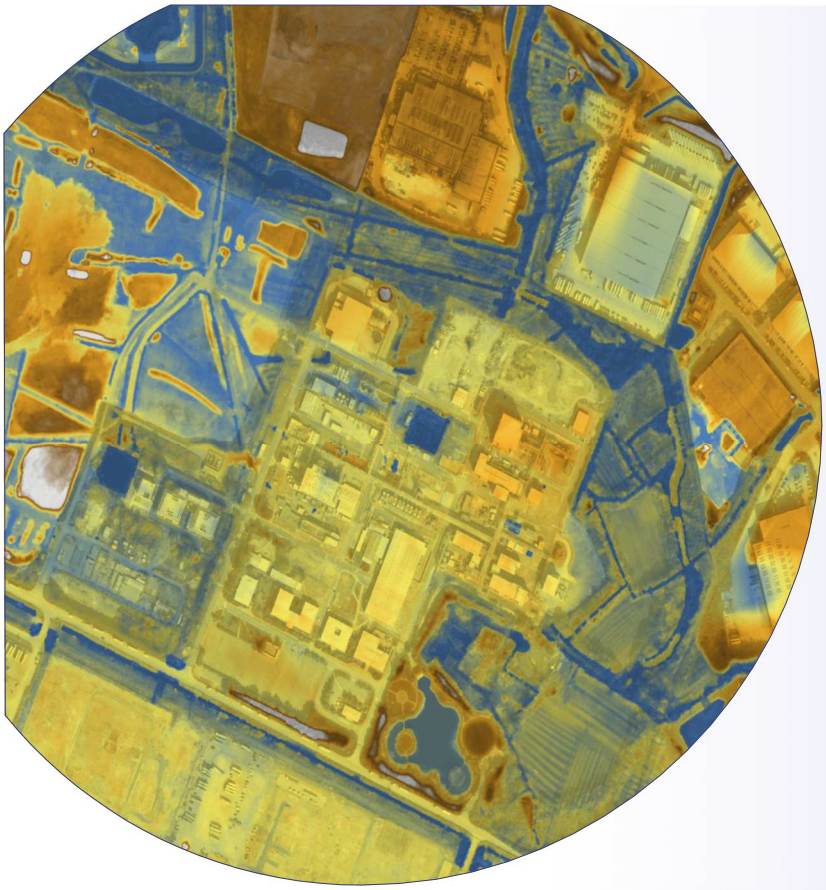

Former Avlon Works, Avonmouth, South Gloucestershire

Geoarchaeological Deposit Model Report

August 2022

Client: Avonmouth Industrial Estates (UK) Ltd

Issue No: V1
OA Reference No: 8172
NGR: ST 5480 8330

oxfordarchaeology

Client Name:	Avonmouth Industrial Estates (UK) Ltd.
Document Title:	Avlon Works Factory, Avonmouth, South Gloucestershire
Document Type:	Geoarchaeological Deposit Model Report
Grid Reference:	ST 5480 8330
Planning Reference:	P21/06880/F
Site Code:	N/A
Invoice Code:	AVALONDA
OA Document File Location:	https://files.oxfordarchaeology.com/nextcloud/index.php/s/r3grjP35idZTJ4s/
Issue No:	V1
Date:	04/08/22
Prepared by:	Thomas Bruce (Geoarchaeology Supervisor)
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Former Avlon Works, Avonmouth, South Gloucestershire

Geoarchaeological Deposit Model Report

Written by Thomas Bruce and Carl Champness

Contents

1 INTRODUCTION 1
1.1 Scope of work 1
1.2 Location, topography and geology 1
1.3 Geoarchaeological background 2
1.4 Archaeological and Historical background 3
2 AIMS AND METHODOLOGY 6
2.1 Aims 6
2.2 Methodology 6
3 RESULTS 9
3.1 Introduction and presentation of results 9
3.2 Deposit model 9
4 DISCUSSION 14
4.1 Reliability of the investigation 14
4.2 Summary of objectives and results 14
4.3 Significance and potential 15
APPENDIX A LITHOLOGICAL BOREHOLE DESCRIPTIONS 17
APPENDIX B BIBLIOGRAPHY 40

List of Figures

Fig. 1 Site location map
Fig. 2 Location of GI boreholes, window sample and test pits with Plot 5000 borehole locations
Fig. 3 LiDAR DTM of site with borehole, window sample and test pit locations
Fig. 4 Map of underlying bedrock geology
Fig. 5 Litho-stratigraphic borehole profile: Transect A
Fig. 6 Litho-stratigraphic borehole profile: Transect B
Fig. 7 Litho-stratigraphic borehole profile: Transect C
Fig. 8 Litho-stratigraphic borehole profile: Transect D

Summary

Oxford Archaeology (OA) was commissioned by BSA Heritage on behalf of Avonmouth Industrial Estates (UK) Ltd to prepare a geoarchaeological deposit model to inform archaeological mitigation for the redevelopment of the former Avlon Works site.

The site is located within an area of significant historic environmental and archaeological interest, comprising the historic Avon Levels and the Severn Estuary. Although no designated heritage assets were identified in the archaeology and heritage statement (BSA Heritage, 2021), several historic medieval or post-medieval farmstead sites are recorded by the South Gloucestershire Historic Environment Record (HER) both within the site and the vicinity. In addition, several archaeological and geoarchaeological investigations have been undertaken in the vicinity, identifying the presence of Romano-British settlement and a complex series of Holocene sediments attributed to the Wentlooge Formation with significant palaeoenvironmental potential.

The purpose of the deposit modelling was to provide additional base-line data with which to inform the design and implementation of any post-determination mitigation. The sub-surface litho-stratigraphy was analysed using sediments recorded from geotechnical (GI) investigations combined with previous geoarchaeological data from the surrounding area. The work utilised data from 94 ground investigation records that were obtained from a mixture of cable percussion boreholes, window samples and test pits.

Four stratigraphic units were identified overlying the Mercia Mudstone bedrock and were correlated to the Wentlooge Formation. The earliest deposits form the Lower Wentlooge Formation and comprise sandy and gravelly deposits deposited through marine and outer estuarine processes during the early to mid-Holocene. Overlying these are a sequence of intercalated alluvial deposits and organic peat horizons belonging to the Middle Wentlooge Formation. These accumulated during the early Neolithic to Late Bronze Age periods and represent alternating periods of wetland expansion and salt marsh development associated with fluctuations in sea-level rise. The Upper Wentlooge alluvium began to accumulate during the Iron Age and contains a Romano-British archaeological horizon associated with settlement activity identified in neighbouring plots. Made ground deposits truncate the Upper Wentlooge deposits throughout the central and western areas of the site, although these deposits remain relatively undisturbed in the eastern and northern parts of the development area.

The presence of Upper Wentlooge sediments throughout site suggests any archaeological remains occurring may remain undisturbed, although more likely in areas where there is less modern truncation and made ground. The site lies immediately west of Plot 5000, and it would therefore seem reasonable to assume there is potential for the continuation of archaeological activity within the eastern and northern areas of the site, albeit diminishing in intensity, as it moves away from the main settlement areas. The surrounding plots to the north and northwest of the site

also have not produced any remains, so the presence of archaeology across the area is therefore not certain.

The Roman land surface was identified at c 5.45m OD in Plot 5000 and if present, it should be preserved within the eastern and northernmost parts of site. The central and western areas appear to have been widely truncated by modern development with made ground deposits present within the upper 1-2m, up to 4m BGL in some places.

The Middle and Lower Wentlooge sediments survive throughout site, which indicates any prehistoric activity is also likely to remain undisturbed. There is significant palaeoenvironmental information preserved within the organic peat deposits. However, this has been extensively assessed in adjacent plots, creating a detailed picture of landscape evolution throughout the Holocene. These deposits will not be significantly impacted by the development and appear to correlate well with the sedimentary sequence studied in the previous areas.

1 INTRODUCTION

1.1 Scope of work

1.1.1 Oxford Archaeology (OA) was commissioned by BSA Heritage on behalf of Avonmouth Industrial Estates (UK) Ltd to prepare a geoarchaeological deposit model to inform a hybrid planning application for the commercial redevelopment of the former Avlon Works site. As part of the desk-based study 94 ground investigation (GI) records were assessed, inputted and correlated into a litho-stratigraphic deposit model.

1.1.2 The site consists of a former AstraZeneca operated pharmaceutical manufacturing works which contained approximately 30 buildings with associated roads, car parks and manufacturing infrastructure. There are areas of woodland, waterbodies and open green space in the east of site, with a mix of buildings, hard surfaced areas and chemical manufacturing plant to the west.

1.1.3 The site is located within an area of significant historic environment and archaeological interest, comprising the historic Avon Levels and the Severn Estuary. Although no designated heritage assets were identified in the archaeology and heritage statement (BSA Heritage, 2021), several historic medieval or post-medieval farmstead sites are recorded by the South Gloucestershire Historic Environment Record (HER) both within the site and the vicinity. In addition, several archaeological and geoarchaeological investigations have been undertaken in the immediate vicinity, identifying the presence of substantial Romano-British settlement within plots adjacent to site and a complex series of Holocene sediments attributed to the Wentlooge Formation that contain significant palaeoenvironmental potential.

1.1.4 The Archaeological Officer at South Gloucestershire Council has recommended a programme of archaeological investigation to mitigate the effects of future groundworks. This geoarchaeological deposit modelling study of the site has been prepared in order to provide additional base-line information with which to inform the design and implementation of any further mitigation.

1.1.5 This report presents the results of the deposit modelling study and has been prepared in accordance with current Historic England (2020) guidelines.

1.2 Location, topography and geology

1.2.1 The site is situated on Henbury Level, an area of low-lying and artificially drained land that forms part of the Avon Levels. It is located within the Severn View Industrial Park, approximately 0.70km east of the Severn Channel, 0.6km south-east of Severn Beach and 0.78km west of the M49 (NGR ST 5480 8330, **Figure 1**). Ground elevations remain relatively level across the site at around 6m OD (Ordnance Datum), with the site extending across approximately 41 hectares (ha).

1.2.2 The area has been substantially developed throughout the latter half of the 20th century on what was formerly agricultural land. Industrial complexes developed in the post-war period have been recently redeveloped with modern commercial warehouse units. Large, modern, warehouse units border the site to the north, south and east

while land has been cleared ahead of redevelopment to the west. It is likely the area was prone to periodic marine inundation until modern sea defences were constructed.

1.2.3 The underlying bedrock geology consists of Triassic Mercia Mudstone, and is overlain by superficial Tidal Flat Deposits (**Fig.4**, BGS, 2022). Previous geoarchaeological investigations in the area (e.g. Champness 2010) have identified a bedrock ridge to the east of site, running north-east to south-west through Plots 4000 and 5000. The Tidal Flat Deposits have been attributed to the Wentlooge Formation, which can be split into three sub-categories; The Lower, Middle and Upper Wentlooge Formations. The Lower Formation consists of marine and estuarine sands interbedded with peat deposits that formed in the early-mid Holocene. The Middle Wentlooge Formation comprises estuarine silt and clay alluvium with intercalated peat horizons, while the Upper Formation is comprised oxidised alluvium with both of the latter showing evidence for episodic marine inundation.

1.3 Geoarchaeological background

1.3.1 The Pleistocene evolution of the Severn Estuary has been the subject of considerable academic study with the currently accepted stratigraphic sequence based on work undertaken by Allen (1987; 1990) and Allen and Rae (1987). Holocene sediments in the area comprise estuarine alluvium, organic clay, and peats. These deposits are macrotidal and well-mixed sediments, receiving fine sediment from many sources. The peat deposits accumulated in a variety of environments, representing alder carr, fen, reedswamp, intertidal saltmarsh, and mudflat and date from the Mesolithic through to the Romano-British period. At least four discrete lithostratigraphic formations, predominantly of sandy to silty clay, have been identified along the shores of the Severn Estuary in the intertidal zone, reaching depths of up to 20m.

1.3.2 The site is located on the eastern margins of the Severn Estuary, on a complex sequence of Holocene sediments known as the Wentlooge Formation. These sediments overlie the Mercia Mudstone bedrock geology throughout the landscape. Investigations to the immediate east of the site, in Plots 4000 and 5000, identified a ridge of Mercia Mudstone aligned north-east to south-west that would have formed drier ground raised above the surrounding wetland and estuarine landscape. Roman activity in both Plots 4000 and 5000 was concentrated away from the major drainage channels, possibly associated with the influence of an underlying bedrock ridge.

1.3.3 The Wentlooge Formation can be broadly divided into three main lithological units, the Lower, Middle and Upper Wentlooge Formations. The Upper and Middle Wentlooge Formations have been assessed previously in numerous investigations both throughout the wider Severn Estuary and Avon Levels (e.g. Allen and Scaife 2001; Allen *et al*. 2002; Gardiner *et al.* 2002), and also within the study area in Plots 4000, 6010, 6020, 7000 and 8000. Extensive assessment of the Lower, Middle and Upper Wentlooge Formations in Plot 5000 by Oxford Archaeology (Champness 2010) was able to characterise the full Wentlooge sequence in the immediate study area, the findings of which are summarised below.

