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Sizewell, Suffolk: A Palaeoenvironmental Evaluation of Deposits Encountered Along the Proposed Leiston Substation 132kV Cable Route

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by

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Summary

Deposits of palaeoenvironmental potential were encountered during ground investigations along the proposed cable route for the Leiston substation at Sizewell, Suffolk. Sedimentary coring supported by trial trenching across the site, confirmed the presence of organic-rich deposits on lowlands proximal to the Sizewell Belts. Sedimentation is likely to have occurred through in-situ organic accumulation in a backwater lagoonal floodplain setting.

Due to the overall lack of archaeological and palaeoenvironmental work previously undertaken within the area, the site is thus deemed to have the potential to yield significant palaeoenvironmental results. Samples were subsequently taken from the organic sequence encountered during trial trenching. Recommendations for palaeoenvironmental assessments are proposed. In addition, it is recommended that further sampling is undertaken in the eastern section of the site using a dynamic percussive rig to access deeper organic deposits that were encountered during the coring survey

KEYWORDS: Sizewell, Leiston, Suffolk, sedimentary coring, peat

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1. INTRODUCTION

Deposits of palaeoenvironmental potential were discovered during ground investigations along the proposed cable route for Leiston Substation, Sizewell, Suffolk (TM 4719 6316). Previous borehole investigations had been undertaken in order to install water and gas monitoring wells, which indicated the presence of organic-rich deposits. The site is located on the North Sea coast immediately south of Sizewell Power Station. The cable route was initially highlighted as having a high potential to encounter deposits of palaeoenvironmental importance due to its proximity to the floodplain of a tributary of the Sizewell Belts (situated to the north). The spatial and temporal variation of these deposits was however poorly understood.

Birmingham Archaeo-Environmental (BA-E) were subsequently subcontracted by Suffolk County Council Archaeological Service (SCCAS) to undertake a high-resolution coring survey along the cable route. This was required in order to evaluate the stratigraphic sequence preserved across the site and assess for palaeoenvironmental potential.

This report presents the results of palaeoenvironmental investigations (manual coring, stratigraphic recording, sampling and palaeoenvironmental evaluation) associated with this scheme of work.

The aim of the work was threefold:

- To identify, record, characterise and sample organic deposits encountered during the previous borehole surveys.
- To assess this material for biological preservation (suitable for pollen and beetle assessments) and identify suitable samples for radiocarbon dating.
- To provide a detailed understanding of the subsurface stratigraphy of any organic-rich deposits, which might aid in the development of archaeological prospection strategies.

2. METHODS

2.1 Borehole Survey

At the time of fieldwork, the field in which the site was located was cultivated, although the area affected by the proposed cable route had been set aside. A site visit was undertaken in April 2008, during which sedimentary coring was undertaken across the site. Core locations were chosen to ensure that a clear spatial understanding of the stratigraphy across the site was gained. This was achieved through the positioning of the cores to create two transects running approximately east-west across the site. A third transect, running northeast to southwest, was positioned where deposits of palaeoenvironmental potential were known to be present (see Figure 1). Upon the completion of the coring transects, additional cores were positioned to further refine the spatial extent of the organic deposit.

Due to the highly minerogenic nature of the soils encountered, coring was initially undertaken using a 4-cm wide Dutch (Edelman) auger. If organic-rich deposits were encountered, coring was continued using a manual gauge 'Eijkelcamp' corer. It was hoped that coring would continue until bedrock or gravels were encountered. However, due to the high sand content encountered within almost all of the sediment cores, combined with the relatively high water table, sediment saturation resulted in borehole collapse, normally at a depth of between 1.60 m and 2.00 m.

2.2 Trial Trenching Survey

Upon the completion of the coring survey, trial trenching was to be undertaken by SCCAS across the site. A number of trenches were located where organic deposits had been encountered during the coring survey. Palaeoenvironmental monitoring was subsequently undertaken during trenching in order to identify organic-rich deposits suitable for palaeoenvironmental consideration. One such trench excavated during the site visit contained a relatively extensive sequence of organic-rich deposits, which warranted sampling to be undertaken.

2.3 Stratigraphic Analysis

Whilst an initial assessment of the sedimentary archive was made on-site, a detailed stratigraphic analysis of samples was undertaken at the Birmingham Archaeo-Environmental laboratory at the University of Birmingham. Sediments were recorded using the Troels-Smith (1955) classification scheme. The scheme breaks down a sediment sample into four main components and allows the inclusion of extra components that are also present, but that are not dominant. Key physical properties of the sediment layers are also identified according to darkness (Da), stratification (St), elasticity (El), dryness of the sediment (Dr) and the sharpness of the upper sediment boundary (UB). A summary of the sedimentary and physical properties classified by Troels-Smith (1955) and the nomenclature used is provided in Table 1. A full stratigraphic breakdown of the cores is provided in Appendix I.

3. PRELIMINARY RESULTS OF FIELDWORK

A total of 25 cores were taken across the site (see Figure 1 for core locations). There was stratigraphic variation encountered during fieldwork, whilst the depth at which coring was terminated varied to between 1.30 m (Core 19) and 2.55 m (Core 23). Borehole collapse in response to the thixotropic nature of the sediments was responsible for the cores not reaching greater depths.

