visual examination of recovered samples of the clay deposits.

The table also suggests allowable bearing resistance using Equations 2 and 3 for cohesive and cohesionless soils respectively.

This table does not take into account the variations in soil composition, and the effects of differential movement within a particular structure. Calculation of the design bearing resistance over the entire structure will entail a knowledge of the magnitude and distribution of the structural actions.

7.2.4 Foundations and ground floor construction

Foundations should transfer loading to below any Made Ground or subsoil. The recommended foundation construction and allowable bearing pressure (ABP) at the borehole locations are presented in Table 2.

Borehole	Depth below EGL* to suitable bearing stratum	Estimated ABP (kPa)	Strata description	Foundation type	Ground floor construction	Groundwater
BH01	2.00m	225	Stiff Glacial Till	Strip & pad	Ground bearing	Strike at 4.00mbgl
BH02	2.00m	225	Stiff Glacial Till	Strip & pad	Ground bearing	Not encountered
DU02	1.20m	150	Stiff Glacial Till	Strip & pad	Ground bearing	Not an analysis of
BH03	2.00m	225	Stiff Glacial Till	Strip & pad	Ground bearing	Not encountered
BH04	1.20m	250	Stiff Glacial Till	Strip & pad	Ground bearing	Strike at 2.00mbgl
вн05	1.20m	175	Stiff Glacial Till	Strip & pad	Ground bearing	Not encountered
BH06	1.20m	150	Stiff Glacial Till	Strip & pad	Ground bearing	Not encountered

Table 2: Construction recommendations

*Existing Ground Level





Based on the findings of the site investigation, spread foundations (strip/pad) are considered suitable with estimated allowable bearing pressures between 150kPa and 250kPa at depths between 1.20m and 2.00m on stiff glacial till.

The base of foundation excavations should be thoroughly inspected; any soft soils should be removed with the resultant void backfilled with ST1 concrete or engineered fill. A consistent bearing stratum should be provided for any building unit to limit differential settlements.

Given the generally fine grained/cohesive nature of the soils throughout the proposed formation levels, excavations for foundations are likely to be relatively stable. However, any instability can be minimised by battering the side slopes at 2 vertical to 1 horizontal and by limiting the duration that the excavation is open. Groundwater control, where required, will be possible by pumping from sumps formed in the base of excavations.

7.2.5 Floor slabs

Floor slabs should not bear directly onto Made Ground or soft soils. Therefore, the use of ground bearing floor slabs is only appropriate following the removal of any surface Made Ground and soft clay layers and their replacement using well-graded well-compacted granular fill. However, a suspended floor slab should be adopted where the difference in levels of the proposed floor and the base of Made Ground/soft soils is greater than 600mm.

7.2.6 Excavations for services

For the installation of services ducts/trenches, it is suggested that open trenching will be the most practicable construction method. Generally speaking, the ground conditions should render the use of open trenching by backhoe excavator possible.

Where working in open trenches, it is thought that trench support systems, by way of a trench box may be required to maintain trench stability and safe working conditions. Groundwater control at these locations should be possible by means of sump pumping.

To preclude the eventuality of differential settlements in pipes, they should be laid on a consistent stratum of appropriate allowable bearing capacity and protected with appropriate fill cover.

Where ducts and chambers must be installed in areas where localised soft spots are encountered, the use of geogrid reinforcement along the base of the very soft/soft soil below the trench base is recommended. This will stiffen the base of the trench and help control longitudinal differential settlement.

Backfilling of trenches may be completed by using compacted Cl 804 granular fill and reinstated as appropriate.





7.2.7 Soil aggressivity

An assessment of the Aggressive Chemical Environment for Concrete (ACEC) was undertaken through reference to the Building Research Establishment (BRE) Special Digest 1 (2017).

As noted by BRE Special Digest 1, sulphates in the soil and groundwater are the chemical agents most likely to attack concrete. The extent to which sulphates affect concrete is linked to their concentrations, the type of ground, the presence of groundwater, the type of concrete and the form of construction in which concrete is used.

BRE Special Digest 1 identifies four different categories of site which require specific procedures for investigation for aggressive ground conditions:

- Sites not subjected to previous industrial development and not perceived as containing pyrite;
- Sites not subjected to previous industrial development and perceived as containing pyrite;
- Brownfield sites not perceived as containing pyrite;
- Brownfield sites perceived as containing pyrite.

For the purposes of this report the site was classified as not having been subject to previous industrial development and not perceived as containing pyrite.

The results of chemical tests (pH and water soluble sulphate contents) on soil samples indicate Design Sulphate Class DS-1 and ACEC Class AC-1 – reference Table C1 of BRE Special Digest 1 (Building Research Establishment, 2005). The Special Digest does not require any measures to protect underground concrete elements greater that 140mm thick. The Special Digest requires additional design measures to be applied to increase protection from the elevated levels of sulphates and acidic soils present in parts of the site.

7.2.8 Access roads, car parks and hard standing

Based on a summary of the CBR tests undertaken at the site, it is envisaged that the upper glacial till layers at the site would be suitable for the placement of road make up layers. Areas tested on site indicate CBR values in excess of 4% at a depth of 0.5mbgl.





Table 2.1 of volume 7 section2 of the Design Manual for Roads and Bridges (below), gives guidance on the average thickness of the pavement layers in relation to the CBR results. As can be seen, a CBR in excess of 4% requires a 450mm thick capping layer.



It is recommended that in-situ testing be undertaken during construction works in order to get an accurate site wide value. Should any area provide lower CBR values in certain areas of the site the above plot should be used to determine the thicknesses of any capping or sub-base layers that may need to be placed in these areas.

The use of geosynthetics in the construction of paved areas, will be beneficial, particularly in areas of Made Ground. These could include a geosynthetic (e.g., a geogrid) at subgrade level with further benefit gained by incorporating further layer(s) within the capping/sub-base layer. Road design should be undertaken by a specialist earthworks contractor/designer.

7.3 Infiltration drainage

In infiltration tests carried out in trial pit SA01 – SA03, the absence of the outflow from the pits precluded calculation of infiltration coefficients. The low-permeability fine-grained soils are therefore considered to be poor infiltration media and would be deemed unsuitable for the implementation of infiltration drainage systems.





7.4 Site contamination and waste disposal

Selected soil samples were analysed for a range of potential contaminants including:

- Metals;
- Speciated total petroleum hydrocarbons (TPH);
- Speciated polycyclic aromatic hydrocarbons (PAH);
- Cyanides;
- Sulphates and sulphide;
- Phenols; and
- Asbestos screening

Select samples were also tested for a Waste Acceptance Criteria (WAC) suite to assess the potential categorisation of waste from the site.

In the initial examination of the potential risk of site contamination, the laboratory results have been compared to the LQM/CIEH S4UL's assessment criteria relevant to the proposed residential land use:

The results from the tested samples do not identify significantly elevated concentrations above the available S4UL's.

It should be noted that the above assessment is based on the results of the soil samples against available S4UL's and this assessment has not been undertaken following the CLR11 guidelines. Any potential contamination identified during site development by visual or olfactory means should be investigated, including further laboratory testing, and appropriate health & safety, waste disposal and remediation measures adopted.

In assessment of the waste acceptance criteria (WAC) results, the test results have been compared with the European Union Directive limits for Inert waste landfill, Stable, Non-reactive hazardous waste in non-hazardous landfill and hazardous waste landfill criteria. From the samples tested for WAC analysis material from the site may potentially be classified as inert/non-hazardous. Any material excavated for off-site disposal would have to be classified under the guidance in the National Hazardous Waste Management Plan (EPA, 2014).

8 **REFERENCES**

Geotechnical Society of Ireland (2016), Specification & Related Documents for Ground Investigation in Ireland

IS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing.

BS 1377: 1990: Methods of test for soils for civil engineering purposes. British Standards Institution.





BS 5930: 2015: Code of practice for ground investigations. British Standards Institution.

BS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. British Standards Institution.

BS EN ISO 14688-1:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 1 Identification and description.

BS EN ISO 14688-2:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 2 Principles for a classification.

BS EN ISO 22476-3:2005+A1:2011: Geotechnical investigation and testing. Field testing. Standard penetration test.

Building Research Establishment (2007), BRE Digest 365: Soakaways.

Contaminated Land Report (CLR) 11, (2009) Model Procedures for the Management of Land Contamination, The Department for Environment, Food and Rural Affairs (Defra) and the Environment Agency.



APPENDIX A SITE AND EXPLORATORY HOLE LOCATION PLANS









APPENDIX B BOREHOLE LOGS

				Project	No.:	Project	t Name:	Borehol	e No.:		
	CAUSEWAY						9	Stockh	ole Lane, Dublin	BH	01
	GEOTECH					Coordi	nates:	Client:		Shoot	1 of 1
	Method Plant Used Top Bas ight Percussion Dando Terrier 0.00 4.5						4.94 E	Fingal (County Council	Sileet .	1011
Method	Plai	nt U	sed	Тор	Base	1		Client's	s Representative:	Scale:	1:50
Light Percussion	n Danc	do Te	rrier	0.00	4.50	24298	5.67 N	Hayes I	Higgins		16
						Ground	d Level:	Dates:	Driller:	JC	
						47.70	D mOD	10/01/	2019 - 10/01/2019	Logger:	SR
Depth	Sample /	Casing Depth	Water Depth	Field Re	cords	Level	Depth (m)	Legend	Description	be Backf	ill
(m) 0.00 - 1.70	Tests B1	(m)	(m)			(mOD)	(Thickness)		MADE GROUND: Firm light brown sandy gravelly CLAY with low cobble	3	
									content. Sand is fine. Gravel is subangular to subrounded fine to coarse.		-
0.50	ES2						-		Cobbles are subrounded.		0.5 —
	-						-				_
							(1.70)				-
1.00	ES3						-				1.0
1.20 1.20 - 1.65	SPT (S)			N=13 (3,3/3	3,4,3,3)						-
	N=13						[1.5
1.70 - 3.00	В5					46.00	1.70		Stiff becoming very stiff dark grey slightly sandy gravelly CLAY with low	1	-
2.00	D6						-		cobble content. Sand is fine. Gravel is subangular to subrounded fine to		2.0
2.00 - 2.45	SPT (S)			N=25 (3,3/7	7,7,5,6)		-		coarse. Cobbles are subrounded.		-
	N=25						-	en en o	а 9		_
							-				2.5 -
							-				-
3.00	D8						- (2.80)				3.0
3.00 - 4.50 3.00 - 3.45	SPT (S)			N=34 (4,5/7	7,9,8,10)		(,	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 		-
	N=34					-				3.5 —	
							-				_
4.00	50						-				-
4.00 - 4.45	SPT (S)			N=46			[4.0
	N=46			(9,9/9,11,13	3,13)		-	الحم مع الحم محم			_
4.50	D10			N-E0 (17 1))/E0 for	43.20	- 4.50	1940 ° - 10' 0	End of Borehole at 4.50m	-	4.5 —
4.30 - 4.70	3PT (3)			50mm)	9/30 101		-				
							-				5.0
											-
											55
							-				-
							-				
							-				6.0
							-				-
							[6.5
							-				-
							-				7.0
							-				
							F				
							E				7.5 -
							-				
							-				8.0
							-				
							-				8.5
							Ē				
							L				9.0
							-				5.0
							-				
							-				9.5 -
							E				
		-	$\left - \right $				<u> </u>			++-	
Remarks						1			Water Strikes Chis	elling Deta	ils
Hand dug inspec	tion pit e	xcava	ated t	o 1.20m.					Struck at (m) Casing to (m) Time (min) Rose to (m) From (m)	To (m) 1	lime (hh:mm)
No groundwater encountered.											
									Water Added Casing Details From (m) To (m) To (m)		
Torminated in	المراجع	no-	te								
reminated in Ve	a y suit de	=pusi	ι3.								

