Morecambe Offshore Windfarm: Generation Assets

Examination Documents

Volume 9

Stage 1 Geoarchaeological Assessment of 2023 and 2024 Geotechnical Data

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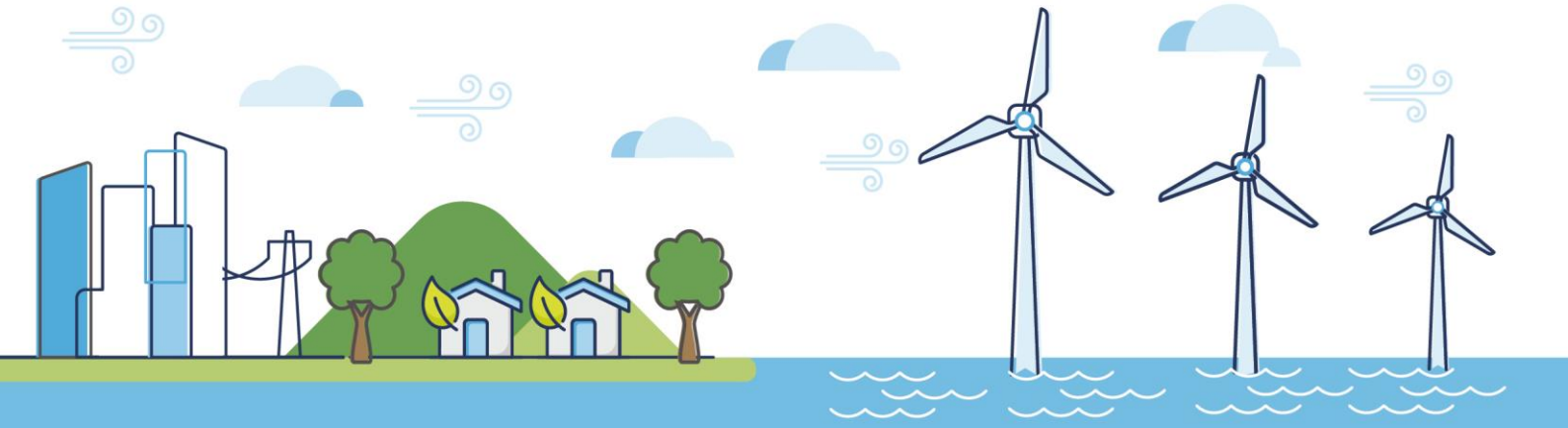

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1 Introduction

1. The following report has been provided at the request of the Examining Authority in their first written questions (PD-011; Reference 1CH5):

    - **Stage 1 Geoarchaeological Assessment of 2023 Geotechnical Data (Royal HaskoningDHV, 2024**)– this was first submitted to Historic England in April 2024 (MOR001-FLO-CON-ENV-TEC-0006)

2. A further technical note has been prepared to outline the results of a Stage 1 geoarchaeological assessment of shallow geotechnical (vibrocore) data and deep geotechnical (borehole) data acquired within the Morecambe Offshore Windfarm: Generation Assets (the Project) during a survey undertaken in 2024 (**Stage 1 Geoarchaeological Assessment of 2024 Geotechnical Data (Royal HaskoningDHV, 2025**).

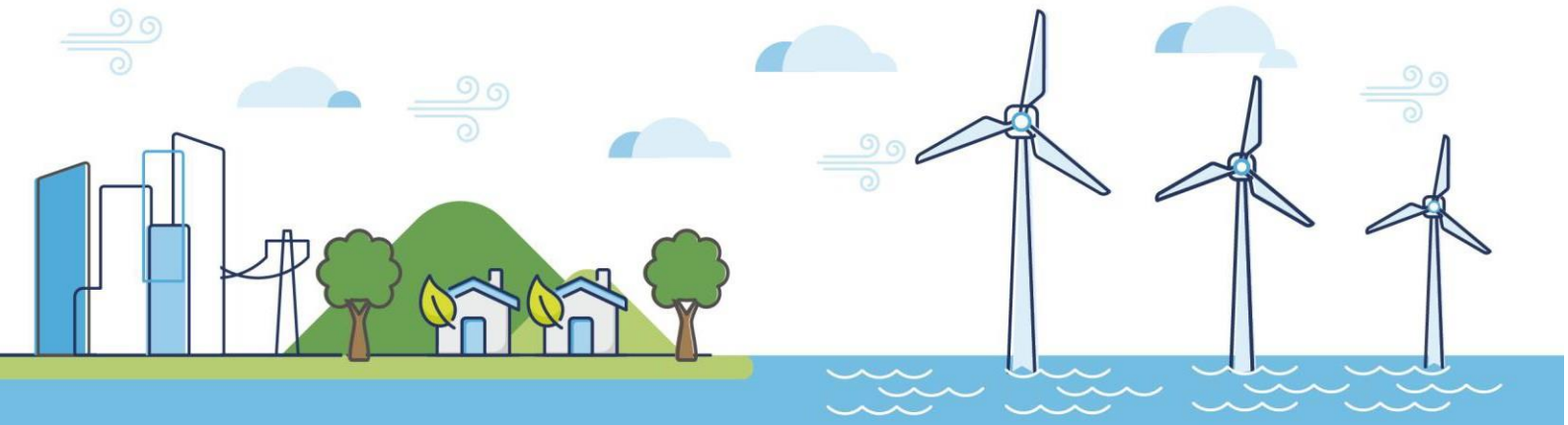
Stage 1 Geoarchaeological Assessment of 2023 Geotechnical Data (Royal HaskoningDHV, 2024)

Stage 1 Geoarchaeological Assessment of Geotechnical Data

Morecambe Offshore Windfarm: Generation Assets

Development Consent Order Documents

MOR001-FLO-CON-ENV-TEC-0006



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01	Final draft for Historic England	15/04/2024

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Glossary of Acronyms

BGS	British Geological Survey
BIIS	British and Irish Ice Sheet
CPT	Cone Penetration Tests
GIS	Glacio-isostatic adjustment
LAT	Lowest Astronomical Tide
MIS	Marine Isotope Stage
OSP	Offshore substation platform(s)
WTG	Wind turbine generators

Glossary of Unit Terms

ka	Thousands of years before present
km	Kilometre
km^2	Square kilometre
mbsf	Meters below seafloor

Glossary of Terminology

Elsterian	500 to 300 thousand years ago the first of three main glacial periods spanning the last one million years, succeeded by the Saalian.
Epoch	A division of time within a geological period generally considered to last several million years, examples from the Quaternary Period include the Holocene and Pleistocene.
Geoarchaeology	The application of earth science principles and techniques to the understanding of the archaeological record. Includes the study of soils and sediments and of natural physical processes that affect archaeological sites such as geomorphology, the formation of sites through geological processes and the effects on buried sites and artefacts.
Glacial/Interglacial	A glacial period is a period of time within an ice age that is marked by colder temperatures and glacier advances. Interglacial correspond to periods of warmer climate between glacial periods. There are three main periods of glaciation within the last one million years, the Elsterian, the Saalian and the Weichselian which ended about 12,000 years ago. The Holocene period corresponds to the current interglacial.
Holocene	Current epoch representing the last 11,700 years, beginning at the end of the Last Glacial Period and marking the current interglacial period.
Hominin	The group representing human species, including modern humans, extinct human species and immediate ancestors.
Marine Isotope Stage	A time period deduced by oxygen isotope data interpreted from core sample(s) to separate warmer (less oxygen isotope) and cooler (more oxygen isotope) periods of history.
Palaeoenvironmental Analysis	The study of sediments and the organic remains of plants and animals to reconstruct the environment of a past geological age.
Palaeolandscape	Ancient landscape infilled or buried by younger sediments, multiple aspects of Palaeoenvironmental Analysis are required to reconstruct the conditions of a location as it was at a specific point in history.
Pleistocene	2.58 to 0.0177 million years ago the first epoch of the Quaternary.
Quaternary	2.58 million years ago to present day, the current geological period consisting of the Pleistocene and Holocene Epochs.
Saalian	Approximately 347 to 128 thousand years ago a glacial period of the Pleistocene separated by the Holstein (earlier) and Eemian (later) interglacial periods.
Sub-epoch	A period of time dividing epochs into periods considered significant, spanning one or multiple ages, such as Early, Middle and late Pleistocene.
Triassic	252 to 201 million years ago the first period of the Mesozoic Era and is generally separated into Triassic Upper, Middle and Lower

	Epochs with multiple stages within these, succeeded by the Jurassic.
Weichselain	120 to 11.5 thousand years ago the last glacial period following the Eemian interglacial period and ending with the beginning of the Holocene.
Windfarm site	The area within which the wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and platform link cables will be present.

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1 Introduction

1.1 Project background

1. Royal HaskoningDHV were commissioned by Morecambe Offshore Windfarm Ltd (the Applicant) to undertake a Stage 1 geoarchaeological assessment of geotechnical data acquired to support the development of the Morecambe Offshore Windfarm: Generation Assets (the Project).

2. The Project is a windfarm site (encompassing all Project infrastructure), is located in the east of the Irish Sea and encompasses a seabed area of 87km^2. The nearest point from the windfarm site to shore (coast of northwest England) is approximately 30km, when measured from mean high water springs (MHWS). The Project includes the generation assets to be located within the windfarm site (wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSPs).

1.2 Summary of previous work

3. There are no known previous geoarchaeological investigations undertaken within the windfarm site. However, a marine archaeological assessment of sub-bottom profiler data has been undertaken to support the environmental baseline of the Project Environmental Statement (MSDS Marine 2023). This assessment provides context on the types and preservation of palaeolandscape features and deposits potentially present within the windfarm site.

4. The marine archaeological assessment of sub-bottom profiler data identified several palaeolandscape features within the windfarm site, including a potential moraine, a submarine fan and localised depressions containing high amplitude reflectors which may be indicative of shallow gas or organic material. During the planning stages of the 2023 geotechnical survey, the proposed borehole locations were reviewed alongside the marine geophysical interpretation and two boreholes (BH112 and BH107) were relocated to target high amplitude features within depressions, and ground truth these anomalies.

1.3 Aims and objectives

5. The aim of this technical report is to outline the findings of a Stage 1 geoarchaeological review of geotechnical survey data acquired within the windfarm site. This will provide a baseline understanding of the sequence and nature of deposits present, and their potential archaeological and palaeoenvironmental significance. The results of this geoarchaeological review will inform the scope of any further geoarchaeological investigations where necessary, as detailed in **Table 1.**

6. The above will be achieved by addressing the following objectives:

- Review geotechnical borehole/vibrocore logs to identify deposits of potential archaeological interest, assigning high, medium and low priority status; and,
- Make recommendations for Stage 2 geoarchaeological recording, where necessary.

Table 1 Staged approach to geoarchaeological investigations

Stage	Description
Stage 1: Geoarchaeological review	Desk-based review of geotechnical and geological data. Establish likely presence/ absence/ distribution of archaeologically relevant deposits. Identify deposits or samples for Stage 2 works.
Stage 2: Geoarchaeological recording/monitoring	Target deposits or samples identified in Stage 1. Describe the sequences recovered and undertake deposit modelling (if suitable). Interpret depositional environment (if possible). Identify if suitable deposits are present for Stage 3 works.
Stage 3: Palaeoenvironmental assessment	Sub-sample deposits of archaeological interest for paleoenvironmental assessment (e.g., pollen, plant macrofossils, foraminifera, ostracod, and diatoms) and associated scientific dating. Provide an outline interpretation of the archaeological and palaeoenvironmental context. Any recommendations for Stage 4 works will depend on the potential for further analysis and the project research objectives.
Stage 4: Palaeoenvironmental analysis	Full analysis of samples and additional scientific dating as specified in Stage 3, together with a detailed synthesis of the results, in their local, regional or wider archaeological and palaeoenvironmental context. Publication would usually follow from a Stage 4 report.
Stage 5: Publication	Publication of the results of Stage 1 to 4 works for submission in a peer reviewed journal, book or monograph, depending on the archaeological significance of the work. The scope and location of the final publication will be agreed in consultation with the client and regulatory bodies where appropriate.

2 Geoarchaeological background

7. Geoarchaeological assessments are typically undertaken with reference to geological periods (e.g. Quaternary), epochs (e.g. Pleistocene) and sub-epochs (e.g. Devensian) that reflect major climate sea-level and/or environmental changes. Here we adopt European nomenclature correlated to the Marine Isotope Stage (MIS) record to distinguish between different climatic periods, with dates given in ka (thousands of years before present). Marine Isotope Stages are deduced from marine palaeoclimatic records and reflect alternating warm (interglacial) and cold (glacial) periods throughout the Quaternary.

8. The bedrock within the windfarm site consists of Triassic Mudstone and Halite as does the majority of the eastern Irish Sea (BGS 2014). Depth to bedrock varies within the eastern Irish Sea and can be encountered between 5 and 20m below seafloor (mbsf) but can be as deep as 50mbsf (BGS 2014). This indicates a

considerable thickness of overlaying Quaternary sediment deposits may be present across the windfarm site.

9. The Pleistocene geological history of the Irish Sea basin is dominated by repeated glacial/interglacial cycles causing variation in the exposure of the windfarm site to marine and glacial processes during this epoch. The three major glaciations likely to have influenced the windfarm site include the Elsterian (from 480 to 430ka), the Saalian (from 350 to 132ka), and the Weichselian (from 122 to 10ka) (Mellett et al. 2015).

10. The British and Irish Ice Sheet (BIIS) was the last ice sheet covering much of Britain and Ireland during the Weichselian glaciation (the last glacial period, 120 to 11.5ka). During this glaciation, two ice sheets coalesced north of the current North Wales Coast in Liverpool Bay and terminated in the Irish Sea (Scourse et al. 2021). Between 25.3 to 20ka both ice sheets retreated, slowed by stabilisation and readvancement periods, leaving the windfarm site ice free by approximately 20.3ka (Chiverell et al. 2021).

11. At the time of the windfarm site becoming ice free, sea levels were predicted to have been -15mOD (Brookes et al., 2008 and Bradley et al., 2011), dropping to -28mOD by 12.3ka (Roberts et al., 2011).The beginning of the Holocene Epoch (11.7ka) was predicted to have experienced very rapid sea level rise, with the Irish Sea reaching +1.5 to +2mOD between 4 to 7ka before dropping to current levels (Roberts et al., 2006, 2011; Lloyd et al., 2013). The sea-level history of the Irish Sea is complex and reconstructions prior to the Holocene rely on models due to a lack of sea-level index points. These models are driven with glacio-isostatic adjustment (GIS) effects that are also poorly constrained due to a complex glacial and deglacial history. As a result, there is a large amount of uncertainty on past sea levels and palaeogeography which makes it difficult to predict if the past landscapes were suitable for human occupation, and if so, if any of the deposits or palaeolandscape features survive.

12. The West Coast Palaeolandscape Survey undertaken in 2011 investigated the potential for submerged landscapes to be preserved in the Irish Sea (Fitch et al. 2011). Sub-bottom profiler data were interpreted to show evidence of Holocene age estuaries, deltas and coastlines, and fluvial channels. However, these were not ground-truthed with geotechnical data. To date, there has been no evidence of submerged palaeolandscapes within the central Irish Sea Basin and published research all suggests the landscape was primarily a glacial one with deglaciation occurring in a marine environment (Scourse et al. 2021).

13. Due to the numerous glacial/interglacial cycles, the deposits of the Irish Sea comprise a mixture of Pleistocene diamict (glacial till), sands and silts overlain by Holocene shallow marine sands, silts and clay. As would be expected with material laid down under the glacial-interglacial conditions previously discussed, interactions between different layers and the depths they are found at vary between location. An outline stratigraphy of the windfarm site is presented in **Table 2**.

Table 2 Interpreted stratigraphy of the Project taken from Mellett et al. 2015

Lithofacies	Description (depositional environment)	Formation[1]	Epoch	Archaeological potential
Sands and muds	Marine	Surface Sands Formation	Holocene	Considered of low potential in itself, but possibly contains re-worked artefacts and can cover wreck sites and other cultural heritage
Sand	Active marine			
Sands, silts and clays	Intertidal to marine			
Cobbles and boulders	Proglacial	Western Irish Sea Formation A	Weichselian	Glaciomarine deposits considered to have low potential. Proglacial and deltaic deposits Considered low but has potential to bury deposits of interest or to contain re- worked material.
Silts with sand and sporadic patches of boulders and cobbles	Glaciomarine to marine			
Sand	Deltaic to glaciomarine			
Silts with sand and sporadic patches of boulders and cobbles	Glaciomarine to marine	Western Irish Sea Formation B	Weichselian	
Sand	Deltaic to glaciomarine			
Gravels with muds, sands, cobbles and boulders	Glaciomarine to glaciolacustrine			
Diamict (stiff to very hard)	Glacial to subglacial	Cardigan Bay Formation	Weichselian	Considered low but has potential to bury deposits of interest or to contain reworked material.
Silt overlying gravelly sand	Proglacial			
N/A (not sampled)	Glacial channels infilled during deglaciation			
Diamicton (very stiff)	Glacial to subglacial			
Mudstone (Mercia), Sandstone (Sherwood) and Halite	Aeolian (wind-blown), lacustrine (lake), shallow marine and hyposaline (evaporating desert lake)	Bedrock	Pre-Quaternary (Permian and Triassic (Permo-Triassic))	N/A

[1]Stratigraphy based on Mellett et al. (2015)

3 Methodology

3.1 Coordinate system

14. All location information and figures are presented as projected coordinates in WGS84 UTM 30N Eastings and Northings.

15. The vertical reference level is given as meters below seafloor (mbsf) which assumes the top of the borehole is equal to the level of the seafloor. Water depths are given as meters below Lowest Astronomical Tide (LAT).

3.2 Geotechnical drilling/coring strategy

16. The geotechnical data assessed in this report was collected by Gardline during a survey undertaken in 2023. The locations of recovered boreholes and CPTS are presented in **Figure 1** and **Appendix 1**.

17. A total of 11 boreholes were acquired using a wireline push-sampler coring system which recovered cores in 0.5 to 1.09m metal tubes at intermittent depths downhole. The sampling strategy resulted in near continuous sampling for the full depth of the boreholes. In addition to the boreholes, 16 Cone Penetration Tests (CPT) with hybrid sampling were undertaken. Samples from these CPTs were only recovered from intervals where bedrock was present. A geoarchaeological review of these geotechnical logs has been undertaken and is presented in **Appendix 2**. However, as no samples were recovered from the Quaternary deposits, the interpretations have not been ground-truthed with physical samples.

18. Borehole core samples were extruded, logged and photographed in the geotechnical contractor's laboratory. Geotechnical logs and core photographs were provided for geoarchaeological review and assessment.

19. The suitability of geotechnical samples for geoarchaeological purposes was assessed according to the drilling/coring strategy employed, using the criteria outlined in **Table 3**. Borehole samples used in this assessment have been assigned Category B.

20. A full list of boreholes included in this assessment is given in **Appendix 1**.

285000 290000 295000 300000 305000 310000

445000 440000 435000 430000 425000

SOUTH MORECAMBE GAS FIELD

CALDER GAS FIELD

CPT149 BH119 CPT122 BH109 BH112 BH118 BH116 CPT150 CPT133 CPT141 CPT127 BH113 CPT136 CPT143 BH117 CPT119 BH107 CPT113 CPT138 BH121 CPT128 CPT134 CPT144 BH111 CPT137 BH114

0 1.3 2.5 5 Kilometres

Legend:

- Morecambe Offshore Windfarm Site
- Borehole
- CPT

Report:
Morecambe Offshore Windfarm: Generation Assets
Environmental Statement

Title:

Borehole and CPT Locations

Figure:	Drawing No:
1	PC1165-RHD-ES-OF-DR-Z-0129

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	26/02/2024	JH	SB	A3	1:100,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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Table 3 Assessment criteria for suitability of geotechnical samples for geoarchaeological purposes

Category	Description
A	Continuous record of deposits recovered with minimal disturbance. Structure and stratigraphy is largely intact. Can be a whole round core or the preserved half of a split core. Cores of this quality are typically recovered using vibrocore or continuous coring methods.
B	Discontinuous record of deposits recovered with minimal disturbance, usually due to a combination of open hole drilling with intermittent coring (e.g. shelby tube), structure and stratigraphy largely intact.
C	Continuous record of deposits recovered. Low recovery or disturbance related to the nature of the deposit (e.g. loose sediment), or due to cores being extruded into bags. Structure and stratigraphy typically not fully preserved.
D	Discontinuous record of deposits recovered resulting from a combination of open hole drilling with intermittent coring, low recovery or disturbance related to the nature of the deposit (e.g. loose sediment), or due to cores being extruded into bags. Structure and stratigraphy typically not fully preserved.

3.3 Review of geotechnical logs

21. Each of the 11 geotechnical borehole logs and 16 CPTs were reviewed by a trained geoarchaeologist in order to determine their potential for further geoarchaeological works. Deposits recovered in boreholes and CPTs were assigned either a high, medium or low priority status based on their perceived geoarchaeological significance as itemised in **Appendix 2**.

4 Results

22. A total of 11 borehole and 16 CPT logs were reviewed as part of the Stage 1 works, with the aim of identifying deposits of potential geoarchaeological interest. Outline descriptions based on geotechnical logs are presented in **Appendix 2**, accompanied by an initial interpretation of the deposits.

23. Mudstone with laminations or crystals of gypsum or Halite was recovered in all boreholes and CPTs except for BH111, BH112, CPT152, CPT134, CPT128, CPT127 and CPT119, these logs consisted of mainly sands and clays up to their maximum depths. This was found between 15.00 (BH114) to 49.71mbsf (BH119), as expected when considering the significant variation in the thickness of Pleistocene and Holocene sediments overlaying the Triassic bedrock.

24. Medium to extremely high strength slightly sandy slightly silty clay rarely interbedded by sand or silt overlays the Mudstone or Halite. This was found in all boreholes and CPTs except for BH109, BH112 and CPT136, instead these logs presented glaciomarine, alluvium and marine clay overlaying bedrock respectively. Glacial clay was found in a range of depths from 0.56 (CPT128) to 42.93mbsf (CPT127).

25. Sediments overlaying this sandy silty clay varied within borehole and CPT logs, characterising the varied periods of glaciation experienced in the Irish Sea during the Pleistocene. Firm to stiff medium to high strength slightly gravelly clay with medium to very widely spaced thin to medium beds of very loose to medium dense silty sand was present in BH107, BH109, BH113, BH117, CPT152, CPT150, CPT127 and CPT122 between 7.10 (BH113) to 28.5mbsf (BH112), with one shallower layer from 3.33 to 6.10mbsf in BH114.

26. Slightly shallower, but within a similar depth range as the gravelly clay, medium dense to very dense fine to coarse sand with rare pockets or beds of clay was present in BH112, BH113, BH116, BH118, BH119 and all CPTs except for CPT133. Fine to coarse sand was mainly found between the seafloor and 27.76mbsf (CPT119). One layer of fine to coarse sand was found at greater depths in CPT127 (42.93 to 50.12mbsf). Fine to coarse sand also formed a large portion of BH109 (15.10m of the logs total 32.49m), BH111 (43.64m of the logs total 50.20m) and CPT128 (46.67m of the logs total 50.21m). Notably fine to coarse sand in BH118 presented organic staining (between 7.00 to 14.30mbsf).

27. Partially interspersed within and layered above fine to coarse sand, silty fine to medium sand with fine to medium gravel sized shell fragments was present within all boreholes with the exception of BH113 but was not present within the CPT logs. The majority of fine to medium sand with shell was found between the seafloor and 11.40mbsf (BH117). Deeper interspersed fine to medium sand with shell layers were found in BH112 and BH119, between 11.14 to 17.30mbsf (BH119). Notably fine to medium sand with shell in BH112 presented organic staining (between 1.10 to 7.10mbsf).

28. Extremely low strength to low strength silty sandy clay with occasional pockets of fine to medium sand and occasional fine to medium gravel sized shell fragments was layered above fine to coarse sand, interspersed with and within fine to medium sand with shell. Silty sandy clay with shell was present in BH113, BH114 and BH117 and all CPTs except for CPT128, CPT122, CPT119 and CPT113 from the seafloor to 7.16mbsf (CPT133). Deeper interspersed very low strength to very high strength silty sandy clay with occasional fine to medium gravel sized shell fragments layers were found in BH117 (11.40 to 12.60mbsf) and CPT136 (32.55 to 45.52mbsf). These shallow clays and sands are typical of the most recent Holocene layers of sediment.

5 Discussion

29. The stratigraphy of deposits recovered in boreholes and CPTs within the windfarm site area are summarised in **Appendix 2**. Where possible, the deposits were assigned to the stratigraphic units detailed in **Table 2**, this is outlined in **Table 4**.

Table 4 Stratigraphy of deposits within the windfarm site

Unit Name	Description	Epoch	Formation[1]
Marine clay	Extremely low to low strength silty clay, occasionally with shell fragments.	Holocene	Surface Sands Formation
Shallow marine sand	Silty sand with shell fragments		
Sand (undifferentiated)	Medium dense to very dense sand, occasionally with thin beds of clay	Weichselian	Western Irish Sea Formation A and/or B (prograded facies)
Glaciomarine	Firm to stiff laminated clay with thin beds of sand	Weichselian	Western Irish Sea Formation A and/or B (glaciomarine to marine)
Glacial clay (interbedded with sand)	Very stiff extremely high strength silty sandy gravelly clay.	Weichselian	Cardigan Bay Formation
Bedrock	Mudstone with gypsum veins and Halite	Pre-Quaternary	N/A

[1]Stratigraphy based on Mellett *et al*. (2015)

30. The lowermost deposits recovered in boreholes comprised extremely high strength silty sandy gravelly clay which overlay bedrock of Mudstone and Halite, grouped within the unit Glacial Clay. Their heterogenous and over-consolidated nature suggests they formed in a glacial environment. During the last glacial period, ice expanded from source areas in Scotland, northwest England and central Ireland converging in the Liverpool Bay area to form the Irish Sea Ice Stream. There has been evidence on the seafloor and in the shallow subsurface (Van Landegham et al. 2020; Scourse et al. 2021) that this ice sheet was grounded, which would have consolidated pre-existing sediments and those laid down directly by the ice. The lowermost deposits recovered in boreholes and CPTs likely formed during this phase of ice advance and were correlated to the Cardigan Bay Formation. These deposits have low geoarchaeological potential as they were deposited by ice during the Weichselian, at a time when the Irish Sea would have been unsuitable for hominin occupation.

31. The Glacial Clay was on occasion interbedded with dense sand deposits that likely also formed in a glacial environment, potentially representing proglacial deltaic environments. These deposits also have a low geoarchaeological potential given their age and formation history.