The general site stratigraphy was typified by dark brown and orange-brown sands. Gravel content varied considerably but was found to show an overall increase with depth through the orange-brown sands. Below the modern agricultural plough soil, dark brown sands with varying organic content were commonly encountered to a depth of *c*. 0.70 m. Orange-brown sands were found to underlie the dark brown sands and were present to a depth of up to *c*. 2.20 m (core 3) before borehole collapse prevented coring from continuing. Towards the centre of the site however, an organic-rich unit was encountered with depth and found to increase in thickness with distance east. The organic-rich unit was found to be interbedded between the dark brown sands and the basal orange-brown sands. The organic unit was encountered within cores 5 to 10 in Transect 1, in cores 15, 16 and 17 within Transect 2 and in cores 2, 21 and 22 in Transect 3 (see Figure 2). There was a distinct increase in unit thickness towards the tributary of the Sizewell Belts to the east. For example, the organic-rich unit was found to be sand-rich and only *c*. 0.10 m thick in core 10. In contrast, core 23 contained an interbedded sequence of organic-rich sands and herbaceous well humified peats between 0.80 m and 2.35 m depth (*c*. 1.55m thick). However, due to the saturated nature of the overlying sands, attempts at coring to obtain a complete and undisturbed sequence from this location were unsuccessful. This was due to the influence of vertical mixing during coring as a result of the high water table and subsequent borehole collapse. In addition, trial trenching proximal to the location of core 2 would not be allowed to exceed a depth of 1.20 m (H&S), also preventing a full sedimentary sequence from being obtained.

The trial trenching that was subsequently undertaken by SCCAS confirmed the spatial variation in the organic-rich unit across the site. The deposit was encountered approximately half way along Trench 27, overlain and underlain by the dark brown sands and orange-brown gravelly sands respectively (Plate 1). Further east, Trench 30 trended north-south and also encountered the organic unit. The unit was much thicker within this trench however, possibly due to the increased proximity to the tributary of the Sizewell Belts (Plate 2).

Upon completion of the stratigraphic survey, samples were taken from Trench 30 in which the thickest organic sequence had been encountered. Two monolith tins were taken in addition to bulk samples and spot samples for radiocarbon dating consideration. Whilst it was clear that a thicker organic sequence was located towards the far east of the site (proximal to Core 23 and Trench 32), suitable sampling could not be undertaken due to the greater depth at which the organic deposits were present in addition to the saturation of the sedimentary sequence.

4. CONCLUSIONS

The stratigraphic sequence encountered along the Leiston substation cable route suggests considerable palaeoenvironmental variation exists across the site. It is concluded that the upper dark brown sand unit is likely to have developed through a combination of wind-blown (aeolian) activity, *in-situ* organic accumulation and occasional flooding from the tributary of the Sizewell Belts. Such aeolian activity along the Suffolk coastline is responsible for the development of the extensive dune fields present along the coastal margin today. The variation in sediment colouration is a consequence of organic content and iron mottling. The dark brown sands for example were found to contain humic remains from the accumulation of organic material. In contrast, the red-brown sands, commonly present below *c*. 0.70 m depth, obtained their colouration through the precipitation of iron oxides in response to water table fluctuations.

The organic-rich unit, encountered in the centre and to the east of the study area, is suggested to have accumulated through a process of *in-situ* organic accumulation in a lagoonal backwater floodplain setting. This is supported by the increase in unit thickness with distance towards the tributary of the Sizewell Belts, along with the overall abundance of very well humified peat (typical of organic remains within a saturated floodplain setting). An alternative explanation however, may relate to the existence of a palaeochannel across the site. This is suggested due to the relatively narrow and restricted nature of the unit's spatial distribution, which cuts roughly east-west across the site. In addition, the western extent of the deposit is approximately aligned with low-lying land along which an access road trends south off Sizewell Gap (Figure 2). If such a palaeochannel was in existence, it may continue further south along the route of this access road. Palaeoenvironmental assessments of the deposits encountered will provide an insight in to the timing and nature of the organic accumulation that occurred across the site.

5. RECOMMENDATIONS FOR FURTHER ANALYSIS

In order to obtain an understanding of the palaeoenvironmental conditions responsible for the development of the organic unit, samples were taken from Trench 30. The following assessment is suggested:

- Radiocarbon dating of the upper and lower unit boundaries of the organic deposit. This will provide an understanding of the timing of the onset and cessation of organic accumulation,

- Pollen analysis should be undertaken at 0.08 m intervals through the organic unit in order to assess the palaeoecological conditions present at the time of deposition (9 samples in total),

- Diatom analysis should also be undertaken at 0.08 m intervals through the organic unit. This will enable an assessment to be made as to whether terrestrial freshwater conditions prevailed throughout the period of organic accumulation, or whether saline waters (in response to fluctuations in relative sea level) influenced the lowland setting,

- Beetle assessments should be undertaken on bulk samples taken from the top, middle and bottom of the organic unit (3 samples in total).

In addition, it is recommended that a dynamic percussive rig is used to take two cores from proximal to the location of core 23 (Figure 1). The organic unit was found to be thickest at this location, but sampling through manual coring was not possible due to the saturated nature of the overlying sands. The use of a dynamic percussive rig would enable the recovery of a complete sedimentary sequence and the two cores will contain sufficient material for multi proxy palaeoenvironmental assessments to be undertaken. This approach would focus subsequent palaeoenvironmental assessments on the deeper organic deposits not encountered elsewhere on site. This, in turn, would complement the palaeoenvironmental assessments recommended for the upper organic deposits encountered and sampled from Trench 30.