						Project	t No.:	Project	Borehole No.:					
	CAL	IC	:=\			18-130	9	Stockh	ole Lane, Dublin	B	H02			
	CAU		E	TECH		Coordi	nates:	Client:		Shee	t 1 of 1			
		0		I L CII		31891	8.93 E	Fingal (County Council					
Method	Pla	nt U	sed	Тор	Base	1	Client's Representative:				1:50			
Light Percussion	n Dano	do Te	errier	0.00	5.00	24296	4.66 N	Hayes	Higgins	Duillau				
						Ground	d Level:	Dates:						
						46.2	6 mOD	08/01/	2019 - 08/01/2019	Logger	:CH			
Depth	Sample /	Casing Depth	Water Depth	Field Re	cords	Level	Depth (m)	Legend	Description	Jater Bac	kfill			
0.00 - 1.60	B1	(m)	(m)			(mod)	(Thickness)		MADE GROUND: Stiff light brown sandy gravelly CLAY with low cobble		_			
							-		content. Sand is fine. Gravel is subangular to subrounded fine to coarse.		-			
0.50	ES2						-				0.5 —			
							(1.60)				-			
1.00	FS3						- (1.00)				1.0			
1.20 - 1.65	SPT (S)			N=16 (2,3/4	1,5,4,3)		-				_			
	N=16						-				-			
1.60 - 2.60	B4					44.66	1.60		Stiff becoming very stiff dark grey slightly gravelly CLAY. Sand is fine. Gravel		1.5 —			
							-		is subangular to subrounded fine to coarse.		-			
2.00 2 00 - 2 45	D5 SPT (S)			N=23 (2 4/5	5 6 7)		-				2.0			
	N=23				,_,_,_,		Ĺ				-			
							-				2.5 —			
							-				-			
3.00	D6						-	······			3.0			
3.00 - 3.45	SPT (S) N=43			N=43 (5.5/9.12.1)	1.11)		(3.40)							
				(-/-/ /	, ,		-				3.5 —			
3.60 - 5.00	B7						-				-			
4 00 - 4 45	SPT (S)			N=31 (6 7/7	7 8 8 8)		-			T	4.0 -			
4.00 4.45	N=31			Seepage at	4.00m		-				_			
							-	· · · · · ·			_			
											4.5 —			
							-				-			
5.00 - 5.45	SPT (S) N=50			N=50 (8.12/13.14	.12.11)	41.26	- 5.00		End of Borehole at 5.00m		5.0 -			
				(-/ / -/	, , ,		-							
							-				5.5 —			
							-							
							-				6.0			
							-							
							-				6.5 —			
							-							
							-				7.0			
							-				-			
							-				7.5			
							-							
											80			
							-							
							-							
							Ē				8.5			
							-							
							-				9.0			
							E							
							-				9.5			
							-							
		+	$\left \right $				[\vdash				
Remarks			·						Water Strikes Chis Struck at (m) Casing to (m) Time (mix) Barra to (m) Free (m)	elling De	tails			
Hand dug inspec	tion pit e	excav	ated t	o 1.20m.					August at (iii) Casang cu (iii) IIIme (min) Kose to (m) From (m) 4.00 4.00	(11)	nine (nin:mm)			
									Water Addad Casing Datails					
									From (m) To (m) To (m) Diam (mm)					
Terminated in ve	ry stiff de	epos	its.											

						Project	t No.:	Project	t Name:	Borehole No.:			
		10	:=\		,	18-130	19	Stockh	ole Lane, Dublin	BHC)3		
KH.	CAU		SEO	TECH		Coordi	nates:	Client:		Sheet '	l of 1		
		0	JEO	TECH		31891	6.93 E	Fingal (County Council				
Method	Pla	nt U	sed	Тор	Base	2 4 2 0 5	0.66 N	Client's	s Representative:	Scale:	1:50		
Light Percussion	Dano	do Te	errier	0.00	5.35	24295	0.66 N	Hayes I	Higgins	Driller	IC		
						Ground	d Level:	Dates:					
						46.6	5 mOD	08/01/	2019 - 08/01/2019	Logger:	SR		
Depth (m)	Sample /	Casing Depth	Water Depth	Field Re	cords	Level	Depth (m)	Legend	Description	backfi	ill		
(m)	lests	(m)	(m)			(mod)	(Thickness)		MADE GROUND: Firm brown sandy gravelly CLAY with low cobble content		_		
						46.35	0.30)		and occasional rootlets. Sand is fine. Gravel is subangular to subrounded		-		
0.50	ES1						-		Stiff greyish brown sandy gravelly CLAY. Sand is fine. Gravel is subangular to		0.5 —		
							-		subrounded fine to coarse.		-		
1.00	FS2						_				10-		
1.20 - 1.65	SPT (S)			N=16 (3.3/4	1.4.4.4)		(1.70)						
	N=16			- (-)-)	, , , ,		-				-		
							-				1.5 —		
											_		
2.00 - 2.45	SPT (S)			N=24 (2,5/4	1,6,6,8)	44.65	2.00	<u> </u>	Stiff becoming very stiff dark grey slightly sandy gravelly CLAY with low		2.0		
	N=24						-	<u>x ~ ~ ~</u> ~	cobble content. Sand is fine. Gravel is subangular to subrounded fine to		-		
							-	x × 0	coarse. Cobbles are subrounded.		2.5 —		
							-	x_o_x			-		
2 00 - 2 45	SDT (S)			N-28 (A A/6	5779)		-	<u>x ° × °</u>					
3.00 - 3.45	N=28			N-28 (4,4/0	,,,,,,		-	<u>~~~</u> 0					
							-	~~~~			-		
							- (2.25)				3.5 —		
							- (3.35)	<u>~~~</u> ~			-		
4.00 - 4.45	SPT (S)			N=33 (9,7/8	3,7,9,9)						4.0		
	N=33						-	× • •			-		
							-	<u>x</u>			4.5 —		
							-	<u>x</u>			-		
4.90 - 5.35	SPT (S)			N=49			-	x			-		
	N=49			(9,12/12,13	3,12,12)		-	<u>x ~ 0</u>			5.0 -		
						41.30	5.35	<u>~~~~</u> 0.	- End of Borehole at 5.35m	. –	-		
							-				5.5 —		
							-				-		
							_				6.0 -		
							-				-		
							-				6.5		
							-				-		
							-						
							-						
							-				-		
							-				7.5 -		
							Ē						
							-				8.0		
							-						
							-				8.5 —		
							-						
							-				-		
											5.0		
							-						
							-				9.5 —		
							Ē						
			\square										
Remarks									Water Strikes Chis Strick of (m) Coring to (m) Time (min) December (m) Time (min)	elling Deta	ils		
Hand dug inspect	tion pit e	ered	ated t	o 1.20m.					SUULK AT (M) CASING TO (M) IIME (MIN) ROSE TO (M) From (M)	10 (M) T	ine (nn:mm)		
NO BIOUNUWALEI	cheount	creu											
									Water Added Casing Details From (m) To (m) To (m) Diam (mm)				
Terminated in ve	ry stiff de	epos	its.										
5													

						Project	t No.:	Project	Borehole No.:			
	CAL	16			,	18-130	9	Stockh	ole Lane, Dublin		BH04	ı
- HH	CAU	-0	E O	TECH		Coordi	nates:	Client:		Sh	eet 1	of 1
				I LOIT		31891	2.93 E	Fingal (County Council		eet 1	01 1
Method	Pla	nt U	sed	Тор	Base	24202		Client's	s Representative:	Scal	e: 1	:50
Light Percussion	n Dano	do Te	rrier	0.00	2.90	24292	0.05 N	Hayes I	Higgins	Dril	ler: Jo	
						Groun	d Level:	Dates:		-	-	
						46.5	2 mOD	09/01/	2019 - 09/01/2019	Log	ger: S	R
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Re	cords	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill	
0.20 - 1.00	D 1					16.22	(0.20)		MADE GROUND: Dark grey angular to subangular fine to coarse GRAVEL.			-
0.20 - 1.00	01					40.52	0.20		Stiff light brown sandy gravelly CLAY with low cobble content. Sand is fine.			-
0.50	ES2						-		subrounded.			0.5 —
									2			
1.00	ES3						- (1.80)					1.0
1.20	D4											_
1.20 - 1.65	SPT (S) N=29			N=29 (3,3/4	1,8,8,9)		-					1.5 —
							-					_
2.00	D6					44.52	- 2.00	a. <u>00</u>	Stiff dark growelightly candy gravelly CLAX Sand is find. Gravel is			2.0
2.00 - 2.60	B7			Water strike	∘ at		(0.60)		subangular to subrounded fine to coarse.			
				2.00m			- (0.00)					2.5 —
2.60 - 2.90	B8					43.92	- 2.60 (0.30)	× ×	Very dense dark grey slightly gravelly silty fine to medium SAND. Gravel is	1		-
2.90 - 3.27	90 - 3.27 SPT (S) N=50 (12,13/50 for 217mm)					43.62	2.90	ו•••×	subangular to subrounded fine to medium. End of Borehole at 2.90m			30-
	21/mm)						-					
							-					-
							-					3.5
							-					-
							-					4.0
							-					4.5 —
							-					
							-					5.0
							-					-
							-					5.5 —
							Ę					
							-					6.0
												-
							-					6.5 -
							-					
							-					70-
							-					-
							-					
							-					1.5
							-					
							Ē					8.0 -
							-					
							-					8.5 —
							Ē					
							-					9.0 -
							-					
							E .					9.5
							-					
			\square				-			\vdash		
Remarks		1				1	1	1	Water Strikes Chis	elling	Detail	5
Hand dug inspec	tion pit e	xcav	ated t	to 1.20m.					Struck at (m) Casing to (m) Time (min) Rose to (m) From (m) 2.00 2.00 20 1.50	To (m	n) Tim	e (hh:mm)
									Water Added Casing Details From (m) To (m) To (m) Diam (mm)			
Terminated in ve	ry dense	dep	osits.									

						Project	t No.:	Project Name:					Bor	ehole	No.:		
	241	IC				18-130	9	Stockh	ole Lane, Dublin							BHO	/5
	CAU	-0	EO	TECH		Coordi	nates:	Client:							SI	neet 1	of 1
		0		I LCII		31891	8.94 E	Fingal (County Council								. 01 1
Method	Plai	nt U	sed	Тор	Base]		Client's	s Representative:						Sca	le:	1:50
Light Percussion	Danc	do Te	rrier	0.00	3.70	24289	5.65 N	Hayes I	Higgins						Dri	lor	
						Ground	d Level:	Dates:					-		<u> </u>		
						48.2	5 mOD	09/01/	2019 - 09/01/2019						Log	ger:	ŝR
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Re	cords	Level (mOD)	Depth (m) (Thickness)	Legend		De	escription				Water	Backfi	II I
0.00 - 1.50	B9	.,				(-		MADE GROUND: Stiff I	light brown	sandy gra	velly CLA	r with low c	obble	-		-
							-		content. Sand is fine. G Cobbles are subrounde	Gravel is sub ed.	angular t	o subroun	ded fine to	coarse.			
0.50	ES1						[0.5
							-										
1.00	ES2						- (2.00)										1.0
1.20	D3																
1.20 - 1.65	SPT (S)			N=19 (3,3/4	1,4,5,6)		-										-
1.50 - 3.20	N=19 B4																1.5
							-										-
2.00	D5 SDT (S)			N=12 (2 2/2	0 2 2 4)	46.26	- 2.00	**************************************	Firm becoming stiff ligh	ht brown sa	ndy grave	lly CLAY v	ith low cob	ble	-		2.0
2.00 - 2.45	N=13			N-13 (2,3/3	5,5,5,4)		-		content. Sand is fine. G	Gravel is sub	angular t	o subroun	ded fine to	coarse.			
						(1.20)			eu.							2.5	
						[(1.20)		e 									
3.00	00 D6						-		* 2 -								3.0
3.00 - 3.45	00 - 3.45 SPT (S) N=27 (3,7/5,6,7,9)					45.06	- 3.20					A			-		
3.20 - 3.70	20 - 3.70 N=27 B7						- (0.50)		Sand is fine. Gravel is s	shtly sandy g subangular t	gravelly C o subrou	AY with lended fine	ow cobble c to coarse. C	ontent. obbles			
2 70	D8					44.50	- 2.70		are subrounded.								3.5 -
3.70 - 4.15	SPT (S)	8 PT (S) N=49 =49 (13.9/9.15.13.12)				44.50	5.70			End of Bo	prehole a	3.70m					
	N=49			(13,9/9,15,13,12)			-										4.0
							-										
							-										4.5
							-										5.0 -
							-										
							-										
							-										5.5
							-										6.0
							-										
							-										6.5
							-										
							-										70
							-										-
							-										
							-										7.5
							E										
							-										8.0
							-										
							-										8.5
							-										
							-										90-
							-										5.0
							-										
							-										9.5
							E										
Remarks										Struck at (m)	Water	Strikes	Rose to (m)	Chi:	selling	g Detai	ls
Hand dug inspect	tion pit e encount	xcav ered	ated t	to 1.20m.											101	<u>, "</u>	
										Mater	٧٩٩٠٩	Casie	Detaila				
										From (m)	To (m)	To (m)	Diam (mm)				
Terminated in ver	ry stiff de	eposi	ts.												L		

