



DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

APPENDIX 12

SOILS, GEOLOGY AND
HYDROGEOLOGY

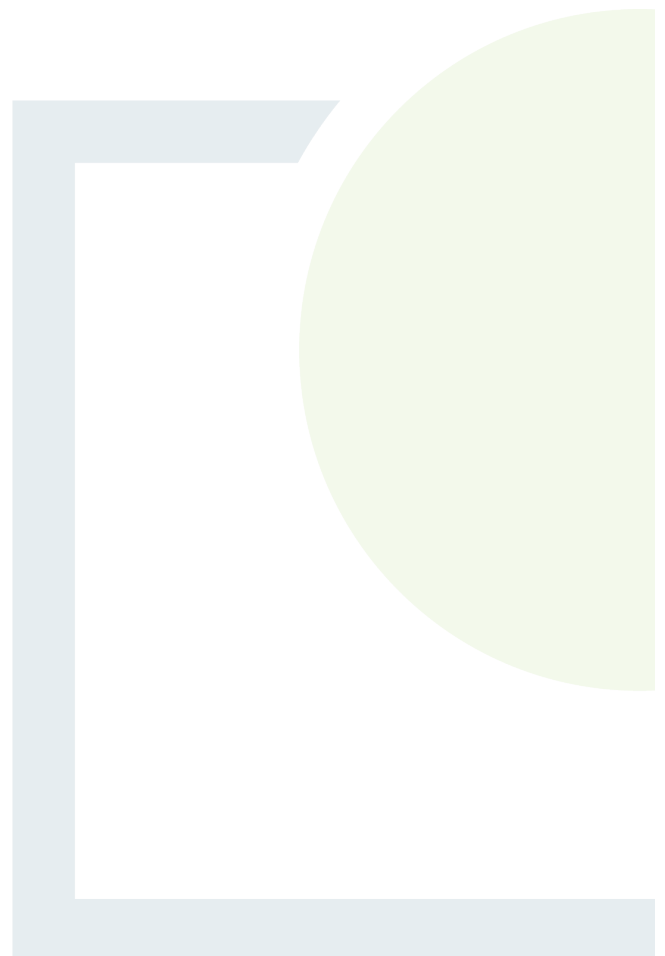
Appendix 12.1 Ground Investigation Report and Laboratory Certificates
Appendix 12.2 Borehole Pump Test Report



DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

APPENDIX 12.1

Ground Investigation Report





CAUSEWAY
GEOTECH



24-1562

GREENGATE BIOGAS GROUND INVESTIGATION REPORT

Client:
GREENGATE BIOGAS POWERSTOWN

Client's Representative:
FEHILY TIMONEY AND COMPANY

Date:
MARCH 2025

Status:
FINAL

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DOCUMENT CONTROL SHEET	1
METHODS OF DESCRIBING SOILS AND ROCKS	1
1 AUTHORITY	2
2 PURPOSE, RATIONALE & SCOPE OF THE INVESTIGATION	2
3 DESCRIPTION OF SITE	2
4 SITE OPERATIONS	3
4.1 SUMMARY OF SITE WORKS	3
4.2 BOREHOLES	3
4.2.1 BOREHOLES BY PERCUSSION BORING AND ROTARY FOLLOW-ON DRILLING	3
4.3 STANDARD PENETRATION TESTS	4
4.4 DYNAMIC PROBES	4
4.5 STANDPIPE INSTALLATIONS	4
4.6 TRIAL PITS	5
4.7 PHOTOIONIZATION DETECTION (PID) TESTING	5
4.8 SURVEYING	5
4.9 GROUNDWATER AND GROUND GAS MONITORING	5
5 LABORATORY WORK	5
5.1 GEOTECHNICAL LABORATORY TESTING OF SOILS	5
5.2 ENVIRONMENTAL LABORATORY TESTING OF SOIL & WATER	6
6 GROUND CONDITIONS	6
6.1 GENERAL GEOLOGY OF THE AREA	6
6.2 GROUND TYPES ENCOUNTERED DURING INVESTIGATION OF THE SITE	6
6.3 GROUNDWATER	7
7 REFERENCES	8
 LIST OF TABLES	
Table 1: Summary of surrounding land uses	2





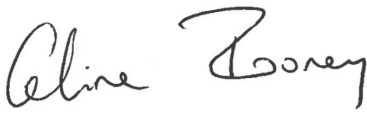
APPENDICES

APPENDIX A –	SITE AND EXPLORATORY HOLE LOCATION PLANS
APPENDIX B –	BOREHOLE LOGS
APPENDIX C –	CORE PHOTOGRAPHS
APPENDIX D –	DYNAMIC PROBE LOGS
APPENDIX E –	TRIAL PIT LOGS
APPENDIX F –	TRIAL PIT PHOTOGRAPHS
APPENDIX G –	GROUNDWATER MONITORING RECORDS
APPENDIX H –	GEOTECHNICAL LABORATORY TEST RESULTS
APPENDIX I –	ENVIRONMENTAL LABORATORY TEST RESULTS
APPENDIX J –	SPT HAMMER ENERGY MEASUREMENT REPORT





DOCUMENT CONTROL SHEET

REPORT NO:		24-1562			
PROJECT TITLE:		GREENGATE BIOGAS POWERSTOWN			
CLIENT:		GREENGATE BIOGAS			
CLIENT'S REPRESENTATIVE:		FEHILY TIMONEY AND COMPANY			
REVISION:	A00	STATUS	INTERIM	ISSUE DATE	13 TH MAR 2025
PREPARED BY:		REVIEWED BY:		APPROVED BY:	
					
Rabie Mohamed		Gabriella Horan BSC		Celine Rooney BSC MSC PGEO (EURGEOL)	

This report presents a factual account of the ground investigation in accordance with the Specification and Related Documents for Ground Investigation in Ireland 2nd Edition, published by Engineers Ireland (2016).

At the time of issuing the interim report, groundwater sampling results are still outstanding and will be included in the final report.



METHODS OF DESCRIBING SOILS AND ROCKS

Soil and rock descriptions are based on the guidance in BS5930:2015+A1:2020, The Code of Practice for Ground 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).
P	Nominal 100mm diameter undisturbed piston sample.
B	Bulk disturbed sample.
LB	Large bulk disturbed sample.
SB	Sonic bulk disturbed sample.
D	Small disturbed sample.
C	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,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.
(Y for Z/ Y for Z)	Incomplete standard penetration test where the full test length was not achieved. The blows 'X' represent the total blows for the given seating or test length 'Z' (mm).
N=X	SPT blow count 'N' given by the summation of the blows 'X' required to drive the full test length (300mm).
HVP / HVR	Uncorrected in situ hand vane peak (HVP) and residual (HVR) result presented in kPa. Vane calibration factor has been applied, but no correction made for soil type.
V VR	Shear vane test (borehole). Shear strength stated in kPa. V: undisturbed vane shear strength VR: remoulded vane shear strength
Soil consistency description	In cohesive soils, where samples are disturbed and there are no suitable laboratory tests, N values may be used to indicate consistency on borehole logs – a median relationship of $N_{x5}=C_u$ is used (as set out in Stroud & Butler 1975).
dd-mm-yyyy	Date at the end and start of shifts, shown at the relevant borehole depth. Corresponding casing and water depths shown in the adjacent columns.
▽	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+A1:2020	
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) measured in millimetres.

1 AUTHORITY

On the instructions of Fehily Timoney and Company, (the “Client’s Representative”), acting on the behalf of GreenGate BioGas (the “Client”), a ground investigation was undertaken at the site to provide geotechnical and environmental information for input to the design and construction of a proposed 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.

All information given in this report is based upon the ground conditions encountered during the ground 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 PURPOSE, RATIONALE & SCOPE OF THE INVESTIGATION

The purpose of this investigation is to assess the ground conditions and to allow an evaluation of the geotechnical and environmental issues with the current site and proposed development.

The rationale has been determined by the Client’s Representative, with the extent of the investigation including boreholes, trial pits, soil and rock core sampling, environmental sampling, groundwater monitoring, in-situ and laboratory testing, and the preparation of a factual account of the ground investigation findings.

3 DESCRIPTION OF SITE

The site is located at Irish Transverse Mercator 670828 668797 Powerstown, Co Carlow on the site of existing sand and gravel quarry. The site location is presented in Appendix A and a summary of the surrounding land uses is presented in Table 1.

Table 1: Summary of surrounding land uses

Location	Description
North	Agricultural land, M9 Motorway.
East	Powerstown Civic Amenity Site, Agricultural land.
South	Kilcarrig Quarries Ireland, Agricultural land.
West	Agricultural land, Regional road R448 & River Barrow.



4 SITE OPERATIONS

4.1 SUMMARY OF SITE WORKS

Site operations, which were conducted between the 2nd and 12th December 2024, comprised:

- four boreholes by light cable percussive extended by rotary follow-on drilling
- twelve standalone dynamic probes conducted using the DPSHB method
- twelve machine-dug trial pits
- in-situ testing, including:
 - Standard Penetration Tests
 - Photoionization Detection (PID) testing
- GPS survey of all completed locations
- groundwater monitoring

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

4.2 BOREHOLES

A total of four boreholes were put down in a minimum diameter of 150mm through soils and rock strata to their completion depths by a combination of methods, including light cable percussion boring by Dando 3000 rig and rotary drilling by Comacchio 405 and Comacchio 602 tracked rotary drilling rigs.

The borehole logs state the methodology and plant used for each location, as well as the appropriate depth ranges.

A summary of the boreholes, subdivided by category in accordance with the methods employed for their completion, is presented in the following sub-sections.

4.2.1 BOREHOLES BY PERCUSSION BORING AND ROTARY FOLLOW-ON DRILLING

Four boreholes (BH01- BH04) were put down by a combination of light cable percussion boring and rotary follow-on drilling techniques with core recovery in bedrock.

Boreholes were initially put down to refusal in minimum 200mm diameter using a Dando 3000 cable percussion boring rig.

Hand dug inspection pits were carried out between ground level and 1.20m depth to ensure boreholes were put down at locations clear of services or subsurface obstructions.

Disturbed (bulk and small tub) samples were taken within the encountered strata. Environmental samples were taken at standard intervals, as directed by the Client's Representative.

Any water strikes encountered during boring were recorded along with any changes in their levels as



the borehole proceeded.

Where water was added to assist with boring, a note has been added to the log to account for same.

Where the cable percussion borehole had not been advanced onto bedrock, rotary percussive methods were employed to advance the borehole to completion/bedrock. Symmetrix cased full-hole drilling was used, with SPTs carried out at standard intervals throughout the overburden, with small and bulk disturbed samples obtained where possible through the soil strata.

Where coring was carried out at BH02, conventional coring methods were used with a metric SK6L core barrel. The core was extracted in up to 1.50m lengths using a metric SK6L core barrel, which produced core of nominal 84mm diameter, and was placed in triple channel wooden core boxes.

Where coring was carried out at BH03, Geobor S Coring was used. The core was extracted in up to 1.50m lengths using an SK6L core barrel, which produced core of nominal 102mm diameter, and was placed in single channel wooden core boxes.

The core was subsequently photographed and examined by a qualified and experienced Engineering Geologist, thus enabling the production of an engineering log in accordance with BS 5930: 2015+A1:2020: Code of practice for ground investigations.

Appendix B presents the borehole logs, with core photographs presented in Appendix C.

4.3 STANDARD PENETRATION TESTS

Standard penetration tests were carried out in accordance with BS EN 22476-3:2005+A1:2011 (BSI, 2011) 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 J.

4.4 DYNAMIC PROBES

Twelve standalone dynamic probes were conducted using the DPSHB method as described in BS EN ISO 22476-3:2005+A1:2011 (BSI, 2011). The method entails a 63.5kg hammer falling 0.75m onto a 50.5mm diameter cone with an apex angle of 90°.

Appendix D provides the dynamic probe logs in the form of plots, against depth, of the number of blows per 100mm penetration.

4.5 STANDPIPE INSTALLATIONS

A groundwater monitoring standpipe was installed in boreholes BH01-BH04.

Details of the installations, including the depth range of the response zone, are provided in Appendix B on the individual borehole logs.



4.6 TRIAL PITS

Twelve trial pits (TP01-TP12) were excavated using an 13t tracked excavator fitted with a 600mm wide bucket, to depths of 1.70-4.50m.

Environmental samples were taken at various depths 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 and the stability of the trial pit walls was noted on completion.

Appendix E presents the trial pit logs with photographs of the pits and arisings provided in Appendix F.

4.7 PHOTOIONIZATION DETECTION (PID) TESTING

PID testing was undertaken on small disturbed samples recovered from all trial pits using a hand-held PID meter, to determine if any volatile organic compound contamination was present in the overburden.

Results of the PID tests are presented on the individual trial pit logs in Appendix E.

4.8 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 R10 GPS system employing VRS and real time kinetic (RTK) techniques.

The plan coordinates (Irish Transverse Mercator) and ground elevation (mOD Malin) at each location are recorded on the individual exploratory hole logs. The exploratory hole location plan presented in Appendix A shows these as-built positions.

4.9 GROUNDWATER MONITORING

Following completion of site works, four rounds of groundwater monitoring were conducted. Groundwater monitoring was carried out using a water interface probe.

The monitoring records are presented in Appendix G.

5 LABORATORY WORK

Laboratory testing was carried out between 16th January and 4th March 2025.

5.1 GEOTECHNICAL LABORATORY TESTING OF SOILS

Laboratory testing of soils comprised:

- **soil classification:** moisture content measurement, Atterberg Limit tests, Particle density and particle size distribution analysis.
- **direct shear:** shear box tests.



- **compaction related:** dry density.
- **soil chemistry:** pH, water-soluble chloride content, sulfate content of water extract, organic matter, BRE Suite D.

Laboratory testing of soils samples was carried out in accordance with BS 1377, Methods of test for soils for civil engineering purposes; Part 1 (BSI, 2016), and Part 2 (BSI, 2022).

The test results are presented in Appendix H.

5.2 ENVIRONMENTAL LABORATORY TESTING OF SOIL & WATER

Environmental testing, as specified by the Client's Representative, was conducted on selected environmental soil and water samples by Derwentside Environmental Testing Services in Consett, Durham.

This included testing for a range of determinants, including:

- Metals
- Speciated total petroleum hydrocarbons (TPH)
- Speciated polycyclic aromatic hydrocarbons (PAH)
- Polychlorinated biphenyls (PCBs)
- Phenols
- Organic matter
- Cyanides
- Sulphate and sulphide
- Ph

Results of environmental laboratory testing are presented in Appendix I.

6 GROUND CONDITIONS

6.1 GENERAL GEOLOGY OF THE AREA

Published geological mapping from the online Geological Survey Ireland spatial resources database indicate the superficial deposits underlying the site comprise of Gravels derived from limestones. These deposits are shown to be underlain by dolomitised peloidal calcarenitic limestone of the Milford Foundation to the west of the site and by dark grey muddy limestone of the Ballysteen Formation to the east of the site.

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:** encountered typically in 100-300mm thickness in TP07-TP12.



- **Made Ground (fill):** sandy gravelly clay fill with interspersed sand and gravel layers and low to medium cobble and boulder content extending to a depth of 1.30-4.70m encountered mainly across the east of the site.
- **Fluvioglacial deposits:** typically greyish brown sands and gravels interspersed with layers of sandy gravelly clay encountered in TP09, TP10 and TP12.
- **Glacial Till:** sandy gravelly clay or gravelly clayey sand, frequently with low cobble content, typically soft in upper horizons, becoming very stiff with increasing depth.
- **Bedrock (Limestone):** Rockhead was encountered at depths ranging from 14.00-20.80m in BH02 and BH03.

Further details of these ground types, including their specific depths and descriptions, can be found on the individual exploratory hole logs accompanying this report.

6.3 GROUNDWATER

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 noted during drilling at BH02, BH03, and BH04 but not in BH01. However, it should be noted that the casing used in supporting the borehole walls during drilling may have sealed out additional groundwater strikes and the possibility of encountering groundwater during excavation works at these locations should not be ruled out.

A groundwater monitoring standpipe was installed in BH01-BH04. The results of subsequent groundwater monitoring, are presented in Appendix G.

Continued monitoring of the four installed standpipes will give an indication of the seasonal variation in groundwater level which should be factored into design considerations.



7 REFERENCES

British Standards Institute (BSI). (2016) BS 1377-1:2016: Methods of test for soils for civil engineering purposes. Part 1: General requirements and sample preparation.

British Standards Institute (BSI). (2022) BS 1377-2:2022: Methods of test for soils for civil engineering purposes. Part 2: Classification tests and determination of geotechnical properties.

British Standards Institute (BSI). (2007) BS EN 1997-2:2007: Eurocode 7 – Geotechnical Design – Part 2: Ground investigation and testing.

British Standards Institute (BSI). (2011) BS EN ISO 22476-3:2006+A1:2011 Geotechnical investigation and testing. Field testing – Standard penetration test.

British Standards Institute (BSI). (2018a) BS EN ISO 14688-1:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 1 Identification and description.

British Standards Institute (BSI). (2018b) BS EN ISO 14688-2:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 2 Principles for a classification.

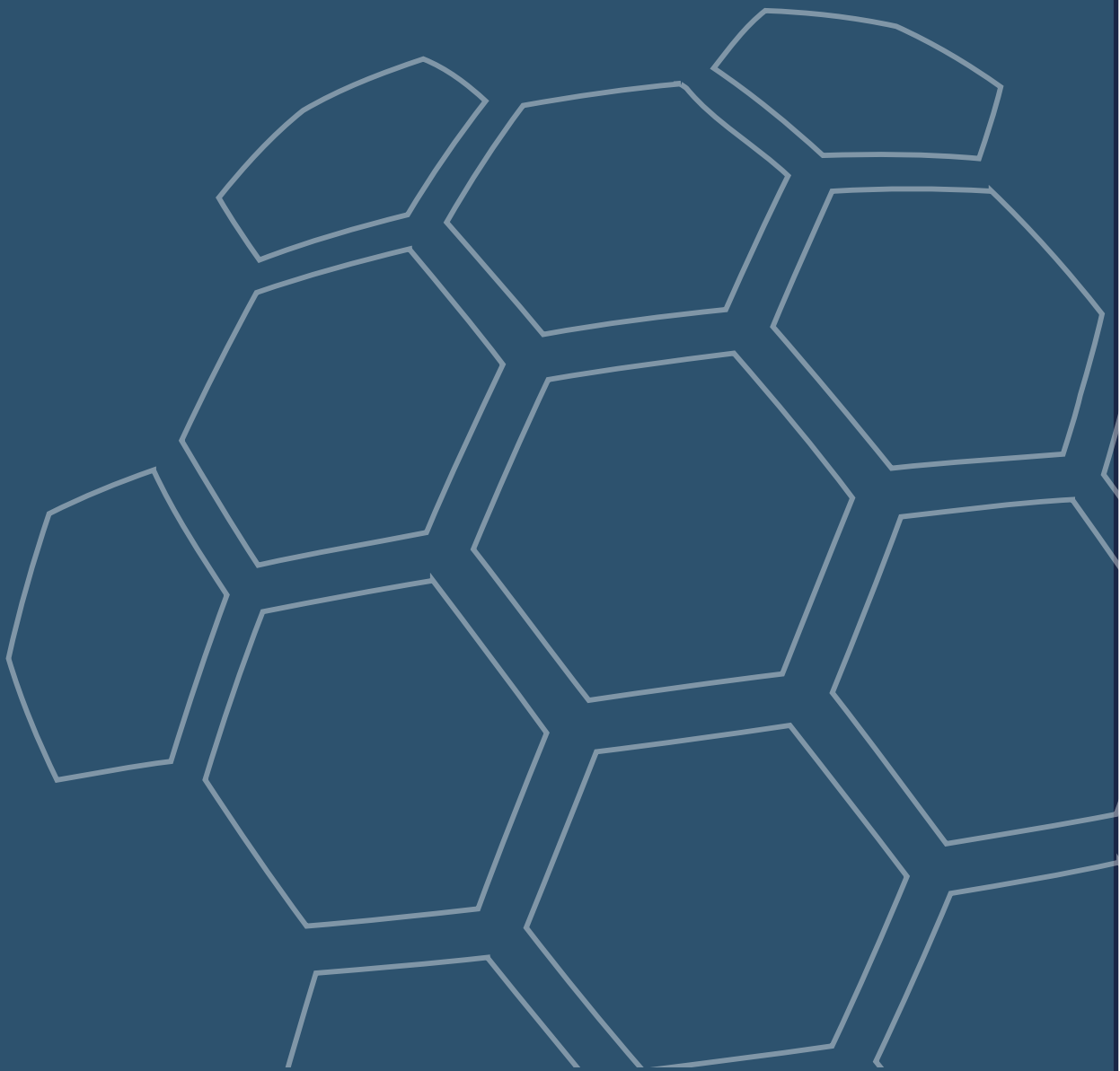
British Standards Institute (BSI). (2020) BS5930:2015+A1:2020: Code of practice for ground investigations.

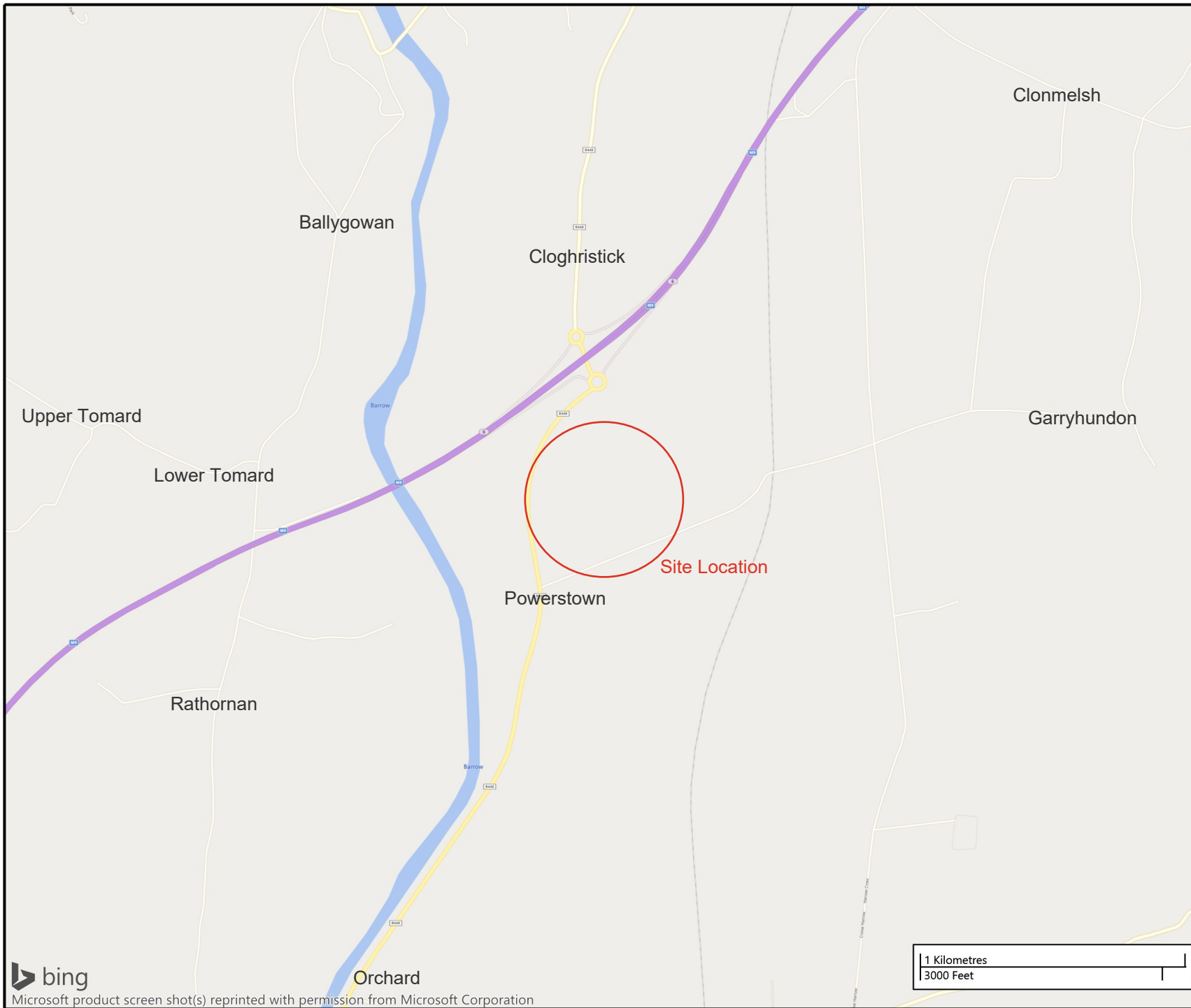
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Geological Survey Ireland (GSI). Geological Survey Ireland spatial resources database. Available at: <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>



APPENDIX A – SITE AND EXPLORATORY HOLE LOCATION PLANS



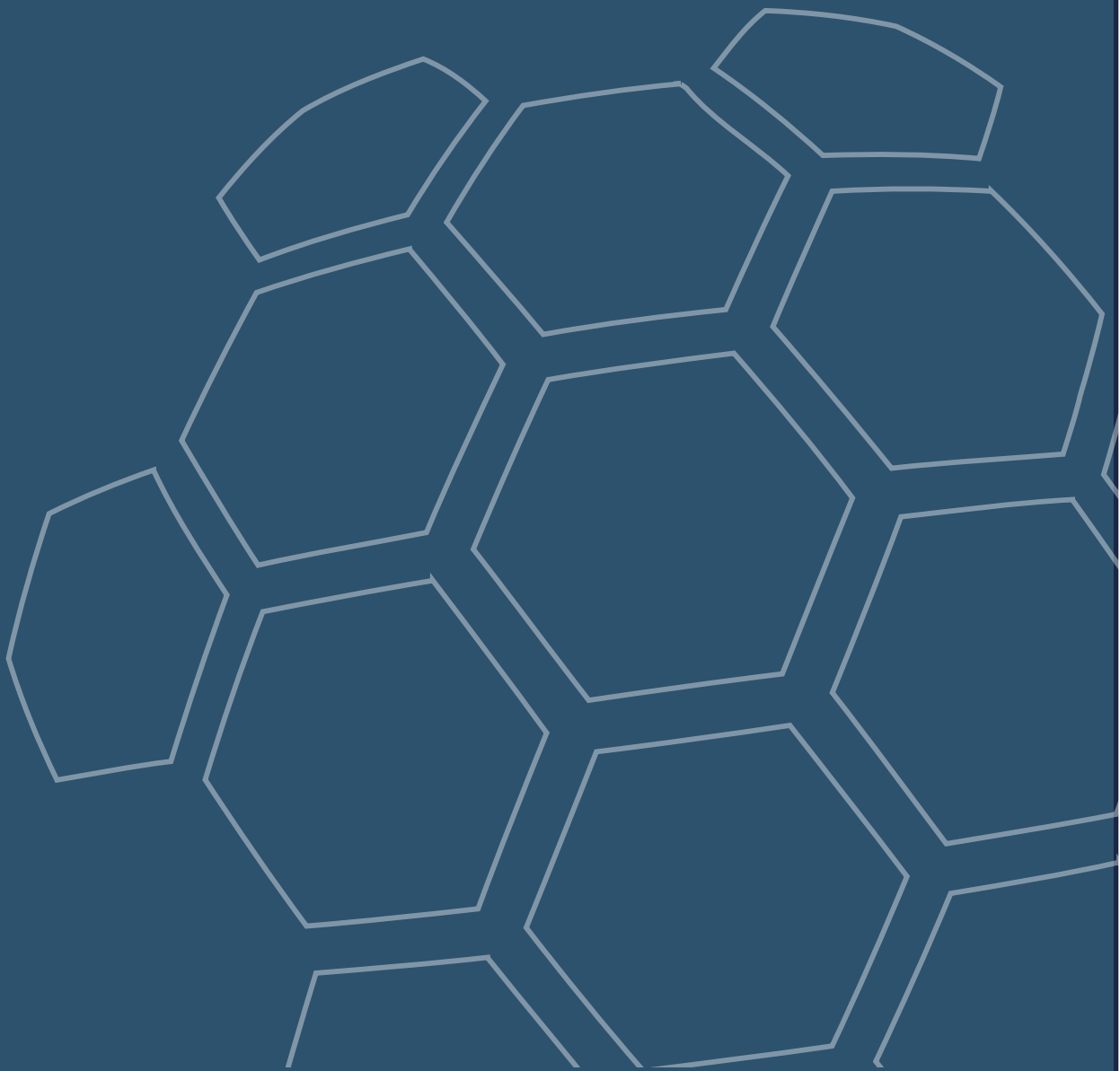


Legend Key	
Project No.	24-1562
Client	GreenGate BioGas Powerstown
Client's Rep	Fehily Timoney and Company
Site Location Plan	
GreenGate BioGas - Powerstown	
	
Last Revision	29/01/2025
Scale	1:20000



Legend Key ● Cable Percussion ■ Dynamic Probe ● Rotary Drilling ■ Trial Pit Note: Exploratory hole locations DP11 and DP12 are approximate and generated using logging software.	
Project No.	24-1562
Client	GreenGate BioGas
Client's Rep	Fehily Timoney and Company
Exploratory Hole Location Plan	
GreenGate BioGas Powerstown	
	
Last Revision	10/03/2025
Scale	1:2000

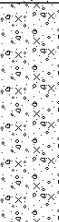
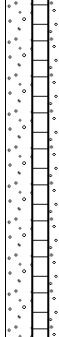
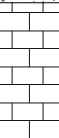
APPENDIX B – BOREHOLE LOGS



 CAUSEWAY GEOTECH				Project No. 24-1562		Project Name: GreenGate BioGas Powerstown Client: GreenGate BioGas Client's Rep: Fehily Timoney and Company			Borehole ID BH01			
Method		Plant Used		Top (m)	Base (m)	Coordinates		Final Depth: 15.50 m	Start Date: 02/12/2024	Driller: CC	Sheet 1 of 2 Scale: 1:50	
Cable Percussion Rotary Percussion		Dando 3000 Comacchio 605		0.00 11.80	11.80 15.50	670832.83 E 668797.93 N		Elevation: 50.78 mOD	End Date: 12/12/2024	Logger: GH	FINAL	
Depth (m)	Sample / Tests	Field Records			Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
0.00 - 1.20	B1									MADE GROUND: Firm brown sandy gravelly SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
1.20	D2				1.20	Dry						
1.20 - 1.65	SPT (C)	N=10 (1,2/2,2,3,3) Hammer SN = 0197										
1.50 - 2.50	B3											
2.00	D4				2.00	Dry						
2.00 - 2.45	SPT (C)	N=11 (2,2/3,3,3,2) Hammer SN = 0197										
2.50 - 3.50	B6						48.28	2.50				
3.00	D5				3.00	Dry				MADE GROUND: Medium dense greyish brown very sandy very silty subangular to subrounded fine to medium GRAVEL. Sand is fine to coarse.		
3.00 - 3.45	SPT (C)	N=20 (2,3/3,6,5,6) Hammer SN = 0197										
4.00	D8				4.00	Dry						
4.00 - 4.70	B7											
4.00 - 4.45	SPT (C)	N=16 (2,3/4,4,4,4) Hammer SN = 0197										
4.70 - 5.50	B9						46.08	4.70				
5.00	D10				5.00	Dry				Stiff brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
5.00 - 5.45	SPT (S)	N=20 (3,3/4,4,6,6) Hammer SN = 0197										
6.00	D12				6.00	Dry						
6.00 - 7.00	B11											
6.00 - 6.45	SPT (S)	N=19 (2,3/4,4,5,6) Hammer SN = 0197										
7.00	D13				7.00	6.60						
7.00 - 7.45	SPT (S)	N=14 (2,3/3,3,4,4) Hammer SN = 0197										
7.50 - 8.50	B14											
8.00	D15				8.00	7.70						
8.00 - 8.45	SPT (S)	N=20 (3,4/4,5,5,6) Hammer SN = 0197										
9.00	D16				9.00	8.50						
9.00 - 9.45	SPT (S)	N=28 (3,4/5,7,7,9) Hammer SN = 0197										
Water Strikes				Chiselling Details			Remarks					
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)	Inspection pit hand dug to 1.20m. No groundwater encountered.					
Casing Details		Water Added										
To (m)	Diam (mm)	From (m)	To (m)									
15.50	200											
				Core Barrel		Flush Type	Termination Reason			Last Updated		
						Air	Terminated at scheduled depth.			13/03/2025		

 CAUSEWAY GEOTECH				Project No. 24-1562		Project Name: GreenGate BioGas Powerstown Client: GreenGate BioGas Client's Rep: Fehily Timoney and Company			Borehole ID BH01											
Method		Plant Used		Top (m) Base (m)		Coordinates		Final Depth: 15.50 m Start Date: 02/12/2024 Driller: CC		Sheet 2 of 2 Scale: 1:50										
Cable Percussion Rotary Percussion		Dando 3000 Comacchio 605		0.00 11.80		670832.83 E 668797.93 N		Elevation: 50.78 mOD End Date: 12/12/2024 Logger: GH		FINAL										
Depth (m)	Sample / Tests	Field Records		Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description		Water	Backfill								
9.40 - 10.50	B17	N=29 (4,6/6,7,8,8) Hammer SN = 0197			5.90	41.38	9.40		Dense grey very sandy slightly silty subangular to subrounded fine to medium GRAVEL. Sand is fine to coarse.											
10.00	D18						N=30 (5,6/6,8,8,8) Hammer SN = 0197	6.10	39.08	11.70				Large BOULDER						
10.00 - 10.45	SPT (S)													50 (25 for 50mm/50 for 60mm) Hammer SN = 0197	6.60	38.98	11.80		Dark brownish grey sandy subrounded GRAVEL. Sand is fine to coarse.	
11.00	D20																		37.38	13.40
11.00 - 11.70	B19	35.28	15.50		End of Borehole at 15.50m															
11.00 - 11.45	SPT (S)																			
11.70 - 11.81	SPT (C)																			
11.80 - 13.00	B21																			
13.00 - 15.00	B22																			
Water Strikes				Chiselling Details			Remarks													
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)	Inspection pit hand dug to 1.20m. No groundwater encountered.													
Casing Details				Water Added																
To (m)	Diam (mm)	From (m)	To (m)																	
15.50	200																			
				Core Barrel		Flush Type	Termination Reason			Last Updated										
						Air	Terminated at scheduled depth.			13/03/2025										

 CAUSEWAY GEOTECH				Project No. 24-1562		Project Name: GreenGate BioGas Powerstown Client: GreenGate BioGas Client's Rep: Fehily Timoney and Company				Borehole ID BH02					
Method		Plant Used		Top (m)	Base (m)	Coordinates		Final Depth: 17.50 m	Start Date: 03/12/2024	Driller: CC	Sheet 1 of 2 Scale: 1:50				
Cable Percussion		Dando 3000		0.00	9.10	670690.56 E		Elevation: 44.13 mOD	End Date: 03/12/2024	Logger: GH	FINAL				
Rotary Percussion		Comacchio 405		9.10	15.00	668713.48 N									
Rotary Coring		Comacchio 405		15.00	17.50										
Depth (m)	Sample / Tests	Field Records			Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill			
0.00 - 1.20	B1	N=15 (2,3/3,4,4,4) Hammer SN = 0197 N=11 (3,2/3,3,3,2) Hammer SN = 0197 N=16 (2,3/4,4,4,4) Hammer SN = 0197 Fair seepage at 3.00m N=11 (1,2/2,3,3,3) Hammer SN = 0197 N=16 (2,3/4,4,4,4) Hammer SN = 0197 N=20 (3,4/4,5,5,6) Hammer SN = 0197 N=26 (3,4/5,6,7,8) Hammer SN = 0197 N=30 (4,5/7,7,8,8) Hammer SN = 0197								MADE GROUND: Brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. Firm brown sandy gravelly SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. Medium dense brown very sandy very silty subangular to subrounded fine to medium GRAVEL. Sand is fine to coarse. Stiff brown sandy SILT. Sand is fine to coarse. Very stiff brown sandy gravelly SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. Medium dense grey slightly silty fine to coarse SAND with medium					
1.20	D2				1.20	Dry	42.73	1.40							
1.20 - 1.65	SPT (S)														
1.40 - 2.50	B3														
2.00	D4				2.00	Dry									
2.00 - 2.45	SPT (C)														
2.70 - 3.50	B5						41.43	2.70							
3.00	D6				3.00	2.10									
3.00 - 3.45	SPT (C)														
4.00	D8				4.00	3.60									
4.00 - 4.45	SPT (C)						39.83	4.30							
4.30 - 5.00	B7														
5.00	D9				5.00	4.70									
5.00 - 5.45	SPT (S)														
5.60 - 6.50	B10						38.53	5.60							
6.00	D11				6.00	5.50									
6.00 - 6.45	SPT (C)														
7.00	D12	7.00	6.10												
7.00 - 8.00	B13														
7.00 - 7.45	SPT (C)														
8.00	D14	8.00	6.90												
8.00 - 9.00	B15														
8.00 - 8.45	SPT (C)														
9.10 - 10.20	B16			35.03	9.10										
Water Strikes				Chiselling Details			Remarks								
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)	Inspection pit hand dug to 1.20m.								
3.00	3.00	20	1.50	9.10	9.10	01:00									
5.70	5.70														
Casing Details		Water Added													
To (m)	Diam (mm)	From (m)	To (m)				Termination Reason								
9.10	200	7.00	9.10												
				Core Barrel		Flush Type	Last Updated								
				SK6L		Water	13/03/2025								

 CAUSEWAY GEOTECH				Project No. 24-1562		Project Name: GreenGate BioGas Powerstown Client: GreenGate BioGas Client's Rep: Fehily Timoney and Company				Borehole ID BH02																		
Method		Plant Used		Top (m)	Base (m)	Coordinates		Final Depth: 17.50 m	Start Date: 03/12/2024	Driller: CC	Sheet 2 of 2 Scale: 1:50																	
Cable Percussion		Dando 3000		0.00	9.10	670690.56 E		Elevation: 44.13 mOD	End Date: 03/12/2024	Logger: GH	FINAL																	
Rotary Percussion		Comacchio 405		9.10	15.00	668713.48 N																						
Rotary Coring		Comacchio 405		15.00	17.50																							
Depth (m)	Sample / Tests	Field Records			Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill																
10.20 - 10.65 10.20 - 11.70 10.20 - 10.65	D19 B17 SPT (S)	N=28 (5,5/6,6,8,8) Hammer SN = 1532			10.2	1.50	33.93	10.20		cobble content.																		
11.70 - 13.20 11.70 - 12.04	B18 SPT (C)	50 (5,6/50 for 185mm) Hammer SN = 1532			11.7	1.50	32.43	11.70		Medium dense grey very sandy silty subrounded fine to medium GRAVEL with low cobble content. Sand is fine to coarse.																		
13.20 - 14.00 13.20 - 13.65	B20 SPT (C)	N=30 (4,6/8,6,7,9) Hammer SN = 1532			13.2	1.00				Dense grey sandy subrounded to well rounded GRAVEL of various lithologies including sandstone and limestone. Sand is fine to coarse.																		
14.00 - 14.20	SPT (C)	50 (25 for 110mm/50 for 90mm) Hammer SN = 1532			14.0	1.00	30.13	14.00		Weathered LIMESTONE with clay infill (Drillers description)																		
16.00		<table><tr><td>90</td><td></td><td></td><td></td></tr><tr><td>100</td><td></td><td></td><td>5</td></tr><tr><td>80</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>			90				100			5	80										29.13	15.00		Medium strong very thinly laminated dark grey LIMESTONE with white calcite veins up to 2mm thick. Slightly weathered: slightly reduced strength, slightly closer fracture spacing and film of clay infill on fracture surfaces. Discontinuities: 1. 0-15 degree bedding fractures, medium spaced (110/200/280), planar, rough, with a film of clay infill (<1mm) on some fracture surfaces. 2.45-60 degree joints at 15.60-15.70m, 16.00-16.15 and at 16.40-16.55, planar, smooth, with up to 1mm of white calcite mineralisation on joint surfaces.		
90																												
100			5																									
80																												
17.00																												
17.50							26.63	17.50		End of Borehole at 17.50m																		
		<table><tr><td>TCR</td><td>SCR</td><td>RQD</td><td>FI</td></tr></table>			TCR	SCR	RQD	FI																				
TCR	SCR	RQD	FI																									
Water Strikes				Remarks																								
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	Inspection pit hand dug to 1.20m.																								
3.00	3.00																											
5.70	5.70	20	1.50																									
Casing Details		Water Added																										
To (m)	Diam (mm)	From (m)	To (m)																									
9.10	200	7.00	9.10																									
				Core Barrel	Flush Type	Termination Reason			Last Updated																			
				SK6L	Water	Terminated at scheduled depth.			13/03/2025																			

				Project No. 24-1562		Project Name: GreenGate BioGas Powerstown Client: GreenGate BioGas Client's Rep: Fehily Timoney and Company				Borehole ID BH03			
Method		Plant Used		Top (m)	Base (m)	Coordinates		Final Depth: 24.20 m	Start Date: 03/12/2024	Driller: SMCW +CC	Sheet 1 of 3 Scale: 1:50		
Cable Percussion Rotary Percussion Rotary Coring		Dando 3000 Comacchio 405 Comacchio 405		0.00 5.30 21.20	5.30 21.20 24.20	670728.15 E 668545.28 N		Elevation: 49.43 mOD	End Date: 03/12/2024	Logger: CMcC +GH	FINAL		
Depth (m)	Sample / Tests	Field Records			Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill	
0.00 - 1.20	B1	N=16 (2,3/4,4,4,4) Hammer SN = 0197			1.20	Dry	47.33	2.10		Stiff brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.			
1.20	D2												
1.20 - 1.65	SPT (S)												
2.00	D4												
2.00 - 2.45	SPT (S)												
2.10 - 2.80	B3												
2.80 - 4.00	B5												
3.00	D6												
3.00 - 3.45	SPT (S)												
4.00	D7												
4.00 - 4.45	SPT (S)	N=11 (2,2/3,3,2,3) Hammer SN = 0197			2.00	Dry	46.63	2.80		Firm grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.			
4.30 - 5.20	B8												
5.00	D9												
5.00 - 5.38	SPT (S)												
5.50 - 7.00	B10												
5.50 - 5.76	SPT (C)												
7.00 - 8.50	B11												
7.00 - 7.20	SPT (C)												
8.50 - 10.00	B12												
8.50 - 8.62	SPT (C)												50 (7,9/50 for 225mm) Hammer SN = 0197
8.50 - 10.00	B12												
8.50 - 8.62	SPT (C)												
7.00 - 8.50	B11												
7.00 - 7.20	SPT (C)												
5.50 - 7.00	B10												
5.50 - 5.76	SPT (C)												
5.00	D9												
5.00 - 5.38	SPT (S)												
4.30 - 5.20	B8												
4.00	D7												
4.00 - 4.45	SPT (S)	N=34 (4,5/6,8,9,11) Hammer SN = 0197			4.00	Dry	45.13	4.30		Dense becoming very dense grey sandy clayey subangular fine to medium GRAVEL with low cobble content. Sand is fine to coarse.			
3.00 - 3.45	SPT (S)												
3.00	D6												
2.80 - 4.00	B5												
2.10 - 2.80	B3												
2.00 - 2.45	SPT (S)												
2.00	D4												
1.20 - 1.65	SPT (S)												
1.20	D2												
0.00 - 1.20	B1												
Water Strikes		Chiselling Details		Remarks									
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)	Inspection pit hand dug to 1.20m						
9.10		20		5.20	5.30	01:00							
15.00		20											
Casing Details		Water Added											
To (m)	Diam (mm)	From (m)	To (m)										
5.30	200												
20.00	200			Core Barrel		Flush Type	Termination Reason				Last Updated		
				SK6L		Water	Terminated at scheduled depth.				13/03/2025		
													

 CAUSEWAY GEOTECH				Project No. 24-1562		Project Name: GreenGate BioGas Powerstown Client: GreenGate BioGas Client's Rep: Fehily Timoney and Company				Borehole ID BH03					
Method		Plant Used		Top (m)	Base (m)	Coordinates		Final Depth:	24.20 m	Start Date:	03/12/2024	Driller:	SMCW +CC	Sheet 2 of 3 Scale: 1:50	
Cable Percussion Rotary Percussion Rotary Coring		Dando 3000 Comacchio 405 Comacchio 405		0.00 5.30 21.20	5.30 21.20 24.20	670728.15 E 668545.28 N		Elevation:	49.43 mOD	End Date:	03/12/2024	Logger:	CMcC +GH	FINAL	
Depth (m)	Sample / Tests	Field Records			Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description			Water	Backfill	
10.00 - 11.50 10.00 - 10.24	B13 SPT (C)	50 (10,10/50 for 95mm) Hammer SN = 1532			10.0	8.40				subangular fine to coarse GRAVEL. Sand is fine to coarse.					9.5
11.50 - 13.00	B14						10.0								
13.00 - 15.50	B15						10.5								
15.50 - 17.00	B16						11.0								
17.00 - 18.50 17.00 - 17.32	B17 SPT (C)	50 (7,10/50 for 170mm) Hammer SN = 1532			17.0	8.00									11.5
18.50 - 20.00	B18						30.93	18.50		Very dense greyish brown sandy subangular fine to coarse GRAVEL with low cobble and boulder content. Sand is fine to coarse.					12.0
Water Strikes				Remarks											
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	Inspection pit hand dug to 1.20m											
9.10		20													
15.00		20													
Casing Details				Water Added											
To (m)	Diam (mm)	From (m)	To (m)												
5.30	200														
20.00	200														
				Core Barrel	Flush Type	Termination Reason				Last Updated					
				SK6L	Water	Terminated at scheduled depth.				13/03/2025					