6. ARCHIVE

All monolith and bulk samples taken during fieldwork are currently stored by Birmingham Archaeo-Environmental, University of Birmingham, Edgbaston, Birmingham, B15 2TT. In addition, original core logs, site location plans, photographs and associated material are stored within Birmingham Archaeo-Environmental.

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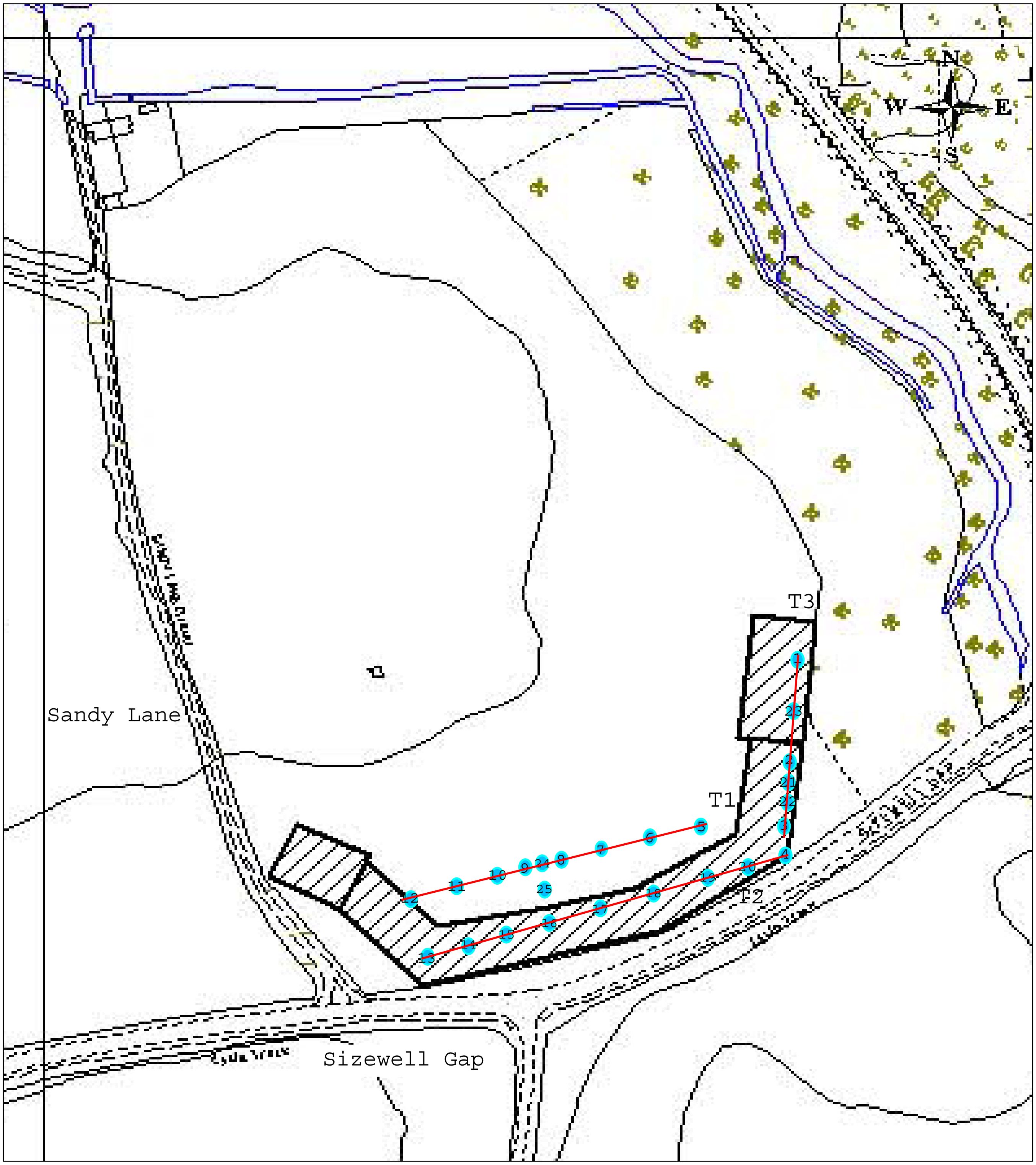

Figure 1: Proposed route of Leiston substation 132kV cable (shaded area), showing approximate location of boreholes undertaken during palaeoenvironmental evaluation.
The precise location of the boreholes (GPS) are provided in Appendix I. Plan provided by Suffolk County Council Archaeological Service