						Project	t No.:	Project	Borehole No.		
	C A I	16				18-130	9	Stockh	ole Lane, Dublin	Bł	106
KH	CAU	23	E	TECH		Coordi	nates:	Client:		Sheet	1 of 1
		0		I LCII		31893	6.94 E	Fingal (County Council		. 1 01 1
Method	Pla	nt U	sed	Тор	Base	1.000	2 6 4 14	Client's	s Representative:	Scale:	1:50
Light Percussion	Dano	do Te	rrier	0.00	3.00	24288	3.64 N	Hayes I	Higgins	Drillor	IC
						Ground	d Level:	Dates:		Dimer.	
						47.2	5 mOD	09/01/	2019 - 09/01/2019	Logger	: SR
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Re	cords	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Baci	cfill
0.00 - 1.00	B1	(,	(,			(1100)	-		MADE GROUND: Stiff light brown sandy gravelly CLAY with low cobble		-
							-		content. Sand is fine. Gravel is subangular to subrounded fine to coarse. Cobbles are subrounded.		-
0.50	ES2										0.5
							-				-
1.00	ES3						-				1.0
1.00 - 2.50	B4						(2.50)				_
1.20 1.20 - 1.65	SPT (S)			N=17 (2,3/3	8,3,5,6)						15 -
	N=17						-				-
							-				_
2.00 2 00 - 2 45	D6 SPT (S)			N=17 (2 4/4	1544)		-				2.0
2100 2110	N=17				.,.,.,.,		-				-
2.50 - 3.00	B7					44.76	- 2.50		Very stiff light brown sandy gravelly CLAY with low cobble content. Sand is		2.5
							(0.50)	م میں میں م	fine. Gravel is subangular to subrounded fine. Cobbles are subrounded.		-
3.00	D8					44.26	- 3.00		End of Borehole at 3 00m		3.0
3.00 - 3.22	SPT (S)			N=50 (4,15) 70mm)	/50 for		E .				
							-				3.5 —
							-				-
							-				40
							-				4.0
							-				
							-				4.5 —
							[
							-				5.0 -
							-				
							-				5.5 —
							-				
							-				6.0
							-				
							E				65
							-				
							-				-
											7.0
							-				
							-				7.5 —
							-				
							 -				8.0
							-				
							Ē				8.5
							-				
							-				9.0
							E				
							-				9.5
							ŀ				
							-				
Downsular					-				Water Strikes Chies		ails
Kemarks Hand dug inspec	tion pit e	excav	ated 1	o 1.20m.					Struck at (m) Casing to (m) Time (min) Rose to (m) From (m)	To (m)	Time (hh:mm)
									Water Added Casing Details		
									From (m) To (m) To (m) Diam (mm)		
Terminated in ve	ry stiff de	eposi	ts.								



APPENDIX C TRIAL PIT LOGS

			Project	: No.:	Project	Name:			1	Trial Pit	No.:	
			18-1309		Stockhole Lane, Dublin					TP01		
		EOTECH	Co-ordinates:		Client:					Sheet 1 of 1		
	0	LOTLOTT	318916.93 E		Fingal County Council					311201 1		
Method:			24293	0.65 N	Client's	s Representative:				Scale	1.25	
Trial Pitting			24233	242930.65 N		Higgins				scale.	1.25	
Plant:			Ground	d Level:	Date:	Date:					GH	
Depth			40.70	Depth (m)	10/12/	2018				e		
(m)	Sample / Tests	Field Records	(mOD)	(Thickness)	Legend	TOPCOU	Description			Mat		
			46.60	(0.10) 0.10		Firm brown slightly sandy slight	ly gravelly silty CLA	Y. Sand is fine to coa	arse.		_	
				-	×— —	Gravel is subangular fine to me	dium.				_	
				-	×— —						_	
0.50	ES1			-							0.5	
				-	\sim \sim	-					_	
				-	\sim \sim						_	
		Seepage at 0.80m		(1.50)	~ 						-	
1.00	20			-	~ 						10	
1.00	ES2			-	× ×							
				-	×						_	
				-	×						_	
				-	 X						-	
			45.10	1.60	× ×						1.5	
			10120	-		Stiff greyish brown slightly sand content. Sand is fine to coarse.	ly slightly gravelly C Gravel is subangul	LAY with medium co ar fine to coarse.	bble		_	
				-		Cobbles are subrounded.	-				_	
				(0.70)	ا میں جب میں ایک میں ا	-					_	
2.00	B4			-	ا میں جب میں ایک میں ا	-					2.0	
				-	م من من الم من من	- - -					_	
			44.40	2.30		Stiff blackich grov slightly sandy	gravelly CLAV with	medium cobble con	tont		_	
				-	م من من الم من من	Sand is fine to coarse. Gravel is	subangular fine to	coarse. Cobbles are	ent.		_	
				-		subrounded.					2.5	
				(0.80)							_	
				(0.80)							_	
				-								
3.00	В5			-							3.0	
			43.60	- 3.10	997 1 972	End c	of trial pit at 3.10m					
				-							_	
				-								
				-							3.5 —	
				-							-	
											_	
				-							_	
				[-							4.0	
				-							-	
											_	
				-							_	
											4.5 —	
				-							-	
				-							_	
											_	
				-								
Remarks							Water	Strikes:	Stabi	lity:		
							Struck at (m):	Remarks:	Unsta	able		
							0.80	Seepage at 0.80m			0.0-	
									Wid	th:	0.80	
Terminated due	to maximum r	each of excavator.							Leng	th:	2.90	

		Project No.:		Project Name:				Tr	Trial Pit No.:			
AR.			18-1309 Co-ordinates:		Stockhole Lane, Dublin					TP02		
		EOTECH			Client:					Shoot	1 of 1	
			318896.93 E		Fingal County Council					JIEEL	1011	
Method: Trial Pitting			242919.65 N		Client's	Client's Representative:					1:25	
Plant:			Group	l evel:	Date:	Hayes Higgins						
13T Excavator			47.20	D mOD	10/12/	 12/2018			Lo	ogger:	GH	
Depth	Sample / Tests	Field Records	Level	Depth (m)	Legend		Description		Vater			
(m)			(mod)	(Thickness)		MADE GROUND: Blackish grey s	slightly sandy angul	ar fine to coarse	>			
						GRAVEL. Sand is fine to coarse.					_	
				. (0.45)							_	
			46.75	0.45							_	
0.50	ES1				×	Stiff light brown slightly sandy s coarse. Gravel is subangular fin	lightly gravelly silty ie to medium.	CLAY. Sand is fine to	0		0.5	
				-	×						_	
				-	× 						-	
				-	× ×						_	
1.00 1.00	B3 ES2			-	×						1.0	
				-	×— — — —						_	
				(1.65)	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						-	
				-	 x						-	
				-	×						1.5 —	
					×						_	
				-	×						_	
				-	×						2.0	
2.10	В4		45.10	2.10	×	Stiff brown clightly conductionth	hy groupilly CLAV So	ad is fine to searce			_	
				-		Gravel is subangular fine to coa	rse.				-	
				-							-	
				- (0.80)							2.5	
											_	
				-							_	
			44 30	- 290							_	
			44.30			Stiff blackish brown slightly san cobble content. Sand is fine to	dy slightly gravelly coarse. Gravel is su	CLAY with medium Ibangular fine to coa	arse.		3.0	
3.10	В5			-		Cobbles are subrounded.		0			_	
				(0.70)							-	
				-							_	
				-							3.5 —	
			43.60	3.60	<u> </u>	End c	of trial pit at 3.60m				_	
											_	
				-							_	
				-							4.0	
				-							_	
				-							_	
				-							-	
				-							4.5 —	
											_	
				-							_	
				-							-	
								1		<u> </u>		
Remarks No groundwater	encountered.						Water	Strikes:	Unstah	ty: de		
							Struck at (m):	Remarks:	onotat			
									Width	n:	0.80	
Terminated due	to maximum rea	ach of excavator.							Lengt	h:	3.20	

		Project No.:		Project Name:				Trial Pit No.:		
CAUSEWAY		18-1309		Stockhole Lane, Dublin				TP03		
	GI	EOTECH	Co-ordinates:		Client:				Shoot	1 of 1
			318882.93 E		Fingal County Council				Sileet	1011
Method:			24285	9.64 N	Client's	s Representative:			Scale: 1:25	
			C		Hayes	Hayes Higgins				
13T Excavator			48.0	2 mOD	10/12/	2018			Logger	GH
Depth	Sample / Tests	Field Records	Level	Depth (m)	Legend		Description		ater	
(m)			(mOD) 47.97	(Thickness) (ရု.ရုန္)		TOPSOIL	2000.19100.		Š	
				-		MADE GROUND: Firm brown sl	lightly sandy slightly	y gravelly SILT with low		-
				-		medium. Cobbles are subround	ded.			_
				-						_
0.50	ES1			-						0.5 —
				-						_
				-						_
				-						_
1.00	В3			(1.85)						1.0
1.00	ES2			-						-
				-						_
				-						_
				-						1.5 —
				-						_
				-						_
			46.12	- 1.90						_
2.00	В4			-		Stiff brown slightly sandy slightl content. Sand is fine to coarse.	ly gravelly CLAY wit Gravel is subangul	h medium cobble ar fine to coarse.		2.0
				-		Cobbles are subrounded.				-
				(0.70)		r *				_
				-	0 0 4 00	- - - - -				_
				-		- - -				2.5 —
			45.42	2.60		Stiff blackish grey slightly sandy	slightly gravelly CL	AY with medium cobble		_
				-		content. Sand is fine to coarse.	Gravel is subangu	ar fine to coarse.		_
				(0.40)						_
3.00	В5		45.02	3.00	ە مېنى خېچ ئىگە مەنىيە	End c	of trial pit at 3.00m			3.0
				-						_
				-						_
				-						_
				-						3.5 —
				-						-
				-						_
										_
				-						4.0
				-						_
				-						_
				-						-
				-						4.5
				-						_
				-						_
				-						-
Remarks								a. II Stat		
No groundwater	encountered.						Water	Strikes: Stat	ole	
							Struck at (m):	Remarks:		
								Wi	dth:	0.80
Terminated due	to maximum rea	ach of excavator.						Len	gth:	2.90

		Project	No.:	Project Name:				т	Trial Pit No.:		
			18-130	9	Stockho	ole Lane, Dublin				ТРС)4
H	G	EVVAL	Co-ord	inates:	Client:					Chart	1 - £ 1
	0	LOTLOIT	31889	9.93 E	Fingal County Council					sneet.	1011
Method:			24286	1 64 N	Client's	Representative:			c	Scale: 1.25	
Trial Pitting			24200	5.04 N	Hayes H	Hayes Higgins					1.25
Plant:			Ground	Level:	Date:	Date:					GH
131 Excavator	[47.95	Denth (m)	10/12/.	2018			_	- 00 - 	
(m)	Sample / Tests	Field Records	(mOD)	(Thickness)	Legend		Description			Mat	
			47.90	- (8:83) -		TOPSOIL MADE GROUND: Firm brown sl	ightly sandy slightly	y gravelly CLAY with			_
				-		fragments of plastic. Sand is fin	e to coarse. Grave	l is subangular fine to	o		_
				(0.55)		Coarse.					-
0.50	504			-							
0.50	ESI		17 35	0.60							0.5
			47.55	0.00	×	Stiff brown slightly sandy slightl Gravel is subangular fine to me	ly gravelly silty CLA dium	Sand is fine to coar	rse.		_
				-	×						_
				-	×						_
1.00	B3				×						1.0
1.00	E52			-	×						_
				-	×						
					X						_
				-	×						1.5 —
				-	×						_
				-	×						_
				-	×						-
				-	×						-
2.00	B4			- (2.00)	×						2.0
				(3.00)	×						_
				-	×						_
				-	×						_
				-	- <u>x</u>						2.5
				-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						_
				-	$\overline{}$						_
				-							_
3.00	B5			-							3.0
0.00	55			-	×—						_
				-	×— —						_
				-	×						_
				-	×						_
				-	×						3.5 —
			44.35	3.60	00°0°0°	Stiff blackish grey slightly sandy	slightly gravelly CL	AY with medium to h	nigh		_
				- (0.40)		Cobbles are subrounded.	coarse. Graver is st	ibangular line to coa	rse.		_
				-	0 0 0 0 0 0 0 0						_
4.00	B6		43.95	4.00		End c	of trial pit at 4.00m				4.0
				-							_
				-							_
				-							4.5
				-							_
				-							_
				-							
				-							_
Bomarilia				_				ſ	C+-!-!!		
Remarks No groundwater	encountered.						Water	Strikes:	Stable	ity:	
-							Struck at (m):	Remarks:	Stubic		
									Widt	h:	0.80
									Lengt	h٠	3 10
ierminated due	to maximum re	each of excavator.							rengt		5.10