32. Overlying Glacial Clay at a number of locations were medium to high strength laminated clays with beds of sand. The presence of laminations suggests deposition

in a quiet water environment and their strength indicates potential overriding by ice. After initial advance (and retreat) of the Irish Sea Ice Stream and deposition of Cardigan Bay Formation, the ISIS readvanced around 18,000 years ago and terminated in a marine environment (Van Landeghem and Chiverrell 2011). During this time, glaciomarine deposits of the Western Irish Sea Formation A and Western Irish Sea Formation B were laid down. The laminated clays recovered in boreholes correlate to these formations and have low geoarchaeological potential as they formed in a glaciomarine environment.

33. A sequence of sands grouped together as (undifferentiated) overlay the Glaciomarine deposits. The depositional history of these deposits is uncertain, but a lack of marine shells suggests a possible non-marine, freshwater environment depositional. However, it is acknowledged that on many occasions, these deposits have been recorded in CPTs and may comprise shell fragments, but it has not been possible to determine this from the CPTs without physical samples. Sand-rich deposits are expected across the Irish Sea and are linked to deltaic systems forming in front of a terrestrial and/or marine terminating ice sheet. The archaeological review of sub-bottom profiler data acquired within the windfarm site identified prograded and clinoform complexes that indicate deltas were likely present in the past (MSDS Marine 2023). The undifferentiated sands recovered in boreholes and CPTs have therefore been interpreted to represent deposition in ice marginal deltas during the Weichselian glacial period and therefore have low geoarchaeological potential.

34. The uppermost deposit recovered in boreholes and CPTs comprised sands with shell fragments and extremely low strength clays. These deposits have been interpreted to represent deposition in a shallow marine environment during the Holocene and correlate to the Surface Sands Formation. The Marine Clays in particular were characteristic of the Western Irish Sea Mudbelt. The geoarchaeological potential of these deposits is low as they were laid down in a marine environment.

6 Recommendations

35. A lithostratigraphic framework representing the deposits recovered from boreholes and vibrocores within the windfarm site is defined in **Table 4**. The deposits recovered document the transition from a glacial, to glaciomarine and finally marine environment during the Weichselian and Holocene. There was no evidence in the boreholes or CPTs of deposits that formed in a sub- aerial, temperate environment that would have been suitable for inhabitation. Therefore, further stage(s) of geoarchaeological assessment are not recommended for the borehole samples recovered from the windfarm site during the 2023 geotechnical survey campaign.

36. There has long been debate as to whether the Irish Sea Ice Stream deglaciated in a terrestrial setting or if it terminated in a marine environment (McCarroll 2001; Scourse and Furze 2001). This has implications for the palaeolandscape potential of the Irish Sea as if the ice sheet terminated in a marine environment, there would not have been a period of subaerial exposure between the ice sheet retreating and sea-levels reaching their present day high. More recent studies hypothesise that there is a broad north south divide in environmental history within the Irish Sea, hinged at a point just south of the Isle of Man. To the north of this divide, the ice sheet terminated in a terrestrial setting and as a result, the seabed may have been sub-aerially exposed and occupied before sea levels rose during the early to mid-Holocene. To the south, the ice sheet was marine based with limited potential for subaerial exposure and a much lower palaeolandscape potential.

37. This is the current working hypothesis, but it is recognised that the divide in environmental history has not been proven definitively with geophysical or geotechnical data. There is also potential that this divide shifted slightly north or south with fluctuating ice margins and sea-levels and should not be treated as a solid line on a map. The location of the windfarm site is such that any geophysical or geotechnical data acquired from the site can be used to test this hypothesis. Therefore, it is recommended that any future geotechnical borehole or vibrocore logs are reviewed by a geoarchaeologist to confirm the site deglaciated in a marine environment and as such has low palaeolandscape potential.

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Appendix 1 – Borehole locations

Hole id	Easting (m)	Northing (m)	Elevation (mLAT)
BH107	458352	5959274.9	31.60
BH109	459344.8	5962975.6	26.65
BH111	461176.7	5957512.4	36.50
BH112	461373.9	5963302.4	27.02
BH113	462909.2	5961370.5	35.18
BH114	464411.5	5956508.1	35.61
BH116	464858.7	5962203.4	31.33
BH117	466016.2	5960590	27.87
BH118	466903.3	5962513.8	27.70
BH119	466991.9	5964392.8	25.85
BH121	455973.9	5959039.1	37.70
CPT152	462488.3	595942.9	26.42
CPT150	466986.3	5962457.8	21.22
CPT149	466973.5	5964490.1	21.09
CPT144	466154	5957453.4	28.26
CPT143	465930	5960641.9	25.41
CPT141	465695	5961677	27.10
CPT138	464634	5958699.5	25.72
CPT137	464482.1	5956579.4	32.13
CPT136	464335.5	5960931.1	28.70
CPT134	462829.4	5958019.9	30.09
CPT133	462825.5	5961423.8	29.80
CPT128	461089.6	5957560.3	33.91
CPT127	460879.7	5961228.2	30.10
CPT122	459258.5	5963025.7	25.20
CPT119	458268.6	5959327.9	31.14
CPT113	455896.4	5959103.9	34.58

Appendix 2 – Stage 1 log review

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
BH107	0	0.52	Dark greenish grey (GLEY1 10Y 4/1) silty fine to medium SAND with frequent fine to coarse gravel sized shell fragments. Calcareous	Shallow marine sand	Low
BH107	0.52	7.76	Greyish brown (2.5Y 5/2) becoming dark greyish brown (2.5Y 4/2) slightly gravelly fine to medium SAND with occasional fine to medium gravel sized shell fragments. Gravel is subangular to rounded fine to medium. Slightly calcareous	Shallow marine sand	Low
BH107	7.76	13.75	Firm to stiff medium to high strength dark reddish brown (5YR 3/2) CLAY with extremely closely to closely spaced thin laminations of fine sand. Slightly calcareous	Glaciomarine	Low
BH107	13.75	20.3	Stiff high strength dark brown (7.5YR 3/2) slightly sandy slightly gravelly CLAY with occasional pockets of sand (<32mm). Sand is fine to medium. Gravel is fine to coarse subangular to rounded of mixed lithology. Slightly calcareous	Glacial clay	Low
BH107	20.3	26.5	Very stiff very high to extremely high strength dark brown (7.5YR 3/2) slightly sandy slightly gravelly CLAY with extremely closely to very closely spaced thin laminations of sand between 19.00m and 20.05m. Sand is fine to medium. Gravel is fine to coarse angular to subrounded. Slightly calcareous	Glacial clay	Low
BH107	26.5	31.2	Dark brown (10YR 4/2) slightly gravelly silty fine to medium SAND. Gravel is subangular to subrounded fine to coarse of mixed lithology. Slightly calcareous	Glacial clay	Low
BH107	31.2	32.2	Very stiff extremely high strength reddish brown (5YR 4/4) slightly sandy slightly gravelly CLAY with frequent pockets of light greenish grey (GLEY1 5GY 7/1) and very dark greenish grey (GLEY1 5GY	Glacial clay	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
			3/1) sand. Gravel is subangular to subrounded fine to medium of sandstone and mudstone. Sand is fine to coarse. Slightly calcareous		
BH107	32.2	33.4	Very stiff extremely high strength dark reddish brown (5YR 3/2) mottled very dark greenish grey (GLEY1 5GY 3/1) CLAY with frequent medium gravel sized crystals of translucent gypsum. Non calcareous	Bedrock	Low
BH107	33.4	37.3	Very stiff extremely high strength very dark greenish grey (GLEY1 5GY_/1 3/1) locally dark reddish brown (5YR 3/2) slightly gravelly CLAY with frequent medium gravel sized crystals of translucent gypsum and cross cutting satin spar veins (up to 2mm). Gravel is angular to subrounded fine to medium of mudstone. Non calcareous	Bedrock	Low
BH107	37.3	40.58	Very stiff extremely high strength dark reddish brown (5YR 3/3) locally very dark greenish grey (GLEY1 5GY_/1 3/1) slightly gravelly CLAY with frequent medium gravel sized crystals of translucent gypsum and cross cutting satin spar veins (up to 2mm). Gravel is angular to subrounded fine to medium of mudstone. Non calcareous	Bedrock	Low
BH109	0	0.76	Dark greenish grey (GLEY1 4/1) silty fine to medium SAND with frequent fine to coarse gravel sized shell fragments. Calcareous	Shallow marine sand	Low
BH109	0.76	14.2	Olive grey (5Y 5/2) fine to medium SAND. Slightly micaceous. Slightly calcareous. Additional: Black organic staining	Sand (undifferentiated)	Low
BH109	14.2	15.86	Dark olive grey (5Y 3/2) very gravelly fine to coarse SAND. Gravel is rounded fine to coarse of mixed lithology. Slightly calcareous	Sand (undifferentiated)	Low
BH109	15.86	18.61	Dark greyish brown (10YR 4/2) silty SAND with extremely closely to very closely spaced thin	Glaciomarine	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
			laminations to very thin beds of soft very dark grey (10YR 3/1) clay. Slightly calcareous		
BH109	18.61	23.86	Firm to stiff medium to high strength very dark greyish brown (10YR 3/2) slightly gravelly CLAY with extremely closely spaced thin laminations of silty fine sand. Gravel is rounded fine to medium. Slightly calcareous. Additional: A cobble	Glaciomarine	Low
BH109	23.86	26.2	Very stiff extremely high strength dark reddish brown (5YR 3/2) locally dark greenish grey (GLEY1 10GY 4/1) CLAY with closely spaced thin to thick laminations of translucent gypsum. Non calcareous	Bedrock	Low
BH109	26.2	28.2	Weak slightly to moderately weathered reddish brown (5YR 3/4) mottled greenish grey (GLEY1 10Y 5/1) MUDSTONE with extremely closely to very closely spaced thin to thick vertical laminations of translucent gypsum. Fractures are very closely to closely spaced vertical planar rough. Non calcareous	Bedrock	Low
BH109	28.2	31.8	Weak slightly to moderately weathered greenish grey (5GY 6/1) mottled reddish brown (5YR 3/4) MUDSTONE with extremely closely to very closely spaced thin to thick vertical laminations of translucent gypsum. Fractures are very closely to closely spaced vertical planar rough. Non calcareous	Bedrock	Low
BH109	31.8	32.49	Weak slightly weathered reddish brown MUDSTONE with extremely closely to closely spaced subvertical to vertical thin to thick laminations of translucent gypsum. Fractures are closely spaced planar rough. Non calcareous	Bedrock	Low
BH111	0	1.6	Very dark greenish grey (GLEY1/5GY 3/1) clayey SAND with frequent fine to coarse gravel	Shallow marine sand	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
			sized shell fragments. Slightly calcareous		
BH111	1.6	2.75	Dark brown (10YR 3/3) clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded. Calcareous	Sand (undifferentiated)	Low
BH111	2.75	4.6	Very stiff extremely high strength dark brown (10YR 3/3) slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is fine to coarse angular to rounded. Slightly calcareous. Additional: a sand lamination	Glacial clay	Low
BH111	4.6	14.2	Dark greyish brown (10YR 4/2) fine to coarse SAND. Slightly calcareous. Additional: with rare pockets of clay	Sand (undifferentiated)	Low
BH111	14.2	16.16	Thick bed of very stiff extremely high strength dark reddish grey (5YR 4/2) slightly sandy slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse. Slightly calcareous	Glacial clay	Low
BH111	16.16	50.2	Dark greyish brown (10YR 4/2) fine to coarse SAND. Slightly calcareous. Additional: with rare pockets of clay	Sand (undifferentiated)	Low
BH112	0	1.1	Very dark grey (5Y 3/1) silty fine to medium SAND with occasional to frequent fine to coarse gravel sized shell fragments. Slightly calcareous	Shallow marine sand	Low
BH112	1.1	7.1	Olive grey (5Y 4/2) fine to medium SAND with rare fine gravel sized shell fragments. Slightly calcareous. Additional: with black organic staining	Shallow marine sand - organic staining	Medium
BH112	7.1	12.69	Dark grey (5Y 5/1) clayey fine to medium SAND. Slightly calcareous. Additional: rare clay laminations	Sand (undifferentiated)	Low
BH112	12.7	15.2	Olive grey (5Y 4/2) fine to medium SAND. Slightly calcareous. Additional: occasional shells	Shallow marine sand	Low
BH112	15.2	28.5	Soft to firm low to medium strength dark greyish brown (10Y	Glaciomarine	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
			4/3) slightly sandy CLAY with extremely closely to very closely spaced thin laminations of brown (10Y 4/3) fine sand from 18.90m. Slightly calcareous		
BH113	0	7.1	Extremely low strength dark grey (2.5Y 4/1) slightly sandy silty CLAY with occasional fine to medium gravel sized shell fragments. Slightly calcareous	Marine clay	Low
BH113	7.1	16.79	Firm to stiff medium to high strength dark grey (5YR 4/1) silty CLAY with extremely closely to closely spaced thin to thick laminations of reddish grey (5YR 5/2) fine sand. Slightly calcareous. Additional: a bed of gravelly silty clay and rare pockets of fine sand	Glaciomarine	Low
BH113	16.8	18.8	Dark greyish brown (10YR 4/2) fine to coarse SAND. Slightly calcareous. Additional: a thin bed of silty sand	Sand (undifferentiated)	Low
BH113	18.8	27.8	Stiff high to very high strength dark greyish brown (10YR 4/2) slightly sandy, slightly gravelly silty CLAY. Gravel is subrounded fine to coarse rounded of various lithology. Slightly calcareous	Glacial clay	Low
BH113	27.8	31.23	Stiff to very stiff very high to extremely high strength dark brown (5YR 3/2) slightly gravelly silty CLAY. Gravel is angular to subrounded fine to coarse of mixed lithology. Slightly calcareous. Additional: a silt lamination	Glacial clay	Low
BH113	31.24	32.9	Very stiff extremely high strength dark reddish brown (5YR 3/2) sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. Calcareous	Glacial clay	Low
BH113	32.9	33.5	Thick bed of dark brown (7.5YR 3/3) silty gravelly fine to coarse sand with occasional pockets (<20mm) of dark reddish brown (5YR 3/2) CLAY. Gravel is	Glacial clay	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
			subangular to subrounded fine to coarse.		
BH113	33.5	34.9	Very stiff extremely high strength dark reddish brown (5YR 3/2) sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. Calcareous	Glacial clay	Low
BH113	34.9	40.32	Weak to medium strong brownish grey (5YR 4/1) HALITE with very closely to medium spaced rough horizontal to subvertical fractures	Bedrock	Low
BH114	0	1.94	Soft extremely low strength very dark grey (5Y 3/1) sandy silty CLAY with occasional fine to medium gravel sized shell fragments. Strong organic odour. Non calcareous	Marine clay	Low
BH114	1.94	3.33	Light brownish grey (2.5 Y 6/2) slightly gravelly fine to medium SAND with frequent fine to medium gravel sized shell fragments. Gravel is angular to subrounded fine to medium of mixed lithology. Non calcareous	Shallow marine sand	Low
BH114	3.33	6.1	Firm to stiff medium to high strength olive brown (2.5Y 4/4) CLAY with frequent lenses of light olive brown (2.5Y 5/6) fine sand. Non calcareous	Glaciomarine	Low
BH114	6.1	12.5	Stiff high strength very dark greyish brown (10 YR 3/2) slightly gravelly CLAY. Gravel is subrounded fine to coarse of mudstone. Calcareous	Glacial clay	Low
BH114	12.5	15	Very stiff very high strength very dark grey (10YR 3/1) slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mixed lithology. Calcareous	Glacial clay	Low
BH114	15	17.2	Very stiff extremely high strength dark reddish brown (5YR 3/3) mottled greenish grey (GLEY1 10GY 5/1) gravelly CLAY. Gravel is subangular to subrounded fine to coarse gypsum, siltstone and mudstone lithorelicts. Non calcareous	Bedrock	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
BH114	17.2	24.02	Extremely weak to weak slightly to moderately weathered dark reddish brown (10R 3/4) mottled greyish blue green (5BG 5/2) MUDSTONE with very closely to widely spaced very thin to thin beds of extremely weak to weak dark greenish grey (GLEY 10G 4/1) silty mudstone. Frequent subhorizontal to subvertical veins of translucent gypsum (<14mm). Fractures are closely to medium spaced subhorizontal undulating rough with a clay veneer. Non calcareous. Additional: a silty mudstone lamination	Bedrock	Low
BH116	0	5.42	Very dark grey (10YR 3/1) silty gravelly fine to coarse SAND with occasional fine to medium gravel sized shell fragments. Gravel is fine to medium, angular to rounded	Shallow marine sand	Low
BH116	5.43	17.3	Dark greyish brown (10YR 4/2) silty fine to coarse SAND. Non calcareous. Micaceous. Additional: bed of clayey sand and closely spaced silt laminations	Sand (undifferentiated)	Low
BH116	17.3	29.2	Firm to stiff high strength dark brown (7.5YR 3/2) slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to rounded. Slightly calcareous	Glacial clay	Low
BH116	29.21	40.56	Extremely weak moderately weathered moderate brown (5YR 3/4) MUDSTONE with vertical very closely spaced thin to thick beds of translucent halite. Fractures are very closely to very widely spaced rough infilled with clay and coarse gravel of various lithology	Bedrock	Low
BH117	0	2.87	Very soft extremely low strength dark greenish grey (GLEY2 10Y/4) slightly sandy silty CLAY with occasional pockets of fine to medium sand (<23mm) and frequent fine to coarse gravel sized shell fragments	Marine clay	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
BH117	2.87	11.4	Grey (5Y 5/1) becoming dark grey (5Y 4/1) fine to coarse SAND with rare pockets of clay (<29mm) and rare fine to medium gravel sized shell fragments. Slightly micaceous. Calcareous	Shallow marine sand	Low
BH117	11.4	12.6	Very low strength brown (10YR 5/3) silty sandy CLAY with occasional shell fragments. Sand is fine to medium. Highly calcareous	Marine clay	Low
BH117	12.6	16.5	Medium to high strength dark brown (7.5YR 3/2) CLAY with extremely closely to medium spaced thin laminations of fine sand. Slightly calcareous	Glaciomarine	Low
BH117	16.5	20	Firm to stiff high strength dark brown (7.5YR 3/2) slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is fine to coarse angular to rounded. Slightly calcareous	Glacial clay	Low
BH117	20	25.4	Stiff high to extremely high strength brown (7.5YR 4/2) silty gravelly CLAY with rare fine gravel sized shell fragments. Gravel is fine to medium subangular to rounded. Non calcareous. Micaceous. Additional: Thin bed of clayey gravelly sand	Glacial clay	Low
BH117	25.4	29.82	Stiff to very stiff high to extremely high strength very dark greyish brown (10YR 3/2) mottled grey (GLEY 4/N) silty CLAY with extremely closely to very closely spaced thin to thick laminations of white (GLEY 8/N) halite	Bedrock	Low
BH117	29.82	35.34	Extremely weak to weak extremely weathered to weathered moderate brown (5YR 3/4) MUDSTONE with vertical extremely closely to very closely spaced thin laminations of translucent halite. Fractures are subvertical to horizontal closely to medium spaced with undulating surfaces and brown clay infill. Micaceous. Non calcareous	Bedrock	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
BH117	35.34	37.25	Weak to medium strong dark reddish brown (10R 3/4) HALITE. Fractures are extremely closely to medium spaced planar rough infilled with clay	Bedrock	Low
BH118	0	7	Very dark greyish brown (2.5Y 3/2) silty fine to medium SAND with rare fine to coarse gravel sized shell fragments. Slightly calcareous	Shallow marine sand	Low
BH118	7	14.3	Olive brown (2.5Y 4/3) slightly silty fine to medium SAND. Slightly micaceous. Slightly calcareous. Additional: occasional black organic staining	Sand (undifferentiated) - organic staining	Medium
BH118	14.3	18.84	Soft low strength dark brown (7.5Y 3/2) silty CLAY with extremely closely to closely spaced thick laminations of brown (7.5YR 3/2) fine sand	Glaciomarine	Low
BH118	18.84	26.69	Firm to stiff high to very high strength dark brown (7.5YR 3/2) slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subrounded to subangular fine to coarse. Slightly calcareous. Additional: silt laminations	Glacial clay	Low
BH118	26.7	36.32	Very stiff extremely high strength reddish brown (5YR 4/3) mottled with greenish grey (5GY 5/1) slightly sandy slightly gravelly silty CLAY with occasional pockets of gypsum (<15mm). Sand is fine. Gravel is angular to rounded. Non calcareous	Bedrock	Low
BH118	36.32	38.5	Extremely weak to very weak slightly weathered greyish blue green (5BG 5/2) MUDSTONE with very closely spaced thin vertical and horizontal laminations of translucent gypsum and extremely to very closely spaced laminations of greenish grey (5GY 5/1) silt. Non calcareous	Bedrock	Low
BH119	0	1.35	Dark greyish brown (2.5Y 4/2) silty fine SAND with frequent fine to medium gravel sized shell fragments. Non calcareous	Shallow marine sand	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
BH119	1.35	11.14	Dark grey (2.5Y 4/1) fine to coarse SAND. Calcareous.	Sand (undifferentiated)	Low
BH119	11.14	17.3	Dark greyish brown (2.5Y 4/2) slightly silty slightly gravelly fine to medium SAND with occasional fine to coarse gravel sized shell fragments. Gravel is subangular fine to medium. Slightly calcareous	Shallow marine sand	Low
BH119	17.3	26.3	Stiff high strength dark greyish brown (2.5Y 4/2) slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse. Slightly calcareous	Glacial clay	Low
BH119	26.3	46.9	Very stiff extremely high strength dark reddish brown (5YR 3/2) locally dark greenish grey (GLEY1 5G 4/1) silty CLAY with very closely to closely spaced very thin to thin laminations of translucent gypsum and greenish grey (5GY 5/1) siltstone. Non calcareous	Bedrock	Low
BH119	46.9	49.71	Weak moderately to highly weathered moderate brown (5YR 4/4) mottled greyish green (5G 5/2) MUDSTONE with extremely closely to very closely spaced thin to thick laminations of translucent gypsum and weak siltstone. Non calcareous	Bedrock	Low
BH121	0	9.8	Dark grey (10YR 4/1) to greyish brown (10YR 2/5) fine to medium SAND with occasional fine to medium gravel sized shell fragments. Slightly calcareous	Shallow marine sand	Low
BH121	9.8	16.1	Stiff to very stiff high to very high strength brown (10YR 4/3) slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mixed lithology. Calcareous	Glacial clay	Low
BH121	16.1	20.72	Stiff to very stiff medium to very high strength dark brown (7.5YR 3/2) slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of	Glacial clay	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
			multiple lithologies. Sand is coarse. Slightly calcareous		
BH121	20.72	27.5	Very stiff extremely high strength reddish brown (2.5YR 4/4) locally greenish grey (GLEY2 10G 5/1) gravelly CLAY. Gravel is angular to subrounded fine to coarse of mudstone lithorelicts. Occasional gypsum crystals (<20mm). Non calcareous	Bedrock	Low
BH121	27.5	29	Thick bed of extremely weak to very weak moderately weathered moderate brown (5YR 3/4) mottled medium bluish grey (5B 5/1) mudstone with frequent subhorizontal translucent gypsum veins. Non calcareous	Bedrock	Low
BH121	29	35.81	Very stiff extremely high strength reddish brown (2.5YR 4/4) locally greenish grey (GLEY2 10G 5/1) gravelly CLAY. Gravel is angular to subrounded fine to coarse of mudstone lithorelicts. Occasional gypsum crystals (<20mm). Non calcareous	Bedrock	Low
CPT152	0	0.5	Extremely low to low strength slightly gravelly silty CLAY	Marine clay	Low
CPT152	0.5	10.3	Dense to very dense slightly gravelly slightly silty SAND	Sand (undifferentiated)	Low
CPT152	10.3	12.1	Extremely high strength silty CLAY with closely to medium space thin beds of medium dense to dense silty sand	Glaciomarine	Low
CPT152	12.1	21.42	Very to extremely high strength slightly gravelly silty sand CLAY	Glacial clay	Low
CPT150	0	5.8	Extremely low to medium strength slightly sandy CLAY	Marine clay	Low
CPT150	5.8	15.06	Dense to very dense sand	Sand (undifferentiated)	Low
CPT150	15.06	25.5	Medium to very high strength CLAY with very widely spaced thin beds of very loose to medium dense sandy silt	Glaciomarine	Low
CPT150	25.5	42.6	Extremely high strength slightly gravelly slightly silty CLAY with a	Glacial clay	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
			thick bed of dense to very dense silty sand		
CPT150	42.6	50.3	Very weak moderate weathered reddish brown (5YR 4/4) locally medium light grey (N6) MUDSTONE with very closely to closely spaced thin laminations of translucent halite	Bedrock	Low
CPT149	0	1.87	Extremely low to very low strength CLAY	Marine clay	Low
CPT149	1.87	15.6	Dense to very dense SAND with two thin beds of high strength clay	Sand (undifferentiated)	Low
CPT149	15.6	29.66	High to very high strength slightly gravelly slightly silty slightly sandy CLAY	Glacial clay	Low
CPT149	29.66	48.11	Extremely weak moderately weathered reddish brown (2.5YR 2.5/4) and greenish grey (GLEY1 5GY 6/1) thinly laminated to thinly bedded MUDSTONE with very closely to closely spaced thin beds of siltstone	Bedrock	Low
CPT144	0	3.63	Extremely low to very low strength silty CLAY	Marine clay	Low
CPT144	3.63	5.95	Medium dense to very dense silty SAND	Sand (undifferentiated)	Low
CPT144	5.95	19.3	Medium to high strength slightly gravelly CLAY	Glacial clay	Low
CPT144	19.3	28.18	Very weak to weak moderate brown (5YR 3/4) Mudstone with veins of translucent gypsum	Bedrock	Low
CPT143	0	3.36	Extremely low to low strength silty CLAY	Marine clay	Low
CPT143	3.36	11.9	Medium dense to very dense slightly silty SAND	Sand (undifferentiated)	Low
CPT143	11.9	32.75	Medium to very high strength slightly silty sandy gravelly CLAY	Glacial clay	Low
CPT143	32.75	37.69	Weak light brownish grey (5YR 6/1) becoming moderate orange pink (5YR 8/4) HALITE with planar fractures	Bedrock	Low
CPT141	0	6.48	Extremely low to low strength CLAY	Marine clay	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
CPT141	6.48	8.1	Medium dense to very dense silty SAND	Sand (undifferentiated)	Low
CPT141	8.1	33.24	Low to extremely high strength silty sandy CLAY	Glacial clay	Low
CPT141	33.24	39.1	Very weak to medium strong slightly weathered greyish brown (5YR 3/2) MUDSTONE infilled by translucent halite	Bedrock	Low
CPT138	0	4.01	Extremely low to low strength CLAY	Marine clay	Low
CPT138	4.01	8.2	Medium dense to very dense SAND	Sand (undifferentiated)	Low
CPT138	8.2	16.37	Medium to high strength CLAY	Glacial clay	Low
CPT138	16.37	22.21	Medium dense to very dense SAND with medium to very widely spaced thin beds of silty sand	Sand (undifferentiated)	Low
CPT138	22.21	25.2	High to extremely high strength silty CLAY	Glacial clay	Low
CPT138	25.2	40.47	Extremely weak moderately weathered moderate brown (5YR 4/4) MUDSTONE with rare veins of translucent gypsum	Bedrock	Low
CPT137	0	3.18	Extremely low to very low strength CLAY	Marine clay	Low
CPT137	3.18	5.07	Medium dense to dense SAND	Sand (undifferentiated)	Low
CPT137	5.07	17.86	Medium to extremely high strength slightly gravelly silty CLAY	Glacial clay	Low
CPT137	17.86	24.45	Very weak to weak slightly weathered dark reddish brown (10R 3/4) mottled greyish blue green (5BG 5/2) MUDSTONE with veins of translucent gypsum	Bedrock	Low
CPT136	0	5.43	Extremely low to very low strength CLAY	Marine clay	Low
CPT136	5.43	7.47	Medium dense to very dense SAND	Sand (undifferentiated)	Low
CPT136	7.47	32.55	Medium to extremely high strength CLAY	Glacial clay	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
CPT136	32.55	45.52	Very high strength dark reddish brown (5YR 3/3) mottled olive (5Y 4/3) slightly gravelly silty sandy CLAY with occasional shell fragments and crystals of translucent gypsum. Gravel is fine to coarse angular to subrounded. Sand is fine to coarse. Non calcareous	Marine clay	Low
CPT136	45.52	50	Weak slightly weathered translucent HALITE	Bedrock	Low
CPT134	0	3.98	Extremely low to very low strength CLAY	Marine clay	Low
CPT134	3.98	8.75	Medium dense to very dense SAND	Sand (undifferentiated)	Low
CPT134	8.75	14.58	Medium to high strength CLAY	Glacial clay	Low
CPT134	14.58	22.33	Medium dense to very dense SAND with a thick bed of very high to extremely high strength sandy clay	Sand (undifferentiated)	Low
CPT134	22.33	29.3	High to very high strength gravelly CLAY	Glacial clay	Low
CPT133	0	7.16	Extremely low to low strength CLAY	Marine clay	Low
CPT133	7.16	36.38	Medium to very high strength gravelly CLAY with a thick bed of very high to extremely high strength silt	Glacial clay	Low
CPT133	36.38	41.2	Medium strong brownish grey (5YR 4/1) HALITE	Bedrock	Low
CPT128	0	0.56	Medium dense to very dense clayey SAND	Sand (undifferentiated)	Low
CPT128	0.56	4.1	High to extremely high strength silty CLAY with a thin bed of dense to very dense silty sand	Glacial clay	Low
CPT128	4.1	50.21	Very dense slightly clayey gravelly silty SAND with a thick bed of very high to extremely high strength silty clay	Sand (undifferentiated)	Low
CPT127	0	5	Extremely low to low strength sandy CLAY	Marine clay	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
CPT127	5	9.26	Dense to very dense SAND	Sand (undifferentiated)	Low
CPT127	9.26	14.7	Medium to very high strength slightly gravelly CLAY with medium to very widely spaced thin to medium beds of very loose to medium dense silty sand	Glaciomarine	Low
CPT127	14.7	18.08	Loose to medium dense silty SAND with medium to widely spaced thin beds of high to very high strength sandy clay	Sand (undifferentiated)	Low
CPT127	18.08	42.93	Stiff medium to very high strength dark brown slightly gravelly silty CLAY	Glacial clay	Low
CPT127	42.93	50.12	Loose to dense slightly gravelly silty SAND with three thin beds of extremely high strength sandy clay	Sand (undifferentiated)	Low
CPT122	0	1	Very loose silty SAND	Sand (undifferentiated)	Low
CPT122	1	15.3	Dense to very dense SAND	Sand (undifferentiated)	Low
CPT122	15.3	17.22	Low to medium strength slightly gravelly CLAY with very closely to medium spaced thin to medium beds of high to extremely high strength silt	Glaciomarine	Low
CPT122	17.22	27.2	Low to extremely high strength slightly silty slightly sandy CLAY	Glacial clay	Low
CPT122	27.2	42.2	Extremely weak to weak dark reddish brown (5YR 3/3) and greenish grey (GLEY2 5B 5/1) silty MUDSTONE interbedded with siltstone with veins of translucent gypsum	Bedrock	Low
CPT119	0	0.28	Very loose to medium dense clayey SAND	Sand (undifferentiated)	Low
CPT119	0.28	8.08	Dense to very dense SAND	Sand (undifferentiated)	Low
CPT119	8.08	19.06	Medium to very high strength slightly gravelly CLAY	Glacial clay	Low