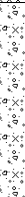
Project Name: GreenGate BioGas Powerstown
Client: GreenGate BioGas
Client's Rep: Fehily Timoney and Company

Borehole ID
BH03

Method	Plant Used	Top (m)	Base (m)	Coordinates				
Cable Percussion	Dando 3000	0.00	5.30	670728.15 E	Final Depth: 24.20 m	Start Date: 03/12/2024	Driller: SMCW +CC	Sheet 3 of 3
Rotary Percussion	Comacchio 405	5.30	21.20					Scale: 1:50
Rotary Coring	Comacchio 405	21.20	24.20	668545.28 N	Elevation: 49.43 mOD	End Date: 03/12/2024	Logger: CMcC +GH	FINAL

Depth (m)	Sample / Tests	Field Records				Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description	Water	Backfill
18.50 - 18.74	SPT (C)	50 (9,12/50 for 95mm) Hammer SN = 1532				18.5	8.90						
20.00 - 20.24	SPT (C)	50 (12,12/50 for 95mm) Hammer SN = 1532				20.0	7.80						
22.70		100	100	55	12			28.63	20.80		LIMESTONE (Drillers description)		
								28.23	21.20		Strong very thinly bedded dark grey and grey fossiliferous LIMESTONE with widely spaced very thin beds of dark grey mudstone. Slightly weathered: slightly reduced strength, slightly closer fracture spacing. Discontinuities: 1. 0-15 degree bedding fractures, closely spaced (10/85/275), predominantly planar, smooth, clean.		
24.20		100	90	22				25.23	24.20		End of Borehole at 24.20m		
		TCR	SCR	RQD	FI								

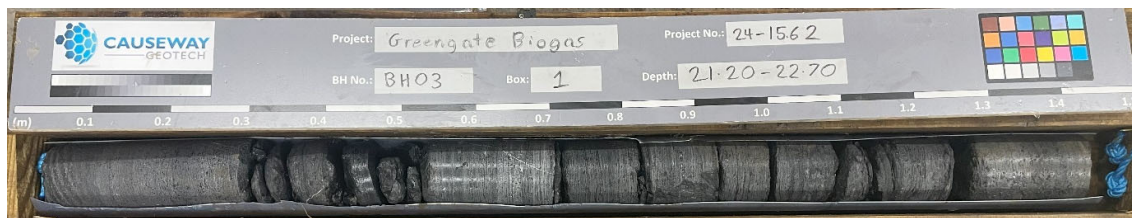
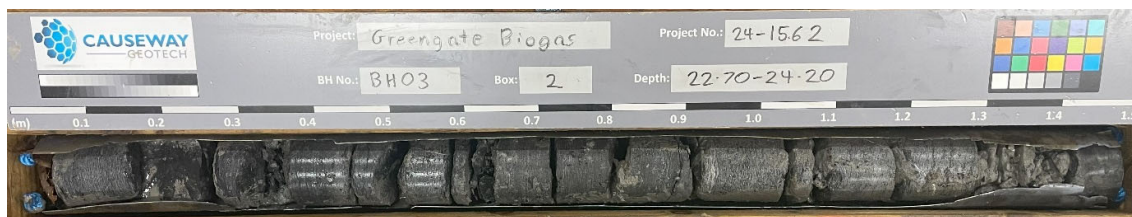
Water Strikes				Remarks				
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	Inspection pit hand dug to 1.20m				
9.10		20						
15.00		20						
Casing Details		Water Added						
To (m)	Diam (mm)	From (m)	To (m)					
5.30	200			Core Barrel	Flush Type	Termination Reason	Last Updated	AGS
20.00	200							

 CAUSEWAY GEOTECH				Project No. 24-1562		Project Name: GreenGate BioGas Powerstown Client: GreenGate BioGas Client's Rep: Fehily Timoney and Company				Borehole ID BH04		
Method		Plant Used		Top (m)	Base (m)	Coordinates		Final Depth: 15.00 m	Start Date: 04/12/2024	Driller: CC+CH	Sheet 1 of 2 Scale: 1:50	
Cable Percussion Rotary Percussion		Dando 3000 Comacchio 605		0.00 3.10	3.10 15.00	670503.23 E 668525.43 N		Elevation: 46.57 mOD	End Date: 04/12/2024	Logger: GH	FINAL	
Depth (m)	Sample / Tests	Field Records		Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description		Water	Backfill
0.00 - 1.30	B1								MADE GROUND: Brown sandy gravelly CLAY with low boulder content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.			
1.20	D2			1.20	Dry	45.27	1.30					
1.20 - 1.65	SPT (C)	N=35 (6,7/7,9,10) Hammer SN = 0197							Dense brown very sandy very silty subangular to subrounded fine to medium GRAVEL with low boulder content. Sand is fine to coarse.			
1.30 - 2.50	B3	Medium steady at 1.30m										
2.00	D4			2.00	1.30							
2.00 - 2.45	SPT (C)	N=44 (7,9/10,10,11,13) Hammer SN = 0197										
2.70 - 4.20	B6											
3.00 - 3.22	SPT (C)	50 (25 for 70mm/50 for 150mm) Hammer SN = 0197		3.00	2.60	43.47	3.10		Medium dense brownish grey very sandy slightly clayey subangular to subrounded GRAVEL. Sand is fine to coarse.			
4.20 - 4.65	D5					42.37	4.20					
4.20 - 5.70	B7								Medium dense grey very sandy subangular to subrounded fine to coarse GRAVEL with low cobble content. Sand is fine to coarse.			
4.20 - 4.65	SPT (S)	N=16 (1,1/3,3,5,5) Hammer SN = 1532		4.20	4.00							
5.70 - 7.20	B8					40.87	5.70		Dense grey gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse.			
5.70 - 6.15	SPT (C)	N=31 (4,6/7,7,9,8) Hammer SN = 1532		5.70	3.00							
7.20 - 8.70	B9											
7.20 - 7.65	SPT (S)	N=30 (5,5/10,7,6,7) Hammer SN = 1532		7.20	4.00							
8.70 - 10.20	B10											
8.70 - 9.15	SPT (S)	N=38 (5,7/8,8,11,11) Hammer SN = 1532		8.70	4.00							
Water Strikes				Chiselling Details			Remarks					
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)	Inspection pit hand dug to 1.20m.					
1.30	1.30	20	0.80	3.00	3.10	01:00						
5.70	5.70	20	3.00									
14.50	14.50	20	2.00									
Casing Details		Water Added										
To (m)	Diam (mm)	From (m)	To (m)									
3.10	200											
				Core Barrel		Flush Type	Termination Reason			Last Updated		
						Water	Terminated at scheduled depth.			13/03/2025		

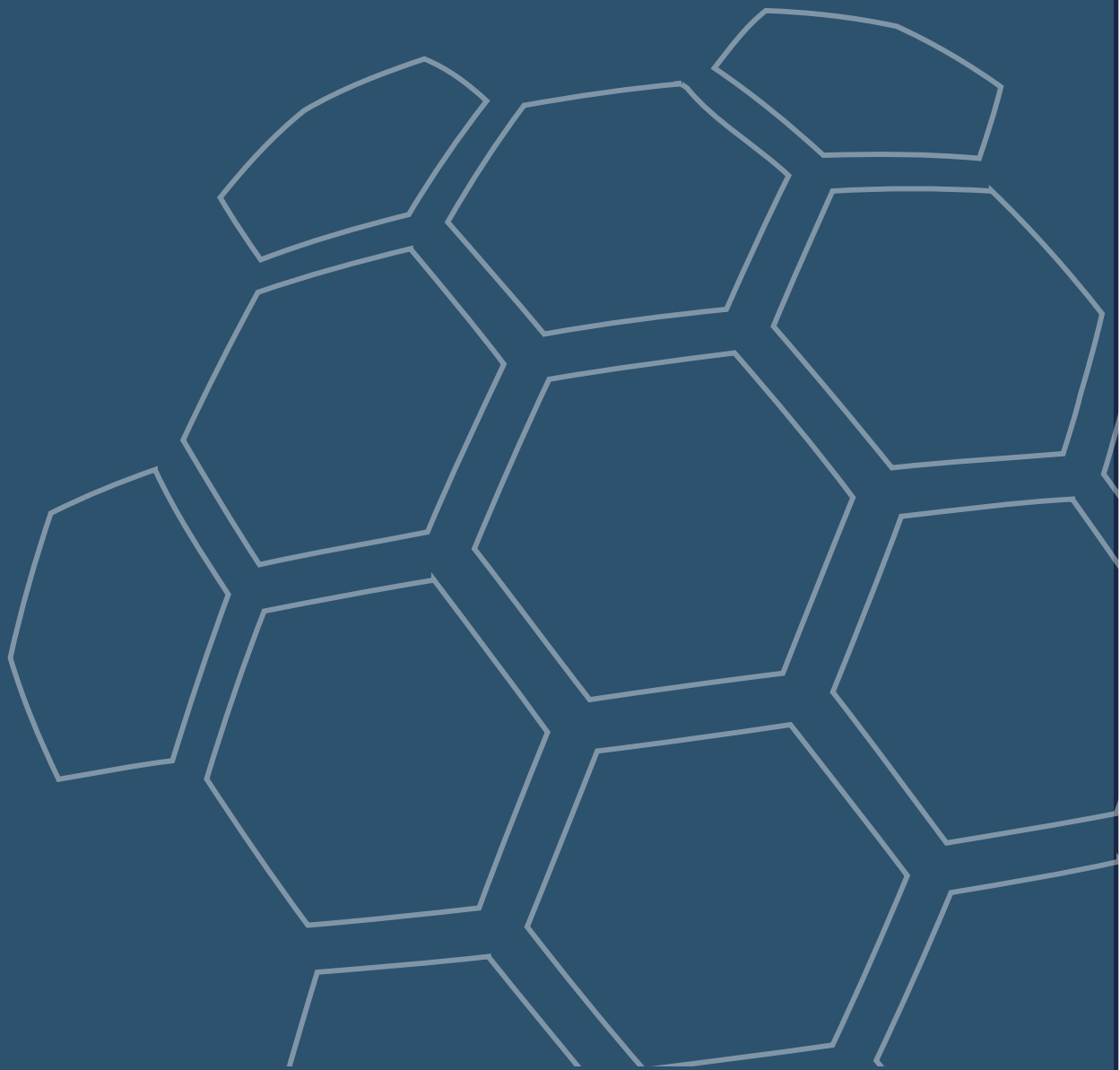
Water Strikes				Remarks				
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	Inspection pit hand dug to 1.20m.				
1.30	1.30	20	0.80					
5.70	5.70	20	3.00					
14.50	14.50	20	2.00					
Casing Details		Water Added						
To (m)	Diam (mm)	From (m)	To (m)					
3.10	200							
				Core Barrel	Flush Type	Termination Reason	Last Updated	
					Water	Terminated at scheduled depth.	13/03/2025	

APPENDIX C – CORE PHOTOGRAPHS



**BH02 BOX1 Depth(15.00-17.50m)****BH03 BOX1 Depth(21.20-22.70m)****BH03 BOX2 Depth(22.70-24.20m)**

APPENDIX D – DYNAMIC PROBE LOGS



 CAUSEWAY GEOTECH		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP01
		Coordinates 670832.10 E 668774.88 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing		Elevation 46.85 mOD	Final Depth: 8.00	Date: 03/12/2024	Operator: Bm	Sheet 1 of 1 Scale: 1:50
Probe Type: DPSH-B						FINAL
Depth (m)	Blows/100mm					Torque (Nm)
		10	20	30	40	
1	1 1 1 3 3 4 5 5 5 4 4 4 4 5 5 4 4 4 4 3 3 4 4 6 5 3 3 2 2 3 5 8 10 15 22 25 27					
2	<					

		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP02
		Coordinates 670865.84 E 668729.12 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing						Sheet 1 of 1 Scale: 1:50
Probe Type: DPSH-B		Elevation 49.77 mOD	Final Depth: 8.00	Date: 03/12/2024	Operator: Bm	FINAL
Depth (m)	Blows/100mm					Torque (Nm)
		10	20	30	40	
1	1					
	3					
	4					
	4					
	4					
	4					
	4					
	5					
	5					
	5					
2	4					
	4					
	4					
	3					
	3					
	3					
	3					
	4					
	4					
	4					
3	2					
	2					
	2					
	2					
	1					
	1					
	1					
	2					
	2					
	2					
4	1					
	1					
	1					
	1					
	1					
	2					
	5					
	5					
	8					
	10					
5	12					
	13					
	13					
	16					
	14					
	11					
	7					
	8					
	12					
	16					
6	30					
	26					
	24					
	18					
	11					
	11					
	11					
	9					
	8					
	8					
7	7					
	7					
	6					
	7					
	7					
	6					
	8					
	9					
	6					
	6					
8	5					
	6					
	6					
	8					
	10					
	13					
	15					
	15					
9						
Fall Height: 750 mm		Remarks				
Hammer Mass: 63.5 kg						
Cone Diameter: 50.5 mm		Termination Reason Terminated at scheduled depth.			Last Updated 13/03/2025	
						



24-1562

GreenGate BioGas Powerstown

DP03

Dynamic Probing

670880.05 E

668648.59 N

GreenGate BioGas

Fehily Timoney and Company

Scale: 1:50

DPSH-B

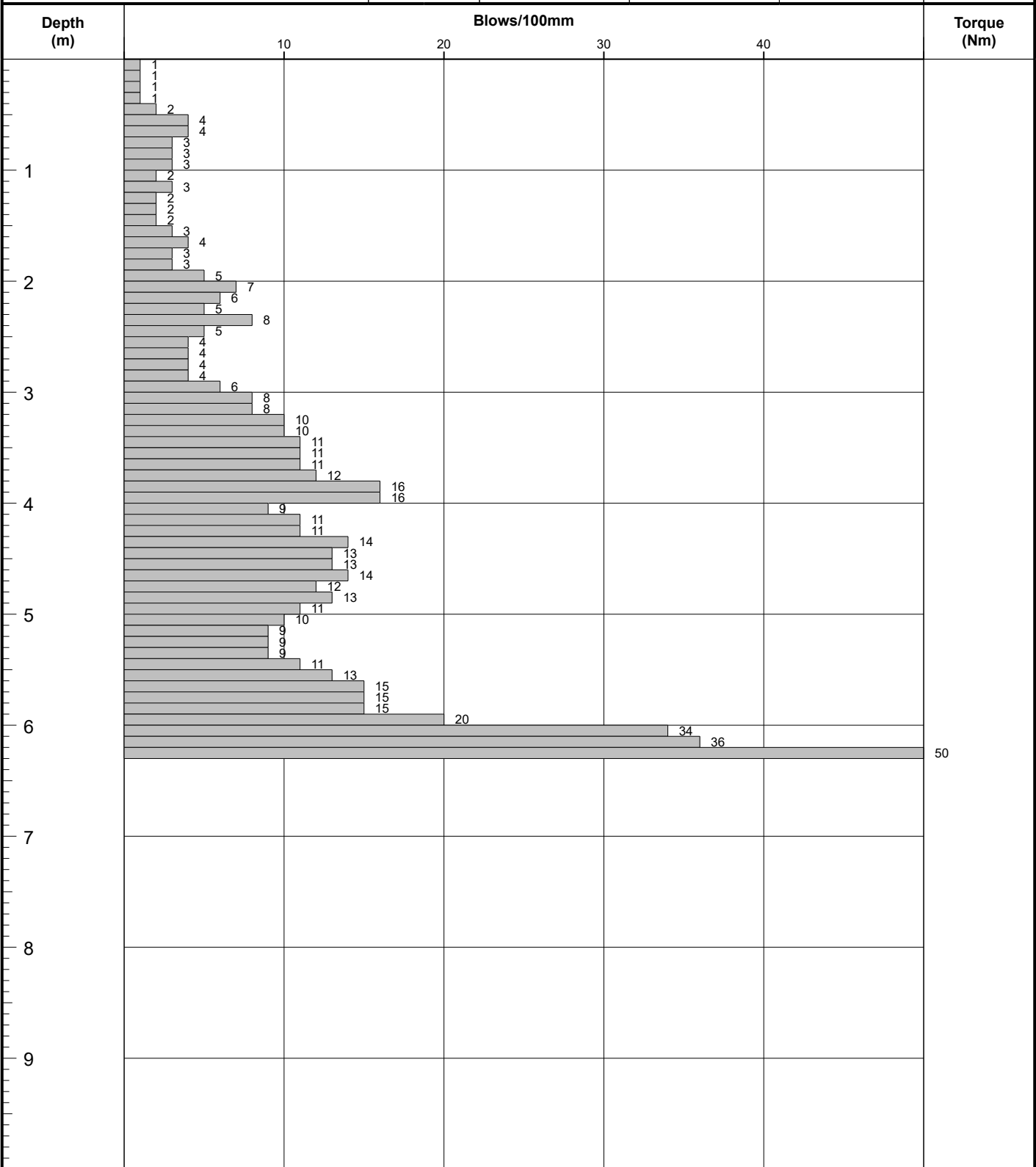
43.92 mOD

6.30

03/12/2024

Bm

FINAL



750 mm

63.5 kg

50.5 mm

Termination Reason

Terminated at refusal.

13/03/2025



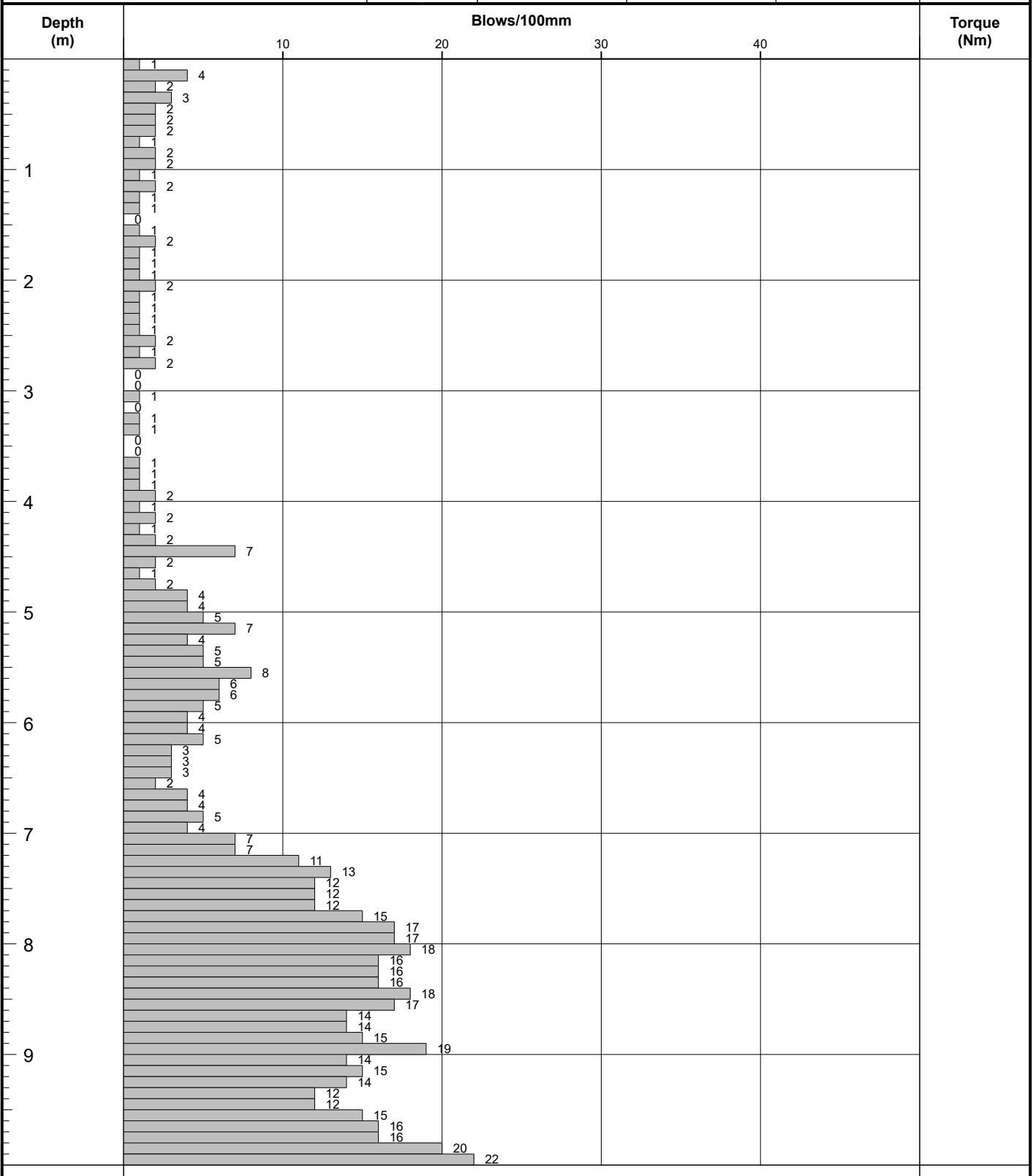


		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP04
		Coordinates 670856.86 E 668683.21 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing						Sheet 2 of 2 Scale: 1:50
Probe Type: DPSH-B		Elevation 49.99 mOD	Final Depth: 15.00	Date: 02/12/2024	Operator: Bm	FINAL
Depth (m)	Blows/100mm					Torque (Nm)
	10 20 30 40					
11	7 7 9 11 11 11 12 11 11 16 18 18 18 18 20 18 18 18 18					
	12 17 18 18 18 19 19 17 18 18 18 20 21 21 21 22 22 25 25					
	23 22 23 24 24 24 26 26 29 32 32 35					
Fall Height: 750 mm		Remarks				
Hammer Mass: 63.5 kg						
Cone Diameter: 50.5 mm		Termination Reason Terminated at scheduled depth.			Last Updated 13/03/2025	

		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP05
		Coordinates 670832.50 E 668714.23 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing						Sheet 1 of 1 Scale: 1:50
Probe Type: DPSH-B		Elevation 48.77 mOD	Final Depth: 8.00	Date: 02/12/2024	Operator: Bm	FINAL
Depth (m)	Blows/100mm					Torque (Nm)
	</					



FINAL





Project Name: GreenGate BioGas Powerstown

DP06

Coordinates
670783.72 E
668765.65 N

Client: GreenGate BioGas
Client's Representative: Fehily Timoney and Company

Sheet 2 of 2

Scale: 1:50

Elevation
49.73 mOD

Date:	04/12/2024
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FINAL

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
					50

Remarks

Termination Reason

Terminated at refusal.

13/03/2025



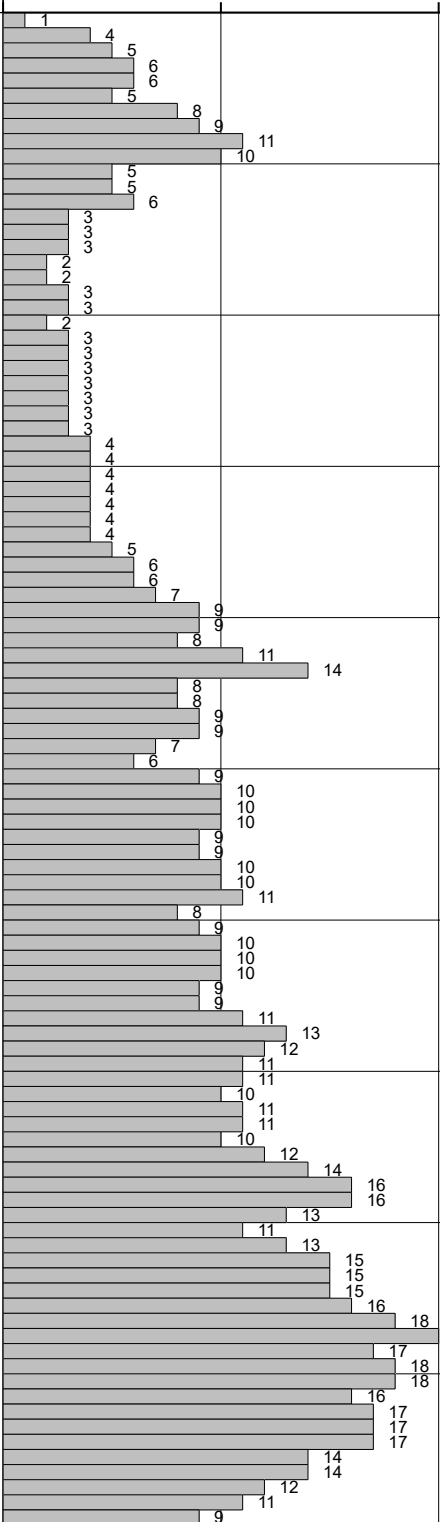
		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP07
		Coordinates 670725.32 E 668758.46 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing						Sheet 1 of 1 Scale: 1:50
Probe Type: DPSH-B		Elevation 50.76 mOD	Final Depth: 7.70	Date: 04/12/2024	Operator: Bm	FINAL
Depth (m)	Blows/100mm					Torque (Nm)
1	1 8 6 6 3 4 3 3 2 2 2 2 1 2 2 1 1 2 2 1					

 CAUSEWAY GEOTECH		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP08
		Coordinates 670797.29 E 668596.12 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing		Elevation 49.39 mOD	Final Depth: 15.00	Date: 03/12/2024	Operator: Bm	Sheet 1 of 2 Scale: 1:50
Probe Type: DPSH-B						FINAL
Depth (m) 1 2 3 4 5 6 7 8 9	Blows/100mm 10 20 30 40					Torque (Nm)
	1 3 11 20 18 19 15 17 14 14 3 4 12 2 2 2 5 9 11 11 8 6 5 6 6 6 5 4 4 4 4 4 3 3 4 7 9 11 15 11 14 14 17 17 20 22 24 19 13 18 13 13 13 13 16 18 18 18 17 15 22 35 28 23 22 22 22 23 22 18 18 18 18 17 15 15 19 19 17 19 19 23 22 23 25 25 16 12 10 9 10 10 13 10 11 12 11 14 14 8					

Fall Height: 750 mm	Remarks		
Hammer Mass: 63.5 kg			
Cone Diameter: 50.5 mm			
Termination Reason Terminated at scheduled depth.		Last Updated 13/03/2025	

		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP08
		Coordinates 670797.29 E 668596.12 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing						Sheet 2 of 2 Scale: 1:50
Probe Type: DPSH-B		Elevation 49.39 mOD	Final Depth: 15.00	Date: 03/12/2024	Operator: Bm	FINAL
Depth (m)	Blows/100mm					Torque (Nm)
11	8 11 8 8 8 8 10 11 7 10 14 12 14 14 15 13 14 18 28					
	11 12 11 11 14 14 14 16 18 14 16 16 16 15 18 18 16 11 15 15 24 25 20 24 28 31 26 26 27					
12						
13						
14						
15						
16						
17						
18						
19						
Fall Height: 750 mm	Remarks					
Hammer Mass: 63.5 kg						
Cone Diameter: 50.5 mm						
Termination Reason Terminated at scheduled depth.					Last Updated 13/03/2025	

		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP09
		Coordinates 670685.37 E 668562.45 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing					Sheet 1 of 1 Scale: 1:50	
Probe Type: DPSH-B		Elevation 47.61 mOD	Final Depth: 3.00	Date: 03/12/2024	Operator: Bm	FINAL
Depth (m)	Blows/100mm					Torque (Nm)
1	1 4 3 4 6 8 10 12 11 6 5 4 4 5 4 7 10 11 12 10 13 13 12 15 10 12 14 17 30					50
2						
3						
4						
5						
6						
7						
8						
9						
Fall Height: 750 mm	Remarks					
Hammer Mass: 63.5 kg						
Cone Diameter: 50.5 mm						
Termination Reason Terminated at refusal.					Last Updated 13/03/2025	

		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP10
		Coordinates 670757.11 E 668671.53 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing		Elevation 45.42 mOD	Final Depth: 11.70	Date: 02/12/2024	Operator: Bm	Sheet 1 of 2 Scale: 1:50
Probe Type: DPSH-B						FINAL
Depth (m)	Blows/100mm					Torque (Nm)
						
Fall Height: 750 mm		Remarks				
Hammer Mass: 63.5 kg						
Cone Diameter: 50.5 mm						
		Termination Reason Terminated at refusal.			Last Updated 13/03/2025	



		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP11
		Coordinates 670685.48 E 668682.31 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing					Sheet 2 of 2 Scale: 1:50	
Probe Type: DPSH-B		Elevation mOD	Final Depth: 11.50	Date: 03/12/2024	Operator: Bm	FINAL
Depth (m)	Blows/100mm					Torque (Nm)
	10	20	30	40		
11						50
	22 28					
	20					
	15					
	13 13					
	11 11					
	12					
	13					
	14					
	17 17					
22						
12						
13						
14						
15						
16						
17						
18						
19						
Fall Height: 750 mm	Remarks Coordinates are approximate and generated using logging software.					
Hammer Mass: 63.5 kg						
Cone Diameter: 50.5 mm	Termination Reason Terminated at refusal.			Last Updated 13/03/2025		
						

		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown		Probe ID DP12	
		Coordinates 670663.60 E 668619.60 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company			
Method: Dynamic Probing		Elevation mOD	Final Depth: 11.80	Date: 03/12/2024	Operator: Bm	Sheet 1 of 2 Scale: 1:50
Probe Type: DPSH-B			FINAL			
Depth (m)	Blows/100mm					Torque (Nm)
	10203040					
	1 5 15 20 26 26 30 30 15 13 11 10 10 8 7 7 6 6 7 7 9 11 11 9 10 11 14 14 15 16 16 15 18 18 20 15 15 17 18 20 15 13 10 8 9 10 10 14 14 12 12 13 12 11 11 13 13 13 14 14 14 16 17 18 19 20 22 25 27 26 27 25 22 20 23 24 24 24 24 20 18 16 16 16 17 18 20 20 20 23 25 26 25 25 25 25 25 25 25 29					

Fall Height: 750 mm	Remarks Coordinates are approximate and generated using logging software.
Hammer Mass: 63.5 kg	
Cone Diameter: 50.5 mm	Termination Reason Terminated at refusal.
Last Updated 13/03/2025	
	

		Project No. 24-1562	Project Name: GreenGate BioGas Powerstown			Probe ID DP12				
		Coordinates 670663.60 E 668619.60 N	Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company							
Method: Dynamic Probing					Sheet 2 of 2 Scale: 1:50					
Probe Type: DPSH-B		Elevation mOD	Final Depth: 11.80	Date: 03/12/2024	Operator: Bm	FINAL				
Depth (m)	Blows/100mm					Torque (Nm)				
11	21 21 18 15 12 10 10 11 12 12 12 12 15 19 24									
						50				
	12									
13										
14										
15										
16										
17										
18										
19										
Fall Height: 750 mm	Remarks Coordinates are approximate and generated using logging software.									
Hammer Mass: 63.5 kg										
Cone Diameter: 50.5 mm	Termination Reason Terminated at refusal.			Last Updated 13/03/2025						
										

APPENDIX E – TRIAL PIT LOGS





24-1562

GreenGate BioGas Powerstown

TP01

570845.36 E

GreenGate BioGas

Fehily Timoney and Company

Scale: 1:25

Trial Pitting

13t Tracked Excavator

47.21 mOD

02/12/2024

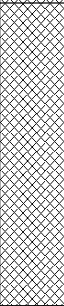
SK

FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50 0.50 0.50	B1 ES3	PID = 0.90ppm	47.06	0.15		MADE GROUND: Soft grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to medium.	
						MADE GROUND: Brown gravelly clayey fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.	0.5
1.50 1.50 1.50	B4 ES6	PID = 0.70ppm	46.31	0.90		MADE GROUND: Brownish grey very gravelly very clayey fine to coarse SAND with medium cobble content. Gravel is rounded fine to medium. Cobbles are rounded of predominantly limestone.	1.0
							1.5
							2.0
2.50	B7		44.61	2.60		MADE GROUND: Brownish grey slightly gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is rounded fine to coarse. Cobbles are rounded of predominantly limestone.	2.5
			44.11	3.10		MADE GROUND: Brownish grey gravelly clayey fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone.	3.0
			43.81	3.40		End of trial pit at 3.40m	3.5
							4.0
							4.5

Water Strikes		Depth: 3.40 Width: 1.30 Length: 2.40	Remarks: Hand vane not possible due to granular content. No groundwater encountered.		
Struck at (m)	Remarks				
		Stability: Unstable below 0.15	Termination Reason Terminated due to collapse.	Last Updated 13/03/2025	

 CAUSEWAY GEOTECH			Project No. 24-1562		Project Name: GreenGate BioGas Powerstown			Trial Pit ID TP02	
			Coordinates 670862.85 E 668722.47 N		Client: GreenGate BioGas				
Method: Trial Pitting					Client's Representative: Fehily Timoney and Company			Sheet 1 of 1 Scale: 1:25	
Plant: 13t Tracked Excavator			Elevation 49.96 mOD		Date: 02/12/2024			Logger: SK	
Depth (m)		Sample / Tests	Field Records		Level (mOD)	Depth (m)	Legend	Description	Water
0.50 0.50 0.50		B1 ES3	PID = 1.00ppm					MADE GROUND: Stiff grey slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse. Cobbles are subrounded predominantly of limestone.	
1.50 1.50 1.50		B4 ES6	PID = 0.80ppm		48.76	1.20		MADE GROUND: Firm brownish grey slightly sandy gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.	
2.50		B7			47.96	2.00		MADE GROUND: Brownish grey very sandy slightly clayey subrounded fine to coarse GRAVEL with medium cobble content. Sand is fine to coarse. Cobbles are rounded of predominantly limestone.	
3.50		B8			46.26	3.70		MADE GROUND: Light brownish grey slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles and boulders are rounded of predominantly limestone.	
3.90		B9			45.86	4.10		MADE GROUND: Stiff greyish brown slightly sandy gravelly CLAY with medium cobble content and low boulder content. Sand is fine to coarse. Gravel is subangular fine to coarse. Cobbles are rounded of predominantly limestone. Boulders are subrounded of predominantly limestone up to 310mm in diameter.	
4.50		B10			45.46	4.50		End of trial pit at 4.50m	
Water Strikes			Depth: 4.50		Remarks: Hand vane not possible due to granular content. No groundwater encountered.				
Struck at (m)		Remarks	Width: 1.50						
			Length: 3.80						
			Stability: Moderately stable		Termination Reason Terminated at scheduled depth.			Last Updated 13/03/2025	
									

 CAUSEWAY GEOTECH			Project No. 24-1562		Project Name: GreenGate BioGas Powerstown			Trial Pit ID TP03			
			Coordinates 670882.10 E 668634.34 N		Client: GreenGate BioGas Client's Representative: Fehily Timoney and Company						
Method: Trial Pitting					Date: 03/12/2024			Logger: SK		Sheet 1 of 1 Scale: 1:25	
Plant: 13t Tracked Excavator			Elevation 43.22 mOD							FINAL	
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description			Water		
0.50 0.50 0.50 0.50	B1 D2 ES3	PID = 0.80ppm	42.52	0.70		MADE GROUND: Dark greyish brown slightly gravelly fine to coarse SAND with low cobble content. Gravel is rounded fine to coarse. Cobbles are rounded of mixed lithology predominantly of limestone.				0.5	
1.50 1.50 1.50 1.50	B4 D5 ES6	Quick seepage PID = 0.40ppm	41.52	1.70		MADE GROUND: Dark brownish grey very gravelly silty fine to coarse SAND with medium cobble content. Gravel is subrounded fine to coarse. Cobbles are rounded of mixed lithology, predominantly of limestone.			▼	1.0 1.5	
						End of trial pit at 1.70m				2.0 2.5 3.0 3.5 4.0 4.5	
Water Strikes			Depth: 1.70		Remarks: Hand vane not possible due to granular content.						
Struck at (m)		Remarks	Width: 3.50								
1.30		Quick seepage	Length: 2.20								
			Stability: Unstable below 0.3m.		Termination Reason Terminated due to collapse.				Last Updated 13/03/2025		



24-1562

GreenGate BioGas Powerstown

TP04

670831.62 E

GreenGate BioGas

Fehily Timoney and Company

Scale: 1:25

Trial Pitting

13t Tracked Excavator

49.85 mOD

03/12/2024

SK

FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50 0.50 0.50	B1 ES3	PID = 0.70ppm				MADE GROUND: Stiff brown slightly sandy slightly gravelly CLAY with medium cobble content and low boulder content. Sand is fine to coarse. Gravel is subrounded fine to medium. Cobbles are rounded of predominantly limestone. Boulders are subrounded of predominantly limestone up to 240mm in diameter.	
1.50 1.50 1.50	B4 ES6	PID = 1.00ppm					
2.50	B7		47.15	2.70		MADE GROUND: Dark greyish brown slightly gravelly slightly clayey fine to coarse SAND with medium cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.	
3.30	B8						
4.00	B9		46.15	3.70		MADE GROUND: Dark greyish brown very sandy slightly clayey subrounded fine to coarse GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are subrounded of predominantly limestone.	
			45.65	4.20		End of trial pit at 4.20m	

Water Strikes		Remarks:		
Struck at (m)	Remarks	Depth:	Hand vane not possible due to granular content.	
		Width:	No groundwater encountered.	
		Length:	3.00	
		Stability:	Termination Reason	Last Updated
		Unstable below 2.6m.	Terminated due to collapse.	13/03/2025



24-1562

GreenGate BioGas Powerstown

TP05

Trial Pitting

670813.38 E

670813.38 E

668732.88 N

GreenGate BioGas

Fehily Timoney and Company

Scale: 1:25

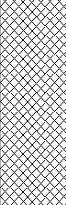
13t Tracked Excavator

46.93 mOD

02/12/2024

SK

FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50 0.50 0.50	B1 ES3	PID = 0.70ppm	46.23	0.70		MADE GROUND: Brown very gravelly clayey fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.	
						MADE GROUND: Brown gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded predominantly limestone.	
1.50 1.50 1.50	B4 ES6	PID = 0.60ppm	45.33	1.60		MADE GROUND: Soft brownish greyish slightly gravelly sandy SILT with low cobble content. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.	
2.50	B7	Moderately quick seepage.	44.33	2.60		MADE GROUND: Dark brownish grey slightly gravelly clayey fine to coarse SAND with low cobble content. Gravel is subrounded fine to medium. Cobbles are rounded of predominantly limestone.	
2.70	B8		44.13	2.80		MADE GROUND: Soft dark brownish grey slightly gravelly sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is subrounded fine to medium. Cobbles are rounded of predominantly limestone.	
2.90	B9		43.73	3.20		MADE GROUND: Very soft dark brownish grey slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is rounded fine to coarse.	
3.50	B10		43.43	3.50	End of trial pit at 3.50m		

Water Strikes		Depth:		Remarks:	
Struck at (m)	Remarks	Width:		Hand vane not possible due to granular content.	
2.80	Moderately quick seepage.	Length:			
		Stability:		Termination Reason	
		Unstable below 2.6m.		Terminated due to collapse.	
				Last Updated	
				13/03/2025	
					



24-1562

GreenGate BioGas Powerstown

TP06

Trial Pitting

670751.67 E

670751.67 E

668754.47 N

GreenGate BioGas

Fehily Timoney and Company

Scale: 1:25

13t Tracked Excavator

49.90 mOD

03/12/2024

SK

FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50 0.50 0.50	B1 ES3	PID = 0.90ppm	49.30	0.60		MADE GROUND: Stiff greyish brown slightly sandy slightly gravelly CLAY with low cobble content and branches. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are subangular of mixed lithology.	
1.50 1.50 1.50	B4 ES6	PID = 0.90ppm				MADE GROUND: Soft brownish grey slightly sandy slightly gravelly CLAY with low cobble and boulder content and rootlets. Sand is fine to coarse. Gravel is subangular fine to coarse. Cobbles are subangular of mixed lithologies. Boulders are subangular of concrete up to 370mm in diameter.	
2.50	B7						
3.50	B8						
4.50	B9		45.40	4.50		End of trial pit at 4.50m	

Water Strikes		Remarks:		
Struck at (m)	Remarks	Depth:	Hand vane not possible due to granular content.	
		Width:	No groundwater encountered.	
		Length:	3.10	
		Stability:	Termination Reason	Last Updated
		Stable	Terminated at scheduled depth.	13/03/2025

 CAUSEWAY GEOTECH			Project No. 24-1562		Project Name: GreenGate BioGas Powerstown			Trial Pit ID TP07	
			Coordinates 670690.21 E 668650.19 N		Client: GreenGate BioGas				
Method: Trial Pitting					Client's Representative: Fehily Timoney and Company			Sheet 1 of 1 Scale: 1:25	
Plant: 13t Tracked Excavator			Elevation 44.15 mOD		Date: 04/12/2024			Logger: SK	
Depth (m)		Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water	
0.50 0.50 0.50		B1 ES3	PID = 0.10ppm	43.85	0.30		Reddish brown TOPSOIL slightly gravelly sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.		
				43.55	0.60		Soft dark brownish grey slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is rounded fine to coarse. Cobbles are rounded of predominantly limestone.		0.5
1.50 1.50 1.50		B4 ES6	PID = 0.20ppm				Soft brownish grey slightly gravelly sandy CLAY with medium cobble content. Sand is fine to coarse. Gravel is rounded fine to coarse. Cobbles are subrounded of predominantly limestone.		1.0 1.5 2.0
2.50		B7		41.95	2.20		Soft greyish brown slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse. Cobbles are subrounded of predominantly limestone.		2.5 3.0
				41.05	3.10		End of trial pit at 3.10m		3.5 4.0 4.5
Water Strikes			Depth: 3.10		Remarks: Hand vane not possible due to granular content. No groundwater encountered.				
Struck at (m)		Remarks	Width: 3.00						
			Length: 3.00						
			Stability: Unstable below 0.2m.		Termination Reason Terminated due to collapse.			Last Updated 13/03/2025	
									



24-1562

GreenGate BioGas Powerstown

TP08

670768.34 E

GreenGate BioGas

Fehily Timoney and Company

Scale: 1:25

Trial Pitting

13t Tracked Excavator

48.44 mOD

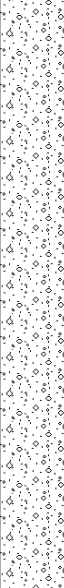
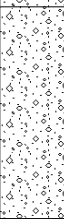
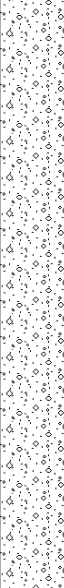
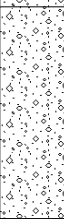
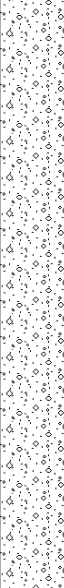
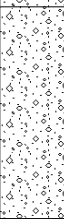
03/12/2024

SK

FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
			48.34	0.10		TOPSOIL	
0.50 0.50 0.50	B1 ES3	PID = 0.50ppm				Stiff brown slightly sandy very gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone.	
		Slow seepage.	47.64	0.80		Dark brown very gravelly very clayey fine to coarse SAND with low cobble content. Gravel is rounded fine to coarse. Cobbles are rounded of predominantly limestone.	
1.50 1.50 1.50	B7 ES9	PID = 0.40ppm				Dark greyish brown gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone.	
2.40	B6		46.44	2.00		Light brown slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to medium. Cobbles are subrounded of predominantly limestone.	
3.40	B4		45.24	3.20		End of trial pit at 4.50m	
4.20	B10		43.94	4.50			

Water Strikes		Depth: 4.50 Width: 1.20 Length: 3.00	Remarks: Hand vane not possible due to granular content.		
Struck at (m)	Remarks				
1.00	Slow seepage.				
		Stability: Moderately stable	Termination Reason Terminated at scheduled depth.	Last Updated 13/03/2025	