		Project No.:		Project Name:					Trial Pit No.:			
			18-130	9	Stockhole Lane, Dublin					TP05		
			Co-ordinates:		Client:					Shoot 1 of 1		
	01		318927.94 E		Fingal County Council					Sneet	I OT I	
Method:					Client's	Client's Representative:					1.25	
Trial Pitting			24203	242850.04 N		Higgins				Scale.	1.25	
Plant:			Ground	Ground Level:		Date:					GH	
131 Excavator			47.75	Denth (m)	10/12/	2018				505		
(m)	Sample / Tests	Field Records	(mOD)	(Thickness)	Legend		Description			Wate		
			47.65	(0.10) 0.10		TOPSOIL	ahtlu oondu oliahtl				_	
				-		medium to high cobble content	:. Sand is fine to co	arse. Gravel is	nun		_	
				-		subangular fine to medium. Co	bbles are subround	led.			_	
				-							_	
0.50	ES1			-							0.5	
				-							_	
				(1.40)							_	
											_	
1.00	B3										1.0	
1.00	ES2			-							_	
				-							_	
				-							_	
			46.25	- 1.50							1.5 —	
				-	<u>α</u> ο	content. Sand is fine to coarse.	Gravelly CLAY wit Gravel is subangul	n medium to high co lar fine to coarse.	ble			
				-	<u>α~_</u> ο	Cobbles are subrounded.					_	
				-	<u>α~~</u> ∘	*					_	
				-	<u>α~o</u> ~o	*					-	
2.00	В4			-	<u>α</u> ο	* 					2.0	
				-	<u>α</u> ο	* 					_	
				-	x <u>~</u> ~	- - 					_	
				-	x <u>~</u> ~						_	
				- (2.00)	x <u>~</u> ~	- - 					2.5	
				-	x <u>~</u> ~							
				-	x ~ ~ ~							
				-	<u>x ^ o</u>						_	
				-	<u>x ^ ~ o</u>						3.0	
				-	<u>x x o</u>							
				-	<u>~~~~</u> ~						-	
					<u>x x o</u>	2 * *					_	
3.50	B5		44.25	- 3.50	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						3.5	
				-		Stiff black slightly sandy slightly Sand is fine to coarse. Gravel is	gravelly CLAY with subangular fine to	high cobble content coarse. Cobbles are			_	
				(0.40)		subrounded.					_	
				-		- + #					_	
			43.85	- 3.90	10 <u>. 2. 27.</u> 3	End c	of trial pit at 3.90m				-	
				-							4.0	
				-							_	
				-							_	
				-								
				-							4.5	
				-							_	
				-							_	
				-								
Remarks							Water	Strikes:	Stab	ility:		
No groundwater	encountered.						Struck at (m):	Remarks:	Stab	e		
							,					
									Wid	th:	0.80	
Terminated due	to maximum rea	ach of excavator.							Leng	gth:	3.20	

		Project	: No.:	Project Name:				Tri	Trial Pit No.:			
			18-130	9	Stockhole Lane, Dublin					TP06		
		EOTECH	Co-ord	inates:	Client:					Sheet 1 of 1		
			31888	7.93 E	Fingal County Council					5110011		
Method:			24294	6.65 N	Client'	s Representative:			Sc	ale:	1:25	
Irial Pitting			-		Hayes	Higgins					1.25	
Plant: 13T Excavator			Ground 47 5	d Level:	Date:	2018			Lo	gger:	GH	
Depth			Level	Depth (m)	10/12/	2010	a :					
(m)	Sample / lests	Field Records	(mOD)	(Thickness)	Legend	торсон	Description		Wat			
			47.47	0:05/		MADE GROUND: Firm brown sl	ightly sandy slightly	y gravelly CLAY with			-	
				-		fragments of plastic and pottery subangular fine to coarse.	y. Sand is fine to co	arse. Gravel is			-	
				(0.65)							_	
0.50	ES1			-							0.5 —	
											-	
			46.82	0.70		 Stiff brown slightly sandy slightl 	ly gravelly silty CLA	with medium cobb	le		-	
				-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	content. Sand is fine to coarse.	Gravel is subangul	ar fine to medium.			-	
1.00	B3			-							10	
1.00	ES2			-							-	
				-							-	
				[-	
				-	<u>x</u> x						-	
		Water Strike at 1 60m		-	<u>~~~</u> ~				-	<u>-</u>	1.5 —	
		Water Strike at 1.00m		-	<u>~~~</u> ~						_	
				(2.10)	<u>x x o</u>						-	
				-	<u>x x</u> o						-	
2.00	B4			-	<u>x x o</u>						2.0	
				-	<u>x x o</u>						_	
				-	<u>x x o</u>						_	
					x <u>x</u> o						_	
				-	x 0 x 0						2.5 —	
				-	x 0 x 0						-	
			44 72	2 80	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						_	
				-	4 10°0	Stiff blackish grey slightly sandy content. Sand is fine to coarse.	slightly gravelly CL Gravel is subangul	AY with medium col ar fine to coarse.	oble		_	
3.00	B5			-		Cobbles are rounded.					3.0	
				-		- 2 -					-	
											_	
				(1.10)		* 0 -					_	
				-		* 2 -					3.5 —	
					4.10°0	* 2 -					_	
				-		2 2					_	
3.90	B6		43.62	- 3.90	4 10°0 0 0 0						_	
				-		End c	of trial pit at 3.90m				4.0	
											-	
				-							-	
				-							_	
				-							4.5	
				-							_	
				-							-	
				-							-	
				-								
Remarks					1		14/-1	Strikos	Stabilit	v:		
							water	SUTIKES:	Stable			
							Struck at (m): 1.60	Remarks: Water Strike at				
								1.60m	Width	:	0.80	
Terminated due	to maximum r	each of excavator.							Length	:	3.10	

				: No.:	Project Name:				Т	Trial Pit No.:		
	CALICI		18-130	9	Stockhole Lane, Dublin					TP07		
		OTECH	Co-ord	inates:	Client:							
	GL		31890	6.33 E	Fingal County Council					Sheet 1	l of 1	
Method:			1	0.00 N	Client's	Client's Representative:					1.05	
Trial Pitting			24295	0.30 N	Hayes H	liggins			S	cale:	1:25	
Plant:			Ground	d Level:	Date:						CU	
13T Excavator			46.12 mOD		10/12/2	2018			L	ogger:	GH	
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend		Description			Vater		
(,			(1100)	(0.15)		TOPSOIL				-		
			45.97	(8·15)			clightly candy angu	lar fine to coarse				
			45.92	0:20		GRAVEL. Sand is fine to coarse.	singintiy sanuy angu					
				(0.40)		MADE GROUND: Firm greyish b Sand is fine to coarse. Gravel is	prown slightly sand	y slight gravelly CLAY.			_	
0.50	ES1			- (0.40)			Subungular fine to	course.			0.5	
			45.52	0.60		Firm marial based allocations		the CLAY Counting for			_	
				-	×— —	Firm greyish brown slightly sand coarse. Gravel is subangular fin	e to medium.	silty CLAY. Sand is fine	to		_	
				-	X						-	
				[×							
1.00	B3			-	×						1.0	
1.00	E52			-	×						-	
				-	×							
				- (1.50)	×							
					×						15	
				-	×							
				-	$\frac{1}{x}$ $\frac{1}{x}$						_	
				-	~ ~~						_	
				-							_	
2.00	B4			-	×— —						2.0	
			44.02	2.10	×	Stiff blackish grey slightly sandy	slightly gravelly CL	AY with medium cobb	le			
				-	م من من من من من	content. Sand is fine to coarse.	Gravel is subangu	lar fine to coarse.			-	
				-		Cobbles are subrounded.					-	
				-								
				-							2.5	
				[
				-								
				- (1.50)							_	
3.00	B5			-							3.0	
				-	م من من م						-	
				[م میں میں میں میں میں							
				-	no - no e						-	
				-								
			42.52	-							3.5 —	
			42.52	3.60		End c	of trial pit at 3.60m				_	
				-							_	
				-							_	
				-							4.0	
				E							_	
				-							_	
				-							-	
				-							_	
				Ē							4.5	
				[_	
				-							_	
				ŀ							_	
				-								
Remarks	1		1		1		Water	Strikes:	Stabil	ity:		
No groundwate	encountered.								Jnsta	ble		
							Struck at (m):	Remarks:				
									Widt	h: (0.80	
Terminated due	to maximum ros	ach of excavator							Leng	th:	2.90	
renninateu uue	co maximum rea	acti UI CACAVALUI.										


APPENDIX D TRIAL PIT PHOTOGRAPHS

Report No.: 18-1309



TP01



December 2018





TP01



Stockhole Lane

Report No.: 18-1309

Report No.: 18-1309



TP01









TP01

Report No.: 18-1309



TP01



Report No.: 18-1309



TP02



December 2018









Stockhole Lane

Report No.: 18-1309

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TP02



Report No.: 18-1309



TP02



Report No.: 18-1309



TP02





Report No.: 18-1309



TP03



Report No.: 18-1309



TP03





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TP03



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TP03



Report No.: 18-1309



TP04





Report No.: 18-1309



TP04





Report No.: 18-1309



TP04



Report No.: 18-1309



TP04





TP05



Report No.: 18-1309



TP05



Report No.: 18-1309



TP05





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TP05





TP05



Report No.: 18-1309



TP05



Report No.: 18-1309



TP06





Report No.: 18-1309



TP06



Report No.: 18-1309



TP06



Report No.: 18-1309



TP06



Report No.: 18-1309



TP06



Report No.: 18-1309



TP07



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TP07





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TP07



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TP07



Report No.: 18-1309



TP07





APPENDIX E INFILTRATION TESTS
Soakaway Infiltration Test



Project No.:	18-1309	1				_	Q^{*}			
Site:	Stockho	le Lane							EWA	Y
Test Locatio	on: SA01						- 72	——GI	EOTECI	Н
Test Date:	10 Dece	mber 2018								
test pit top test pit base	o dimensions e dimensions	width (m) 0.40 0.40	length (m) 2.00 1.50		Ana <u>l</u>	ysis using m and (ethod as de CIRIA Repo	escribed in Bl rt C697-The .	RE Digest 3 SUDS Mani	'65 ual
test	oit depth (m)	2.00	C	lepth to g	groundwa	ater before	adding w	ater (m) =	0.28	
time (mins) 0 1 2 4 6 8 10 15 20 25 30 45 60 75 90	depth to water surface (m) 0.28 0.29 0.29 0.29 0.29 0.29 0.29 0.29 0.29	depth of water in pit (m) 1.72 1.72 1.71 1.71 1.71 1.71 1.71 1.71	From §	graph bel test star test end infiltr	ow: t - 75% d 1.29 time is - 25% de 0.43 time is	epth at m water de not deterr epth at m water de not deterr	epth nined nined 7 ery low			
time (mins)	depth to water (m)	depth of water in pit (m)	time elapsed (mins)	volui wate (n	ne of r lost 1 ³)	Area of w base at 50 (m	valls and 0% drop ²)	q (m/min)	q (m/h)	
	0.71	1.29 0.43								
2.00		-]