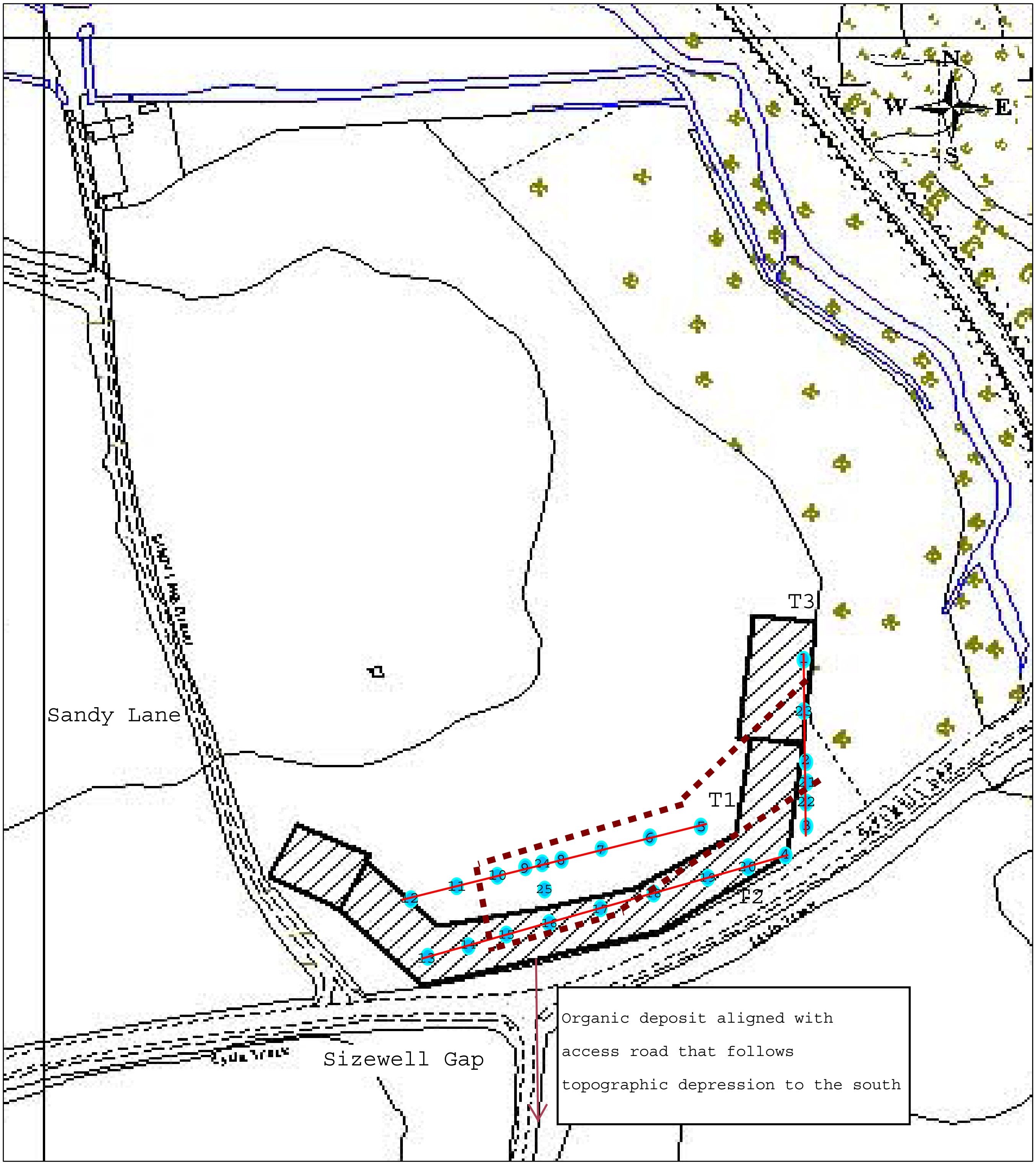

Figure 2: Proposed route of Leiston substation 132kV cable (shaded area), showing approximate spatial extent of the organic-rich deposits encountered during the palaeoenvironmental evaluation. The approximate limit of the organic unit is highlitghed by the brown dashed line. Refer to the stratigraphic logs in Appendix I for precise sedimentological details.

Plate 1: View along Trench 27, looking east. The start of the organic-rich unit is visible within the trench, with a relatively sharp contact boundary evident with the sands to the west.