1.3.4 The Lower Wentlooge Formation consists of estuarine and marine sands that were deposited during the early-mid Holocene. These represent high-energy deposits

formed in an intertidal channel system surrounded by low tidal mud-flats, which suggest that the area was once part of a larger marine embayment or backwater lagoon. This sequence appears to have been protected from the more extreme tidal range of the Bristol Channel and the presence of intercalated Mesolithic peat deposits indicate it was cut off from marine influence on multiple occasions. The presence of a burnt layer of reeds within the peat deposits may indicate that these stabilised environments were attractive to Mesolithic groups.

1.3.5 The change into the Middle Wentlooge Formation is marked by the deposition of low-energy intercalated silty clays and peats, indicating the end of outer estuarine influences, the silting up of the embayment, and cycles of sea-level change. Marine conditions transition from estuarine mud-flats to mixed brackish and freshwater mid to high salt marsh environments during the Neolithic and Bronze Age that were still subject to marine inundation. Marshland systems developed throughout these periods and evolved into large expanses of alder carr and reedswamp, which were dissected by areas occupied by eroding creeks. The intercalated peat deposits represent predominantly freshwater environments with only occasional brackish incursions. The middle sequence repeatedly alters through cycles of marine transgressions and regressions, marked by the intercalated alluvium and peat deposits. Areas of dynamic wetland vegetation were returned back to scoured mud-flats during marine transgressions, which in turn developed into salt marsh and then back to marshland, reed fen and alder carr environments.

1.3.6 The Upper Formation consists of estuarine silty clays and sands representing an increase in marine incursions from the Late Bronze Age. This sequence appears to have accumulated quite rapidly during a period of accelerated sea-level rise between the early Iron Age and the early Romano-British period that saw the development from mid to high salt marsh. Alluvial deposition was probably augmented during this period by changes in agricultural practices and other land use, resulting in greater wash-off into local river systems (Moore *et al.* 2002). The upper surface of the alluvium appears to have stabilised by the early Roman period suggesting that sedimentation had significantly reduced by this period. Reclamation during the Roman period is thought to have isolated the Wentlooge Surface within large areas of tidal wetland in the lower estuary and the preservation of this surface and the alluvial topsoil may indicate that some limited alluviation occurred over the Roman surface in parts of the Levels.

1.4 Archaeological and Historical background

1.4.1 The area surrounding the site has been the subject of numerous archaeological and geoarchaeological investigations from the late 1990s onwards. Work has been undertaken on sites located immediately to the north (Plots 6010, 6020, 6030 7000, 8000; Wessex 2006b and Oxford 2018) east (Plots 4000; Ritchie *et al*. 2008, and 5000; Champness 2010) and west of site, as well as in the wider area (Figures 2 and 4).

1.4.2 The general archaeological background to the site has been presented in the Archaeology and Heritage Statement (BSA Heritage 2021) and only the most relevant points will be summarised here:

Prehistoric (10,000 BC to AD 43)

1.4.3 Evidence for prehistoric activity is sparse within the area. Limited evidence for Late Iron Age activity was recorded to the east of the site in Plot 5000, where a layer of burnt reeds was identified within peat deposits dating from the Mesolithic, indicating the potential prehistoric exploitation of wetland environments (Champness 2010). Similar, charred peat deposits were also identified during an archaeological investigation directly to the south-west of site and also within Plot 4000 (Ritchie *et al.* 2008). These were dated to the Early and Late Bronze Age respectively.

Roman (AD 43 to AD 410)

1.4.4 It was not until the Romano-British era that the Avonmouth-Severnside wetlands were partly reclaimed through the construction of protective earthen embankments and the excavation of ditches and sluices to drain the land (Severn Estuary Levels Research Committee website). Romano-British settlement within the wetlands area tended to prefer the occupation of the relatively dry land further from the coast within the Avonmouth-Severnside Levels (Mullin, Brunning & Chadwick, 2009).

1.4.5 At Crooks Marsh (Figure 4), to the south of the site, a Romano-British settlement dating from the late 4th to early 5th centuries was identified during clay extraction and consisted of ditches and enclosures, c.0.5m below ground surface, with coins dated to AD 367-383 and other finds suggesting occupation from 4th to 5th centuries (Mullin, Brunning & Chadwick, 2009). There was evidence of silting and recutting of ditches associated with small rectangular features and industrial activity on the site was suggested from increased levels of charcoal and heat-damaged clay and pottery (Masser *et al.* 2005).

1.4.6 Further work around the site revealed three ditches containing substantial quantities of 3rd to 4th century pottery, coins and some very late 4th or early 5th century shell-gritted wares. The environmental evidence suggested an open environment where ditches were periodically flooded by saltwater, but wheat and barley were grown and processed in the vicinity (Mullin, Brunning & Chadwick, 2009).

1.4.7 At Minor's Lane, situated to the south of the site, a watching brief on cable laying works, located part of a ditch network extending over a considerable area. The ditch contained Romano-British pottery, consisting of Severn-Valley wares and grey wares of the 2nd century date with similar sherds in the subsoil (Allen & Scaife, 2010). The cumulative evidence suggested continuous or intermittent occupation of the area from the 2nd to at least the late 4th century (Masser *et al.* 2005).

1.4.8 Excavations at Farm Lane, to the east of the site recovered evidence for a pair of parallel ditches which contained mid-2nd century AD pottery and features dating to the 3rd to 4th centuries AD were also excavated (Ibid). However, there was no evidence to suggest that the site was occupied beyond AD 350. The environment during the 2nd century around the site appears to have been open grassland with probable cereal cultivation and animal grazing nearby. By the end of the 2nd century, the site appears to have been occasionally inundated by the tide (Ibid).

1.4.9 Romano-British settlement dating from the 2nd - 4th centuries and associated with farmstead activity was identified by Wessex Archaeology in Plot 4000 (Ritchie *et al*. 2008), situated approximately 200m to the north-east of site. Enclosure ditches, at least three roundhouses and possible evidence of metalworking were identified directly below the topsoil, at *c* 5.45m OD. Romano-British activity was also identified in Plot 5000 by Oxford Archaeology (Champness 2010), which included interconnecting co-axial enclosures and droveways. No strong structural evidence was found suggesting that this activity relates to the farmstead settlement in Plot 4000, but is further from the main area of activity. Only limited evidence for further Romano-British activity was recorded in the adjacent plots with archaeological activity appearing to decrease westwards and on lower ground. No substantial archaeology was recorded in Plots 6010, 6020, 7000 and 8000 that sit directly to the north of site, or in a forty-trench evaluation undertaken immediately to the west.

Medieval to modern (AD 410 to present day)

1.4.10 The archaeological sites identified within the site boundary relate to buildings of possible medieval origin present in the southern part of site. These include a number of farmsteads, including Vimpenny's Farm in the south and Hook Farm to the east. The latter comprised a possibly moated farmhouse evident on 19th century and later maps, with stone walling still surviving within the putative moat. Aerial photography also identifies areas of ridge and furrow to the west of site, which has since been levelled, indicating the presence of open medieval field systems in the area.

1.4.11 Medieval and post-medieval remains of Creed's and Dyer's farms were also recorded during archaeological works in Plots 6030 and 6040 (Oxford Archaeology 2018), to the north-east of site, and there are numerous records of medieval and post-medieval farmsteads in the wider landscape.

2 AIMS AND METHODOLOGY

2.1 Aims

2.1.1 The primary aim of the geoarchaeological deposit modelling was to provide additional base-line information on the depth and nature of the sub-surface Quaternary sediments underlying the site and their archaeological and palaeoenvironmental potential. This information is intended to inform the requirement for and nature of any future mitigation strategies for the site.

2.1.2 The specific aims and objectives of the modelling were to:

- characterise the sequence of sediments and patterns of accumulation across the site, including the depth and lateral extent of major stratigraphic units, and the character of any basal land surface pre-dating these sediments;
- outline the anticipated environments of deposition associated with the sediments, formation processes and taphonomy that may have affected preservation of archaeological remains;
- identify significant variations in the deposit sequence indicative of localised features such as topographic highs (e.g. floodplain islands, offshore sandbars) or palaeochannels;
- identify the location and extent of any waterlogged organic deposits and address the potential for the preservation of palaeoenvironmental remains and deposits suitable for scientific dating;
- clarify the relationships between sediment sequences and other deposit types, including periods of 'soil' or peat growth, and the effects of relatively recent human disturbance, including the location and extent of made-ground;
- relate the site sequences to current local to regional models.

3.2.2 The programme of archaeological investigation was conducted within the general research parameters and objectives defined by *the South West Archaeological Research Framework (SWARF) Project - a Resource Assessment and the Research Agenda for archaeology in South West England* (Holbrook 2022).

2.2 Methodology

2.2.1 Overall, data from 36 geotechnical samples were included in the deposit models. These comprised a combination of test pit, window sample and cable percussion borehole data. The distribution of the boreholes is illustrated in **Figures 2** and **3** and the locations listed in **Table 1**. The maximum depth achieved was 12.5m below current ground level (BGL). For comparison, data from 7 geoarchaeological borehole samples from Plot 5000 has been included to assess the continuity of the Wentlooge Formation and these locations are presented in **Table 2**.

Table 1: Summary of geotechnical boreholes

Borehole	Easting	Northing	Elevation	Total Depth
CP101	354741	183444	6.48	12.50
CP102	354800	183269	6.80	12.50
CP103	354176	183167	6.40	11.00
CP104	354593	183049	7.07	12.50
CP105	354443	183404	6.51	12.50
CP301	354623	183276	6.59	12.25
CP302	354593	183287	6.54	12.52
CP303	354504	183282	6.49	7.95
TP202	354662	183578	6.00	2.50
TP203	354731	183528	6.26	2.85
TP209	354905	183115	6.34	2.75
TP210	354924	183148	6.25	3.00
TP220	354740	183073	6.29	2.70
TP224	354829	183091	6.11	2.70
TP225	354857	183028	6.24	2.55
TP228	354888	182987	6.16	2.40
TP304	354235	183233	6.27	3.40
TP305	354267	183236	6.11	3.40
TP306	354299	183216	6.29	3.60
TP310	354700	183491	6.40	3.65
TP321	354416	183336	6.50	3.70
TP322	354404	183314	6.41	3.50
TP323	354396	183283	6.46	3.40
TP325	354670	183279	6.59	3.50
TP328	354672	183410	6.48	3.50
TP336	354500	183447	5.59	3.60
TP341	354669	183451	6.41	3.20
TP346	354848	183240	6.20	3.50
WS204	354870	183132	6.25	5.45
WS205	354944	183157	6.16	5.45
WS206	354922	183211	6.27	5.45
WS207	354951	183258	6.29	5.45
WS209	354900	183309	5.93	5.45
WS210	354843	182906	6.49	5.45
WS211	354776	182900	6.47	5.45
WS212	354649	182969	6.88	5.45

Table 2: Summary of Plot 5000 geotechnical boreholes

Borehole	Easting	Northing	Elevation	Total Depth
OABH1	355256	183434	6.15	5.00
OABH3	355209	183337	5.94	7.00
OABH4	355279	183365	5.99	7.10
OABH6	355208	183279	6.00	6.13
OABH7	355256	183287	5.90	6.00
OAAH5	355122	183233	6.05	4.00
OAAH8	355104	183162	5.89	5.00

2.2.2 A pdf of the graphical borehole logs, along with AGS compatible digital database was provided by the client as an Excel workbook. The digital data was imported into geological modelling software (Rockworks 2022) for correlation of lithological data into stratigraphic units. Correlation was carried out in tandem with analysis of a series of data layers in GIS software (QGIS). The layers included Environment Agency (EA) LiDAR data (**Figure 3**), and BGS 1:50,000 Superficial Geology. The litho-stratigraphic borehole profiles were arranged into four transects, Transect A, Transect B, Transect C and Transect D, which dissected the site broadly E-W, NE-SW and N-S respectively. These were then exported and illustrated in **Figures 5-8**.

3 RESULTS

3.1 Introduction and presentation of results

3.1.1 The results of the litho-stratigraphic deposit modelling are presented below. Lithological units that have been correlated are based on the descriptions in the geotechnical records, which were very brief and largely uninformative, and sediment descriptions from Plot 5000.

3.2 Deposit model

3.2.1 Analysis of the borehole data across the site identified a broad series of commonly occurring litho-stratigraphic units:

I. Topsoil, Subsoil and Made Ground;

II. Upper Wentlooge Formation;

III. Middle Wentlooge Formation;

IV. Lower Wentlooge Formation; and

V. Mercia Mudstone Bedrock.

3.2.2 **Table 3** provides a summary of the elevations (m OD) and depths (m BGL) for each of these units, illustrated in **Figures 5-8**. The detailed lithological descriptions for each borehole are presented in Appendix A.

Bedrock

3.2.3 The mudstone bedrock was not identified in any samples recovered during the GI works from the Avlon Works site, which is consistent with data obtained from the south-west of Plot 5000. Mercia Mudstone is present to the north-eastern part of Plot 5000, forming part of a NE-SW oriented bedrock ridge which also extends through Plot 4000. From here the bedrock surface appears to slope down to the west and south-west and is not encountered throughout the Avlon Works site up to depths of at least -5.96m OD. The bedrock ridge underlying Plots 4000 and 5000 is believed to separate a former inlet of the Severn from the present-day river. This ridge is thought to underlie Pilning, Severn Beach and Seabank. Carter *et al* (2003) estimate that the bedrock ridge would have passed below the high tide level by c.3800 cal BC. However, it still appears to have continued to affect sedimentation patterns and creek formation within the marsh, and may have been a significant influence on the location of late Roman settlement within the Avonmouth Levels.