Hole id	Depth from (m)	Depth to (m)	Description	Interpretation/ Unit	Priority
CPT119	19.06	27.76	Dense to very dense SAND with a very thick bed of extremely high strength sandy clay	Sand (undifferentiated)	Low
CPT113	0	1.32	Very loose to loose SAND	Sand (undifferentiated)	Low
CPT113	1.32	10.06	Medium dense to very dense SAND	Sand (undifferentiated)	Low
CPT113	10.06	31.1	High to very high strength silty sandy CLAY with three beds of medium dense to very dense silty sand	Glacial clay	Low
CPT113	31.1	34.4	Extremely weak to very weak slightly to highly weathered moderate brown (5YR 3/4) mottled greenish grey (5G 6/1) MUDSTONE with frequent crystals of translucent gypsum	Bedrock	Low
CPT113	34.4	43.9	Extremely high strength gravelly CLAY with frequent crystals of translucent gypsum	Bedrock	Low
CPT113	43.9	49.13	Weak to medium strong semitranslucent reddish brown (5YR 4/4) and pink (5YR 7/4) HALITE with thin laminations of mudstone	Bedrock	Low

Stage 1 Geoarchaeological Assessment of 2024 Geotechnical Data (Royal HaskoningDHV, 2025)

Note / Memo

HaskoningDHV UK Ltd.
Water & Maritime

To:	Historic England and Morecambe Offshore Windfarm Ltd
From:	Claire Mellett
Date:	17 January 2025
Copy:	Sarah Read, Alix Scullion
Our reference:	PC1165-RHD-XX-XX-ME-X-0001
Classification:	Project related
Checked by	Victoria Boothby

Subject: **Morecambe Offshore Wind Farm: Generation Assets - Stage 1 Geoarchaeological Assessment of 2024 Geotechnical Data**

1 Introduction

This technical note outlines the results of a Stage 1 geoarchaeological assessment of shallow geotechnical (vibrocore) data and deep geotechnical (borehole) data acquired within the Morecambe Offshore Windfarm: Generation Assets (the Project) during a survey undertaken in 2024. This technical note should be considered alongside the Stage 1 geoarchaeological assessment of 2023 geotechnical data (Royal HaskoningDHV, 2024; MOR001-FLO-CON-ENV-TEC-0006).

The objective of this technical note is to review new geotechnical data in relation to the proposed lithostratigraphy defined for the Project within the Stage 1 geoarchaeological assessment of 2023 geotechnical data (Royal HaskoningDHV, 2024 (appended to this report)) (**Table 1**) with the aim of updating the lithostratigraphy, if required, and associated geoarchaeological potential where necessary.

Table 1 Lithostratigraphy of deposits with the Project Windfarm site (Royal HaskoningDHV, 2024; MOR001-FLO-CON-ENV-TEC-0006)

Unit Name	Description	Epoch	Formation[1]
Marine Clay	Extremely low to low strength silty clay, occasionally with shell fragments.	Holocene	Surface Sands Formation
Shallow Marine Sand	Silty sand with shell fragments		
Sand (undifferentiated)	Medium dense to very dense sand, occasionally with thin beds of clay	Weichselian	Western Irish Sea Formation A and/or B (prograded facies)
Glaciomarine	Firm to stiff laminated clay with thin beds of sand	Weichselian	Western Irish Sea Formation A and/or B (glaciomarine to marine)

Unit Name	Description	Epoch	Formation[1]
Glacial Clay (interbedded with sand)	Very stiff extremely high strength silty sandy gravelly clay.	Weichselian	Cardigan Bay Formation
Glacial Sand	Dense gravelly/clayey sand.	Weichselian	Cardigan Bay Formation
Bedrock	Mudstone with gypsum veins and Halite	Pre-Quaternary	N/A

This data review is being undertaken according to the recommendation made in the Stage 1 geoarchaeological assessment of 2023 geotechnical data (Royal HaskoningDHV, 2024; MOR001-FLO-CON-ENV-TEC-0006) to test the following hypothesis:

- The site deglaciated in a marine environment and as such has low palaeolandscape potential.

2 Methods

2.1 Coordinate system

All location information and figures are presented as projected coordinates in WGS84 UTM Zone 30N Eastings and Northings.

The vertical reference level is given as meters below seafloor (mbsf) which assumes the top of the borehole is equal to the level of the seafloor. Water depths are given as meters below Lowest Astronomical Tide (LAT).

2.2 Geotechnical drilling/coring strategy

The geotechnical data assessed in this report was collected by Gardline during surveys undertaken between April and May 2024 (shallow geotechnical) and between May and July 2024 (deep geotechnical) (Gardline, 2024a,b).

The locations of recovered vibrocores are presented in **Figure 1** and in **Appendix A**. In total, 70 core samples were recovered with a High Powered Vibrocore at 39 locations. Maximum sample recovery was 6.00m at IAC 03 VC. Minimum sample recovery was 1.60m at IAC 14 VC. Fifty-nine of the cores are located with the Project boundary and 11 are located within the export cable corridor which is outside the area covered by this review.

Core samples were extruded, logged and photographed in the geotechnical contractor's laboratory. Geotechnical logs and core photographs were provided for geoarchaeological review and assessment.

The locations of recovered boreholes and cone penetration tests (CPTs) are presented in **Figure 2** and in **Appendix A**. In total, 22 sampling boreholes and 36 CPTs, which included a selection of downhole sampling utilising Shelby tubes, were undertaken within the Project boundary. The coring system utilised a triple barrel rotary core system, comprising of an outer and inner barrel with a plastic core retaining liner.

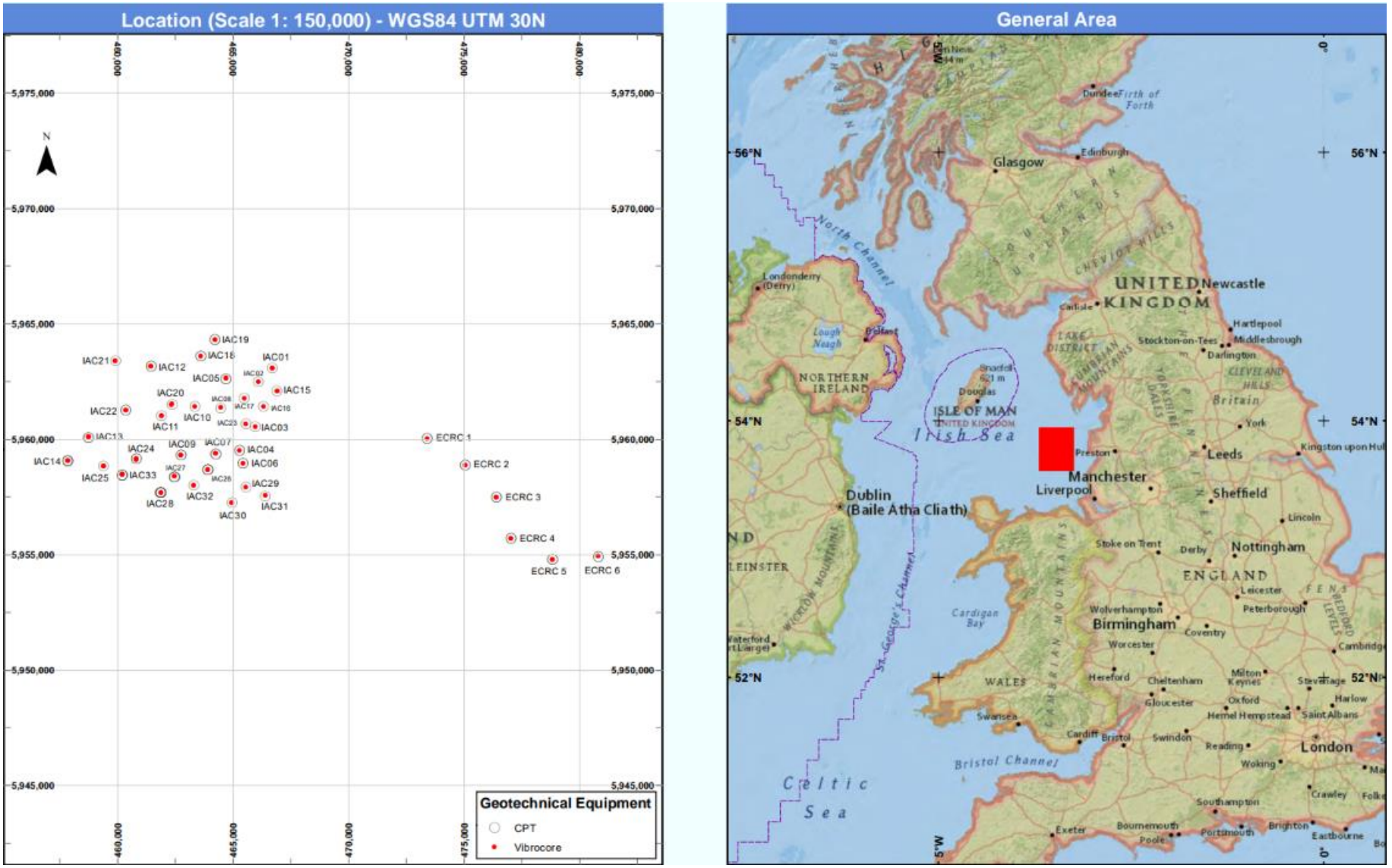

Figure 1 Location of vibroocres acquired during 2024 geotechnical survey (Gardline 2024a)

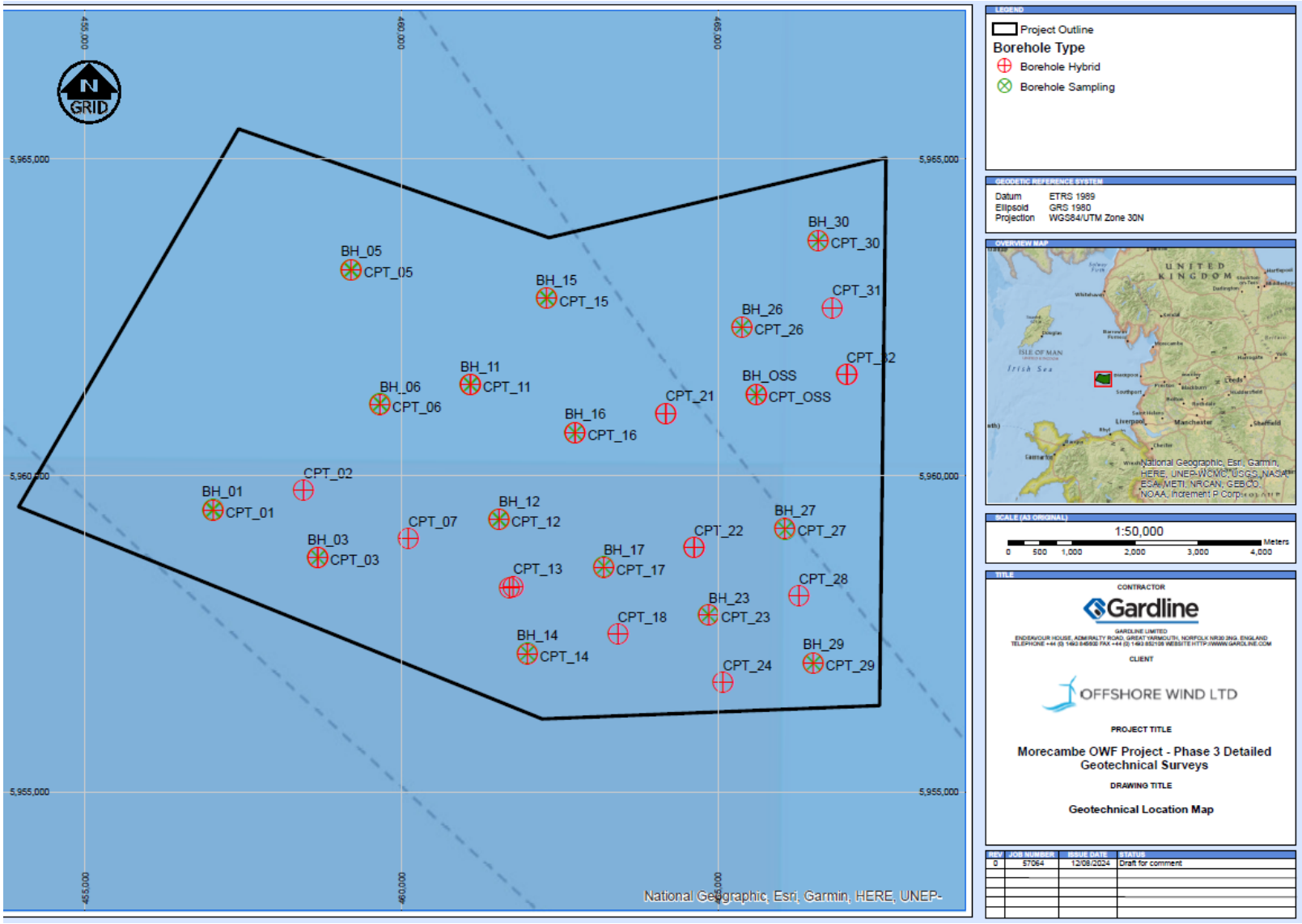

Figure 2 Location of boreholes and CPTs acquired during 2024 geotechnical survey (Gardline 2024b)

The borehole samples were extruded, photographed and described by Geotechnical Engineers onboard although a selection of downhole samples were retained in Shelby tube for extrusion onshore. Following logging and basic field testing, core samples were retained within their core liner, wrapped and sealed for storage. The onboard Geotechnical logs and core photographs were provided for geoarchaeological review and assessment.

The suitability of geotechnical samples for geoarchaeological purposes was assessed according to the drilling/coring strategy employed, using the criteria outlined in **Table 2** (Category A samples are more suitable for geoarchaeological purposes when compared with Category D samples). Vibrocore and borehole samples used in this assessment have been assigned Category A. The CPT downhole samples have been assigned Category B.

Table 2 Assessment criteria for suitability of geotechnical samples for geoarchaeological purposes

Category	Description
A	Continuous record of deposits recovered with minimal disturbance. Structure and stratigraphy is largely intact. Can be a whole round core or the preserved half of a split core. Cores of this quality are typically recovered using vibrocore or continuous coring methods.
B	Discontinuous record of deposits recovered with minimal disturbance, usually due to a combination of open hole drilling with intermittent coring (e.g. shelby tube), structure and stratigraphy largely intact.
C	Continuous record of deposits recovered. Low recovery or disturbance related to the nature of the deposit (e.g. loose sediment), or due to cores being extruded into bags. Structure and stratigraphy typically not fully preserved.
D	Discontinuous record of deposits recovered resulting from a combination of open hole drilling with intermittent coring, low recovery or disturbance related to the nature of the deposit (e.g. loose sediment), or due to cores being extruded into bags. Structure and stratigraphy typically not fully preserved.

2.3 Review of geotechnical logs

Each of the 59 vibrocore logs, 22 borehole logs and 36 CPT logs were reviewed by a trained geoarchaeologist in order to determine their depositional history to test the hypotheses outlined in Section 1. Deposits recovered were assigned either a high, medium or low priority status based on their perceived geoarchaeological significance as itemised in **Appendix B**.

3 Results

3.1 Vibrocores

The dominant sediments recovered in vibrocores were silty sands with shell fragments that are interpreted as Shallow Marine Sand Unit (Table 1) and have low priority status in terms of their perceived geoarchaeological significance. These sands are found overlying, and in some cases underlying a very soft extremely low strength clay comprising shell fragments that is interpreted as Marine Clay Unit (Table 1). This deposit formed in a marine environment and has low priority status.

In some cases, a silty sand deposit is recovered that does not include any shell fragments. This deposit is correlated to the Sand (undifferentiated) Unit (Table 1) which formed in a glacial environment at the margin of Irish Sea Ice Stream, and therefore has low priority status. At two locations, the vibrocores recover a high strength, silty, gravelly clay which correlate to the Glacial Clay Unit (Table 1) and also have low priority status.
The descriptions of the Shallow Marine Sand Unit occasionally include reference to organic odour, brown/organic staining and brown to black organic laminations. These potentially organic inclusions are considered to be of modern age, likely laid down in the current marine environment as the deposits also

comprise shell fragments. The stratigraphic position of the Shallow Marine Sand Unit above the Marine Clay also supports the interpretation that these inclusions are modern and of marine origin. A fragment of plastic was recorded in vibrocore IAC-06-VC at 0.9 mbsf which suggests modern marine sedimentation rates are high. If this is the case, the organic odour and laminations could relate to industrial activity associated with the oil and gas platforms in the Irish Sea. The South Morecambe Gas field is located within the north part of the windfarm site, while the South Morecambe Drilling Platform 3 (DP3), which is now decommissioned, was previously located within the windfarm site and the Calder Accommodation Platform 1 (CA1) is located 0.9km to the west of the windfarm site.

3.2 Boreholes/CPTs

The lowermost deposits recovered in boreholes comprised extremely high strength silty sandy gravelly clay (Glacial Clay Unit) and dense gravelly sands (Glacial Sand Unit) which overlay bedrock of Mudstone and Halite (Table 1). These glacial clays and sands likely formed during the phase of ice advance during the last glacial period and are correlated to the Cardigan Bay Formation. These deposits have low geoarchaeological potential as they were deposited by ice during the Weichselian, at a time when the Irish Sea would have been unsuitable for hominin occupation. The Glacial Clay Unit is also on occasion interbedded with dense sand deposits that likely also formed in a glacial environment, potentially representing proglacial deltaic environments.

Overlying the Glacial Clay Unit and Glacial Sand Unit at a number of locations were medium to high strength laminated clays with beds of sand. The presence of laminations suggests deposition in a quiet water environment and their strength indicates potential overriding by ice and are attributed to the glaciomarine deposits of the Western Irish Sea Formation A and Western Irish Sea Formation B.

The Glaciomarine Unit is overlain by a sequence of sands grouped together as the Sand (undifferentiated) Unit, also seen in the vibrocores and interpreted to represent deposition in ice marginal deltas during the Weichselian glacial period. The uppermost deposits comprised the sands with shell fragments (Shallow marine sand Unit) and extremely low strength clays (Marine Clay Unit) correlating to the Surface Sands Formation. The Marine Clay Unit in particular were characteristic of the Western Irish Sea Mudbelt. The geoarchaeological potential of these deposits is low as they were laid down in a marine environment.

Each of these deposits has low geoarchaeological potential, documenting the transition from a glacial, to glaciomarine and finally marine environment during the Weichselian and Holocene. There is no evidence in the boreholes or CPTs of deposits that formed in a sub-aerial, temperate environment that would have been suitable for inhabitation.

4 Conclusions

The deposits conform to the expected stratigraphy and have low geoarchaeological priority status and do not change the hypotheses that *the site deglaciated in a marine environment and as such has low palaeolandscape potential*. Therefore, there are no recommendations for further geoarchaeological assessment of the vibrocores or boreholes acquired during the 2024 geotechnical survey.

5 References

Gardline (2024a) Morecambe Phase 3 Scope 1: Vol 1: Geotechnical Field Operations and Preliminary Results. Document Reference: MOR001-GAR-01-SNV-GEO-RPT-000.

Gardline (2024b) Morecambe Phase 3 Volume 1: Operations and Preliminary Results Report Scope 2 Scope 2. Document Reference: MOR001-GAR-01-SNV-GEO-RPT-0011.

Royal HaskoningDHV (2024) Stage 1 Geoarchaeological Assessment of Geotechnical Data Morecambe Offshore Windfarm Generation Assets. Development Consent Order Document MOR001-FLO-CON-ENV-TEC-0006.