Soakaway Infiltration Test



Project No.:	18-1309)					
Site:	Stockho	le Lane				CAUS	EWAY
Test Locatio	on: SA02					GE	OIECH
Test Date:	10 Dece	mber 2018					
test pit top test pit base test p	p dimensions e dimensions pit depth (m)	width (m) 0.40 0.40 1.50	length (m) 2.50 2.00	Ana. epth to groundwa	lysis using method as de and CIRIA Repo ater before adding w	escribed in BI rt C697-The s rater (m) =	RE Digest 365 SUDS Manual Dry
time (mins)	depth to water surface (m)	depth of water in pit (m)	From a	ranh holouu			
0	0.33	1.17	FIOIIIg	tapli below:	anth at		
2	0.33	1.17		0 8775	m water denth		
<u> </u>	0.34	1.10		time is	not determined		
6	0.35	1.15		chine 15	not acter minea		
8	0.37	1.13		test end - 25% de	onth at		
10	0.38	1.12		0.2925	m water depth		
15	0.39	1.11		time is	not determined		
20	0.41	1.09					
25	0.42	1.08					
30	0.43	1.07		infiltration ra	te (q) is very low		
45	0.47	1.03					
60	0.50	1.00					
75	0.53	0.97					
90	0.54	0.96					
105	0.55	0.95					
120	0.56	0.94					
135	0.57	0.93					
150	0.58	0.92					
105	0.39 dopth to	0.91 dopth of	timo	volume of	Area of walls and		
timo	ueptilto	water in nit	alancad	water lost	has at 50% drop	a	a
ume	water	water in pit	erapsed	water just	base at 50% urop	y ((')	Ч (т./h)
(mins)	(m)	(m)	(mins)	(m [°])	(m)	(m/min)	(m/h)
	0.62	0.8775					
	1.21	0.2925					
	•						



Soakaway Infiltration Test



Project No.:	18-1309)					
Site:	Stockho	le Lane				CAUSI	EWAY
Test Locati	on: SA03				-	———GE	OTECH
Test Date:	10 Dece	mber 2018					
test pit toj test pit bas	o dimensions e dimensions	width (m) 0.40 0.40	length (m) 2.50 2.00	Anal	lysis using method as de and CIRIA Repo	escribed in BF rt C697-The S	RE Digest 365 SUDS Manual
test	pit depth (m)	2.00	0	lepth to groundwa	ater before adding w	ater (m) =	Dry
time (mins) 0 1	depth to water surface (m) 0.58 0.60	depth of water in pit (m) 1.42 1.40	From g	raph below: test start - 75% d	lepth at		
2	0.64	1.36		1.065	m water depth		
4	0.66	1.34		time is	20.0 minutes		
6	0.70	1.30					
8	0.73	1.27		test end - 25% de	epth at		
10	0.76	1.24		0.555 time is	not determined		
20	0.07	1.15		time is	not acter mineu		
20	1.02	0.98					
30	1.11	0.89		infiltration ra	ate (a) is verv low		
45	1.24	0.76			(b) j j		
60	1.39	0.61					
75	1.45	0.55					
90	1.50	0.50					
105	1.52	0.48					
120	1.55	0.45					
135	1.57	0.43					
150	1.58	0.42					
	depth to	depth of	time	volume of	Area of walls and		
time	water	water in pit	elapsed	water lost	base at 50% drop	q	q
(mins)	(m)	(m)	(mins)	(m ³)	(m ²)	(m/min)	(m/h)
20	0.94	1.065					
	1.65	0.355					
1.60							





APPENDIX F INDIRECT IN-SITU CBR TEST RESULTS



Causeway Geotech Ltd Dynamic Cone Penetrometer (DCP) test results and estimated CBR Stockhole Lane **Project: CBR01**

CBR estimated using TRL Road Note 8:

Log CBR = 2.48-1.057 Log (mm/blow)

Date: 10-Dec-18

Project No: 18-1309

Test Number:



Causeway Geotech Ltd Dynamic Cone Penetrometer (DCP) test results and estimated CBR Stockhole Lane **Project: CBR02**

CBR estimated using TRL Road Note 8:

Log CBR = 2.48-1.057 Log (mm/blow)

Date: 10-Dec-18

Project No: 18-1309

Test Number:



Causeway Geotech Ltd Dynamic Cone Penetrometer (DCP) test results and estimated CBR Project: Stockhole Lane Test Number: CBR03

CBR estimated using TRL Road Note 8:

Log CBR = 2.48-1.057 Log (mm/blow)

Project No: 18-1309

Date: 10-Dec-18

depth cumulative number of blows CBR from mm/blow (%) to (mm) 6.4 4.8 9.5 depth below ground level (mm) -



APPENDIX G GEOTECHNICAL LABORATORY TEST RESULTS







+44 (0)28 2766 6640 info@causewaygeotech.com www.causewaygeotech.com

10122

SOIL AND ROCK SAMPLE ANALYSIS LABORATORY TEST REPORT

Project Name:	Stockhole Lane, Dublin
Project No.:	18-1309
Client:	Fingal County Council
Engineer:	Hayes Higgins
Date:	18/01/19

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.

Approved Signatory

topen Wohn

Stephen Watson Laboratory Manager

Signed for and on behalf of Causeway Geotech Ltd

Causeway Geotech Ltd 8 Drumahiskey Road, Ballymoney Co. Antrim, N. Ireland, BT53 7QL

Registered in Northern Ireland. Company Number: NI610766















+44 (0)28 2766 6640 info@causewaygeotech.com www.causewaygeotech.com

Project Name: Stockhole Lane, Dublin

Report Reference: Soils 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	8
SOIL	Liquid and Plastic Limits of soil-1 point cone penetrometer method	BS 1377-2: 1990: Cl 4.4, 5.3 & 5.4	8
SOIL	Particle size distribution - wet sieving	BS 1377-2: 1990: Cl 9.2	8
SOIL	Particle size distribution - sedimentation hydrometer method	BS 1377-2: 1990: Cl 9.5	8
SOIL	Moisture Condition Value at natural moisture content	BS 1377-4: 1990: Cl 5.4	6

SUB-CONTRACTED TESTS

In agreement with Client, the following tests were conducted by an approved sub-contractor. All subcontracting laboratories used are UKAS accredited.

Material tested	Type of test/Properties measured/Range of measurement	Standard specifications	No. of results included in the report
SOIL – Subcontracted to Pro Soils Limited (UKAS 2183)	pH Value of Soil		7
SOIL – Subcontracted to Chemtest Ltd (UKAS 2183)	Sulphate Content water extract		7
SOIL – Subcontracted to Chemtest Ltd <i>(UKAS 2183)</i>	Total Sulphur Content		7

Causeway Geotech Ltd

8 Drumahiskey Road, Ballymoney Co. Antrim, N. Ireland, BT53 7QL









	USE GE	WAY OTECH			Summai	ry of (Clas	sific	ation	Test	Re	sult	ts	
Project No. 18-	309		Project	Name		S	tockh	ole Lar	ne, Dubli	n				
Hole No.	Ref	Sar Top	nple Base	Туре	Soil Description	Dens bulk Ma/m	sity dry n3	W %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Casagrande Classification
TP01	3	1.00		в	Brown slightly sandy slightly gravelly CLAY.			22.0	90	33 -1pt	19	14		CL
TP02	3	1.00		В	Lght brown slightly sandy slightly gravelly CLAY.			22.0	68	33 -1pt	17	16		CL
TP03	3	1.00		В	MADE GROUND: Brown slightly sandy slightly gravelly CLAY.			14.0	70	55 -1pt	31	24		МН
TP04	3	1.00		в	Brown slightly sandy slightly gravelly CLAY.			26.0	66	29 -1pt	18	11		CL
TP04	5	3.00		в	Brown slightly sandy slightly gravelly CLAY.			11.0	90	31 -1pt	18	13		CL
TP05	3	1.00		в	MADE GROUND: Brown slightly sandy slightly gravelly CLAY			15.0	64	30 -1pt	18	12		CL
TP06	3	1.00		в	Brown slightly sandy slightly gravelly CLAY.			22.0	90	46 -1pt	22	24		СІ
TP07	3	1.00		В	Greyish brown slightly sandy slightly gravelly CLAY.			20.0	68	43 -1pt	23	20		СІ
All tests perfe	ormed	in acco	rdance v	vith BS	S1377:1990 unless specifie	d otherw	ise	-	-	-			LAI	B 01R Version 4
Key Density Linear n wd - wat wi - imn	test leasure er displa nersion i	ment unles acement in water	s :	Liquid L 4pt con cas - C 1pt - sir	Limit Particl e unless : sp - sr asagrande method gj - ga ngle point test	e density nall pyknom s jar	neter	Date F	Printed	19	Appr	oved	By Watson	







LAB 05R Version 4

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Si	te Na	me		Stockh	nole Lan	e, Dub	lin													S	amp	ole N	۱o.							100	3		
So	oil Des	scription		Brown	slightly s	andy sl	ightly	' grav	elly (CLAY	-									0	Dept	h, m	n							1.0	00		
S	oecim	en Refer	ence		7			Spec Dep	cimer th	ו					1			r	n	S	amp	ole T	уре	9						E	3		
Т	est Me	ethod		BS1377	7:Part 2:1	990, cl	auses	s 9.2	and 9	9.5										К	(eyL	AB II	D					(Caus	201	8121	1826	5
		CLAY			SILT				- .		SA	ND						- .		G	RAV	ΈL					COI	BBLES	8	BC	ULD	ERS	
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Stephen.Watson

LAB 05R Version 4

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Si	te Name		Stockhole Lane,	Dublin							Sa	mple N	lo.			3	
S	oil Description		MADE GROUND: E	Brown sli	ghtly sandy	slightly	gravel	ly CL/	۹Y		De	epth, m	I		:	1.00	
S	pecimen Refere	ence	7		Specimen Depth	l			1	m	Sa	mple T	уре			В	
Т	est Method		BS1377:Part 2:199	90, clause	es 9.2 and 9	0.5					Ke	eylab ii	D		Caus20)18121828	
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	63		100	0	.0227		44		1	Sand						30	
	50		100	0	.0163		41]	Silt						33	
	37.5		100	0 0	.0088		34 26		\mathbf{I}	Clay						1/	
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			Approved													UKAS	Ī
			Stenhen Wate	son							LAE	3 05R	Version 4	4		10122	

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S	ite Name		Stockhole Lane,	Dublin	I													۰,	San	nple	No										3				
S	oil Description		Brown slightly sar	ıdy sligh	ntly gr	avelly	CLAY	<i>(</i> .										I	Dep	oth,	m									1.	.00				
S	pecimen Referen	ce	7		Sp De	ecime pth	'n					1				r	n	0.	San	nple	Тур	be									в				
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			Stephen.Wat	son														LA	٨B	05F	٦V	/er	sic	n 4	4						10)12	22		

	CAUSEWAY	D)N	Job Ref	18-1309
	GEOTECH					Borehole/Pit No.	TP07
Sit	e Name	Stockhole Lane,	Dublin			Sample No.	3
So	il Description	Greyish brown slig	htly sandy slightly gravell	y CLAY.		Depth, m	1.00
Sp	ecimen Reference	7	Specimen Depth		1 m	Sample Type	В
Te	st Method	BS1377:Part 2:199	00, clauses 9.2 and 9.5	-		KeyLAB ID	Caus2018121830
	CLAY	SILT	Course Fire	SAND		GRAVEL	COBBLES BOULDERS
	100				oarse Fine		
	90						
	80						
	70						
% (/0						
assing	60						
ge Pa	50						
centa	40						
Perc	30						
	20						
	10						
	0						
	Sie	ving	Sedimentati	Particle S	Size mm		·
	Particle Size mm	% Passing	Particle Size mm	% Passing	Dry N	Aass of sample, g	533
	125	100	0.0606	75	Sample Prop	oortions	% dry mass
	90 75	100	0.0454	72	Cobbles		0
	63	100	0.0232	66	Sand		18
	50	100	0.0167	62	Silt		43
	37.5	100	0.0087	58 45	Clay		32
	20	100	0.0027	36	Grading Ana	Ilysis	
	14	100	0.0015	28	D100	mm	0.0127
	6.3	99 97	╢────┤──		D60 D30	mm mm	0.0127
	5	96			D10	mm	-
	3.35	95			Uniformity C	Coefficient	
	2	93	╢────┤──		Curvature Co	Demicient	
	0.6	89	Particle density (assu	umed)	Remarks		
	0.425	88	2.65 Mg/	m3	Preparation and	testing in accordance with BS1377	7-2 :1990 unless noted below
	0.3	85					
	0.212	81	4				(Î)
	0.063	75	1				
		Approved					
		Stephen.Wats	on			LAB 05R Version 4	10122