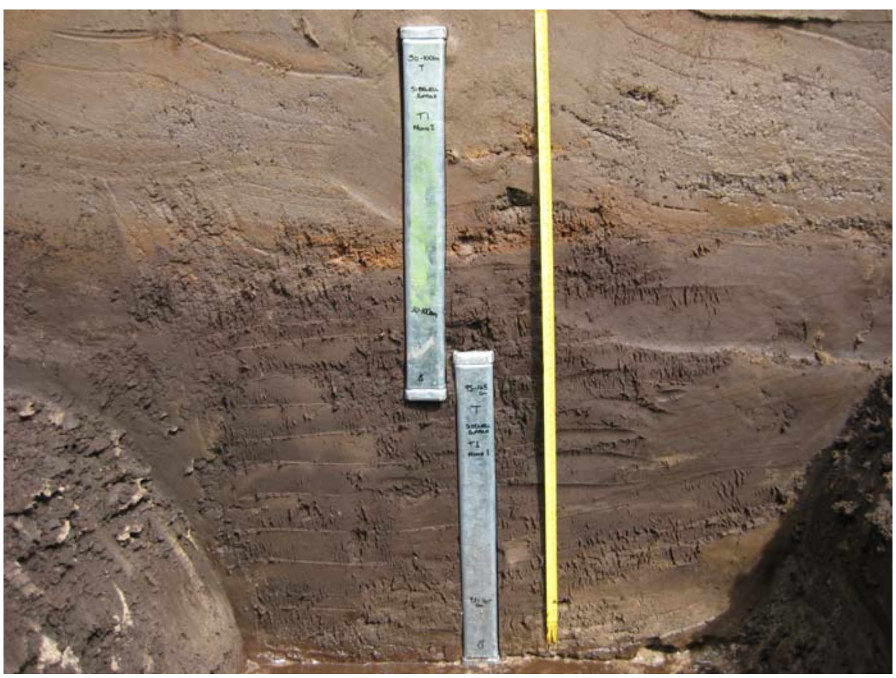

Plate 2: View of west-facing trench section in Trench 30. The organic unit was much thicker than that encountered in Trench 27, with up to c. 0.65m of organics at the northern end of the trench.

Degree of Darkness	
nig.4	black
nig.3	
nig.2	
nig.1	
nig.0	white

Degree of Stratification	
strf.4	well stratified
strf.3	
strf.2	
strf.1	
strf.0	no stratification

Degree of Elasticity	
elas.4	very elastic
elas.3	
elas.2	
elas.1	
elas.0	no elasticity

Degree of Dryness	
sicc.4	very dry
sicc.3	
sicc.2	
sicc.1	
sicc.0	water

	Sharpness of Upper Boundary
lim.4	< 0.5mm
lim.3	< 1.0 & > 0.5mm
lim.2	< 2.0 & > 1.0mm
lim.1	< 10.0 & > 2.0mm
lim.0	> 10.0mm

	Sh	*Substantia humosa*	Humous substance, homogeneous microscopic structure
I Turfa	*Tb*	*T. bryophytica*	Mosses +/- humous substance
	Tl	*T. lignosa*	Stumps, roots, intertwined rootlets, of ligneous plants
	Th	*T. herbacea*	Roots, intertwined rootlets, rhizomes of herbaceous plants
II Detritus	*Dl*	*D. lignosus*	Fragments of ligneous plants >2mm
	Dh	*D. herbosus*	Fragments of herbaceous plants >2mm
	Dg	*D. granosus*	Fragments of ligneous and herbaceous plants <2mm >0.1mm
III Limus	*Lf*	*L. ferrugineus*	Rust, non-hardened. Particles <0.1mm
IV Argilla	*As*	*A.steatodes*	Particles of clay
	Ag	*A. granosa*	Particles of silt
V Grana	*Ga*	*G. arenosa*	Mineral particles 0.6 to 0.2mm
	Gs	*G. saburralia*	Mineral particles 2.0 to 0.6mm
	Gg(min)	*G. glareosa minora*	Mineral particles 6.0 to 2.0mm
	Gg(maj)	*G. glareosa majora*	Mineral particles 20.0 to 6.0mm
	Ptm	*Particulae testae molloscorum*	Fragments of calcareous shells

Table 1 Physical and sedimentary properties of deposits according to Troels-Smith (1955)

APPENDIX I

Core Stratigraphy

Refer to Table 1 for summary of sedimentary classification scheme of Troels-Smith (1955)

Core 1 (TM 47285 62753)

0.00-0.40m	Da	St	El	Dr	UB
	2+	0	0	3	-
	Ga4, Sh+, Th+, Ggmin+,				
	Grey-brown sand topsoil				
0.40-2.00m	Da	St	El	Dr	UB
	2	0	0	2	1
	Ga4, Ggmin+, Ag+				
	Orange-brown sand				

Borehole abandoned due to borehole collapse (saturated sands)

Core 2 (TM 47291 62725)

0.00-0.60m	Da	St	El	Dr	UB
	Ga4, Sh+, Ag+				
	Grey-brown sand topsoil				
0.60-1.20m	Da	St	El	Dr	UB
	3	0	0	2	1
	Ga3, Sh1, Ag+				
	Dark grey-brown organic-rich sand				
1.20-1.80m	Da	St	El	Dr	UB
	Ga2, Ag1, As1, Sh+				
	Grey-brown silty sand with occasional organic mottling				
1.80-2.50m	Da	St	El	Dr	UB
	3	0	2	2	2
	Sh2, Dg1, Dh1, Dl+, Ag+, ggmin+				
	Dark red-brown herbaceous well humified peat with occasional wood fragments				

Borehole abandoned at 2.50m due to borehole collapse (saturated sands)

Core 3 (TM 47295 62697)

0.00-0.30m	Da	St	El	Dr	UB
	3	0	0	2	-
	Ga4, Sh+, Th+, Ggmin+				
	Dark grey-brown sand topsoil				
0.30-2.20m	Da	St	El	Dr	UB

	2	0	0	3	1

Ga4, Ggmin+, Ggmaj+, Gs+
Light yellow-brown coarse pebbly sand
- becoming orange-brown with depth, with increasing gravel content

Borehole abandoned at 2.20m due to borehole collapse (saturated sands)

Core 4 (TM 47273 62680)