Appendix A

Vibrocore locations

ID	Easting (m)	Northing (m)
IAC 01 VC	466720.6	5963086.9
IAC 01A VC	466719.5	5963090.1
IAC 02 VC	466101.2	5962492.6
IAC 03 VC	465964.6	5960552.7
IAC 04 VC	465301.3	5959554.3
IAC 05 VC	464711.5	5962648.6
IAC 05A VC	464707.1	5962649.5
IAC 06 VC	465451.8	5958956.2
IAC 07 VC	464260.3	5959390.7
IAC 07A VC	464268.3	5959389.2
IAC 08 VC	464485	5961364.9
IAC 09 VC	462758.8	5959339.5
IAC 09A VC	462761.3	5959347.1
IAC 10 VC	463357.8	5961454.1
IAC 11 VC	461917.3	5961051.9
IAC 11A VC	461912.7	5961046.7
IAC 12 VC	461463.4	5963173
IAC 12A VC	461464.4	5963178.1
IAC 12B VC	461461.6	5963165.3
IAC 13 VC	458749.8	5960099.5
IAC 13A VC	458754.8	5960093.2
IAC 14 VC	457848	5959073.2
IAC 14A VC	457851.6	5959078.2
IAC 14B VC	457842.4	5959079.2
IAC 15 VC	466927	5962115.2
IAC 15A VC	466924	5962118.7
IAC 16 VC	466323.6	5961428.9
IAC 17 VC	465495.7	5961812.1
IAC 18 VC	463614.3	5963629.6
IAC 19 VC	464217.6	5964312.6
IAC 19A VC	464217.4	5964307.8
IAC 20 VC	462354.1	5961534.6
IAC 20A VC	462360	5961537.8
IAC 21 VC	459919.2	5963400.8
IAC 21A VC	459915.1	5963399.7
IAC 22 VC	460370.5	5961275.5
IAC 22A VC	460371.9	5961280
IAC 23 VC	465569.5	5960683.6
IAC 24 VC	460825	5959154.5
IAC 24A VC	460825	5959145.1
IAC 24B VC	460823.9	5959157.3
IAC 25 VC	459390.3	5958849.9
IAC 25A VC	459395.9	5958847.8
IAC 25B VC	459395.2	5958853.8
IAC 26 VC	463910.3	5958697.3
IAC 26A VC	463911.7	5958693.7
IAC 27 VC	462479.7	5958398.7
IAC 27A VC	462476.1	5958401.9
IAC 28 VC	461877.5	5957712.1
IAC 28A VC	461877.3	5957706.3
IAC 29 VC	465570	5957939.9

ID	Easting (m)	Northing (m)
IAC 30 VC	464968.2	5957260.7
IAC 30A VC	464961.3	5957256.5
IAC 31 VC	466398	5957562.2
IAC 32 VC	463306.3	5958016.4
IAC 32A VC	463314.9	5958017.1
IAC 33 VC	460223	5958467.2
IAC 33A VC	460219.8	5958464.6
IAC 33B VC	460222.4	5958474.5

Borehole locations

ID	Easting (m)	Northing (m)
BH_01	457015.5	5959453.5
BH_01_A	457023	5959457.6
BH_03	458681.2	5958696.3
BH_05	459205.6	5963251.5
BH_05_A	459209.6	5963247.8
BH_05_B	459206	5963243.5
BH_06	459657.5	5961127.9
BH_06_A	459661.8	5961124.6
BH_11	461092.6	5961429.2
BH_11_A	461087.1	5961431.9
BH_12	461541.2	5959308.2
BH_12_A	461543.9	5959304.5
BH_14	461991.6	5957184.5
BH_15	462294.3	5962798.4
BH_15_A	462298.2	5962794.2
BH_17	463196.6	5958551.9
BH_23	464853.6	5957792.8
BH_26	465381.6	5962346.1
BH_27	466063.3	5959155.4
BH_29	466511.4	5957035.5
BH_30	466592.5	5963707.5
BH_OSS	465606	5961276.1
CPT_01	457023.7	5959453.4
CPT_02	458451.4	5959757.4
CPT_03	458677.2	5958696.4
CPT_03_A	458677.3	5958700.7
CPT_05	459205.6	5963247.7
CPT_06	459657.5	5961124
CPT_07	460109.4	5959004.4
CPT_08	460334.1	5957938.5
CPT_10	460636.7	5963552.2
CPT_11	461088.1	5961427.8
CPT_11_A	461084.3	5961425.9
CPT_12	461539.9	5959303.8
CPT_13	461765.6	5958242.5
CPT_13_A	461707.3	5958227.5
CPT_14	461991.9	5957180.8
CPT_15	462294.2	5962793.4
CPT_16	462745.3	5960670.2
CPT_16_A	462745.4	5960674.1
CPT_17	463196.5	5958547.3
CPT_18	463421.2	5957484.9
CPT_21	464176.6	5960975
CPT_21_A	464175.9	5960979.7

ID	Easting (m)	Northing (m)
CPT_22	464627.3	5958851.5
CPT_22_A	464623.6	5958852.5
CPT_23	464854.2	5957788.8
CPT_24	465078.3	5956727.5
CPT_26	465381.7	5962340.8
CPT_27	466059.5	5959159.9
CPT_28	466284.3	5958093.5
CPT_29	466506	5957034.8
CPT_30	466587.7	5963707
CPT_31	466812.2	5962649.8
CPT_32	467035.3	5961587.4
CPT_32_A	467048.9	5961587.2
CPT_OSS	465608	5961279.5
CPT_OSS_A	465612.6	5961279.6

Appendix B

Geoarchaeological Review of Vibrocores

ID	Depth (mbsf)	Description	Unit Name	Priority
IAC 01 VC	0.21	Very dark grey clayey fine to medium SAND with occasional coarse sand to medium gravel size shell fragments. Organic odour	Shallow marine sand	Low
	3.88	Dark greyish brown to brown slightly silty fine to medium SAND with rare medium sand to fine gravel size shell fragments. Rare black organics throughout. Slight organic odour.	Shallow marine sand	Low
IAC 01A VC	0.5	Very soft extremely low strength very dark grey silty sandy CLAY with occasional fine to coarse sand sized shell fragments. Sand is fine	Marine clay	Low
	3.3	Greyish brown fine to medium SAND with fine sand sized shell fragments	Shallow marine sand	Low
IAC 02 VC	1.78	Very dark grey very clayey becoming clayey fine to medium SAND with frequent coarse sand to medium gravel size shell fragments. Organic odour. At 0.09m - occasional closely spaced pockets of brown fine to medium sand.	Shallow marine sand	Low
	4.38	Dark grey to brown slightly silty fine to medium SAND with rare coarse sand to medium gravel size shell fragments. At 2.05m - rare medium spaced very thin beds and thick laminations of very dark grey clayey fine to medium sand.	Shallow marine sand	Low
IAC 03 VC	0.45	Very soft extremely low strength very dark grey slightly sandy silty CLAY with occasional coarse sand to coarse gravel size shell fragments. Sand is fine. Organic odour. Black organic staining	Marine clay	Low
	0.55	Possible boundary in FC and REM		Low
	1.63	Very soft very low strength dark grey silty CLAY with occasional coarse sand to medium gravel size shell fragments. Brown staining.	Marine clay	Low
	2.09	Very soft very low strength dark grey sandy CLAY with occasional coarse sand to fine gravel size shell fragments. Sand is fine. Slight organic odour.	Marine clay	Low
	2.54	Possible boundary in MLV and TC/ER		Low
	2.73	Soft very low strength dark grey sandy CLAY with abundant coarse sand to medium gravel size shell fragments.	Marine clay	Low
	3.07	Dark grey slightly gravelly clayey fine to medium SAND with abundant coarse sand to medium gravel size shell fragments. Gravel is fine to medium and sub rounded.	Shallow marine sand	Low
	5.61	Dark greyish brown slightly silty fine to medium SAND with rare coarse sand size shell fragments. At 3.30m - close to medium spaced occasional pockets and thick laminations to thin beds of very dark grey sandy clay. Sand is fine to medium.	Shallow marine sand	Low
IAC 04 VC	0.26	Dark greyish brown silty fine to medium SAND with occasional coarse sand to medium gravel size shell fragments. At 0.00 to 0.25m - closely spaced thin beds of very dark grey clayey fine to medium sand.	Shallow marine sand	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
	1.21	Dark greyish brown slightly silty fine to medium SAND with rare coarse sand size shell fragments.	Shallow marine sand	Low
	3.4	Light olive brown slightly gravelly fine to coarse SAND with occasional coarse sand to medium gravel size shell fragments and frequent black organics. Gravel is fine to medium and sub rounded.	Shallow marine sand	Low
	3.89	Possible boundary in TC/ER		Low
	4.58	Light olive brown fine to medium SAND with rare medium to coarse sand size shell fragments.	Shallow marine sand	Low
IAC 05 VC	4.09	Dark greyish brown to brown slightly silty fine to medium SAND with rare coarse sand to medium gravel size shell fragments. At 0.08m to 0.35m - medium bedded very dark grey slightly clayey fine to medium sand with abundant coarse sand to coarse gravel size shell fragments and slight organic odour. At 0.93m - closely spaced fine to medium gravel size pockets of black organics.	Shallow marine sand	Low
IAC 05A VC	0.5	Dark grey becoming greyish brown fine to medium silty SAND with fine to medium sand size shell fragments.	Shallow marine sand	Low
	3.25	Dark grey becoming greyish brown fine to medium silty SAND.	Sand (undifferentiated)	Low
IAC 06 VC	0.66	Soft very low strength very dark grey sandy CLAY with frequent coarse sand to coarse gravel size shell fragments. Sand is fine to medium. Organic odour. Brown staining.	Marine clay	Low
	4.82	Dark greyish brown to yellowish brown slightly silty fine to medium SAND with rare coarse sand size shell fragments. At 0.91m - coarse gravel to cobble size piece of transparent soft plastic.	Shallow marine sand	Low
IAC 07 VC	0.35	Dark grey slightly clayey fine to medium SAND with abundant coarse sand to medium gravel size shell fragments and closely spaced thinly bedded olive brown silty fine to medium sand. Gravel is fine and sub rounded. From 0.00m - very closely spaced coarse gravel size pockets of black organics. Organic odour	Shallow marine sand	Low
	3.99	Dark greyish brown slightly silty gravelly fine to coarse SAND with rare coarse sand to medium gravel size shell fragments and frequent closely spaced coarse sand size black organics. Gravel is fine to medium and sub rounded. At 0.55m to 0.78m - thinly laminated brown staining.	Shallow marine sand	Low
IAC 07A VC	0.5	Grey slightly silty fine to medium SAND with frequent coarse sand sized to fine gravel size shell fragments.	Shallow marine sand	Low
	2.68	Greyish brown fine to coarse SAND with occasional coarse sand sized to fine gravel size shell fragments, and rare fine to medium sub angular to sub rounded gravel.	Shallow marine sand	Low
IAC 08 VC	0.35	Very soft extremely low strength very dark grey slightly sandy CLAY with occasional coarse sand to coarse gravel size shell fragments. Sand is fine to medium. Olive brown staining. Organic odour. At 0.00m to 0.12m - occasional closely spaced coarse gravel size pockets of black organic staining.	Marine clay	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
	0.45	Possible boundary in FC and REM		Low
	4.05	Very soft extremely low to very low strength very dark grey silty CLAY with occasional coarse sand to medium gravel size shell fragments. Slight organic odour.	Marine clay	Low
	4.85	Very soft very low strength very dark grey slightly sandy CLAY with rare coarse sand to fine gravel size shell fragments. Organic odour.	Marine clay	Low
	5.1	Possible boundary in MLV and REM		Low
	5.52	Soft very low strength very dark grey sandy CLAY with frequent coarse sand to medium gravel size shell fragments. Sand is fine to medium. Slight organic odour	Marine clay	Low
IAC 09 VC	0.8	Dark grey clayey fine to medium SAND with frequent coarse sand to medium gravel size shell fragments. Organic odour. At 0.59m - brown staining.	Shallow marine sand	Low
	1.1	Dark greyish brown slightly clayey fine to coarse SAND with abundant coarse sand to medium gravel size shell fragments.	Shallow marine sand	Low
	3.36	Olive brown slightly silty slightly gravelly fine to medium SAND with rare coarse sand to medium gravel size shell fragments. Gravel is fine and sub rounded.	Shallow marine sand	Low
IAC 09A VC	0.5	Dark grey brown silty fine to medium SAND with rare fine sand to medium gravel size shell fragments.	Shallow marine sand	Low
	1.5	Dark greyish brown fine to medium clayey SAND with occasional fine to medium sand size shell fragments.	Shallow marine sand	Low
	2.5	Dark greyish brown fine to medium SAND with occasional fine sand size shell fragments.	Shallow marine sand	Low
	3.5	Greyish brown fine to coarse slightly gravelly SAND with frequent coarse sand to coarse gravel size shell fragments. Gravel is fine and sub rounded.	Shallow marine sand	Low
IAC 10 VC	0.12	Very soft extremely low strength very dark grey slightly sandy CLAY with rare coarse sand size shell fragments and rare black staining. Sand is fine to medium. Slight organic odour.	Marine clay	Low
	4.62	Very soft to soft extremely low to very low strength dark grey silty CLAY with rare coarse sand to medium gravel size shell fragments and rare black and brown staining. Slight organic odour.	Marine clay	Low
	4.78	Soft extremely low strength very dark grey slightly sandy CLAY with rare coarse sand to medium gravel size shell fragments and thick laminations of black organics. Rare pockets of black staining.	Marine clay	Low
IAC 11 VC	0.5	Very soft extremely low strength very dark grey sandy CLAY. Sand is fine	Marine clay	Low
	1.5	Soft extremely low strength dark brown sandy CLAY. Sand is fine.	Marine clay	Low
	3.5	Soft extremely low strength dark brown slightly sandy CLAY. Sand is fine.	Marine clay	Low
	4.05	Greyish brown fine to coarse gravelly SAND. Gravel is fine to coarse and sub rounded.	Sand (undifferentiated)	Low
IAC 11A VC	0.27	Very soft extremely low strength dark grey sandy CLAY with rare medium to coarse sand size shell	Marine clay	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
		fragments. Black organic staining. Slight organic odour		
	1.26	Very soft very low strength dark grey slightly sandy silty CLAY with occasional coarse sand to medium gravel size shell fragments. Sand is fine. Brown staining.	Marine clay	Low
	1.56	Possible boundary in FC and REM, and TC/ER		Low
	3.63	Very soft very low strength dark grey silty CLAY with occasional coarse sand to medium gravel size shell fragments. Slight organic odour.	Marine clay	Low
	3.98	Soft to firm very low strength dark grey slightly sandy slightly gravelly CLAY with frequent coarse sand to medium gravel size shell fragments. Sand is fine to medium. Gravel is fine to coarse and sub rounded.	Marine clay	Low
	4.05	Dark greyish brown slightly silty gravelly fine to medium SAND with occasional coarse sand to fine gravel size shell fragments.	Shallow marine sand	Low
IAC 12 VC	0.5	Very soft extremely low strength dark grey silty sandy CLAY with occasional fine to coarse sand size shell fragments. Sand is fine to medium	Marine clay	Low
	3	Greyish brown fine to medium SAND.	Sand (undifferentiated)	Low
IAC 12A VC	0.5	Very soft extremely low strength dark grey silty sandy CLAY with occasional fine to coarse sand size shell fragments. Sand is fine.	Marine clay	Low
	2.93	Greyish brown fine to medium SAND.	Sand (undifferentiated)	Low
IAC 12B VC	1.24	Pale brown slightly gravelly fine to medium SAND with rare coarse sand to medium gravel size shell fragments. At 0.18m to 0.36m - occasional yellowish brown staining. Gravel is fine to medium and sub rounded.	Shallow marine sand	Low
	1.44	Possible boundary in TC/ER		Low
	3.2	Pale brown slightly silty fine to medium SAND. Occasional yellowish brown staining throughout. At 2.66m - thickly laminated black organics.	Shallow marine sand	Low
IAC 13 VC	0.34	Dark grey silty fine to medium SAND with frequent coarse sand to fine gravel size shell fragments.	Shallow marine sand	Low
	2.4	Dark grey slightly silty fine to medium SAND with frequent becoming abundant coarse sand to coarse gravel size shell fragments. At 0.73m - rare thin bed of very dark grey fine to medium sand with organic staining and organic odour.	Shallow marine sand	Low
	3.66	Brown fine to medium SAND with rare coarse sand size shell fragments. At 2.44m to 2.46m - black organic staining. At 2.99m - rare thick laminations of dark grey clayey sand. At 3.09m - rare medium gravel size pocket of fine sub rounded gravel.	Shallow marine sand	Low
IAC 13A VC	0.5	Dark greyish brown fine to medium SAND with frequent fine to medium sand size shell fragments.	Shallow marine sand	Low
	3.5	Dark greyish brown fine to medium silty SAND with frequent fine to medium sand size shell fragments. From 2.00m - with rare fine and sub rounded gravel.	Shallow marine sand	Low
	3.6	Brown medium SAND with frequent medium to coarse sand size and rare medium gravel size shells and shell fragments.	Shallow marine sand	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
IAC 14 VC	0.5	Greyish brown fine to medium SAND with frequent coarse sand size shell fragments.	Shallow marine sand	Low
	1.5	Very soft to soft greyish brown sandy CLAY with numerous fine to medium gravel size shell and shell fragments, with fine to medium and sub rounded gravel. Sand is fine.	Marine clay	Low
	1.6	Brown fine to coarse SAND with occasional fine to medium sub angular to sub rounded gravel, and with frequent coarse sand size shell fragments.	Shallow marine sand	Low
IAC 14A VC	0.5	Dark greyish brown slightly silty SAND with frequent coarse sand size shell fragments.	Shallow marine sand	Low
	1.5	Greyish brown fine to coarse SAND with frequent coarse sand size to medium gravel size shell fragments.	Shallow marine sand	Low
	3	Brown fine to coarse SAND with rare fine and sub rounded gravel. Micaceous.	Sand (undifferentiated)	Low
IAC 14B VC	0.41	Brown slightly silty slightly gravelly fine to medium SAND with occasional coarse sand to fine gravel size shell fragments. Gravel is fine and sub rounded.	Shallow marine sand	Low
	1.22	Brown slightly gravelly fine to coarse SAND with occasional coarse sand to coarse gravel size shell fragments. Gravel is fine and sub rounded. At 0.42m - rare Coarse gravel size pockets of dark grey slightly clayey fine to coarse sand. Organic odour	Shallow marine sand	Low
	3.4	Greyish brown gravelly fine to coarse SAND with occasional coarse sand to medium gravel size shell fragments. Gravel is fine and sub rounded.	Shallow marine sand	Low
IAC 15 VC	2.25	Very soft extremely low strength very dark grey sandy CLAY with occasional coarse sand size shell fragments. Sand is fine to medium.	Marine clay	Low
IAC 15A VC	0.5	Very soft extremely low strength very dark grey silty CLAY with frequent coarse sand to medium gravel size shell fragments and organic odour. Occasional coarse gravel size pockets of black organic staining.	Marine clay	Low
	1.33	Soft extremely low strength very dark grey slightly sandy CLAY with frequent coarse sand to coarse gravel size shell fragments and slight organic odour. Sand is fine to medium. Rare coarse gravel size pockets of brown staining.	Marine clay	Low
	2.97	Dark grey clayey fine to medium SAND with frequent coarse sand size shell fragments. Slight organic odour.	Shallow marine sand	Low
	4.03	Firm extremely low strength very dark grey slightly sandy CLAY with frequent coarse sand to medium gravel size shell fragments. Sand is fine to medium.	Marine clay	Low
	5.27	Dark grey clayey fine to medium SAND with occasional coarse sand to fine gravel size shell fragments.	Shallow marine sand	Low
IAC 16 VC	0.69	Very soft extremely low strength very dark greyish brown silty CLAY with occasional coarse sand to coarse gravel size shell fragments and slight organic odour. At 0.40m - rare medium gravel size pockets of black staining.	Marine clay	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
	3.58	Very soft to soft extremely low to very low strength dark grey CLAY with rare coarse sand to cobble size shell fragments. Slight organic odour.	Marine clay	Low
	4.19	Soft extremely low strength dark grey slightly sandy silty CLAY with rare coarse sand to medium gravel size shell fragments. Sand is fine to medium.	Marine clay	Low
	4.44	Possible boundary in MLV and REM		Low
	5.09	Very dark grey clayey fine to medium SAND with abundant coarse sand to medium gravel size shell fragments and slight organic odour. At 4.93m to 5.04m - thinly bedded olive brown fine to medium sand.	Shallow marine sand	Low
IAC 17 VC	0.22	Very soft extremely low strength very dark grey silty CLAY with rare coarse sand size shell fragments and organic odour. Rare dark olive brown staining.	Marine clay	Low
	0.52	Possible boundary in TC/ER and FC and REM		Low
	4.89	Very soft to soft extremely low to very low strength dark grey CLAY with occasional coarse sand to coarse gravel size shell fragments and slight organic odour. Rare coarse sand to medium gravel size pockets of black organic staining.	Marine clay	Low
IAC 18 VC	0.6	Very dark grey clayey fine SAND with frequent coarse sand to medium gravel size shell fragments. Olive brown staining throughout. Organic odour.	Shallow marine sand	Low
	4.63	Brown slightly silty fine to medium SAND with rare coarse sand to fine gravel size shell fragments.	Shallow marine sand	Low
IAC 19 VC	0.5	Very soft extremely low strength very dark greyish brown sandy CLAY. Sand is fine.	Marine clay	Low
	1.5	Very soft extremely low strength dark greyish brown sandy CLAY with fine to medium sand size shell fragments. Sand is fine.	Marine clay	Low
	3.8	Greyish brown fine to medium SAND.	Sand (undifferentiated)	Low
IAC 19A VC	0.83	Very dark grey clayey fine to medium SAND with frequent coarse sand to medium gravel size shell fagments. Slight organic odour.	Shallow marine sand	Low
	1.09	Dark grey slightly clayey fine to medium SAND with frequent coarse sand to fine gravel size shell fragments.	Shallow marine sand	Low
	1.94	Dark yellowish brown slightly gravelly fine to medium SAND with occasional coarse sand to fine gravel size shell fragments. Slight organic odour. Gravel is fine and sub rounded. At 1.24m to 1.32m - rare thin bed of dark yellowish brown slightly gravelly fine to coarse sand.	Shallow marine sand	Low
	3.78	Brown to dark greyish brown fine to medium SAND with rare coarse sand sized shell fragments. Slight organic odour.	Shallow marine sand	Low
IAC 20 VC	0.5	Dark greyish brown fine to medium clayey SAND.	Sand (undifferentiated)	Low
	2.3	Very soft extremely low strength greyish brown sandy CLAY. Sand is fine.	Marine clay	Low
IAC 20A VC	0.5	Very soft extremely low strength very dark grey sandy CLAY with occasional coarse sand to medium gravel size shell fragments and organic	Marine clay	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
		odour. Rare pockets of coarse gravel size black organic staining. Sand is fine to medium		
	4.23	Very soft to firn extremely low to very low strength dark grey silty CLAY with occasional coarse sand to medium gravel size shell fragments and organic odour. Occasional pockets of coarse sand to medium gravel size black organic staining.	Marine clay	Low
	4.82	Soft very low strength dark grey slightly sandy CLAY with occasional coarse sand to medium gravel size shell fragments and slight organic odour. Occasional pockets of coarse sand size black organic staining.	Marine clay	Low
IAC 21 VC	0.5	Very dark greyish brown fine to medium silty SAND with frequent fine to medium sand size shell fragments	Shallow marine sand	Low
	3.42	Dark greyish brown fine to medium SAND with rare fine sand size shell fragments	Shallow marine sand	Low
IAC 21A VC	1.62	Very dark grey slightly clayey fine to medium SAND with frequent coarse sand to coarse gravel size shell fragments and occasional coarse sand to medium gravel size pockets of olive brown and black staining. At 0.28m - rare coarse sand to fine gravel size black organics.	Shallow marine sand	Low
	1.85	Brown gravelly fine to medium SAND with rare coarse sand size shell fragments and rare fine gravel size pocket of yellowish brown sand. Gravel is fine to medium and sub rounded	Shallow marine sand	Low
	4.45	Dark grey to pale brown slightly silty fine to medium SAND with rare coarse sand size shell fragmetns and slight organic odour. At 2.15m to 2.24m, 2.40m to 2.46m, and 3.60m to 3.80m - very closely to closely spaced thickly laminated to very thinly bedded very dark grey slightly clayey sand. At 2.67m - very closely spaced thinly laminated dark yellowish brown sand. At 4.00m - rare medium gravel size yellowish brown staining.	Shallow marine sand	Low
IAC 22 VC	0.5	Dark greyish brown fine to medium silty SAND with fine to medium sand size shell fragments.	Shallow marine sand	Low
	2.5	Very soft extremely low strength dark grey sandy CLAY. Sand is fine.	Marine clay	Low
	3.5	Very soft extremely low strength dark grey sandy CLAY with occasional coarse sand to coarse gravel size shell fragments. Sand is fine.	Marine clay	Low
	3.65	Dark brown fine to coarse SAND.	Sand (undifferentiated)	Low
IAC 22A VC	0.3	Very dakr grey clayey fine to medium SAND with occasional coarse sand to medium gravel size shell fragments and rare pockets of black and brown staining. Slight organic odour.	Shallow marine sand	Low
	0.6	Very soft extremely low strength very dark grey sandy CLAY with occasional coarse sand to medium gravel size shell fragments. Sand is fine. Slight organic odour.	Marine clay	Low
	1.58	Very soft to firm extremely low to very low strength very dark grey silty CLAY with occasional coarse sand to medium gravel size shell fragments and rare pockets of brown staining. Slight organic odour.	Marine clay	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
	2.99	Soft to firm very low strength very dark grey sandy CLAY with frequent coarse sand to medium gravel size shell fragments and slight organic odour.	Marine clay	Low
	3.95	Brown fine to medium SAND with rare coarse sand to fine gravel size shell fragments.	Shallow marine sand	Low
IAC 23 VC	0.4	Very soft extremely low strength very dark grey slightly sandy CLAY with rare coarse sand to medium gravel size shell fragments and slight organic odour. Occasional medium gravel to coarse gravel size pockets of black and brown staining. Sand is fine.	Marine clay	Low
	0.5	Possible boundary in FC and REM		Low
	2	Very soft to soft extremely low to very low strength dark grey silty CLAY with occasional coarse sand to medium gravel size shell fragments and rare pockets of medium gravel size black organic staining. At 1.85m - rare pocket of coarse gravel size brown staining	Marine clay	Low
	3.36	Soft to firm very low to low strength dark grey slightly sandy becoming sandy gravelly CLAY with frequent coarse sand to coarse gravel size shell fragments and slight organic odour. Sand is fine to medium. Gravel is fine to medium and sub rounded.	Marine clay	Low
	4.2	Greyish brown slightly gravelly fine to medium SAND with rare coarse sand size shell fragments. Occasional very closely spaced thickly laminated dark grey slightly clayey fine to medium sand. Gravel is coarse sand to medium gravel and sub rounded.	Shallow marine sand	Low
IAC 24 VC	0.5	Very dark greyish brown fine to medium silty SAND with fine to medium size shell fragments.	Shallow marine sand	Low
	2.5	Very soft extremely low strength dark grey sandy CLAY with fine to medium sand size shell fragments. Sand is fine.	Marine clay	Low
	3.3	Brownish grey fine to coarse SAND.	Sand (undifferentiated)	Low
IAC 24A VC	0.5	Very dark greyish brown fine to medium silty SAND with fine to medium size shell fragments.	Shallow marine sand	Low
	2.5	Very soft extremely low strength dark grey sandy CLAY with fine to medium sand size shell fragments. Sand is fine.	Marine clay	Low
	3.05	Brownish grey fine to coarse SAND.	Sand (undifferentiated)	Low
IAC 24B VC	0.25	Dark grey slightly clayey fine to medium SAND with occasional coarse sand to fine gravel size shell fragments and slight organic odour. Rare black and olive brown staining.	Shallow marine sand	Low
	1.1	Dark grey clayey fine to medium SAND with frequent coarse sand to coarse gravel size shell fragments and rare black and olive brown staining.	Shallow marine sand	Low
	3.58	Light brownish grey to grey slightly silty fine to medium SAND with rare coarse sand size shell fragments and slight organic odour. At 2.25m - occasional closely spaced thickly laminated to very thinly bedded brown gravelly medium to coarse sand. Gravel is fine and sub rounded. At 3.46m -	Shallow marine sand	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
		rare very closely spaced thinly laminated to very thinly bedded very dark grey staining		
IAC 25 VC	0.5	Dark greyish brown slightly silty fine SAND with frequent fine to medium sand size shell fragments.	Shallow marine sand	Low
	1.5	Very soft extremely low strength dark grey slightly silty sandy CLAY with frequent medium to coarse sand size shell fragments. Sand is fine.	Marine clay	Low
	2.5	Greyish brown fine to medium SAND with rare medium to coarse sand size shell fragments. Micaceous.	Shallow marine sand	Low
	2.74	Greyish brown medium to coarse SAND with occasional fine sub angular to sub rounded gravel.	Sand (undifferentiated)	Low
IAC 25A VC	0.5	Greyish brown fine to medium SAND with occasional fine sand size shell fragments.	Shallow marine sand	Low
	1.5	Very soft extremely low strength greyish brown slightly silty sandy CLAY with frequent medium to coarse sand size shell fragments. Sand is fine.	Marine clay	Low
	2.3	Greyish brown fine to coarse SAND with fine to coarse sand size shell fragments, with rare coarse subrounded gravel.	Shallow marine sand	Low
IAC 25B VC	0.3	Dark grey slightly clayey fine to medium SAND with occasional coarse sand size shell fragments and slight organic odour. At 0.07m - rare medium gravel size pocket of black organic staining	Shallow marine sand	Low
	1.19	Dark grey clayey fine to medium SAND with frequent coarse sand to coarse gravel size shell fragments and slight organic odour.	Shallow marine sand	Low
	1.5	Greyish brown to light olive brown slightly gravelly fine to medium SAND with occasional coarse sand to medium gravel size shell fragments and rare pockets of medium gravel size grey slightly clayey fine to medium sand. Gravel is fine to meduim and sub rounded.	Shallow marine sand	Low
	3.24	Greyish brown to grey gravelly fine to coarse SAND with occasional coarse sand to coarse gravel sized shell fragments and slight organic odour. At 1.68m - occasional very closely to medium spaced thickly laminated to thinly bedded very dark grey gravelly medium to coarse sand. Gravel is fine to medium and sub rounded.	Shallow marine sand	Low
IAC 26 VC	2.5	Very soft extremely low strength dark grey sandy CLAY with occasional fine sand sized to medium gravel size shell fragments. Sand is fine.	Marine clay	Low
	3.58	Greyish brown fine to medium SAND with occasional medium to coarse sand size shell fragments.	Shallow marine sand	Low
IAC 26A VC	0.4	Very soft extremely low strength very dark grey slightly sandy CLAY with occasional coarse sand size shell fragments and slight organic odour. Occasional medium gravel size pockets of black organic staining.	Marine clay	Low
	0.7	Possible boundary in FC and REM, and ER/TC		Low
	2.59	Very soft to firm extremely low to very low strength very dark grey slightly sandy to sandy CLAY with frequent coarse sand to medium gravel size shell fragments. Rare brown medium gravel size staining throughout.	Marine clay	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
	3.63	Brown slightly silty fine to medium SAND with rare coarse sand to medium gravel size shell fragments and rare closely spaced thinly laminated very dark greyish brown gravelly fine to medium sand. Gravel is fine and sub rounded. At 2.92m - rare medium gravel size pockets of very dark grey slightly clayey fine to medium sand.	Shallow marine sand	Low
IAC 27 VC	0.5	Dark greyish brown fine to medium silty SAND with occasional fine to coarse sand size shell fragments.	Shallow marine sand	Low
	2.8	Soft extremely low to low strength dark grey sandy CLAY with rare coarse sand size shell fragments. Sand is fine. From 2.00m - frequent fine to medium gravel size shell fragments.	Marine clay	Low
	3.5	Brown fine to medium SAND with rare fine sub rounded gravel.	Sand (undifferentiated)	Low
	3.52	Dark greyish brown fine to medium SAND with rare coarse sand size shell fragments.	Shallow marine sand	Low
IAC 27A VC	0.33	Very dark grey clayey fine to medium SAND with occasional coarse sand to medium gravel size shell fragments and organic odour. Rare black organic staining.	Shallow marine sand	Low
	2.14	Very soft extremely low strength dark grey slightly sandy CLAY with frequent coarse sand to medium gravel size shell fragments and olive brown staining. Slight organic odour. Sand is fine to medium.	Marine clay	Low
	2.59	Possible boundary in MLV and REM, and TC/ER		Low
	2.86	Soft extremely low strength dark greyish brown silty CLAY with rare coarse sand size shell and slight organic odour.	Marine clay	Low
	3.17	Dark greyish brown clayey fine to medium SAND with ocasional coarse sand to fine gravel size shell fragments and slight organic odour.	Shallow marine sand	Low
	4.45	Yellowish brown to brown slightly silty slightly gravelly fine to medium SAND with occasional coarse sand to medium gravel size shell fragments. Gravel is fine and sub rounded. At 3.85m - thin bed of dark grey organic staining.	Shallow marine sand	Low
IAC 28 VC	0.5	Very dark greyish brown fine to medium silty SAND with fine to medium sand size shell fragments.	Shallow marine sand	Low
	1.5	Very soft extremely low strength greyish brown sandy CLAY with fine to medium sand size shell fragments. Sand is fine.	Marine clay	Low
	2.5	Medium to coarse clayey sub rounded GRAVEL with occasional coarse sand to medium gravel size shell fragments.	Shallow marine sand	Low
	3.1	Very stiff extremely high strength slightly gravelly sandy CLAY. Gravel is fine to medium sub rounded. Sand is fine	Glacial clay	Low
IAC 28A VC	1.72	Dark grey clayey fine to medium SAND with frequent coarse sand to medium gravel size shell fragments and organic odour. Occasional fine gravel to coarse gravel size black and olive brown staining.	Shallow marine sand	Low
	1.93	Very soft dark olive brown slightly sandy gravelly CLAY with abundant coarse sand to medium	Marine clay	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
		gravel size shell fragments. Sand is fine to medium. Gravel is fine to coarse and sub rounded.		
	2.9	Very stiff very high strength dark reddish brown slightly gravelly silty CLAY with rare coarse sand sized shell fragments. Gravel s fine to coarse and sub rounded.	Glacial clay	Low
IAC 29 VC	0.25	Very soft extremely low strength very dark grey sandy CLAY with occasional coarse sand size shell fragments and slight organic odour. Sand is fine to medium. Occasional medium gravel size black and brown staining	Marine clay	Low
	0.55	Possible boundary in TC/ER and FC and REM		Low
	2.09	Very soft to firm very low strength dark grey slightly sandy CLAY with occasional coarse sand to medium gravel size shell fragments and rare medium gravel size black staining.	Marine clay	Low
	3.21	Soft to firm very low to low strength dark grey sandy CLAY with occasional coarse sand to medium gravel size shell fragments and slight organic odour. Sand is fine to medium.	Marine clay	Low
	4.14	Greyish brown to yellowish brown silty fine to medium SAND with rare coarse sand size shell fragments and slight organic odour. At 3.53m - rare medium gravel size pocket of black organic staining.	Shallow marine sand	Low
IAC 30 VC	1.96	Very soft to soft extremely low strength very dark grey slightly sandy to sandy CLAY with frequent coarse sand to medium gravel size shell fragments and organic odour. Occasional medium gravel size black and olive brown staining. Sand is fine to medium.	Marine clay	Low
	2.77	Very dark grey clayey fine to medium SAND with frequent coarse sand to medium gravel sized shell fragments and slight organic odour.	Shallow marine sand	Low
	3.07	Dark greyish brown slightly gravelly silty fine to medium SAND with occasional coarse sand to fine gravel size shell fragments. Gravel is fine and sub rounded.	Shallow marine sand	Low
	3.37	Possible boundary in UUT and REM		Low
	3.65	Stiff very high strength dark reddish brown slightly sandy slightly gravelly CLAY with occasional coarse sand to fine gravel size shell fragments. Sand is fine to medium. Gravel is fine and sub rounded.	Glacial clay	Low
	3.73	Brown sandy SILT. Sand is fine.	Glacial clay	Low
IAC 30A VC	0.5	Dark grey silty fine SAND with frequent fine to medium sand size shell fragments.	Shallow marine sand	Low
	2.5	Very soft extremely low to very low strength dark grey silty sandy CLAY with rare fine to medium sand size shell fragments. Sand is fine.	Marine clay	Low
	2.9	Olive grey fine to coarse SAND with rare medium to coarse sand size shell fragments.	Shallow marine sand	Low
	3.15	Stiff high to extremely high strength dark grey silty CLAY with rare medium sub rounded gravel and pockets of silty fine sand.	Glacial clay	Low
IAC 31 VC	0.34	Very soft extremely low strength very dark grey slightly sandy CLAY with occasional coarse sand	Marine clay	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
		size shell fragments. Black organic staining. Organic odour.		
	0.44	Possible boundary in FC and REM		Low
	2.49	Very soft extremely low strength dark grey CLAY with occasional coarse sand to medium gravel size shell fragments. Black organic staining. Slight organic odour.	Marine clay	Low
	2.84	Very soft very low strength dark grey slightly sandy CLAY with frequent coarse sand to medium gravel size shell fragments.	Marine clay	Low
	3.77	Very soft extremely low strength dark grey silty CLAY with occasional coarse sand to fine gravel size shell fragments, Slight black organic staining.	Marine clay	Low
	4.19	Dark grey slightly gravelly clayey fine to medium SAND with occasional coarse sand to fine gravel size shell fragments. Gravel is medium to coarse and sub rounded.	Shallow marine sand	Low
	4.54	Brown silty fine SAND with occasional very closely spaced thick to thin laminations of soft very dark grey clay	Sand (undifferentiated)	Low
IAC 32 VC	0.5	Dark grey silty fine SAND with frequent fine to medium sand size shell fragments.	Shallow marine sand	Low
	3.5	Very soft extremely low to very low strength dark grey silty sandy CLAY with rare fine to medium sand size shell fragments. Sand is fine.	Marine clay	Low
	3.8	Dark greyish brown fine to medium SAND with rare fine to coarse sand size shell fragments	Shallow marine sand	Low
IAC 32A VC	0.36	Very soft extremely low strength very dark grey slightly sandy CLAY with occasional coarse sand to medium gravel size shell fragments. Black organic staining. Organic odour	Marine clay	Low
	1.92	Very soft extremely low strength dark grey silty CLAY with frequent coarse sand to medium gravel size shell fragments. Slight organic odour.	Marine clay	Low
	2.46	Very soft extremely low strength dark grey slightly sandy CLAY with abundant coarse sand to medium gravel size shell fragments.	Marine clay	Low
	4.3	Very soft to soft extremely low strength dark grey silty CLAY with rare coarse sand to fine gravel size shell fragments.	Marine clay	Low
	4.55	Possible boundary in MLV		Low
	4.85	Dark greyish brown slightly silty fine to medium SAND with occasional coarse sand size shell fragments.	Shallow marine sand	Low
IAC 33 VC	0.5	Very dark grey fine to medium silty SAND with occasional fine to coarse sand size shell fragments.	Shallow marine sand	Low
	1.5	Very soft extremely low strength sandy CLAY with occasional coarse sand to fine gravel size shell fragments. Sand is fine.	Marine clay	Low
	3.3	Greyish brown fine to coarse gravelly SAND with occasional fine to coarse sand size shell fragments. Gravel is fine and sub rounded. Micaceous.	Shallow marine sand	Low
IAC 33A VC	0.5	Very dark grey fine to medium silty SAND with occasional fine to coarse sand size shell fragments.	Shallow marine sand	Low