 CAUSEWAY GEOTECH			Project No. 24-1562		Project Name: GreenGate BioGas Powerstown			Trial Pit ID TP09																																																																																																													
			Coordinates 670693.82 E 668583.17 N		Client: GreenGate BioGas																																																																																																																
Method: Trial Pitting			Elevation 46.85 mOD			Client's Representative: Fehily Timoney and Company			Sheet 1 of 1 Scale: 1:25																																																																																																												
Plant: 13t Tracked Excavator			Date: 03/12/2024			Logger: SK		FINAL																																																																																																													
<table><tr><th>Depth (m)</th><th>Sample / Tests</th><th>Field Records</th><th>Level (mOD)</th><th>Depth (m)</th><th>Legend</th><th>Description</th><th>Water</th><th></th></tr><tr><td>0.50 0.50 0.50</td><td>B1 ES3</td><td>PID = 0.50ppm</td><td>46.65</td><td>0.20</td><td></td><td>Reddish brown TOPSOIL.</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>Soft brownish grey gravelly very sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone.</td><td></td><td>0.5</td></tr><tr><td></td><td></td><td></td><td>46.05</td><td>0.80</td><td></td><td>Soft greyish reddish slightly gravelly sandy CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is subrounded fine to medium. Cobbles are subrounded of predominantly limestone. Boulders are subangular of predominantly limestone lp to 300mm in diameter.</td><td></td><td>1.0</td></tr><tr><td>1.50 1.50 1.50</td><td>B4 ES6</td><td>PID = 0.40ppm</td><td>45.25</td><td>1.60</td><td></td><td>Light brownish grey slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone.</td><td></td><td>1.5</td></tr><tr><td>2.00</td><td>B7</td><td></td><td></td><td></td><td></td><td>Light greyish brown slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.</td><td></td><td>2.0</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2.5</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>3.0</td></tr><tr><td>3.00</td><td>B8</td><td></td><td></td><td></td><td></td><td></td><td></td><td>3.5</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>4.0</td></tr><tr><td>4.00</td><td>B9</td><td></td><td>43.05</td><td>3.80</td><td></td><td>Light greyish brown slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.</td><td></td><td>4.5</td></tr><tr><td></td><td></td><td></td><td>42.35</td><td>4.50</td><td></td><td>End of trial pit at 4.50m</td><td></td><td></td></tr></table>										Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water		0.50 0.50 0.50	B1 ES3	PID = 0.50ppm	46.65	0.20		Reddish brown TOPSOIL.									Soft brownish grey gravelly very sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone.		0.5				46.05	0.80		Soft greyish reddish slightly gravelly sandy CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is subrounded fine to medium. Cobbles are subrounded of predominantly limestone. Boulders are subangular of predominantly limestone lp to 300mm in diameter.		1.0	1.50 1.50 1.50	B4 ES6	PID = 0.40ppm	45.25	1.60		Light brownish grey slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone.		1.5	2.00	B7					Light greyish brown slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.		2.0									2.5									3.0	3.00	B8							3.5									4.0	4.00	B9		43.05	3.80		Light greyish brown slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.		4.5				42.35	4.50		End of trial pit at 4.50m		
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water																																																																																																														
0.50 0.50 0.50	B1 ES3	PID = 0.50ppm	46.65	0.20		Reddish brown TOPSOIL.																																																																																																															
						Soft brownish grey gravelly very sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone.		0.5																																																																																																													
			46.05	0.80		Soft greyish reddish slightly gravelly sandy CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is subrounded fine to medium. Cobbles are subrounded of predominantly limestone. Boulders are subangular of predominantly limestone lp to 300mm in diameter.		1.0																																																																																																													
1.50 1.50 1.50	B4 ES6	PID = 0.40ppm	45.25	1.60		Light brownish grey slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone.		1.5																																																																																																													
2.00	B7					Light greyish brown slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.		2.0																																																																																																													
								2.5																																																																																																													
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3.00	B8							3.5																																																																																																													
								4.0																																																																																																													
4.00	B9		43.05	3.80		Light greyish brown slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.		4.5																																																																																																													
			42.35	4.50		End of trial pit at 4.50m																																																																																																															
<table><tr><td colspan="2">Water Strikes</td><td rowspan="2">Depth: 4.50 Width: 1.20 Length: 3.00</td><td rowspan="2">Remarks: Hand vane not possible due to granular content. No groundwater encountered.</td></tr><tr><td>Struck at (m)</td><td>Remarks</td></tr><tr><td></td><td></td><td>Stability: Moderately stable</td><td>Termination Reason: Terminated at scheduled depth.</td></tr><tr><td colspan="2"></td><td colspan="2">Last Updated: 13/03/2025</td></tr></table>										Water Strikes		Depth: 4.50 Width: 1.20 Length: 3.00	Remarks: Hand vane not possible due to granular content. No groundwater encountered.	Struck at (m)	Remarks			Stability: Moderately stable	Termination Reason: Terminated at scheduled depth.			Last Updated: 13/03/2025																																																																																															
Water Strikes		Depth: 4.50 Width: 1.20 Length: 3.00	Remarks: Hand vane not possible due to granular content. No groundwater encountered.																																																																																																																		
Struck at (m)	Remarks																																																																																																																				
		Stability: Moderately stable	Termination Reason: Terminated at scheduled depth.																																																																																																																		
		Last Updated: 13/03/2025																																																																																																																			
																																																																																																																					



24-1562

GreenGate BioGas Powerstown

TP10

Trial Pitting

570637.07 E

568589.31 N

GreenGate BioGas

Fehily Timoney and Company

Scale: 1:25

13t Tracked Excavator

44.38 mOD

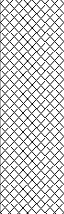
04/12/2024

SK

FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
						Dark brown TOPSOIL.	
0.50 0.50 0.50	B1 ES3	PID = 0.40ppm	44.13	0.25		Firm brown slightly gravelly very sandy CLAY with low cobble content with occasional rootlets. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.	0.5
0.90	B6		43.68	0.70		Brownish grey very gravelly clayey fine to coarse SAND with low cobble and boulder content. Gravel is subangular fine to coarse. Cobbles are subrounded of predominantly limestone. Boulders are subrounded of predominantly limestone up to 230mm in diameter.	1.0
1.50 1.50	ES5	PID = 0.40ppm	42.78	1.60		Greyish brown sandy slightly clayey subrounded fine to coarse GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are subrounded of predominantly limestone.	1.5
1.90	B7		41.98	2.40		Firm greyish brown slightly sandy gravelly SILT with medium cobble and low boulder content. Sand is fine to coarse. Gravel is subangular fine to coarse. Cobbles are rounded of predominantly limestone. Boulders are rounded of predominantly limestone up to 240mm in diameter.	2.0
2.90	B8	Slow seepage.	41.48	2.90		End of trial pit at 2.90m	2.5
							3.0
							3.5
							4.0
							4.5

Water Strikes		Depth: 2.90	Remarks: Hand vane not possible due to granular content.
Struck at (m)	Remarks		
2.80	Slow seepage.	Width: 1.50 Length: 3.80	
		Stability: Stable	Termination Reason Terminated at refusal on boulder / possible bedrock. Last Updated 13/03/2025 

 CAUSEWAY GEOTECH			Project No. 24-1562		Project Name: GreenGate BioGas Powerstown			Trial Pit ID TP11									
			Coordinates 670618.10 E 668525.20 N		Client: GreenGate BioGas												
Method: Trial Pitting						Client's Representative: Fehily Timoney and Company			Sheet 1 of 1 Scale: 1:25								
Plant: 13t Tracked Excavator			Elevation 47.23 mOD		Date: 04/12/2024			Logger: SK		FINAL							
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description				Water							
0.50 0.50 0.50	B1 ES3	PID = 0.40ppm	46.98	0.25		Dark brown TOPSOIL.											
						MADE GROUND: Greyish brown very gravelly very clayey fine to coarse SAND. Gravel is subrounded fine to medium.					0.5						
1.50 1.50 1.50	B4 ES6	PID = 0.50ppm	46.23	1.00		MADE GROUND: Dark grey very sandy clayey subrounded fine to coarse GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are subrounded of predominantly limestone.					1.0						
2.50	B9		45.33	1.90		MADE GROUND: Firm greyish brown slightly sandy gravelly CLAY with medium cobble and boulder content. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are rounded of predominantly limestone. Boulders are subrounded of predominantly limestone up to 480mm in diameter.					1.5						
3.50	B10		43.63	3.60		End of trial pit at 3.60m					2.0						
											2.5						
											3.0						
											3.5						
											4.0						
											4.5						
Water Strikes <table><tr><td>Struck at (m)</td><td>Remarks</td></tr><tr><td></td><td></td></tr></table>			Struck at (m)	Remarks			Depth: 3.60 Width: 1.40 Length: 3.20 Stability: Unstable below 1.9m.		Remarks: Hand vane not possible due to granular content. No groundwater encountered. Termination Reason Terminated due to collapse.							Last Updated 13/03/2025 	
Struck at (m)	Remarks																



24-1562

GreenGate BioGas Powerstown

TP12

Trial Pitting

670536.95 E

668478.13 N

GreenGate BioGas

Fehily Timoney and Company

Scale: 1:25

13t Tracked Excavator

48.98 mOD

04/12/2024

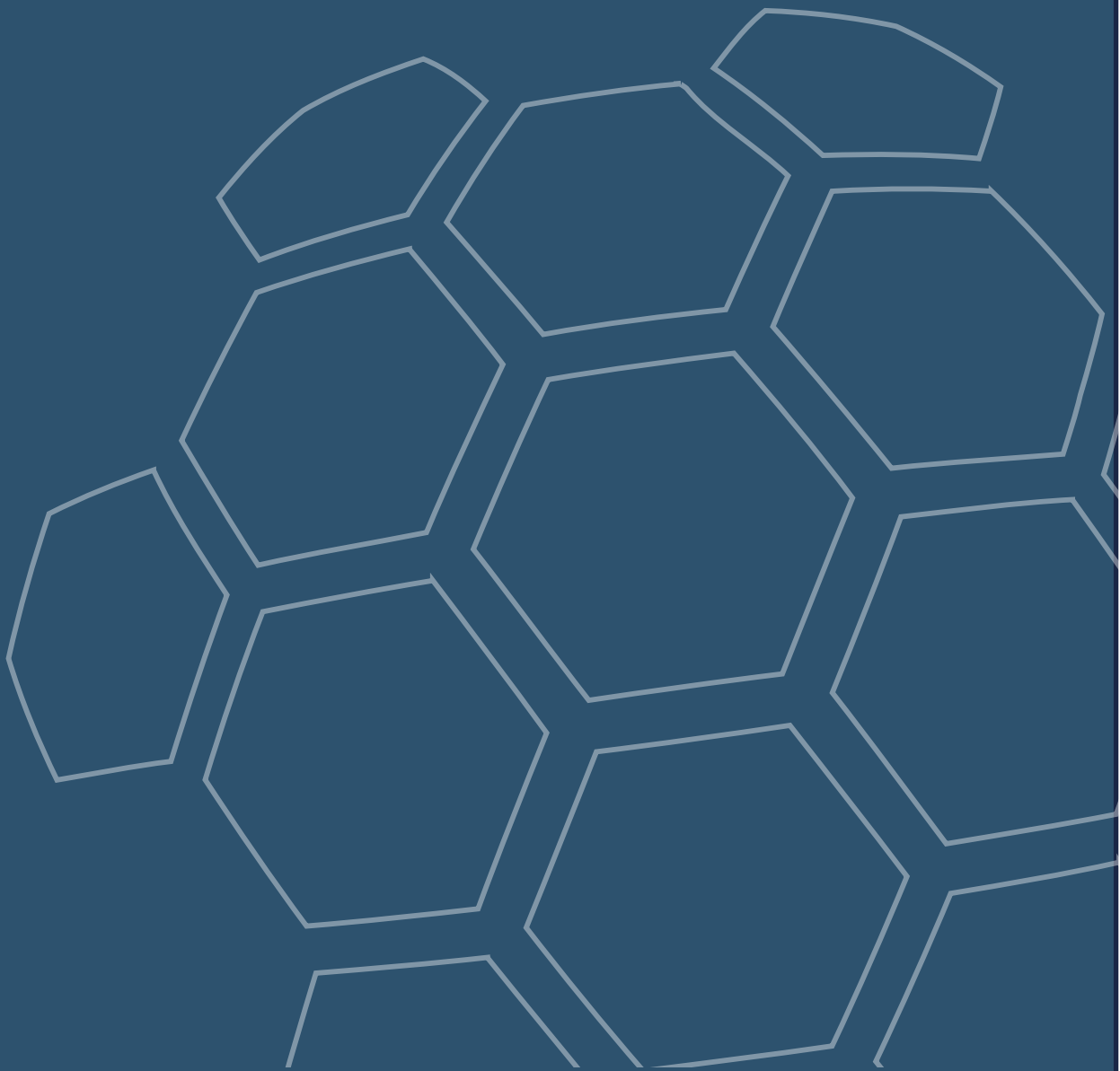
SK

FINAL

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m)	Legend	Description	Water
0.50	B1 ES3	PID = 0.50ppm	48.78	0.20		Dark brown TOPSOIL with rootlets.	
0.50						Dark brownish grey gravelly clayey fine to coarse SAND with medium cobble content. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone.	
0.50						Firm greyish brown slightly sandy gravelly CLAY with high cobble and boulder content. Sand is fine to coarse. Gravel is subrounded fine to coarse. Cobbles are subrounded of predominantly limestone. Boulders are subrounded of predominantly limestone up to 350mm in diameter.	
1.50	B4 ES6	PID = 0.50ppm	48.03	0.95			
1.50							
1.50							
			46.98	2.00		End of trial pit at 2.00m	

Water Strikes		Depth:	Remarks:	Last Updated	
Struck at (m)	Remarks				
		2.00	Hand vane not possible due to granular content. No groundwater encountered.		
		2.10			
		3.70			
		Stability:	Termination Reason		
		Unstable below 0.2	Terminated due to collapse.	13/03/2025	

APPENDIX F – TRIAL PIT PHOTOGRAPHS





TP01



TP01



TP01



TP01



TP01



TP01



TP02



TP02



TP02



TP02



TP02



TP02



TP03



TP03



TP03



TP03



TP03



TP03



TP04



TP04



TP04



TP04



TP04



TP04



TP05



TP05



TP05



TP05



TP05



TP05



TP06



TP06



TP06



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TP06



TP07



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TP07



TP08



TP08



TP08



TP08



TP08



TP08



TP09



TP09



TP09



TP09



TP09



TP09



TP10



TP10



TP10



TP10



TP10



TP11



TP11



TP11



TP11



TP11



TP11



TP12



TP12



TP12



TP12



TP12

APPENDIX G – GROUNDWATER MONITORING RECORDS



GROUNDWATER MONITORING RECORDS

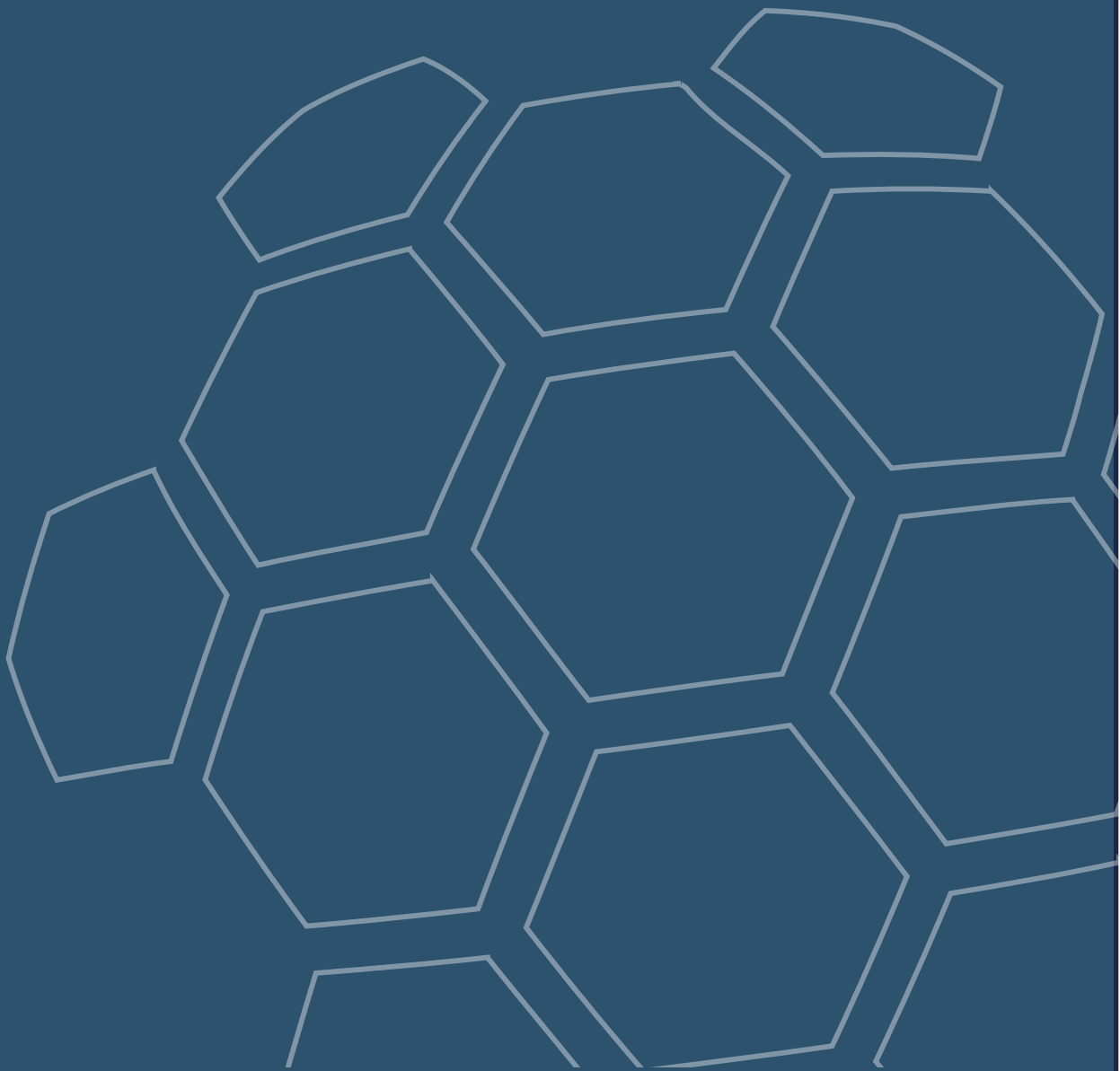
Project Number: 24-1562

Project Name: GreenGate BioGas



Borehole Number	Installation Depth (m)	Depth to water level (mbgl)			
		19/12/2024	09/01/2025	13/02/2025	27/02/2025
BH01	15.50	5.50	N/A	8.57	7.93
BH02	14.50	N/A	2.20	2.13	1.93
BH03	20.80	7.45	N/A	7.21	7.16
BH04	13.00	N/A	13.27	5.28	5.05

APPENDIX H – GEOTECHNICAL LABORATORY TEST RESULTS



**SOIL AND ROCK SAMPLE ANALYSIS
LABORATORY TEST REPORT****6 February 2025**

PROJECT NAME	GreenGate BioGas
PROJECT NUMBER	24-1562
CLIENT	GreenGate BioGas
ENGINEER	Fehily Timoney and Company

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). This testing was performed between 16/01/2025 and 06/02/2025.

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

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

Stephen Watson

Laboratory Manager

Signed for and on behalf of Causeway Geotech Ltd



**PROJECT NAME:** GreenGate BioGas**REPORT REFERENCE:** Schedule 1

The table below details the tests carried out, the specifications used, and the number of tests included in this report. Tests marked with* in this report are not United Kingdom Accreditation Service (UKAS) accredited and are not included in Causeway Geotech Limited's scope of UKAS Accreditation Schedule of Tests.

The results contained in this report relate to the sample(s) as received. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This report shall not be reproduced other than in full, without the prior written approval of the laboratory.

Material tested	Type of test/Properties measured/Range of measurement	Standard specifications	No. of results included in the report
SOIL	Water Content of Soil	<i>BS 1377-2: 2022: CI 4</i>	19
SOIL	Liquid and Plastic Limits of soil-1 point cone penetrometer method	<i>BS 1377-2: 2022: CI 5.3</i>	8
SOIL	Particle density by Gas jar method	<i>BS 1377-2: 2022: CI 9.2</i>	9
SOIL	Particle size distribution - wet sieving	<i>BS 1377-2: 2022: CI 10</i>	17
SOIL	Particle size distribution - sedimentation hydrometer method	<i>BS 1377-2: 2022: CI 10</i>	12
SOIL	Dry density/moisture content relationship (4.5 kg rammer)	<i>BS 1377-2: 2022: CI 11.4</i>	2
SOIL	Direct Shear Test using 60mm Small Shearbox (up to 3 days)	<i>BS EN ISO 17892-10:2018</i>	2
	Extra over days (more than initial 3 days)		2



Summary of Classification Test Results

Project No.

24-1562

Project Name

GreenGate BioGas

Hole No.	Sample				Specimen Description	Density		W	Passing 425µm	LL	PL	PI	Particle density Mg/m3	Casagrande Classification
	Ref	Top	Base	Type		bulk	dry							
TP01	4	1.50		B	Brown sandy slightly gravelly silty CLAY.			10.4						
TP02	1	0.50		B	Grey sandy slightly gravelly silty CLAY.			12.2	66	24	13	11	2.67-gj	CL
TP02	4	1.50		B	Brown sandy slightly gravelly silty CLAY.			7.7						
TP02	8	3.50		B	Grey gravelly slightly silty fine to coarse SAND.			3.9						
TP03	4	1.50		B	Brown gravelly slightly silty fine to coarse SAND.			8.1						
TP04	4	1.50		B	Brown sandy slightly gravelly silty CLAY.			10.7	62	24	13	11	2.65-gj	CL
TP04	9	4.00		B	Brown gravelly slightly silty fine to coarse SAND.			3.9						
TP05	1	0.50		B	Brown gravelly slightly silty fine to coarse SAND.			5.7						
TP05	7	2.50		B	Brown sandy slightly gravelly silty CLAY.			14.2	87	24	17	7	2.81-gj	CL
TP06	9	4.50		B	Brown sandy slightly gravelly silty CLAY.			15.4	50	32	22	10	2.6-gj	CL
TP07	1	0.50		B	Brown sandy slightly gravelly silty CLAY.			14.4	54	24	16	8	2.64-gj	CL
TP07	4	1.50		B	Brown sandy slightly gravelly silty CLAY.			11.3	69	30	17	13	2.77-gj	CL

All tests performed in accordance with BS1377-2:2022 unless specified otherwise

LAB 26R - Version 2

Key

Density test

Liquid Limit

Particle density

Linear measurement unless :

4pt cone unless :

sp - small pyknometer

wd - water displacement

cas - Casagrande method

gj - gas jar

wi - immersion in water

1pt - single point test

Date Printed

02/06/2025 00:00

Approved By

Stephen Watson



10122

Summary of Classification Test Results

Project No.		Project Name												
24-1562		GreenGate BioGas												
Hole No.	Sample				Specimen Description	Density		W	Passing 425µm	LL	PL	PI	Particle density Mg/m3	Casagrande Classification
	Ref	Top	Base	Type		bulk Mg/m3	dry							
TP08	7	1.50		B	Brown sandy gravelly silty CLAY.			7						
TP08	10	4.20		B	Brown sandy slightly gravelly silty CLAY.			13.9						
TP09	4	1.50		B	Brown slightly gravelly silty fine to coarse SAND.			12.5	75	22	18	4	2.64-gj	ML
TP10	6	0.90		B	Brown sandy gravelly silty CLAY.			8						
TP11	1	0.50		B	Brown sandy slightly gravelly silty CLAY.			11.3						
TP11	10	3.50		B	Brown sandy slightly gravelly silty CLAY.			10.5	51	26	19	7	2.65-gj	CL
TP12	4	1.50		B	Brown slightly sandy subangular fine to coarse GRAVEL with cobbles.			3.5					2.63-gj	

All tests performed in accordance with BS1377-2:2022 unless specified otherwise

LAB 26R - Version 2

Key			Date Printed	Approved By	 10122
Density test	Liquid Limit	Particle density	02/06/2025 00:00	Stephen Watson	
Linear measurement unless :	4pt cone unless :	sp - small pyknometer			
wd - water displacement	cas - Casagrande method	gj - gas jar			
wi - immersion in water	1pt - single point test				



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP01

Site Name

GreenGate BioGas

Sample No.

4

Specimen Description

Brown sandy slightly gravelly silty CLAY.

Sample
Depth (m)Top
Base

1.50

Specimen Reference

6

Specimen
Depth

1.5

m

Sample Type

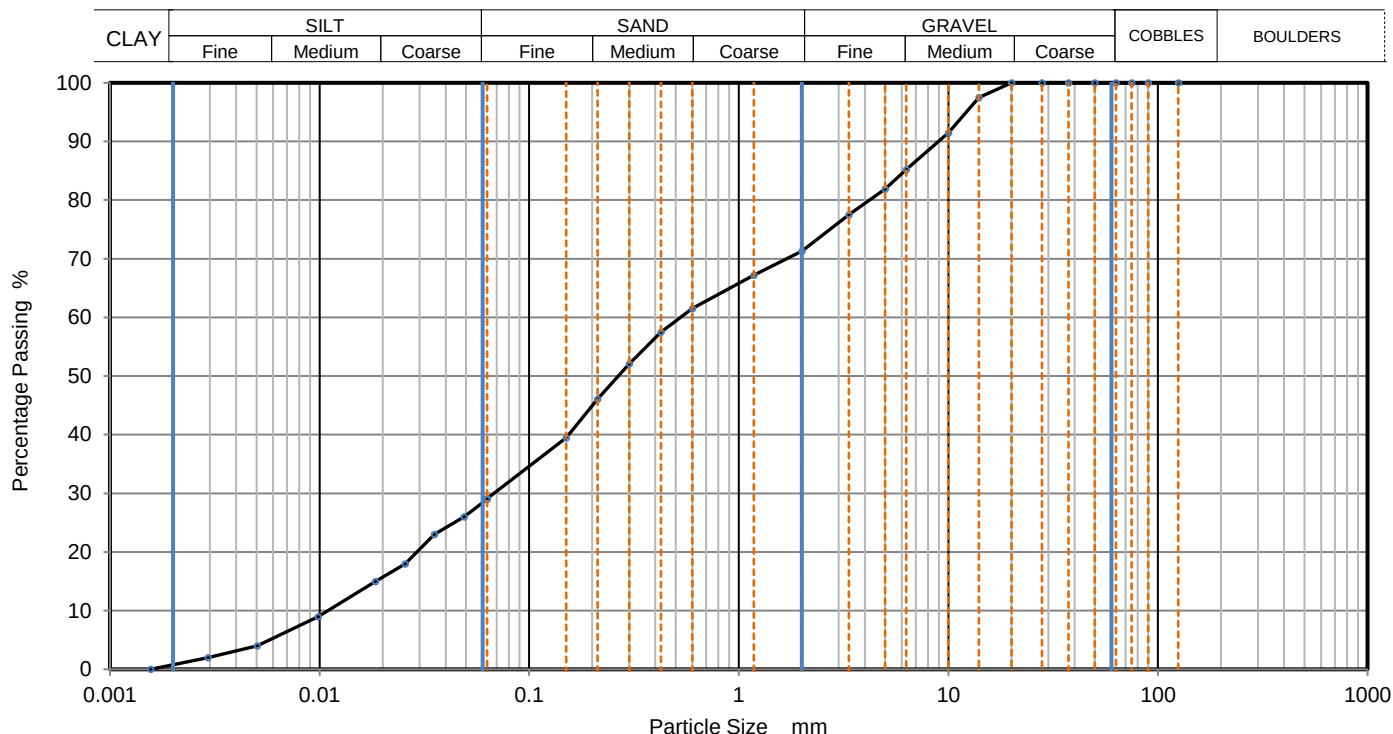
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121728



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	29
90	100	0.04896	26
75	100	0.03531	23
63	100	0.02561	18
50	100	0.01844	15
37.5	100	0.00986	9
28	100	0.00504	4
20	100	0.00294	2
14	98	0.00156	0
10	92		
6.3	85		
5	82		
3.35	78		
2	71		
1.18	67		
0.6	62	Particle density (assumed) 2.65 Mg/m ³	
0.425	58		
0.3	52		
0.212	46		
0.15	40		
0.063	29		

Dry Mass of sample, g

388

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	28.7
Sand	42.3
Silt	28.2
Clay	0.8

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	47
Curvature Coefficient	0.78

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

Approved

Stephen Watson

LAB 30R - Version 1



10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP02

Site Name

GreenGate BioGas

Sample No.

1

Specimen Description

Grey sandy slightly gravelly silty CLAY.

Sample
Depth (m)Top
Base

0.50

Specimen Reference

10

Specimen
Depth

0.5

m

Sample Type

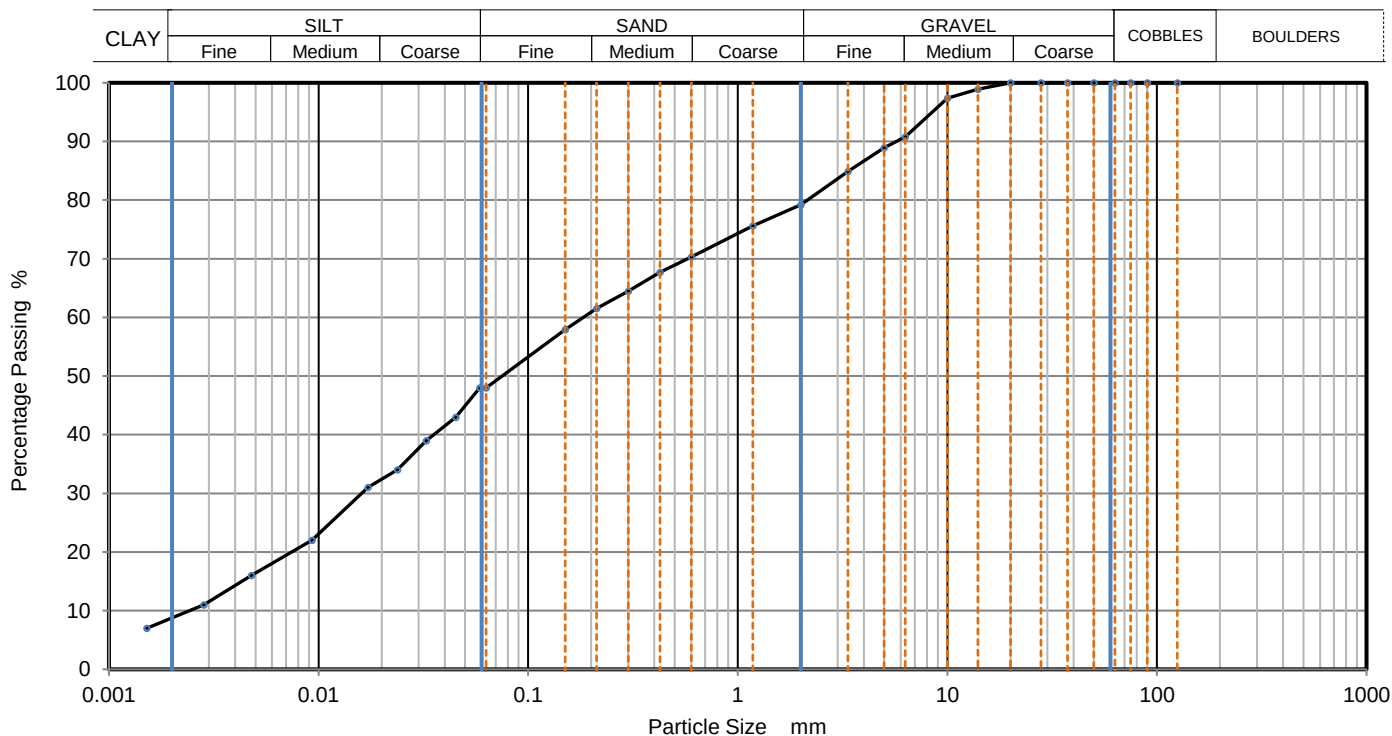
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121729



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.05881	48
90	100	0.04518	43
75	100	0.03270	39
63	100	0.02381	34
50	100	0.01719	31
37.5	100	0.00929	22
28	100	0.00479	16
20	100	0.00283	11
14	99	0.00151	7
10	97		
6.3	91		
5	89		
3.35	85		
2	79		
1.18	76		
0.6	70	Particle density (assumed) 2.65 Mg/m ³	
0.425	68		
0.3	65		
0.212	62		
0.15	58		
0.063	48		

Dry Mass of sample, g

385

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	20.8
Sand	31.2
Silt	39.0
Clay	9.0

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	78
Curvature Coefficient	0.61

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



Approved

Stephen Watson

LAB 30R - Version 1

10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP02

Site Name

GreenGate BioGas

Sample No.

8

Specimen Description

Grey gravelly slightly silty fine to coarse SAND.

Sample
Depth (m)

Top

3.50

Base

Specimen Reference

6

Specimen
Depth

3.5

m

Sample Type

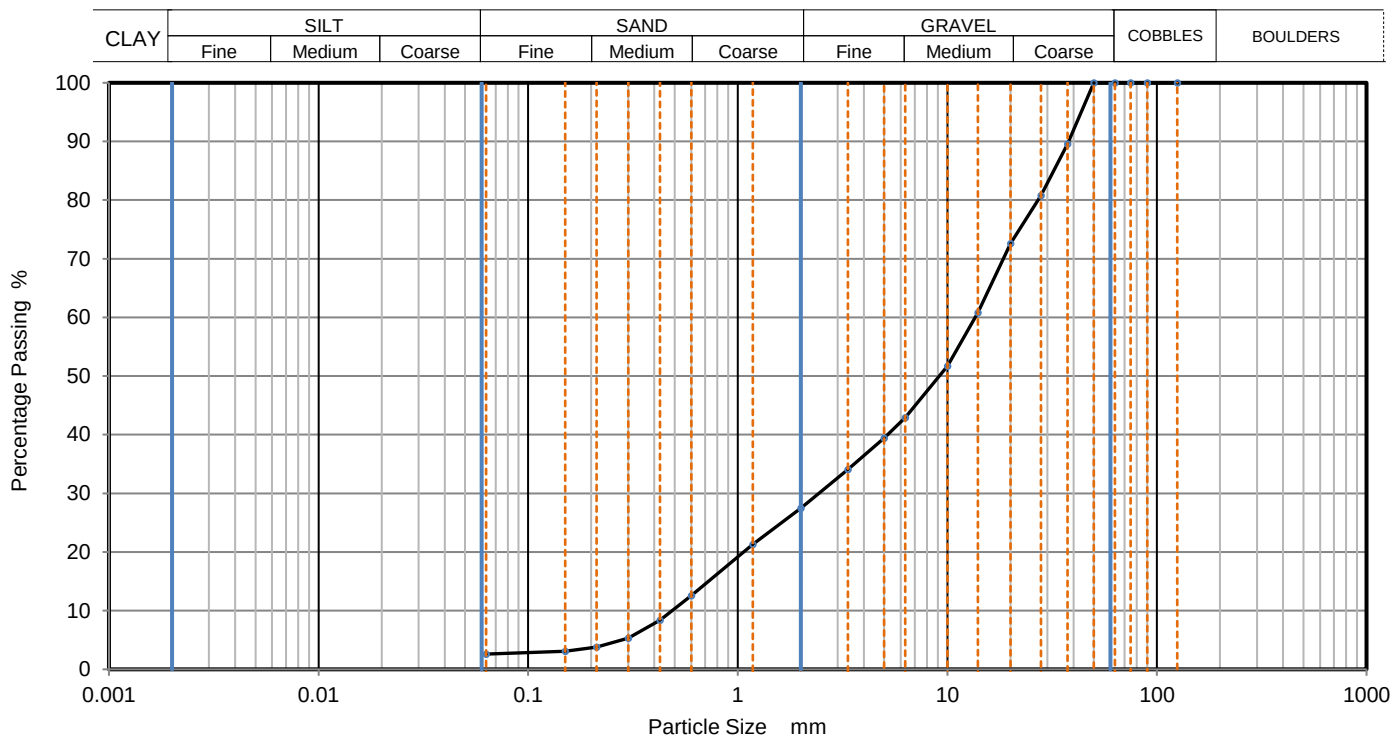
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121732



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	90		
28	81		
20	73		
14	61		
10	52		
6.3	43		
5	39		
3.35	34		
2	28		
1.18	21		
0.6	13		
0.425	8		
0.3	5		
0.212	4		
0.15	3		
0.063	3		

Dry Mass of sample, g

3769

Sample Proportions

% dry mass

Cobbles	0.0
Gravel	72.5
Sand	24.9
Fines <0.063mm	3.0

Grading Analysis

D100	mm	
D60	mm	13.6
D30	mm	2.43
D10	mm	0.484
Uniformity Coefficient		28
Curvature Coefficient		0.9

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

Approved

Stephen Watson

LAB 30R - Version 1



10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP03

Site Name

GreenGate BioGas

Sample No.

4

Specimen Description

Brown gravelly slightly silty fine to coarse SAND.

Sample
Depth (m)Top
Base

1.50

Specimen Reference

8

Specimen
Depth

1.5

m

Sample Type

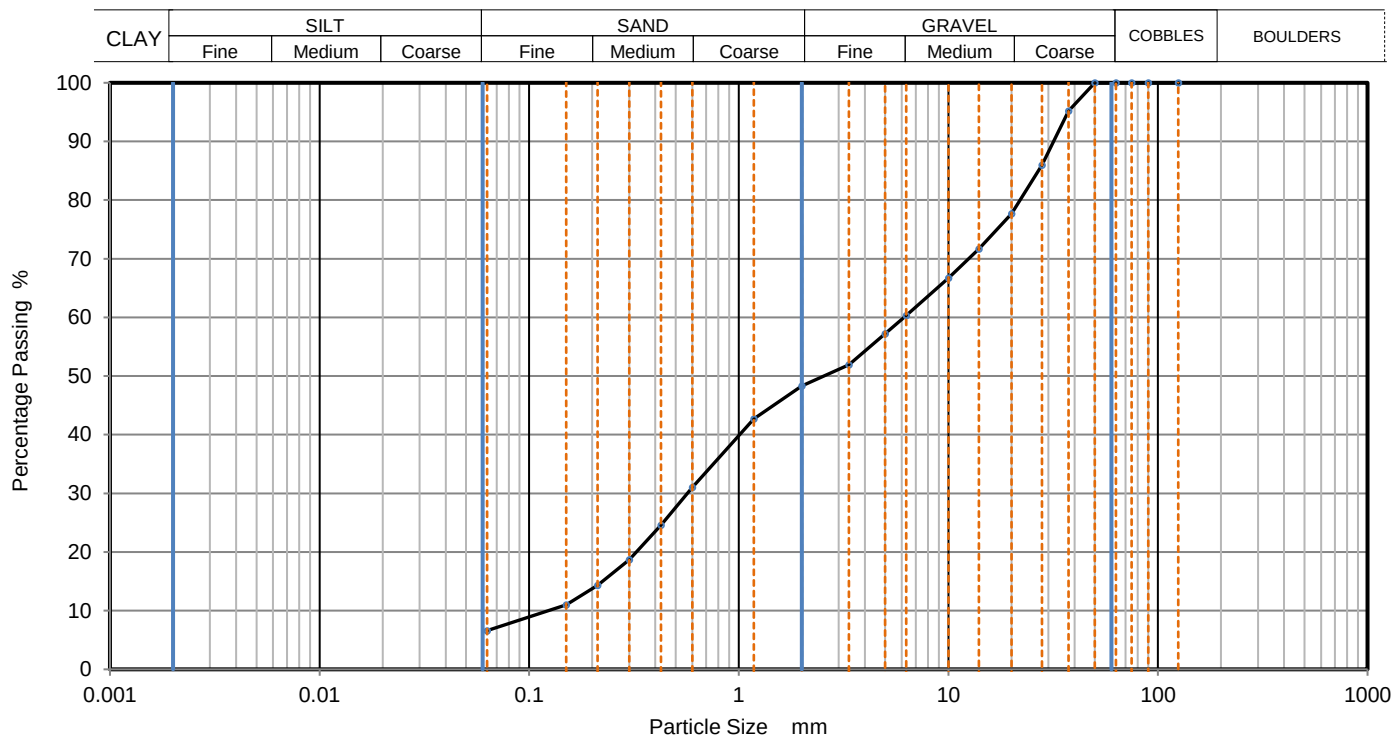
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121733



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	86		
20	78		
14	72		
10	67		
6.3	60		
5	57		
3.35	52		
2	48		
1.18	43		
0.6	31		
0.425	25		
0.3	19		
0.212	14		
0.15	11		
0.063	7		

Dry Mass of sample, g

3542

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	51.7
Sand	41.8
Fines <0.063mm	7.0

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	50
Curvature Coefficient	0.42

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



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Stephen Watson

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10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP04

Site Name

GreenGate BioGas

Sample No.

4

Specimen Description

Brown sandy slightly gravelly silty CLAY.

Sample
Depth (m)Top
Base

1.50

Specimen Reference

10

Specimen
Depth

1.5

m

Sample Type

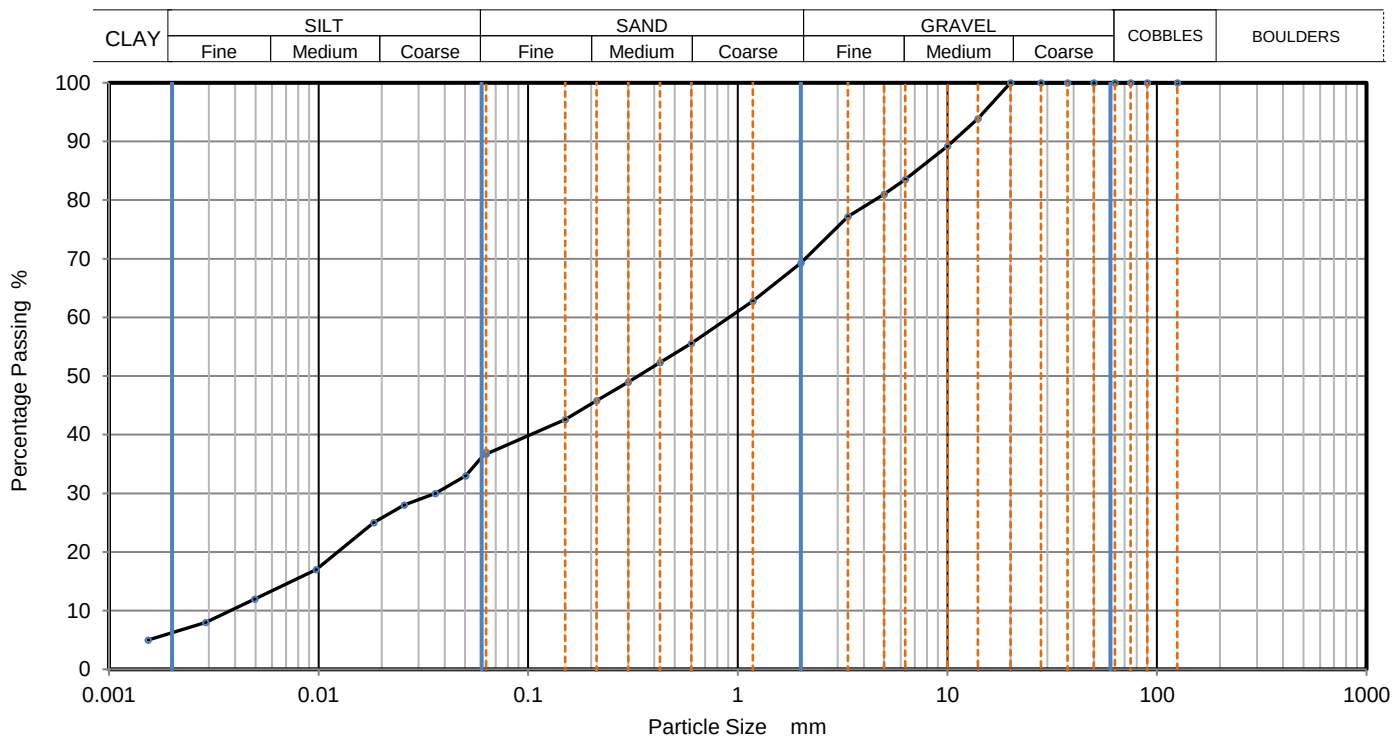
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121735



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	37
90	100	0.05026	33
75	100	0.03599	30
63	100	0.02561	28
50	100	0.01833	25
37.5	100	0.00975	17
28	100	0.00495	12
20	100	0.00289	8
14	94	0.00154	5
10	89		
6.3	84		
5	81		
3.35	77		
2	69		
1.18	63		
0.6	56	Particle density (assumed) 2.65 Mg/m3	
0.425	52		
0.3	49		
0.212	46		
0.15	43		
0.063	37		

Dry Mass of sample, g

457

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	30.7
Sand	32.6
Silt	30.3
Clay	6.4

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	240
Curvature Coefficient	0.37

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

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Stephen Watson

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PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP04

Site Name

GreenGate BioGas

Sample No.