0.00-0.35m	Da	St	El	Dr	UB
	2+	0	0	2	1

Ga4, Sh+, Th+, Ag+, Ggmin+
Dark brown organic sand topsoil

0.35-1.10m	Da	St	El	Dr	UB
	2	0	0	2	1

Ga4, Ag+, Ggmin+, Ggmaj+, Lf+
Orange-brown sand

1.10-2.10m	Da	St	El	Dr	UB

Ga4, Ggmin+, Ggmaj+, Gs+
Orange-brown pebbly sand

Borehole abandoned at 2.10m due to borehole collapse (saturated sands)

Core 5 (TM 47258 62705)

0.00-0.30m	Da	St	El	Dr	UB
	3	0	0	2	-

Ga4, Sh+, Th+, Ag+
Dark brown organic sand topsoil

0.30-0.70m	Da	St	El	Dr	UB
	3	0	0	2	1

Ga3, Sh1, Ag+, Th+
Dark brown organic-rich sand

0.70-1.80m	Da	St	El	Dr	UB

Dg2, Dh1, Sh1, Ag+, Th+
Dark red-brown herbaceous well humified peat

Borehole abandoned at 1.80m due to borehole collapse (saturated sands)

Core 6 (TM 47240 62689)

0.00-0.20m	Da	St	El	Dr	UB
	3	0	0	2	-

Ga2, Ag1, Sh1, Th+
Dark brown organic sand topsoil

	Da	St	El	Dr	UB
0.20-0.50m	3+	0	0	2	1

Ga2, Sh1, Ag+, Th+
Dark brown-black organic-rich sand

	Da	St	El	Dr	UB
0.50-1.80m	3+	0	2	2	2

Sh2, Ga2, Ag+, As+, Th+, Dg+
Dark brown organic-rich sand with occasional peat horizons

Borehole abandoned at 1.80m due to borehole collapse (saturated sands)

Core 7 (TM 47217 62686)

	Da	St	El	Dr	UB
0.00-0.60m	2+	0	0	2	-

Ga2, Ag1, Sh1, Th+, As+
Grey-brown organic-rich sand topsoil

	Da	St	El	Dr	UB
0.60-1.70m	3	1	2	2	2

Dh2, Dg1, Sh1, Th+
Dark red-brown herbaceous peat

Gravel encountered at 1.70m depth

Core 8 (TM 47217 62673)

	Da	St	El	Dr	UB
0.00-0.35m	3	0	0	2	-

Ga2, Ag1, Sh1, Th+
Dark brown organic-rich sand topsoil

	Da	St	El	Dr	UB
0.35-0.60m	3+	0	1	2	1

Ga3, Sh1, Ag+
Dark brown-black organic-rich sand

	Da	St	El	Dr	UB
0.60-0.85m	3+	1	2	2	2

Dg2, Dh1, Sh1, Th+
Dark red-brown herbaceous humified peat

	Da	St	El	Dr	UB
0.85-1.10m	2	0	0	2	1

Ga3, Sh1, Ag+
DLight brown organic-rich sand

	Da	St	El	Dr	UB
1.10-2.00m	2	0	0	1	1

Ga4, Ag+, Ggmin+
Yellow-brown saturated coarse sands with occasional gravel

Borehole abandoned at 2.00m due to borehole collapse (saturated sands)

Core 9 (TM 47177 62664)

0.00-0.20m	Da	St	El	Dr	UB
	3	0	0	2	-
	Ga4, Ag+, Sh+, Th+				
	Dark grey-brown organic sand topsoil				
0.20-0.65m	Da	St	El	Dr	UB
	3+	0	0	2	1
	Ga3, Sh1, Th+, Ag+				
	Dark brown organic-rich sand				
0.65-0.75m	Da	St	El	Dr	UB
	3+	0	2	2	2
	Sh2, Dg2, Th+, Ag+, Ga+				
	Dark brown very well humified peat				
0.75-1.05m	Da	St	El	Dr	UB
	Ga4, Ag+, Lf+, Ggmin+				
	Light brown sands				
1.05-2.00m	Da	St	El	Dr	UB
	2	0	0	1	2
	Ga3, Ag1, Ggmin+, Lf+				
	Orange-brown silty sand				

Borehole abandoned at 2.00m due to borehole collapse (saturated sands)

Core 10 (TM 47161 62658)

0.00-0.20m	Da	St	El	Dr	UB
	3	0	0	2	-
	Ga4, Ag+, Sh+, Th+				
	Dark grey-brown organic sand topsoil				
0.20-0.60m	Da	St	El	Dr	UB
	3+	0	0	2	1
	Ga3, Sh1, Ag+, Th+				
	Dark brown organic-rich sand				
0.60-0.70m	Da	St	El	Dr	UB
	Ga2, Sh2, Ag+, Th+, Dg+				
	Dark brown very well humified sand-rich peat				
0.70-0.90m	Da	St	El	Dr	UB
	2	0	0	2	2
	Ga4, Ag+				
	Light brown sand				
0.90-2.00m	Da	St	El	Dr	UB
	Ga3, Ag1, Ggmin+, Ggmaj+				
	Orange-brown sand with increasing gravel content with depth				

Borehole abandoned at 2.00m due to borehole collapse (saturated sands)

Core 11 (TM 47146 62649)