ID	Depth (mbsf)	Description	Unit Name	Priority
	1.5	Very soft extremely low strength sandy CLAY with occasional coarse sand to fine gravel size shell fragments. Sand is fine.	Marine clay	Low
	2.55	Greyish brown fine to coarse gravelly SAND with occasional fine to coarse sand size shell fragments. Gravel is fine and sub rounded. Micaceous.	Shallow marine sand	Low
IAC 33B VC	0.34	Dark grey clayey fine to medium SAND with frequent medium sand to coarse sand size shell fragments. Very dark grey and olive brown staining. Slight organic odour.	Shallow marine sand	Low
	1.03	Dark grey slightly clayey slightly gravelly fine to medium SAND with frequent medium sand to medium gravel size shell fragments. Gravel is fine to medium and sub rounded,	Shallow marine sand	Low
	1.89	Light olive brown slightly gravelly fine to medium SAND with occasional coarse sand size shell fragments. Gravel is fine and sub rounded.	Shallow marine sand	Low
	2.57	Light olive brown fine to medium SAND with occasional coarse sand size shell fragments.	Shallow marine sand	Low
	3.03	Olive brown slightly gravelly fine to coarse SAND with occasional coarse sand to medium gravel size shell fragments. At 2.82m - occasional very closely to extremely closely spaced thick laminations to very thin beds of olive brown slightly gravelly medium to coarse sand. Gravel is fine to medium and sub rounded.	Shallow marine sand	Low
	3.5	Dark greyish brown slightly silty fine to medium SAND with rare coarse sand size shell fragments.	Shallow marine sand	Low

ID	Depth (mbsf)	Description	Unit	Priority
BH_01	2.5	Dark grey (10YR 4/1) slightly silty fine to coarse SAND with frequent coarse sand to medium gravel sized shell fragments. Highly calcareous	Shallow marine sand	Low
	9.4	Dark greyish brown (10YR 4/2) fine to medium SAND with frequent coarse sand to medium gravel sized shell fragments. Calcareous	Shallow marine sand	Low
	From 6.20m	Becoming fine to medium		
	16.08	Firm to stiff high to very high strength dark greyish brown (10YR 4/2) slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. Slightly calcareous	Glacial clay	Low
	24.8	Firm to stiff very high strength very dark greyish brown (10YR 3/2) slightly sandy slightly gravelly silty CLAY with occasional pockets (>50mm) of multicoloured fine to coarse sand. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. Slightly calcareous	Glacial clay	Low
	At 17.17m	One medium gravel sized nodule of gypsum		
	17.80-18.10m	Medium bed of dark yellowish brown (10YR 3/4) slightly gravelly fine to coarse sand. Gravel is subrounded fine to coarse. Calcareous		
	At 19.10m	One medium gravel sized nodule of gypsum		
	21.64-22.10m	Medium bed of dark yellowish brown (10YR 3/4) slightly gravelly clayey fine to coarse sand. Gravel is subangular to subrounded fine to medium. Highly calcareous		
	22.70-24.00m	With extremely closely spaced thin laminations of reddish brown (10YR 4/3) fine to coarse sand		
	24.20-24.75m	Medium bed of reddish brown (5YR 4/3) slightly clayey fine to coarse sand with extremely closely to closely spaced pockets (>40mm thick) of dark greyish brown (10YR 3/2) slightly sandy clay. Highly calcareous		
	31.6	Very stiff extremely high strength dark brown (10YR 3/3) slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. Slightly calcareous	Glacial clay	Low
	29.70-30.92m	Thick bed of brown (7.5YR 4/2) slightly silty fine to coarse sand. Calcareous		
	36.5	Very stiff extremely high strength dark reddish brown (5YR 3/3) mottled greenish grey (GLEY 1 6/1) gravelly CLAY. Gravel is angular to subangular fine to medium of mudstone and siltstone lithorelics. Slightly calcareous	Glacial clay	Low
	32.65-34.48m	Thick bed of very dark brown (7.5YR 2.5/1) slightly clayey slightly gravelly fine to medium sand. Gravel is subangular to subrounded fine		
	35.80-36.00m	With white to colourless gypsum		

ID	Depth (mbsf)	Description	Unit	Priority
	46.2	Extremely weak dark reddish brown (10R 3/4) slightly to moderately weathered MUDSTONE with closely to very widely spaced thin to medium beds of extremely weak medium grey (N5) and medium dark grey (N4) siltstone and frequent inclusions (>50mm) of extremely weak medium grey (N5) and medium dark grey (N4) siltstone and extremely close to widely spaced horizontal to inclined white (N9) to colourless gypsum veins (>30 mm). Slightly calcareous	Bedrock	Low
	45.50-46.05m	AZCL, driller notes extremely fast drilling and zone of no resistance. Possible highly weathered zone		
	52.3	Very stiff extremely high strength dark reddish brown (2.5YR 3/4) mottled greenish grey (GLEY1 10Y 6/1) gravelly CLAY. Gravel is angular to subrounded fine to coarse of mudstone and siltstone lithorelics and with crystals of halite and gypsum	Bedrock	Low
	52.32	Semitranslucent HALITE	Bedrock	Low
BH_01_A	54.8	Extremely weak to very weak dark reddish brown (10YR 3/4) MUDSTONE with frequent pockets (>40mm) of medium blueish grey (5B 5/1) siltstone and frequent pockets (>20mm) white (N9) and colourless halite and gypsum. Non-calcareous	Bedrock	Low
	54.10-54.57m	Medium bed of very stiff very high strength dark reddish brown (5YR 3/4) silty clay with occassional pockets (>5mm thick) of medium blueish grey (5B 5/1) siltstone and rare pockets (>5mm) of white (N9) to colourless gypsum crystals. Slightly calcareous		
	65.64	Weak semitransulant colourless to pale yellowish orange (10YR 8/6) HALITE with abundant inclusions of dark reddish brown (10R 3/4) mudstone and medium blueish grey (5B 5/1) siltstone. Non-calcareous	Bedrock	Low
	61.58-62.40m	Thick bed of very weak dark reddish brown (10R 3/4) mudstone with very closely spaced thin laminations of medium blueish grey (5B 5/1) siltstone and frequent pockets (>20mm) of colourless to pale yellowish orange (10YR 8/6) mineralisation. Non-calcareous		
	62.40-64.82m	Medium bed of very weak to weak medium blueish grey (5B 7/1) siltstone with thick laminations to thin beds of weak dark reddish brown (10YR 4/2) mudstone with horizontal to vertical white (N9) veins of gypsum (>2mm). Non calcareous		
	64.40-64.75m	Medium bed of weak medium blueish grey (5B 5/1) siltstone with inclined to vertical veins of white (N9) gypsum (>2mm) and international orange sylvite (>45mm)		
	64.75-65.64m	Thick bed of weak moderate reddish brown (10R 4/6) mudstone with occasional pcokets of medium blueish grey (5B 5/1) siltstone (>25mm) and vertical to horizontal veins of white (N9) gypsum (>2mm thick) and international orange sylvite (>40mm thick)		
CPT_01	2.24	Very loose silty SAND	Shallow marine sand	Low
	1.43-1.54	Loose		
	9.4	Dense to very dense SAND	Shallow marine sand	Low

ID	Depth (mbsf)	Description	Unit	Priority
	16.08	High to very high strength slightly gravelly silty CLAY	Glacial clay	Low
	24.3	Very high strength slightly gravelly silty CLAY	Glacial clay	Low
	16.54-17.14m	Thick bed of very dense silty sand		
	17.14-18.70m	Extremely high strength		
	23.16-23.60m	Medium bed of medium dense to dense silty sand		
	23.80-24.06m	Medium bed of medium dense to dense silty sand		
	31	Extremely high strength slightly gravelly silty sandy CLAY	Glacial clay	Low
	30.00-31.00m	Thick bed of very dense silty sand		
	47.4	Extremely high strength silty CLAY	Glacial clay	Low
	36.00-36.50m	Medium bed of very dense silty sand		
	50.06	Extremely high strength slightly gravelly silty sandy CLAY	Bedrock	Low
	65.14	Likely bedrock assumed HALITE	Bedrock	Low
CPT_02	0.8	Extremely low to low strength CLAY	Marine clay	Low
	11.56	Dense to very dense SAND	Sand (undifferentiated)	Low
	16.7	Medium to very high strength slightly gravelly CLAY	Glacial clay	Low
	26.9	Extremely high strength slightly gravelly CLAY	Glacial clay	Low
	20.27-21.50m	Thick bed of dense to very dense slightly gravelly silty sand		
	24.50-24.84m	Medium bed of very dense gravelly silty sand		
	50.26	Extremely high strength sandy CLAY	Glacial clay	Low
	45.50-48.30m	Very thick bed of dense to very dense sand		
BH_03	4.9	Olive brown (2.5Y 4/4) slightly silty sightly gravelly SAND with occassional to abundant coarse sand to fine gravel sized shell fragments and whole shells	Shallow marine sand	Low
	0.50-0.73m	Very thin bed of olive brown (2.5YR 4/4) slightly silty slightly clayey fine to medium sand. Calcareous to highly calcareous		
	10.02	Soft to stiff low to very high strength dark brown (10YR 3/3) gravelly sandy CLAY with medium spaced to widely spaced thick laminations to very thin beds of dark yellowish brown (10YR 4/4) slightly silty fine to medium sand. Gravel is sub-rounded to sub-angular fine to medium. Sand is fine. Slightly micaceous. Calcareous	Glaciomarine	Low

ID	Depth (mbsf)	Description	Unit	Priority
	13.1	Brown (10YR 4/3), dark yellowish brown (10YR 4/4) and reddish brown (5YR 4/3) silty fine to coarse SAND with extremely closely spaced thin to thick laminations of firm to stiff dark yellowish brown (10YR 3/4) sandy clay and thick bed of brown (10YR 4/3) slighlty clayey silty fine to medium sand . Highly calcaroeus	Glacial sand	Low
	10.14-10.92m	Thick bed of brown (10YR 4/3) slightly clayey silty fine to medium sand . Highly calcareous		
	30.2	Firm to very stiff high to very high strength dark reddish brown (5YR 3/3) to dark reddish grey (5YR 3/3) gravelly silty sandy CLAY with rare fine gravel sized dark red (2.5YR 3/6) weathered mudstone and dark greenish grey (GLEY 2 4/1) to light blueish grey (5B 7/2) weathered to fresh siltstone and rare pockets (up to 2mm thick) white (N9) gypsum crystals and thin laminations of brown (7.5YR 4/4) silty sand and rare pockets (up to 20mm thick) firm to stiff greenish grey (GLEY 2 5/1) clayey silt and closely to very widely spaced thin laminations to thick beds of reddish brown (5YR 4/4) slightly clayey slightly silty slightly gravelly fine to coarse sand. Gravel is sub-angular to sub-rounded fine to medium. Sand is fine. Highly calcareous	Bedrock	Low
	29.59-30.03m	With extremely closely to closely spaced inclined to vertical white (N9) gypsum veins (up to 5mm thick)		
	65.3	Very weak to weak dark reddish brown (10R 3/4) to moderate brown (5YR 4/4) MUDSTONE with occassional pockets (up to 110mm thick) of medium blueish grey (5B 5/1) to light blueish grey (5B 7/2) siltstone and medium spaced horizontal to inclined white (N9) to moderate orange pink (10R 7/4) gypsum veins (up to5mm thick) and occassional pockets (up to 5mm thick) of white (N9) gypsum crystals and rare pockets (up to 25mm thick) white (N9) mineralisation. Highly calcareous	Bedrock	Low
	31.04-31.24m	Very thin bed of medium blueish grey (5B 5/1) sitstone with pockets (up to 50mm thick) dark reddish brown (10R 3/4) mudstone		
	35.00-35.56m	Medium bed of light greenish grey (GLEY 1 7/1) slightly sandy SILT with occasional lenses of dark reddish brown (10YR 4/2) silty clay (up to 10mm thick) and occasional lithorelics of light blueish grey (5B 7/1) siltstone (up to 10mm thick). Sand is fine. Highly calcareous		
CPT_03	2	Very loose to loose clayey SAND	Shallow marine sand	Low
	5.11	Very dense SAND	Sand (undifferentiated)	Low
	9	High strength CLAY	Glaciomarine	Low
	7.60-8.48m	Thick bed of medium dense to dense sand		

ID	Depth (mbsf)	Description	Unit	Priority
	12	Very high to extremely high strength CLAY with very closely to medium spaced thin to medium beds of medium dense to very dense sand	Glacial clay	Low
	16.58	Medium to very high strength slightly gravelly silty CLAY	Glacial clay	Low
	16.8	Very dense silty SAND	Glacial sand	Low
CPT_03_A	15.8	Not recorded	N/A	N/A
	16.33	High to very high strength CLAY	Glacial clay	Low
	17.53	Very dense silty SAND	Glacial clay	Low
	24.11	Very high to extremely high strength slightly gravelly silty CLAY	Glacial clay	Low
	32.1	Extremely high strength slightly gravelly silty CLAY	Glacial clay	Low
	65.48	Extremely high strength gravelly CLAY/possible bedrock	Bedrock	Low
BH_05	4.4	Dark grey (5Y 4/1) gravelly fine to coarse SAND with occasional coarse sand to fine gravel size shell and shell fragments. Gravel is sub-angular to sub-rounded fine. Calcareous	Shallow marine sand	Low
	11.65	Dark grey (5Y 4/1) to brown (7.5YR 4/2) fine to medium SAND with occasional pockets of organic staining. Calcareous	Sand (undifferentiated)	Low
	5.20-5.23m	Very thin bed of black (5Y 2.5/1) organic slightly clayey fine sand		
	6.90-7.16m	With extremely closely spaced to very closely spaced thin to thick laminations of black (5YR 2.5/1) organic clayey fine sand		
BH_05_A	10.6	Not recorded	N/A	N/A
	13.4	Dark greyish brown (2.5Y 4/2) fine to coarse SAND. Calcareous	Sand (undifferentiated)	Low
	16	Soft to firm medium strength dark olive brown (2.5Y 3/3) sandy CLAY with closely spaced thin laminations to thin beds of dark greyish brown (2.5Y 4/2) slightly clayey fine sand. Sand is fine. Calcareous	Glaciomarine	Low
	13.86-14.55m	Thick bed of dark greyish brown (2.5Y 4/2) silty fine SAND with closely spaced thin to thick laminations of soft to firm dark olive brown (2.5Y 3/3) sandy clay. Calcareous		
	19.4	Firm low strength dark olive brown (2.5Y 3/3) thinly to thickly laminated silty CLAY with closely to medium spaced partings of light brownish grey (10 YR 6/2) fine sand. Calcareous	Glaciomarine	Low
	18.30-18.65m	With closely spaced thick laminations to thin beds of light brownish grey (10YR 6/2) fine sand		
	21.4	Firm low to high strength dark olive brown (2.5Y 3/3) slightly gravelly silty CLAY. Gravel is subangular to subrounded fine. Calcareous	Glaciomarine	Low

ID	Depth (mbsf)	Description	Unit	Priority
	22.26	Firm to stiff high to very high strength dark olive brown (2.5Y 3/3) slightly sandy slightly gravelly CLAY. Sand is fine gravel is subangular to subrounded fine. Calcareous	Glaciomarine	Low
	23.7	Very stiff extremely high strength dark greenish grey (GLEY 4/1) thickly laminated CLAY with frequent lithorelics of extremely weak mudstone (up to 40mm in diameter) and very closely to closely spaced subhorizontal to inclined gypsum veins (up to 40mm thick). Calcareous	Bedrock	Low
	27.9	Extremely weak dark reddish brown (10R 3/4) weathered MUDSTONE with extremely closely to very closely spaced pockets (up to 10mm) of dark greenish grey (GLEY 1 4/1) clay and subhorizontal to subvertical translucent to white (N9) mottled light grey (N7) gypsum and mineralisation veins (up to 30mm thick). Non-calcareous	Bedrock	Low
	27.00-27.90m	Thick bed of extremely weak medium bluish grey (5B 5/1) thinly to thicky laminated SILTSTONE with pockets (up to 20mm thick) of dark reddish brown (10R 3/4) mudstone and very closely space inclined white (N9) gypsum veins (up to 10mm thick). Laminations and bedding are inclined. Non-calcareous		
	36.9	Extremely weak to very weak dark reddish brown (10R 3/4) MUDSTONE with very closely to closely spaced pockets of medium blueish grey (5B 5/1) siltstone (up to 30mm in diameter) and extremely closely to widely spaced subhorizontal to inclined gypsum veins (up to 20mm thick). Non-calcareous	Bedrock	Low
	31.90-32.94m	Thick bed of thinly interlaminated to very thinly interbedded with very weak to weak medium blueish grey (5B 5/1) siltstone. Bedding and laminations are inclined		
	33.28-33.56m	Thin bed of very thickly interlaminated to very thinly interbedded with light blueish grey (5B 5/1) siltstone. Bedding is inclined		
		Extremely weak medium blueish grey (5B 5/1) thickly laminated to very thinly bedded SILTSTONE with very closely spaced horizontal to inclined white (N9) gypsum veins (up to 15mm thick) and closely to widely spaced horizontal to inclined greyish pink (5R 8/2) mineralisation veins (up to 20mm thick). Bedding is inclined. Non-calcareous		
	39.1	Very weak dark reddish brown (10R 5/1) MUDSTONE with very close to medium spaced pockets (up to 30mm in diameter) of medium blueish grey (5B 5/1) siltstone and extremely close to closely spaced horizontal to inclined white (N9) gypsum veins (up to 10mm thick) with occasional greyish pink (5R 8/2) mineralisation along vein edges. Non-calcareous	Bedrock	Low