9

Specimen Description

Brown gravelly slightly silty fine to coarse SAND.

Sample
Depth (m)Top
Base

4.00

Specimen Reference

6

Specimen
Depth

4

m

Sample Type

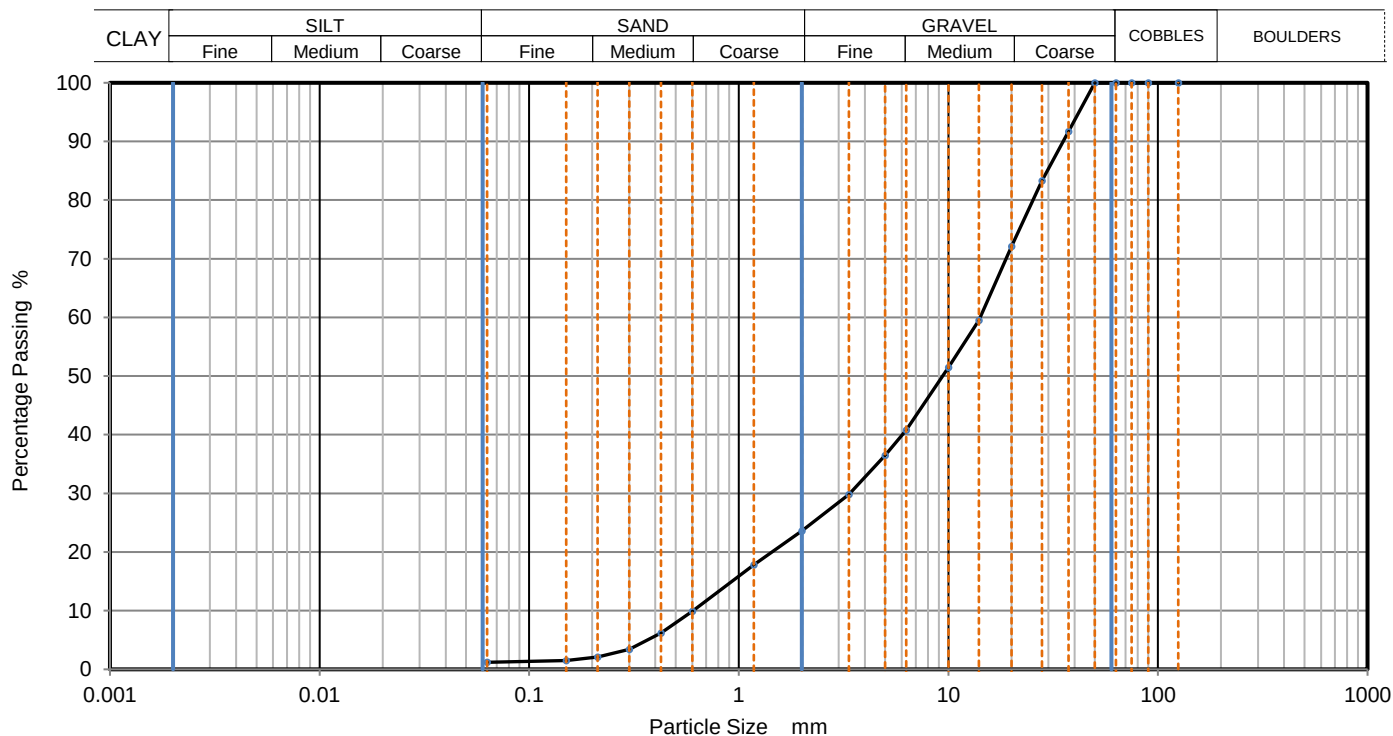
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121736



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	92		
28	83		
20	72		
14	60		
10	52		
6.3	41		
5	37		
3.35	30		
2	24		
1.18	18		
0.6	10		
0.425	6		
0.3	3		
0.212	2		
0.15	2		
0.063	1		

Dry Mass of sample, g

3705

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	76.4
Sand	22.4
Fines <0.063mm	1.0

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	23
Curvature Coefficient	1.3

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

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10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP05

Site Name

GreenGate BioGas

Sample No.

1

Specimen Description

Brown gravelly slightly silty fine to coarse SAND.

Sample
Depth (m)Top
Base

0.50

Specimen Reference

6

Specimen
Depth

0.5

m

Sample Type

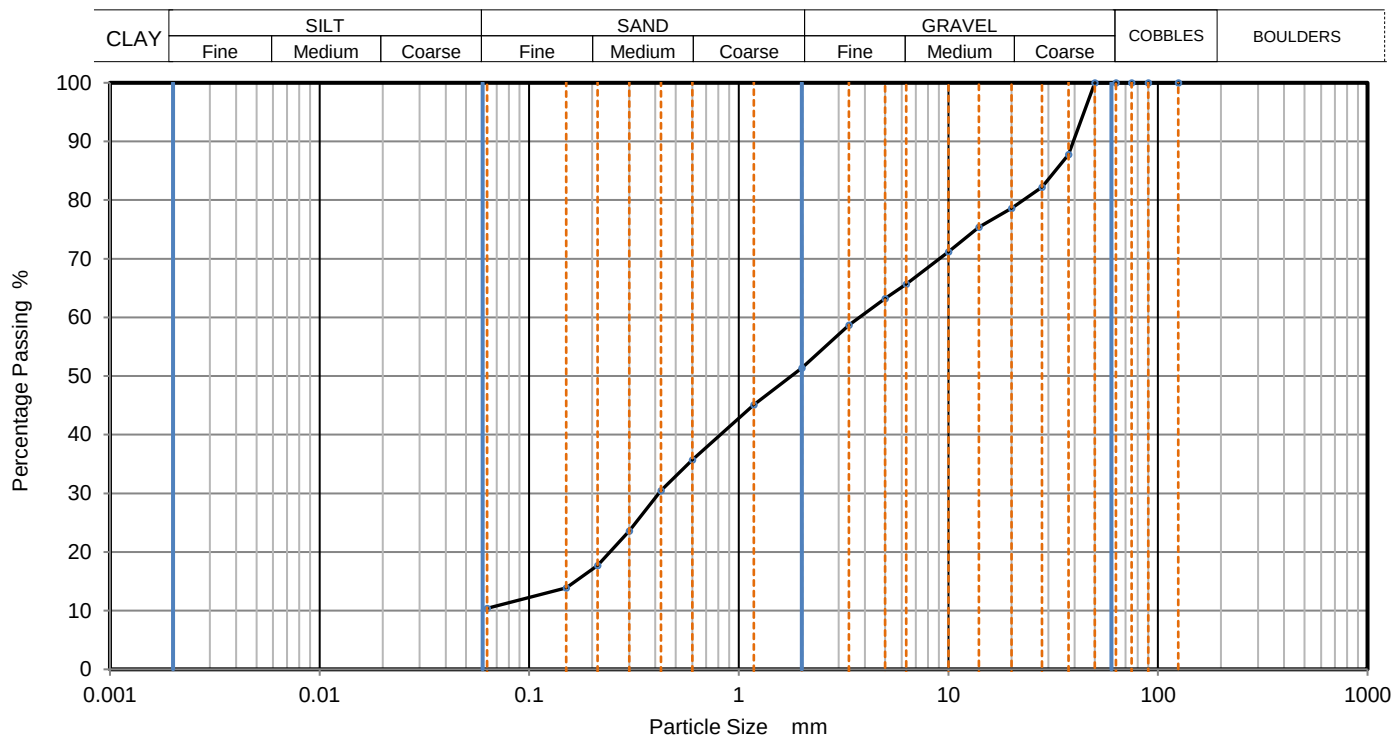
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121737



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	82		
20	79		
14	75		
10	71		
6.3	66		
5	63		
3.35	59		
2	51		
1.18	45		
0.6	36		
0.425	31		
0.3	24		
0.212	18		
0.15	14		
0.063	10		

Dry Mass of sample, g

4350

Sample Proportions

% dry mass

Cobbles	0.0
Gravel	48.6
Sand	41.0
Fines <0.063mm	10.0

Grading Analysis

D100	mm	
D60	mm	3.75
D30	mm	0.415
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

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PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP05

Site Name

GreenGate BioGas

Sample No.

7

Specimen Description

Brown sandy slightly gravelly silty CLAY.

Sample
Depth (m)Top
Base

2.50

Specimen Reference

10

Specimen
Depth

2.5

m

Sample Type

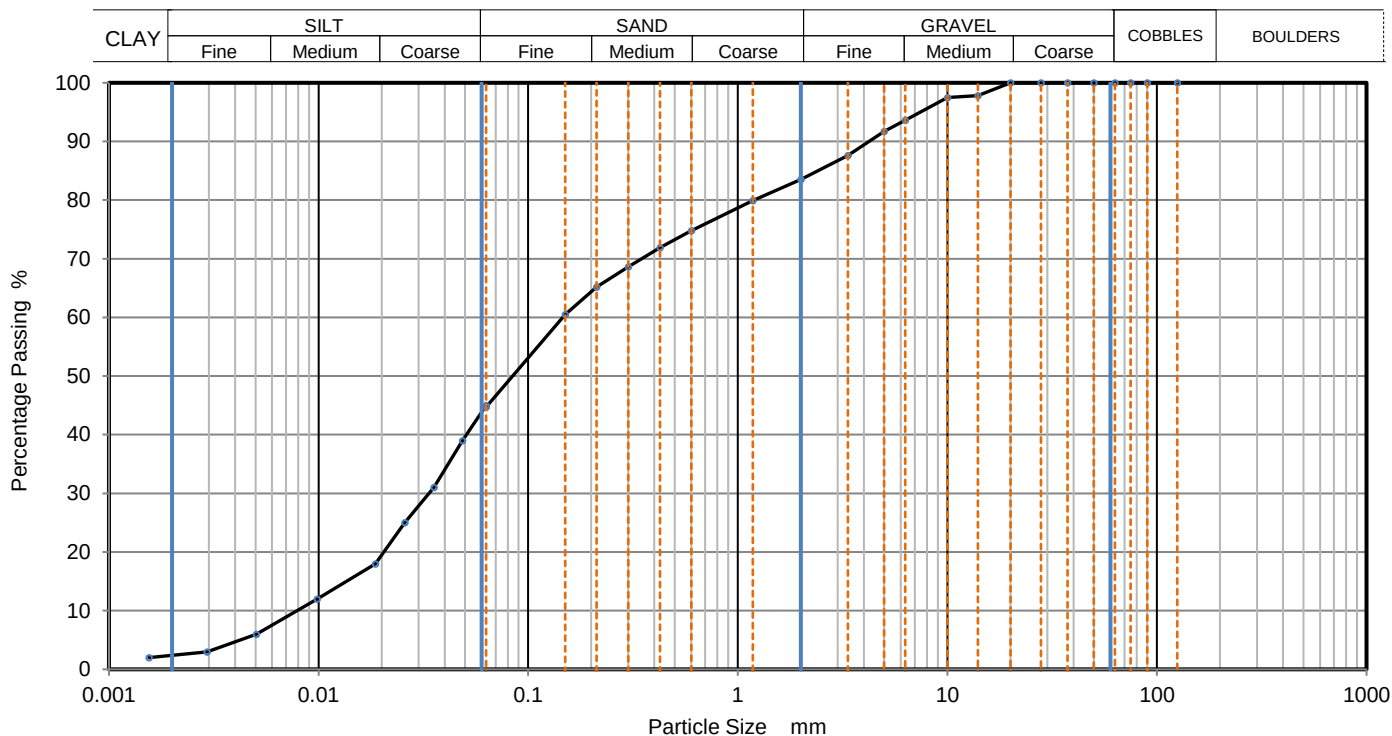
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121738



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	45
90	100	0.04863	39
75	100	0.03554	31
63	100	0.02577	25
50	100	0.01866	18
37.5	100	0.00986	12
28	100	0.00504	6
20	100	0.00294	3
14	98	0.00155	2
10	98		
6.3	94		
5	92		
3.35	88		
2	84		
1.18	80		
0.6	75	Particle density (assumed) 2.65 Mg/m ³	
0.425	72		
0.3	69		
0.212	65		
0.15	61		
0.063	45		

Dry Mass of sample, g

371

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	16.5
Sand	38.8
Silt	42.5
Clay	2.2

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	19
Curvature Coefficient	1

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



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PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP06

Site Name

GreenGate BioGas

Sample No.

9

Specimen Description

Brown sandy slightly gravelly silty CLAY.

Sample
Depth (m)Top
Base

4.50

Specimen Reference

10

Specimen
Depth

4.5

m

Sample Type

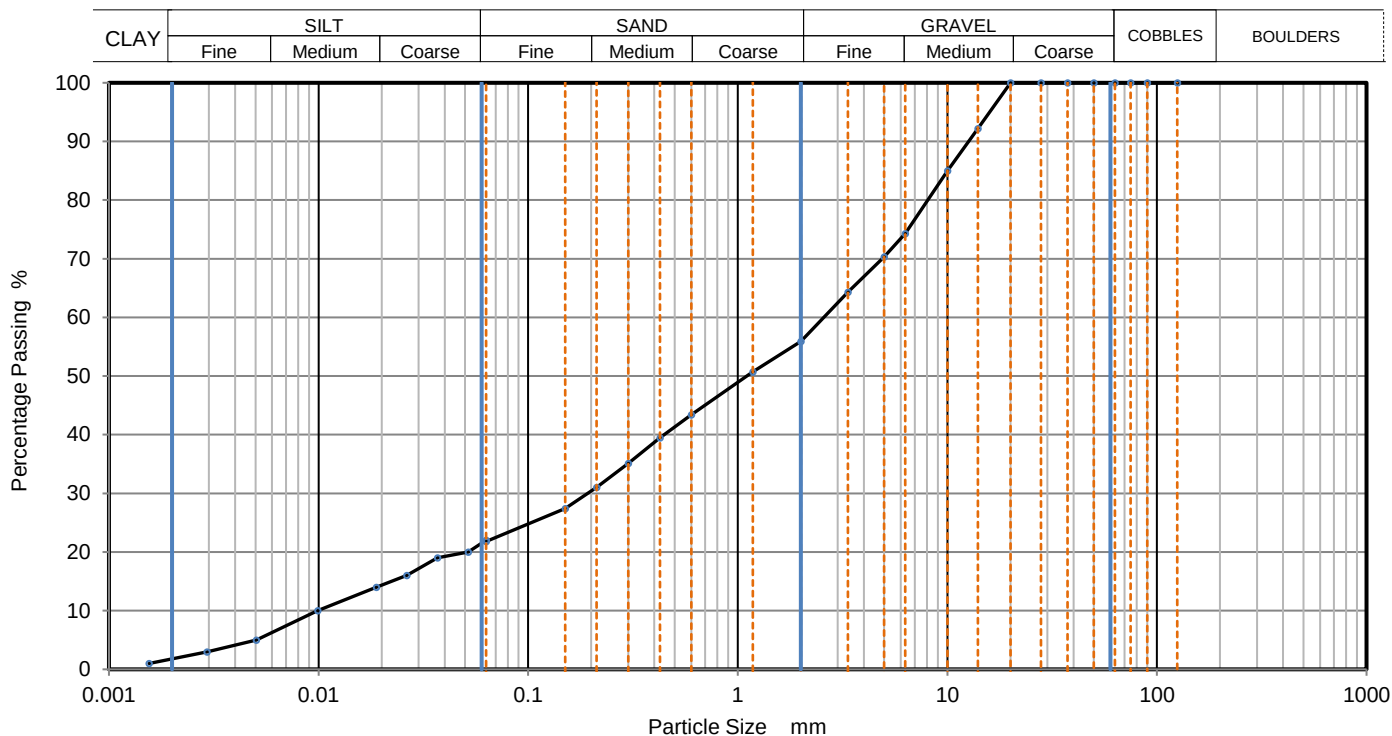
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121740



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	22
90	100	0.05184	20
75	100	0.03688	19
63	100	0.02638	16
50	100	0.01887	14
37.5	100	0.00991	10
28	100	0.00504	5
20	100	0.00294	3
14	92	0.00155	1
10	85		
6.3	74		
5	70		
3.35	64		
2	56		
1.18	51		
0.6	43	Particle density (assumed) 2.65 Mg/m ³	
0.425	40		
0.3	35		
0.212	31		
0.15	27		
0.063	22		

Dry Mass of sample, g

410

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	44.1
Sand	34.1
Silt	19.9
Clay	1.9

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	240
Curvature Coefficient	1.3

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



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LAB 30R - Version 1

10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP07

Site Name

GreenGate BioGas

Sample No.

4

Specimen Description

Brown sandy slightly gravelly silty CLAY.

Sample
Depth (m)Top
Base

1.50

Specimen Reference

10

Specimen
Depth

1.5

m

Sample Type

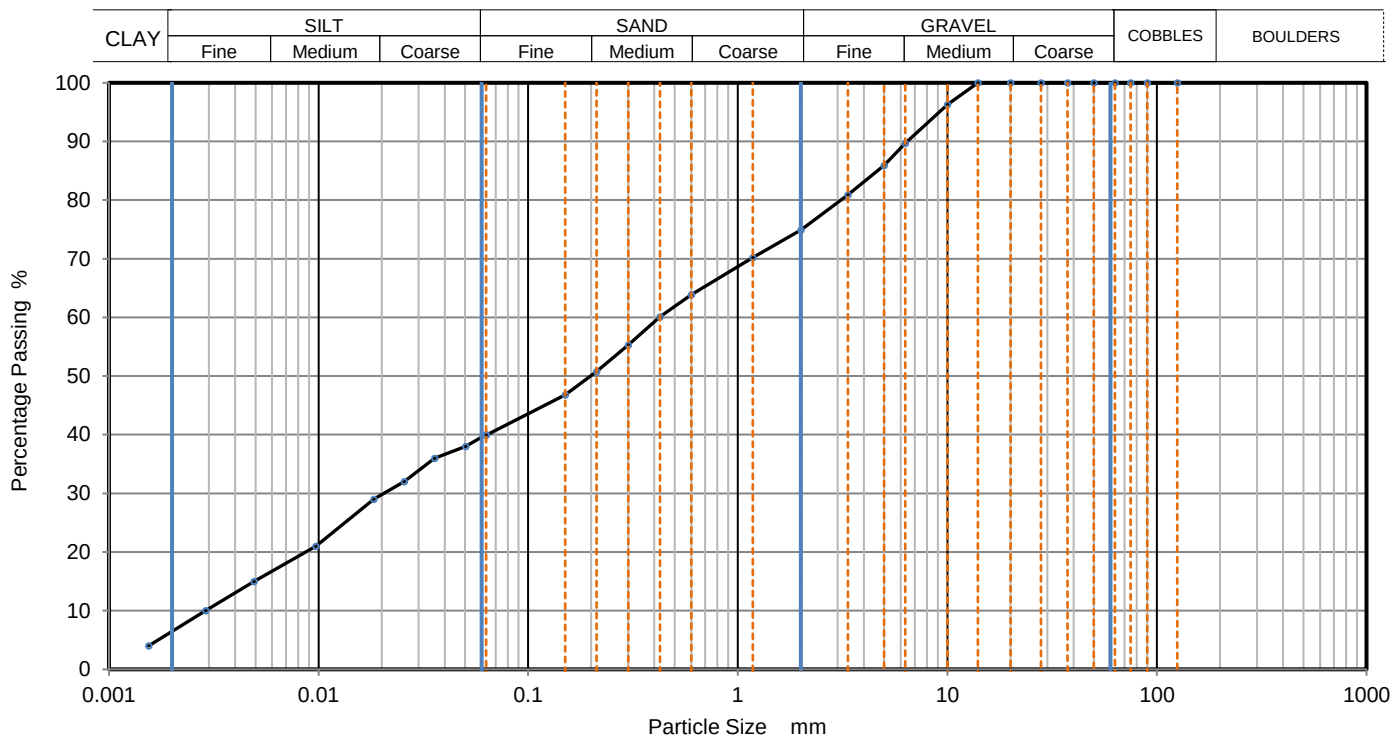
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121742



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	40
90	100	0.05026	38
75	100	0.03577	36
63	100	0.02561	32
50	100	0.01833	29
37.5	100	0.00969	21
28	100	0.00493	15
20	100	0.00289	10
14	100	0.00155	4
10	96		
6.3	90		
5	86		
3.35	81		
2	75		
1.18	70		
0.6	64	Particle density (assumed) 2.65 Mg/m3	
0.425	60		
0.3	55		
0.212	51		
0.15	47		
0.063	40		

Dry Mass of sample, g

407

Sample Proportions

% dry mass

Cobbles	0.0
Gravel	25.1
Sand	35.0
Silt	33.8
Clay	6.1

Grading Analysis

D100	mm	
D60	mm	0.422
D30	mm	0.0209
D10	mm	0.00303
Uniformity Coefficient		140
Curvature Coefficient		0.34

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

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10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP08

Site Name

GreenGate BioGas

Sample No.

7

Specimen Description

Brown sandy gravelly silty CLAY.

Sample
Depth (m)Top
Base

1.50

Specimen Reference

6

Specimen
Depth

1.5

m

Sample Type

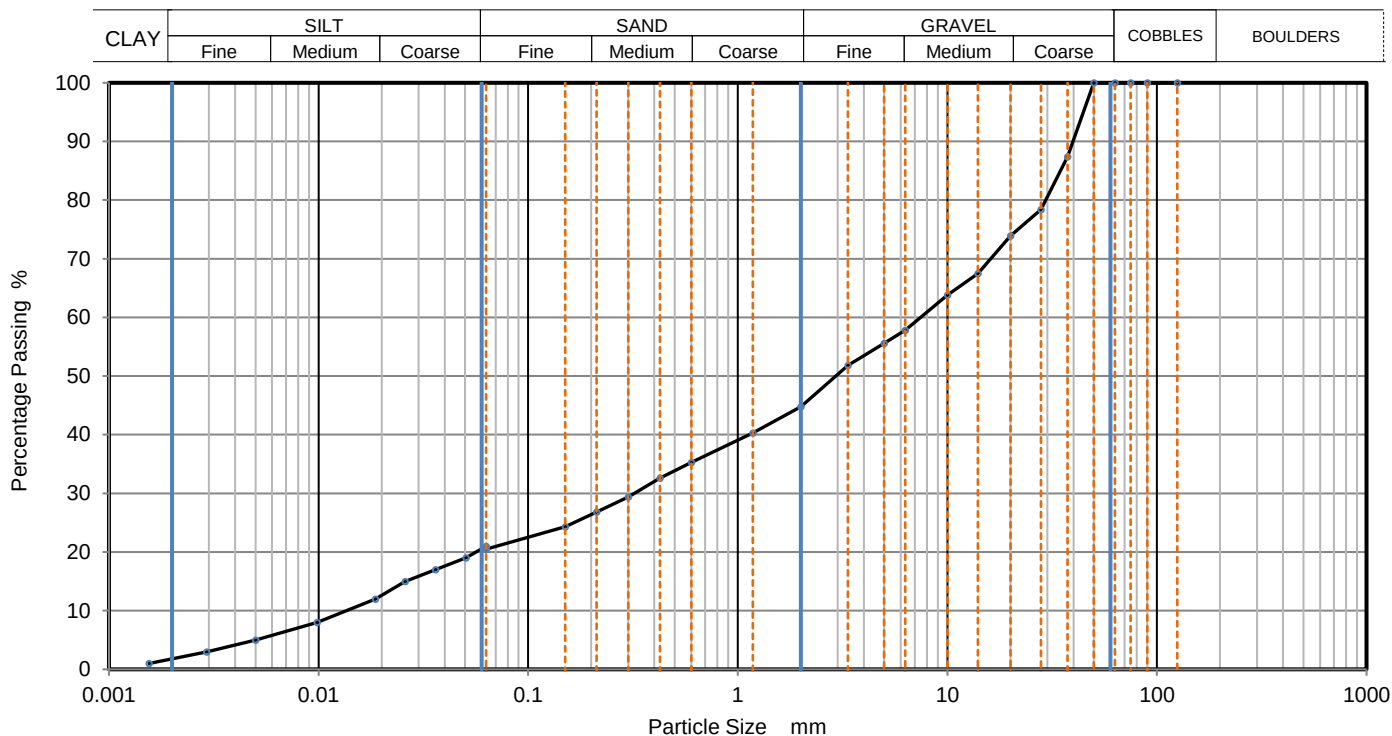
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121743



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	21
90	100	0.05058	19
75	100	0.03621	17
63	100	0.02592	15
50	100	0.01866	12
37.5	87	0.00986	8
28	78	0.00501	5
20	74	0.00292	3
14	68	0.00155	1
10	64		
6.3	58		
5	56		
3.35	52		
2	45		
1.18	40		
0.6	35	Particle density (assumed) 2.65 Mg/m ³	
0.425	33		
0.3	29		
0.212	27		
0.15	24		
0.063	21		

Dry Mass of sample, g

3558

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	55.2
Sand	24.2
Silt	18.8
Clay	1.8

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	530
Curvature Coefficient	0.97

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



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LAB 30R - Version 1

10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP08

Site Name

GreenGate BioGas

Sample No.

10

Specimen Description

Brown sandy slightly gravelly silty CLAY.

Sample
Depth (m)Top
Base

4.20

Specimen Reference

6

Specimen
Depth

4.2

m

Sample Type

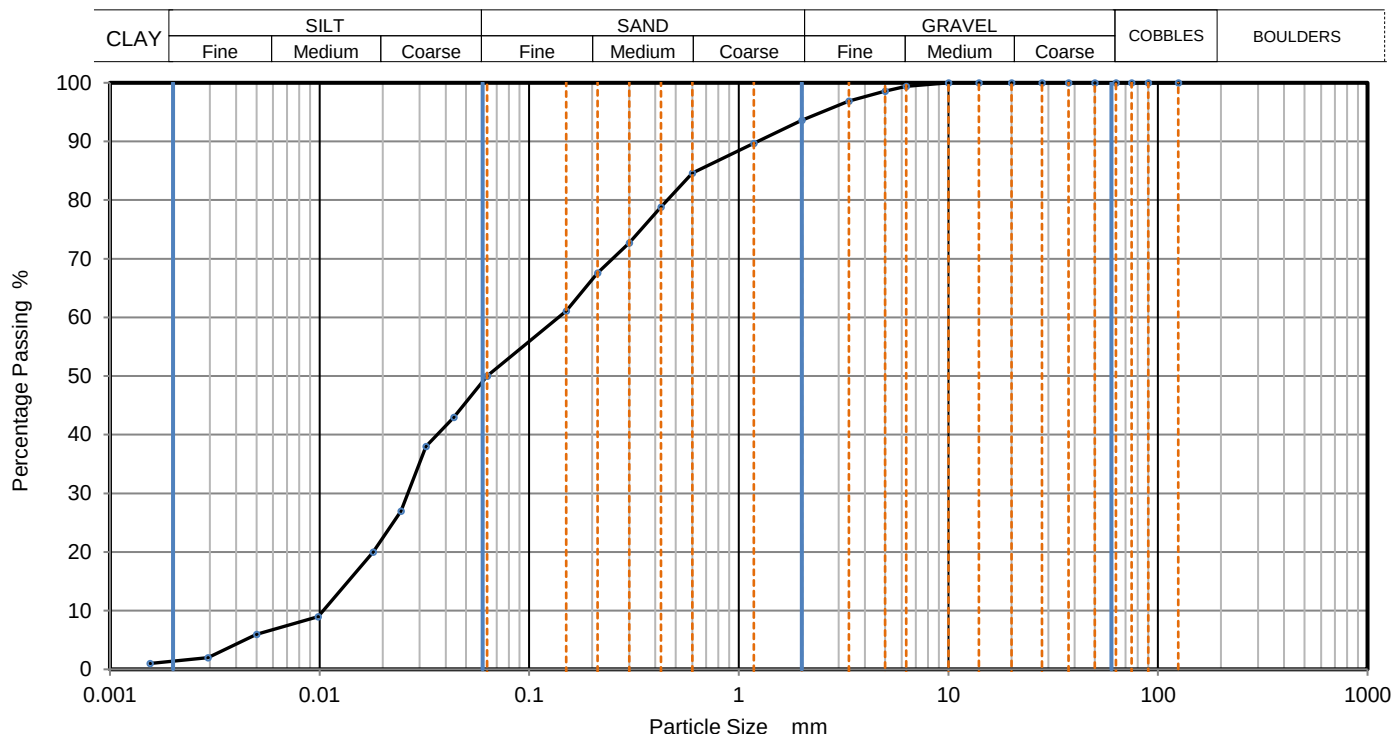
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121744



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	50
90	100	0.04373	43
75	100	0.03220	38
63	100	0.02448	27
50	100	0.01800	20
37.5	100	0.00986	9
28	100	0.00501	6
20	100	0.00294	2
14	100	0.00155	1
10	100		
6.3	99		
5	99		
3.35	97		
2	94		
1.18	90		
0.6	85	Particle density (assumed) 2.65 Mg/m ³	
0.425	79		
0.3	73		
0.212	68		
0.15	61		
0.063	50		

Dry Mass of sample, g

370

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	6.4
Sand	43.6
Silt	48.4
Clay	1.6

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	13
Curvature Coefficient	0.49

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



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10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP09

Site Name

GreenGate BioGas

Sample No.

4

Specimen Description

Brown slightly gravelly silty fine to coarse SAND.

Sample
Depth (m)Top
Base

1.50

Specimen Reference

10

Specimen
Depth

1.5

m

Sample Type

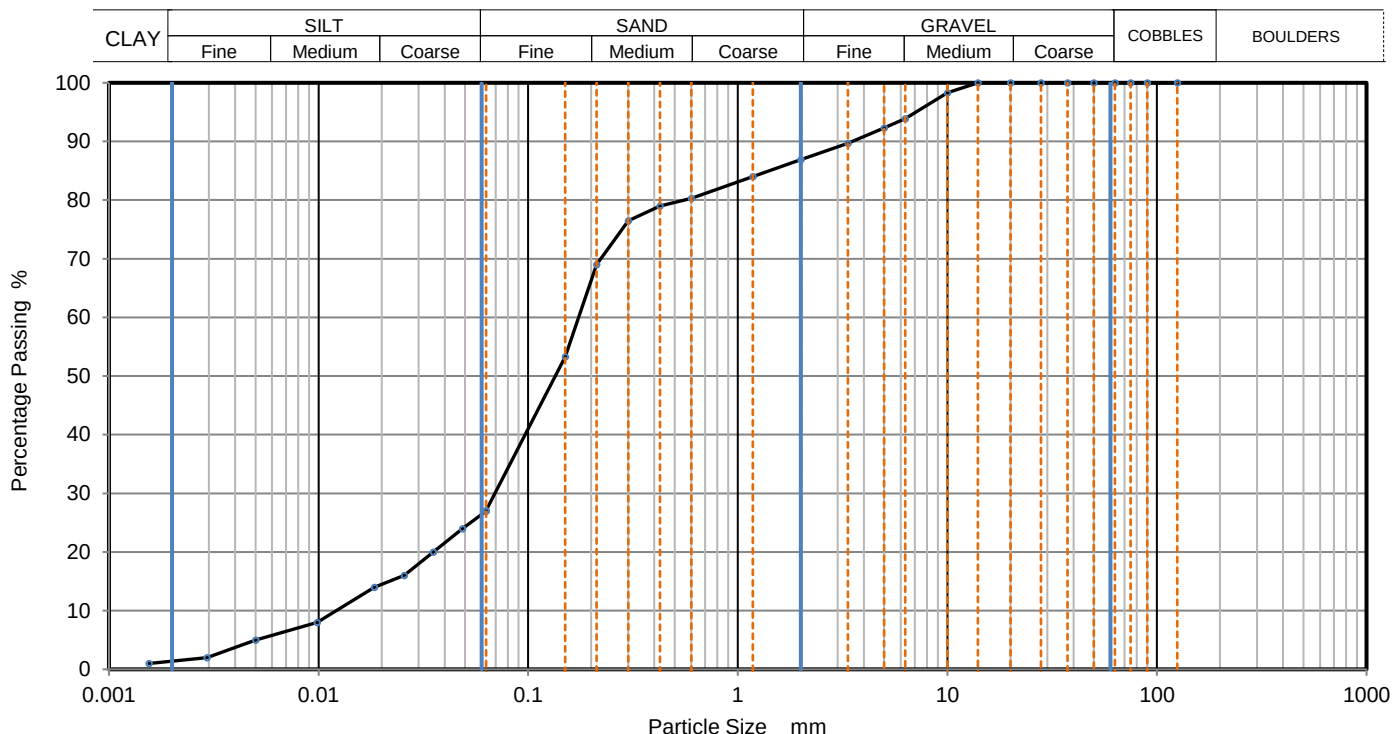
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121745



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	27
90	100	0.04863	24
75	100	0.03531	20
63	100	0.02561	16
50	100	0.01844	14
37.5	100	0.00986	8
28	100	0.00501	5
20	100	0.00294	2
14	100	0.00155	1
10	98		
6.3	94		
5	92		
3.35	90		
2	87		
1.18	84		
0.6	80	Particle density (assumed) 2.65 Mg/m ³	
0.425	79		
0.3	77		
0.212	69		
0.15	53		
0.063	27		

Dry Mass of sample, g

376

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	13.1
Sand	59.8
Silt	25.7
Clay	1.4

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	14
Curvature Coefficient	2.2

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



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PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP10

Site Name

GreenGate BioGas

Sample No.

6

Specimen Description

Brown sandy gravelly silty CLAY.

Sample
Depth (m)Top
Base

0.90

Specimen Reference

6

Specimen
Depth

0.9

m

Sample Type

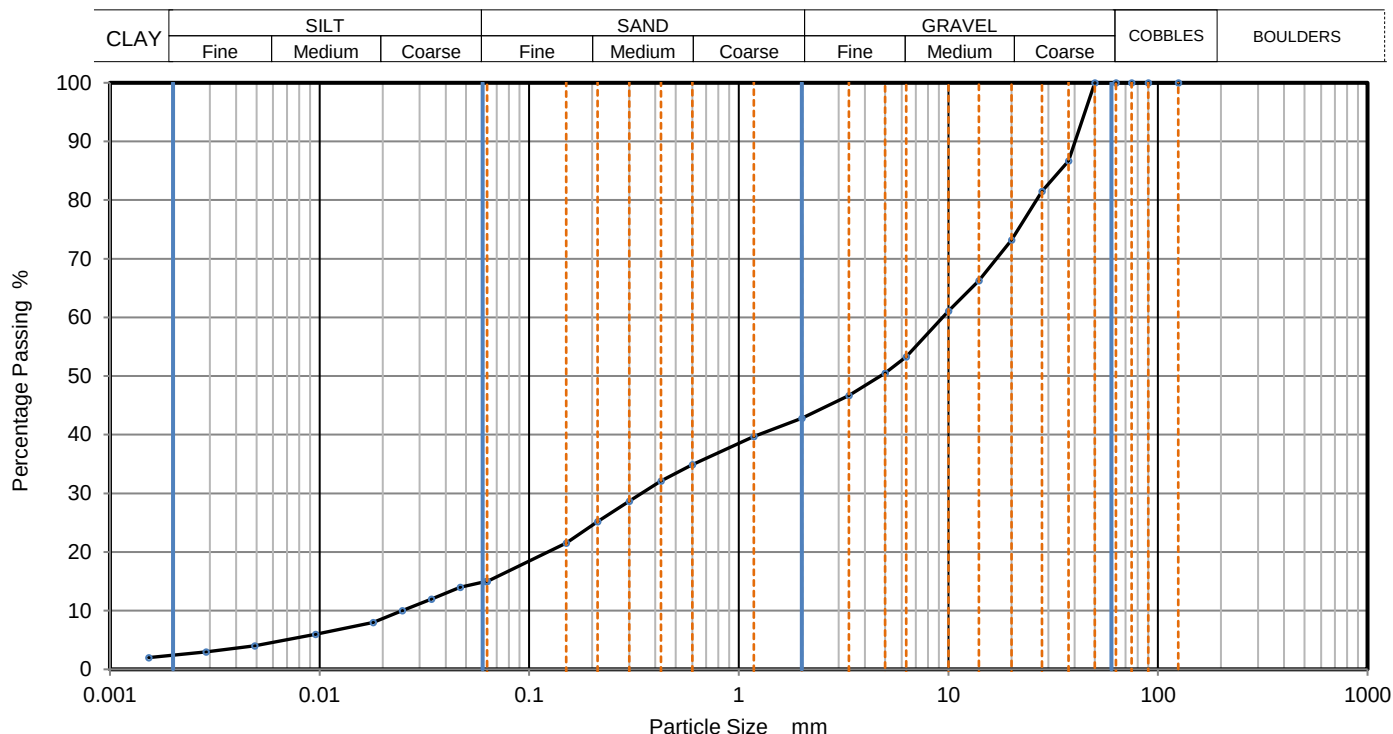
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121746



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06219	15
90	100	0.04694	14
75	100	0.03415	12
63	100	0.02481	10
50	100	0.01800	8
37.5	87	0.00958	6
28	82	0.00490	4
20	73	0.00288	3
14	66	0.00153	2
10	61		
6.3	53		
5	51		
3.35	47		
2	43		
1.18	40		
0.6	35	Particle density (assumed) 2.65 Mg/m ³	
0.425	32		
0.3	29		
0.212	25		
0.15	22		
0.063	15		

Dry Mass of sample, g

3980

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	57.2
Sand	27.8
Silt	12.7
Clay	2.3

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	400
Curvature Coefficient	0.54

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



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Stephen Watson

LAB 30R - Version 1

10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP11

Site Name

GreenGate BioGas

Sample No.

1

Specimen Description

Brown sandy slightly gravelly silty CLAY.

Sample
Depth (m)Top
Base

0.50

Specimen Reference

6

Specimen
Depth

0.5

m

Sample Type

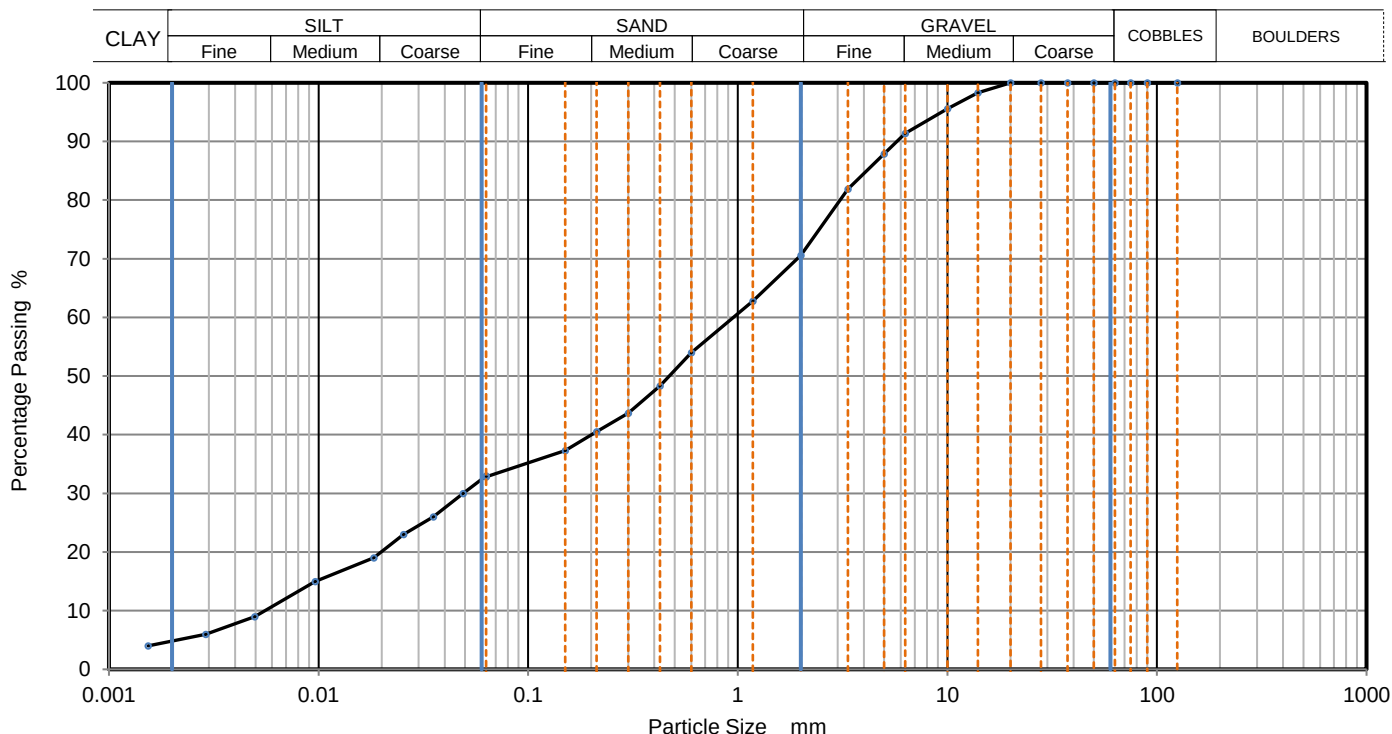
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121747



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	33
90	100	0.04896	30
75	100	0.03531	26
63	100	0.02545	23
50	100	0.01833	19
37.5	100	0.00963	15
28	100	0.00495	9
20	100	0.00289	6
14	98	0.00154	4
10	96		
6.3	91		
5	88		
3.35	82		
2	71		
1.18	63		
0.6	54	Particle density (assumed) 2.65 Mg/m ³	
0.425	48		
0.3	44		
0.212	41		
0.15	37		
0.063	33		

Dry Mass of sample, g

398

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	29.4
Sand	37.8
Silt	28.0
Clay	4.8

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	170
Curvature Coefficient	0.43

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

Approved

Stephen Watson

LAB 30R - Version 1



10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP11

Site Name

GreenGate BioGas

Sample No.

10

Specimen Description

Brown sandy slightly gravelly silty CLAY.

Sample
Depth (m)Top
Base

3.50

Specimen Reference

10

Specimen
Depth

3.5

m

Sample Type

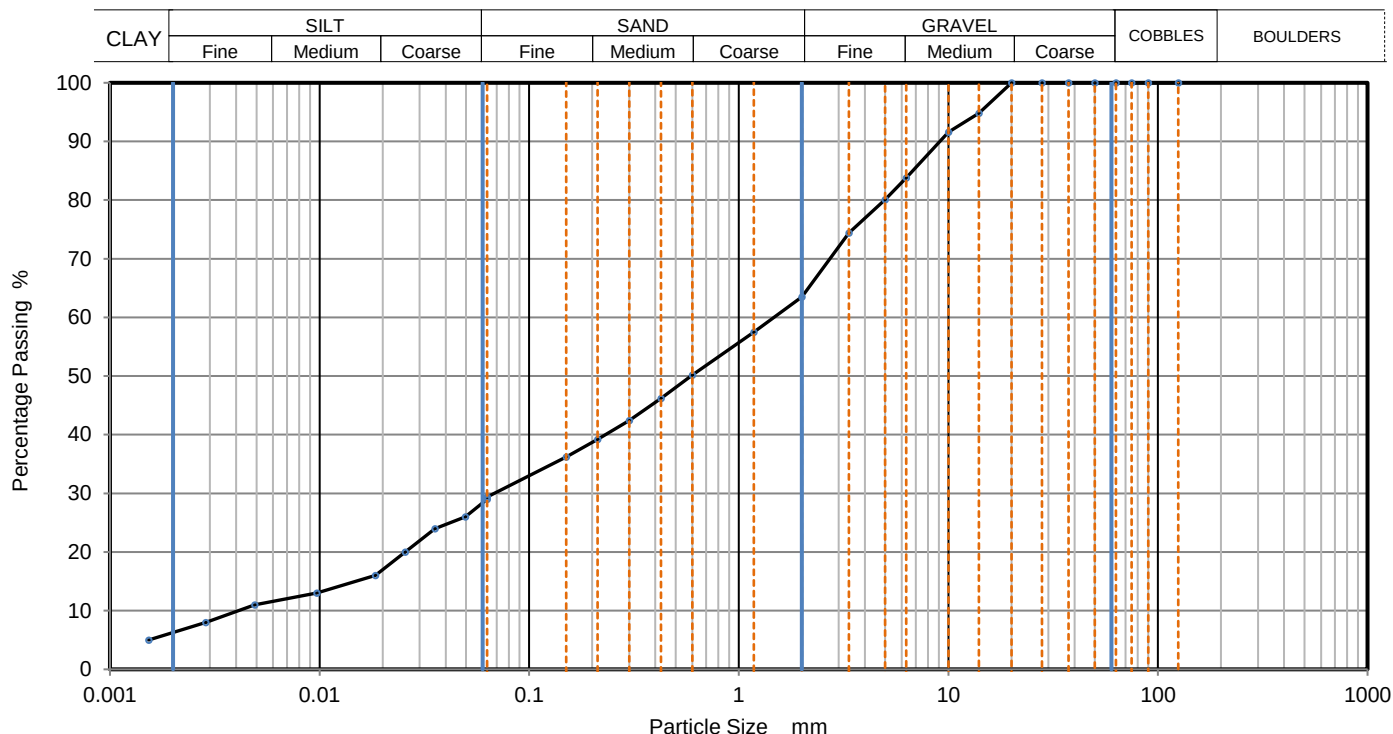
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121748



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	29
90	100	0.04961	26
75	100	0.03554	24
63	100	0.02561	20
50	100	0.01844	16
37.5	100	0.00969	13
28	100	0.00490	11
20	100	0.00286	8
14	95	0.00153	5
10	92		
6.3	84		
5	80		
3.35	74		
2	64		
1.18	58		
0.6	50	Particle density (assumed) 2.65 Mg/m ³	
0.425	46		
0.3	42		
0.212	39		
0.15	36		
0.063	29		

Dry Mass of sample, g

389

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	36.5
Sand	34.1
Silt	23.2
Clay	6.2

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	340
Curvature Coefficient	0.73

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



Approved

Stephen Watson

LAB 30R - Version 1

10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

TP12

Site Name

GreenGate BioGas

Sample No.