	JSEN				Moisture Condi	tion Valu	e at Natu	iral Moist	ture Conte	ent
Project No.	GEOT	ECH	Droiget I	lama		Juillia	I y OI Kes	buito		
Project No. 18-	1309		FIOJECT	vame		Stockho	le Lane, Dub	lin		
Hole No.	Def	Sar	nple	Tures	Soil Description	Retained on 20mm sieve	Moisture Content <20mm	Moisture Condition Value	Method of Interpretation	Remarks
	Rer	тор	Base	туре		%	%			
TP01	3	1.00		в	Brown slightly sandy slightly gravelly CLAY.	0	22.0	5.1	Best fit line	
TP02	3	1.00		в	Lght brown slightly sandy slightly gravelly CLAY.	6	20.1	12.3	Best fit line	
TP04	3	1.00		в	Brown slightly sandy slightly gravelly CLAY.	4	26.6	12.3	Best fit line	
TP05	3	1.00		в	MADE GROUND: Brown slightly sandy slightly gravelly CLAY	0	19.5	9.8	Best fit line	
TP06	3	1.00		В	Brown slightly sandy slightly gravelly CLAY.	0	23.1	9.9	Best fit line	
TP07	3	1.00		в	Greyish brown slightly sandy slightly gravelly CLAY.	2	20.7	8.8	Best fit line	
									LA	AB 10R Version 4
Key Test pe annotat	rformec ed othe	l in accorda rwise	ance with I	BS137	7:Part4:1990, clause 5.4 unless	Date Printed 18/01	/2019	Approved By Stephe	n.Watson	UKAS 10122



Chemtest Ltd. The right chemistry to deliver results Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.com

Report No.:	19-01216-1		
Initial Date of Issue:	17-Jan-2019		
Client	Causeway Geotech Ltd		
Client Address:	8 Drumahiskey Road Balnamore Ballymoney County Antrim BT53 7QL		
Contact(s):	Carin Cornwall Colm Hurley Darren O'Mahony Gabriella Horan John Cameron Lucy Newland Matthew Gilbert Neil Haggan Paul Dunlop Paul McNamara Sean Ross Stephen Franey Stephen Watson Stuart Abraham		
Project	18-1309 Stocklane, Co. Dublin		
Quotation No.:		Date Received:	15-Jan-2019
Order No.:		Date Instructed:	15-Jan-2019
No. of Samples:	7		
Turnaround (Wkdays):	3	Results Due:	17-Jan-2019
Date Approved:	17-Jan-2019		
Approved By:			
Alr.			

Details:

Robert Monk, Technical Manager



Client: Causeway Geotech Ltd		Che	mtest Jo	ob No.:	19-01216	19-01216	19-01216	19-01216	19-01216	19-01216	19-01216
Quotation No.:	(Chemte	est Sam	ple ID.:	753616	753617	753618	753619	753620	753621	753622
Order No.:		Clie	nt Samp	le Ref.:	4	4	3	4	4	4	4
	Sample Location:		TP01	TP02	TP03	TP04	TP05	TP06	TP07		
			Sampl	e Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):		2.0	2.1	1.0	2.0	2.0	2.0	2.0		
	Date Sampled:		14-Jan-2019								
Determinand	Accred.	SOP	Units	LOD							
Moisture	N	2030	%	0.020	11	12	11	11	7.4	20	7.9
рН	U	2010		N/A	8.8	8.6	8.1	8.5	8.6	7.7	8.5
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010	< 0.010	0.24	< 0.010	< 0.010	0.10	0.010
Sulphate (Total)	U	2430	mg/kg	100	420	500	7000	500	1300	1300	16000

The right chemistry to deliver results

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



APPENDIX H ENVIRONMENTAL LABORATORY TEST RESULTS





Chemistry to deliver results The right chemistry to deliver results Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.com

Report No.:	18-39262-1		
Initial Date of Issue:	24-Dec-2018		
Client	Causeway Geotech Ltd		
Client Address:	8 Drumahiskey Road Balnamore Ballymoney County Antrim BT53 7QL		
Contact(s):	Carin Cornwall Ciaran Doherty Darren O'Mahony Gabriella Horan John Cameron Lucy Newland Matthew Gilbert Neil Haggan Paul Dunlop Paul McNamara Sean Ross Stephen Franey Stephen Watson Stuart Abraham		
Project	18-1309 Stockhole Lane		
Quotation No.:	Q18-13245	Date Received:	13-Dec-2018
Order No.:		Date Instructed:	13-Dec-2018
No. of Samples:	14		
Turnaround (Wkdays):	4	Results Due:	18-Dec-2018
Date Approved:	24-Dec-2018		
Approved By:			
M.J.			

Details:

Martin Dyer, Laboratory Manager

Client: Causeway Geotech Ltd		Che	mtest J	ob No.:	18-39262	18-39262	18-39262	18-39262	18-39262	18-39262	18-39262	18-39262	18-39262
Quotation No.: Q18-13245	(Chemte	est Sam	ple ID.:	741224	741225	741226	741227	741228	741229	741230	741231	741232
Order No.:		Clie	nt Samp	ole Ref.:	ES								
		Sa	ample L	ocation:	TP01	TP01	TP02	TP02	TP03	TP03	TP04	TP04	TP05
			Sampl	le Type:	SOIL								
			Top De	pth (m):	0.50	1.00	0.50	1.00	0.50	1.00	0.50	1.00	0.50
			Date Sa	ampled:	10-Dec-2018								
			Asbest	tos Lab:	COVENTRY								
Determinand	Accred.	SOP	Units	LOD									
АСМ Туре	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected								
Moisture	N	2030	%	0.020	18	19	18	17	12	12	18	14	14
рН	U	2010		N/A	8.1	8.3	8.1	8.0	8.3	8.3	7.8	7.8	8.4
Arsenic	U	2450	mg/kg	1.0	15	14	10	11	22	21	20	19	19
Barium	U	2450	mg/kg	10	140	140	120	110	110	82	110	95	180
Cadmium	U	2450	mg/kg	0.10	1.5	1.4	1.3	1.5	2.6	2.0	2.7	2.2	3.2
Chromium	U	2450	mg/kg	1.0	24	28	22	19	17	15	23	26	17
Molybdenum	U	2450	mg/kg	2.0	3.8	3.4	2.9	2.5	5.5	3.6	3.4	3.0	3.5
Antimony	Ν	2450	mg/kg	2.0	2.5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	21	20	14	16	28	22	42	37	28
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.45	0.39	< 0.10
Nickel	U	2450	mg/kg	0.50	50	53	28	32	70	48	63	63	56
Lead	U	2450	mg/kg	0.50	21	19	23	23	28	24	96	86	40
Selenium	U	2450	mg/kg	0.20	0.38	0.45	0.72	0.69	0.98	0.86	1.2	1.1	0.65
Zinc	U	2450	mg/kg	0.50	59	59	57	65	97	61	100	97	520
Chromium (Trivalent)	N	2490	mg/kg	1.0	24	28	22	19	17	15	23	26	17
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Organic Carbon	U	2625	%	0.20	0.47	0.64	0.74	0.84	0.76	0.85	2.8	2.4	1.4
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	0	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	0	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	0	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
I otal Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	IN N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N II	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH > C40 C12		2080	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH > C12 C16		2000	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C10		2000	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH SC10-C21	11	2000	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH SC21-000	N	2000	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrosorhana	IN NI	2000	mg/kg	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOTAL ATOMALIC HYDROCARDONS	IN	2000	тту/кg	0.0	< 0.0	< 0.0	< 0.0	< 0.0	< 0.0	< 0.0	< 0.0	< 0.0	< 0.0

Client: Causeway Geotech Ltd		Che	mtest J	ob No.:	18-39262	18-39262	18-39262	18-39262	18-39262	18-39262	18-39262	18-39262	18-39262
Quotation No.: Q18-13245	(Chemte	est Sam	ple ID.:	741224	741225	741226	741227	741228	741229	741230	741231	741232
Order No.:		Clie	nt Samp	le Ref.:	ES								
		Sa	ample L	ocation:	TP01	TP01	TP02	TP02	TP03	TP03	TP04	TP04	TP05
			Sampl	e Type:	SOIL								
			Top De	pth (m):	0.50	1.00	0.50	1.00	0.50	1.00	0.50	1.00	0.50
			Date Sa	ampled:	10-Dec-2018								
			Asbest	tos Lab:	COVENTRY								
Determinand	Accred.	SOP	Units	LOD									
Total Petroleum Hydrocarbons	Ν	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	Ν	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.54	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Coronene	Ν	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 17 PAH's	Ν	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Client: Causeway Geotech Ltd		Che	mtest Jo	ob No.:	18-39262	18-39262	18-39262	18-39262	18-39262
Quotation No.: Q18-13245	(Chemte	st Sam	ple ID.:	741233	741234	741235	741236	741237
Order No.:		Clie	nt Samp	le Ref.:	ES	ES	ES	ES	ES
		Sa	ample Lo	ocation:	TP05	TP06	TP06	TP07	TP07
			Sampl	e Type:	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Dep	oth (m):	1.00	0.50	1.00	0.50	1.00
			Date Sa	ampled:	10-Dec-2018	10-Dec-2018	10-Dec-2018	10-Dec-2018	10-Dec-2018
			Asbest	os Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD					
АСМ Туре	U	2192		N/A	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected				
Moisture	N	2030	%	0.020	13	17	18	15	15
pH	U	2010	, -	N/A	8.6	7.5	8.2	8.2	8.3
Arsenic	U	2450	ma/ka	1.0	18	19	16	16	15
Barium	U	2450	ma/ka	10	95	160	140	140	130
Cadmium	U	2450	ma/ka	0.10	2.3	2.4	2.0	2.5	2.0
Chromium	U	2450	mg/kg	1.0	18	20	20	20	19
Molybdenum	U	2450	mg/kg	2.0	3.5	5.1	4.4	4.5	3.8
Antimony	N	2450	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	23	27	24	22	22
Mercury	U	2450	mg/kg	0.10	< 0.10	0.14	0.11	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	55	48	49	49	44
Lead	U	2450	mg/kg	0.50	30	47	31	28	25
Selenium	U	2450	mg/kg	0.20	0.68	2.4	0.85	0.82	0.69
Zinc	U	2450	mg/kg	0.50	62	84	69	71	65
Chromium (Trivalent)	N	2490	mg/kg	1.0	18	20	20	20	19
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Organic Carbon	U	2625	%	0.20	0.87	2.0	1.3	0.98	0.90
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Client: Causeway Geotech Ltd		Che	mtest Jo	ob No.:	18-39262	18-39262	18-39262	18-39262	18-39262
Quotation No.: Q18-13245	(Chemte	st Sam	ple ID.:	741233	741234	741235	741236	741237
Order No.:		Clie	nt Samp	le Ref.:	ES	ES	ES	ES	ES
		Sa	ample Lo	ocation:	TP05	TP06	TP06	TP07	TP07
			Sampl	e Type:	SOIL	SOIL	SOIL	SOIL	SOIL
			Тор Dep	oth (m):	1.00	0.50	1.00	0.50	1.00
			Date Sa	ampled:	10-Dec-2018	10-Dec-2018	10-Dec-2018	10-Dec-2018	10-Dec-2018
			Asbest	os Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD					
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Coronene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 17 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10



Project:	18-1309	Stockhole	Lane	
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Chemtest Job No:	18-39262				Landfill V	Vaste Acceptanc	e Criteria
Chemtest Sample ID:	741224					Limits	
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP01					hazardous	Hazardous
Top Depth(m):	0.50				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.47	3	5	6
Loss On Ignition	2610	U	%	2.7			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100		
рН	2010	U		8.1		>6	
Acid Neutralisation Capacity	2015	N	mol/kg	0.0050		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/S	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0092	< 0.50	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	0.021	0.21	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	1.6	16	800	15000	25000
Fluoride	1220	U	0.26	2.6	10	150	500
Sulphate	1220	U	9.8	98	1000	20000	50000
Total Dissolved Solids	1020	N	85	840	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 (%)	18



Project:	18-1309	Stockhole	Lane	
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Chemtest Job No:	18-39262				Landfill V	Vaste Acceptanc	e Criteria
Chemtest Sample ID:	741225					Limits	
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP01					hazardous	Hazardous
Top Depth(m):	1.00				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.64	3	5	6
Loss On Ignition	2610	U	%	2.8			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100		
рН	2010	U		8.3		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.014		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.023	< 0.50	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	0.0094	0.094	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	2.0	20	800	15000	25000
Fluoride	1220	U	0.35	3.5	10	150	500
Sulphate	1220	U	150	1500	1000	20000	50000
Total Dissolved Solids	1020	N	250	2500	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	8.1	81	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	19