ID	Depth (mbsf)	Description	Unit	Priority
BH_05_B	47.3	Very weak to weak dark reddish brown (10R 5/1) thickly laminated to very thinly bedded MUDSTONE with extremely closely to widely spaced thin laminations to medium beds of extremely weak to weak blueish grey (5B 5/1) siltstone and very closely to widely spaced pockets of blueish grey (5B 5/1) siltstone (up to 40mm in diameter) and cross cutting translucent, white (N9), light grey (N7) subhorizontal to inclined gypsum veins (up to 40mm thick) with rare moderate orange pink (10R 7/4) colouration along vein edges and rare gypsum inclusions (up to 50mm in diameter). Laminations and bedding are inclined. Non-calcareous	Bedrock	Low
	38.50-38.80m	subvertical cross cutting trace of bioturbation (20mm thick)		
	41.5-42.02m	Weak medium blueish grey (5B 5/1) and light olive grey (5Y 6/1) inclined (40 degrees) thickly laminated SILTSTONE with extremely closely spaced to very closely spaced thinly laminated to very thinly bedded dark reddish brown (10R 5/1) mudstone and very closely spaced horizontal to inclined (50-60 degrees) white (N9) to colourless gpsum vains (up to 10mm thick). Non-calcareous		
	43.00-43.20m	Medium bed of extremely weak weathered slightly clayey siltstone. Non-intact		
	44.22-44.78m	Weak medium blueish grey (5B 5/1) inclined (50-60 degrees) thickly laminated to thinly bedded SILTSTONE with very closely spaced to medium spaced thickly laminated to very thinly bedded dark reddish brown (10R 5/1) mudstone and very closely spaced to closely spaced horizontal to inclined (60-70 degrees) white (N9) to colourless gpsum vains (up to 20mm thick) with moderate orange pink (10R 7/4) mineralisation along the edge of the gypsum vain (up to 4mm thick). Non-calcareous		
	46.20-46.30m	Non-intact, drilling induced		
CPT_05	1.22	Very loose to medium dense silty SAND	Shallow marine sand	Low
	13.4	Medium to very dense SAND	Sand (undifferentiated)	Low
	16.41	Medium to very high strength CLAY with closely to widely spaced very thin to medium beds of loose to dense sand	Glaciomarine	Low
	22.09	Medium to high strength slightly gravelly CLAY	Glaciomarine	Low
	23.8	High becoming extremely high strength silty CLAY	Glaciomarine	Low
	26	Extremely high strength silty CLAY	Glaciomarine	Low

ID	Depth (mbsf)	Description	Unit	Priority
	27.2	Extremely weak medium dark grey (N4) locally dark brown (10R 3/4) thinly to thickly laminated MUDSTONE with closely spaced veins of randomly orientated white (N9) and colourless gypsum (up to 10mm). Locally weathered to a stiff to very stiff clay. Calcareous	Bedrock	Low
	26.20-26.34m	Disturbed by CPT		
	39.18	Very weak to weak dark reddish brown (10R 3/4) thinly laminated to very thickly bedded MUDSTONE with closely to very widely spaced thin laminations to thin beds of dark grey (N4) very weak to weak siltstone and very closely to very widely spaced pockets of grey (N4) very weak to weak siltstone (up to 40mm in diameter) and subhorizontal to subvertical translucent to white (N9) mottled light grey (N7) and reddish orange (10R 6/6) gypsum and mineralisation veins (up to 30mm thick). Laminations and bedding subhorizontal to inclined. Calcareous	Bedrock	Low
	34-35.60	Thick bed of very weak to weak dark grey (N4) SILTSTONE with extremely close to very closely spaced subhorizontal to inclined white (N9) gypsum veins (up to 10mm thick) cross cut by inclined moderate reddish orange (10R 6/6) mineralisation veins (up to 20mm). Non-calcareous		
BH_06	3.61	Very dark greyish brown (2.5Y 3/2) dark greyish brown (2.5Y 4/2) clayey fine to medium SAND with frequent fine gravel sized shells and shell fragments. Calcareous	Shallow marine sand	Low
	3.50-3.60m	Thin bed of light olive brown (2.5Y 5/6) slightly silty fine to coarse SAND with occassional fine gravel sized shell fragments. Calcareous		
	7.56	Olive brown (2.5Y 4/6) fine to coarse SAND. Highly calcareous	Sand (undifferentiated)	Low
	5.10-5.27m	Thin bed of olive brown (2.5Y 4/6) slightly gravelly fine to coarse SAND. Gravel is sub-angular to sub-rounded fine sized. Highly calcareous		
	6.40-6.73m	Medium bed of olive brown (2.5Y 4/6) fine to coarse SAND with extremely closely spaced thin laminations of black (GLEY 1 2.5/N) fine to medium sand. Highly calcareous		
	7.30-7.53m	Medium bed of soft to firm low strength dark brown (10YR 3/3) sandy CLAY with rare pockets (up to 10mm thick) olive brown (2.5Y 4/6) sand. Sand is fine to medium. Calcareous		
	11.6	Dark yellowish brown (10YR 4/6) silty fine to medium SAND with extremely closely spaced thin to thick laminations of soft brown (10YR 5/3) clay. Highly calcareous	Sand (undifferentiated)	Low
	9.20-9.50m	Medium bed of dark yellowish brown (10YR 4/6) clayey SAND. Highly calcaroeus		
	14.6	Soft to firm low to medium strength brown (10YR 4/3) slightly silty sandy CLAY with extremely closely spaced thin laminations of dark yellowish brown (10YR 3/4) silty sand. Highly calcareous	Glaciomarine	Low

ID	Depth (mbsf)	Description	Unit	Priority
	12.21-12.43m	Medium bed of dark yellowish brown (10YR 4/6) silty fine to medium SAND with extremely closely spaced thin to thick laminations of soft brown (10YR 5/3) slightly sandy clay. Highly calcareous		
	18.1	Firm high strength brown (10YR 5/3) slightly gravelly silty CLAY. Gravel is fine to medium subangular to rounded mixed lithology. Slightly calcareous	Glacial clay	Low
	21.14	Weathered extremely weak to very weak dark reddish brown (2.5YR 5/3) MUDSTONE with occasional pockets of light blueish grey (5B 7/1) siltstone (up 8mm thick) and rare pockets of very weak colourless gypsum (up to 3mm thick)	Bedrock	Low
	20.90-21.14m	Medium bed of weak moderate reddish brown (10R 4/6) MUDSTONE with occasional very weak white (N9) gypsum crystals (up to 6mm) and rare light blueish grey (5B 7/1) siltstone pockets (up to 2mm)		
BH_06_A	26.3	Very weak slightly weathered dark reddish brown (10R 3/4) MUDSTONE with rare to occasional pockets (up to 40mm) blueish grey (5B 5/1) siltstone and white (N9) to very pale orange (10YR 8/2) gypsum veins (up to 30mm). Highly calcareous	Bedrock	Low
	31.07	Extremely weak dark reddish brown (10YR 3/4) extremely weathered to weathered MUDSTONE with rare pockets of lightly blueish grey (5B 7/1) siltstone and pockets of white to colourless (N9) gypsum (up to 20mm). Highly calcareous	Bedrock	Low
CPT_06	3.08	Very loose clayey SAND	Shallow marine sand	Low
	7.33	Dense to very dense SAND	Sand (undifferentiated)	Low
	8.75	Medium to high strength sandy CLAY	Glaciomarine	Low
	8.16-8.35m	Thin bed of dense silty SAND		
	10.99	Loose to medium dense clayey SAND with closely to widely spaced very thin to thin beds of high to very high strength sandy clay	Glacial sand	Low
	17.5	Medium to high strength gravelly CLAY	Glacial clay	Low
	12.19-12.47m	Medium bed of loose to medium dense clayey sand		
	From 17.06m	Becoming high to extremely high strength silty clay		

ID	Depth (mbsf)	Description	Unit	Priority
	46.7	Extremely weak to weak dark reddish brown (10R 3/4) fresh to slightly weathered MUDSTONE with rare pockets of light blueish grey (5B 7/1) siltstone (up to 2mm) and very closely to closely spaced rough undulating subhorizontal to horizontal tight to moderately wide very light grey (N8) gypsum veins (up to 5mm thick) and vertical to horizontal very closely to widely spaced tight to moderately wide white (N9) halite veins (up to 10mm thick). Highly calcareous to calcareous.	Bedrock	Low
	26.20-27.70m	Core loss noted - Possible soil bedding/interface		
	28.17-28.80m	Thick bed of extremely high strength CLAY		
	28.80-28.90m	Thin bed of slightly weathered very weak greyish orange pink (5YR 7/2) HALITE with frequent pockets of dark reddish brown (10YR 3/4) mudstone		
	29.60-29.68m	Thin bed of slightly weathered very weak greyish orange pink (5YR 7/2) HALITE with frequent pockets of dark reddish brown (10YR 3/4) mudstone		
	30.00-30.05m	Very thin bed of slightly weathered very weak greyish orange pink (5YR 7/2) halite		
	41.61-41.65m	Weathered mudstone		
	42.25-42.31m	Weathered mudstone		
	43.03-43.20m	weathered mudstone		
	50	Extremely weak to weak moderate brown (5YR 4/4) slightly weathered MUDSTONE with very closely to medium spaced subhorizontal to horizontal very light grey (N8) gypsum veins (up to 3mm thick) and subhorizontal to inclined closely to widely spaced white (N9) halite veins (up to 9mm thick). Calcareous	Bedrock	Low
	49.36-49.79m	Medium bed of extremely weak light blueish grey (5B 7/1) weathered siltstone. Highly calcareous		
	50.04	Very weak colourless fresh GYPSUM	Bedrock	Low
CPT_07	1.38	Extremely low to low strength sandy CLAY	Marine clay	Low
	5.9	Medium dense to very dense SAND	Shallow marine sand	Low
	8.73	Medium dense to dense SAND with closely to widely spaced thin beds of high to very high strength sandy clay	Sand (undifferentiated)	Low
	13.1	Dense to very dense SAND	Sand (undifferentiated)	Low

ID	Depth (mbsf)	Description	Unit	Priority
	23.66	Very high strength to extremely high strength slightly gravelly silty CLAY	Glacial clay	Low
	26.4	Extremely high strength silty gravelly CLAY	Glacial clay	Low
	37.2	Fresh weak semitranslucent greyish red (10YR 4/3) HALITE with rare pockets of greenish grey (5G 5/1) clay. Non calcareous	Bedrock	Low
CPT_08	1.7	Extremely low to very low strength sandy CLAY	Marine clay	Low
	4.9	Dense to very dense silty SAND with closely to widely spaced thin to medium beds of high to extremely high strength sandy clay	Shallow marine sand	Low
	18.14	Dense to very dense silty SAND	Sand (undifferentiated)	Low
	16.26-16.36m	Thin bed of extremely high strength sandy clay		
	21.72	Very high to extremely strength silty CLAY	Glacial clay	Low
	65.36	Extremely high strength silty CLAY / possible BEDROCK	Bedrock	Low
CPT_10	1.28	Very loose silty SAND	Shallow marine sand	Low
	13.14	Medium dense to very dense SAND	Sand (undifferentiated)	Low
	6.52-6.78m	Medium bed of high to very high strength silt		
	14.18	Medium dense to very dense silty SAND with very closely to medium spaced very thin to thin beds of medium dense to very dense sand	Glaciomarine	Low
	15.52	Medium to high strength sandy CLAY with very closely to medium spaced thin beds of very loose to medium dense silty sand	Glaciomarine	Low
	17.24	Medium dense to dense silty SAND	Glaciomarine	Low
	From 16.32m	Becoming medium dense to very dense		
	19.95	Medium to very high strength silty sandy CLAY with very closely to medium spaced very thin to medium beds of very loose to medium dense silty sand	Glaciomarine	Low
	19.20-19.48m	Medium bed of dense to very dense sand		
	24.07	Medium to high strength CLAY with very closely to closely spaced thin to medium beds of high to very high strength sandy clay	Glaciomarine	Low
	50.66	Medium to high strength slightly gravelly CLAY	Glacial clay	Low

ID	Depth (mbsf)	Description	Unit	Priority
BH_11	6.3	Very soft extremely low strength grey (10Y 6/1) silty CLAY. Slightly calcareous	Marine clay	Low
	9.18	Grey (10Y 6/1) fine to medium SAND. Slightly calcareous	Shallow marine sand	Low
	From 8.20m	With occasional fine gravel sized shell fragments		
	13.9	Firm medium strength reddish brown (5.2YR 5/3) silty CLAY with extremely closely to closely spaced thin laminations of yellowish brown (10YR 5/4) fine sand. Slightly calcareous to calcareous	Glaciomarine	Low
	22.06	Stiff high strength reddish brown (5.2YR 5/3) silty CLAY with extremely closely to closely spaced thin laminations of yellowish brown (10YR 5/4) fine sand. Slightly calcareous to calcareous	Glaciomarine	Low
	From 21.90m	Slightly gravelly. Gravel is subangular fine to medium of sandstone		
	23.8	Very stiff high to very high strength dark reddish brown (5YR 3/3) slightly gravelly sandy CLAY with rare fine gravel sized shell fragments. Gravel is rounded to subangular fine to coarse of mixed lithologies. Sand is fine to coarse. Calcareous	Glaciomarine	Low
	23.70-23.80m	Subrounded cobble of sandstone		
	26.6	Very stiff high strength thinly laminated dark brown (10YR 3/3) slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse of mixed lithology. Sand is fine to coarse. Calcareous	Glaciomarine	Low
	25.90-26.20m	Medium bed of very stiff reddish brown (5YR 4/3) slightly gravelly sandy clay. Gravel is angular to subrounded fine to medium of mixed lithologies. Sand is fine to medium. Calcareous		
	26.45-26.60m	Thin bed of firm medium strength dark yellowish brown (10YR 4/4) sandy silty clay. Sand is fine to medium. Calcareous		
	28.6	Stiff medium to high strength thinly to thickly laminated dark brown (10YR 3/3) CLAY with extremely closely to closely spaced thin to thick laminations of pale brown (10YR 6/3) fine sand. Calcareous	Glaciomarine	Low
	From 28.10m	Slightly gravelly. Gravel is subangular fine to medium of sandstone		
	28.96	Very stiff high strength dark brown (10YR 3/3) slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse of mixed lithologies. Sand is medium to coarse. Slightly calcareous	Glacial clay	Low
BH_11_A	32.78	Very stiff high to very high strength dark brown (10YR 3/3) slightly gravelly slightly sandy CLAY. Gravel is angular to rounded fine to coarse of mixed lithology. Sand is fine to coarse. Slightly calcareous	Glacial clay	Low
	35.7	Very stiff extremely high strength dark brown (10YR 3/3) slightly sandy gravelly CLAY. Gravel is angular to rounded fine to coarse of mixed lithology. Sand is fine to medium. Calcareous	Glacial clay	Low

ID	Depth (mbsf)	Description	Unit	Priority
	35.70-39.00m	Assumed zone of core loss	N/A	N/A
	40.5	Very stiff very high to extremely high strength dark brown (2.5YR 4/4) slightly gravelly silty CLAY. Gravel is angular to rounded fine to medium of mixed lithology. Slightly calcareous	Glacial clay	Low
	42	Very stiff very high strength reddish brown (2.5YR 4/4) silty CLAY. Slightly calcareous	Glacial clay	Low
	45.37	Extremely weak to weak moderately weathered moderate reddish brown (10R 4/6) mottled greyish green (5G 5/2) MUDSTONE. Frequent subhorizontal and subvertical veins of translucent gypsum (up to14mm). Slightly calcareous	Bedrock	Low
	45.37-46.50m	Assumed zone of core loss	N/A	N/A
	47.25	Very stiff extremely high strength moderate reddish brown (10R 4/6) gravelly CLAY. Gravel is angular fine to coarse of mudstone lithorelicts. Non calcareous (WEATHERED MUDSTONE)	Bedrock	Low
CPT_11	6.48	Extremely low to low strength CLAY	Marine clay	Low
	9.24	Medium dense to very dense SAND	Sand (undifferentiated)	Low
	16.6	Low to medium becoming medium to very high strength sandy gravelly CLAY with closely to medium spaced thin to medium beds of very loose to medium dense silty sand.	Glaciomarine	Low
	22.9	Medium to very high strength sandy CLAY with close to widely spaced very thinly to thinly beds of very loose to medium dense silty sand.	Glaciomarine	Low
	26.1	High strength sandy CLAY	Glaciomarine	Low
	31.62	High to very high strength gravelly CLAY with closely to widely spaced very thin to thinly beds of loose to medium dense silty sand	Glaciomarine	Low
	29.48-29.60m	Very high to extremely high strength		
	38.1	Extremely high strength slightly gravelly sandy CLAY	Glaciomarine	Low
	34.20-34.70m	Assumed core run loss zone		
	37.40-37.57m	Thin bed of loose to dense sand		
	41.5	Medium dense to very dense slightly gravelly SAND	Glacial sand	Low
	38.80-39.30m	Medium bed of medium dense to very dense silty sand		
CPT_11_A	34.72	Medium dense to very dense silty SAND	Glacial sand	Low
	40.5	Not recorded	N/A	N/A

ID	Depth (mbsf)	Description	Unit	Priority
	50.14	Extremely high strength gravelly silty CLAY	Glacial clay	Low
	41.60-41.84m	Very high strength		
	43.36-44.12m	Thick bed of medium dense to very dense silty clayey sand		
	49.52-49.72m	Thinly bed of medium dense to very dense silty clayey sand		
BH_12	1.47	Very dark grey (10YR 3/1) clayey fine to medium SAND with frequent fine to medium gravel sized shell fragments. Highly calcareous with a weak organic odour	Shallow marine sand	Low
	10.6	Brown (10YR 4/3) fine to coarse SAND with occasional pockets (up to 30mm thick) of black (GLEY 1 2.5/N) clayey sand (weak organic odour) and occasional fine gravel sized shell fragments. Calcareous	Shallow marine sand	Low
	1.80-2.10m	With abundant fine to medium gravel size shell fragments and shells. Highly calcareous		
	8.20-8.75m	With extremely closely spaced thin laminations of black (10YR 2/1) slightly sandy clay. Slightly calcareous		
	18.1	Reddish brown (2.5YR 4/3) to dark brown (7.5YR (3/3) fine to coarse SAND. Calcareous	Sand (undifferentiated)	Low
	11.80-11.85m	With black (10YR 2/1) staining		
	12.60-13.30m	Medium bed of reddish brown (5YR 4/3) gravelly fine to coarse sand gravel is subangular to subrounded fine to medium. Highly calcareous		
	14.50-15.42m	Slightly silty		
	15.76-15.86m	Thin bed of brown (7.5YR 4/3) very sandy clay. Calcareous		
	16.20-16.27m	Thin bed of brown (7.5YR 4/3) sandy clay. Highly calcareous		
	16.30-16.35m	Thin bed of brown (7.5YR 4/3) sandy clay. Slightly organic. Highly calcareous		
	16.60-17.78	Gravelly, gravel is subangular to subrounded fine to medium of mixed lithologies		
	21.5	Dark brown 7.5YR (3/3) slightly gravelly clayey fine to medium SAND. Slightly calcareous	Glacial sand	Low
	19.50-19.57m	Thin bed of high strength dark reddish brown (7.5YR 3/4) slightly sandy slightly gravelly clay gravel is subangular to subrounded fine to medium. Calcareous		
	24.38	Very stiff extremely high strength dark reddish brown (5YR 3/4) slightly sandy CLAY with frequent fine gravel sized gypsum and pockets (up to 20mm thick) of pale blue (5B 7/2) weathered siltstone. Sand is fine. Slightly calcareous	Bedrock	Low

ID	Depth (mbsf)	Description	Unit	Priority
	35	Extremely weak moderate reddish brown (10R 4/6) mottled grey (N5) slightly to completely weathered MUDSTONE with frequent pockets of extremely weak grey (N5) moderately weathered siltstone with frequent fine gravel sized crystals and horizontal to inclined veins of white (N9) and translucent gypsum (up to 30mm thick). Locally recovered as residual gravelly clay with mudstone and siltstone lithorelics (up to 60mm in diameter). Slightly calcareous	Bedrock	Low
	26.30-26.55m	Non-intact, completely weathered, recovered as gravelly clay with frequent mudstone and siltstone lithorelics (up to 60mm in diameter)		
	26.55-27.80m	Non-intact, completely weathered recovered as gravelly clay with frequent mudstone and siltstone lithorelics (up to 60mm in diameter)		
	27.80-28.40m	AZCL, driller notes zone of extremely fast drilling and low resistance. Possible zone of residual soil		
	29.80-30.30m	Medium bed of extremely weak light blueish grey (5B 7/1) mottled moderate reddish brown (10R 4/6) slightly to moderately weathered siltstone with occasional gypsum crystals (up to 30mm in diameter)		
	36.71	Very stiff extremely high strength dark reddish brown (5YR 3/3) CLAY with frequent lithorelics of extremely weak mudstone and frequent thick laminations of halite (POSSIBLE RESIDUAL SOIL)	Bedrock	Low
	36.30-36.70m	AZCL, disturbed by P53 and P53A. Possssible residual soil		
	40.06	Weak semitranslucent to pink (5YR 7/4) HALITE with frequent inclusions of moderate reddish brown (10R 4/6) and greenish grey (5G 4/1) mudstone and siltstone (up to 50mm in diameter) and frequent traces of mudstone and siltstone on drilling induced fracture faces (possible washout).	Bedrock	Low
BH_12_A	21.2	Dark reddish grey (5YR 4/2) slightly gravelly fine to medium SAND with pockets (up to 20mm thick) of firm to stiff yellowish red (5YR 4/6) sandy clay. Gravel is sub-angular to sub-rounded fine. Calcareous	Glacial sand	Low
	26.5	Not recorded	N/A	N/A
	29	Stiff to very stiff extremely high strength dark reddish brown (2.5YR 3/3) silty CLAY with lithorelics of mudstone and frequent pockets (up to 50mm thick) of light bluish grey (5B 7/1) siltstone and extremely closely spaced to very closely spaced horizontal white (N9) to colourless gypsum veins (up to 20mm thick) and occasional pockets of white (N9) gypsum crystals (up to 10mm thick). Slightly calcareous	Bedrock	Low
	29.21	Extremely weak to very weak dark reddish brown (10R 3/4) weathered MUDSTONE with occasional pockets (up to 20mm thick) of light bluish grey (5B 7/1) siltstone and occasional pockets of white (N9) gypsum crystals and veins (up to 8mm thick)	Bedrock	Low
	36	Not recorded	N/A	N/A

ID	Depth (mbsf)	Description	Unit	Priority
	36.6	Extremely weak moderate redddish brown (10R 4/6) MUDSTONE with rare gravel size fragments (up to 20mm thick) medium light grey (N6) siltstone and rare fine gravel sized gypsum crystals. Gravel is fine to coarse. Non-calcareous	Bedrock	Low
	41.99	Weak semitranslucent to translucent white (N9) to colourless and occassional speckled with moderate orange pink (10R 7/4) HALITE with frequent inclusions of reddish brown (10R 4/6) mudstone and medium light grey (N6) siltstone. Non-calcareous	Bedrock	Low
	41.42-41.72m	Medium bed of weak medium light grey(N9) SILTSTONE with occassional inclusions (up to 50mm thick) dark reddish brown (10R 3/4) mudstone and pockets (up to 50mm thick) semitranlucent colourless to white (N9) halite and randomly orientated white (N9) to colourless mineral veins (up to 4mm thick). Non-calcareous		
	44.2	Weak moderate reddish brown (10R 4/6) MUDSTONE with rare inclusions (up to 30mm thick) medium grey (N5) to light bluish grey (5B 7/1) siltstone and extremely closely spaced to medium spaced horizontal to inclined to vertical white (N9) to colourless to light red (5R 6/6) mineral veins (up to 10mm thick). Non-calcareous	Bedrock	Low
	42.75-43.16m	Medium bed of weak semitranslucent to translucent white (N9) to colourless HALITE with frequent inclusions of reddish brown (10R 4/6) mudstone and medium light grey (N6) siltstone. Non-calcareous		
	43.50-43.75m	With closely spaced subvertical to horizontal colourless halite vein infill (up to 20mm thick & 250mm long) and rare pockets of light bluish grey (5B 7/1) siltstone (up to 2mm)		
	50.26	Weak semitranslucent light grey (N8) to greyish pink (5R 8/2) HALITE. Non-calcareous	Bedrock	Low
CPT_12	1.5	Very loose SAND	Shallow marine sand	Low
	21.6	Medium dense to very dense SAND	Sand (undifferentiated)	Low
	9.36-10.72m	Thick bed of very dense gravelly sand		
	13.56-13.68m	Thin bed of extremely high strength clay		
	15.00-15.12m	Thin bed of extremely high strength clay		
	17.24-18.88m	Thick bed of high to extremely high strength slightly gravelly silty clay		
	26	Extremely high strength slightly gravelly sandy silty CLAY	Glacial clay	
	36.7	Extremely high strength silty CLAY	Glacial clay	
	39.56	Likely bedrock assumed HALITE	Bedrock	Low