4

Specimen Description

Brown slightly sandy subangular fine to coarse GRAVEL with cobbles.

Sample
Depth (m)Top
Base

1.50

Specimen Reference

10

Specimen
Depth

1.5

m

Sample Type

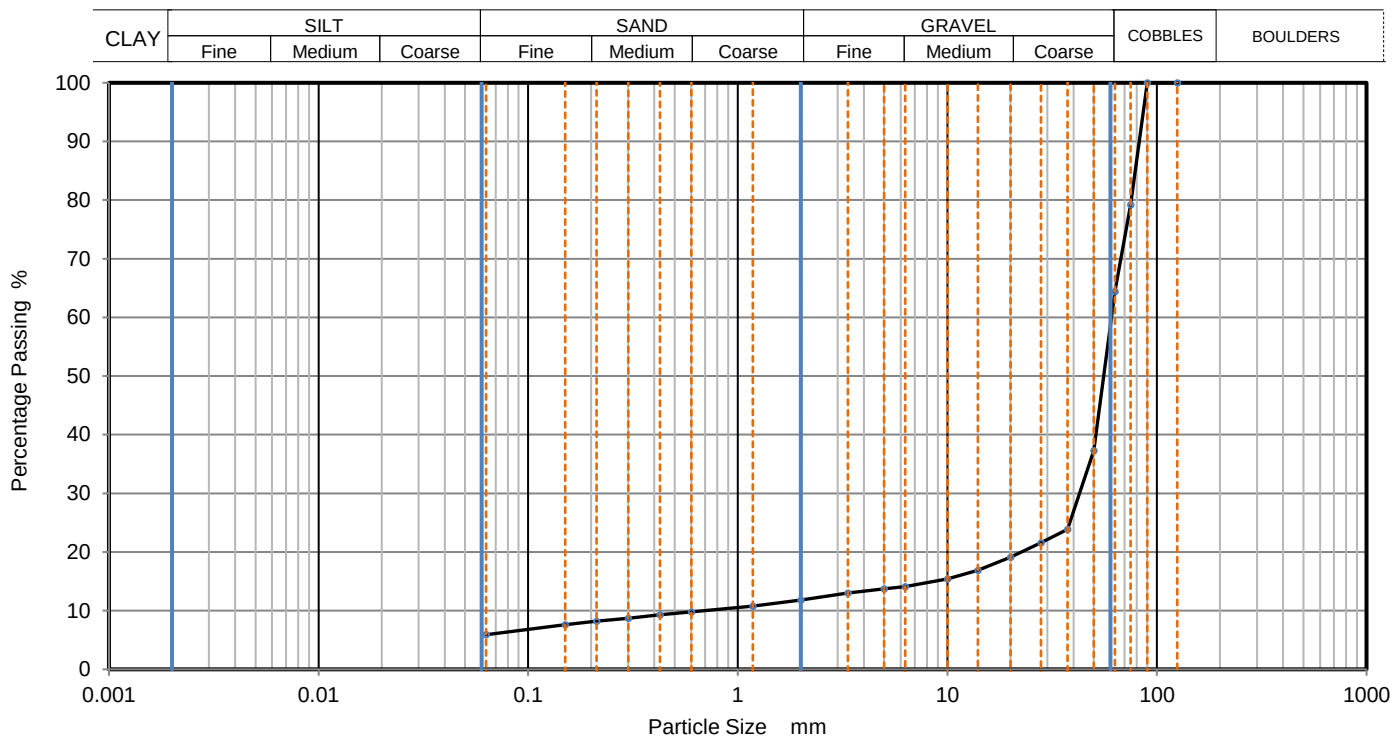
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2024121749



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	79		
63	64		
50	37		
37.5	24		
28	22		
20	19		
14	17		
10	15		
6.3	14		
5	14		
3.35	13		
2	12		
1.18	11		
0.6	10		
0.425	9		
0.3	9		
0.212	8		
0.15	8		
0.063	6		

Dry Mass of sample, g

11994

Sample Proportions	% dry mass
Cobbles	35.6
Gravel	52.6
Sand	5.9
Fines <0.063mm	6.0

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	86
Curvature Coefficient	43

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



Approved

Stephen Watson

LAB 30R - Version 1

10122



Dry Density / Water Content Relationship Heavy Compaction

Job Ref

24-1562

Borehole / Pit No

TP04

Site Name

GreenGate BioGas

Sample No

1

Specimen Description

Brown sandy gravelly silty CLAY.

Sample
Depth (m)Top
Base

0.50

Specimen Ref.

3

Specimen Depth

m

Sample Type

B

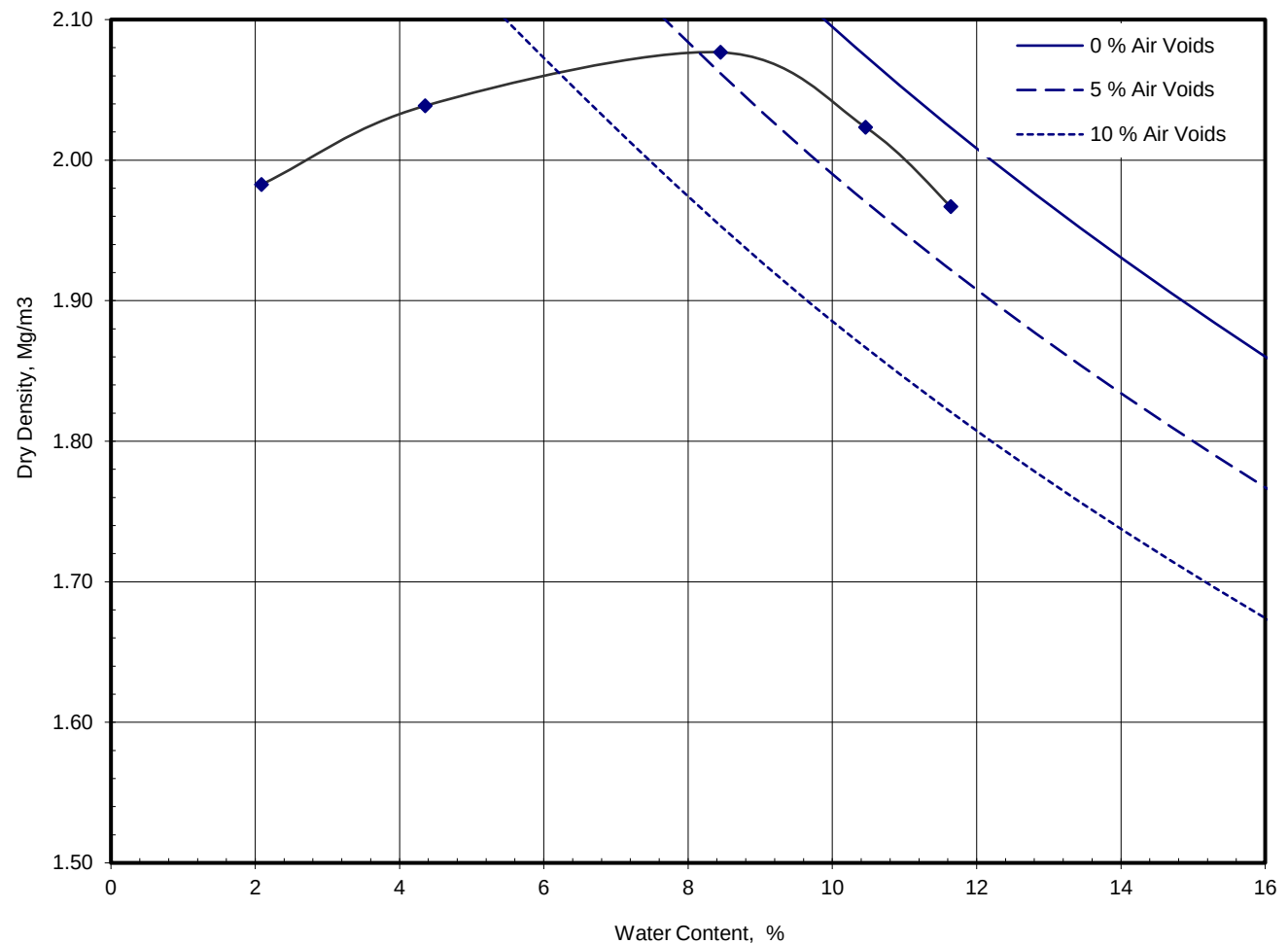
Test Method

BS1377-2: 2022, clause 11.5, 4.5kg rammer

Keylab ID

Caus2024121734

Compaction Test Reference/No.



Preparation	Material used was	air dried
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	12
Material Retained on 20.0 mm Sieve	%	26
Particle Density - Assumed	Mg/m ³	2.65

Maximum Dry Density	Mg/m ³	2.08
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Optimum Water Content	%	8.4
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LAB 32R - Version 1

Approved

Stephen Watson

Remarks





Dry Density / Water Content Relationship Heavy Compaction

Job Ref

24-1562

Borehole / Pit No

TP06

Site Name

GreenGate BioGas

Sample No

7

Specimen Description

Brown sandy gravelly silty CLAY.

Sample
Depth (m)Top
Base

2.50

Specimen Ref.

3

Specimen Depth

m

Sample Type

B

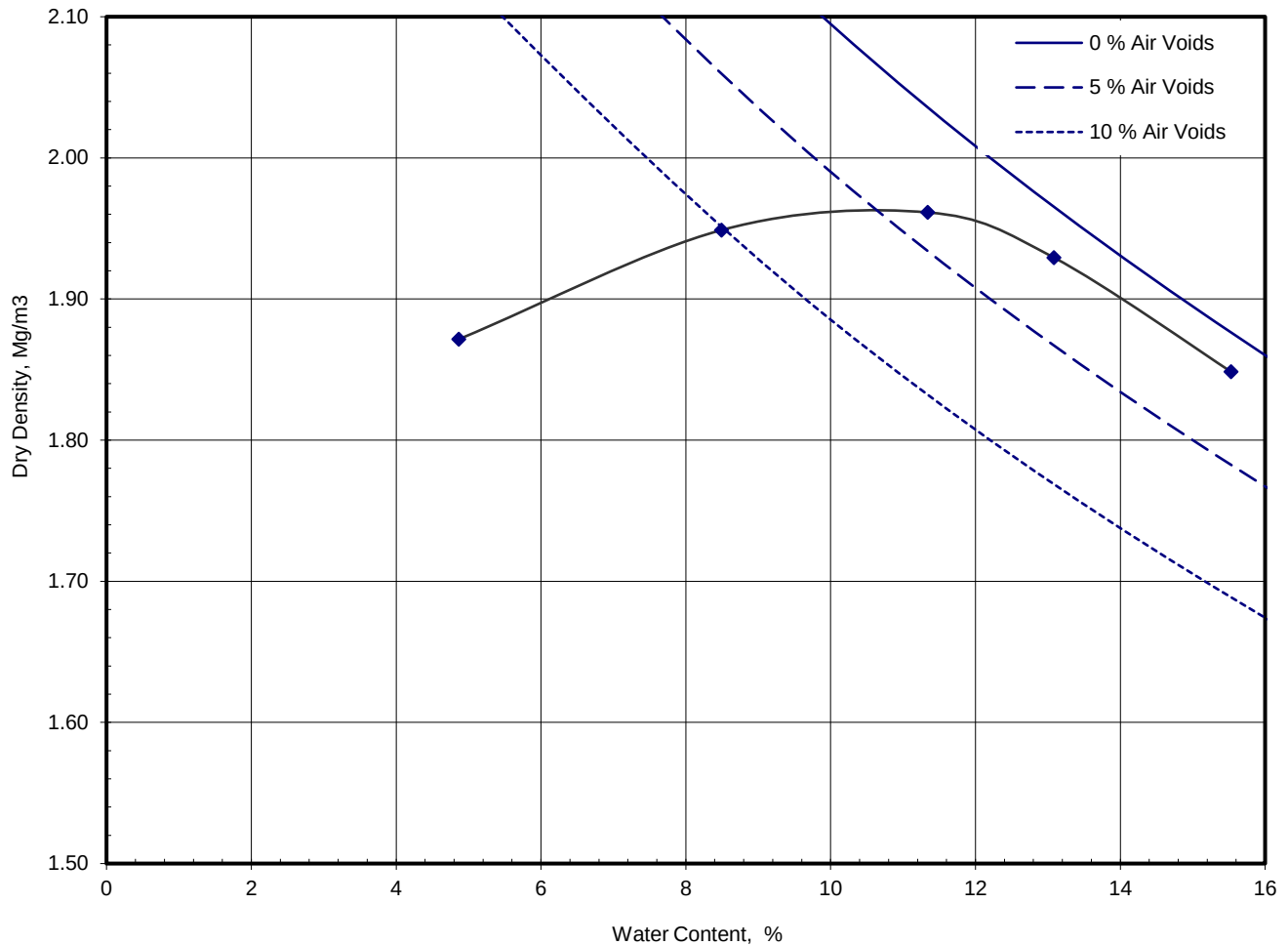
Test Method

BS1377-2: 2022, clause 11.5, 4.5kg rammer

Keylab ID

Caus2024121739

Compaction Test Reference/No.



Preparation	Material used was air dried	
Mould Type	1 Litre	
Samples Used	Single sample tested	
Material Retained on 37.5 mm Sieve	%	25
Material Retained on 20.0 mm Sieve	%	37
Particle Density - Assumed	Mg/m³	2.65

Maximum Dry Density	Mg/m³	1.96
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Optimum Water Content	%	11
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LAB 32R - Version 1

Approved

Stephen Watson

Remarks

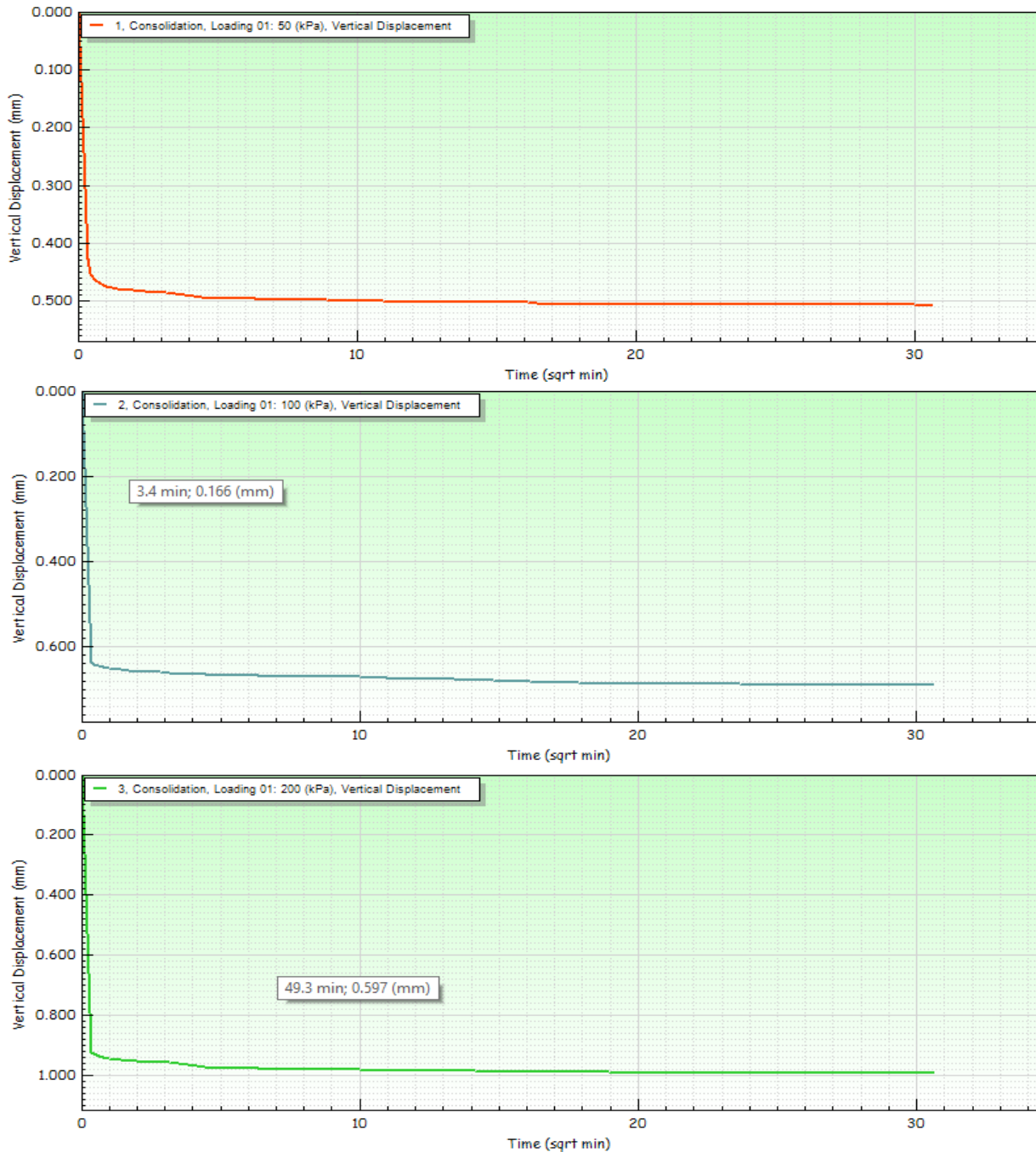


Direct Shear Test BS EN ISO 17892-10:2018				
Project Number	24-1562	Project	GreenGate BioGas	
Location Number	TP01	Sample Reference	4	
Depth (m)	1.50	Sample Submerged?	Yes	No
Sample Type	B	Particle Density (Mg/m ³)	2.65	Assumed
Description	Brown sandy slightly gravelly silty CLAY.			
Sample Preparation	Sample is recompacted using material passing 2mm test sieve			
Stage		1	2	3
Initial Conditions				
Height (mm)		20.0	20.0	20.0
Diameter (mm)		60.0	60.0	60.0
Water Content (%)		12.0	12.0	12.0
Bulk Density (Mg/m ³)		2.10	2.09	2.09
Dry Density (Mg/m ³)		1.87	1.87	1.87
Voids Ratio		0.417	0.419	0.419
Consolidation				
Normal Pressure (kPa)		50	100	200
Vertical Displacement (mm)		0.507	0.691	0.993
Shearing				
Rate of Strain (mm/min)		0.154	0.154	0.154
Peak Shear Stress (kPa)		59.7	94.6	161.6
Hoz Displacement (mm)		10.2	10.2	10.2
Hoz Displacement at Peak Shear Stress (mm)		1.617	1.557	1.737
Final Conditions				
Water Content (%)		14.0	14.0	13.0
Dry Density (Mg/m ³)		1.93	1.96	2.04
Voids Ratio		0.384	0.368	0.345

 	Tested	Approved
	Aaron Nutt	Joseph Nicholl

Direct Shear Test BS EN ISO 17892-10:2018				
Project Number	24-1562	Project	GreenGate BioGas	
Location Number	TP01	Sample Reference	4	
Depth (m)	1.50	Sample Submerged?	Yes	No
Sample Type	B	Particle Density (Mg/m^3)	2.65	Assumed

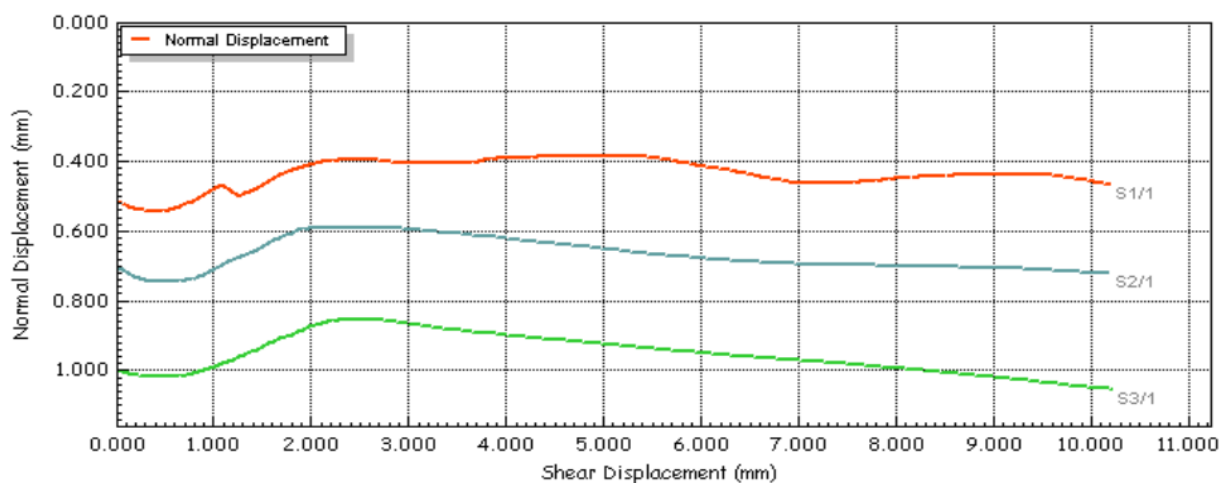
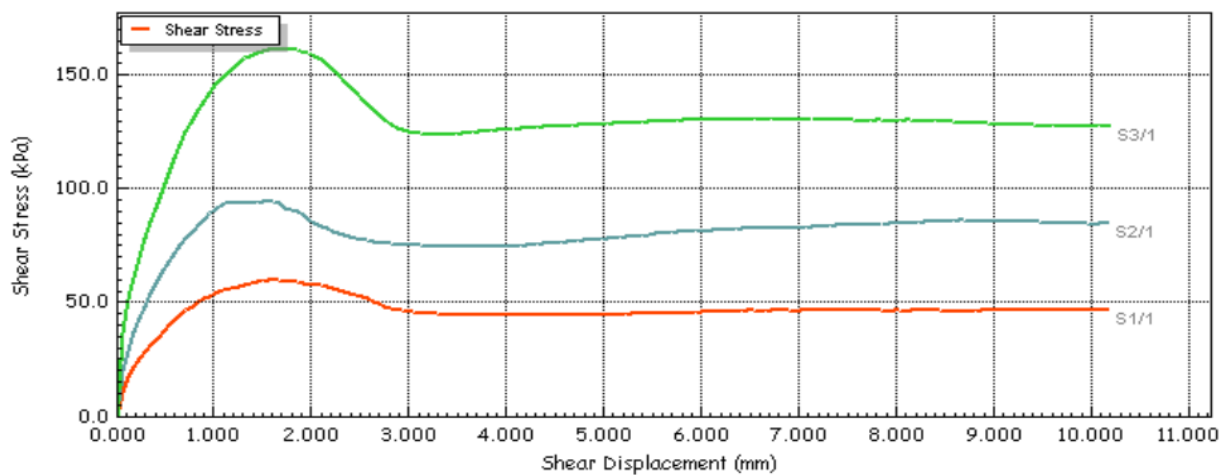
Consolidation Graphs



 10122		Tested	Approved
		Aaron Nutt	Joseph Nicholl

Direct Shear Test BS EN ISO 17892-10:2018				
Project Number	24-1562	Project	GreenGate BioGas	
Location Number	TP01	Sample Reference	4	
Depth (m)	1.50	Sample Submerged?	Yes	No
Sample Type	B	Particle Density (Mg/m^3)	2.65	Assumed

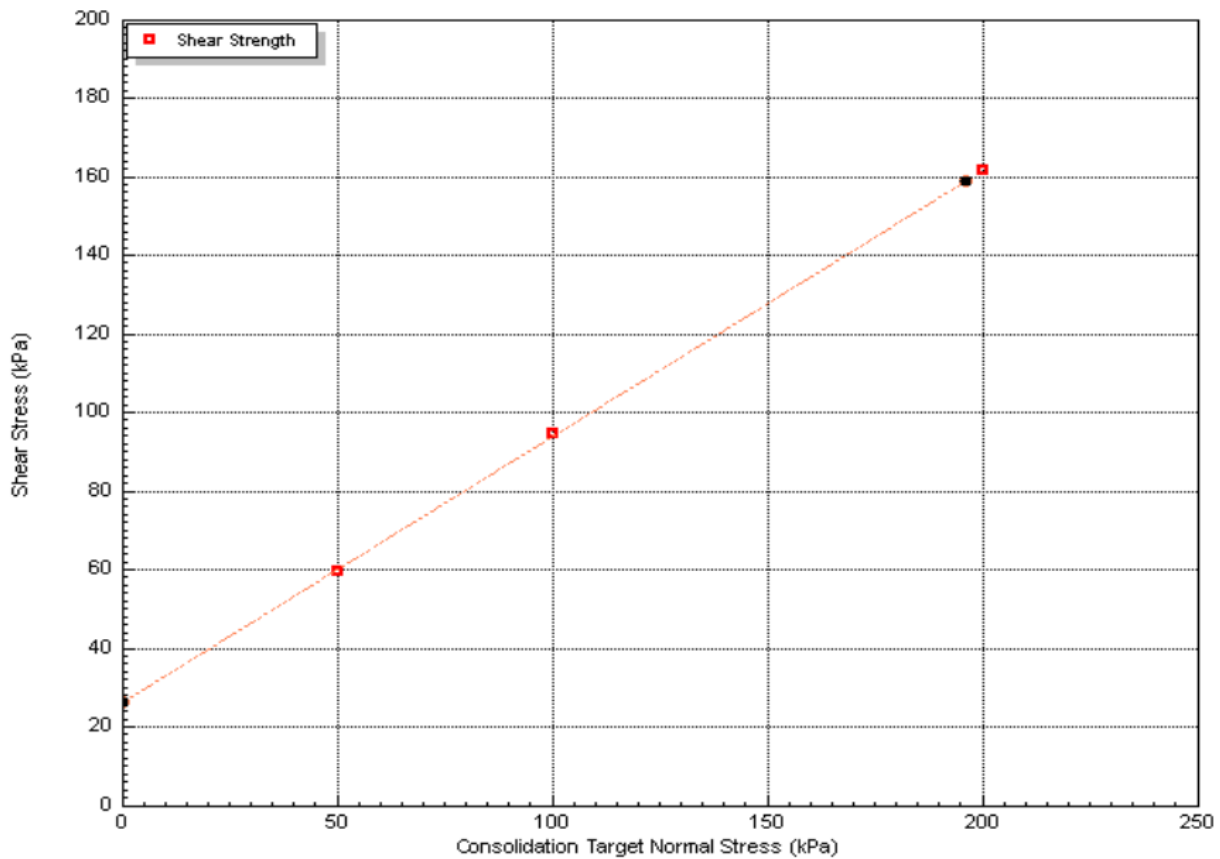
Shear Stage



 	Tested	Approved
	Aaron Nutt	Joseph Nicholl

Direct Shear Test BS EN ISO 17892-10:2018				
Project Number	24-1562	Project	GreenGate BioGas	
Location Number	TP01	Sample Reference	4	
Depth (m)	1.50	Sample Submerged?	Yes	No
Sample Type	B	Particle Density (Mg/m^3)	2.65	Assumed

Stage	1	2	3
Envelope Failure Results			
Apparent Cohesion (kPa)	26		
Angle of Shearing Resistance (°)	34.0		



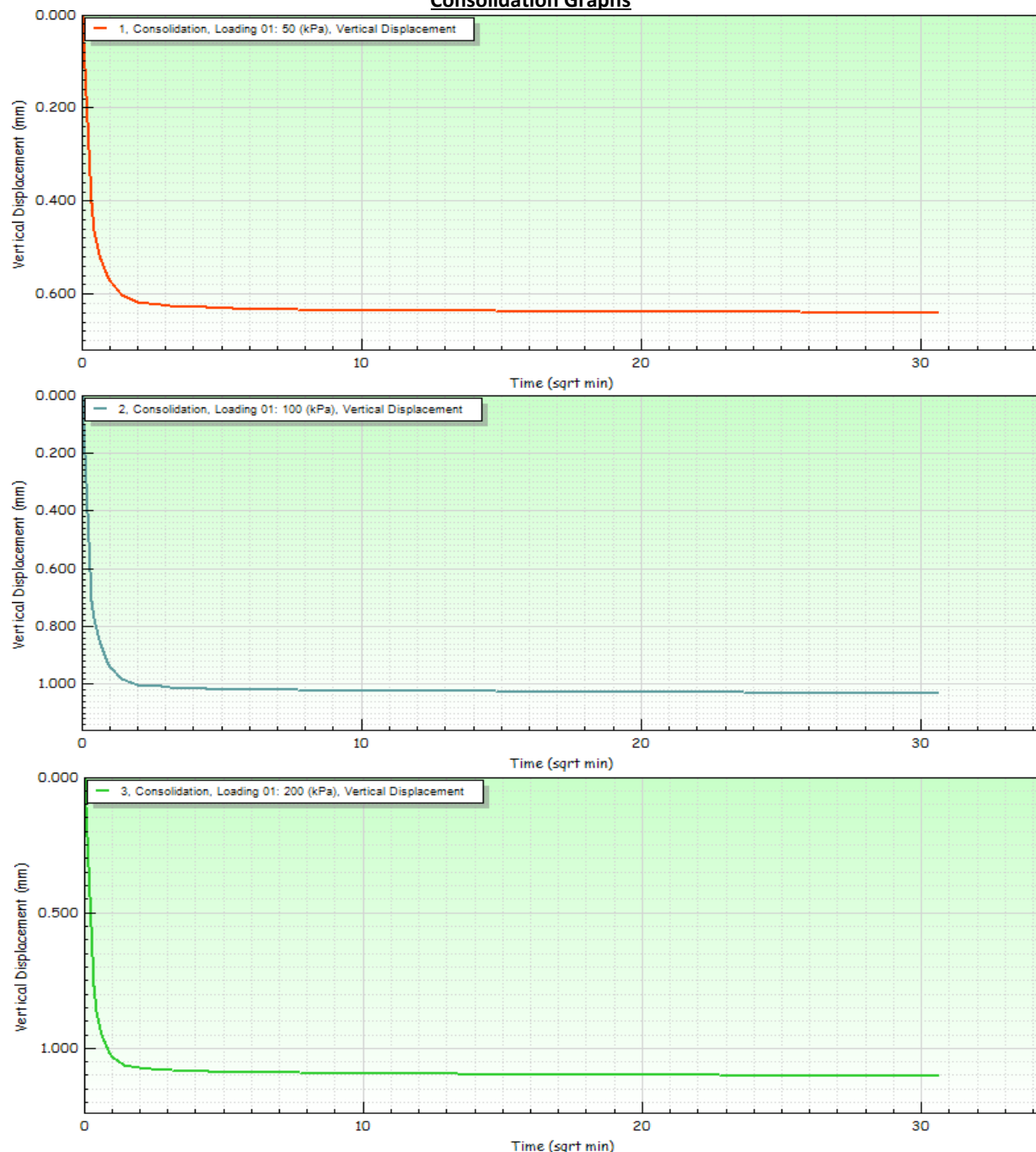
 10122		Tested	Approved
		Aaron Nutt	Joseph Nicholl

Direct Shear Test BS EN ISO 17892-10:2018				
Project Number	24-1562	Project	GreenGate BioGas	
Location Number	TP10	Sample Reference	6	
Depth (m)	0.90	Sample Submerged?	Yes	No
Sample Type	B	Particle Density (Mg/m ³)	2.65	Assumed
Description	Brown sandy gravelly silty CLAY.			
Sample Preparation	Sample is recompacted using material passing 2mm test sieve			
Stage		1	2	3
Initial Conditions				
Height (mm)		20.0	20.0	20.0
Diameter (mm)		60.0	60.0	60.0
Water Content (%)		14.0	14.0	14.0
Bulk Density (Mg/m ³)		2.16	2.16	2.16
Dry Density (Mg/m ³)		1.90	1.90	1.90
Voids Ratio		0.395	0.397	0.393
Consolidation				
Normal Pressure (kPa)		50	100	200
Vertical Displacement (mm)		0.641	1.032	1.103
Shearing				
Rate of Strain (mm/min)		0.083	0.083	0.083
Peak Shear Stress (kPa)		49.2	83.9	167.8
Hoz Displacement (mm)		10.2	10.2	10.2
Hoz Displacement at Peak Shear Stress (mm)		2.157	2.517	2.877
Final Conditions				
Water Content (%)		14.0	14.0	13.0
Dry Density (Mg/m ³)		2.00	2.07	2.10
Voids Ratio		0.354	0.330	0.323

 	Tested	Approved
	Aaron Nutt	Joseph Nicholl

Direct Shear Test BS EN ISO 17892-10:2018				
Project Number	24-1562	Project	GreenGate BioGas	
Location Number	TP10	Sample Reference	6	
Depth (m)	0.90	Sample Submerged?	Yes	No
Sample Type	B	Particle Density (Mg/m^3)	2.65	Assumed

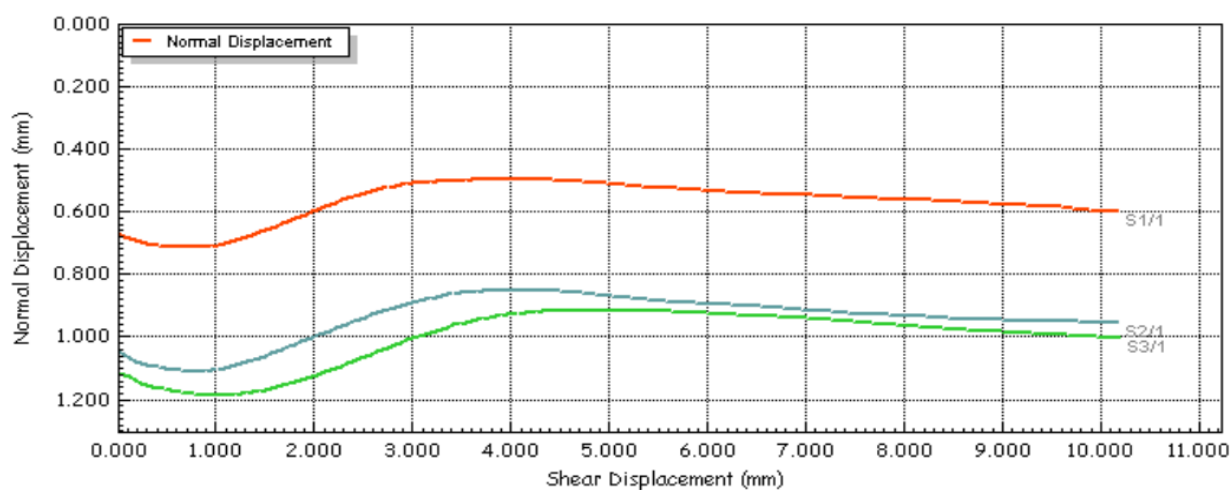
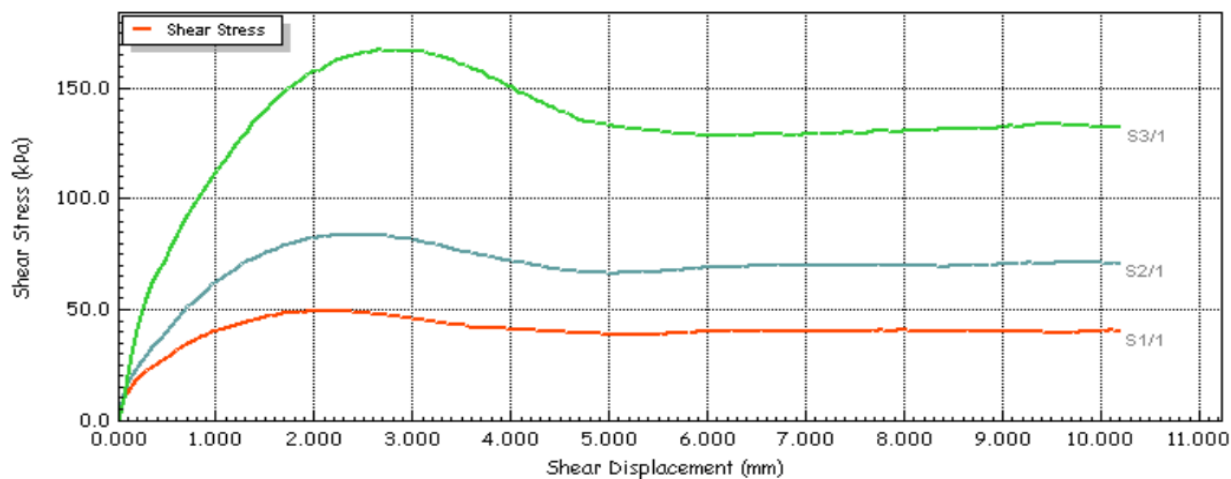
Consolidation Graphs



 10122		Tested	Approved
		Aaron Nutt	Joseph Nicholl

Direct Shear Test BS EN ISO 17892-10:2018				
Project Number	24-1562	Project	GreenGate BioGas	
Location Number	TP10	Sample Reference	6	
Depth (m)	0.90	Sample Submerged?	Yes	No
Sample Type	B	Particle Density (Mg/m ³)	2.65	Assumed

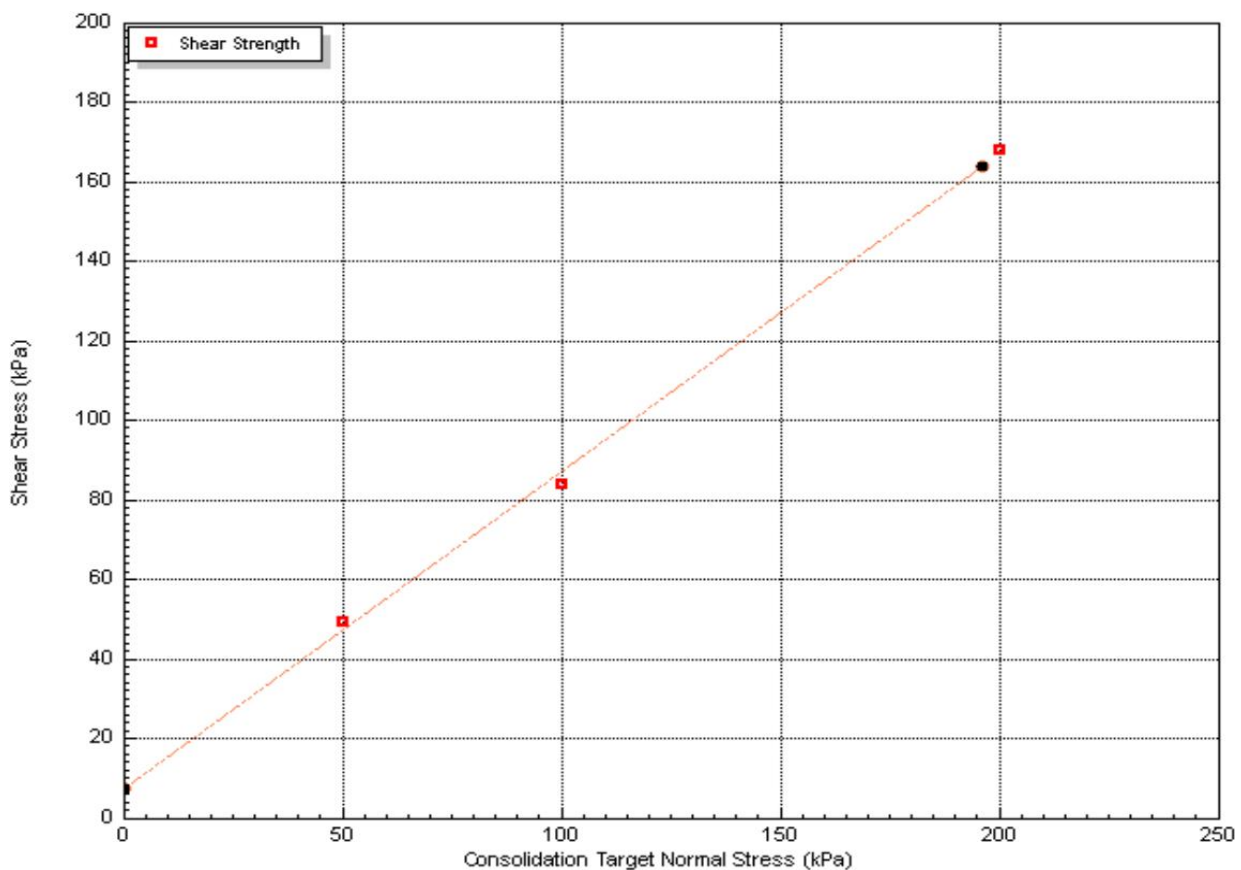
Shear Stage



 	Tested	Approved
	Aaron Nutt	Joseph Nicholl

Direct Shear Test BS EN ISO 17892-10:2018				
Project Number	24-1562	Project	GreenGate BioGas	
Location Number	TP10	Sample Reference	6	
Depth (m)	0.90	Sample Submerged?	Yes	No
Sample Type	B	Particle Density (Mg/m^3)	2.65	Assumed

Stage	1	2	3
Envelope Failure Results			
Apparent Cohesion (kPa)	7		
Angle of Shearing Resistance (°)	38.5		



 	Tested	Approved
	Aaron Nutt	Joseph Nicholl



SOIL AND ROCK SAMPLE ANALYSIS LABORATORY TEST REPORT

4 March 2025

PROJECT NAME	GreenGate BioGas
PROJECT NUMBER	24-1562
CLIENT	GreenGate BioGas
ENGINEER	Fehily Timoney and Company

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). This testing was performed between 16/02/2025 and 04/03/2025.

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

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

Stephen Watson

Laboratory Manager

Signed for and on behalf of Causeway Geotech Ltd



**PROJECT NAME:** GreenGate BioGas**REPORT REFERENCE:** Schedule 2

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.

The results contained in this report relate to the sample(s) as received. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This report shall not be reproduced other than in full, without the prior written approval of the laboratory.

Material tested	Type of test/Properties measured/Range of measurement	Standard specifications	No. of results included in the report
SOIL	Water Content of Soil	BS 1377-2: 2022: CI 4	12
SOIL	Liquid and Plastic Limits of soil-1 point cone penetrometer method	BS 1377-2: 2022: CI 5.3	1
SOIL	Liquid and Plastic Limits of soil-4 point cone penetrometer method	BS 1377-2: 2022: CI 5.2	4
SOIL	Particle size distribution - wet sieving	BS 1377-2: 2022: CI 10	7
SOIL	Particle size distribution - sedimentation hydrometer method	BS 1377-2: 2022: CI 10	4





SUB-CONTRACTED TESTS

In agreement with Client, the following tests were conducted by an approved sub-contractor. All sub-contracting 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 Derwentside Environmental Testing Services Limited (UKAS 2139)	pH Value of Soil	<i>Documented In-House Method No DETSC 2008 based on BS 1377: Part 3:1990</i>	6
SOIL – Subcontracted to Derwentside Environmental Testing Services Limited (UKAS 2139)	Sulphate Content water extract	<i>Documented In-House Method No DETSC 2004 based on BS 1377: Part 3:1990</i>	6
SOIL – Subcontracted to Derwentside Environmental Testing Services Limited (UKAS 2139)	Organic Matter Content	<i>Documented In-House Method No DETSC 2002 based on BS 1377: Part 3:1990</i>	6
SOIL – Subcontracted to Derwentside Environmental Testing Services Limited (UKAS 2139)	Water soluble chloride content	<i>Documented In-House Method No DETSC 2006 based on BS 1377: Part 3:1990</i>	6
SOIL – Subcontracted to Derwentside Environmental Testing Services Limited (UKAS 2139)	BRE Test - Suite D		6



Summary of Classification Test Results

Project No.