The Holocene Sequence

3.2.4 The sequence of Holocene sediments that overlie the Mercia Mudstone bedrock comprise a tripartite sequence of silty sands and gravels, organic alluvium with peat horizons, and clayey silts. This sequence has been divided, on the basis of sedimentation types, into three main stratigraphic units that correspond with the Lower, Middle and Upper Wentlooge Formation units identified in previous investigations within the immediate area.

Table 3: Summary of litho-stratigraphy (top of unit)

	Elevation (m OD)							Elevation (m BGL)						
Bore	**T**	**S**	**MG**	**UW**	**MW**	**LW**	**B**	**T**	**S**	**MG**	**UW**	**MW**	**LW**	**B**
CP101			6.48	5.48	4.48	-3.72				0.00	1.00	2.00	10.20	
CP102			6.8	5.8	3.8	-3.4				0.00	1.00	3.00	10.20	
CP103			6.4	5.2	3.4	-0.1				0.00	1.20	3.00	6.50	
CP104			7.07	5.47	2.97	1.57				0.00	1.60	4.10	5.50	
CP105			6.51		5.51	-2.49				0.00		1.00	9.00	
CP301			6.59	5.09	4.09	-1.51				0.00	1.50	2.50	8.10	
CP302			6.54		2.54	-1.56				0.00		4.00	8.10	
CP303			6.49	5.29	3.79	-0.61				0.00	1.20	2.70	7.10	
TP202	6.00			5.75	3.65			0.00			0.25	2.35		
TP203	6.26			6.06	4.96			0.00			0.20	1.30		
TP209	6.34			6.19	3.84			0.00			0.15	2.50		
TP210	6.25			6.1	4.15			0.00			0.15	2.10		
TP220			6.29	5.19	3.79					0.00	1.10	2.50		
TP224			6.11	5.91	3.61					0.00	0.20	2.50		
TP225	6.24		6.09	4.04				0.00			0.15	2.20		
TP228	6.16			5.96	4.66			0.00			0.20	1.50		
TP304			6.27	4.77	3.27					0.00	1.50	3.00		
TP305			6.11	5.21	4.51					0.00	0.90	1.60		
TP306			6.29	6.09	3.69					0.00	0.20	2.60		
TP310			6.4	6.1	4.4					0.00	0.30	2.00		
TP321			6.5	5.7	3.5					0.00	0.80	3.00		
TP322			6.41	5.76	4.41					0.00	0.65	2.00		
TP323			6.46	5.26	3.86					0.00	1.20	2.60		
TP324			6.57	6.37	4.07					0.00	0.20	2.50		
TP325			6.59		4.09					0.00		2.50		
TP328			6.48	6.38	4.48					0.00	0.10	2.00		
TP336			5.59	4.64	3.59					0.00	0.95	2.00		
TP341			6.41	6.01	4.41					0.00	0.40	2.00		
TP346	6.2			5.9	3.7			0.00			0.30	2.50		
WS204	6.25			6.1	4.15			0.00			0.15	2.10		
WS205	6.16			6.01	4.06	2.16		0.00			0.15	2.10	4.00	
WS206	6.27			6.07	4.27	1.87		0.00			0.20	2.00	4.40	
WS207	6.29			6.09	4.39			0.00			0.20	1.90		
WS209	5.97			5.77	3.97			0.00			0.20	2.00		
WS210	6.49			6.39	4.49			0.00			0.10	2.00		
WS211	6.47			6.32	4.47			0.00			0.15	2.00		
WS212			6.88	5.88				0.00			1.00			
OAAH5	6.05	5.8		5.45	3.45	1.55		0.00	0.25		0.60	2.60	4.50	
OAAH8	5.89	5.69		5.39	3.29	2.39		0.00	0.20		0.50	2.60	3.50	
OABH1	6.15	6.07		5.91	4.8		1.75	0.00	0.08		0.24	1.35		4.40
OABH4	5.99	5.76		5.54	3.91	1.74		0.00	0.23		0.45	2.08	4.25	

OABH6	6	5.83		5.54	3.81	1.67		0.00	0.17		0.46	2.19	4.33	

T = Topsoil; S = Subsoil; MG = Made Ground; UW = Upper Wentlooge Formation; MW = Middle Wentlooge Formation; LW = Lower Wentlooge Formation; B = Bedrock

Lower Wentlooge Formation

3.2.5 Deposits forming the lower part of the sequence were only encountered in the cable percussion boreholes and two of the window samples (WS205 and WS206). These are described as generally sandy deposits, with sandy silts and sandy clays present, although thick deposits of dense gravels were identified within CP301 and CP302 (4.05m and 4.42m thick respectively). Gravelly sandy silts are present to the base of WS205 and WS206. These contrast significantly from the overlying silty clay deposits and they also occur at similar elevations to Lower Wentlooge deposits observed in Plot 5000 (2.06m and 1.87m OD), indicating they comprise part of the lower member.

3.2.6 The sandy deposits comprising the Lower Wentlooge Formation represent estuarine sedimentation occurring within an intertidal channel system surrounded by low tidal mud-flats throughout the early-mid Holocene. Fine, gently sloping laminations were recorded in neighbouring Plot 5000 and suggest fluctuating intertidal conditions within a backwater inlet, likely to have been protected from the most severe tidal range (OA, 2010). Although no laminations were noted in the GI data, it is likely that the sandy and gravelly deposits recorded were formed under similar marine conditions. The increased representation of gravelly deposits suggests that the Avlon Works site was closer to the intertidal zone and outer estuary, with increased marine influence.

3.2.7 The surface of these deposits drops off dramatically to the west, to -3.40m OD at CP102. This significant drop may reflect a similar decrease in the underlying bedrock, however as the surface of the sandy deposits rises further to the west, to -1.51m OD at CP301 and -0.1m OD at CP103, it suggests that this depression may have formed through erosion by channel incision occurring during the deposition of the Middle Wentlooge Formation. However, without any samples or direct observations to confirm this, it remains speculative.

Middle Wentlooge Formation

3.2.8 There is a marked change from the sandy and gravelly deposits of the Lower Wentlooge Formation to intercalated silty clays and peats belonging to the Middle Wentlooge. As seen in Plot 5000 this change is denoted by the deposition of pseudo fibrous peat in CP302 and WS205, although this peat horizon is not present elsewhere throughout site. The lower peat horizon in WS205 occurs at a similar depth to the lower peats identified in Plot 5000 (2.16m OD) and is likely to be of similar age. These peats were dated to 3970-3790 cal BC in Plot 5000, indicating this change in sedimentation occurred in the early prehistoric period.

3.2.9 Deposits of the Middle Wentlooge occur between approximately 4.90m OD and -3.40m OD and comprise minerogenic blue/grey silty clays that are intercalated with organic peat horizons. Up to three peat horizons were recorded throughout this

sequence in the GI data (WS204, 205 and 206) and are generally <0.5m thick, which is consistent with deposits recorded in Plot 5000. Multiple peat horizons, however, were only recorded in the eastern part of site, with only a singular peat horizon, occurring between 4.05m OD and 2.54m OD identified throughout the rest of site. This may be due to sampling method as the majority of data collection points were test pits that could only be excavated to 3m BGL, but also could be due to difficulties in recording. The peat horizon in CP302, for example, is recorded as 4.1m thick, while boreholes situated <100m to the east and west recorded an absence of peat entirely. The top peat horizon occurs at similar depths to its equivalent seen in Plot 5000 (3-4m OD), which has been dated to 1020-840 cal BC. It is probable that the upper peat deposits throughout the Avlon Works site are of similar age.

3.2.10 The pronounced depression in the basal surface of the Middle Wentlooge sediments in CP102 indicates the presence of a palaeochannel that may have run along the base of the bedrock ridge. Deposits within it are described as brown and reddish clays, which suggests they could be oxidized and consistent with channel deposits. The lower surface of the Middle Wentlooge Formation rises to the east and west, between WS206 and CP301, restricting the width of a possible channel to a maximum of roughly 300m.

3.2.11 This sequence represents a phase of fluctuating sea-levels during the Neolithic and Bronze Age. The peat deposits indicate periods of partial stabilization and the expansion of freshwater wetland environments during marine regressions, while the minerogenic silty clays were deposited during marine transgressions during periods of estuarine flooding within a saltmarsh environment.

Upper Wentlooge Formation

3.2.12 The Upper Wentlooge Formation consists of predominantly brown clays and silts occurring between 6.07m OD and 2.97m OD. These deposits were noted to be oxidized and structureless with a weathered upper surface in Plot 5000 and represent deposition in estuarine conditions beginning around 2500-3000 years ago. Deposition is thought to have ceased in the Roman and post-Roman period with any reclamation during the Roman period isolating the Wentlooge Surface from further tidal sedimentation (OA, 2010).

3.2.13 This upper surface occurs beneath the topsoil at 6.01-6.07m OD in the east of site in areas of woodland and open green space, but appears to be truncated by made ground under the more developed areas beneath the Avlon works. The level of truncation varies, but is more heavily truncated towards the central and western areas of site, up to depths of 4m BGL (2.54m OD, CP302).

3.2.14 The Upper Wentlooge surface has been recorded between 5.24 and 5.54m OD in Plot 5000 and represents the deposit within which Romano-British archaeological features were identified. It may constitute the land surface associated with the Roman archaeology that has been identified previously in the area as the BaRAS layer (BaRAS 1998) or Wentlooge Surface (Allen 1987). It is therefore likely to still be preserved across the majority of the site, despite modern truncation, although may have been lost in areas of more substantial truncation.

Subsoil, Topsoil and Made Ground

3.2.15 Made ground deposits are extensive throughout the developed central and western areas of site. The deposit models, GI descriptions and LiDAR data show that these areas have been built up above the surrounding terrain and are underlain by teram. However, the models show these areas are generally <1m above the lower lying areas to the east. Made ground deposits are generally between 1-2m thick across most of the central and western areas, with some deposits in these areas being >2m and up to 4m thick (e.g., CP302). This suggests that the upper parts of the Upper Wentlooge Formation have been truncated away in the more developed areas of the site. However, deposits that have been classified as made ground in the GI data do not differentiate between modern and archaeological deposits. Often archaeological deposits are classified as made ground deposits in GI investigations and it is possible that this is the case here.

3.2.16 Any made ground within the woodland and open green space areas to the eastern part of site is generally <1m thick and probably restricted to the more landscaped areas.

4 DISCUSSION

4.1 Reliability of the investigation

4.1.1 The GI works undertaken were extensive throughout the site, with a total of 94 data points. However, the vast majority of these were test pits, which could only be excavated to around 3m BGL and into the upper parts of the Middle Wentlooge Formation. They do provide an indication of the level of modern truncation that has occurred throughout site and the depth to the archaeological horizon within the Upper Wentlooge Formation. The window samples and cable percussion boreholes give a much better indication of the deeper sub-surface sediment sequences, including the Lower and Middle Wentlooge Formations. However, the coverage of window samples was restricted to the eastern edge of site and only seven cable percussion boreholes were completed.

4.1.2 The lithological descriptions from the borehole logs derive from a geotechnical ground investigation. In places the descriptions were quite brief and variable. The sediments were not observed directly by a geoarchaeologist; consequently, a degree of interpretation has been involved when correlating the stratigraphic units. The investigations were also not undertaken with archaeology in mind, therefore there is lower confidence in the interpretation of certain units like the presence of modern made ground.

4.2 Summary of objectives and results

4.2.1 The deposit modelling has broadly served well in characterising the sub-surface stratigraphic structure underlying the site. Four litho-stratigraphic units have been identified overlying the Mercia Mudstone bedrock and these have been correlated to the Wentlooge Formation and the sequences recorded in surrounding plots.

4.2.2 The Lower Wentlooge Formation overlies bedrock and comprises estuarine and marine sands and gravels of early-mid Holocene date. These deposits were laid down by high-energy intertidal channel systems surrounded by low tidal mud-flats and were protected from the more extreme tidal range of the Bristol Channel. Investigations in Plot 5000 show the area was once part of a larger marine embayment or backwater lagoon where sea-level was 5m below its current level (Champness, 2010). An early Neolithic peat deposit at the top of the Lower Wentlooge Formation was identified in Plot 5000 and correlates to a similar peat deposit present on the Avlon Works site.

4.2.3 A sequence of intercalated silty clay alluvium and organic peat deposits overlie the sandy deposits and comprise the Middle Wentlooge Formation. This indicates the end of outer estuarine influences and the silting up of the embayment. Dating from Middle Wentlooge sediments has been undertaken in adjacent Plots 4000, 5000 and 8000, and revealed that this sequence accumulated between the early Neolithic and late Bronze Age. Fluctuations in sea-level change throughout this period are reflected by three separate peat horizons present in the eastern part of the Avlon Works site. These would have formed through the expansion of predominantly freshwater wetland environments, such as alder carr and reedswamp, whereas the minerogenic alluvium

accumulated as mud-flats and salt marsh expanded and were dissected by creek systems. Peat deposits occur throughout the site within this sequence.

4.2.4 A possible palaeochannel was identified within the Middle Wentlooge sequence. This could reflect a change in drainage patterns and hydrological regime associated with sea-level fluctuations as the embayment silted-up.