ID	Depth (mbsf)	Description	Unit	Priority
	37.60-38.60m	C01 NO RECOVERY		
CPT_13	2.2	Extremely low to low strength sandy CLAY	Marine clay	Low
	8.9	Dense to very dense SAND	Sand (undifferentiated)	Low
	19.64	Very high to extremely high strength slightly gravelly silty CLAY	Glacial clay	Low
CPT_13_A	17.95	Very stiff extremely high strength moderate brown (5YR 4/4) mottled medium bluish grey (5B 5/1) gravelly CLAY with frequent crystals (up to 6mm) and subhorizontal to subvertical veins of gypsum (up to 4mm). Gravels are angular fine to medium of mudstone lithorelicts. Non calcareous (WEATHERED MUDSTONE)	Bedrock	Low
	12.68-12.76m	Greenish grey (5G 6/1)		
	From 17.70m	Very high strength		
	28.37	Weak to medium strong pinkish grey (5YR 8/1) and light brown (5YR 5/6) to dusky brown (5YR 2/2) translucent HALITE with frequent irregular shaped inclusions of dusky brown (5YR 2/2) mudstone (up to16mm x 2mm). Fractures are extremely closely to closely spaced subhorizontal undulating rough with occasional clay smear. Non calcareous	Bedrock	Low
	From 24.60m	Inclusions of mudstone become moderate brown (5YR 3/4) and dark greenish grey (5G 4/1)		
	32.48	Weak to medium strong light brown (5YR 5/6) and dusky brown (5YR 2/2) translucent HALITE with frequent irregular shaped inclusions of moderate brown (5YR 3/4) and dark greenish grey (5G 4/1) mudstone (up to 16mm x 2mm). Fractures are extremely closely to very closely spaced subhorizontal undulating rough with occasional clay smear. Non calcareous	Bedrock	Low
	39.98	Weak to medium strong weathered light grey (N8) to greyish pink (5R 8/2) HALITE. Fractures are closely to medium spaced planar rough. Non calcareous	Bedrock	Low
	50.45	Weak to medium strong weathered light grey (N8) to greyish pink (5R 8/2) HALITE with very dark grey (5Y 3/1) clay veneered layers. Fractures are closely to medium spaced planar rough. Non calcareous	Bedrock	Low
BH_14	2.3	Dark grey (2.5Y 4/1) clayey silty fine to coarse SAND with occasional fine gravel sized shell fragments. Calcareous	Shallow marine sand	Low
	17.6	Dark brown (10YR 3/3) gravelly silty fine to coarse SAND. Gravel is sub angular to sub rounded fine to coarse. Slightly calcareous.	Glacial sand	Low

ID	Depth (mbsf)	Description	Unit	Priority
	2.70-3.09m	Medium bed of very stiff extremely high strength dark olive brown (2.5Y 3/3) slightly gravelly slightly sandy silty clay. Gravel is subangular to subrounded and fine to coarse. Sand is fine. Highly calcareous		
	11.70-11.90m	Medium bed of stiff dark brown (10YR 3/4) slightly clayey sandy silt. Sand is fine. Calcareous		
	16.95-17.02m	thin bed of dark greyish brown (10YR 4/2) sandy silt. Sand is fine. Slightly calcareous.		
	21.98	Brown (10YR 4/3) very silty fine SAND. Calcareous.	Glacial sand	Low
	19.40-19.70m	Medium bed of brown (10YR 4/3) sandy silt. Sand is fine. Calcareous		
	24.08	Very stiff extremely high strength dark greyish brown (10YR 3/2) clayey sandy SILT. Calcareous	Glacial clay	Low
	22.20-22.28m	Thin bed of very stiff extremely high strength dark greyish brown (10YR 3/2) silty clay. Calcareous		
	22.80-22.95m	Thin bed of brown (7.5YR 4/2) silty fine sand. Calcareous.		
	32.55	Very stiff extremely high strength dark brown (7.5Y 3/3) silty CLAY with occasional pockets (<40mm) of white (7.5YR 3/3) gypsum and rare pockets (<30mm) of dark greenish grey (GLEY1 4/10GY) fine to coarse sand and rare pockets (<25mm) of dark greenish grey (GLEY1 4/10GY) clay. Slightly becoming non calcareous	Glacial clay	Low
	30.00-30.50m	Mottled with dark greenish grey (GLEY1 4/10GY)		
	35	Very stiff extremely high strength dark greenish grey (GLEY1 4/10GY) mottled dark brown (10YR 3/3) silty CLAY with occasional pockets (<35mm) of white (10YR 8/1) gypsum and subhorizontal thin laminae of white (10YR 8/1) gypsum. Non calcareous	Glacial clay	Low
	50.5	Very stiff extremely high strength dark reddish brown (5YR 3/4) mottled with dark greenish grey (GLEY1 4/10GY) silty CLAY with occasional pockets (<45mm) of white (5YR 8/1) gypsum. Non calcareous	Glacial clay	Low
CPT_14	1.69	Extremely low to very low strength silty CLAY	Marine clay	Low
	3.16	High to extremely high strength silty CLAY	Glacial clay	Low
	2.06-2.23m	Thin bed of dense to very dense silty sand		
	20.3	Dense to very dense silty SAND	Glacial sand	Low
	8.60-9.32m	Sleeve malfunction during push		
	12.48-12.53m	Very thin bed of extremely high strength silty clay		

ID	Depth (mbsf)	Description	Unit	Priority
	13.59-13.64m	Very thin bed of extremely high strength sandy clay		
	16.98-17.04m	Thin bed of dense to very dense silty clay		
	24.9	Dense to very dense sandy SILT	Glacial clay	Low
	43.18	Extremely high strength silty CLAY with widely to very widely spaced thin to medium beds of extremely high strength sandy clay	Glacial clay	Low
	39.60-40.40m	Thick bed of medium dense to very dense sandy silt		
	50.34	Extremely high strength silty CLAY	Glacial clay	Low
BH_15	1.8	Brown (7.5YR 5/2) slightly gravelly silty SAND with rare gravel size shell fragments. Sand is fine to coarse. Gravel is fine, angular to subangular. Calcareous	Shallow marine sand	Low
	12.72	Brown (7.5YR 5/2) silty SAND. Sand is fine to coarse. Calcareous	Shallow marine sand	Low
	5.90-6.85m	With occasional fine gravel size shell fragments		
BH_15_A	13.2	Brown (7.5YR 4/2) fine to coarse slightly silty SAND	Shallow marine sand	Low
	12.42-12.52m	With black staining		
	15.69	Grey (7.5YR 4/1) fine to coarse SAND. Calcareous	Sand (undifferentiated)	Low
	15.10-15.20m	With black staining		
	19.2	Brown (7.5YR 4/2) slightly sandy SILT. Sand is fine	Marine clay	Low
	18.15-18.75m	Thick bed of soft to firm low strength brown (7.5YR 4/2) silty clay		
	27.5	Soft to stiff low to medium strength brown (7.5YR 4/2) silty CLAY	Glaciomarine	Low
	36.5	Stiff to very stiff medium to very high strength brown (7.5YR 3/2) slightly silty gravelly CLAY. Gravel is fine to medium subangular to subrounded	Glacial clay	Low
	44	Stiff to very stiff high to extremely high strength dark brown (7.5YR 3/2) slightly silty gravelly CLAY. Gravel is fine to medium subangular to subrounded	Glacial clay	Low
	38.47-38.56m	Thin bed of brown (7.5YR 5/2) fine to coarse sand		
	41.10-41.28m	Thin bed of brown (7.5YR 3/4) fine to medium silty sand		

ID	Depth (mbsf)	Description	Unit	Priority
	50.1	Very stiff extremely high strength brown (7.5YR 4/3) gravelly silty CLAY	Glacial clay	Low
	48.20-48.39m	Thin bed of very stiff extremely high strength (GLEY 1 6/N) SILT with occasional pockets of brown (7.5YR 4/3) clay (up to 3mm thick). Non Calcareous		
	49.00-49.20m	Thin bed of very stiff extremely high strength (GLEY 1 6/N) SILT with occasional pockets of brown (7.5YR 4/3) clay (up to 3mm thick). Non Calcareous		
CPT_15	0.8	Very loose to loose clayey SAND	Shallow marine sand	Low
	16.81	Dense to very dense SAND	Shallow marine sand	Low
	18.14	Very loose to medium dense clayey SAND	Glacial sand	Low
	17.05-17.23m	Very thin bed of very high to extremely high strength sandy CLAY		
	19.02	High to extremely high strength sandy CLAY	Glacial clay	Low
	37.45	Low to high strength slightly gravelly CLAY	Glaciomarine	Low
	39.41	Extremely high strength sandy CLAY	Glacial clay	Low
	43.01	Very high to extremely high strength sandy CLAY with medium spaced thin to thick beds of medium dense to very dense clayey sand	Glacial clay	Low
	48.52	Extremely high strength silty CLAY	Glacial clay	Low
CPT_16	3.95	Extremely low to low strength sandy CLAY	Marine clay	
	13.5	Medium to very high strength slightly gravelly sandy CLAY	Glaciomarine	Low
	5.42-7.78m	With closely to widely thin to medium beds of loose to medium dense clayey sand		
	27.49	High to extremely high strength slightly gravelly silty CLAY	Glaciomarine	Low
	15.37-15.49m	Thin bed of medium dense silty sand		
	29.94	Medium dense to very dense SAND	Glaciomarine	Low
	27.62-28.72m	Swell affecting data		
CPT_16_A	26.5	Not recorded	N/A	N/A
	27.62	High to extremely high strength slightly gravelly silty CLAY	Glaciomarine	Low

ID	Depth (mbsf)	Description	Unit	Priority
	27.36-27.45m	Thin bed of loose to medium dense sand		
	30.5	Medium dense to very dense SAND	Glacial sand	Low
	31.94	Extremely high strength silty CLAY	Glacial clay	Low
	33.9	Dense to very dense silty SAND	Glacial sand	Low
	32.70-33.09m	Thick bed of dense to very dense sand		
	36.25	Extremely weak moderate reddish brown (10R 4/6) MUDSTONE with rare pockets (up to 10mm thick) of light blueish grey (5B 7/1) to medium light grey (N6) siltstone and extremely to very closely spaced horizontal to inclined to vertical white (N9) to colourless gypsum veins (up to 10mm thick) and rare fine gravel sized white (N9) gypsum crystals. Slightly calcareous to non-calcareous	Bedrock	Low
	35.13-35.27m	Slightly weathered mudstone		
BH_17	2.7	Very soft extremely low to very low strength dark grey (10YR 4/1) slightly sandy silty CLAY with rare fine gravel sized shell fragments. Sand is fine. Non Calcareous	Marine clay	Low
	1.00-2.70m	With rare to occasional fine to medium gravel sized shell fragments		
	2.00-2.70m	Greyish brown (10YR 5/2). Calcareous		
	7.8	Olive brown (2.5Y 4/4) slightly silty fine to medium SAND with rare fine to medium gravel sized shell fragments. Calcareous	Shallow marine sand	Low
	6.30-6.96m	Gravelly. Gravel is subrounded to subangular fine to coarse so mixed lithology		
	6.96-7.8m	Thick bed of stiff high strength brown (10YR 4/3) silty clay		
	15.17	Firm to stiff medium to high strength dark greyish brown (10YR 4/2) silty CLAY with extremely closely to very closely spaced thin laminae (<6mm) of pale brown (10YR 6/3) fine sand. Calcareous	Glaciomarine	Low
	15.12-15.17m	With rare pockets (<25mm) of fine sand		
	22.1	Dark yellowish brown (10YR 4/4) fine to medium SAND. Calcareous	Glacial sand	Low
	27	Light brownish grey (10YR 6/2) fine to medium SAND. Calcareous	Glacial sand	Low
	28	Very stiff extremely high strength dark greyish brown (10YR 4/20 slightly gravelly silty CLAY. Gravel is subrounded to subangular fine to medium. Calcareous	Glacial clay	Low

ID	Depth (mbsf)	Description	Unit	Priority
	30.8	Brown (10YR 4/3) very silty fine SAND. Slightly calcareous	Glacial sand	Low
	28.30-28.50m	With rare pockets (<25mm) of very stiff dark greyish brown (10YR 4/2) silty clay		
	28.70-28.80m	Thin bed of very stuff dark greyish brown (10YR 4/3) silty clay		
	33.9	Very stiff extremely high strength brown (7.5YR 4/4) to dark brown (7.5YR 3/3) slightly gravelly silty CLAY. Gravel is subrounded to subangular fine to coarse of mixed lithology. Slightly calcareous	Glacial clay	Low
	38.68	Brown (7.5YR 4/4) to greyish brown (10YR 5/2) silty fine SAND. Calcareous	Glacial sand	Low
	41.34	Grayish brown (10YR 5/2) gravelly fine to medium SAND. Gravel is subangular to subrounded fine to medium of mixed lithology. Calcareous	Glacial sand	Low
	44.2	Grayish brown (10YR 5/2) fine to medium SAND. Calcareous	Glacial sand	Low
	45.4	Dark brown (7.5YR 3/4) very silty fine sand SAND. Calcareous	Glacial sand	Low
	44.40-44.52m	Thin bed of very stiff extremely high strength brown (7.5YR 4/3) slightly gravelly silty clay. Gravel is subrounded to subangular fine to medium. Calcareous		
	47.4	Very stiff extremely high strength brown (7.5YR 4/3) slightly gravelly silty CLAY with occasional pockets (<15mm) and rare very closely spaced thin laminae of brown (7.5YR 5/1) silty fine sand. Gravel is subrounded to subangular fine to medium. Calcareous	Glacial clay	Low
	47.10-47.20m	Thin bed brown(10YR 4/3) silty fine sand. Calcareous		
	48.8	Brown(10YR 4/3) silty fine SAND with occasional pockets (<16mm) of brown (7.5YR 4/4) fine sand. Gravel is subrounded to subangular fine. Calcareous	Glacial sand	Low
	48.00-48.06m	Very thin bed of very stiff slightly gravelly silty clay. Gravel is subrounded to subangular fine. Calcareous		
	49.62	Very stiff extremely high strength dark brown (7.5YR 3/3) slightly sandy silty CLAY. Sand is fine to coarse. Calcareous	Glacial clay	Low
	50.2	Yellowish brown (10YR 5/4) silty fine to medium SAND. Calcareous	Glacial sand	Low
CPT_17	2.72	Extremely low to very low strength silty CLAY	Marine clay	Low
	6.73	Very dense slightly gravelly silty SAND	Shallow marine sand	Low
	15.08	Medium to very high strength silty CLAY	Glaciomarine	Low
	26.51	Dense to very dense slightly gravelly silty SAND	Glacial sand	Low

ID	Depth (mbsf)	Description	Unit	Priority
	29.69	Very high to extremely high strength sandy silty CLAY	Glacial clay	Low
	33.45	Extremely high strength slightly gravelly silty CLAY	Glacial clay	Low
	30.58-30.91m	Medium bed of dense to very dense silty sand		
	42.45	Dense to very dense silty SAND	Glacial sand	Low
	36.50-36.82m	Medium bed of extremely high strength sandy clay		
	44.73	Extremely high strength slightly gravelly silty CLAY with medium to widely spaced thin beds of medium dense to dense sandy silt	Glacial clay	Low
	50.08	Medium dense to very dense silty SAND	Glacial sand	Low
	46.13-46.65m	With closely spaced very thin to thin beds of medium dense to dense sandy silt		
	47.87-48.00m	Thin bed of extremely high strength sandy clay		
	48.11-48.51m	Medium bed of extremely high strength silty clay		
	48.66-48.77m	Thin bed of extremely high strength sandy clay		
CPT_18	3.92	Extremely low to very low strength silty CLAY	Marine clay	Low
	8.34	Medium dense to very dense SAND	Sand (undifferentiated)	Low
	6.28-6.62m	Very loose to medium dense		
	18.4	Medium to very high strength slightly gravelly sandy CLAY	Glaciomarine	Low
	17.38-17.76m	Medium bed of loose to dense silty sand		
	19.26	High to very high strength silty CLAY	Glacial clay	Low
	20.76	Extremely high strength silty CLAY (POSSIBLE WEATHERED MUDSTONE)	Bedrock	Low
	25.5	Very weak slightly weathered moderate brown (5YR 3/4) MUDSTONE with subhorizontal to subvertical translucent gypsum veins (<14mm). Occasional greenish grey (5GY 6/1) reduction spots (<50x50mm). Rare gypsum nodules (<7mm). Calcareous	Bedrock	Low
	21.88-21.92m	Inclined 20 degrees fracture undulating rough infilled with clay (<12mm).		
	23.00-23.07m	Inclined 30 degrees fracture planar rough infilled with brown and greenish grey clay.		

ID	Depth (mbsf)	Description	Unit	Priority
	25.45-25.50m	Greenish grey (5G 6/1)		
	28	Very weak moderately weathered moderate brown (5YR 3/4) mottled greenish grey (5G 6/1) MUDSTONE with frequent subhorizontal to subvertical veins of translucent gypsum (<10mm). Calcareous	Bedrock	Low
	30.5	Extremely weak to very weak moderately weathered moderate brown (5YR 3/4) mottled greenish grey (5G 6/1) MUDSTONE with frequent subhorizontal to subvertical veins of translucent gypsum (<5mm). Fractures are closely to medium spaced subhorizontal undulating rough infilled with clay. Calcareous	Bedrock	Low
	39.9	Weak moderate brown (5YR 3/4) MUDSTONE with frequent subhorizontal to 60 degrees veins of translucent gypsum (<16mm). Occasional nodules of translucent gypsum (<20mm). Rare greenish grey (5GY 6/1) reduction spots (<8mm). Calcareous.	Bedrock	Low
	32.69-32.82m	Subhorizontal to inclined 15 degrees planar rough fracture with gravelly clay infill		
	32.90-34.40m	Assumed zone of core loss		
	34.40-34.90	Recovered as a clayey subangular medium to coarse gravel of very weak mudstone and very stiff gravelly clay with frequent mudstone lithorelicts (Possibly drilling disturbed)		
	36.85-37.16m	Nodules of gypsum are frequent		
	39.30-39.37m	Greenish grey (5GY 6/1)		
	39.43-39.45m	Greenish grey (5GY 6/1)		
CPT_21	5.72	Extremely low to low strength CLAY	Marine clay	Low
	7.35	Dense to very dense SAND	Sand (undifferentiated)	Low
	From 7.00m	Becoming silty		
	8.4	High to extremely high strength silty CLAY with closely to medium spaced thin beds of medium dense to dense silty sand	Glaciomarine	Low
	18.51	Medium to high strength gravelly CLAY	Glacial clay	Low
	22.85	High to very high strength silty gravelly CLAY	Glacial clay	Low
	20.85-21.15m	Medium bed of medium dense silty sand		
	23.9	Very high to extremely high strength slightly gravelly silty CLAY	Glacial clay	Low

ID	Depth (mbsf)	Description	Unit	Priority
CPT_21_A	24.87	High to extremely high strength CLAY	Glacial clay	Low
	24.2	Thick bed of very high to extremely high strength CLAY/SILT		
	34.8	Extremely high strength silty CLAY	Glacial clay	Low
	41.96	Extremely high strength silty CLAY	Glacial clay	Low
	50.14	Extremely high strength silty CLAY	Glacial clay	Low
CPT_22	3.25	Extremely low to very low strength CLAY	Marine clay	Low
	9.55	Medium dense to very dense SAND	Sand (undifferentiated)	Low
	9.21-9.25m	Very thin bed of extremely high strength sandy clay		
	16.74	Medium to very high strength CLAY	Glacial clay	Low
	17.32	Medium dense to dense silty SAND	Glacial sand	Low
CPT_22_A	23.88	Medium to very high strength silty CLAY	Glacial clay	Low
	21.10-21.41m	Medium bed of very high to extremely high strength sandy clay		
	23.08-23.24m	Medium bed of loose to medium dense silty sand		
	26.3	Very high to extremely high strength silty CLAY	Glacial clay	Low
	24.72-25.06m	Medium bed of extremely high strength silty sandy clay		
	25.64-25.78m	Thin bed of medium dense to dense sandy silty CLAY		
	27.06	Extremely high strength silty CLAY (POSSIBLE WEATHERED MUDSTONE)	Bedrock	Low
	29	Extremely weak to very weak moderately to highly weathered moderate brown (5YR 4/4) MUDSTONE with rare crystals and subhorizontal veins of translucent gypsum (<6mm). Fractures are closely to medium spaced subhorizontal to 30 degrees undulating rough with clay infill (<10mm). Weathered in places to a stiff clay with frequent mudstone lithorelicts. Calcareous	Bedrock	Low
	28.35-28.65m	Greenish grey (5GY 6/1)		
	28.90-28.96m	Greenish grey (5GY 6/1)		

ID	Depth (mbsf)	Description	Unit	Priority
	32.12	Extremely weak to weak moderately to highly weathered moderate brown (5YR 4/4) mottled greyish blue green (5BG 5/2) MUDSTONE with occasional crystals and subhorizontal veins of translucent and pinkish grey (5YR 8/1) gypsum (<20mm). Fractures are closely to widely spaced subhorizontal undulating rough with clay infill (<4mm). Weathered in places to a stiff clay with frequent mudstone lithorelicts. Calcareous	Bedrock	Low
	29.15-29.40m	Greyish blue green (5BG 5/2)		
	32.00-32.12m	Pale green (10G 6/2)		
	36.5	Extremely weak to very weak slightly to highly weathered moderate brown (5YR 4/4) MUDSTONE with frequent crystals and subhorizontal to subvertical veins of translucent and white (N9) gypsum (<40mm). Fractures are closely to medium spaced subhorizontal undulating rough with clay infill (<4mm). Weathered in places to a stiff clay with frequent mudstone lithorelicts. Calcareous	Bedrock	Low
	33.05-33.17m	Pale green (10G 6/2). Weathered to a firm clay with frequent mudstone lithorelicts and crystals of gypsum (<18mm)		
	43.89	Extremely weak to very weak moderately to highly weathered moderate brown (5YR 4/4) mottled greenish grey (5G 6/1) MUDSTONE with occasional subhorizontal to subvertical veins (<25mm) of moderate reddish orange (10R 6/6) gypsum. Fractures are closely to medium spaced subhorizontal undulating rough. Calcareous	Bedrock	Low
	Below 40.50m	Slightly weathered		
	42.20-42.30m	Inclined (45 degrees) planar rough clean fracture		
	43.84-43.88m	Greenish grey (5G 6/1) with frequent cross cutting subhorizontal veins of translucent gypsum (<4mm)		
	46.68	Extremely weak to very weak moderately weathered to highly weathered moderate brown (5YR 4/4) MUDSTONE with frequent crystals and subhorizontal veins of translucent gypsum (<12mm). Fractures are closely to widely spaced subhorizontal undulating rough with clay infill (<12mm). Calcareous	Bedrock	Low
	44.35-44.45m	Highly weathered to a very stiff clay with frequent lithorelicts		
	Below 45.10m	Frequent subhorizontal to subvertical veins of translucent gypsum (<1mm)		
	50.5	Extremely weak highly weathered moderate brown (5YR 4/4) MUDSTONE with frequent subhorizontal to subvertical veins of translucent gypsum (<8mm). Weathered in places to a very stiff extremely high strength clay with frequent mudstone lithorelicts. Slightly calcareous	Bedrock	Low

ID	Depth (mbsf)	Description	Unit	Priority
	Below 48.00m	Moderate brown (5YR 4/4) mottled greenish grey (5G 6/1)		
	49.65m	Inclined (30 degrees) planar rough clean fracture		
BH_23	4.57	Very dark grey (5Y 3/1) very clayey fine SAND with rare fine to coarse gravel sized shell fragments. Calcareous.	Shallow marine sand	Low
	8.6	Dark grey (5Y 4/1) fine to coarse SAND with rare fine to coarse gravel sized shell fragments. Calcareous	Shallow marine sand	Low
	7.90-8.35m	with closely spaced thin beds of very dark grey (5Y 3/1) firm clay		
	12.7	Firm to stiff high to very high strength dark greyish brown (10YR 4/3) slightly sandy silty CLAY. Sand is fine. Calcareous	Glacial clay	Low
	20.8	Firm to stiff high to very high strength dark greyish brown (10YR 4/3) slightly gravelly silty CLAY. Gravel is subangular to sub rounded and fine to coarse. Slightly calcareous	Glacial clay	Low
	18.00-18.74m	Stiff extremely high strength		
	25.75	Brown (7.5YR 4/2) silty fine to coarse SAND with medium spaced thin beds of very stiff extremely high strength brown (7YR 4/4) slightly gravelly silty clay. Gravel is subangular to subrounded fine to coarse. Calcareous	Glacial sand	Low
	23.70m	Becoming dark brown (10YR 3/3)		
	36.4	Very stiff extremely high strength dark brown (7.5YR 4/2) slightly gravelly silty CLAY. Gravel is subangular to subrounded and fine to coarse. Calcareous.	Glacial clay	Low
	30.80-31.80m	Thick bed of brown (10YR 4/3) silty fine to medium SAND. Calcareous		
	38.9	Dark brown (10YR 3/3) silty fine to coarse SAND. Calcareous	Glacial sand	Low
	41.64	Very stiff extremely high strength dark greyish brown (10YR 3/3) mottled with dark greenish grey (GLEY1 4/10GY) silty CLAY with occasional pockets (<10mm) of translucent gypsum and occasional pockets (<15mm) of greenish grey (GLEY1 10GY 6/1) silt. Slightly calcareous	Bedrock	Low
	50.14	Very stiff extremely high strength dark brown (7.5YR 3/3) silty CLAY with rare pockets (<60mm) of translucent and white (7.5YR 8/1) gypsum. Calcareous	Bedrock	Low
	46.80-48.16m	With a vertical thick lamination of white (7.5YR 8/1) gypsum		
CPT_23	4	Extremely low to very low strength CLAY	Marine clay	Low
	8.04	Medium dense to very dense SAND	Sand (undifferentiated)	Low

ID	Depth (mbsf)	Description	Unit	Priority
	7.07-7.12m	Thin bed of very high strength silty clay		
	21.23	Medium to very high strength slightly gravelly CLAY	Glaciomarine	Low
	8.32-8.38m	Thin bed of loose silty sand		
	8.92-9.04m	Thin bed of loose to medium dense silty sand		
	26.2	Medium dense to very dense SAND	Glacial sand	Low
	22.61-23.08m	Very loose to loose		
	23.32-24.00m	Slightly gravelly		
	24.21-24.32m	Thin bed of extremely high strength clay		
	30.95	Very high to extremely high strength sandy CLAY	Glacial clay	Low
	28.89-29.11m	Medium bed of medium dense to dense sandy silt		
	33.12	Medium dense to very dense silty SAND with closely spaced very thin to thin beds of extremely high strength clay	Glacial sand	Low
	35.98	Extremely high strength silty CLAY	Glacial clay	Low
	37.9	Dense to very dense silty SAND	Glacial sand	Low
	41.7	Extremely high strength sandy CLAY	Glacial clay	Low
	50.12	Extremely high strength silty CLAY	Glacial clay	Low
CPT_24	1.2	Extremely low strength silty CLAY.	Marine clay	Low
	Below 0.90m	Low to medium strength		
	2.9	Medium to high strength CLAY.	Marine clay	Low
	11.01	Medium to very high strength slightly gravelly sandy silty CLAY	Glaciomarine	Low
	7.53-7.67m	Thin bed of very high strength silty clay.		
	8.29-8.39m	Thin bed of high strength silty clay.		
	11.58	High to extremely high strength silty CLAY.	Glacial clay	Low
	12.94	Extremely high strength CLAY (POSSIBLE WEATHERED MUDSTONE)	Bedrock	Low