Projec	:t: 18-'	1309 St	tockhol	e Lane
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Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741226				Limits		
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP02					hazardous	Hazardous
Top Depth(m):	0.50				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.74	3	5	6
Loss On Ignition	2610	U	%	3.3			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		8.1		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.010		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values for compliance leaching te		eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/S	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.037	< 0.50	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	0.0071	0.071	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0013	< 0.50	4	50	200
Chloride	1220	U	2.2	22	800	15000	25000
Fluoride	1220	U	1.0	10	10	150	500
Sulphate	1220	U	240	2400	1000	20000	50000
Total Dissolved Solids	1020	N	350	3500	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	8.8	88	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	18



Project:	18-1309	Stockhole	Lane
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Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741227					Limits	
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP02					hazardous	Hazardous
Top Depth(m):	1.00				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.84	3	5	6
Loss On Ignition	2610	U	%	3.3			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100		
рН	2010	U		8.0	-	>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.010		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values for compliance leaching tes		eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/S	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0061	< 0.50	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	0.0047	< 0.050	0.5	10	30
Nickel	1450	U	0.0012	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	2.2	22	800	15000	25000
Fluoride	1220	U	0.27	2.7	10	150	500
Sulphate	1220	U	21	210	1000	20000	50000
Total Dissolved Solids	1020	N	78	780	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	10	100	500	800	1000

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



Project:	18-1309	Stockhole	Lane
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Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741228					Limits	
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP03					hazardous	Hazardous
Top Depth(m):	0.50				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.76	3	5	6
Loss On Ignition	2610	U	%	2.7			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		8.3		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.26		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values for compliance leaching test		eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/S	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.012	< 0.50	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	0.010	0.10	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0039	0.039	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	1.7	17	800	15000	25000
Fluoride	1220	U	0.34	3.4	10	150	500
Sulphate	1220	U	29	290	1000	20000	50000
Total Dissolved Solids	1020	N	100	1000	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	9.5	95	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12



Project:	18-1309	Stockhole	Lane	
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Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741229					Limits	
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP03					hazardous	Hazardous
Top Depth(m):	1.00				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.85	3	5	6
Loss On Ignition	2610	U	%	2.5			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		8.3		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.092		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values for compliance leaching tes		eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/S	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.023	< 0.50	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	0.014	0.14	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0042	0.042	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	2.8	28	800	15000	25000
Fluoride	1220	U	0.30	3.0	10	150	500
Sulphate	1220	U	67	670	1000	20000	50000
Total Dissolved Solids	1020	N	160	1600	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	7.8	78	500	800	1000

Solid Information						
Dry mass of test portion/kg	0.090					
Moisture (%)	12					



Project: 18-1309 Stockhole Lane	
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Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741230					Limits	
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP04					hazardous	Hazardous
Top Depth(m):	0.50				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	2.8	3	5	6
Loss On Ignition	2610	U	%	6.9			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		7.8		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.030		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	0.0014	< 0.050	0.5	2	25
Barium	1450	U	0.0093	< 0.50	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	0.0053	0.053	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0020	0.020	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	1.2	12	800	15000	25000
Fluoride	1220	U	0.48	4.8	10	150	500
Sulphate	1220	U	22	220	1000	20000	50000
Total Dissolved Solids	1020	N	120	1200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	7.7	77	500	800	1000

Solid Information						
Dry mass of test portion/kg	0.090					
Moisture (%)	18					


Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741231				Limits		
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP04					hazardous	Hazardous
Top Depth(m):	1.00				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	2.4	3	5	6
Loss On Ignition	2610	U	%	6.4			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		7.8		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.031		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/	S 10 I/kg
Arsenic	1450	U	0.0013	< 0.050	0.5	2	25
Barium	1450	U	0.0079	< 0.50	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	0.0042	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0022	0.022	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	2.1	21	800	15000	25000
Fluoride	1220	U	0.48	4.8	10	150	500
Sulphate	1220	U	16	160	1000	20000	50000
Total Dissolved Solids	1020	N	120	1200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	9.3	93	500	800	1000

Solid Information							
Dry mass of test portion/kg	0.090						
Moisture (%)	14						



Projec	:t: 18-'	1309 St	tockhol	e Lane
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Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741232				Limits		
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP05					hazardous	Hazardous
Top Depth(m):	0.50				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	1.4	3	5	6
Loss On Ignition	2610	U	%	3.5			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		8.4		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.026		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.020	< 0.50	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	0.0018	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0014	0.014	0.1	0.5	7
Zinc	1450	U	0.0019	< 0.50	4	50	200
Chloride	1220	U	2.0	20	800	15000	25000
Fluoride	1220	U	0.26	2.6	10	150	500
Sulphate	1220	U	200	2000	1000	20000	50000
Total Dissolved Solids	1020	N	290	2900	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	14



Projec	:t: 18-'	1309 St	tockhol	e Lane
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Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741233				Limits		
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP05					hazardous	Hazardous
Top Depth(m):	1.00				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.87	3	5	6
Loss On Ignition	2610	U	%	2.8			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		8.6		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.039		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/S	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0050	< 0.50	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	0.0015	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.17	1.7	10	150	500
Sulphate	1220	U	11	110	1000	20000	50000
Total Dissolved Solids	1020	N	140	1400	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	5.0	50	500	800	1000

Solid Information							
Dry mass of test portion/kg	0.090						
Moisture (%)	13						



Project: 18-1309 Stockhole Lane	
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Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741234				Limits		
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP06					hazardous	Hazardous
Top Depth(m):	0.50				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	2.0	3	5	6
Loss On Ignition	2610	U	%	5.4			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		7.5		>6	
Acid Neutralisation Capacity	2015	N	mol/kg	0.022		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/	S 10 I/kg
Arsenic	1450	U	0.0014	< 0.050	0.5	2	25
Barium	1450	U	0.012	< 0.50	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	0.0012	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0012	0.012	0.1	0.5	7
Zinc	1450	U	0.0024	< 0.50	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.18	1.8	10	150	500
Sulphate	1220	U	140	1400	1000	20000	50000
Total Dissolved Solids	1020	N	160	1600	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.4	< 50	500	800	1000

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



Projec	:t: 18-'	1309 St	tockhol	e Lane
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Chemtest Job No:	18-39262				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	741235					Limits	
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP06					hazardous	Hazardous
Top Depth(m):	1.00				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	1.3	3	5	6
Loss On Ignition	2610	U	%	4.1			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		8.2		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.031		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/S	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0042	< 0.50	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	0.0010	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0011	0.011	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.13	1.3	10	150	500
Sulphate	1220	U	21	210	1000	20000	50000
Total Dissolved Solids	1020	N	220	2200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	5.2	52	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	18



oject: 18-1309 Stockhole Lane

Chemtest Job No:	18-39262				Landfill V	Vaste Acceptanc	e Criteria
Chemtest Sample ID:	741236					Limits	
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP07					hazardous	Hazardous
Top Depth(m):	0.50				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.98	3	5	6
Loss On Ignition	2610	U	%	3.9			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100		
рН	2010	U		8.2		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.019		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0051	< 0.50	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	< 0.0010	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.13	1.3	10	150	500
Sulphate	1220	U	26	260	1000	20000	50000
Total Dissolved Solids	1020	N	72	710	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	7.0	70	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	15



Projec	:t: 18-'	1309 St	tockhol	e Lane
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Chemtest Job No:	18-39262				Landfill V	e Criteria	
Chemtest Sample ID:	741237					Limits	
Sample Ref:	ES					Stable, Non-	
Sample ID:						reactive	
Sample Location:	TP07					hazardous	Hazardous
Top Depth(m):	1.00				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Dec-2018					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.90	3	5	6
Loss On Ignition	2610	U	%	3.8			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0	100		
рН	2010	U		8.3		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.019		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/S	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0036	< 0.50	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	< 0.0010	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.16	1.6	10	150	500
Sulphate	1220	U	23	230	1000	20000	50000
Total Dissolved Solids	1020	N	65	650	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	7.4	74	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	15



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



Chemistry to deliver results The right chemistry to deliver results Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.com

Report No.:	19-00669-1		
Initial Date of Issue:	15-Jan-2019		
Client	Causeway Geotech Ltd		
Client Address:	8 Drumahiskey Road Balnamore Ballymoney County Antrim BT53 7QL		
Contact(s):	Carin Cornwall Colm Hurley Darren O'Mahony Gabriella Horan John Cameron Lucy Newland Matthew Gilbert Neil Haggan Paul Dunlop Paul McNamara Sean Ross Stephen Franey Stephen Watson Stuart Abraham		
Project	18-1309 Stockhole Lane		
Quotation No.:	Q18-13245	Date Received:	10-Jan-2019
Order No.:		Date Instructed:	10-Jan-2019
No. of Samples:	2		
Turnaround (Wkdays):	4	Results Due:	15-Jan-2019
Date Approved:	15-Jan-2019		
Approved By:			
M.J.			

Details:

Martin Dyer, Laboratory Manager

The right chemistry to deliver results Project: 18-1309 Stockhole Lane

<u>Results - Soil</u>

Client: Causeway Geotech Ltd	Chemtest Job No.:			19-00669	19-00669	
Quotation No.: Q18-13245	Chemtest Sample ID.:			751094	751096	
		Sa	ample Lo	ocation:	BH02	BH03
			Sampl	e Type:	SOIL	SOIL
			Top Dep	oth (m):	0.50	0.50
			Date Sa	ampled:	08-Jan-2019	08-Jan-2019
		Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD		
АСМ Туре	U	2192		N/A	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected
Moisture	Ν	2030	%	0.020	19	15
рН	U	2010		N/A	8.4	7.9
Arsenic	U	2450	mg/kg	1.0	21	21
Barium	U	2450	mg/kg	10	160	160
Cadmium	U	2450	mg/kg	0.10	2.9	2.9
Chromium	U	2450	mg/kg	1.0	22	22
Molybdenum	U	2450	mg/kg	2.0	4.9	4.4
Antimony	Ν	2450	mg/kg	2.0	2.1	2.3
Copper	U	2450	mg/kg	0.50	30	30
Mercury	U	2450	mg/kg	0.10	0.17	0.12
Nickel	U	2450	mg/kg	0.50	62	64
Lead	U	2450	mg/kg	0.50	39	33
Selenium	U	2450	mg/kg	0.20	0.97	0.74
Zinc	U	2450	mg/kg	0.50	94	78
Chromium (Trivalent)	Ν	2490	mg/kg	1.0	22	22
Chromium (Hexavalent)	Ν	2490	mg/kg	0.50	< 0.50	< 0.50
Total Organic Carbon	U	2625	%	0.20	1.1	1.1
Aliphatic TPH >C5-C6	Ν	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	Ν	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	Ν	2680	mg/kg	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10

The right chemistry to deliver results Project: 18-1309 Stockhole Lane

Client: Causeway Geotech Ltd	Chemtest Job No.:			19-00669	19-00669	
Quotation No.: Q18-13245	(Chemte	est Sam	ple ID.:	751094	751096
		Sample Location:			BH02	BH03
			Sampl	e Type:	SOIL	SOIL
			Top Dep	oth (m):	0.50	0.50
			Date Sa	ampled:	08-Jan-2019	08-Jan-2019
			Asbest	os Lab:	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	Ν	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.11	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	Ν	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Coronene	Ν	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 17 PAH's	Ν	2800	mg/kg	2.0	< 2.0	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	Ν	2815	mg/kg	0.10	< 0.10	< 0.10



t: 18-1309 Stockhole Lane

Chemtest Job No:	19-00669				Landfill V	Vaste Acceptanc	e Criteria
Chemtest Sample ID:	751094					Limits	
Sample Ref:						Stable, Non-	
Sample ID:						reactive	
Sample Location:	BH02					hazardous	Hazardous
Top Depth(m):	0.50				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	08-Jan-2019					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	1.1	3	5	6
Loss On Ignition	2610	U	%	4.4			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0 < 2.0	100		
рН	2010	U		8.4		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.029		To evaluate	To evaluate
Eluate Analysis	10:1 Eluate			10:1 Eluate 10:1 Eluate Limit values for compl			eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0062	< 0.50	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	0.0043	< 0.050	0.5	10	30
Nickel	1450	U	0.0022	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	3.5	35	800	15000	25000
Fluoride	1220	U	0.53	5.3	10	150	500
Sulphate	1220	U	10	100	1000	20000	50000
Total Dissolved Solids	1020	N	120	1200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.0	< 50	500	800	1000