24-1562

Project Name

GreenGate BioGas

Hole No.	Sample				Specimen Description	Density		W	Passing 425µm	LL	PL	PI	Particle density Mg/m3	Casagrande Classification
	Ref	Top	Base	Type		bulk	dry							
BH01	7	4.00	4.70	B	Brow slightly gravelly clayey fine to coarse SAND.			6.1						
BH01	14	7.50	8.50	B	Brown sandy slightly gravelly silty CLAY.			20.3	91	27	20	7		CL
BH01	19	11.00	11.70	B	Brown slightly gravelly slightly clayey fine to coarse SAND.			4.9						
BH02	1	0.00	1.20	B	Brown sandy slightly gravelly silty CLAY.			15.9	41	32	20	12		CL
BH02	6	3.00		D	Brown slightly gravelly clayey fine to coarse SAND.			7.9						
BH02	13	7.00	8.00	B	Brown slightly gravelly slightly silty fine to coarse SAND.			11.3	65	24 -1pt	NP			
BH02	17	10.20	11.70	B	Brown slightly gravelly slightly silty fine to coarse SAND.			8.8						
BH03	1	0.00	1.20	B	Brown sandy slightly gravelly silty CLAY.			15.5	57	31	18	13		CL
BH03	5	2.80	4.00	B	Brown sandy slightly gravelly silty CLAY.			18	80	29	18	11		CL
BH03	10	5.50	7.00	B	Brown slightly gravelly slightly silty fine to coarse SAND.			5.9						
BH03	14	11.50	13.00	B	Brown slightly gravelly silty fine to coarse SAND.			12						
BH04	3	1.30	2.50	B	Brown sandy slightly gravelly silty CLAY.			9.6						

All tests performed in accordance with BS1377-2:2022 unless specified otherwise

LAB 26R - Version 2

Key

Density test

Liquid Limit

Particle density

Linear measurement unless :

4pt cone unless :

sp - small pyknometer

wd - water displacement

cas - Casagrande method

gj - gas jar

wi - immersion in water

1pt - single point test

Date Printed

03/03/2025 00:00

Approved By

Stephen Watson



10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

BH01

Site Name

GreenGate BioGas

Sample No.

7

Specimen Description

Brow slightly gravelly clayey fine to coarse SAND.

Sample
Depth (m)Top
Base

4.00

4.70

Specimen Reference

5

Specimen
Depth

4

m

Sample Type

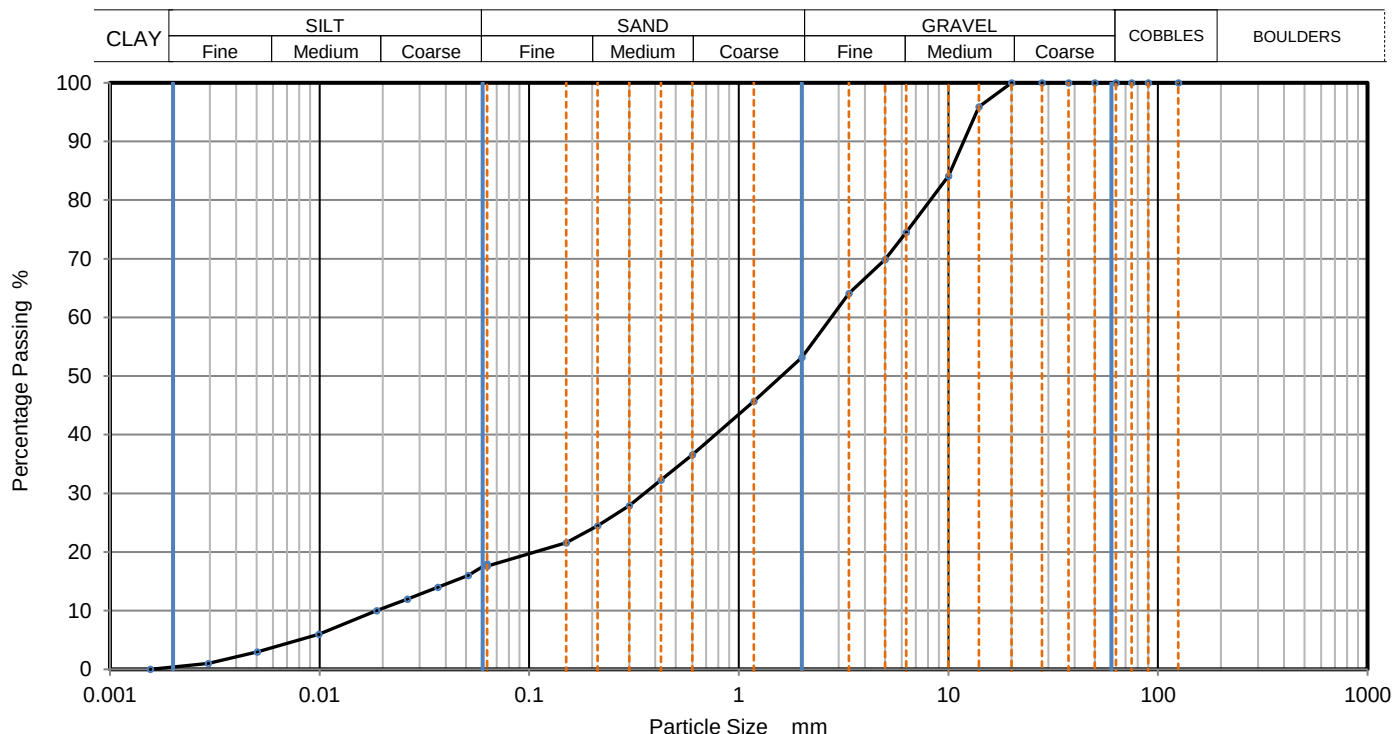
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2025011681



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	18
90	100	0.05121	16
75	100	0.03664	14
63	100	0.02621	12
50	100	0.01874	10
37.5	100	0.00989	6
28	100	0.00505	3
20	100	0.00295	1
14	96	0.00156	0
10	84		
6.3	75		
5	70		
3.35	64		
2	53		
1.18	46		
0.6	37	Particle density (assumed) 2.65 Mg/m3	
0.425	32		
0.3	28		
0.212	25		
0.15	22		
0.063	18		

Dry Mass of sample, g

409

Sample Proportions

% dry mass

Cobbles	0.0
Gravel	46.8
Sand	35.5
Silt	17.3
Clay	0.4

Grading Analysis

D100	mm	
D60	mm	2.76
D30	mm	0.354
D10	mm	0.0181
Uniformity Coefficient		150
Curvature Coefficient		2.5

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

Approved

Stephen Watson

LAB 30R - Version 1



10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

BH01

Site Name

GreenGate BioGas

Sample No.

19

Specimen Description

Brown slightly gravelly slightly clayey fine to coarse SAND.

Sample
Depth (m)

Top

11.00

Base

11.70

Specimen Reference

4

Specimen
Depth

11

m

Sample Type

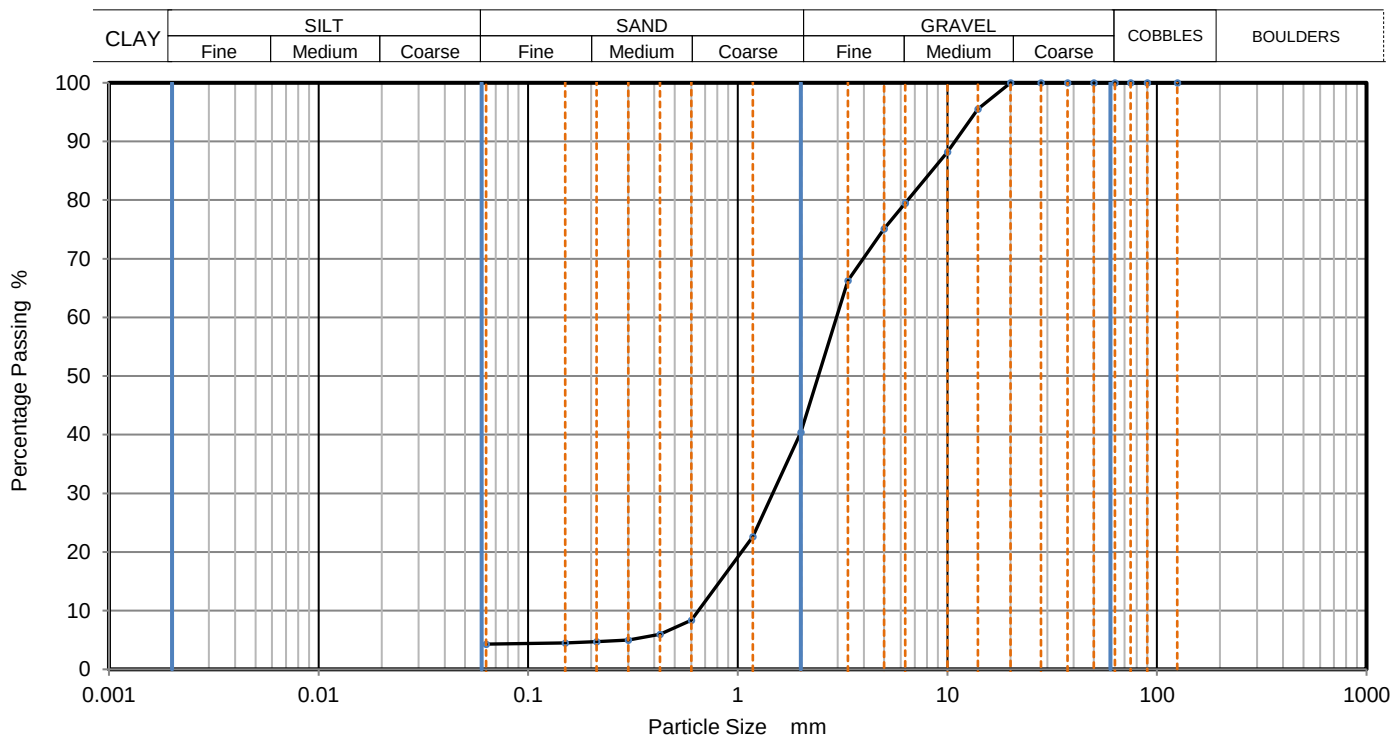
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2025011683



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	96		
10	88		
6.3	80		
5	75		
3.35	66		
2	40		
1.18	23		
0.6	8		
0.425	6		
0.3	5		
0.212	5		
0.15	5		
0.063	4		

Dry Mass of sample, g

425

Sample Proportions

% dry mass

Cobbles	0.0
Gravel	59.6
Sand	36.1
Fines <0.063mm	4.0

Grading Analysis

D100	mm	
D60	mm	2.96
D30	mm	1.47
D10	mm	0.646
Uniformity Coefficient		4.6
Curvature Coefficient		1.1

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

Approved

Stephen Watson

LAB 30R - Version 1



10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

BH02

Site Name

GreenGate BioGas

Sample No.

6

Specimen Description

Brown slightly gravelly clayey fine to coarse SAND.

Sample
Depth (m)Top
Base

3.00

Specimen Reference

5

Specimen
Depth

3

m

Sample Type

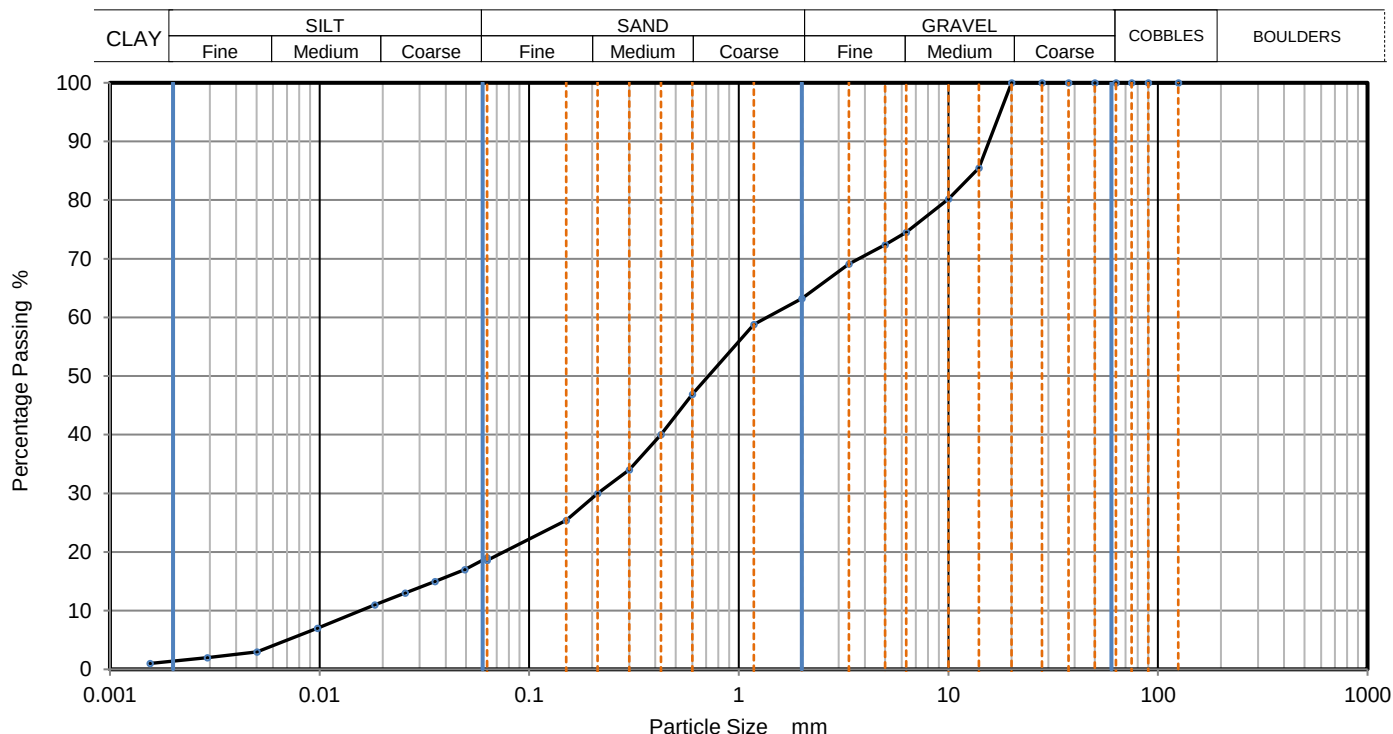
D

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2025011685



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	19
90	100	0.04933	17
75	100	0.03555	15
63	100	0.02560	13
50	100	0.01832	11
37.5	100	0.00979	7
28	100	0.00503	3
20	100	0.00292	2
14	86	0.00155	1
10	80		
6.3	75		
5	72		
3.35	69		
2	63		
1.18	59		
0.6	47	Particle density (assumed) 2.65 Mg/m ³	
0.425	40		
0.3	34		
0.212	30		
0.15	25		
0.063	19		

Dry Mass of sample, g

408

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	36.8
Sand	44.6
Silt	17.3
Clay	1.3

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	88
Curvature Coefficient	2.1

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

Approved

Stephen Watson

LAB 30R - Version 1



10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

BH02

Site Name

GreenGate BioGas

Sample No.

17

Specimen Description

Brown slightly gravelly slightly silty fine to coarse SAND.

Sample
Depth (m)Top
Base10.20
11.70

Specimen Reference

4

Specimen
Depth

10.2

m

Sample Type

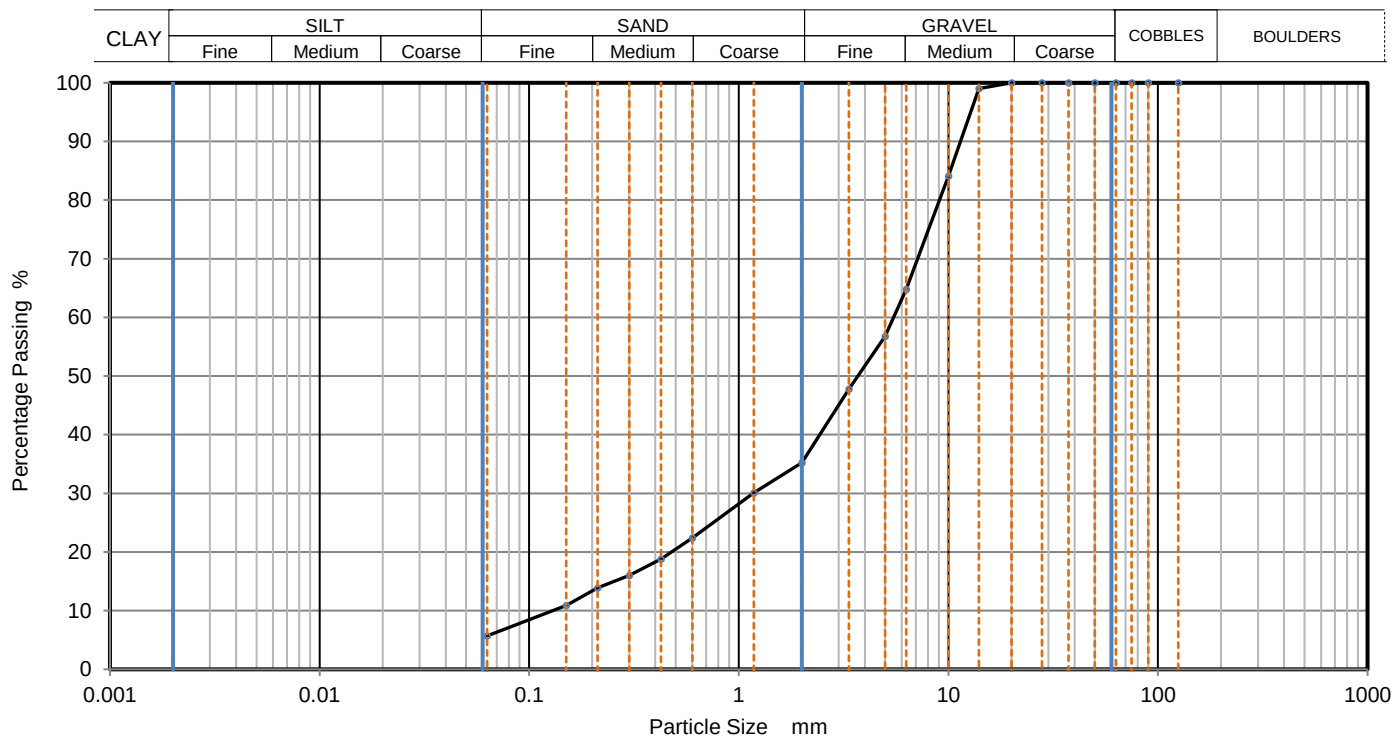
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2025011687



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	84		
6.3	65		
5	57		
3.35	48		
2	35		
1.18	30		
0.6	22		
0.425	19		
0.3	16		
0.212	14		
0.15	11		
0.063	6		

Dry Mass of sample, g

509

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	64.8
Sand	29.5
Fines <0.063mm	6.0

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	43
Curvature Coefficient	1.9

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

Approved

Stephen Watson

LAB 30R - Version 1



10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

BH03

Site Name

GreenGate BioGas

Sample No.

10

Specimen Description

Brown slightly gravelly slightly silty fine to coarse SAND.

Sample
Depth (m)

Top

5.50

Base

7.00

Specimen Reference

5

Specimen
Depth

5.5

m

Sample Type

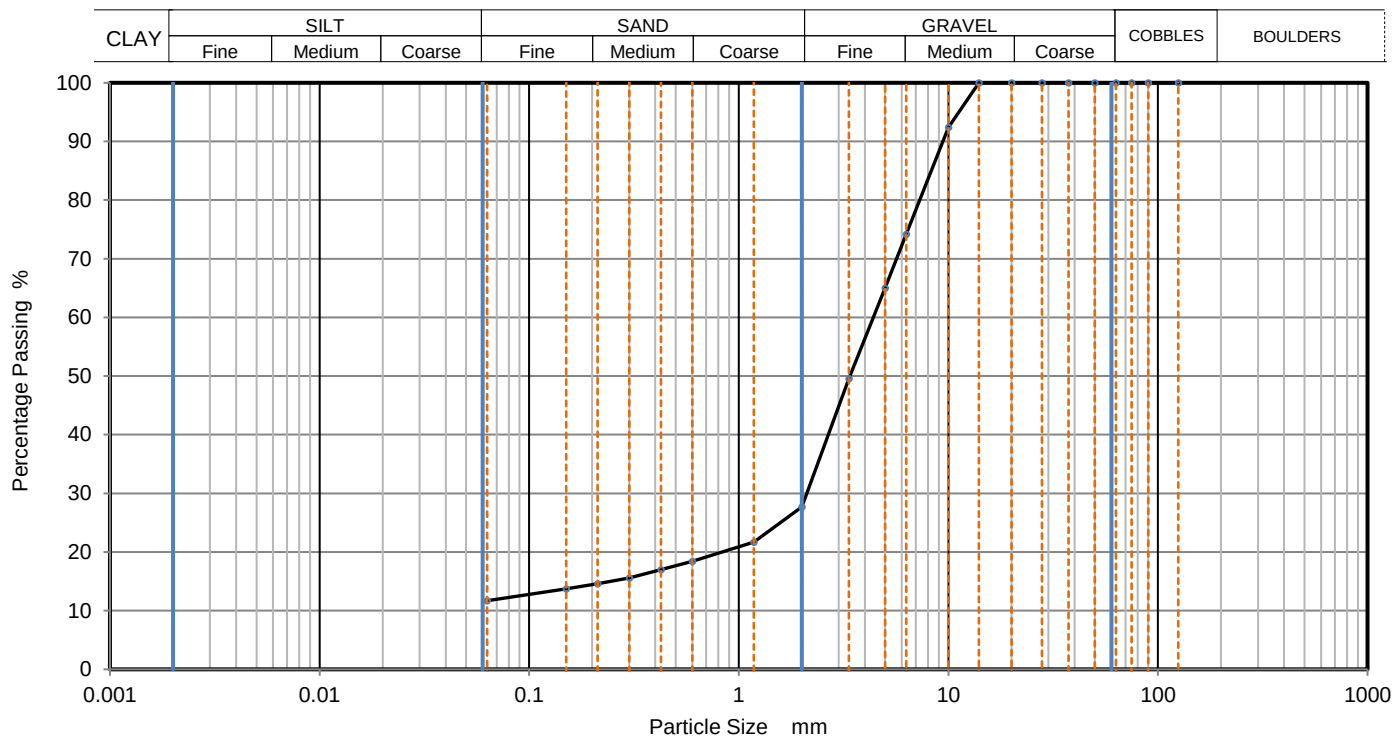
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2025011690



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	92		
6.3	74		
5	65		
3.35	50		
2	28		
1.18	22		
0.6	18		
0.425	17		
0.3	16		
0.212	15		
0.15	14		
0.063	12		

Dry Mass of sample, g

410

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	72.3
Sand	16.0
Fines <0.063mm	12.0

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

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

Approved

Stephen Watson

LAB 30R - Version 1



10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

BH03

Site Name

GreenGate BioGas

Sample No.

14

Specimen Description

Brown slightly gravelly silty fine to coarse SAND.

Sample
Depth (m)Top
Base11.50
13.00

Specimen Reference

4

Specimen
Depth

11.5

m

Sample Type

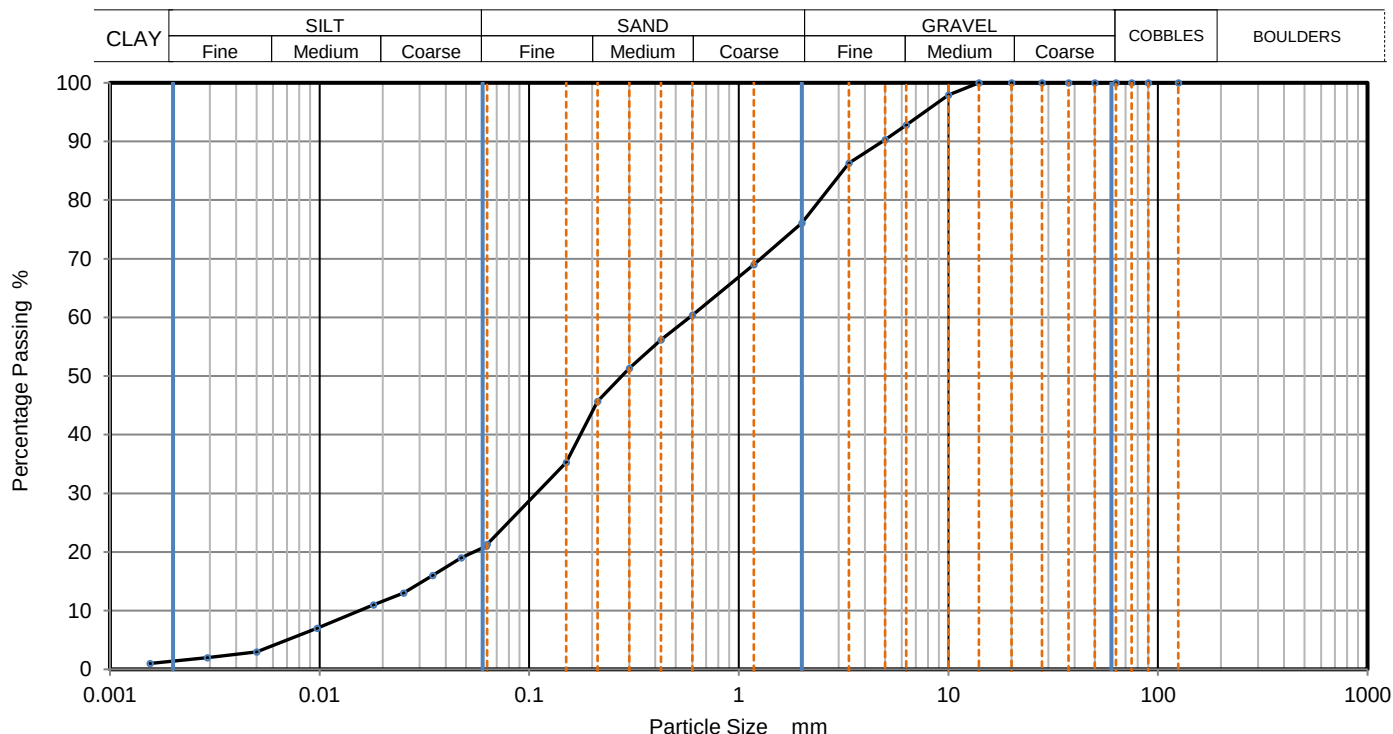
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2025011691



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06236	21
90	100	0.04737	19
75	100	0.03465	16
63	100	0.02514	13
50	100	0.01810	11
37.5	100	0.00973	7
28	100	0.00500	3
20	100	0.00292	2
14	100	0.00155	1
10	98		
6.3	93		
5	90		
3.35	86		
2	76		
1.18	69		
0.6	60	Particle density (assumed) 2.65 Mg/m3	
0.425	56		
0.3	51		
0.212	46		
0.15	35		
0.063	21		

Dry Mass of sample, g

433

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	23.9
Sand	54.8
Silt	20.1
Clay	1.2

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	38
Curvature Coefficient	1.3

Remarks

Preparation and testing in accordance with ISO 17892-4:2016



Approved

Stephen Watson

LAB 30R - Version 1

10122



PARTICLE SIZE DISTRIBUTION

Job Ref

24-1562

Borehole/Pit No.

BH04

Site Name

GreenGate BioGas

Sample No.

3

Specimen Description

Brown sandy slightly gravelly silty CLAY.

Sample
Depth (m)

Top

1.30

Base

2.50

Specimen Reference

4

Specimen
Depth

1.3

m

Sample Type

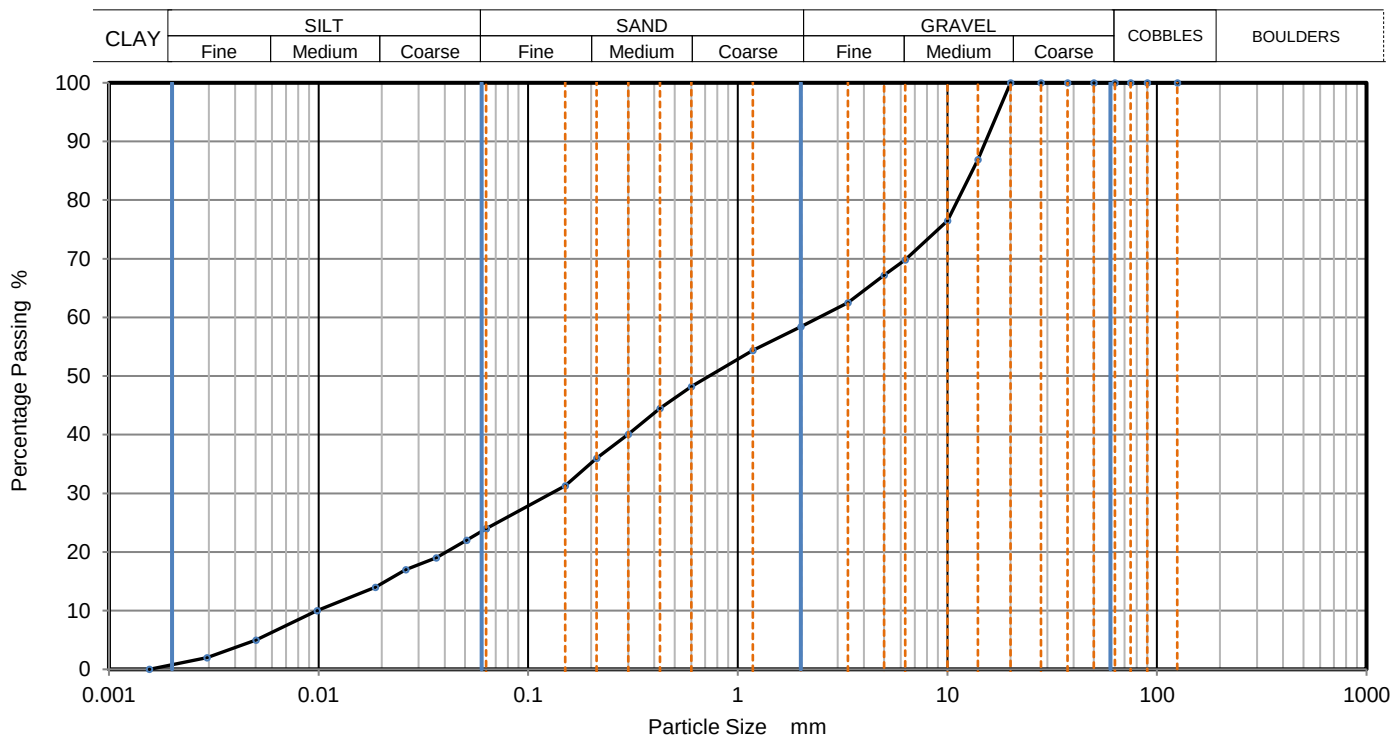
B

Test Method

BS1377-2:2022 Clause 10

KeyLAB ID

Caus2025011692



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.06300	24
90	100	0.05090	22
75	100	0.03642	19
63	100	0.02606	17
50	100	0.01864	14
37.5	100	0.00984	10
28	100	0.00503	5
20	100	0.00293	2
14	87	0.00156	0
10	77		
6.3	70		
5	67		
3.35	63		
2	58		
1.18	54		
0.6	48	Particle density (assumed) 2.65 Mg/m ³	
0.425	45		
0.3	40		
0.212	36		
0.15	31		
0.063	24		

Dry Mass of sample, g

446

Sample Proportions	% dry mass
Cobbles	0.0
Gravel	41.6
Sand	34.4
Silt	23.1
Clay	0.9

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	240
Curvature Coefficient	0.65

Remarks

Preparation and testing in accordance with ISO 17892-4:2016

Approved

Stephen Watson

LAB 30R - Version 1



10122

Certificate of Analysis

Certificate Number 25-04034

Issued: 04-Mar-25

Client Causeway Geotech
8 Drumahiskey Road
Ballymoney
County Antrim
BT53 7QL

Our Reference 25-04034

Client Reference ~ 24-1562

Order No ~ (not supplied)

Contract Title ~ GreenGate BioGas

Description 6 Soil samples.

Date Received 24-Feb-25

Date Started 24-Feb-25

Date Completed 04-Mar-25

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "JC Coffey".

John Coffey
Quality Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 25-04034

Client Ref ~ 24-1562

Contract Title ~ GreenGate BioGas

Lab No	2469241	2469242	2469243	2469244	2469245	2469246
Sample ID ~	BH01	BH01	BH02	BH02	BH03	BH04
Depth ~	2.50-3.50	7.50-8.50	0.00-1.20	1.40-2.50	0.00-1.20	0.00-1.30
Other ID ~	6	14	1	3	1	1
Sample Type ~	B	B	B	B	B	B
Sampling Date ~	21/02/2025	21/02/2025	21/02/2025	21/02/2025	21/02/2025	21/02/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Inorganics									
pH	DETSC 2008#		pH	12.0	11.2	12.3	10.7	10.3	9.7
Organic matter	DETSC 2002#	0.1	%	1.1	0.6	0.5	0.4	0.9	0.8
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	7.8	6.4	11	3.4	6.8	7.5
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	44	39	51	26	39	44
Sulphur as S, Total	DETSC 2320	0.01	%	0.03	0.02	0.02	0.01	0.02	0.02
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.08	0.04	0.06	0.03	0.03	0.04

Information in Support of the Analytical Results

Our Ref 25-04034
 Client Ref ~ 24-1562
 Contract ~ GreenGate BioGas

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2469241	BH01 2.50-3.50 SOIL	21/02/25	PT 500ml		
2469242	BH01 7.50-8.50 SOIL	21/02/25	PT 500ml		
2469243	BH02 0.00-1.20 SOIL	21/02/25	PT 500ml		
2469244	BH02 1.40-2.50 SOIL	21/02/25	PT 500ml		
2469245	BH03 0.00-1.20 SOIL	21/02/25	PT 500ml		
2469246	BH04 0.00-1.30 SOIL	21/02/25	PT 500ml		

Key: P-Plastic T-Tub

Normec DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report

LABORATORY RESTRICTION REPORT

Project Reference	24-1562	To	Gabriella Horan
Project Name	Greengate BioGas	Position	Project Manager
TR reference	24-1562 / G01	From	Joe Nicholl
		Position	Laboratory Quality Manager

The following sample(s) and test(s) are restricted as detailed below. Could you please complete the "Required Action" column and return the completed form to the laboratory.

Hole Number	Sample			Test Type	Reason for Restriction	Required Action
	Number	Depth (m)	Type			
BH01	7	4.00	B	4.5kg Compaction	Material is free draining sand(non cohesive) and not suited to moisture relationship ship testing.	CANCEL
BH02	6	3.00	D	4.5kg Compaction	Material is free draining sand(non cohesive) and not suited to moisture relationship ship testing.	CANCEL
BH03	10	5.50	B	4.5kg Compaction	Material is free draining sand(non cohesive) and not suited to moisture relationship ship testing.	CANCEL

For electronic reporting a form of electronic signature or printed name is acceptable

Laboratory Signature Joe Nicholl	Project Manager Signature Gabriella Horan
Date 03 March 2025	Date

APPENDIX I – ENVIRONMENTAL LABORATORY TEST RESULTS





Certificate of Analysis

Certificate Number 24-27765

Issued: 06-Jan-25

Client Causeway Geotech
Unit 1 Fingal House
Stephenstown Industrial Estate
Balbriggan
Co. Dublin
K32 VR66

Our Reference 24-27765

Client Reference ~ 24-1562

Order No ~ (not supplied)

Contract Title ~ Greengate Biogas Powerstown

Description 14 Soil samples.

Date Received 19-Dec-24

Date Started 19-Dec-24

Date Completed 06-Jan-25

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



Normec DETS Limited

Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY

Symbol key at end of report Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 12

Summary of Chemical Analysis

Soil Samples

Our Ref 24-27765

Client Ref ~ 24-1562

Contract Title ~ Greengate Biogas Powerstown

Lab No	2443252	2443253	2443254	2443255	2443256	2443257
Sample ID ~	TP01	TP01	TP02	TP03	TP04	TP05
Depth ~	0.50	1.50	1.50	0.50	1.50	1.50
Other ID ~						
Sample Type ~	ES	ES	ES	ES	ES	ES
Sampling Date ~	02/12/2024	02/12/2024	02/12/2024	03/12/2024	03/12/2024	03/12/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
CSL Subcon Prep	\$	0			Y			Y	
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	11		7.9	3.3	4.3	7.9
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	2.0		0.5	< 0.2	0.6	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.5		0.6	0.3	0.3	0.7
Chromium	DETSC 2301#	0.15	mg/kg	13		15	4.9	8.8	8.2
Copper	DETSC 2301#	0.2	mg/kg	16		16	6.9	19	14
Lead	DETSC 2301#	0.3	mg/kg	14		11	5.2	5.6	13
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	15		16	6.8	23	16
Phosphorus	DETSC 2301*	1	mg/kg		290			290	
Potassium	DETSC 2301*	1	mg/kg		440			480	
Zinc	DETSC 2301#	1	mg/kg	66		44	26	37	48
Inorganics									
pH	DETSC 2008#		pH	8.6		9.6	9.2	9.3	9.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2		< 0.1	< 0.1	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	3.0		1.0	0.1	2.0	0.8
Nitrogen	DETSC 2121*	0.01	%		< 0.01			< 0.01	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	290		91	12	46	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >EC10-EC12: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50		< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC12-EC16: EH_2D_AL	DETSC 3521#	1.2	mg/kg	< 1.20		< 1.20	< 1.20	< 1.20	< 1.20
Aliphatic >EC16-EC21: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50		< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC21-EC35: EH_2D_AL	DETSC 3521#	3.4	mg/kg	< 3.40		< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic >EC35-EC40: EH_2D_AL	DETSC 3521*	3.4	mg/kg	< 3.40		< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic >EC40-EC44: EH_2D_AL	DETSC 3521*	3.4	mg/kg	< 3.40		< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic C5-C44: EH_2D+HS_1D_AL	DETSC 3521*	10	mg/kg	< 10.00		< 10.00	< 10.00	< 10.00	< 10.00
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >EC10-EC12: EH_2D_AR	DETSC 3521#	0.9	mg/kg	< 0.90		< 0.90	< 0.90	< 0.90	< 0.90
Aromatic >EC12-EC16: EH_2D_AR	DETSC 3521#	0.5	mg/kg	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Aromatic >EC16-EC21: EH_2D_AR	DETSC 3521#	0.6	mg/kg	< 0.60		< 0.60	< 0.60	< 0.60	< 0.60
Aromatic >EC21-EC35: EH_2D_AR	DETSC 3521#	1.4	mg/kg	< 1.40		< 1.40	< 1.40	< 1.40	< 1.40
Aromatic >EC35-EC40: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40		< 1.40	< 1.40	< 1.40	< 1.40
Aromatic >EC40-EC44: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40		< 1.40	< 1.40	< 1.40	< 1.40
Aromatic C5-C44: EH_2D+HS_1D_AR	DETSC 3521*	10	mg/kg	< 10.00		< 10.00	< 10.00	< 10.00	< 10.00
TPH Ali/Aro C5-C44: EH_2D+HS_1D_Total	DETSC 3521*	10	mg/kg	< 10.00		< 10.00	< 10.00	< 10.00	< 10.00

Summary of Chemical Analysis

Soil Samples

Our Ref 24-27765

Client Ref ~ 24-1562

Contract Title ~ Greengate Biogas Powerstown

Lab No	2443252	2443253	2443254	2443255	2443256	2443257
Sample ID ~	TP01	TP01	TP02	TP03	TP04	TP05
Depth ~	0.50	1.50	1.50	0.50	1.50	1.50
Other ID ~						
Sample Type ~	ES	ES	ES	ES	ES	ES
Sampling Date ~	02/12/2024	02/12/2024	02/12/2024	03/12/2024	03/12/2024	03/12/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10		< 0.10	< 0.10	< 0.10	< 0.10
PCBs									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 52	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 101	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 153	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 138	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 180	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 7 Total	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.5		< 0.3	< 0.3	< 0.3	< 0.3
Subcontracted Analysis									
Faecal coliforms	§*	10	cfu/g		<10			<10	
Salmonella	§*	25	cfu/g		N.D.			N.D.	

Summary of Chemical Analysis

Soil Samples

Our Ref 24-27765

Client Ref ~ 24-1562

Contract Title ~ Greengate Biogas Powerstown

Lab No	2443258	2443259	2443260	2443261	2443262	2443263
Sample ID ~	TP06	TP06	TP07	TP08	TP09	TP10
Depth ~	0.50	1.50	1.50	1.50	1.50	0.50
Other ID ~						
Sample Type ~	ES	ES	ES	ES	ES	ES
Sampling Date ~	03/12/2024	03/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
CSL Subcon Prep	\$	0			Y		Y		
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	6.9		4.6	6.1	5.2	6.2
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3		0.3	< 0.2	< 0.2	0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.4		0.6	0.6	0.5	0.5
Chromium	DETSC 2301#	0.15	mg/kg	8.0		6.7	7.7	7.4	9.9
Copper	DETSC 2301#	0.2	mg/kg	9.7		12	14	11	9.8
Lead	DETSC 2301#	0.3	mg/kg	11		7.6	8.4	8.6	10
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	11		13	14	13	13
Phosphorus	DETSC 2301*	1	mg/kg		330		310		
Potassium	DETSC 2301*	1	mg/kg		500		430		
Zinc	DETSC 2301#	1	mg/kg	40		36	41	38	60
Inorganics									
pH	DETSC 2008#		pH	8.6		9.3	9.0	8.9	8.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	1.4		0.3	0.3	0.1	1.0
Nitrogen	DETSC 2121*	0.01	%		0.04		< 0.01		
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	35		33	< 10	< 10	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >EC10-EC12: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50		< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC12-EC16: EH_2D_AL	DETSC 3521#	1.2	mg/kg	< 1.20		< 1.20	< 1.20	< 1.20	< 1.20
Aliphatic >EC16-EC21: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50		< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC21-EC35: EH_2D_AL	DETSC 3521#	3.4	mg/kg	< 3.40		< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic >EC35-EC40: EH_2D_AL	DETSC 3521*	3.4	mg/kg	< 3.40		< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic >EC40-EC44: EH_2D_AL	DETSC 3521*	3.4	mg/kg	< 3.40		< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic C5-C44: EH_2D+HS_1D_AL	DETSC 3521*	10	mg/kg	< 10.00		< 10.00	< 10.00	< 10.00	< 10.00
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >EC10-EC12: EH_2D_AR	DETSC 3521#	0.9	mg/kg	< 0.90		< 0.90	< 0.90	< 0.90	< 0.90
Aromatic >EC12-EC16: EH_2D_AR	DETSC 3521#	0.5	mg/kg	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Aromatic >EC16-EC21: EH_2D_AR	DETSC 3521#	0.6	mg/kg	< 0.60		< 0.60	< 0.60	< 0.60	< 0.60
Aromatic >EC21-EC35: EH_2D_AR	DETSC 3521#	1.4	mg/kg	< 1.40		< 1.40	< 1.40	< 1.40	< 1.40
Aromatic >EC35-EC40: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40		< 1.40	< 1.40	< 1.40	< 1.40
Aromatic >EC40-EC44: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40		< 1.40	< 1.40	< 1.40	< 1.40
Aromatic C5-C44: EH_2D+HS_1D_AR	DETSC 3521*	10	mg/kg	< 10.00		< 10.00	< 10.00	< 10.00	< 10.00
TPH Ali/Aro C5-C44: EH_2D+HS_1D_Total	DETSC 3521*	10	mg/kg	< 10.00		< 10.00	< 10.00	< 10.00	< 10.00

Summary of Chemical Analysis

Soil Samples

Our Ref 24-27765

Client Ref ~ 24-1562

Contract Title ~ Greengate Biogas Powerstown

Lab No	2443258	2443259	2443260	2443261	2443262	2443263
Sample ID ~	TP06	TP06	TP07	TP08	TP09	TP10
Depth ~	0.50	1.50	1.50	1.50	1.50	0.50
Other ID ~						
Sample Type ~	ES	ES	ES	ES	ES	ES
Sampling Date ~	03/12/2024	03/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.03		< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10		< 0.10	< 0.10	< 0.10	< 0.10
PCBs									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 52	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 101	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 153	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 138	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 180	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
PCB 7 Total	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3		< 0.3	< 0.3	< 0.3	< 0.3
Subcontracted Analysis									
Faecal coliforms	§*	10	cfu/g		<10		<10		
Salmonella	§*	25	cfu/g		N.D.		N.D.		