ID	Depth (mbsf)	Description	Unit	Priority
	14.7	Very weak slightly weathered greenish grey (5G 6/1) MUDSTONE with occasional subhorizontal veins of translucent gypsum (<18mm). Fractures are closely to widely spaced subhorizontal planar. Non calcareous	Bedrock	Low
	13.74-13.93m	Highly weathered. Recovered as a stiff gravelly clay. Gravel is angular fine to medium of mudstone lithorelicts		
	Below 14.10m	Greenish grey (5G 6/1) mottled moderate brown (5YR 4/4)		
	17.91	Very weak to weak moderately weathered becoming slightly weathered moderate brown (5YR 4/4) MUDSTONE with frequent subhorizontal to subvertical veins of translucent gypsum (<17mm). Fractures are widely spaced subhorizontal planar rough with clay infill (<10mm). Rare greenish grey (5G 6/1) reduction spots and patches (<20mm). Non calcareous	Bedrock	Low
	14.70-15.10m	Weathered in places to a very stiff clay with frequent mudstone lithorelicts		
	22.3	Weak slightly weathered moderate brown (5YR 4/4) MUDSTONE with frequent subhorizontal to inclined 60 degrees veins of translucent gypsum (<14mm). Frequent greenish grey (5G 6/1) reduction patches (up to 60mm x 12mm). Non calcareous	Bedrock	Low
	18.56-18.84m	Moderately weathered. Recovered as a clayey angular medium to coarse gravel of mudstone and gypsum (Possibly drilling induced)		
	18.78-18.86m	Greenish grey (5G 6/1)		
	19.43-19.46m	Greenish grey (5G 6/1)		
	20.47m	Inclined 20 degrees planar rough clean fracture		
	Below 21.10m	Reduction patches are rare		
BH_26	1.6	Very soft extremely low to very low strength dark grey (2.5Y 4/4) sandy CLAY. Sand is fine. Calcareous	Marine clay	Low
	5.9	Dark greyish brown (2.5Y 4/2) fine SAND. Calcareous	Shallow marine sand	Low
	2.60-3.00m	Medium bed of very soft very low to low strength dark grey (2.5Y 4/4) sandy clay. Sand is fine. Calcareous		
	4.50-5.45m	With rare to occasional fine to medium gravel sized shell fragments. Calcareous		
	11.4	Olive brown (2.5Y 4/3) silty fine to medium SAND. Slightly calcareous	Shallow marine sand	Low
	7.00-7.56m	Dark greyish brown silty fine to medium with rare fine gravel sized shell fragments		

ID	Depth (mbsf)	Description	Unit	Priority
	13.8	Grey (5Y 5/1) clayey fine to medium SAND with extremely to closely spaced thick laminations to very thin beds of olive grey (5Y 5/2) clay. Calcareous	Glaciomarine	Low
	12.80-13.38m	Medium bed of soft low strength grey (5Y 5/1) sandy clay. Calcareous		
	16.57	Firm to stiff medium to high strength brown (10YR 4/3) silty CLAY. Calcareous	Glacial clay	Low
	29.3	Stiff high strength brown (7.5YR 4/4) slightly gravelly CLAY. Gravel is subrounded to subangular fine to medium of mixed lithology. Slightly calcareous	Glacial clay	Low
	36.1	Stiff to very stiff very high to extremely high strength dark greyish brown (10YR 4/2) slightly gravelly silty CLAY. Gravel is subrounded to subangular fine to medium of mixed lithology. Slightly calcareous	Glacial clay	Low
	41.5	Extremely weak to very weak moderately weathered moderate brown (5YR 3/4) mottled greenish grey (5G 6/1) MUDSTONE with closely to medium spaced very thin beds of very stiff dark brown (7.5YR 3/3) silty clay and occasional to frequent subhorizontal to subvertical veins of translucent and white (N9) gypsum(<12mm). Fractures are subhorizontal to subvertical very closely to medium spaced undulating rough. Non calcareous	Bedrock	Low
	50.5	Very weak moderately to highly weathered moderate brown (5YR 3/4) mottled greenish grey (5G 6/1) MUDSTONE with occasional subhorizontal to subvertical veins (<14mm) of translucent gypsum. Fractures are subhorizontal to subvertical very closely to medium spaced undulating rough. Non calcareous	Bedrock	Low
	49.00-50.00m	With closely to medium spaced very thin beds of very stiff brown (10YR 3/3) silty clay		
CPT_26	1.1	Extremely low to low strength sandy CLAY	Marine clay	Low
	6.6	Very loose to medium dense SAND with closely to medium spaced thin beds of low to medium strength sandy clay	Shallow marine sand	Low
	12.06	Medium dense to very dense silty SAND	Shallow marine sand	Low
	14.42	Loose to medium dense clayey SAND with closely to medium spaced thin to medium beds of medium to high strength sandy clay	Glaciomarine	Low
	18	Low to medium strength silty CLAY	Glaciomarine	Low
	24.7	Medium strength to high strength gravelly CLAY	Glacial clay	Low
	32.52	High to very high strength slightly gravelly silty CLAY	Glacial clay	Low
	39.2	Extremely high strength slightly gravelly silty CLAY	Glacial clay	Low

ID	Depth (mbsf)	Description	Unit	Priority
	42.2	Extremely weak to very weak moderately weathered moderate brown (5YR 3/4) mottled greenish grey (5G 6/1) MUDSTONE with closely to medium spaced very thin beds of very stiff dark brown (7.5YR 3/3) silty clay and occasional to frequent subhorizontal to subvertical veins of translucent and white (N9) gypsum(<12mm). Fractures are subhorizontal to subvertical very closely to medium spaced undulating rough. Non calcareous	Bedrock	Low
	40.30-40.65m	Very stiff extremely high strength greenish grey (5GY 6/1) silty clay with occasional pockets (<15mm) of translucent and white (N9) gypsum. Non calcareous		
	50.6	Very weak moderately to highly weathered moderate brown (5YR 3/4) mottled greenish grey (5G 6/1) MUDSTONE with occasional subhorizontal to subvertical veins (<14mm) of translucent gypsum. Fractures are subhorizontal to subvertical very closely to medium spaced undulating rough. Non calcareous	Bedrock	Low
BH_27	12.3	Dark greyish brown (7.5YR 4/2) silty SAND. Sand is fine to coarse. Calcareous	Sand (undifferentiated)	Low
	18.3	Firm high strength reddish brown (5YR 4/3) silty CLAY with closely to medium spaced thin laminations of reddish grey (5YR 5/2) silt. Calcareous	Glaciomarine	Low
	29.1	Stiff very high strength dark reddish brown (5YR 3/2) silty gravelly CLAY. Gravel is fine to coarse, subangular to rounded. Calcareous	Glacial clay	Low
	48.9	Very stiff extremely high strength dark brown (7.5YR 3/2) silty gravelly CLAY. Gravel is fine to coarse, subangular to rounded. Calcareous	Glacial clay	Low
	50.1	Brown (10YR 4/3) silty SAND. Sand is fine to medium. Calcareous	Glacial sand	Low
CPT_27	12.5	Dense to very dense SAND	Sand (undifferentiated)	Low
	12.12-12.49m	Medium bed of loose to medium dense clayey SAND		
	28.31	Medium to very high strength strength slightly gravelly silty CLAY	Glaciomarine	Low
	45.8	Extremely high strength slightly gravelly silty CLAY	Glacial clay	Low
	29.60m	Brown (7.5YR 4/3) Silty gravelly CLAY. Gravels are fine to coarse subangular to subrounded. Cobble recovered (5cm x 8cm x 7cm) of grey igneous rock		
	50.22	Extremely high strength slightly gravelly silty CLAY	Glacial clay	Low
CPT_28	0.44	Extremely low strength silty CLAY	Marine clay	Low

ID	Depth (mbsf)	Description	Unit	Priority
	11.28	Dense to very dense SAND	Sand (undifferentiated)	Low
	10.83-11.14m	Medium bed of low to medium strength slightly gravelly silty clay		
	21.74	Medium to very high strength slightly gravelly CLAY	Glaciomarine	Low
	23.8	Very high to extremely high strength silty CLAY	Glacial clay	Low
	27.28	Extremely high strength sandy gravelly CLAY	Glacial clay	Low
	31	Extremely weak to very weak moderately weathered moderate brown (5YR 3/4) MUDSTONE. Fractures are subhorizontal closely to medium spaced open undulating and rough. Non calcareous	Bedrock	Low
	28.00-29.00m	With occasional very closely to closely spaced subhorizontal to subvertical veins of white gypsum (up to 5mm). Non calcareous		
	29.00-29.70m	Moderate brown (5YR 3/4) with mottled light olive grey (5Y 4/1)		
	30.00-30.95m	With rare medium to coarse gravel sized clasts of white (N9) gypsum		
	36.1	Extremely weak moderately to high weathered moderate brown (5YR 3/4) MUDSTONE with very closely to closely spaced very thin to thin beds beds of very stiff extremely high strength dark brown (7.5YR 3/3) clay. Calcareous	Bedrock	Low
	34.60-34.95m	Slightly weathered with rare medium to coarse gravel sized clasts of white (N9) gypsum		
	43.6	Extremely weak to very weak moderately weathered reddish brown (5YR 3/4) MUDSTONE with rare veins (up to 60mm) of translucent gypsum. Fractures are subhorizontal to horizontal very closely to medium spaced undulating rough. Calcareous	Bedrock	Low
	38.10-38.52m	Weak		
	41.10-42.04m	Mottled with dark greenish grey (GLEY1 4/10GY)		
	48.38	Very weak to weak moderately weathered moderate brown (5YR 3/4) MUDSTONE with occasional subhorizontal to subvertical white (N9) gypsum veins (<8mm). Fractures are subhorizontal to subvertical closely to medium spaced open undulating and rough. Calcareous	Bedrock	Low
	44.60-45.35m	Fractures are subhorizontal extremely closely to medium spaced open undulating and rough		
	46.86-46.95m	Greenish grey (5G 6/1)		
BH_29	2.45	Very soft extremely low to very low strength dark grey (2.5Y 4/1) CLAY. Slightly calcareous	Marine clay	Low

ID	Depth (mbsf)	Description	Unit	Priority
	5.68	Stiff medium to very high strength dark grey (5YR 3/1) CLAY with very closely to closely laminatios of light grey (5YR 7/1) silt. Non calcareous	Glaciomarine	Low
	14.3	Stiff medium to high strength dark brown (7.5YR 3/3) slightly gravelly slightly sandy silty CLAY with very clolsely to closely spaced thin laminations of light grey (5YR 7/1) silt. Gravel is subangular to subrounded fine to medium mixed lithologies. Sand is fine. Non calcaeous	Glaciomarine	Low
	Below 13.80m	Very stiff high to very strength		
	15.1	Very stiff extremely high strength dark brown (7.5YR 3/3) mottled greenish grey (GLEY 2 7/1) slightly gravelly slightly sandy silty CLAY with rare veins of translucent gypsum (<3mm). Gravel is subangular to subrounded fine to medium mixed lithologies and mudstone lithorelics. Sand is fine to medium. Calcareous	Bedrock	Low
	20.1	Very weak to weak slightly weathered moderate brown (5YR 4/4) MUDSTONE with frequent subhorizontal to subvertical veins of translucent gypsum (<25mm). Fractures are closely to widely spaced subhorizontal undulating rough with gravelly clay infill (<10mm). Slightly calcareous	Bedrock	Low
	15.70-16.15m	Extremely weak to very weak moderately weathered.		
	16.05-16.08m	Subhorizontal planar rough fracture with gravelly clay infill.		
	16.45-17.10m	Frequent nodules of gypsum (<25mm).		
	17.25m	Thick lamination of light olive grey (5Y 5/2) siltstone		
	17.74-17.79m	Weathered to a stiff gravelly clay. Gravels are angular fine to coarse of mudstone lithorelicts		
	27.88	Very weak to weak slightly weathered moderate brown (5YR 4/4) MUDSTONE with frequent subhorizontal to subvertical veins of translucent gypsum (<16mm). Fractures are medium to widely spaced subhorizontal planar rough. Calcareous	Bedrock	Low
	21.45-21.91m	Medium bed of extremely weak to very weak slightly weathered moderate brown (5YR 4/4) mottled dark greenish grey (5G 4/1) MUDSTONE with frequent subhorizontal to subvertical veins of translucent gypsum (<18mm). Calcareous		
	25.66-25.67m	Subhorizontal fracture planar smooth infilled with claybound gravel (<5mm)		
	27.14-27.15m	Subhorizontal fracture planar rough infilled with moderate brown and greenish grey clay		
	38.6	Weak moderate brown (5YR 3/4) MUDSTONE with frequent subhorizontal to subvertical veins of translucent gypsum (<10mm). Fractures are subhorizontal medium to very widely spaced planar rough. Slightly calcareous	Bedrock	Low

ID	Depth (mbsf)	Description	Unit	Priority
	Below 30.30m	Veins of gypsum are subhorizontal to inclined 50 degrees		
	30.45-31.00m	Frequent crystals of gypsum (<20mm)		
	31.65-31.70m	Nodule of gypsum crystals (35mm x 40mm)		
	32.74-32.80m	Occasional greenish grey (5G 6/1) reduction spots (<15mm)		
	33.10-33.60m	Rare lenses of greenish grey (5GY 6/1) siltstone (up to 10mm x 60mm)		
	47.6	Very weak to weak slightly weathered moderate brown (5YR 4/4) mottled greenish grey (5G 6/1) MUDSTONE with frequent crystals (<8mm) and subhorizontal to inclined 45 degrees veins of translucent gypsum (<10mm). Medium spaced very thin to thin greenish grey (5G 6/1) beds. Non calcareous	Bedrock	Low
CPT_29	3	Extremely low to very low strength CLAY	Marine clay	Low
	12.34	Medium to high strength slightly gravelly CLAY	Glaciomarine	Low
	15.18	High to very high strength slightly gravelly silty CLAY	Glacial clay	Low
	14.28m	Becoming extremely high strength		
BH_30	1.4	Very dark grey (2.5Y 3/1) very clayey fine to medium SAND with rare fine gravel sized shell fragments. Calcareous	Shallow marine sand	Low
	15.4	Brown (10YR 5/3) silty fine to medium SAND. Calcareous	Sand (undifferentiated)	Low
	16.42	Grey (5Y 5/1) laminated clayey fine to medium SAND with extremely to very closely spaced thin laminations of firm greenish grey (5GY 5/1) clay. Calcareous	Glaciomarine	Low
	15.40-16.00m	Medium bed of firm to stiff low to medium strength dark grey (5Y 4/1) sandy CLAY with rare fine gravel sized shell fragments. Calcareous		
	19.28	Olive grey (5Y 5/2) silty fine to medium SAND with occasional medium to coarse sand sized shell fragments. Rare pockets (up to 15mm) black (5Y 2.5/1) organic matter. Calcareous	Glacial sand	Low
	27.05	Stiff to very stiff very high to extremely high strength dark reddish brown (5YR 3/4) gravelly sandy silty CLAY. Gravel is fine to medium subangular to subrounded of mixed lithology. Sand is fine to medium. Non calcareous	Glacial clay	Low
	30.39	Very stiff extremely high strength reddish grey (5YR 5/2) silty CLAY with occasional fragments (up to 5mm) of translucent gypsum with extremely closely to closely spaced thin laminations of greenish grey (5G 6/1) mudstone. Non calcareous	Bedrock	Low

ID	Depth (mbsf)	Description	Unit	Priority
	27.30-27.47m	Extremely weak to very weak moderately weathered light brownish grey (5YR 6/1) mottled light olive grey (5Y 6/1) mudstone. Non calcareous		
	38.6	Extremely weak to very weak moderately weathered greenish grey (5G 6/1) and moderate brown (5YR 4/4) MUDSTONE with closely spaced thin to medium beds of weak to medium dark reddish brown (5YR 3/3) silty clay. Frequent subhorizontal to subvertical veins of gypsum (up to14mm). Fractures are subhorizonal to subvertical closley to widely spaced undulating rough. Non calcareous	Bedrock	Low
	31.20-31.38m	Fractures are subhorizonal to subvertical closley to widely spaced undulating rough		
	31.60-31.84m	Medium bed of very stiff extremely high strength dark greenish grey (5YR 4/1) silty clay with occasional pockets (up to15mm) translucent gypsum fragments. Non calcareous		
	33.35-33.85m	Medium bed of very stiff extremely high strength reddish brown (5YR 4/3) silty clay. Non calcareous		
	34.85-34.95m	With occasional subhorizontal thick laminations of translucent gypsum		
	37.10-37.22m	Very stiff extremely high strength friable dark greenis grey (10Y 4/1) silty clay with occasional pockets (up to 10mm) of translucent gypsum fragments. Non calcareous		
	37.22-38.60m	Assumed zone of core loss		
	42.6	Extremely weak moderately to highly weathered greenish grey (5G 6/1) and moderate brown (5YR 3/4) MUDSTONE with closely to medium spaced subhorizontal thick laminations (up to 18mm) of translucent gypsum. Fractures are horizontal to sbhorizontal very closely to closely spaced undulating rough. Non calcareous	Bedrock	Low
	41.10-42.60m	Very closely to closely very thin beds of weak grey (5Y 4/1) siltstone		
	50.45	Extremely weak to very weak moderately weathered moderate brown (5YR 4/4) locally mottled with greenish grey (5G 6/1) MUDSTONE with very closely to medium spaced subhorizontal thick laminations of translucent gypsum. Fractures are subhorizontal very closely to medium spaced undulating rough locally infilled with reddish brown clay. Non calcareous	Bedrock	Low
CPT_30	0.56	Very loose to loose clayey SAND	Shallow marine sand	Low
	18.93	Dense to very dense gravelly SAND	Sand (undifferentiated)	Low
	14.80-16.05m	Thick bed of high to very high strength silty sandy clay		

ID	Depth (mbsf)	Description	Unit	Priority
	24.48	High to very high strength sligthly gravelly silty CLAY	Glacial clay	Low
	24.03-24.43m	Thin bed of loose to medium dense sandy silt		
	24.34-24.42m	Thin bed of loose to medium dense sandy silt		
	35	Extremely high strength silty sandy CLAY / weathered MUDSTONE	Bedrock	Low
	50.24	Extremely weak to very weak highly weathered greenish grey (5G 6/1) and moderate brown (5YR 4/4) MUDSTONE with closely spaced thin to medium beds of weak to medium dark reddish brown (5YR 3/3) siltstone. Frequent subhorizontal to subvertical veins of gypsum (up to 14mm). Fractures are subhorizonal to subvertial closley to widely spaced undulating rough. Non calcareous	Bedrock	Low
	39.20-40.70m	Very weak to weak to very weak highly weathered greenish grey (5G 6/1) and moderate brown (5YR 4/4) with closely spaced thin to medium beds of weak to medium dark reddish brown (5YR 3/3) silty clay. Frequent subhorizontal to subvertical veins of gypsum (up to14mm). Fractures are subhorizonal to subvertial closley to widely spaced undulating rough. Non calcareous		
CPT_31	1.5	Extremely low to low strength silty CLAY	Marine clay	Low
	2.3	Very loose to dense silty SAND	Shallow marine sand	Low
	12.4	Dense to very dense gravelly silty SAND	Sand (undifferentiated)	Low
	14.38	Loose to medium dense clayey SAND	Sand (undifferentiated)	Low
	13.01-13.10m	Thin bed of high to very high strength silty clay		
	13.78-13.85m	Thin bed of high to very high strength silty clay		
	18.43	Medium dense to dense gravelly silty SAND	Sand (undifferentiated)	Low
	30.19	Medium to very high strength gravelly silty CLAY	Glacial clay	Low
	43.3	Very stiff extremely high strength greenish grey (10GY 5/2) silty CLAY with medium to widely spaced thin beds of extremely weak moderately weathered greenish grey (5GY 6/1) mudstone. Non calcareous	Bedrock	Low

ID	Depth (mbsf)	Description	Unit	Priority
	50.57	Extremely weak to very weak moderately to highly weathered greenish grey (5G 6/1) and moderate brown (5YR 4/4) MUDSTONE with frequent extremely closely to closely spaced subhorizontal to subvertical thin to thick laminations (up to 12mm) translucent gypsum viens. Fractures are subhorizontal very closley to closely spaced undulating rough. Non calcareous	Bedrock	Low
CPT_32	5.81	Extremely low to very low strength CLAY	Marine clay	Low
	10.2	Dense to very dense slightly gravelly SAND	Sand (undifferentiated)	Low
	20.93	Low strength to high strength slightly gravelly CLAY	Glacial clay	Low
	27.25	Very high to extremely high strength slightly gravelly CLAY	Glacial clay	Low
	37.44	Extremely high strength silty CLAY	Bedrock	Low
	31.10-31.42m	Greenish grey (10GY 6/1) mottled light brownish grey (5YR 6/1) clay with occasional fragments of gypsum. Non calcareous		
	31.40-32.10m	Very stiff extremely high strength reddish brown (5YR 3/4) silty clay with occasional subhorizontal veins (up to 10mm) of translucent gypsum. Non calcareous		
CPT_32_A	38.3	Extremely weak to very weak moderately weathered light brownish grey (5YR 6/1) mottled light olive grey (5Y 6/1) MUDSTONE with frequent fragments (up to 5mm) of white (N9) and translucent gypsum. Fractures are closely to medium spaced subhorizontal undulating rough. Non calcareous	Bedrock	Low
	39.4	Very stiff extremely high strength greenish grey (5G 6/1) silty CLAY with occasional fragments (up to 5mm) of translucent gypsum. Non calcareous	Bedrock	Low
	40.4	Extremely high strength CLAY	Bedrock	Low
	41	Extremely high strength sandy silty CLAY	Bedrock	Low
	50.28	Extremely high strength silty CLAY	Bedrock	Low
BH_OSS	5.54	Very soft extremely low strength dark grey (7.5YR 4/1) CLAY	Marine clay	Low
	6.65	Very soft extremely low strength dark grey (7.5YR 4/1) sandy CLAY. Sand is fine to medium	Marine clay	Low
	10.41	Dark grey (2.5Y 4/1) fine SAND. Slightly calcareous	Glaciomarine	Low
	8.41-9.62m	Thin bed of very soft very low strength dark grey (7.5YR 4/1) sandy clay. Sand is fine to medium. Sligtly calcareaous		
	16.41	Firm to stiff medium to high strength greyish brown (10YR 5/2) silty CLAY. Sligtly calcareaous	Glaciomarine	Low
	13.00-14.44m	With very closley to close spaced thin lamination of light grey (10YR 7/1) silty sand. Micaceous. Non calcareous		

ID	Depth (mbsf)	Description	Unit	Priority
	22.8	Stiff high to very high strength dark brown (10YR 3/3) gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of mixed lithology. Sand is fine. Slightly calcareous	Glacial clay	Low
	26.9	Stiff to very stiff very high to extremely high strength drak brown (10YR 3/3) slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to medium of mixed lithology. Slightly Calcareous	Glacial clay	Low
	40.41	Very stiff extremely high strength dark brown (7.5YR 3/3) slightly gravelly silty CLAY. Gravel is subrounded to subangular fine to medium. Calcareous	Glacial clay	Low
	31.10-33.16m	Dark greyish brown (10YR 4/2) slightly gravelly sandy clay. Gravel is subrounded to subangular fine to medium. Sand is fine. Calcareous		
	37.52-40.41m	With occasional pockets (<20mm) of white (10YR 8/1) gypsum		
	42.2	Very stiff extremely high strength friable very dark brown (7.5YR 2.5/3) silty CLAY with occasional subhorizontal to subvertical thin lamination of white (N9) gypsum viens. Non calcareous	Glacial clay	Low
	48.51	Weak dark greyish brown (5YR 3/2) and light brown (5YR 5/6) HALITE. Fractures are horizontal to subhorizonta extremely closely spaced undulating rough.With dark brown (10YR 3/3) clay staining on fracture surfaces	Bedrock	Low
	45.20-45.38m	Thin bed of weak moderately weathered dark greenish grey (5G 4/1) mudstone with thick laminae of dark greyish brown (5YR 3/2) and light brown (5YR 5/6) halite		
	50.9	Very weak to weak moderate brown (5YR 3/4) with locally mottled dark greenish grey (5G 4/1) MUDSTONE with occasional inclusion of light brown (5YR 5/6) halite crystal. Fractures are horizontal to subhorizontal extremely to closely spaced undulating to planar rough	Bedrock	Low
	65.63	Weak greyish brown (5YR 3/2) and light brown (5YR 5/6) HALITE. Fractures are horizontal to subhorizontal extremely closely spaced undulating rough with dark brown (10YR 3/3) clay staining on fracture surfaces. Frequent subhorizontal to subvertical veins of translucent gypsum (<14mm)	Bedrock	Low
CPT_OSS	5.8	Extremely low to low strength CLAY	Marine clay	Low
	10.16	Medium dense to very dense silty SAND	Sand (undifferentiated)	Low
	5.99-6.11m	Thin bed of very loose sandy silt		
	6.75-6.85m	Thin bed of very high strength silty clay		
	8.3	Loose to dense silty SAND	Sand (undifferentiated)	Low

ID	Depth (mbsf)	Description	Unit	Priority
	7.30-7.40m	Thin bed of medium to high strength silty clay		
	9.4	Medium dense to very dense silty SAND	Sand (undifferentiated)	Low
	27.4	Medium to very high strength slightly gravelly silty CLAY	Glacial clay	Low
	32.28	Very high to extremely high strength slightly gravelly sandy CLAY with medium spaced thin to medium beds of medium dense to dense sandy silt	Glacial clay	Low
	41.16	Very high to extremely high strength slightly gravelly silty CLAY	Glacial clay	Low
	46.2	Weak greyish brown (5R 3/2) HALITE. Fractures are horizontal to subhorizontal extremely to very closely spaced undulating rough with occasional dissolution cavities (<10mm)	Bedrock	Low
	43.72-44.32m	Medium bed of weak slightly to moderately weathered moderate brown (5YR 3/4) mudstone with rare subhorizontal thick laminae of white (N9) gypsum veins. Fractures are closely to medium spaced open planar and smooth		
	44.32-44.40m	Orange (10R 6/6) and very pale orange (10YR 2/2)		
	48.3	Weak slightly to moderate weathered moderate brown (5YR 3/4) MUDSTONE with closely to medium spaced beds of greyish brown (5R 3/2) halite. Fractures are very closely to closely spaced open planar smooth. Non Calcareous	Bedrock	Low
	47.45-47.52m	dark greenish grey (5G 4/1)		
	47.70-47.80m	With rare pockets (<30mm) very pale orange (10YR 2/2) halite crystal		
	48.30-49.10m	Assumed zone of core loss		