Solid Information							
Dry mass of test portion/kg	0.090						
Moisture (%)	19						



Project: 18-1309 Stockhole La	ne
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Chemtest Job No:	19-00669				LandfIII Waste Acceptance Criteria			
Chemtest Sample ID:	751096					Limits		
Sample Ref:						Stable, Non- reactive		
Sample Location:	BH03					hazardous	Hazardous	
Top Depth(m):	0.50				Inert Waste	waste in non-	Waste	
Bottom Depth(m):					Landfill	hazardous	Landfill	
Sampling Date:	08-Jan-2019					Landfill		
Determinand	SOP	Accred.	Units					
Total Organic Carbon	2625	U	%	1.1	3	5	6	
Loss On Ignition	2610	U	%	3.3			10	
Total BTEX	2760	U	mg/kg	< 0.010	6			
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1			
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500			
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0 < 2.0	100			
рН	2010	U		7.9		>6		
Acid Neutralisation Capacity	2015	Ν	mol/kg	< 0.0020		To evaluate	To evaluate	
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	eaching test		
			mg/l	mg/kg	using B	using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25	
Barium	1450	U	0.0021	< 0.50	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	υ	< 0.00050	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U	0.0011	< 0.050	0.5	10	30	
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40	
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50	
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5	
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7	
Zinc	1450	U	< 0.0010	< 0.50	4	50	200	
Chloride	1220	U	1.6	16	800	15000	25000	
Fluoride	1220	U	0.22	2.2	10	150	500	
Sulphate	1220	U	50	500	1000	20000	50000	
Total Dissolved Solids	1020	N	85	840	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-	
Dissolved Organic Carbon	1610	U	11	110	500	800	1000	

Solid Information							
Dry mass of test portion/kg	0.090						
Moisture (%)	15						

The right chemistry to deliver results

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



Chemistry to deliver results The right chemistry to deliver results Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.com

Report No.:	19-00780-1		
Initial Date of Issue:	16-Jan-2019		
Client	Causeway Geotech Ltd		
Client Address:	8 Drumahiskey Road Balnamore Ballymoney County Antrim BT53 7QL		
Contact(s):	Carin Cornwall Colm Hurley Darren O'Mahony Gabriella Horan John Cameron Lucy Newland Matthew Gilbert Neil Haggan Paul Dunlop Paul McNamara Sean Ross Stephen Franey Stephen Watson Stuart Abraham Lucy Peaker		
Project	18-1309 Stockhole Lane		
Quotation No.:	Q18-13245	Date Received:	11-Jan-2019
Order No.:		Date Instructed:	11-Jan-2019
No. of Samples:	4		
Turnaround (Wkdays):	4	Results Due:	16-Jan-2019
Date Approved:	16-Jan-2019		
Approved By:			

0

Details:

Robert Monk, Technical Manager



The right chemistry to deliver results Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.com

Chemtest The right chemistry to deliver results

<u>Results - Soil</u>

Droi	in of	19-1200	Stockholo	Lano
PIO	ect:	10-1309	Stockhole	Lane

Client: Causeway Geotech Ltd		Chemtest Job No.:		19-00780	19-00780	19-00780	19-00780	
Quotation No.: Q18-13245	(Chemte	est Sam	ple ID.:	751559	751561	751563	751565
		S	ample Lo	ocation:	BH04	BH05	BH06	BH01
			Sampl	e Type:	SOIL	SOIL	SOIL	SOIL
			Top Dep	pth (m):	0.5	0.5	0.5	0.5
			Date Sa	ampled:	09-Jan-2019	09-Jan-2019	09-Jan-2019	10-Jan-2019
		Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	
Determinand	Accred.	SOP	Units	LOD				
АСМ Туре	U	2192		N/A	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	12	13	7.7	17
На	U	2010		N/A	8.4	8.4	8.5	8.1
Arsenic	U	2450	ma/ka	1.0	19	20	24	18
Barium	U	2450	mg/kg	10	77	76	160	140
Cadmium	U	2450	mg/kg	0.10	2.2	2.1	1.7	2.7
Chromium	U	2450	mg/kg	1.0	14	16	13	27
Molybdenum	U	2450	mg/kg	2.0	2.8	3.9	5.3	3.6
Antimony	N	2450	mg/kg	2.0	< 2.0	< 2.0	4.3	3.7
Copper	U	2450	mg/kg	0.50	20	25	25	27
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.21
Nickel	U	2450	mg/kg	0.50	41	48	40	64
Lead	U	2450	mg/kg	0.50	13	22	23	49
Selenium	U	2450	mg/kg	0.20	< 0.20	< 0.20	0.29	0.67
Zinc	U	2450	mg/kg	0.50	50	63	52	100
Chromium (Trivalent)	N	2490	mg/kg	1.0	14	16	13	27
Chromium (Hexavalent)	Ν	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Organic Carbon	U	2625	%	0.20	0.49	0.83	0.58	1.7
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10

The right chemistry to deliver results Project: 18-1309 Stockhole Lane

Results - Soil

Client: Causeway Geotech Ltd		Chemtest Job No.:		19-00780	19-00780	19-00780	19-00780	
Quotation No.: Q18-13245		Chemte	est Sam	ple ID.:	751559	751561	751563	751565
		Sa	ample Lo	ocation:	BH04	BH05	BH06	BH01
			Sampl	e Type:	SOIL	SOIL	SOIL	SOIL
			Top De	pth (m):	0.5	0.5	0.5	0.5
			Date Sa	ampled:	09-Jan-2019	09-Jan-2019	09-Jan-2019	10-Jan-2019
			Asbest	os Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD				
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Coronene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 17 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	N	2815	ma/ka	0.10	< 0.10	< 0.10	< 0.10	< 0.10



t: 18-1309 Stockhole Lane

Chemtest Job No:	19-00780				Landfill V	Vaste Acceptanc	e Criteria
Chemtest Sample ID:	751559					Limits	
Sample Ref: Sample ID:						Stable, Non- reactive	
Sample Location:	BH04					hazardous	Hazardous
Top Depth(m):	0.5				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	09-Jan-2019					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.49	3	5	6
Loss On Ignition	2610	U	%	2.4			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0 < 2.0	100		
pН	2010	U		8.4		>6	
Acid Neutralisation Capacity	2015	N	mol/kg	0.46		To evaluate	To evaluate
Eluate Analysis	10:1 Eluate			10:1 Eluate Limit values for compliance			eaching test
			mg/l	mg/kg	using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0042	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.010	0.04	1	5
Chromium	1450	U	0.0022	< 0.050	0.5	10	70
Copper	1450	U	0.0021	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0085	0.085	0.5	10	30
Nickel	1450	U	0.0024	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	0.0044	0.044	0.06	0.7	5
Selenium	1450	U	0.0012	0.012	0.1	0.5	7
Zinc	1450	U	0.0017	< 0.50	4	50	200
Chloride	1220	U	7.3	73	800	15000	25000
Fluoride	1220	U	0.43	4.3	10	150	500
Sulphate	1220	U	23	230	1000	20000	50000
Total Dissolved Solids	1020	N	98	970	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	51	510	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12



t: 18-1309 Stockhole Lane

Chemtest Job No:	19-00780				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	751561					Limits	
Sample Ref:						Stable, Non-	
Sample ID:						reactive	
Sample Location:	BH05					hazardous	Hazardous
Top Depth(m):	0.5				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	09-Jan-2019					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.83	3	5	6
Loss On Ignition	2610	U	%	3.5			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0 < 2.0	100		
рН	2010	U		8.4		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.34		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using BS EN 12457 at L/S 10 I/kg		
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0059	< 0.50	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	0.0075	0.075	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	0.0015	0.015	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	2.8	28	800	15000	25000
Fluoride	1220	U	0.44	4.4	10	150	500
Sulphate	1220	U	4.8	48	1000	20000	50000
Total Dissolved Solids	1020	N	91	910	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.8	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	13



Project: 18-1309 Stockhole L	ane
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Chemtest Job No:	19-00780				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	751563					Limits	
Sample Ref: Sample ID:						Stable, Non- reactive	
Sample Location:	BH06					hazardous	Hazardous
Top Depth(m):	0.5				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	09-Jan-2019					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	0.58	3	5	6
Loss On Ignition	2610	U	%	2.2			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0 < 2.0	100		
рН	2010	U		8.5		>6	
Acid Neutralisation Capacity	2015	N	mol/kg	0.28		To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values	for compliance I	eaching test
			mg/l	mg/kg	using B	S EN 12457 at L/	S 10 I/kg
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0084	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.010	0.04	1	5
Chromium	1450	U	0.0046	< 0.050	0.5	10	70
Copper	1450	U	0.0011	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0085	0.085	0.5	10	30
Nickel	1450	U	0.0018	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	0.0024	0.024	0.06	0.7	5
Selenium	1450	U	0.0015	0.015	0.1	0.5	7
Zinc	1450	U	0.0017	< 0.50	4	50	200
Chloride	1220	U	4.8	48	800	15000	25000
Fluoride	1220	U	0.60	6.0	10	150	500
Sulphate	1220	U	20	200	1000	20000	50000
Total Dissolved Solids	1020	N	120	1200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.9	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	7.7



Project: 18-1309 Stockhole Lane

Chemtest Job No:	19-00780				LandfIII Waste Acceptance Criteria		
Chemtest Sample ID:	751565					Limits	
Sample Ref:						Stable, Non-	
Sample ID:						reactive	
Sample Location:	BH01					hazardous	Hazardous
Top Depth(m):	0.5				Inert Waste	waste in non-	Waste
Bottom Depth(m):					Landfill	hazardous	Landfill
Sampling Date:	10-Jan-2019					Landfill	
Determinand	SOP	Accred.	Units				
Total Organic Carbon	2625	U	%	1.7	3	5	6
Loss On Ignition	2610	U	%	5.5			10
Total BTEX	2760	U	mg/kg	< 0.010	6		
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1		
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500		
Total (Of 17) PAH's	2800	Ν	mg/kg	< 2.0 < 2.0	100		
рН	2010	U		8.1		>6	
Acid Neutralisation Capacity	2015	Ν	mol/kg	0.080		To evaluate	To evaluate
Eluate Analysis	10:1 Eluate		10:1 Eluate	Limit values	for compliance l	eaching test	
			mg/l	mg/kg	using BS EN 12457 at L/S 10 I/kg		
Arsenic	1450	U	0.0014	< 0.050	0.5	2	25
Barium	1450	U	0.0052	< 0.50	20	100	300
Cadmium	1450	U	0.00011	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.050	0.5	10	70
Copper	1450	U	0.0025	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0039	< 0.050	0.5	10	30
Nickel	1450	U	0.0037	< 0.050	0.4	10	40
Lead	1450	U	0.0021	0.021	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0012	0.012	0.1	0.5	7
Zinc	1450	U	0.0044	< 0.50	4	50	200
Chloride	1220	U	4.6	46	800	15000	25000
Fluoride	1220	U	0.66	6.6	10	150	500
Sulphate	1220	U	7.5	75	1000	20000	50000
Total Dissolved Solids	1020	N	85	840	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	5.7	57	500	800	1000

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

Waste Acceptance Criteria

The right chemistry to deliver results

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



APPENDIX I SPT HAMMER ENERGY MEASUREMENT REPORT





SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Neil Burrows	
Southern Testing Laboratories	
Unit 11	
Charlwoods Road	
East Grinstead	
RH19 2HU	

Instrumented Rod Data

Diameter d _r (mm):	54
Wall Thickness t _r (mm):	6.0
Assumed Modulus E _a (GPa):	200
Accelerometer No.1:	6458
Accelerometer No.2:	9607

SPT Hammer Ref:	NT6
Test Date:	14/04/2018
Report Date:	15/04/2018
File Name:	NT6.spt
Test Operator:	CAUSEWAY

SPT Hammer Information

Hammer Mass	m (kg):	63.5
Falling Height	h (mm):	760
SPT String Leng	10.5	

Comments / Location

Causeway Yard



Calculations

Area of Rod A	(mm2):		905
Theoretical Ene	ergy E _{theor}	(J):	473
Measured Ener	gy E _{meas}	(J):	264

Energy Ratio E r (%):

The recommended calibration interval is 12 months





Als?

N P Burrows Signed: Title: Field Operations Manager