Summary of Chemical Analysis

Soil Samples

Our Ref 24-27765

Client Ref ~ 24-1562

Contract Title ~ Greengate Biogas Powerstown

Lab No	2443264	2443265
Sample ID ~	TP11	TP12
Depth ~	1.50	1.50
Other ID ~		
Sample Type ~	ES	ES
Sampling Date ~	04/12/2024	04/12/2024
Sampling Time ~	n/s	n/s

Test	Method	LOD	Units		
CSL Subcon Prep	\$	0		Y	Y
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	5.9	2.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.1
Chromium	DETSC 2301#	0.15	mg/kg	9.0	4.0
Copper	DETSC 2301#	0.2	mg/kg	13	5.7
Lead	DETSC 2301#	0.3	mg/kg	12	3.0
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	13	5.4
Phosphorus	DETSC 2301*	1	mg/kg	390	140
Potassium	DETSC 2301*	1	mg/kg	500	290
Zinc	DETSC 2301#	1	mg/kg	41	69
Inorganics					
pH	DETSC 2008#		pH	8.4	8.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.5	0.4
Nitrogen	DETSC 2121*	0.01	%	< 0.01	< 0.01
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	13	15
Petroleum Hydrocarbons					
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic >EC10-EC12: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50
Aliphatic >EC12-EC16: EH_2D_AL	DETSC 3521#	1.2	mg/kg	< 1.20	< 1.20
Aliphatic >EC16-EC21: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50
Aliphatic >EC21-EC35: EH_2D_AL	DETSC 3521#	3.4	mg/kg	< 3.40	< 3.40
Aliphatic >EC35-EC40: EH_2D_AL	DETSC 3521*	3.4	mg/kg	< 3.40	< 3.40
Aliphatic >EC40-EC44: EH_2D_AL	DETSC 3521*	3.4	mg/kg	< 3.40	< 3.40
Aliphatic C5-C44: EH_2D+HS_1D_AL	DETSC 3521*	10	mg/kg	< 10.00	< 10.00
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic >EC10-EC12: EH_2D_AR	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90
Aromatic >EC12-EC16: EH_2D_AR	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50
Aromatic >EC16-EC21: EH_2D_AR	DETSC 3521#	0.6	mg/kg	< 0.60	< 0.60
Aromatic >EC21-EC35: EH_2D_AR	DETSC 3521#	1.4	mg/kg	< 1.40	< 1.40
Aromatic >EC35-EC40: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40	< 1.40
Aromatic >EC40-EC44: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40	< 1.40
Aromatic C5-C44: EH_2D+HS_1D_AR	DETSC 3521*	10	mg/kg	< 10.00	< 10.00
TPH Ali/Aro C5-C44: EH_2D+HS_1D_Total	DETSC 3521*	10	mg/kg	< 10.00	< 10.00

Summary of Chemical Analysis

Soil Samples

Our Ref 24-27765

Client Ref ~ 24-1562

Contract Title ~ Greengate Biogas Powerstown

Lab No	2443264	2443265
Sample ID ~	TP11	TP12
Depth ~	1.50	1.50
Other ID ~		
Sample Type ~	ES	ES
Sampling Date ~	04/12/2024	04/12/2024
Sampling Time ~	n/s	n/s

Test	Method	LOD	Units		
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10
PCBs					
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 52	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 101	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 153	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 138	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 180	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
PCB 7 Total	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3
Subcontracted Analysis					
Faecal coliforms	§*	10	cfu/g	<10	<10
Salmonella	§*	25	cfu/g	N.D.	N.D.

Summary of Asbestos Analysis

Soil Samples

Our Ref ~ 24-27765

Client Ref ~ 24-1562

Contract Title ~ Greengate Biogas Powerstown

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2443252	TP01 0.50	SOIL	NAD	none	Michael Kay
2443254	TP02 1.50	SOIL	NAD	none	Michael Kay
2443255	TP03 0.50	SOIL	NAD	none	Michael Kay
2443256	TP04 1.50	SOIL	NAD	none	Michael Kay
2443257	TP05 1.50	SOIL	NAD	none	Michael Kay
2443258	TP06 0.50	SOIL	NAD	none	Michael Kay
2443260	TP07 1.50	SOIL	NAD	none	Michael Kay
2443261	TP08 1.50	SOIL	NAD	none	Michael Kay
2443262	TP09 1.50	SOIL	NAD	none	Michael Kay
2443263	TP10 0.50	SOIL	NAD	none	Michael Kay
2443264	TP11 1.50	SOIL	NAD	none	Michael Kay
2443265	TP12 1.50	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 24-27765
 Client Ref ~ 24-1562
 Contract ~ Greengate Biogas Powerstown

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2443252	TP01 0.50 SOIL	02/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443253	TP01 1.50 SOIL	02/12/24	GJ 250ml, GJ 60ml, PT 1L		
2443254	TP02 1.50 SOIL	02/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443255	TP03 0.50 SOIL	03/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443256	TP04 1.50 SOIL	03/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443257	TP05 1.50 SOIL	03/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443258	TP06 0.50 SOIL	03/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443259	TP06 1.50 SOIL	03/12/24	GJ 250ml, GJ 60ml, PT 1L		
2443260	TP07 1.50 SOIL	04/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443261	TP08 1.50 SOIL	04/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443262	TP09 1.50 SOIL	04/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	

Information in Support of the Analytical Results

Our Ref 24-27765
 Client Ref ~ 24-1562
 Contract ~ Greengate Biogas Powerstown

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2443263	TP10 0.50 SOIL	04/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443264	TP11 1.50 SOIL	04/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2443265	TP12 1.50 SOIL	04/12/24	GJ 250ml, GJ 60ml, PT 1L	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic >EC10-EC12	EH_2D_AL
Aliphatic >EC12-EC16	EH_2D_AL
Aliphatic >EC16-EC21	EH_2D_AL
Aliphatic >EC21-EC35	EH_2D_AL
Aliphatic >EC35-EC40	EH_2D_AL
Aliphatic >EC40-EC44	EH_2D_AL
Aliphatic C5-C44	EH_2D+HS_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic >EC10-EC12	EH_2D_AR
Aromatic >EC12-EC16	EH_2D_AR
Aromatic >EC16-EC21	EH_2D_AR
Aromatic >EC21-EC35	EH_2D_AR
Aromatic >EC35-EC40	EH_2D_AR
Aromatic >EC40-EC44	EH_2D_AR
Aromatic C5-C44	EH_2D+HS_1D_AR
TPH Ali/Aro C5-C44	EH_2D+HS_1D_Total

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report

Certificate of Analysis

Certificate Number 25-03499

Issued: 02-Mar-25

Client Causeway Geotech
8 Drumahiskey Road
Ballymoney
County Antrim
BT53 7QL

Our Reference 25-03499

Client Reference ~ 24-1562

Order No ~ (not supplied)

Contract Title ~ Greengate BioGas Powerstation

Description 4 Water samples.

Date Received 18-Feb-25

Date Started 18-Feb-25

Date Completed 28-Feb-25

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Reyhan Irfan
Operations Manager



2139

Summary of Chemical Analysis

Water Samples

Our Ref 25-03499

Client Ref ~ 24-1562

Contract Title ~ Greengate BioGas Powerstation

Lab No	2465815	2465816	2465817	2465818
Sample ID ~	BH01	BH02	BH03	BH04
Depth ~	8.58	2.14	7.27	5.72
Other ID ~				
Sample Type ~	EW	EW	EW	EW
Sampling Date ~	06/02/2025	06/02/2025	06/02/2025	06/02/2025
Sampling Time ~	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic, Dissolved	DETSC 2306	0.001	mg/l	0.0012	< 0.0010	< 0.0010	< 0.0010
Boron, Dissolved	DETSC 2306*	0.012	mg/l	0.078	0.067	0.058	0.066
Cadmium, Dissolved	DETSC 2306	0.0001	mg/l	0.0001	< 0.0001	< 0.0001	< 0.0001
Calcium, Dissolved	DETSC 2306	0.09	mg/l	100	82	77	90
Chromium, Dissolved	DETSC 2306	0.0003	mg/l	0.0024	0.0028	0.0022	0.0018
Copper, Dissolved	DETSC 2306	0.0004	mg/l	0.0032	0.0014	0.0012	0.0021
Iron, Dissolved	DETSC 2306	0.0055	mg/l	0.79	0.55	0.37	0.46
Lead, Dissolved	DETSC 2306	0.0001	mg/l	0.0015	0.0011	0.0008	0.0008
Magnesium, Dissolved	DETSC 2306	0.02	mg/l	9.3	12	11	9.9
Manganese, Dissolved	DETSC 2306	0.0002	mg/l	0.0834	0.0068	0.0095	0.0968
Mercury, Dissolved	DETSC 2306	0.0001	mg/l	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel, Dissolved	DETSC 2306	0.0005	mg/l	0.0032	0.0016	0.0012	0.0021
Potassium, Dissolved	DETSC 2306	0.08	mg/l	1.9	1.7	1.7	1.9
Sodium, Dissolved	DETSC 2306	0.07	mg/l	8.0	33	38	8.5
Zinc, Dissolved	DETSC 2306	0.0013	mg/l	0.021	0.016	0.019	0.012
Inorganics							
Conductivity	DETSC 2009	1	uS/cm	564	685	626	686
Temperature	*	1	°C	16	16	16	16
pH	DETSC 2008		pH	7.3	7.4	7.3	7.6
Alkalinity as CaCO ₃ (Automated)	DETSC 2030	10	mg/l	220	240	290	350
Biochemical Oxygen Demand, Total	DETSC 2031	1	mg/l	6.1	2.9	6.6	3.4
Chemical Oxygen Demand, Total	DETSC 2032	10	mg/l	89	110	110	120
Odour BS EN 1008	DETSC 2140*			NONE	NONE	NONE	NONE
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40
Dissolved, Oxygen	DETSC 2048*	0.1	mg/l	11.5	11.5	11.7	11.8
Suspended Solids	DETSC 2034	5	mg/l	1600	530	150	190
Total Dissolved Solids	DETSC 2035	5	mg/l	390	400	410	390
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.10	< 0.015	0.016	< 0.015
Chloride	DETSC 2055	0.1	mg/l	27	33	9.5	23
Fluoride	DETSC 2055*	0.1	mg/l	< 0.50	< 0.50	< 0.50	< 0.50
Ortho Phosphate as P	DETSC 2205	0.01	mg/l	0.08	0.03	0.03	0.03
Sulphate as SO ₄	DETSC 2055	0.1	mg/l	52	33	4.3	44
Total Organic Carbon	DETSC 2085	1	mg/l	8.3	3.6	2.8	4.8
Total Oxidised Nitrogen as N	DETSC 2202	0.7	mg/l	4.1	7.4	1.4	5.3
PAHs							
Naphthalene	DETSC 3304	0.05	ug/l	0.10	0.09	0.07	0.07
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.06	0.03	0.03	0.02
Fluorene	DETSC 3304	0.01	ug/l	0.05	0.02	0.03	0.02
Phenanthrene	DETSC 3304	0.01	ug/l	0.15	0.06	0.10	0.05

Summary of Chemical Analysis

Water Samples

Our Ref 25-03499

Client Ref ~ 24-1562

Contract Title ~ Greengate BioGas Powerstation

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Other ID ~				
Sample Type ~	EW	EW	EW	EW
Sampling Date ~	06/02/2025	06/02/2025	06/02/2025	06/02/2025
Sampling Time ~	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Anthracene	DETSC 3304	0.01	ug/l	0.03	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.07	0.03	0.06	0.03
Pyrene	DETSC 3304	0.01	ug/l	0.05	0.02	0.05	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	0.52	0.25	0.36	< 0.20
OCPs							
alpha-BHC	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
gamma-BHC (Lindane)	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
beta-BHC	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
delta-BHC	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Heptachlor	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aldrin	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Heptachlor epoxide	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
gamma-Chlordane	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Endosulphan I	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4,4-DDE	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Dieldrin	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Endrin	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Endosulphan II	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Endrin aldehyde	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4,4-DDT	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Endosulphan sulphate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Methoxychlor	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Endrin ketone	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
OPPs							
Dichlorvos	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Mevinphos	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Demeton-O	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Ethoprop	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Naled	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Phorate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Demeton-S	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Diazinon	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Disulfoton	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Water Samples

Our Ref 25-03499

Client Ref ~ 24-1562

Contract Title ~ Greengate BioGas Powerstation

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Sampling Date ~	06/02/2025	06/02/2025	06/02/2025	06/02/2025
Sampling Time ~	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Methylparathion	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Ronnel	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Fenthion	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Chlopyrifos	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Trichloronate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Merphos	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Stirofos	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Tokuthion	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Fensulfothion	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Bolstar	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Azinphos methyl	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Coumaphos	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Triazines							
Atraton	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Prometon	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Simazine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Atrazine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Propazine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Terbutylazine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Secbumeton	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Symetryn	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Ametryn	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Prometryne	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Terbutryn	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Subcontracted Analysis							
Molybdate Reactive Phosphorus (MRP)	\$*	0.03	mg/l	<0.03	<0.03	<0.03	<0.03
Total coliforms	\$*	0	fu/100ml	88	78	214	21
Faecal Coliforms	\$*	0	n/100ml	1.00	1.00	0.00	1.00

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Test	Method	LOD	Units				
VOCs							
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1

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Test	Method	LOD	Units				
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1
SVOCs							
Phenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

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Test	Method	LOD	Units				
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

Information in Support of the Analytical Results

Our Ref 25-03499
Client Ref ~ 24-1562
Contract ~ Greengate BioGas Powerstation

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2465815	BH01 8.58 WATER	06/02/25	GB 1L, GV x2, PB 1L	BOD (2 days), Dissolved Oxygen (2 days), Kone (4 days), Kone PO4 (5 days), pH/Cond (1 days), Ammoniacal Nitrogen as N (10 days), OC Pesticides (7 days), OP Pesticides (7 days), PAH MS (4 days), SVOC (7 days), Dissolved s (7 days), Suspended s (2	
2465816	BH02 2.14 WATER	06/02/25	GB 1L, GV x2, PB 1L	BOD (2 days), Dissolved Oxygen (2 days), Kone (4 days), Kone PO4 (5 days), pH/Cond (1 days), Ammoniacal Nitrogen as N (10 days), OC Pesticides (7 days), OP Pesticides (7 days), PAH MS (4 days), SVOC (7 days), Dissolved s (7 days), Suspended s (2	
2465817	BH03 7.27 WATER	06/02/25	GB 1L, GV x2, PB 1L	BOD (2 days), Dissolved Oxygen (2 days), Kone (4 days), Kone PO4 (5 days), pH/Cond (1 days), Ammoniacal Nitrogen as N (10 days), OC Pesticides (7 days), OP Pesticides (7 days), PAH MS (4 days), SVOC (7 days), Dissolved s (7 days), Suspended s (2	
2465818	BH04 5.72 WATER	06/02/25	GB 1L, GV x2, PB 1L	BOD (2 days), Dissolved Oxygen (2 days), Kone (4 days), Kone PO4 (5 days), pH/Cond (1 days), Ammoniacal Nitrogen as N (10 days), OC Pesticides (7 days), OP Pesticides (7 days), PAH MS (4 days), SVOC (7 days), Dissolved s (7 days), Suspended s (2	

Key: G-Glass P-Plastic B-Bottle V-Vial

Normec DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Key:

~ Sample details are provided by the client and can affect the validity of the results
* -not accredited.
-MCERTS (accreditation only applies if report carries the MCERTS logo).
\$ -subcontracted.
n/s -not supplied.
I/S -insufficient sample.
U/S -unsuitable sample.
t/f -to follow.
nd -not detected.

End of Report

Certificate of Analysis

Certificate Number 25-04034

Issued: 04-Mar-25

Client Causeway Geotech
8 Drumahiskey Road
Ballymoney
County Antrim
BT53 7QL

Our Reference 25-04034

Client Reference ~ 24-1562

Order No ~ (not supplied)

Contract Title ~ GreenGate BioGas

Description 6 Soil samples.

Date Received 24-Feb-25

Date Started 24-Feb-25

Date Completed 04-Mar-25

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "JC Coffey".

John Coffey
Quality Manager



Summary of Chemical Analysis Soil Samples

Our Ref 25-04034

Client Ref ~ 24-1562

Contract Title ~ GreenGate BioGas

Lab No	2469241	2469242	2469243	2469244	2469245	2469246
Sample ID ~	BH01	BH01	BH02	BH02	BH03	BH04
Depth ~	2.50-3.50	7.50-8.50	0.00-1.20	1.40-2.50	0.00-1.20	0.00-1.30
Other ID ~	6	14	1	3	1	1
Sample Type ~	B	B	B	B	B	B
Sampling Date ~	21/02/2025	21/02/2025	21/02/2025	21/02/2025	21/02/2025	21/02/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Inorganics									
pH	DETSC 2008#		pH	12.0	11.2	12.3	10.7	10.3	9.7
Organic matter	DETSC 2002#	0.1	%	1.1	0.6	0.5	0.4	0.9	0.8
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	7.8	6.4	11	3.4	6.8	7.5
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	44	39	51	26	39	44
Sulphur as S, Total	DETSC 2320	0.01	%	0.03	0.02	0.02	0.01	0.02	0.02
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.08	0.04	0.06	0.03	0.03	0.04

Information in Support of the Analytical Results

Our Ref 25-04034
 Client Ref ~ 24-1562
 Contract ~ GreenGate BioGas

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2469241	BH01 2.50-3.50 SOIL	21/02/25	PT 500ml		
2469242	BH01 7.50-8.50 SOIL	21/02/25	PT 500ml		
2469243	BH02 0.00-1.20 SOIL	21/02/25	PT 500ml		
2469244	BH02 1.40-2.50 SOIL	21/02/25	PT 500ml		
2469245	BH03 0.00-1.20 SOIL	21/02/25	PT 500ml		
2469246	BH04 0.00-1.30 SOIL	21/02/25	PT 500ml		

Key: P-Plastic T-Tub

Normec DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

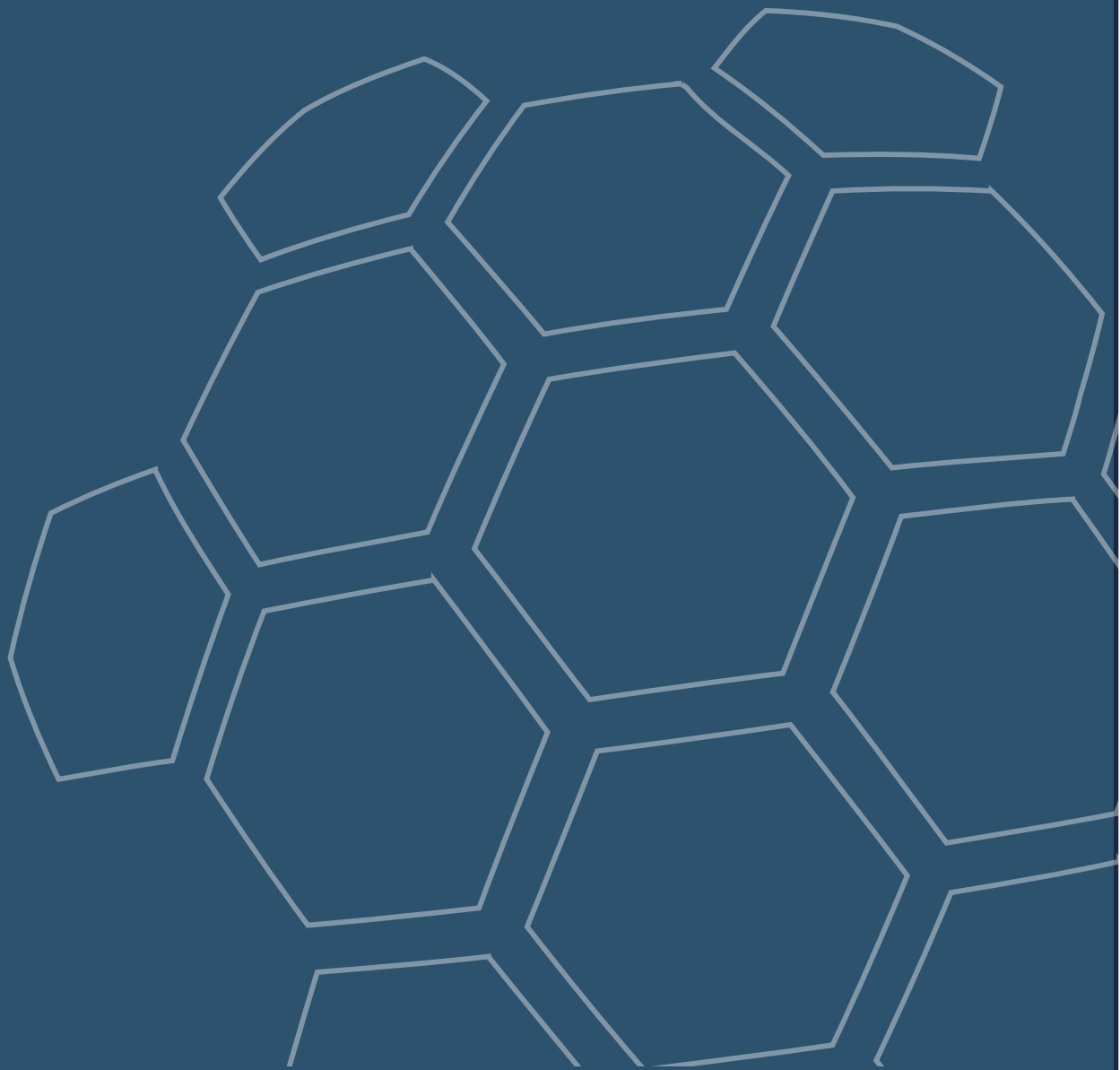
U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report

APPENDIX J – SPT HAMMER ENERGY MEASUREMENT REPORT



SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Southern Testing
Unit 11
Charlwoods Road
East Grinstead
West Sussex
RH19 2HU

SPT Hammer Ref: 0197
Test Date: 17/02/2024
Report Date: 19/02/2024
File Name: 0197.spt
Test Operator: RS

Instrumented Rod Data

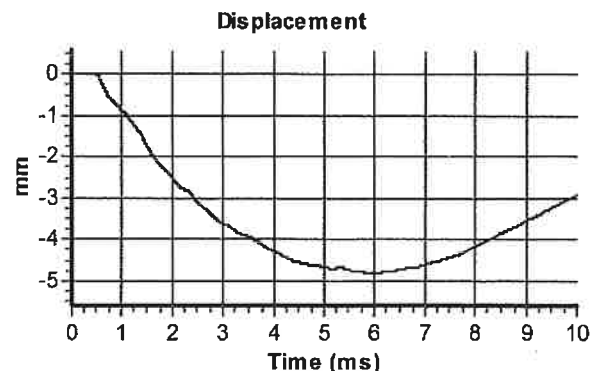
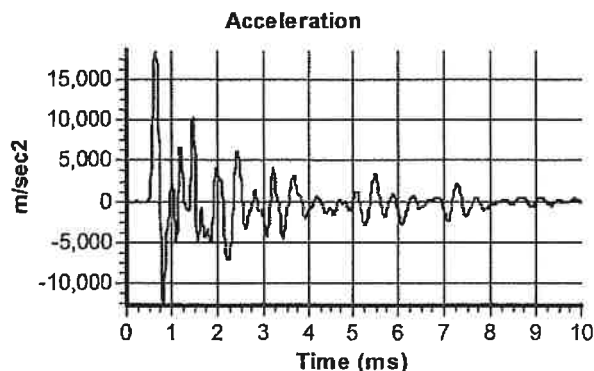
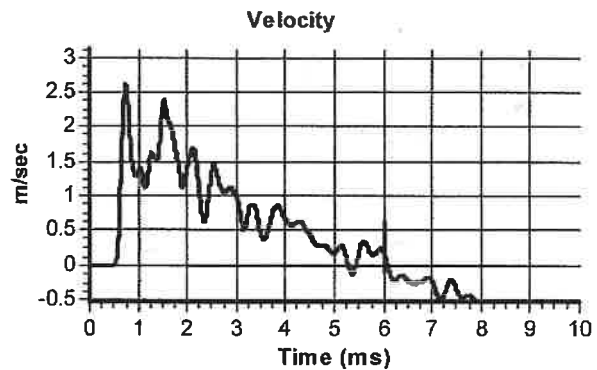
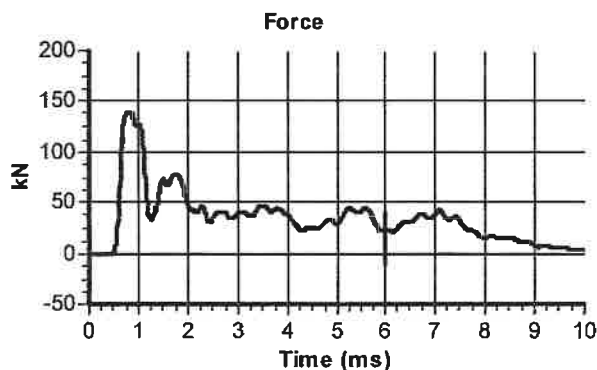
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.6
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 64786
Accelerometer No.2: 64789

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location

CAUSEWAY



Calculations

Area of Rod A (mm^2): 983
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 314

Energy Ratio E_r (%): **66**



Signed: Bob Stewart
Title: Technician

The recommended calibration interval is 12 months

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Southern Testing
Unit 11
Charlwoods Road
East Grinstead
West Sussex
RH19 2HU

SPT Hammer Ref: 1532
Test Date: 17/02/2024
Report Date: 19/02/2024
File Name: 1532.spt
Test Operator: RS

Instrumented Rod Data

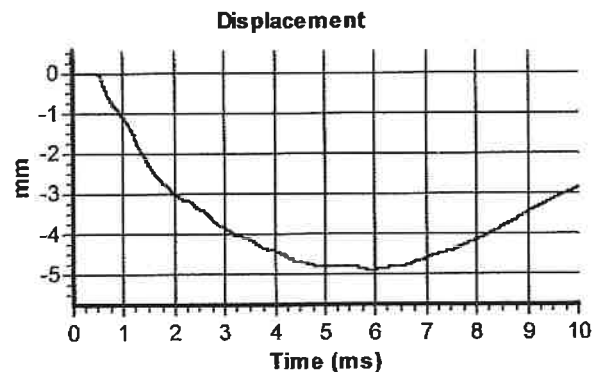
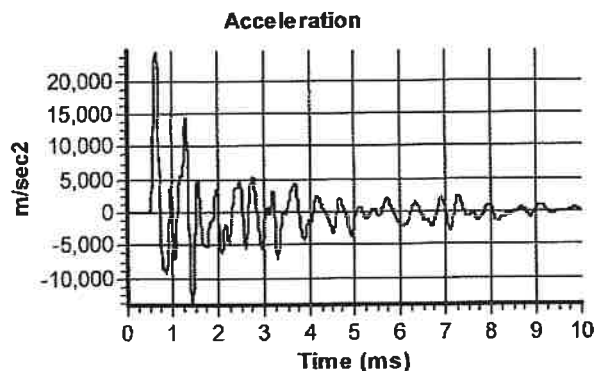
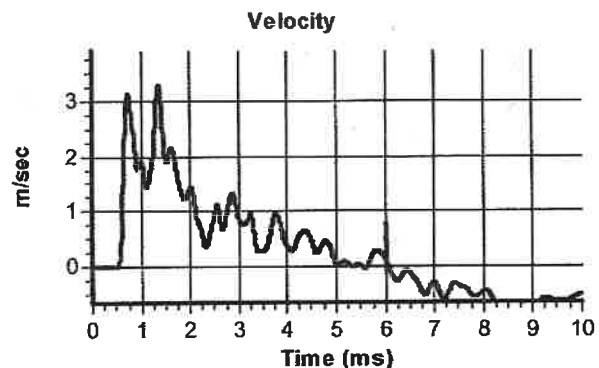
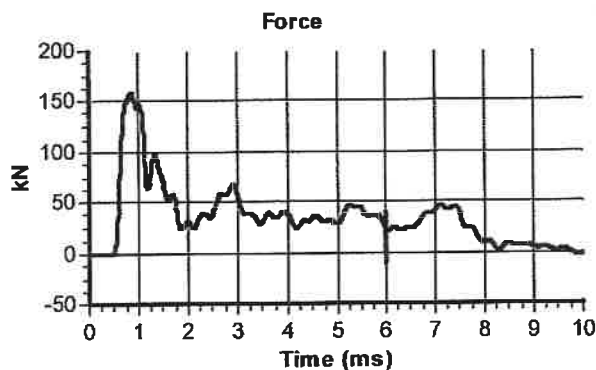
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.6
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 64786
Accelerometer No.2: 64789

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location

CAUSEWAY



Calculations

Area of Rod A (mm^2): 983
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 361

Energy Ratio E_r (%): **76**

Signed: Bob Stewart
Title: Technician

The recommended calibration interval is 12 months



CAUSEWAY
GEOTECH

Causeway Geotech Limited has made its commitment to health and safety of people, the environment and the quality of its services an integral part of our strategy.

Whether it be ensuring people's safety or meeting the challenges of operating in an ecologically diverse environment, we aim to act in a sustainable and responsible manner at all times.

CERTIFICATIONS



MEMBERSHIP



CAUSEWAY GEOTECH LTD

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Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US

Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Fehily Timoney
Unit 3/4
Northwood House
Northwood Crescent
Northwood
Dublin
Dublin
DO9 X899

Attention: Sean Foley

CERTIFICATE OF ANALYSIS

Date of report Generation:	23 June 2026
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	260528-113
Your Reference:	P24-188
Location:	Powerstown
Report No:	806388
Order Number:	Z5218

This report has been revised and directly supersedes 805499 in its entirety.

We received 2 samples on Thursday May 28, 2026 and 2 of these samples were scheduled for analysis which was completed on Tuesday June 23, 2026. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Justin Keeton
Business Unit Leader - Land





CERTIFICATE OF ANALYSIS

Validated

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
33496260	BH01		0.00 - 0.00	27/05/2026
33496275	BH04		0.00 - 0.00	27/05/2026

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		33496260										33496275									
	Customer Sample Reference		BH01										BH04									
	AGS Reference																					
	Depth (m)		0.00 - 0.00										0.00 - 0.00									
	Container		0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	50ml digtube (ALE001)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	50ml digtube (ALE001)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)					
	Sample Type		GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW					
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 2	X								X											
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 2					X							X								
Anions by Kone (w)	All	NDPs: 0 Tests: 2			X							X										
BOD True Total	All	NDPs: 0 Tests: 2		X							X											
COD Unfiltered	All	NDPs: 0 Tests: 2		X							X											
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2						X				X										
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	X							X												
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 2			X							X										
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2			X							X										
Mercury Dissolved	All	NDPs: 0 Tests: 2						X				X										
Nitrite by Kone (w)	All	NDPs: 0 Tests: 2							X							X						
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 2	X								X											
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2	X								X											
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 4	X		X						X		X									
PFAS Liquids (Full Suite)	All	NDPs: 0 Tests: 2				X							X									

SDG: 260528-113

Report Number: 806388

Superseded Report: 805499

Client Ref.: P24-188

Location: Powerstown

Results Legend



Test



No Determination Possible

Sample Types -

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- UE - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water
- Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH01	BH04				
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery *** 6.2 FTAB (see appendix) 1-4*§@ Sample deviation (see appendix)			0.00 - 0.00 Ground Water (GW) 27/05/2026 . 28/05/2026 260528-113 33496260	0.00 - 0.00 Ground Water (GW) 27/05/2026 . 28/05/2026 260528-113 33496275				
Component	LOD/Units		Method					
BOD, unfiltered	<1 mg/l		TM045	2.02	2.41			
				#	#			
Oxygen, dissolved	<0.3 mg/l		TM046	9.42	9.1			
Carbon, Organic (diss.filt)	<3 mg/l		TM090	<3	<3			
Ammoniacal Nitrogen as NH4	<0.3 mg/l		TM099	<0.3	<0.3			
				#	#			
COD, unfiltered	<7 mg/l		TM107	72.5	19.8			
			#	#				
Redox potential	mV	TM110	147	131				
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5	0.823				
			#	2 #				
Boron (diss.filt)	<10 µg/l	TM152	47.9	34.6				
			#	2 #				
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08				
			#	2 #				
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1				
			#	2 #				
Copper (diss.filt)	<0.3 µg/l	TM152	0.404	<0.3				
			#	2 #				
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	<0.2				
			#	2 #				
Manganese (diss.filt)	<3 µg/l	TM152	4.44	424				
			#	2 #				
Nickel (diss.filt)	<0.4 µg/l	TM152	0.575	0.912				
			#	2 #				
Zinc (diss.filt)	<1 µg/l	TM152	<1	1.22				
			#	2 #				
Sodium (Dis.Filt)	<0.076 mg/l	TM152	15.9	8.91				
			#	2 #				
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	12.1	12.4				
			#	2 #				
Potassium (Dis.Filt)	<0.2 mg/l	TM152	2.18	1.17				
			#	2 #				
Calcium (Dis.Filt)	<0.2 mg/l	TM152	141	111				
			#	2 #				
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019	0.0527				
			#	2 #				
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01				
			#	2 #				
Nitrite as NO2	<0.05 mg/l	TM184	<0.05	<0.05				
			#	#				
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05	<0.05				
			#	#				
Sulphate	<2 mg/l	TM184	60.7	52				
			#	#				
Chloride	<2 mg/l	TM184	34	22.4				
			#	#				
Nitrate as NO3	<0.3 mg/l	TM184	29.5	20.4				
			#	#				
Nitrogen, Total	<1 mg/l	TM212	7.34	5.37				
			#	#				
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	<0.03				
			#	#				
pH	<1 pH Units	TM256	7.69	7.77				
			#	#				
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.715	0.568				
			#	#				
Dissolved solids, Total (meter)	<5 mg/l	TM256	573	436				
			#	#				
Alkalinity, Total as CaCO3	<3 mg/l	TM256	424	247				
			#	#				
Phenol	<0.002 mg/l	TM259	<0.002	<0.002				
			#	#				



CERTIFICATE OF ANALYSIS

Validated

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

Results Legend			Customer Sample Ref.		BH01	BH04				
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery *** 6:2 FTAB (see appendix) 1-4* @ Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 27/05/2026	0.00 - 0.00 Ground Water (GW) 27/05/2026				
Component	LOD/Units	Method								
Cresols	<0.006 mg/l	TM259			<0.006	<0.006				
					#	#				
Xylenols	<0.008 mg/l	TM259			<0.008	<0.008				
					#	#				
Phenols, Total Detected monohydric	<0.016 mg/l	TM259			<0.016	<0.016				
					#	#				
Trifluralin	<0.01 µg/l	TM343			<0.1	<0.05				
alpha-HCH	<0.01 µg/l	TM343			<0.1	<0.05				
gamma-HCH (Lindane)	<0.01 µg/l	TM343			<0.1	<0.05				
Heptachlor	<0.01 µg/l	TM343			<0.1	<0.05				
Aldrin	<0.01 µg/l	TM343			<0.1	<0.05				
beta-HCH	<0.01 µg/l	TM343			<0.1	<0.05				
Isodrin	<0.01 µg/l	TM343			<0.1	<0.05				
delta-HCH	<0.01 µg/l	TM343			<0.1	<0.05				
Heptachlor epoxide	<0.01 µg/l	TM343			<0.1	<0.05				
Endosulphan I	<0.01 µg/l	TM343			<0.1	<0.05				
trans-Chlordane	<0.01 µg/l	TM343			<0.1	<0.05				
cis-Chlordane	<0.01 µg/l	TM343			<0.1	<0.05				
Dieldrin	<0.01 µg/l	TM343			<0.1	<0.05				
Endosulphan II	<0.02 µg/l	TM343			<0.2	<0.1				
Endosulphan Sulphate	<0.02 µg/l	TM343			<0.2	<0.1				
Permethrin I	<0.01 µg/l	TM343			<0.1	<0.05				
Permethrin II	<0.01 µg/l	TM343			<0.1	<0.05				
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344			<0.2	<0.5				
Hexachlorobutadiene	<0.01 µg/l	TM344			<0.2	<0.5				
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344			<0.2	<0.5				
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344			<0.2	<0.5				
Dichlorvos	<0.01 µg/l	TM344			<0.2	<0.5				
Dichlobenil	<0.01 µg/l	TM344			<0.2	<0.5				
Mevinphos	<0.01 µg/l	TM344			<0.2	<0.5				
Tecnazene	<0.01 µg/l	TM344			<0.2	<0.5				
Hexachlorobenzene	<0.01 µg/l	TM344			<0.2	<0.5				
Phorate	<0.01 µg/l	TM344			<0.2	<0.5				
Diazinon	<0.01 µg/l	TM344			<0.2	<0.5				
Triallate	<0.01 µg/l	TM344			<0.2	<0.5				
Atrazine	<0.01 µg/l	TM344			<0.2	<0.2				



CERTIFICATE OF ANALYSIS

Validated

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

Results Legend			Customer Sample Ref.		BH01	BH04			
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery *** 6:2 FTAB (see appendix) 1-4*§@ Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 27/05/2026	0.00 - 0.00 Ground Water (GW) 27/05/2026			
Component	LOD/Units	Method							
Simazine	<0.01 µg/l	TM344			0.24	<2			
Disulfoton	<0.01 µg/l	TM344			<0.2	<0.2			
Propetamphos	<0.01 µg/l	TM344			<0.2	<0.2			
Chlorpyrifos-methyl	<0.01 µg/l	TM344			<0.2	<0.2			
Pirimiphos-methyl	<0.01 µg/l	TM344			<0.2	<0.2			
Fenchlorophos	<0.01 µg/l	TM344			<0.2	<0.2			
Chlorpyrifos	<0.01 µg/l	TM344			<0.2	<0.2			
Fenthion	<0.01 µg/l	TM344			<0.2	<0.2			
Fenitrothion	<0.01 µg/l	TM344			<0.2	<0.2			
Triadimefon	<0.01 µg/l	TM344			<0.2	<0.2			
Pendimethalin	<0.01 µg/l	TM344			<0.2	<0.2			
Parathion	<0.01 µg/l	TM344			<0.2	<0.2			
trans-Chlordane	<0.01 µg/l	TM344			<0.2	<0.2			
cis-Chlordane	<0.01 µg/l	TM344			<0.2	<0.2			
Ethion	<0.01 µg/l	TM344			<0.2	<0.2			
Carbophenothion	<0.01 µg/l	TM344			<0.2	<0.2			
Dinitro-o-cresol	<0.1 µg/l	TM411			<1	<1			
Clopyralid	<0.04 µg/l	TM411			<0.4	<0.4			
MCPA	<0.05 µg/l	TM411			<0.5	<0.5			
Mecoprop	<0.04 µg/l	TM411			<0.4	<0.4			
Dicamba	<0.04 µg/l	TM411			<0.4	<0.4			
MCPB	<0.05 µg/l	TM411			<0.5	<0.5			
2,4-DB	<0.1 µg/l	TM411			<1	<1			
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411			<0.5	<0.5			
Dichlorprop	<0.1 µg/l	TM411			<1	<1			
Triclopyr	<0.05 µg/l	TM411			<0.5	<0.5			
Fenoprop (Silvex)	<0.1 µg/l	TM411			<1	<1			
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411			<0.5	<0.5			
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411			<0.5	<0.5			
Bromoxynil	<0.04 µg/l	TM411			<0.4	<0.4			
Benazolin	<0.04 µg/l	TM411			<0.4	<0.4			
Ioxynil	<0.05 µg/l	TM411			<0.5	<0.5			
Pentachlorophenol	<0.04 µg/l	TM411			<0.4	<0.4			



CERTIFICATE OF ANALYSIS

Validated

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

Results Legend			Customer Sample Ref.		BH01	BH04				
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery. *** 6:2 FTAB (see appendix) 1-4# Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 27/05/2026	0.00 - 0.00 Ground Water (GW) 27/05/2026				
Component	LOD/Units	Method								
Fluoroxypyr	<0.1 µg/l	TM411			<1	<1				
PFBA (375-22-4)	<2 ng/l	TM434			<4	<4	#	#		
PFMOPra (377-73-1)	<1 ng/l	TM434			<2	<2	#	#		
3:3 FTCA (356-02-5)	<5 ng/l	TM434			<10	<10	#	#		
PFPA (2706-90-3)	<1 ng/l	TM434			<2	<2	#	#		
PFMOBA (863090-89-5)	<1 ng/l	TM434			<2	<2	#	#		
4:2 FTS (757124-72-4)	<1 ng/l	TM434			<2	<2	#	#		
NFDHA (151772-58-6)	<3 ng/l	TM434			<6	<6	#	#		
PFBS (375-73-5)	<1 ng/l	TM434			<2	<2	#	#		
PFHxA (307-24-4)	<1 ng/l	TM434			<2	<2	#	#		
HFPO-DA (13252-13-6)	<2 ng/l	TM434			<4	<4	#	#		
PFEESA (113507-82-7)	<1 ng/l	TM434			<2	<2	#	#		
PFHpA (375-85-9)	<1 ng/l	TM434			<2	<2	#	#		
PFPeS (2706-91-4)	<1 ng/l	TM434			<2	<2	#	#		
5:3 FTCA (914637-49-3)	<5 ng/l	TM434			<10	<10	#	#		
ADONA (919005-14-4)	<1 ng/l	TM434			<2	<2	#	#		
6:2 FTS (27619-97-2)	<1 ng/l	TM434			<2	<2	#	#		
FBSA (30334-69-1)	<1 ng/l	TM434			<2	<2	#	#		
PFOA (335-67-1)	<0.65 ng/l	TM434			<1.3	<1.3	#	#		
PFHxS (355-46-4)	<1 ng/l	TM434			<2	<2	#	#		
PFNA (375-95-1)	<1 ng/l	TM434			<2	<2	#	#		
PFHpS (375-92-8)	<1 ng/l	TM434			<2	<2	#	#		
8:2 FTS (39108-34-4)	<2 ng/l	TM434			<4	<4	#	#		
HFPO-TA (13252-14-7)	<5 ng/l	TM434			<10	<10	#	#		
PFDA (335-76-2)	<2 ng/l	TM434			<4	<4	#	#		
MeFOSAA (2355-31-9)	<2 ng/l	TM434			<4	<4	◆ #	◆ #		
7:3 FTCA (812-70-4)	<5 ng/l	TM434			<10	<10	#	#		
Linear PFOS (1763-23-1)	<0.65 ng/l	TM434			<1.3	<1.3	#	#		
Branched PFOS	<0.65 ng/l	TM434			<1.3	<1.3	#	#		
EtFOSAA (2991-50-6)	<2 ng/l	TM434			<4	<4	◆ #	◆ #		
PFUnA (2058-94-8)	<2 ng/l	TM434			<4	<4	#	#		
9CI-PF3ONS (756426-58-1)	<1 ng/l	TM434			<2	<2	#	#		
PFNS (68259-12-1)	<1 ng/l	TM434			<2	<2	#	#		

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

[illegible]

SDG: 260528-113

Report Number: 806388

Superseded Report: 805499

Client Ref.: P24-188

Location: Powerstown

PAH Spec MS - Aqueous (W)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

VOC MS (W)

Results Legend			Customer Sample Ref.		BH01		BH04					
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00		0.00 - 0.00					
M	mCERTS accredited.				Ground Water (GW)		Ground Water (GW)					
aq	Aqueous / settled sample.				27/05/2026		27/05/2026					
diss.filt	Dissolved / filtered sample.				28/05/2026		28/05/2026					
tot.unfilt	Total / unfiltered sample.				260528-113		260528-113					
* Subcontracted - refer to subcontractor report for accreditation status.					33496260		33496275					
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery												
*** 6.2 FTAB (see appendix)												
1-4*§@ Sample deviation (see appendix)												
Component	LOD/Units	Method										
Dibromofluoromethane**	%	TM208	102		96.6							
Toluene-d8**	%	TM208	98.1		97.8							
4-Bromofluorobenzene**	%	TM208	98.1		95.4							
Dichlorodifluoromethane	<1 µg/l	TM208	<1		<1							
Chloromethane	<1 µg/l	TM208	<1		<1		#		#			
Vinyl chloride	<1 µg/l	TM208	<1		<1		#		#			
Bromomethane	<1 µg/l	TM208	<1		<1		#		#			
Chloroethane	<1 µg/l	TM208	<1		<1		#		#			
Trichlorofluoromethane	<1 µg/l	TM208	<1		<1		#		#			
1,1-Dichloroethene	<1 µg/l	TM208	<1		<1		#		#			
Carbon disulphide	<1 µg/l	TM208	<1		<1		#		#			
Dichloromethane	<3 µg/l	TM208	<3		<3		#		#			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1		<1		#		#			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1		<1		#		#			
1,1-Dichloroethane	<1 µg/l	TM208	<1		<1		#		#			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1		<1		#		#			
2,2-Dichloropropane	<1 µg/l	TM208	<1		<1							
Bromochloromethane	<1 µg/l	TM208	<1		<1		#		#			
Chloroform	<1 µg/l	TM208	<1		<1		#		#			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1		<1		#		#			
1,1-Dichloropropene	<1 µg/l	TM208	<1		<1		#		#			
Carbontetrachloride	<1 µg/l	TM208	<1		<1		#		#			
1,2-Dichloroethane	<1 µg/l	TM208	<1		<1		#		#			
Benzene	<1 µg/l	TM208	<1		<1		#		#			
Trichloroethene	<1 µg/l	TM208	<1		<1		#		#			
1,2-Dichloropropane	<1 µg/l	TM208	<1		<1		#		#			
Dibromomethane	<1 µg/l	TM208	<1		<1		#		#			
Bromodichloromethane	<1 µg/l	TM208	<1		<1		#		#			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1		<1		#		#			
Toluene	<1 µg/l	TM208	<1		<1		#		#			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1		<1		#		#			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1		<1		#		#			
1,3-Dichloropropane	<1 µg/l	TM208	<1		<1		#		#			



CERTIFICATE OF ANALYSIS

Validated

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

VOC MS (W)

Results Legend			Customer Sample Ref.		BH01	BH04				
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 27/05/2026	0.00 - 0.00 Ground Water (GW) 27/05/2026				
m	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
* Subcontracted - refer to subcontractor report for accreditation status.										
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery										
*** 6:2 FTAB (see appendix)										
1-4* Sample deviation (see appendix)										
Component	LOD/Units	Method								
Tetrachloroethene	<1 µg/l	TM208			<1	<1				
					#	#				
Dibromochloromethane	<1 µg/l	TM208			<1	<1				
					#	#				
1,2-Dibromoethane	<1 µg/l	TM208			<1	<1				
					#	#				
Chlorobenzene	<1 µg/l	TM208			<1	<1				
					#	#				
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1				
					#	#				
Ethylbenzene	<1 µg/l	TM208			<1	<1				
					#	#				
m,p-Xylene	<1 µg/l	TM208			<1	<1				
					#	#				
o-Xylene	<1 µg/l	TM208			<1	<1				
					#	#				
Styrene	<1 µg/l	TM208			<1	<1				
					#	#				
Bromoform	<1 µg/l	TM208			<1	<2				
					#	#				
Isopropylbenzene	<1 µg/l	TM208			<1	<1				
					#	#				
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1				
					#	#				
1,2,3-Trichloropropane	<1 µg/l	TM208			<1	<1				
					#	#				
Bromobenzene	<1 µg/l	TM208			<1	<1				
					#	#				
Propylbenzene	<1 µg/l	TM208			<1	<1				
					#	#				
2-Chlorotoluene	<1 µg/l	TM208			<1	<1				
					#	#				
1,3,5-Trimethylbenzene	<1 µg/l	TM208			<1	<1				
					#	#				
4-Chlorotoluene	<1 µg/l	TM208			<1	<1				
					#	#				
tert-Butylbenzene	<1 µg/l	TM208			<1	<1				
					#	#				
1,2,4-Trimethylbenzene	<1 µg/l	TM208			<1	<1				
					#	#				
sec-Butylbenzene	<1 µg/l	TM208			<1	<1				
					#	#				
4-iso-Propyltoluene	<1 µg/l	TM208			<1	<1				
					#	#				
1,3-Dichlorobenzene	<1 µg/l	TM208			<1	<1				
					#	#				
1,4-Dichlorobenzene	<1 µg/l	TM208			<1	<1				
					#	#				
n-Butylbenzene	<1 µg/l	TM208			<1	<1				
					#	#				
1,2-Dichlorobenzene	<1 µg/l	TM208			<1	<1				
					#	#				
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208			<1	<1				
1,2,4-Trichlorobenzene	<1 µg/l	TM208			<1	<1				
					#	#				
Hexachlorobutadiene	<1 µg/l	TM208			<1	<1				
					#	#				
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208			<1	<1				
					#	#				
Naphthalene	<1 µg/l	TM208			<1	<1				
					#	#				
1,2,3-Trichlorobenzene	<1 µg/l	TM208			<1	<1				
					#	#				
1,3,5-Trichlorobenzene	<1 µg/l	TM208			<1	<1				



CERTIFICATE OF ANALYSIS

Validated

SDG: 260528-113
Client Ref.: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

Table of Results - Appendix

Method No	Description
TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	Determination of Ammonium in Water Samples using the Kone Analyser
TM107	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM178	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM343	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM411	Acid Herbs in Water by GCMS
TM046	Measurement of Dissolved Oxygen by Oxygen Meter
TM110	Redox Potential
TM152	Analysis of Aqueous Samples by ICP-MS
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM212	Determination of Total Nitrogen by High Temperature Catalytic Oxidation followed by Chemiluminescence Detection
TM241	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM344	Determination of selected pesticides (Suite II) by GCMS
TM434	Analysis of PFAS in aqueous matrices.