4.2.5 Silt and clay alluvium of the Upper Wentlooge Formation overlies the intercalated alluvial and peat deposits. The surface of this represents the horizon in which Iron Age and Romano-British archaeological activity has been identified within Plots 4000 and 5000. Alluvial deposition was probably augmented during this period by changes in agricultural practices and other land-use, resulting in greater wash-off into local river systems (Moore *et al*. 2002). The upper surface of the alluvium appears to have stabilised by the early Roman period, suggesting that sedimentation had significantly reduced by this period. This surface was identified at *c* 5.45m OD in Plot 5000 and, if present, it should be preserved within the eastern and northernmost parts of site. The central and western areas have been widely truncated by modern development with made ground deposits present within the upper 1-2m, up to 4m BGL in some places.

4.3 Significance and potential

4.3.1 In term of archaeological potential, the site is located to the south-west of areas containing substantial Romano-British settlement activity dating from the 2nd _ 4th centuries. Investigations in Plots 4000 and 5000 have identified roundhouses, enclosures and droveways with evidence of metalworking relating to agricultural activity (Ritchie et al. 2008 and Champness 2010). Activity appears to be concentrated within Plot 4000, becoming more peripheral to the south-east in Plot 5000. The Avlon Works site sits immediately west of Plot 5000, further to the south-west of Plot 4000. It would therefore be reasonable to expect a continuation of archaeological activity within the eastern and northern areas of site, although significantly decreasing in intensity to those seen in Plot 5000, as the site lies further away from the main settlement. This potential activity is likely to take the form of surrounding fieldsystems and animal enclosure ditches, rather than settlement activity. It should also be noted that other plots within the area to the north and northwest of the site have not produced any archaeological remains, and therefore the presence of archaeology across the site is not certain.

4.3.3 The less developed parts of the site are predominantly wooded, suggesting tree rooting, landscaping and waterbodies will have significantly impacted preservation within these areas. In other areas of open green space within the site, little made ground and topsoil depths of around 0.2-0.40m have been recorded, pockets of archaeology may survive, and would be accessible close to the surface for further investigation. The deeper sediments of the Lower Wentlooge were also identified in two locations within the western part of the site. Several window samples here reached similar depths, but did not encounter bedrock, suggesting the bedrock ridge present in Plots 4000 and 5000 may slope off towards the west. If correct this may suggest that the west of the site may have been more fluvial active and associated with tidal drainage systems, which may have been less favourable for settlement.

4.3.4 The deposit modelling identified extensive made ground deposits throughout the central and western areas of site. The majority of data from these areas showed made ground deposits possibly truncating Upper Wentlooge sediments between 1-2m BGL, although in several places potential truncation was >2m BGL and even up to 4m BGL. As the archaeological horizon containing Romano-British activity is present at *c* 5.45m OD in Plot 5000, if it is present at similar levels across this site then any modern made ground deposits >1.5m thick are likely to have truncated this horizon. However, no differentiation has been made between modern and archaeological made ground deposits within the geotechnical records. It is possible that deposits interpreted as made ground in the GI logs could also represent the Romano-British archaeological horizon still present beneath the modern topsoil.

4.3.5 Middle and Lower Wentlooge sediments dating from the Mesolithic to Late Bronze Age survive across site at depth, beneath the level of truncation. Evidence of prehistoric activity occurring within these sediments has been observed in adjacent plots, so it is therefore possible for it to be present within these deposits within the Avlon Works site. However, it will be preserved at depths that are likely to be beyond what can be achieved through trial trenching as the surface of the Middle Wentlooge Formation generally occurs at depths at or beyond 2m BGL. The Middle Wentlooge surface appears to be more accessible to the eastern and northern parts of site where it should occur at roughly 2m BGL. It is likely that at these depths any trenching would encounter significant ground water issues, although deposits may be investigated through sondages as part of a trenching or geoarchaeological test pitting programme.

4.3.6 In terms of paleoenvironmental potential, several organic peat deposits have been identified within the Middle and Lower Wentlooge Formations throughout site. Extensive analysis of similar peat deposits from Plots 4000 and 5000 revealed high potential for palaeoenvironmental reconstruction (Ritchie *et al.* 2008 and Champness 2010). Assessment of the pollen, plant macrofossils, insects, diatoms, ostracods, and foraminifera assemblages were undertaken as part of this analysis, alongside radiocarbon dating of the peat deposits, and characterised the evolution of the environment well from the early Holocene through to the Romano-British period. This documented the changes of the landscape from an outer estuarine environment, through the development of saltmarsh and mud-flats, and periods of wetland expansion up to the Romano-British period where alluviation appears to have halted. Any further palaeoenvironmental work will add to this record, although due to its proximity to the previous sample areas, is unlikely to provide significant new contributions to our understanding of this landscape.

4.3.8 Further purposive boreholes or geoarchaeological observations may help to confirm the presence of a speculative Middle Wentlooge palaeochannel sequence that was identified in the GI records to underlie the western part of the site. Confirmation of the extent of the underlying bedrock ridge may also help to provide a greater understanding of the distribution of Roman activity on the Levels.

APPENDIX A LITHOLOGICAL BOREHOLE DESCRIPTIONS

Bore	Top (m OD)	Base (m OD)	Lithology	Comment
CP101	0.00	1.00	Made Ground	MADE GROUND
CP101	1.00	4.20	Silty clay	Firm medium strength to very soft extremely low strength blue grey silty CLAY.
CP101	4.20	10.20	Silty clay	Very soft extremely low strength to stiff high strength brown silty CLAY.
CP101	10.20	12.50	Gravel	Medium dense brown GRAVEL.
CP102	0.00	1.00	Made Ground	MADE GROUND
CP102	1.00	3.00	Silty clay	Soft low strength brown silty CLAY.
CP102	3.00	3.60	Peat	Spongy dark brown pseudo fibrous PEAT (organic odour)
CP102	3.60	7.90	Silty clay	Soft low strength blue grey silty CLAY.
CP102	7.90	9.50	Clay	Very stiff very high strength brown CLAY.
CP102	9.50	10.20	Clay	Very stiff high strength red CLAY.
CP102	10.20	12.50	Sand	Medium dense blue grey SAND.
CP103	0.00	0.05	Made Ground	MADE GROUND: Asphalt.
CP103	0.05	1.20	Made Ground	MADE GROUND
CP103	1.20	3.40	Silty clay	Firm medium strength to very soft extremely low strength blue grey silty CLAY.
CP103	3.40	3.90	Peat	Spongy dark brown pseudo fibrous PEAT (organic odour)
CP103	3.90	6.50	Silty clay	Very soft extremely low strength blue grey silty CLAY.
CP103	6.50	11.00	Sand	Loose to medium dense blue grey medium SAND.
CP104	0.00	1.60	Made Ground	MADE GROUND
CP104	1.60	4.10	Silty clay	Soft low strength brown silty CLAY.
CP104	4.10	4.60	Peat	Spongy dark brown pseudo fibrous PEAT (organic odour)
CP104	4.60	5.50	Silty clay	Firm medium strength blue grey silty CLAY.
CP104	5.50	9.50	Sand	Loose blue grey SAND.
CP104	9.50	11.00	Gravel	Medium dense red GRAVEL.
CP104	11.00	12.50	Sand	Medium dense reddish brown SAND.
CP105	0.00	1.00	Made Ground	MADE GROUND
CP105	1.00	4.20	Peat	Spongy dark brown pseudo fibrous PEAT (organic odour)
CP105	4.20	9.00	Silty clay	Soft low strength to stiff high strength blue grey silty CLAY.

CP105	9.00	11.10	Sand	Medium dense brown SAND and GRAVEL.
CP105	11.10	12.50	Sand	Medium dense reddish brown SAND and GRAVEL.
CP301	0.00	1.50	Made Ground	MADE GROUND: Stiff brown gravelly clay. Gravel is fine to coarse angular of sandstone and mudstone.
CP301	1.50	2.50	Silty clay	Stiff brown silty CLAY.
CP301	2.50	8.10	Silt	Firm brown SILT. Becomes soft between 4.50 m bgl and 6.00 m bgl.
CP301	8.10	8.20	Gravelly clay	Firm bown very gravelly CLAY. Gravel is fine to coarse angular of sandstone and mudstone.
CP301	8.20	12.25	Gravel	Dense brown GRAVEL. Gravel is fine to coarse angular of sandstone and mudstone.
CP302	0.00	4.00	Made Ground	MADE GROUND: Stiff brown gravelly clay. Gravel is fine to coarse angular of sandstone and mudstone.
CP302	4.00	8.10	Peat	Soft brown pseudo fibrous PEAT.
CP302	8.10	10.00	Gravel	Medium dense brown GRAVEL. Gravel is fine to coarse angular of sandstone and mudstone.
CP302	10.00	12.00	Gravel	Dense brown GRAVEL with coarse SAND. Gravel is fine to coarse angular of sandstone and mudstone.
CP302	12.00	12.52	Gravel	Dense brown GRAVEL with frequent cobbles. Gravel is fine to coarse angular of sandstone and mudstone. Cobbles are angular of sandstone and mudstone
CP303	0.00	1.20	Made Ground	MADE GROUND: Stiff bown gravelly clay. Gravel is fine to coarse angular of sandstone and mudstone.
CP303	1.20	2.70	Silt	Soft brown clayey SILT.
CP303	1.20	7.10	Silt	Stiff brown clayey SILT. Becomes firm at 6.00 m bgl.
CP303	2.70	7.10	Silt	Very soft brown SILT.
CP303	7.10	7.95	Sand	Dense grey coarse SAND.
TP201	0.00	0.25	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP201	0.25	2.40	Clay	Stiff medium strength brown mottled grey slightly sandy CLAY. Becoming firm low strength at 1.50 m bgl.
TP201	2.40	2.55	Silty clay	Light blueish grey silty CLAY.

TP201	2.55	2.65	Peat	Black pseudo fibrous PEAT with a strong organic odour.
TP201	2.65	2.70	Silty clay	Light blueish grey silty CLAY.
TP202	0.00	0.25	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP202	0.25	2.35	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming stiff medium strength at 1.00 m bgl.
TP202	2.35	2.50	Silty clay	Light blueish grey silty CLAY with occasional pockets of black pseudo fibrous peat with a strong organic odour.
TP203	0.00	0.20	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP203	0.20	1.30	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
TP203	1.30	2.70	Silty clay	Soft very low strength light grey slightly sandy silty CLAY.
TP203	2.70	2.80	Peat	Black pseudo fibrous PEAT with a strong organic odour.
TP203	2.80	2.85	Silty clay	Light blueish grey silty CLAY with frequent rootlets.
TP204	0.00	0.10	Made Ground	Made Ground: Light reddish brown sandy gravel. Gravel is fine to coarse subangular to angular of mudstone.
TP204	0.10	2.40	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 1.50 m bgl.
TP204	2.40	2.50	Silty clay	Light grey sandy silty CLAY.
TP205	0.00	0.20	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP205	0.20	2.10	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 2.00 m bgl.
TP205	2.10	2.50	Silty clay	Light grey sandy silty CLAY.
TP205	2.40	2.50	Peat	Black pseudo fibrous PEAT with a strong organic odour.
TP206	0.00	0.25	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP206	0.25	1.90	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
TP206	1.90	2.35	Silty clay	Firm low strength light grey sandy silty CLAY.
TP206	2.35	2.40	Peat	Black pseudo fibrous PEAT with a strong organic odour.

TP207	0.00	0.20	Topsoil	Brown slightly gravelly slightly sandy clay with frequent rootlets. Gravel is fine to coarse subrounded to rounded of mudstone. (TOPSOIL)
TP207	0.20	2.30	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
TP207	2.30	2.50	Silty clay	Light grey sandy silty CLAY with occasional pockets of black pseudo fibrous peat with a strong organic odour.
TP208	0.00	0.20	Made Ground	Made Ground: Light reddish brown sandy slightly clayey gravel. Gravel is fine to coarse subangular to angular of mudstone.
TP208	0.20	2.10	Sandy clay	Friable brown sandy CLAY
TP208	2.10	2.40	Silty clay	Light grey slightly sandy silty CLAY.
TP208	2.40	2.50	Peat	Black pseudo fibrous PEAT with a strong organic odour.
TP209	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP209	0.15	2.50	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
TP209	2.50	2.60	Silty clay	Light blueish grey silty CLAY.
TP209	2.60	2.75	Peat	Black pseudo fibrous PEAT with a strong organic odour.
TP210	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP210	0.15	2.10	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 2.00 m bgl.
TP210	2.10	2.20	Silty clay	Very soft extremely low strength light blueish grey silty CLAY.
TP210	2.20	2.30	Peat	Black pseudo fibrous PEAT with a strong organic odour.
TP210	2.30	3.00	Silty clay	Very soft extremely low strength light blueish grey silty CLAY.
TP211	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP211	0.15	2.20	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
TP211	2.20	2.25	Silty clay	Light blueish grey silty CLAY.
TP211	2.25	2.35	Peat	Black pseudo fibrous PEAT with a strong organic odour.
TP211	2.35	3.20	Silty clay	Very soft extremely low strength light blueish grey silty CLAY.