0.00-0.20m	Da	St	El	Dr	UB
	2+	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				
0.20-0.60m	Da	St	El	Dr	UB
	3+	0	0	2	1
	Ga3, Sh1, Ggmin+, Th+, Ag+				
	Dark brown organic-rich sand				
0.60-0.90m	Da	St	El	Dr	UB
	1	0	0	1	2
	Ga4, Ag+, Ggmin+, Ggmaj+				
	Light brown pebbly sand				
0.90-1.80m	Da	St	El	Dr	UB
	2	0	0	1	2
	Ga4, Ag++, Ggmin+, Ggmaj+				
	Orange brown gravelly sand				

Borehole abandoned at 1.80m due to borehole collapse (saturated sands)

Core 12 (TM 47133 62641)

0.00-0.30m	Da	St	El	Dr	UB
	3	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				
0.30-1.80m	Da	St	El	Dr	UB
	2	0	0	2	1
	Ga4, Ag+, Ggmin+, Gs+				
	Orange-brown sand				

Borehole abandoned at 1.80m due to borehole collapse (saturated sands)

Core 13 (TM 47146 62621)

.00-0.30m	Da	St	El	Dr	UB
	3	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				
0.30-0.70m	Da	St	El	Dr	UB
	2+	0	0	1+	1
	Ga4, Ag+, Sh+, Ggmin+				
	Medium brown sand				
0.70-1.70m	Da	St	El	Dr	UB
	Ga4, Ag+, ggmin+				
	Orange-brown sands				

Borehole abandoned at 1.70m due to borehole collapse (saturated sands)

Core 14 (TM 47162 62626)

0.00-0.40m	Da	St	El	Dr	UB
	3	0	0	2+	0
	Ga4, Ag+, Sh+, Th+, Ggmin+				
	Dark brown sand topsoil				
0.40-0.60m	Da	St	El	Dr	UB
	2	0	0	2	1
	Ga4, Ag+				
	Light brown sand				
0.60-1.70m	Da	St	El	Dr	UB
	Ga4, Ag+, Ggmin+				
	Orange-brown sand				

Borehole abandoned at 1.70m due to borehole collapse (saturated sands)

Core 15 (TM 47187 62626)

0.00-0.20m	Da	St	El	Dr	UB
	3	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				
0.20-0.70m	Da	St	El	Dr	UB
	3	0	0	2	1
	Ga3, Sh1, Th+, Ag+				
	Dark brown organic-rich sand				
0.70-1.10m	Da	St	El	Dr	UB
	Ga2, Ag1, Sh1, Th+, Ggmin+				
	Dark grey-brown organic silty sand				
1.10-1.30m	Da	St	El	Dr	UB
	Sh2, Dg1, Ga1, Ag+, Th+				
	Dark brown sand-rich well humified peat				
1.30-1.60m	Da	St	El	Dr	UB
	2	0	0	1	1
	Ga4, Ag+, Sh+				
1.60-1.80m	Da	ST	El	Dr	UB
	2	0	0	1	1
	Ga3, Ag1, Ggmin+, Ggmaj+				

Borehole abandoned at 1.80m due to borehole collapse (saturated sands)

Core 16 (TM 47210 62638)

	Da	St	El	Dr	UB
0.00-0.25m	3	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				

	Da	St	El	Dr	UB
0.25-0.50m	3	0	0	2	1
	Ga4, Ag+				
	Light brown sand				

	Da	St	El	Dr	UB
0.50-1.80m	2+	0	0	2	1
	Ga4, Ag+, Lf+, Ggmin+				
	Orange-brown sand				

Borehole abandoned at 1.80m due to borehole collapse (saturated sands)

Core 17 (TM47230 62646)

	Da	St	El	Dr	UB
0.00-0.30m	3	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				

	Da	St	El	Dr	UB
0.30-0.50m	2	0	0	2	1
	Ga4, Ag+, Sh+, Ggmin+				
	Light brown sand				

	Da	St	El	Dr	UB
0.50-1.70m	2	0	0	2	1
	Ga4, Ag+, Lf+, Ggmin+, ggmaj+				
	Orange-brown sand				

Borehole abandoned at 1.70m due to borehole collapse (saturated sands)

Core 18 (TM 47247 62653)

	Da	St	El	Dr	UB
0.00-0.20m	3	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				

	Da	St	El	Dr	UB
0.20-0.45m	3	0	0	2	1
	Ga3, Sh1, Ag+, Th+				
	Dark brown organic-rich sand				

	Da	St	El	Dr	UB
0.45-0.80m	2	0	0	3	1
	Ag2, Ga1, As1, Ggmin+				
	Light yellow-brown pebbly sandy silt				

0.80-1.70m	Da	St	El	Dr	UB
	2+	0	0	2	1
	Ga4, Ag+				
	Orange-brown sand				

Borehole abandoned at 1.70m due to borehole collapse (saturated sands)

Core 19 (TM 47260 62658)

0.00-0.20m	Da	St	El	Dr	UB
	3	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				
0.20-0.90m	Da	St	El	Dr	UB
	2+	0	0	2+	1
	Ga4, Ag+, Ggmin+				
	Light brown sand				
0.90-1.30m	Da	St	El	Dr	UB
	2	0	0	2	1
	Ga2, Ggmin2, Ggmaj+, Ag+				
	Orange-brown gravells sand				

Gravel encountered at 1.30m depth

Core 20 (TM 47283 62671)