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

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Superseded Report: 805499

Test Completion Dates

Lab Sample No(s)	33496260	33496275
Customer Sample Ref.	BH01	BH04
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water

Acid Herbicides by GCMS	23-Jun-2026	23-Jun-2026
Ammoniacal Nitrogen	04-Jun-2026	04-Jun-2026
Anions by Kone (w)	04-Jun-2026	04-Jun-2026
BOD True Total	02-Jun-2026	03-Jun-2026
COD Unfiltered	01-Jun-2026	01-Jun-2026
Dissolved Metals by ICP-MS	11-Jun-2026	11-Jun-2026
Dissolved Organic/Inorganic Carbon	02-Jun-2026	02-Jun-2026
Dissolved Oxygen by Probe	29-May-2026	29-May-2026
Hexavalent Chromium (w)	04-Jun-2026	04-Jun-2026
Mercury Dissolved	03-Jun-2026	02-Jun-2026
Nitrite by Kone (w)	01-Jun-2026	01-Jun-2026
PAH Spec MS - Aqueous (W)	03-Jun-2026	03-Jun-2026
Pesticides (Suite I) by GCMS	09-Jun-2026	09-Jun-2026
Pesticides (Suite II) by GCMS	05-Jun-2026	10-Jun-2026
PFAS Liquids (Full Suite)	11-Jun-2026	11-Jun-2026
pH Value	01-Jun-2026	02-Jun-2026
pH Value of Filtered Water	29-May-2026	29-May-2026
Phenols by HPLC (W)	05-Jun-2026	05-Jun-2026
Phosphate by Kone (w)	04-Jun-2026	04-Jun-2026
Redox Potential	01-Jun-2026	01-Jun-2026
Total Nitrogen	02-Jun-2026	02-Jun-2026
VOC MS (W)	01-Jun-2026	01-Jun-2026



CERTIFICATE OF ANALYSIS

SDG: 260528-113
Client Ref: P24-188

Report Number: 806388
Location: Powerstown

Superseded Report: 805499

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur - e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

If during the search of the two 'pinch' samples by PLM only 1 or 2 fibres or fibre bundles are seen and identified as asbestos, the term 'trace asbestos identified' is reported.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Potentially respirable fibres are identified by using a Phase Contrast Microscope.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

21. 6:2 FTAB

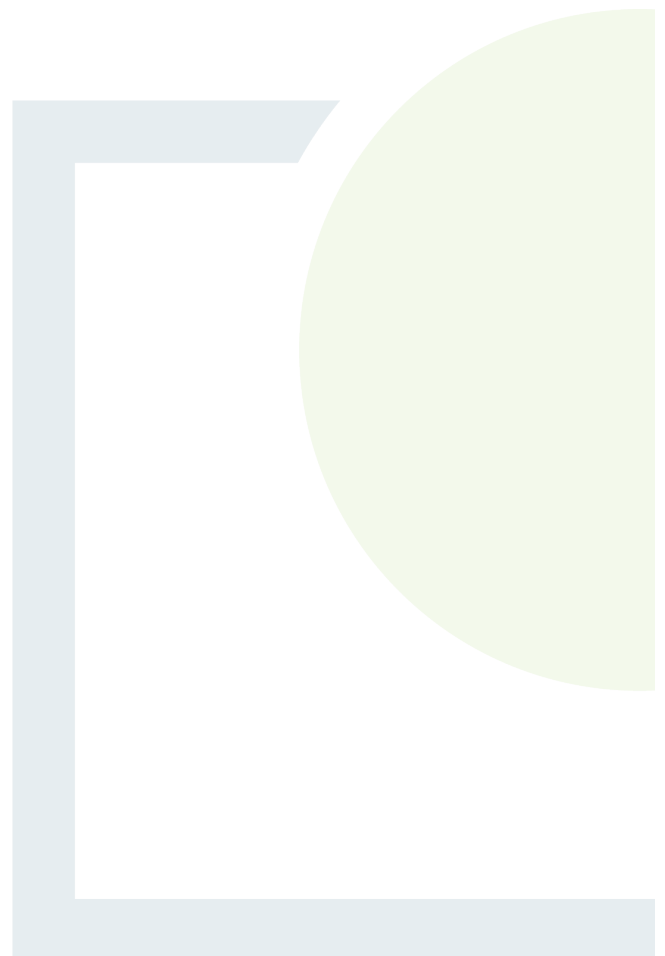
Recovery of 6:2 FTAB in the quality control samples has been observed to be <50% of the target value. Please note the 6:2 FTAB result is supplied as indicative only.



DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

APPENDIX 12.2

Borehole Pump Test Report





CAUSEWAY
GEOTECH



25-0549

POWERSTOWN - BOREHOLE PUMP TEST GI REPORT

Client:
FEHILY TIMONEY

Date:
NOVEMBER 2025

Status:
FINAL

CAUSEWAY GEOTECH LTD
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Co. Antrim, Northern Ireland, BT53 7QL

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DOCUMENT CONTROL SHEET	1
METHODS OF DESCRIBING SOILS AND ROCKS	1
1 AUTHORITY.....	2
2 PURPOSE, RATIONALE & SCOPE OF THE INVESTIGATION	2
3 DESCRIPTION OF SITE	2
4 SITE OPERATIONS	3
4.1 SUMMARY OF SITE WORKS	3
4.2 BOREHOLE.....	3
4.3 STANDPIPE INSTALLATIONS.....	3
4.4 PUMP TEST	3
4.5 SURVEYING.....	4
5 GROUND CONDITIONS.....	4
5.1 GENERAL GEOLOGY OF THE AREA.....	4
5.2 GROUND TYPES ENCOUNTERED DURING INVESTIGATION OF THE SITE.....	4
5.3 GROUNDWATER.....	4
6 REFERENCES	5

LIST OF TABLES

Table 1: Summary of surrounding land uses	2
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APPENDICES

- APPENDIX A – SITE AND EXPLORATORY HOLE LOCATION PLANS
- APPENDIX B – BOREHOLE LOGS
- APPENDIX C – GROUNDWATER MONITORING RECORDS





DOCUMENT CONTROL SHEET

REPORT NO:		25-0549			
PROJECT TITLE:		POWERSTOWN – BOREHOLE PUMP TEST			
CLIENT:		FEHILY TIMONEY			
REVISION:	A00	STATUS	FINAL	ISSUE DATE	11 TH NOV 2025
PREPARED BY:		REVIEWED BY:		APPROVED BY:	
					
Rabie Mohamed		Stephen Franey BSc MSc MEnvSc CEnv		Stephen Franey BSc MSc MEnvSc CEnv	

This report presents a factual account of the ground investigation in accordance with the Specification and Related Documents for Ground Investigation in Ireland 2nd Edition, published by Engineers Ireland (2016).



METHODS OF DESCRIBING SOILS AND ROCKS

Soil and rock descriptions are based on the guidance in BS5930:2015+A1:2020, The Code of Practice for Ground 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).
P	Nominal 100mm diameter undisturbed piston sample.
B	Bulk disturbed sample.
LB	Large bulk disturbed sample.
SB	Sonic bulk disturbed sample.
D	Small disturbed sample.
C	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,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.
(Y for Z/ Y for Z)	Incomplete standard penetration test where the full test length was not achieved. The blows 'X' represent the total blows for the given seating or test length 'Z' (mm).
N=X	SPT blow count 'N' given by the summation of the blows 'X' required to drive the full test length (300mm).
HVP / HVR	Uncorrected in situ hand shear vane test. Peak (HVP) and remoulded (HVR) results presented in kPa. Vane calibration factor has been applied, but no correction made for soil type.
c_{fv} / c_{rv}	Borehole shear vane test. Undisturbed (c_{fv}) and remoulded (c_{rv}) shear strengths presented in kPa.
Soil consistency description	In cohesive soils, where samples are disturbed and there are no suitable laboratory tests, N values may be used to indicate consistency on borehole logs – a median relationship of $N \times 5 = C_u$ is used (as set out in Stroud & Butler 1975).
dd-mm-yyyy	Date at the end and start of shifts, shown at the relevant borehole depth. Corresponding casing and water depths shown in the adjacent columns.
▽	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+A1:2020	
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) measured in millimetres.



1 AUTHORITY

On the instructions of Fehily Timoney (the “Client”), a ground investigation was undertaken at the site to provide geotechnical and environmental information.

This report details the work carried out both on site and in the chemical testing laboratory; it contains a description of the site and the works undertaken, the exploratory hole logs and the laboratory test results.

All information given in this report is based upon the ground conditions encountered during the ground investigation works, and on the results of the laboratory 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 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 PURPOSE, RATIONALE & SCOPE OF THE INVESTIGATION

The purpose of this investigation is to assess the ground conditions and to allow an evaluation of the geotechnical and environmental issues with the current site and proposed development.

The rationale has been determined by the Client, with the extent of the investigation including boreholes, environmental sampling, groundwater monitoring, laboratory testing, and the preparation of a factual account of the ground investigation findings.

3 DESCRIPTION OF SITE

The site is located at Irish Transverse Mercator 670900 668612 Powerstown, Co. Carlow. The site location is presented in Appendix A and a summary of the surrounding land uses is provided in Table 1.

Table 1: Summary of surrounding land uses

Location	Description
North	Industrial premises, Agricultural land.
East	Industrial premises, L3045 Powerstown Road, Agricultural land.
South	L3045 Powerstown Road, Agricultural land, Industrial premises.
West	Agricultural land, R448 Road, River Barrow.

4 SITE OPERATIONS

4.1 SUMMARY OF SITE WORKS

Site operations, which were conducted between 23rd September and 24th October 2025, comprised:

- one rotary drilled borehole
- a standpipe installation in one borehole
- in-situ testing, including:
 - one pump test including step-tests and 72-hour pump test.
- GPS survey of all completed locations
- groundwater monitoring

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

4.2 BOREHOLE

One borehole (BH01) was put to completion by rotary drilling techniques only. The borehole was completed using a Comacchio T7 tracked rotary drilling rig.

A hand dug inspection pit was carried out between ground level and 1.20m depth to ensure borehole was put down at locations clear of services or subsurface obstructions.

Symmetrix-cased full hole rotary percussive drilling techniques were employed to advance the boreholes to their completion depths.

Appendix B presents the borehole logs.

4.3 STANDPIPE INSTALLATIONS

A 175mm groundwater monitoring standpipe was installed in borehole BH01.

Details of the installations, including the depth range of the response zone, are provided in Appendix B on the individual borehole logs.

4.4 PUMP TEST

Step tests and a 72-hour pump test was carried in BH01 after the installation of the groundwater well.

Monitoring of nearby standpipes was carried out using manual dip-meters and digital data loggers to measure “drawdown” of the groundwater during tests.

Manual dip results are provided in Appendix C.



4.5 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 R10 GPS system employing VRS and real time kinetic (RTK) techniques.

The plan coordinates (Irish Transverse Mercator) and ground elevation (mOD Malin) at each location are recorded on the individual exploratory hole logs. The exploratory hole location plan presented in Appendix A shows these as-built positions.

5 GROUND CONDITIONS

5.1 GENERAL GEOLOGY OF THE AREA

Published geological mapping from the online Geological Survey Ireland spatial resources database indicate the superficial deposits underlying the site comprise gravels derived from limestones. These deposits are shown to be underlain by dolomitised dark-grey muddy limestone of the Ballysteen Formation.

5.2 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:

- **Sand and gravel deposits:** sand and gravel, frequently with high cobble and boulder content.
- **Bedrock (Limestone):** Rockhead was encountered at depths ranging from 14m in BH01.

Further details of these ground types, including their specific depths and descriptions, can be found on the individual exploratory hole logs accompanying this report.

5.3 GROUNDWATER

A groundwater strike was encountered at 14.50m during the exploratory work. Details of the strike, and relative changes in level during the works, is presented on the exploratory hole log.

It is noted that temporary casing used to support the borehole walls may have sealed out additional strikes, and the possibility of encountering groundwater during excavation in these areas cannot be ruled out.

In addition, groundwater inflows within bedrock may have been masked by the fluid used as the drilling flush medium.

6 REFERENCES

Association of Geotechnical and Geoenvironmental Specialists (AGS). (2022) UK Specification for Ground Investigation. 3rd Edition. ICE Publishing.

British Standards Institute (BSI). (2016) BS 1377-1:2016: Methods of test for soils for civil engineering purposes. Part 1: General requirements and sample preparation.

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British Standards Institute (BSI). (2018a) BS EN ISO 14688-1:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 1 Identification and description.

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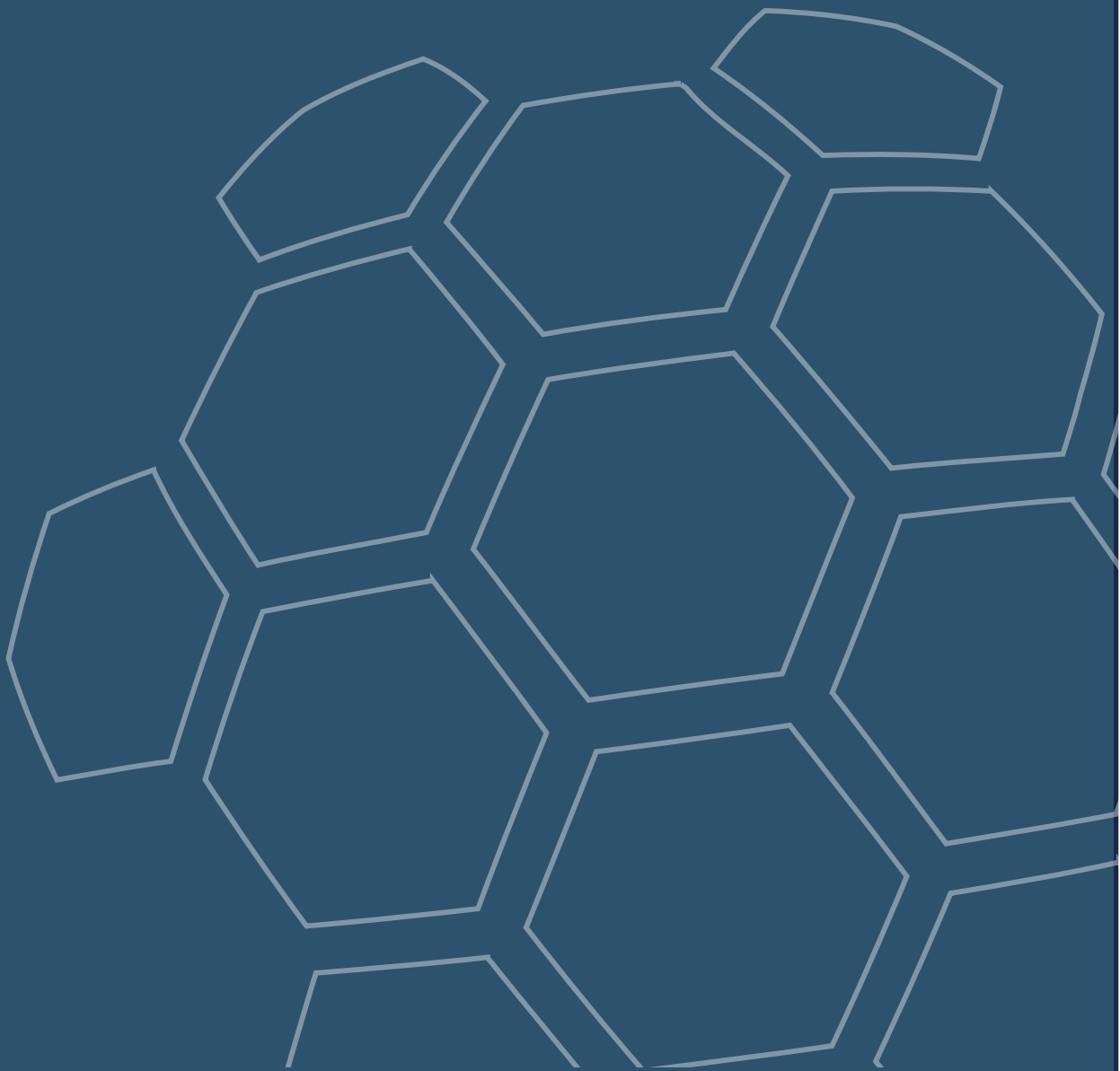
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Geological Survey Ireland (GSI). Geological Survey Ireland spatial resources database. Available at: <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>



APPENDIX A – SITE AND EXPLORATORY HOLE LOCATION PLANS



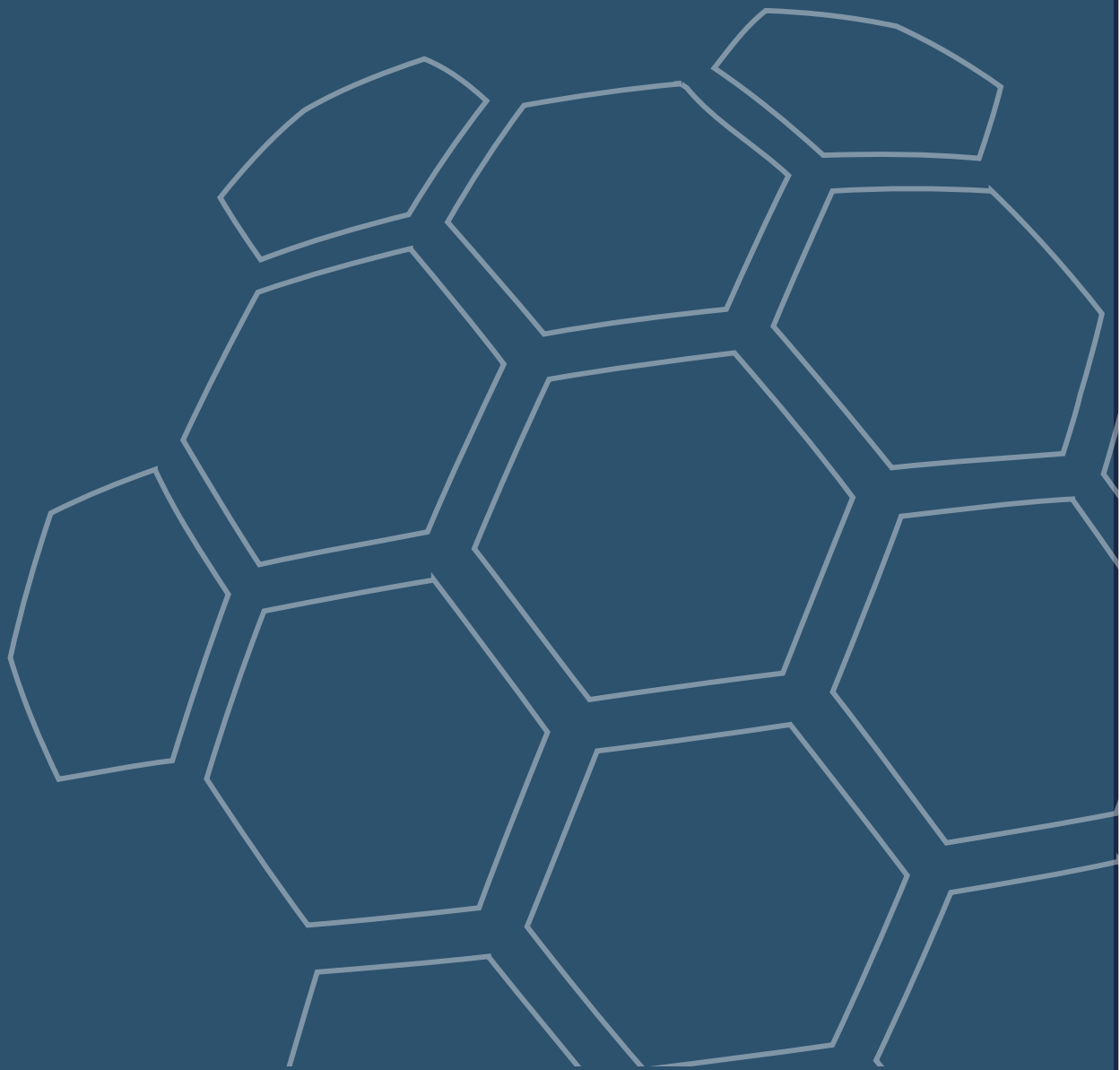


Project No.	25-0549
Client	Fehily Timoney
Site Location Plan	
Powerstown - Borehole Pump Test	
	
Last Revision	10/11/2025
Scale	1:20000

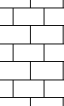


Legend Key  Borehole location	
Project No.	25-0549
Client	Fehily Timoney
Borehole Location Plan	
Powerstown - Borehole Pump Test	
 CAUSEWAY GEOTECH	
Last Revision	10/11/2025
Scale	1:1500

APPENDIX B – BOREHOLE LOGS



 CAUSEWAY GEOTECH				Project No. 25-0549		Project Name: Powerstown - Borehole Pump Test Client: Fehily Timoney Client's Rep: N/A				Borehole ID BH01							
Method Symmetrix Drilling Rotary Open Hole Drilling		Plant Used Comacchio T7 Comacchio T7		Top (m) 0.00 15.00		Base (m) 15.00 40.00		Coordinates 670917.31 E 668624.71 N		Final Depth: 40.00 m Start Date: 23/09/2025 Driller: GT		Sheet 1 of 6 Scale: 1:40					
								Elevation: 50.36 mOD End Date: 26/09/2025 Logger: SF		FINAL							
Depth (m)	Sample / Tests	Field Records			Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description			Water	Backfill			
							45.86	4.50		MADE GROUND: Greyish brown fine to coarse SAND and fine to coarse GRAVEL (Driller's description)					Greyish brown fine to coarse SAND and fine to coarse GRAVEL with high cobble and boulder content (Driller's description)		
Water Strikes				Remarks													
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	Borehole drilled by symmetrix and open hole techniques as per specification.													
14.50	14.50	20	14.00														
Casing Details				Water Added													
To (m)	Diam (mm)	From (m)	To (m)														
15.00	275																
40.00	250																
				Core Barrel		Flush Type		Termination Reason				Last Updated					
								Terminated at scheduled depth.				10/11/2025					

 CAUSEWAY GEOTECH				Project No. 25-0549		Project Name: Powerstown - Borehole Pump Test Client: Fehily Timoney Client's Rep: N/A				Borehole ID BH01					
Method Symmetrix Drilling Rotary Open Hole Drilling		Plant Used Comacchio T7 Comacchio T7		Top (m) 0.00 15.00	Base (m) 15.00 40.00	Coordinates 670917.31 E 668624.71 N		Final Depth: 40.00 m	Start Date: 23/09/2025	Driller: GT	Sheet 2 of 6 Scale: 1:40				
								Elevation: 50.36 mOD	End Date: 26/09/2025	Logger: SF	FINAL				
Depth (m)	Sample / Tests	Field Records			Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description		Water	Backfill		
							36.36	14.00						7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5	
										Grey LIMESTONE (Driller's description)					
															
Water Strikes				Remarks											
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	Borehole drilled by symmetrix and open hole techniques as per specification.											
14.50	14.50	20	14.00												
Casing Details				Water Added											
To (m)	Diam (mm)	From (m)	To (m)							Core Barrel		Flush Type	Termination Reason	Last Updated	
15.00	275												Terminated at scheduled depth.	10/11/2025	
40.00	250														



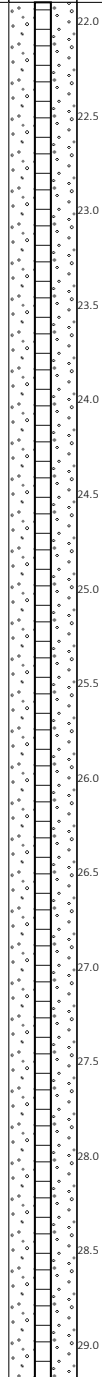


Client's Rep: N/A

Borehole ID
BH01

Sheet 4 of 6
Scale: 1:40

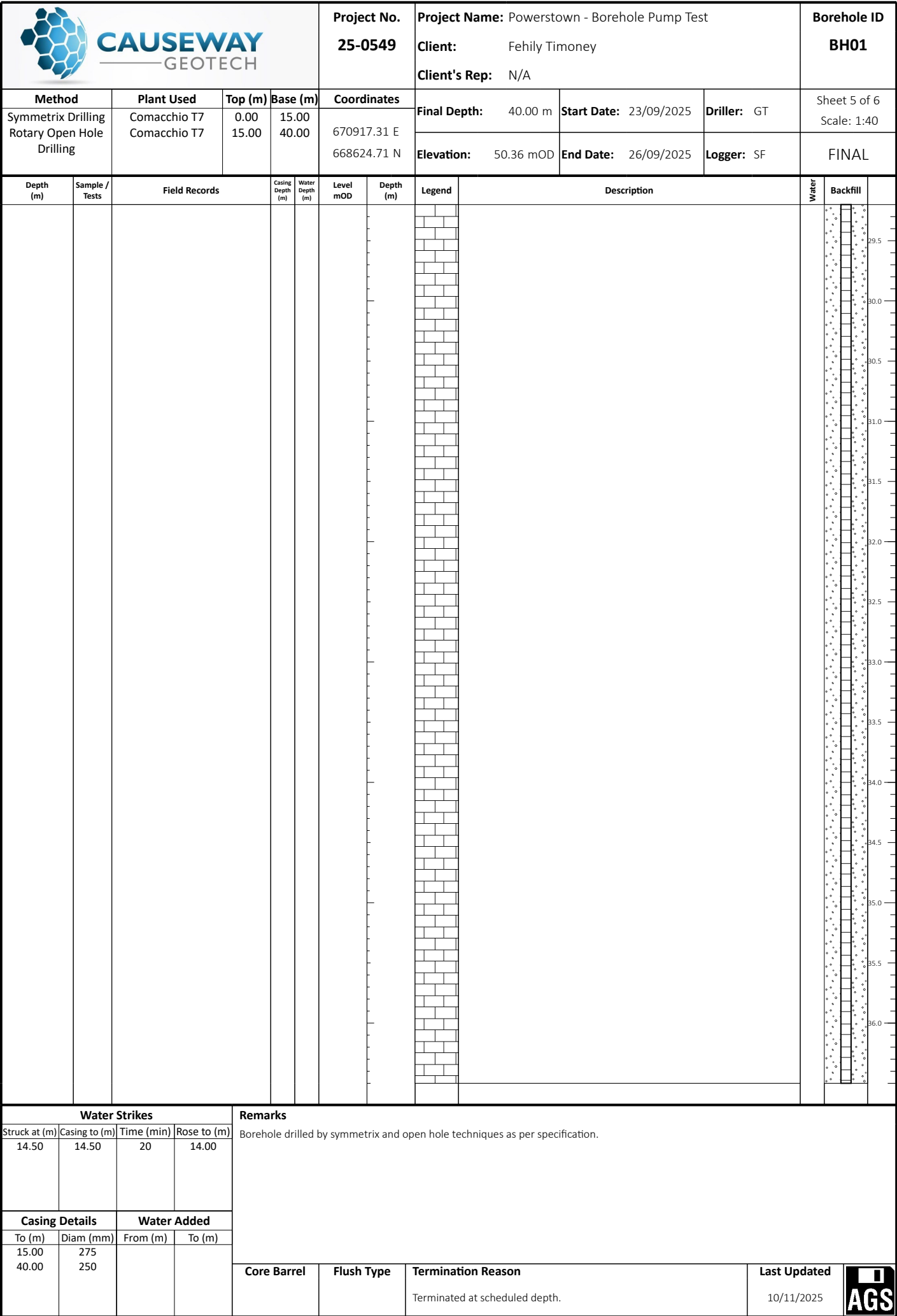
	Backfill
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Terminated at scheduled depth.

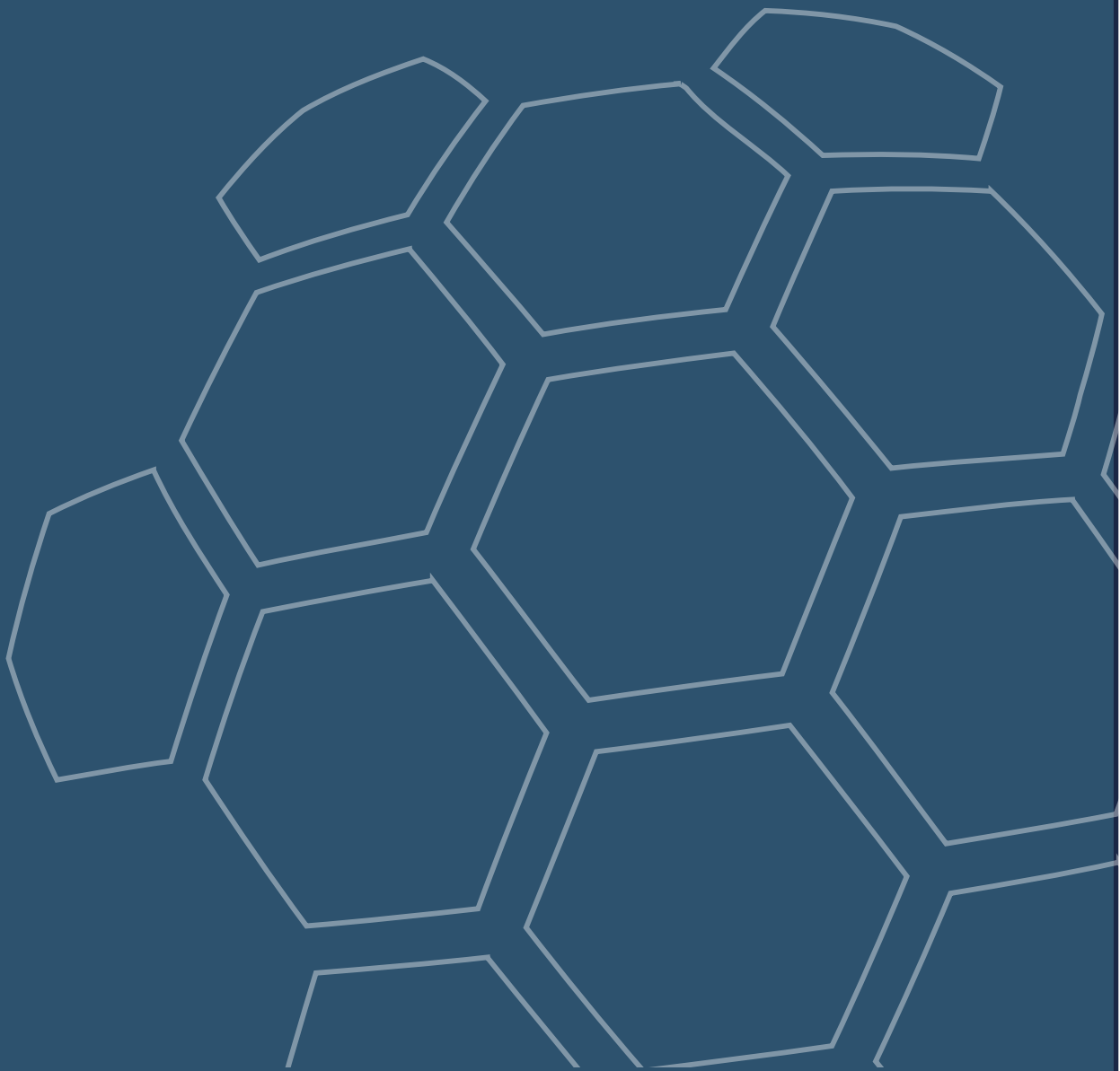
10/11/2025







APPENDIX C – GROUNDWATER MONITORING RECORDS



Job No:	25-549				
Job Title:	Powerstown Step Test - 6m ³ per hour				
BH Number	PUMP01				
Date	Interval (Minutes)	Time (24Hr)	Water level (from top of standpipe)	Water level (from ground level)	m ³ per hour
20/10/2025	0	13:30	9.23	8.83	6
	1	13:31	9.24	8.84	6
	2	13:32	9.33	8.93	6
	3	13:33	9.35	8.95	6
	4	13:34	9.37	8.97	6
	5	13:35	9.37	8.97	6
	6	13:36	9.36	8.96	6
	7	13:37	9.42	9.02	6
	8	13:38	9.4	9.00	6
	9	13:39	9.39	8.99	6
	10	13:40	9.45	9.05	6
	11	13:41	9.4	9.00	6
	12	13:42	9.36	8.96	6
	13	13:43	9.41	9.01	6
	14	13:44	9.4	9.00	6
	15	13:45	9.4	9.00	6
	20	13:50	9.4	9.00	6
	25	13:55	9.41	9.01	6
	30	14:00	9.4	9.00	6
	45	14:15	9.51	9.11	6

Job No:	25-549				
Job Title:	Powerstown Step Test - 8m ³ per hour				
BH Number	PUMP01				
Date	Interval (Minutes)	Time (24Hr)	Water level (from ground level)	Water level (from ground level)	m ³ per hour
20/10/2025	0	14:30	9.4	9.00	8
	1	14:31	9.53	9.13	8
	2	14:32	9.64	9.24	8
	3	14:33	9.6	9.20	8
	4	14:34	9.63	9.23	8
	5	14:35	9.67	9.27	8
	6	14:36	9.6	9.20	8
	7	14:37	9.6	9.20	8
	8	14:38	9.57	9.17	8
	9	14:39	9.59	9.19	8
	10	14:40	9.62	9.22	8
	11	14:41	9.61	9.21	8
	12	14:42	9.6	9.20	8
	13	14:43	9.58	9.18	8
	14	14:44	9.6	9.20	8
	15	14:45	9.6	9.20	8
	20	14:50	9.62	9.22	8
	25	14:55	9.6	9.20	8
	30	15:00	9.58	9.18	8
	45	15:15	9.6	9.20	8

Job No:	25-549				
Job Title:	Powerstown Step Test - 10m ³ per hour				
BH Number	PUMP01				
Date	Interval (Minutes)	Time (24Hr)	Water level (from ground level)	Water level (from ground level)	m ³ per hour
20/10/2025	0	15:30	9.6	9.20	10
	1	15:31	9.8	9.40	10
	2	15:32	9.8	9.40	10
	3	15:33	9.83	9.43	10
	4	15:34	9.8	9.40	10
	5	15:35	9.73	9.33	10
	6	15:36	9.77	9.37	10
	7	15:37	9.77	9.37	10
	8	15:38	9.75	9.35	10
	9	15:39	9.75	9.35	10
	10	15:40	9.75	9.35	10
	11	15:41	9.75	9.35	10
	12	15:42	9.81	9.41	10
	13	15:43	9.84	9.44	10
	14	15:44	9.83	9.43	10
	15	15:45	9.83	9.43	10
	20	15:50	9.81	9.41	10
	25	15:55	9.8	9.40	10
	30	16:00	9.8	9.40	10
	45	16:15	9.83	9.43	10
	60	16:30	9.82	9.42	10

Job No:	25-549				
Job Title:	Powerstown Step Test - 12m ³ per hour				
BH Number	PUMP01				
Date	Interval (Minutes)	Time (24Hr)	Water level (from ground level)	Water level (from ground level)	m ³ per hour
20/10/2025	0	16:30	9.86	9.46	12
	1	16:31	9.9	9.50	12
	2	16:32	9.9	9.50	12
	3	16:33	9.91	9.51	12
	4	16:34	9.91	9.51	12
	5	16:35	9.96	9.56	12
	6	16:36	10	9.60	12
	7	16:37	9.86	9.46	12
	8	16:38	9.9	9.50	12
	9	16:39	9.91	9.51	12
	10	16:40	9.91	9.51	12
	11	16:41	9.92	9.52	12
	12	16:42	9.92	9.52	12
	13	16:43	9.92	9.52	12
	14	16:44	9.93	9.53	12
	15	16:45	9.93	9.53	12
	20	16:50	9.92	9.52	12
	25	16:55	9.92	9.52	12

Job No:	25-549				
Job Title:	Powerstown Step Test - Recovery				
BH Number	PUMP01				
Date	Interval (Minutes)	Time (24Hr)	Water level (from ground level)	Water level (from ground level)	m ³ per hour
20/10/2025	0	17:00	9.9	9.50	-
	1	17:01	9.1	8.70	-
	2	17:02	9.08	8.68	-
	3	17:03	9.06	8.66	-
	4	17:04	9.05	8.65	-
	5	17:05	9.08	8.68	-
	6	17:06	9.08	8.68	-
	7	17:07	9.08	8.68	-
	8	17:08	9.08	8.68	-
	9	17:09	9.08	8.68	-
	10	17:10	9.08	8.68	-
	11	17:11	9.08	8.68	-
	12	17:12	9.08	8.68	-
	13	17:13	9.08	8.68	-
	14	17:14	9.08	8.68	-
	15	17:15	9.08	8.68	-

Job No:	25-549				
Job Title:	Powerstown Pumptest				
BH Number	PUMP01				
Date	Interval (Minutes)	Time (24Hr)	Water level (from top of standpipe)	Water level (from ground level)	m ³ per hour
21/10/2025	0	07:30	9.90	9.50	12
	15	07:45	9.92	9.52	12
	30	08:00	9.91	9.51	12
	60	08:30	9.97	9.57	12
	90	09:00	9.99	9.59	12
	150	10:00	9.95	9.55	12
	210	11:00	9.97	9.57	11.8
	270	12:00	9.93	9.53	11.8
	390	14:00	9.92	9.52	11.8
	450	16:00	9.97	9.57	11.8
	570	18:00	9.98	9.58	11.8
	680	20:00	9.95	9.55	12
	800	22:00	10.00	9.60	12
22/10/2025	920	00:00	10.01	9.61	12
	1040	02:00	10.00	9.60	12
	1160	04:00	9.99	9.59	12
	1280	06:00	10.03	9.63	12
	1400	08:00	9.98	9.58	12
	1520	10:00	9.94	9.54	12
	1640	12:00	10.02	9.62	12
	1760	14:00	9.90	9.50	11.25
	1880	16:00	9.95	9.55	12.25
	2000	18:00	9.90	9.50	11
	2120	20:00	9.95	9.55	11
	2240	22:00	9.99	9.59	11
23/10/2025	2360	00:00	10.01	9.61	11
	2480	02:00	9.98	9.58	11
	2600	04:00	9.97	9.57	11
	2720	06:00	9.98	9.58	11
	2840	08:00	9.94	9.54	11
	2960	10:00	9.95	9.55	12
	3080	12:00	9.96	9.56	11.5
	3200	14:00	9.97	9.57	11.5
	3320	16:00	9.98	9.58	11.5
	3440	18:00	9.98	9.58	11.5
	3560	20:00	9.98	9.58	11.5
	3680	22:00	10.00	9.60	11.5
24/10/2025	3800	00:00	10.00	9.60	11.5
	3920	02:00	10.00	9.60	11.5
	4040	04:00	10.01	9.61	11.5
	4160	06:00	9.99	9.59	11.5
	4250	07:30	9.99	9.59	11.5

Job No:	25-549				
Job Title:	Powerstown Pumptest - Recovery after 72Hr Pump test				
BH Number	PUMP01				
Date	Interval (Minutes)	Time (24Hr)	Water level (from ground level)	Water level (from ground level)	m ³ per hour
20/10/2025	0	07:30	9.99	9.59	-
	1	07:31	9.78	9.38	-
	2	07:32	9.56	9.16	-
	3	07:33	9.47	9.07	-
	4	07:34	9.38	8.98	-
	5	07:35	9.2	8.80	-
	10	07:40	9.1	8.70	-
	15	07:45	9.09	8.69	-
	20	07:50	9.1	8.70	-
	30	08:00	9.12	8.72	-

Job No:	25-549			
Job Title:	Powerstown Pumptest			
BH Number	GW02		BH03	
Date	Time (24Hr)	Water level (MBGL)	Time (24Hr)	Water level (MBGL)
22/10/2025	08:00	8.23	08:00	8.33
	10:00	8.23	10:00	8.33
	12:00	8.23	12:00	8.33
	14:00	8.23	14:00	8.33
	16:00	8.23	16:00	8.33
	18:00	8.23	18:00	8.33
	20:00	8.23	20:00	8.33
	22:00	8.23	22:00	8.33
	00:00	8.23	00:00	8.33
23/10/2025	02:00	8.23	02:00	8.33
	04:00	8.23	04:00	8.33
	06:00	8.23	06:00	8.33
	08:00	8.23	08:00	8.33
	10:00	8.23	10:00	8.33
	12:00	8.23	12:00	8.33
	14:00	8.23	14:00	8.33
	16:00	8.23	16:00	8.33
	18:00	8.23	18:00	8.33
	20:00	8.23	20:00	8.33
	22:00	8.23	22:00	8.33
	00:00	8.23	00:00	8.33
24/10/2025	02:00	8.23	02:00	8.33
	04:00	8.23	04:00	8.33
	06:00	8.23	06:00	8.33
	08:00	8.23	08:00	8.33



CAUSEWAY
GEOTECH

Causeway Geotech Limited has made its commitment to health and safety of people, the environment and the quality of its services an integral part of our strategy.

Whether it be ensuring people's safety or meeting the challenges of operating in an ecologically diverse environment, we aim to act in a sustainable and responsible manner at all times.

CERTIFICATIONS / ACCREDITATIONS



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