TP212	0.00	0.05	Made Ground	Made Ground: Brown slightly sandy clay with frequent rootlets. (Reworked topsoil)
TP212	0.05	0.30	Made Ground	Made Ground: Reddish brown sandy gravel. Gravel is fine to coarse subangular to angular of mudstone.
TP212	0.30	0.60	Made Ground	Made Ground: Firm low strength light brown gravelly clay with frequent cobbles. Gravel is fine to coarse subangular to angular of mudstone and sandstone. Cobbles are angular of mudstone and paving flags.
TP212	0.60	2.60	Silty clay	Firm low strength light blueish grey silty CLAY with frequent rootlets. Becoming soft very low strength at 2.50 m bgl.
TP212	2.60	2.70	Peat	Black pseudo fibrous PEAT with a strong organic odour.
TP213	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP213	0.15	2.20	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming very soft extremely low strength at 2.00 m bgl.
TP213	2.20	2.40	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
TP213	2.40	2.90	Silty clay	Very soft extremely low strength light grey sandy silty CLAY.
TP214	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP214	0.15	2.60	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming very soft extremely low strength at 2.50 m bgl.
TP214	2.60	2.65	Silty clay	Very soft extremely low strength light blueish grey sandy silty CLAY.
TP214	2.65	2.75	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
TP214	2.75	3.00	Silty clay	Very soft extremely low strength light blueish grey sandy silty CLAY.
TP215	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)

TP215	0.15	2.50	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 2.00 m bgl.
TP215	2.50	2.85	Silty clay	Very soft extremely low strength light blueish grey sandy silty CLAY with occasional pockets of black pseudo fibrous peat with a strong organic odour.
TP217	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP217	0.15	2.30	Clay	Stiff medium strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 2.00 m bgl.
TP217	2.30	2.40	Silty clay	Firm low strength light blueish grey sandy silty CLAY with frequent rootlets.
TP217	2.40	2.50	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
TP217	2.50	2.90	Silty clay	Firm low strength light blueish grey sandy silty CLAY.
TP218	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP218	0.15	2.50	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 1.50 m bgl.
TP218	2.50	2.80	Silty clay	Soft very low strength light blueish grey sandy silty CLAY with occasional pockets of black pseudo fibrous peat with a strong organic odour.
TP219	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP219	0.15	2.40	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
TP219	2.40	2.50	Silty clay	Soft very low strength light blueish grey sandy silty CLAY with frequent rootlets.
TP219	2.50	2.60	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
TP219	2.60	2.70	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
TP219	2.70	2.80	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.

TP219	2.80	3.20	Silty clay	Light blueish grey sandy silty CLAY.
TP220	0.00	0.15	Made Ground	Made Ground: Brown slightly sandy clay with frequent rootlets. (Reworked topsoil)
TP220	0.15	1.10	Made Ground	Made Ground: Brown very gravelly clay with frequent cobbles. Gravel is fine to coarse angular of mudstone and sandstone. Cobbles are subangular to angular of mudstone sandstone and brick.
TP220	1.10	2.50	Clay	Firm low strength greyish brown slightly sandy CLAY.
TP220	2.50	2.70	Silty clay	Soft very low strength light blueish grey very silty CLAY.
TP220	2.60	2.70	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
TP221	0.00	0.30	Made Ground	Made Ground: Brown gravelly slightly sandy clay with frequent rootlets. Gravel is fine to coarse subangular of mudstone and sandstone. (Reworked topsoil)
TP221	0.30	2.45	Made Ground	Made Ground: Dark brown gravelly clay with frequent cobbles. Gravel is fine to coarse subangular to angular of mudstone and sandstone. Cobbles are subangular to angular of mudstone and brick.
TP221	2.45	2.55	Clay	Stiff medium strength light grey slightly sandy CLAY.
TP222	0.00	0.25	Made Ground	Made Ground: Brown gravelly slightly sandy clay with frequent rootlets. Gravel is fine to coarse subangular of mudstone and sandstone. (Reworked topsoil)
TP222	0.25	2.20	Clay	Stiff medium strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 1.50 m bgl.
TP222	2.20	2.40	Clay	Light grey slightly sandy CLAY.
TP222	2.40	2.50	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
TP222	2.50	2.65	Clay	Light grey slightly sandy CLAY.
TP223	0.00	0.20	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)

TP223	0.20	2.50	Clay	Stiff medium strength brown mottled grey slightly sandy CLAY. Becoming firm low strength at 1.50 m bgl.
TP223	2.50	2.70	Clay	Light grey slightly silty CLAY with a band of black pseudo fibrous peat with a strong organic odour at 2.60 m bgl.
TP224	0.00	0.20	Made Ground	Made Ground: Light brown sandy slightly clayey gravel. Gravel is fine to coarse subangular to angular of mudstone.
TP224	0.20	2.50	Clay	Stiff medium strength brown mottled grey slightly sandy CLAY. Becoming firm low strength at 1.00 m bgl.
TP224	2.50	2.60	Silty clay	Light blueish grey sandy silty CLAY.
TP224	2.60	2.70	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
TP225	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP225	0.15	2.20	Clay	Firm low strength light brown mottled grey slightly sandy CLAY.
TP225	2.20	2.55	Silty clay	Light grey sandy silty CLAY.
TP226	0.00	0.20	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP226	0.20	2.30	Clay	Firm low strength light brown mottled grey slightly sandy CLAY. Becoming soft very low strength between 1.00 m bgl and 1.50 m bgl.
TP226	2.30	2.40	Silty clay	Light grey sandy silty CLAY.
TP226	2.40	2.50	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
TP227	0.00	0.20	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP227	0.20	2.40	Clay	Soft very low strength light brown mottled grey slightly sandy CLAY.
TP227	2.40	2.60	Silty clay	Light grey sandy silty CLAY.
TP228	0.00	0.20	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP228	0.20	2.10	Clay	Firm low strength light brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 1.50 m bgl.

TP228	2.10	2.30	Silty clay	Light grey sandy silty CLAY.
TP228	2.30	2.40	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
TP229	0.00	0.10	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
TP229	0.10	2.00	Clay	Firm low strength light brown mottled grey slightly sandy CLAY.
TP229	2.00	2.90	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
TP301	0.00	0.10	Made Ground	MADE GROUND: Light grey gravel. Gravel is fine to coarse angular of mudstone.
TP301	0.10	0.34	Made Ground	MADE GROUND: Reddish brown sandy gravel. Gravel is fine to coarse angular of sandstone, mudstone and brick.
TP301	0.34	2.90	Silty clay	Stiff dark brown slightly silty gravelly CLAY. Gravel is fine to coarse angular to subangular of sandstone and mudstone.
TP302	0.00	1.10	Made Ground	MADE GROUND: Brown gravel with occasional cobbles. Gravel is fine to coarse angular of sandstone, mudstone, brick, and asphalt. Cobbles are angular of brick and metal.
TP302	1.10	1.90	Gravelly clay	Stiff brown silty gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.
TP302	1.90	3.30	Silty clay	Firm light blueish grey silty CLAY with occasional pockets of soft black pseudo fibrous PEAT. Becomes soft at 3.00 m bgl.
TP303	0.00	0.60	Made Ground	MADE GROUND: Gravelly clay. Gravel is fine to coarse angular of sandstone, mudstone, brick and wood.
TP303	0.60	2.60	Gravelly clay	Stiff light brown slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.
TP303	2.60	2.70	Peat	Soft black pseudo fibrous PEAT.
TP303	2.70	3.40	Clay	Soft light blueish grey silty CLAY.

TP304	0.00	1.50	Made Ground	MADE GROUND: Dark brown very gravelly clay with frequent cobbles. Gravel is fine to coarse angular of sandstone, mudstone and brick with constituents of metal. Cobbles are angular of mudstone, brick and concrete.
TP304	1.50	3.00	Gravelly clay	Stiff light brown gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone. Becomes firm at 2.50 m bgl.
TP304	3.00	3.40	Silty clay	Soft light blueish grey silty CLAY with occasional pockets of soft black pseudo fibrous PEAT.
TP305	0.00	0.90	Made Ground	MADE GROUND: Dark brown very gravelly clay with frequent rootlets. Gravel is fine to coarse angular of sandstone, mudstone, and brick.
TP305	0.90	1.60	Sandy clay	Brown gravelly slightly sandy silty CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.
TP305	1.60	3.40	Silty clay	Light blueish grey silty CLAY with occasional pockets of soft black pseudo fibrous PEAT.
TP306	0.00	0.20	Made Ground	MADE GROUND: Brown gravel. Gravel is fine to coarse angular of sandstone and mudstone.
TP306	0.20	2.60	Silty clay	Firm blueish grey slightly gravelly silty CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.
TP306	2.60	3.60	Silty clay	Soft blueish grey silty CLAY.
TP307	0.00	0.10	Made Ground	MADE GROUND: Light grey gravel. Gravel is fine to coarse angular of sandstone mudstone.
TP307	0.10	0.20	Made Ground	MADE GROUND: Brown silty clayey gravel. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete.
TP307	0.20	0.40	Silty clay	Stiff light blueish grey slightly gravelly silty CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.

TP307	0.40	2.70	Gravelly clay	Firm brown slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.
TP307	2.70	2.80	Peat	Soft black pseudo fibrous PEAT.
TP307	2.80	3.10	Silty clay	Soft blueish Grey silty CLAY.
TP308	0.00	0.20	Made Ground	MADE GROUND: Brown gravelly clay. Gravel is fine to coarse angular sandstone, mudstone, and concrete.
TP308	0.20	0.60	Gravelly clay	Stiff blueish grey slightly gravelly silty CLAY. Gravel is fine to coarse angular of sandstone and mudstone.
TP308	0.60	2.65	Gravelly clay	Stiff brown slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.
TP308	2.65	2.70	Peat	Soft black pseudo fibrous PEAT.
TP308	2.70	3.20	Silty clay	Blueish grey silty CLAY.
TP309	0.00	1.95	Made Ground	MADE GROUND: Brown slightly sandy gravel. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete.
TP309	1.95	2.90	Clay	Firm greyish brown slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.
TP310	0.00	0.30	Made Ground	MADE GROUND: Brown very gravelly CLAY. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete.
TP310	0.30	0.55	Clay	Stiff brown slightly gravelly CLAY with occasional rootlets. Gravel is fine to coarse subangular of sandstone and mudstone.
TP310	0.55	3.65	Silty clay	Soft greyish brown silty CLAY.
TP311	0.00	0.15	Made Ground	MADE GROUND: Brown slightly sandy gravelly clay with frequent rootlets. Gravel is fine to medium subangular of mudstone and sandstone (Reworked topsoil).
TP311	0.15	0.95	Made Ground	MADE GROUND: Brown gravelly clay. Gravel is subangular to angular of sandstone and mudstone.
TP311	0.95	1.10	Made Ground	MADE GROUND: Reddish brown gravel. Gravel is fine to coarse angular of sandstone and mudstone.

TP311	1.10	2.10	Made Ground	MADE GROUND: Brown gravelly clay with occasional cobbles. Gravel is fine to coarse angular of sandstone, mudstone, and concrete with constituents of plastic. Cobbles are angular of concrete.
TP311	2.10	3.30	Gravelly clay	Firm greyish brown slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone. Becomes stiff at 3.00 m bgl.
TP312	0.00	0.10	Made Ground	MADE GROUND: Brown slightly sandy gravelly clay with frequent rootlets. Gravel is fine to medium subangular of mudstone and sandstone (Reworked topsoil).
TP312	0.10	1.10	Made Ground	MADE GROUND: Brown slightly clayey slightly sandy gravel. Gravel is fine to coarse angular of sandstone, mudstone, concrete, brick, concrete, glass, and metal.
TP312	1.10	3.00	Gravelly clay	Stiff greyish brown slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.
TP313	0.00	2.20	Made Ground	MADE GROUND: Brown very gravelly clay. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete.
TP313	2.20	2.45	Silty clay	Stiff light blueish grey silty CLAY.
TP313	2.45	2.50	Peat	Soft black pseudo fibrous PEAT.
TP313	2.50	3.30	Clay	Soft light blueish grey silty CLAY.
TP314	0.00	1.90	Made Ground	MADE GROUND: Brown very gravelly clay with frequent rootlets. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete with constituents of plastic and metal.
TP314	1.90	3.00	Silty clay	Firm light blueish grey silty CLAY.
TP314	3.00	3.05	Peat	Soft black pseudo fibrous PEAT.
TP314	3.05	3.50	Silty clay	Firm light blueish grey silty CLAY.
TP315	0.00	0.65	Made Ground	MADE GROUND: Light orangish brown slightly clayey gravel. Gravel is fine to coarse angular of sandstone and mudstone.