0.00-0.30m	Da	St	El	Dr	UB
	3	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				
0.30-0.50m	Da	St	El	Dr	Ub
	3	0	0	2	1
	Ga3, Sh1, Ag+, Th+				
	Dark brown organic-rich topsoil				
0.50-0.70m	Da	St	El	Dr	UB
	2	0	0	2	2
	Ga4, Ag+, Ggmin+				
	Light brown sand				
0.70-1.50m	Da	St	El	Dr	UB
	2+	0	0	2	2
	Ga3, Ggmin1, Ag+				
	Orange-brown pebbly sand				

Borehole abandoned at 1.50m due to borehole collapse (saturated sands)

Core 21 (TM 47297 62703)

0.00-0.20m	Da	St	El	Dr	UB
	3	0	0	2	-
	Ga3, Ag1, Sh+, Th+				
	Dark brown organic sand topsoil				
0.20-0.50m	Da	St	El	Dr	Ub
	2+	0	0	2	1
	Ga4, Ag+, Th+				
	Light brown sand				
0.50-0.80m	Da	St	El	Dr	UB
	2+	0	0	2	1
	Ga4, Ag+, Lf+, Ggmin+				
	Orange-brown sand				
0.80-1.40m	Da	St	El	Dr	UB
	3+	0	2	2	2
	Dg2, Sh1, Dh1, Th+, Ag+				
	Dark brown herbaceous well humified peat				
1.40m-1.70m	Da	St	El	Dr	UB
	3	0	1	2	2
	Ga2, Dg1, Sh1, Ag+				
	Dark brown organic-rich sand				

Borehole abandoned at 1.70m due to borehole collapse (saturated sands)

Core 22 (TM 47299 62699)

0.00-0.20m	Da	St	El	Dr	Ub
	3	0	0	2	1
	Ga2, Ag1, Sh1, Th+				
	Dark brown organic-rich topsoil				
0.20-0.60m	Da	St	El	Dr	UB
	3	0	0	2	1
	Ga3, Sh1, Ag+, Th+				
	Dark brown organic-rich sand				
0.60-1.50m	2	0	0	1	1
	Ga4, Ag+				
	Light brown sand				
1.50-1.70m	Da	St	El	Dr	UB
	Ga4, Ag+, Ggmin+, Ggmaj+				
	Orange-brown pebbly sand				

Borehole abandoned at 1.70m due to borehole collapse (saturated sands)

Core 23 (TM 47290 62735)

0.00-0.20	Da	St	El	Dr	Ub
	3	0	0	2	1
	Ga3, Sh1, Ag+, Th+				
	Dark brown organic-rich topsoil				
0.20-0.80m	Da	St	El	Dr	UB
	3	0	0	2	1
	Ga3, Sh1, Ag+, Th+				
	Dark brown organic-rich sand				
0.80-1.30m	Da	St	El	Dr	UB
	3	0	1	2	1
	Dg2, Sh1, Dh1, Th+, Ag+				
	Dark brown very well humified peat				
1.30-1.45m	Da	St	El	Dr	Ub
	3	0	0	2	2
	Ga3, Sh1, Ag+, Dg+				
	Grey-brown organic-rich sand				
1.45-2.35m	Da	St	El	Dr	UB
	3	0	2	2	2
	Dg2, Sh1, Dh1, Dl+, Th+, Ag+				
2.35-2.55m	Da	St	El	Dr	UB
	2	0	0	2	2
	Ga4, Ag+, Sh+, Gs+, Ggmin+				
	Light grey-brown sands				

Borehole abandoned at 2.55m due to borehole collapse (saturated sands)

Core 24 (TM 47184 62668)

0.00-0.30m	Da	St	El	Dr	Ub
	3	0	0	2	1
	Ga3, Sh1, Ag+, Th+				
	Dark brown organic-rich topsoil				
0.30-0.60m	Da	St	El	Dr	UB
	3	0	0	2	2
	Ga3, Sh1, Th+, Dg+, Ag+, As+				
0.60-0.75m	Da	St	El	Dr	UB
	3	0	1	2	2
	Ga2, Sh2, Dg+, Ggmin+				
	Dark brown sand-rich peat				
0.75-1.10m	Da	St	El	Dr	UB
	2	0	0	2	2
	Ga3, Ag1, Sh+, Ggmin+				
	Light brown silty sand				

1.10-1.70m	Da	St	El	Dr	Ub
	2+	0	0	1	2
	Ga4, Ag+, Ggmin+, Ggmaj+				

Borehole abandoned at 1.70m due to borehole collapse (saturated sands)

Core 25 (TM 47189 62660)

0.00-0.30	Da	St	El	Dr	Ub
	3	0	0	2	1
	Ga3, Sh1, Ag+, Th+				
	Dark brown organic-rich topsoil				
0.30-0.60m	Da	St	El	Dr	UB
	3	0	0	2	2
	Ga3, Sh1, Th+, Dg+, Ag+, As+				
	Dark brown organic-rich sand				
0.60-1.15m	Da	St	El	Dr	UB
	2	0	0	2	2
	Ga4, Ag+, Sh+				
	Light brown sand				
1.15-1.90m	Da	St	El	Dr	UB
	2+	0	0	2	2
	Ga4, Ag+, Lf+				
	Orange-brown sand				

Borehole abandoned at 1.90m due to borehole collapse (saturated sands)