TP315	0.65	0.75	Made Ground	MADE GROUND: Black gravel. Gravel is fine to medium angular mudstone and asphalt.
TP315	0.75	2.10	Sandy clay	Stiff brown slightly sandy CLAY.
TP315	2.10	2.45	Silty clay	Stiff light blueish grey silty CLAY.
TP315	2.45	2.50	Peat	Soft black pseudo fibrous PEAT.
TP315	2.50	3.40	Silty clay	Firm light blueish grey silty CLAY.
TP316	0.00	2.40	Made Ground	MADE GROUND: Stiff brown gravelly clay with occasional cobbles. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete. Cobbles are angular of brick.
TP316	2.40	2.50	Silty clay	Light blueish grey silty CLAY.
TP316	2.40	3.50	Silty clay	Firm light blueish grey silty CLAY.
TP317	0.00	1.60	Made Ground	MADE GROUND: Firm brown gravelly clay with occasional cobbles. Gravel is fine to coarse angular of mudstone, brick, and concrete. Cobbles are angular of concrete.
TP317	1.60	2.90	Silty clay	Firm light blueish grey silty CLAY.
TP318	0.00	2.70	Made Ground	MADE GROUND: Brown sandy very gravelly clay with frequent cobbles. Gravel is fine to coarse angular of mudstone and brick. Cobbles are angular of concrete and brick.
TP318	2.70	3.40	Silty clay	Firm light blueish grey silty CLAY.
TP319	0.00	1.00	Made Ground	MADE GROUND: Reddish brown slightly sandy gravel. Gravel is fine to coarse angular of sandstone, mudstone and brick.
TP319	1.00	1.20	Made Ground	MADE GROUND: Black slightly clayey slightly sandy gravel. Gravel is fine to coarse angular of sandstone and mudstone.
TP319	1.20	2.60	Gravelly clay	Stiff brown slightly gravelly CLAY.
TP320	0.00	0.25	Made Ground	MADE GROUND: Brown slightly sandy slightly gravelly clay with frequent rootlets. Gravel is fine to coarse subangular of sandstone and mudstone (Reworked topsoil).
TP320	0.25	1.20	Made Ground	MADE GROUND: Red slightly sandy gravel. Gravel is fine to coarse angular of sandstone and mudstone.
TP320	1.20	2.90	Silty clay	Stiff light blueish grey slightly silty CLAY. Becomes firm at 2.50 m bgl.

TP320	2.90	3.00	Peat	Soft black pseudo fibrous PEAT.
TP320	3.00	3.35	Silty clay	Blueish grey silty CLAY.
TP321	0.00	0.80	Made Ground	MADE GROUND: Dark brown slightly sandy gravelly clay with occasional cobbles. Gravel is fine to coarse angular sandstone and mudstone. Cobbles are angular of concrete and brick.
TP321	0.80	3.40	Silty clay	Stiff blueish grey silty CLAY. Becomes soft at 3.00 m bgl.
TP321	3.40	3.50	Peat	Soft black pseudo fibrous PEAT.
TP321	3.50	3.70	Silty clay	Blueish grey silty CLAY.
TP322	0.00	0.65	Made Ground	MADE GROUND: Brown slightly clayey gravel with occasional cobbles. Gravel is fine to coarse angular of sandstone and mudstone with constituents of metal. Cobbles are angular of concrete and brick.
TP322	0.65	2.00	Gravelly clay	Stiff brown slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.
TP322	2.00	2.80	Silty clay	Stiff blueish grey silty CLAY.
TP322	2.80	2.90	Peat	Soft black pseudo fibrous PEAT.
TP322	2.90	3.50	Silty clay	Soft blueish grey silty CLAY.
TP323	0.00	1.20	Made Ground	MADE GROUND: Brown gravel. Gravel is fine to coarse angular of sandstone, mudstone, and brick.
TP323	1.20	2.60	Sandy clay	Soft greyish brown slightly sandy CLAY.
TP323	2.60	3.10	Silty clay	Very soft dark blueish grey silty CLAY.
TP323	3.10	3.20	Peat	Soft black pseudo fibrous PEAT.
TP323	3.20	3.40	Silty clay	Dark blueish grey silty CLAY.
TP324	0.00	1.90	Made Ground	MADE GROUND: Brown slightly sandy gravel with frequent cobbles. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete. Cobbles are angular of concrete and brick.
TP324	1.90	2.90	Silty clay	Firm light blueish grey silty CLAY with occasional rootlets.
TP325	0.00	2.50	Made Ground	MADE GROUND: Dark brown very gravelly clay with occasional cobbles. Gravel is fine to coarse angular of sandstone, mudstone, and brick with constituents of metal. Cobbles are angular of brick and mudstone.

TP325	2.50	3.30	Silty clay	Firm greyish brown silty CLAY.
TP325	3.30	3.45	Peat	Soft black pseudo fibrous PEAT.
TP325	3.45	3.50	Silty clay	Firm greyish brown silty CLAY.
TP326	0.00	2.65	Made Ground	MADE GROUND: Dark brown very gravelly clay with occasional cobbles. Gravel is fine to coarse angular of sandstone, mudstone, and brick with constituents of metal. Cobbles are angular of brick and mudstone.
TP326	2.65	3.00	Silty clay	Firm greyish brown silty CLAY.
TP327	0.00	2.50	Made Ground	MADE GROUND: Brown slightly clayey gravel with occasional cobbles. Gravel is fine to coarse angular of sandstone and mudstone with constituents of metal. Cobbles are angular of concrete and brick.
TP327	2.50	3.40	Silty clay	Firm greyish brown silty CLAY.
TP328	0.00	0.10	Made Ground	MADE GROUND: Orangish brown slightly sandy gravel. Gravel is fine to coarse angular of mudstone and sandstone.
TP328	0.10	2.70	Silty clay	Firm blueish grey slightly silty CLAY. Becomes soft at 2.00 m bgl.
TP328	2.70	2.80	Peat	Soft black pseudo fibrous PEAT.
TP328	2.80	3.50	Silty clay	Very soft dark blueish grey slightly silty CLAY.
TP329	0.00	2.80	Made Ground	MADE GROUND: Firm brown very gravelly clay with frequent cobbles. Gravel is fine to coarse angular of sandstone, mudstone, brick and concrete. Cobbles are angular of concrete and brick.
TP329	2.80	3.30	Gravelly clay	Very soft brown slightly gravelly CLAY. Gravel is fine to coarse subangular sandstone and mudstone.
TP329	3.30	3.35	Peat	Soft black pseudo fibrous PEAT.
TP329	3.35	3.45	Silty clay	Blueish grey silty CLAY.
TP330	0.00	2.60	Made Ground	MADE GROUND: Brown very gravelly clay. Gravel is fine to coarse angular sandstone, mudstone, brick, and concrete with constituents of metal.
TP330	2.60	2.90	Gravelly clay	Firm brown slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.

TP330	2.90	3.50	Silty clay	Soft blueish grey silty CLAY with pockets soft black pseudo fibrous PEAT.
TP331	0.00	0.60	Made Ground	MADE GROUND: Brown gravel with frequent cobbles. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete with constituents of metal. Cobbles are angular of brick.
TP331	0.60	0.70	Made Ground	MADE GROUND: Black gravel. Gravel is fine to coarse angular of granite and mudstone.
TP331	0.70	3.00	Silty clay	Firm blueish grey silty CLAY. Becomes very soft at 2.00 m bgl.
TP331	3.00	3.10	Peat	Soft black pseudo fibrous PEAT.
TP331	3.10	4.20	Silty clay	Soft blueish grey silty CLAY with occasional rootlets.
TP332	0.00	1.85	Made Ground	MADE GROUND: Brown gravelly clay with pockets of black fine to coarse gravel. Gravel is fine to coarse angular of sandstone, mudstone, and brick.
TP332	1.85	3.70	Clay	Soft blueish grey CLAY with pockets of soft black pseudo fibrous PEAT.
TP333	0.00	2.30	Made Ground	MADE GROUND: Brown very gravelly clay with frequent cobbles. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete with constituents of metal. Cobbles are angular of concrete and brick.
TP333	2.30	3.70	Silty clay	Firm blueish grey silty CLAY with occasional pockets of soft black pseudo fibrous PEAT.
TP334	0.00	1.90	Made Ground	MADE GROUND: Brown very gravelly clay. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete.
TP334	1.90	3.50	Silty clay	Firm blueish grey silty CLAY. Becomes very soft at 3.00 m bgl.
TP335	0.00	0.60	Made Ground	MADE GROUND: Orangish brown slightly sandy gravel. Gravel is fine to coarse angular of mudstone and sandstone.

TP335	0.60	0.90	Made Ground	MADE GROUND: Brown gravelly clay. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete.
TP335	0.90	2.50	Silty clay	Firm blueish grey silty CLAY. Becomes very soft at 2.00 m bgl.
TP335	2.50	2.60	Peat	Soft black pseudo fibrous PEAT.
TP335	2.60	4.00	Silty clay	Very soft blueish grey silty CLAY with occasional rootlets.
TP336	0.00	0.60	Made Ground	MADE GROUND: Brown gravel. Gravel is fine to coarse angular of sandstone and mudstone.
TP336	0.60	0.95	Made Ground	MADE GROUND: Brown gravelly clay. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete.
TP336	0.95	2.45	Silty clay	Firm blueish grey silty CLAY. Becomes very soft at 2.00 m bgl.
TP336	2.45	2.60	Peat	Soft black pseudo fibrous PEAT.
TP336	2.60	3.60	Silty clay	Very soft blueish grey silty CLAY with pockets of soft black pseudo fibrous PEAT.
TP337	0.00	2.20	Made Ground	MADE GROUND: Brown very gravelly clay with frequent cobbles. Gravel fine to coarse angular of sandstone and mudstone. Cobbls are angular of mudstone, concrete and brick.
TP337	2.20	2.80	Silty clay	Firm blueish grey silty CLAY.
TP337	2.80	2.90	Peat	Soft black pseudo fibrous PEAT.
TP337	2.90	4.00	Silty clay	Very soft blueish grey silty CLAY.
TP338	0.00	2.00	Made Ground	MADE GROUND: Brown very gravelly clay. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete.
TP338	2.00	2.90	Silty clay	Firm blueish grey silty CLAY.
TP338	2.90	3.05	Peat	Soft black pseudo fibrous PEAT.
TP338	3.05	3.90	Silty clay	Very soft blueish grey very silty CLAY with frequent rootlets.
TP339	0.00	1.50	Made Ground	MADE GROUND: Brown very gravelly clay with occasional cobbles. Gravel is fine to coarse angular of sandstone and mudstone with constituents of metal. Cobbles are angular of concrete.
TP339	1.50	2.60	Silty clay	Firm blueish grey silty CLAY.

TP340	0.00	1.40	Made Ground	MADE GROUND: Brown very gravelly clay with occasional cobbles. Gravel is fine to coarse angular of sandstone, mudstone, brick, and concrete with constituents of metal. Cobbles are angular of concrete and brick.
TP340	1.40	3.10	Silty clay	Firm light blueish grey slightly silty CLAY.
TP340	3.10	3.20	Peat	Soft black pseudo fibrous PEAT.
TP340	3.20	3.30	Silty clay	Soft light blueish grey silty CLAY.
TP341	0.00	0.40	Made Ground	MADE GROUND: Brown very gravelly clay. Gravel is fine to coarse angular of sandstone, mudstone, and brick.
TP341	0.40	2.80	Clay	Firm brown slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone. Becomes soft at 2.00 m bgl.
TP341	2.80	2.90	Peat	Soft black pseudo fibrous PEAT.
TP341	2.90	3.20	Silty clay	Soft blueish grey silty CLAY.
TP342	0.00	0.40	Made Ground	MADE GROUND: Brown slightly sandy clay with frequent rootlets. (Reworked Topsoil)
TP342	0.40	1.20	Silty clay	Firm brown slightly silty CLAY.
TP342	1.20	2.20	Silty clay	Firm blueish grey slightly silty CLAY.
TP342	2.20	2.30	Peat	Soft black pseudo fibrous PEAT.
TP342	2.30	3.65	Silty clay	Very soft blueish grey silty CLAY with frequent rootlets.
TP343	0.00	1.10	Made Ground	MADE GROUND: Brown slightly sandy gravel. Gravel is fine to coarse angular of sandstone and mudstone.
TP343	1.10	2.15	Made Ground	MADE GROUND: Brown gravelly clay. Gravel is fine to coarse angular of sandstone and mudstone.
TP343	2.15	2.50	Sandy clay	Soft greyish brown slightly sandy CLAY with occasional pockets of soft black pseudo fibrous PEAT.
TP343	2.50	3.80	Silty clay	Firm blueish grey silty CLAY.
TP344	0.00	0.35	Made Ground	MADE GROUND: Brown gravel with frequent cobbles. Gravel is fine to coarse angular of mudstone, brick, and concrete. Cobbles are angular of mudstone, concrete, and brick.
TP344	0.35	2.50	Sandy clay	Stiff light blueish is grey slightly sandy CLAY. Becomes very soft at 2.00 m bgl.

TP344	2.50	3.40	Silty clay	Very soft light bluish grey silty CLAY.
TP345	0.00	0.30	Made Ground	MADE GROUND: Orangish brown gravel. Gravel is fine to coarse angular of mudstone, sandstone, and brick.
TP345	0.30	2.10	Sandy clay	Firm light blueish grey slightly sandy CLAY.
TP345	2.10	3.60	Silty clay	Very soft blueish grey very silty CLAY.
TP346	0.00	0.30	Made Ground	MADE GROUND: Orangish brown gravel. Gravel is fine to coarse angular of mudstone and brick.
TP346	0.30	0.80	Sandy clay	Stiff light blueish grey slightly sandy CLAY.
TP346	0.80	3.50	Silty clay	Soft lueish grey silty CLAY. Becomes firm at 2.50 m bgl.
WS201	0.00	0.20	Made Ground	Made Ground: Light reddish brown sandy gravel. Gravel is fine to coarse subangular to angular of mudstone.
WS201	0.20	2.00	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
WS201	2.00	4.80	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS201	4.80	4.95	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
WS201	4.95	5.45	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS202	0.00	0.20	Made Ground	Made Ground: Light reddish brown sandy gravel. Gravel is fine to coarse subangular to angular of mudstone.
WS202	0.20	2.10	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
WS202	2.10	2.40	Silty clay	Firm low strength light blueish grey slightly sandy silty CLAY.
WS202	2.40	2.60	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
WS202	2.60	5.45	Silty clay	Soft very low strength light blueish grey slightly sandy silty CLAY.
WS203	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
WS203	0.15	2.30	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 2.00 m bgl.
WS203	2.30	2.90	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.

WS203	2.90	3.00	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
WS203	3.00	3.50	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS203	3.50	3.60	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS203	3.60	4.60	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS203	4.60	4.70	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS203	4.70	5.45	Silty clay	Firm light blueish grey sandy silty slightly gravelly CLAY. Gravel is fine to medium subrounded to rounded of mudstone.
WS204	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
WS204	0.15	2.10	Clay	Firm low strength brown mottled grey slightly sandy CLAY with occasional rootlets to 0.50 m bgl. Becoming soft very low strength at 2.00 m bgl.
WS204	2.10	2.50	Silty clay	Soft very low strength light grey sandy silty CLAY.
WS204	2.50	2.60	Peat	Black pseudo fibrous PEAT with a strong organic odour and frequent rootlets.
WS204	2.60	3.60	Silty clay	Soft very low strength light grey sandy silty CLAY.
WS204	3.60	3.70	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS204	3.70	4.70	Silty clay	Soft very low strength light grey sandy silty CLAY.
WS204	4.70	4.80	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS204	4.80	5.45	Silty clay	Stiff medium strength light grey sandy silty CLAY.
WS205	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
WS205	0.15	1.20	Clay	Firm low strength brown mottled grey slightly sandy CLAY with occasional rootlets to 0.50 m bgl.
WS205	1.20	2.10	Clay	Soft very low strength light grey slightly sandy CLAY.
WS205	2.10	2.20	Silty clay	Soft very low strength light grey sandy silty CLAY.

WS205	2.20	2.30	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS205	2.30	3.00	Silty clay	Soft very low strength light grey sandy silty CLAY.
WS205	3.00	3.10	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS205	3.10	4.00	Silty clay	Soft very low strength light grey sandy silty CLAY.
WS205	4.00	4.10	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS205	4.10	5.45	Gravelly sandy silt	Very stiff light blueish grey gravelly sandy SILT. Gravel is fine to coarse rounded of mudstone.
WS206	0.00	0.20	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
WS206	0.20	2.00	Clay	Firm low strength brown mottled grey slightly sandy CLAY with occasional rootlets to 0.40 m bgl. Becoming soft very low strength at 2.00 m bgl.
WS206	2.00	2.10	Silty clay	Soft very low strength light grey sandy silty CLAY with occasional rootlets.
WS206	2.10	2.20	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS206	2.20	3.00	Silty clay	Soft very low strength light grey sandy silty CLAY
WS206	3.00	3.10	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS206	3.10	3.50	Silty clay	Soft very low strength light grey sandy silty CLAY
WS206	3.50	3.60	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS206	3.60	4.40	Silty clay	Soft very low strength light grey sandy silty CLAY
WS206	4.40	5.45	Gravelly sandy silt	Stiff medium strength light grey sandy SILT with frequent rootlets.
WS207	0.00	0.20	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
WS207	0.20	1.90	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
WS207	1.50	1.60	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS207	1.60	2.00	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.

WS207	1.90	2.30	Silty clay	Soft very low strength light grey slightly silty CLAY.
WS207	2.00	2.10	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS207	2.10	3.50	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS207	2.30	1.50	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS207	3.50	3.60	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS207	3.60	5.45	Silty clay	Soft very low strength light blueish grey sandy silty CLAY. Becoming firm low strength at 5.00 m bgl.
WS208	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
WS208	0.15	1.90	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
WS208	1.90	2.50	Silty clay	Soft very low strength light grey slightly silty CLAY.
WS208	2.50	2.60	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS208	2.60	2.70	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS208	2.70	3.50	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS208	3.50	3.60	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS208	3.60	4.50	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS208	4.50	4.60	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS208	4.60	5.45	Silty clay	Soft very low strength light blueish grey sandy silty CLAY.
WS209	0.00	0.20	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
WS209	0.20	1.90	Clay	Firm low strength brown mottled grey slightly sandy CLAY.
WS209	1.90	2.00	Silty clay	Soft very low strength light grey slightly silty CLAY.
WS209	2.00	2.20	Silty clay	Soft very low strength light blueish grey sandy very silty CLAY.
WS209	2.20	2.30	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS209	2.30	2.80	Silty clay	Soft very low strength light blueish grey sandy very silty CLAY.

WS209	2.80	2.90	Peat	Black pseudo fibrous PEAT with a strong organic odour.
WS209	2.90	5.45	Silty clay	Soft very low strength light blueish grey sandy very silty CLAY. Becoming firm low strength at 5.00 m bgl.
WS210	0.00	0.10	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
WS210	0.10	2.00	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 2.00 m bgl.
WS210	2.00	5.45	Silty clay	Soft very low strength light grey slightly sandy silty CLAY.
WS211	0.00	0.15	Topsoil	Brown slightly sandy clay with frequent rootlets. (TOPSOIL)
WS211	0.15	2.00	Clay	Firm low strength brown mottled grey slightly sandy CLAY. Becoming soft very low strength at 2.00 m bgl.
WS211	2.00	5.45	Silty clay	Soft very low strength light grey slightly sandy silty CLAY.
WS212	0.00	0.15	Made Ground	Made Ground: Brown slightly gravelly slightly sandy clay. Gravel is fine to coarse subangular to angular of mudstone and sandstone.
WS212	0.15	1.00	Made Ground	Made Ground: Stiff medium strength brown gravelly clay. Gravel is fine to coarse angular of mudstone and sandstone.
WS212	1.00	5.45	Clay	Stiff medium strength strength brown mottled grey slightly sandy CLAY.

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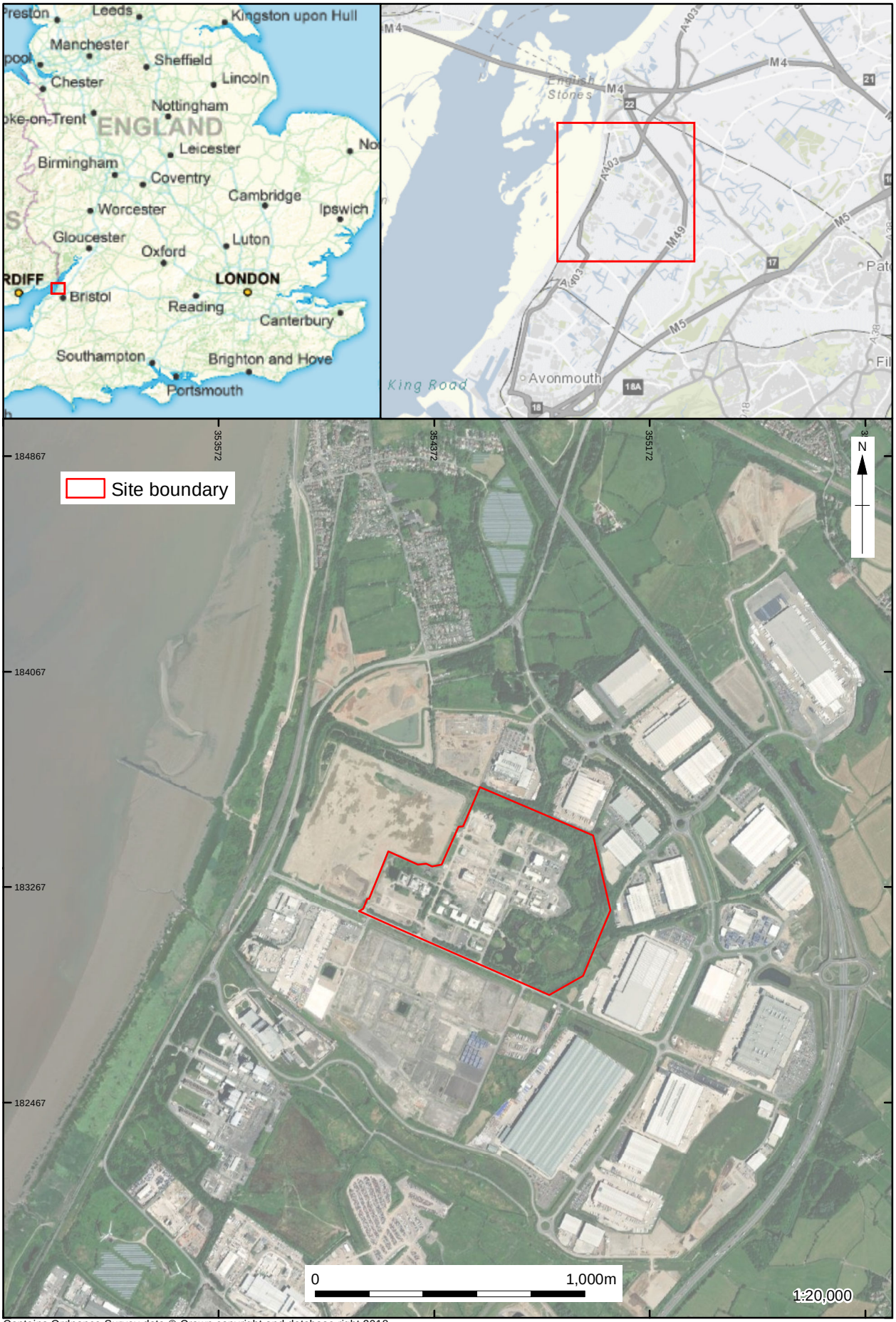

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Figure 1: Site location

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- Site boundary
- Previous plots
- Oxford Archaeology Borehole (OABH)
- Cable Percussion Borehole (CP)
- Window Sample (WS)
- Test Pit (TP)

Transect

- A
- B
- C
- D

N

0 200m

1:5,500 @ A3

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Figure 2: Location of GI boreholes, window sample and test pits with Plot 5000 borehole locations

oxford archaeology

Site boundary
Previous plots
Oxford Archaeology Borehole (OABH)
Cable Percussion Borehole (CP)
Window Sample (WS)
Test Pit (TP)

Transect

A
B
C
D

m OD
5.80
5.90
6.00
6.10
6.20
6.30
6.40
6.50
6.60
6.70
6.80
6.90
7.00
7.10
7.20
7.30
7.40
7.50
7.60
7.70
7.80
7.90
8.00
8.10
8.20
8.30
8.40
8.50

N

0 200m

1:5,500 @ A3

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Figure 3: LiDAR DTM of site with borehole, window sample and test pit locations

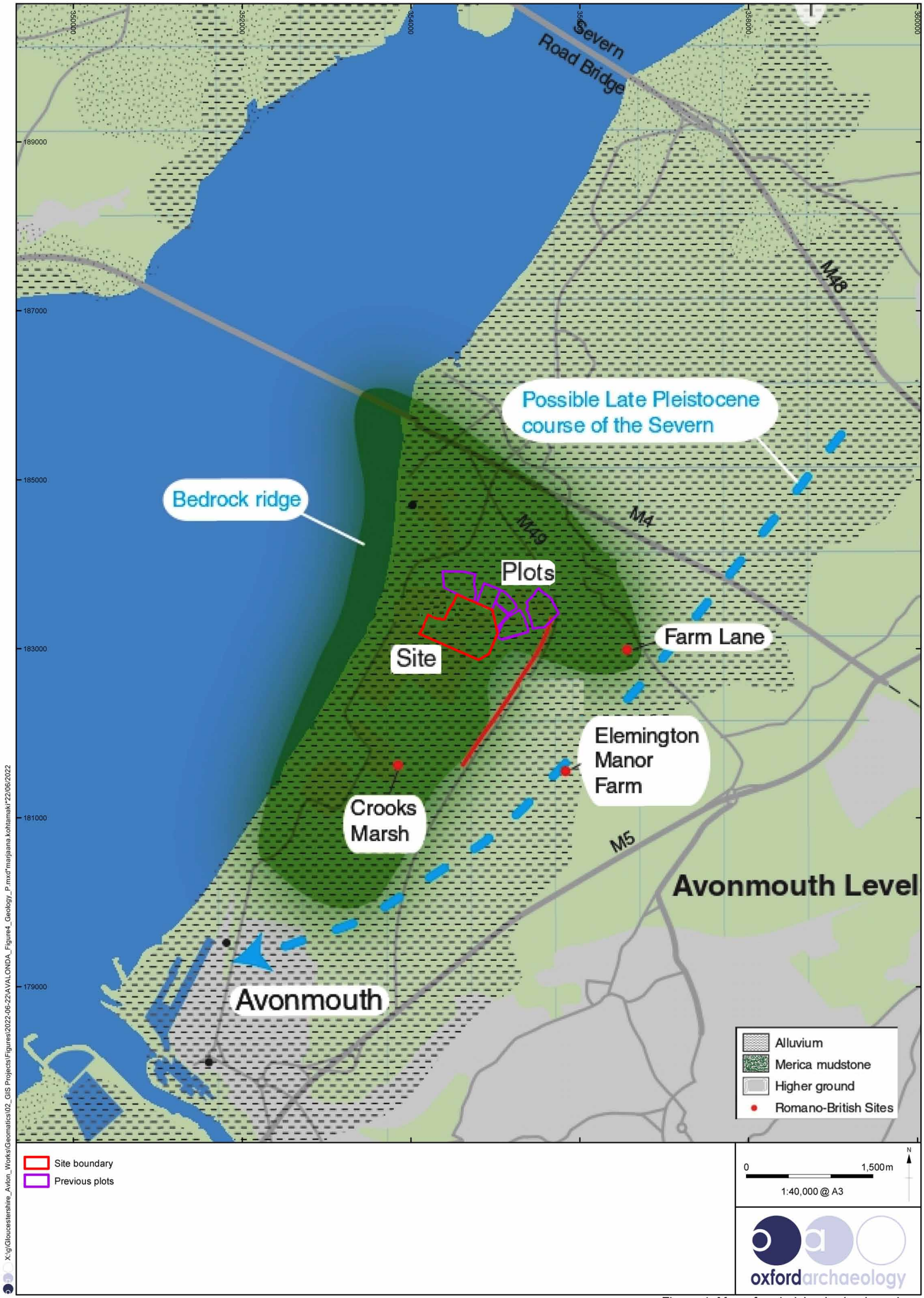

Figure 4: Map of underlying bedrock geology

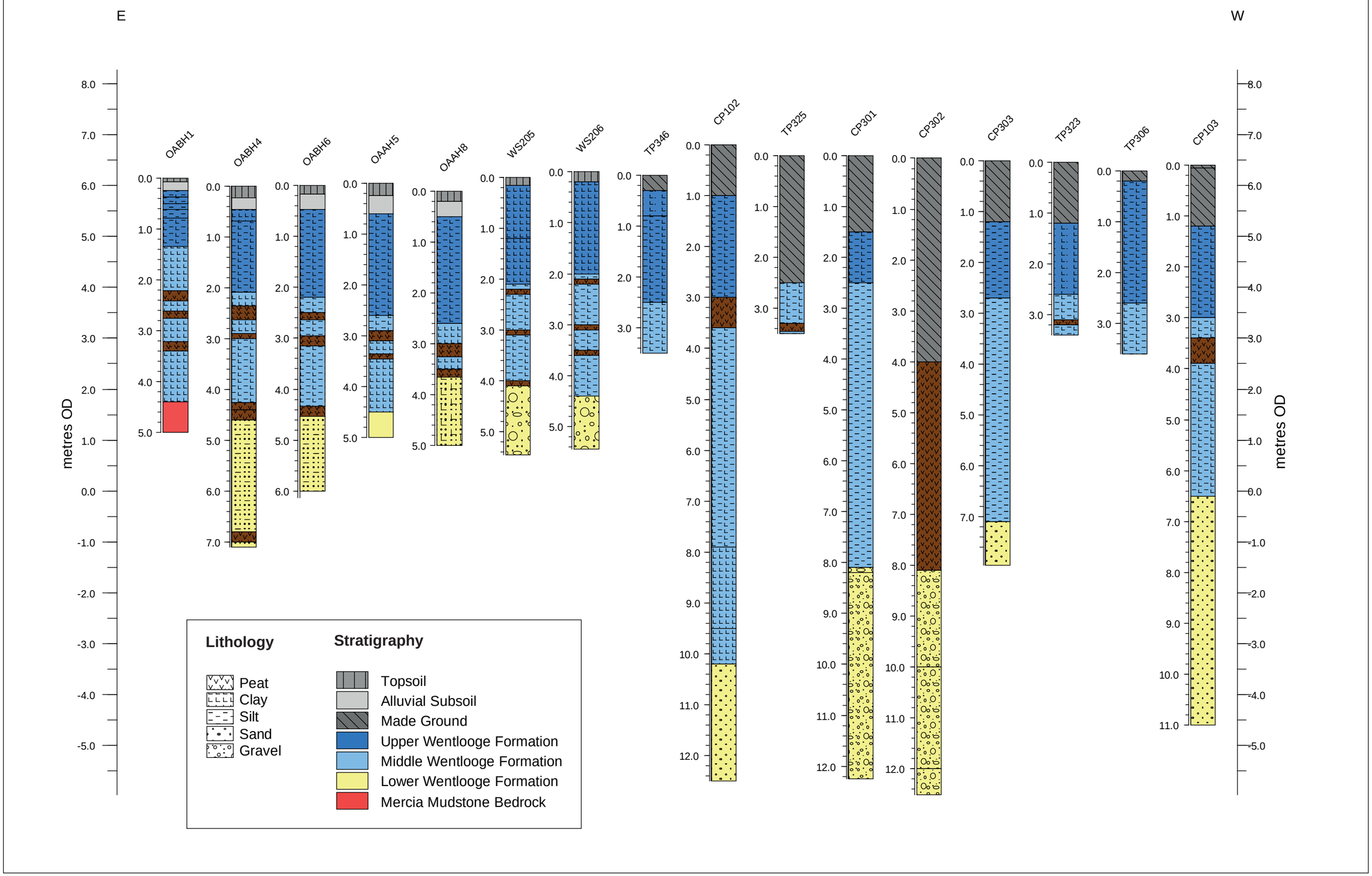

Figure 5: Transect A, litho-stratigraphic borehole profiles

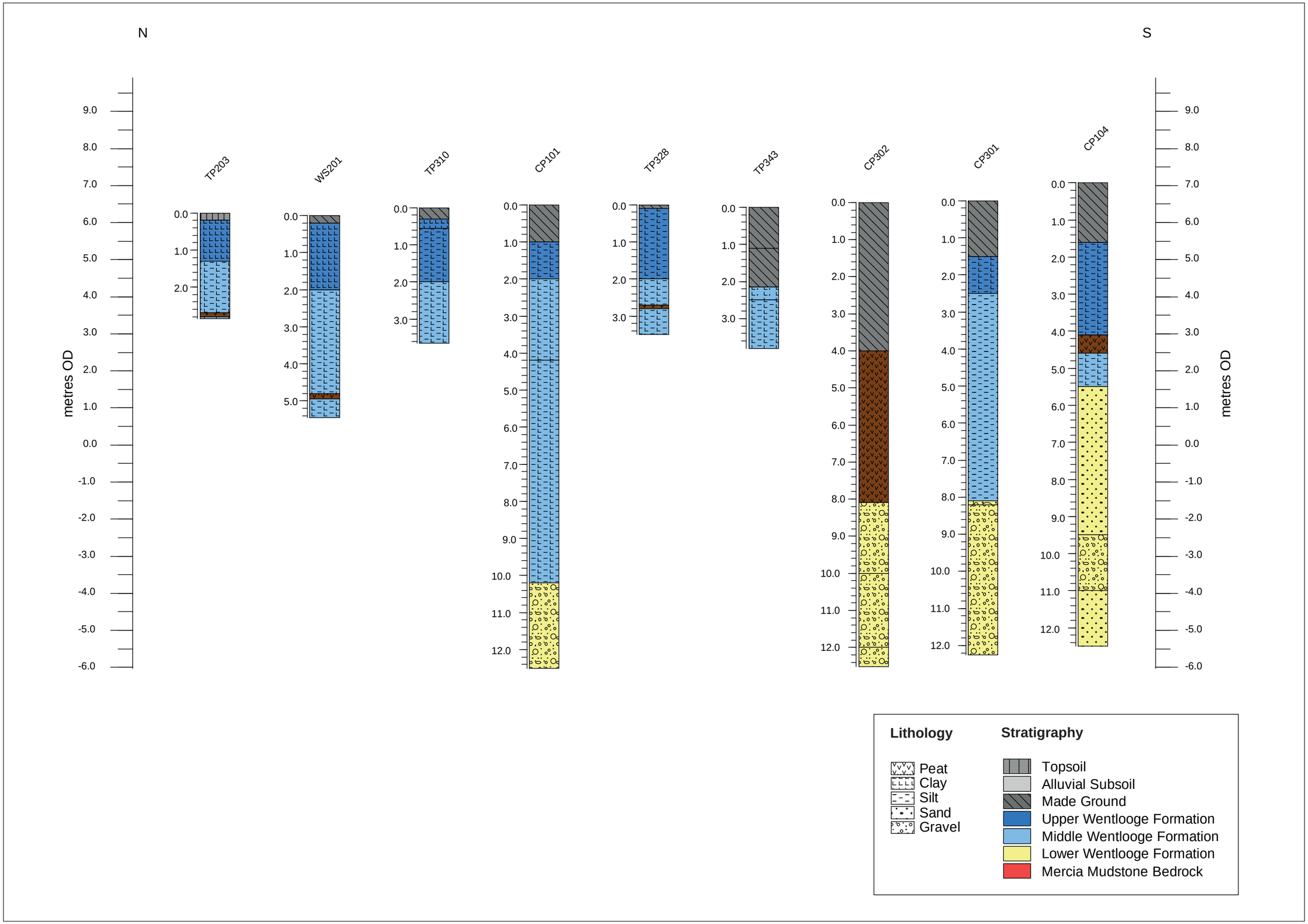

Figure 6: Transect B, litho-stratigraphic profiles

NE

SW

metres OD

OABH1

OABH4

OABH6

OAAH5

OAAH8

WS205

WS204

TP225

TP228

WS210

WS211

WS212

Lithology

- Peat
- Clay
- Silt
- Sand
- Gravel

Stratigraphy

- Topsoil
- Alluvial Subsoil
- Made Ground
- Upper Wentlooge Formation
- Middle Wentlooge Formation
- Lower Wentlooge Formation
- Mercia Mudstone Bedrock

Figure 7: Transect C, litho-stratigraphic profiles

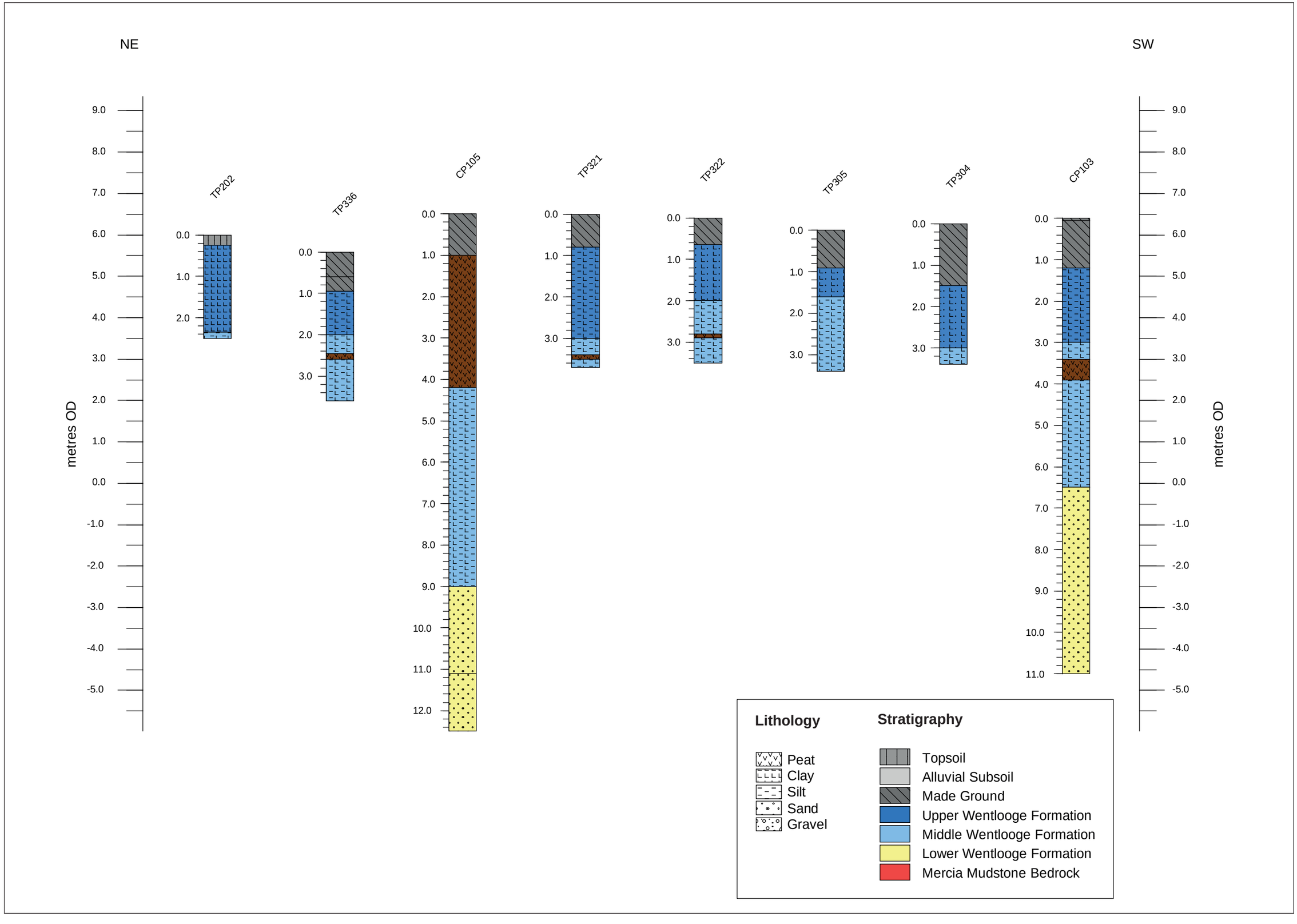

Figure 8: Transect D, litho-stratigraphic profiles

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