

L13 facing north – north east



L13 facing west towards the mast



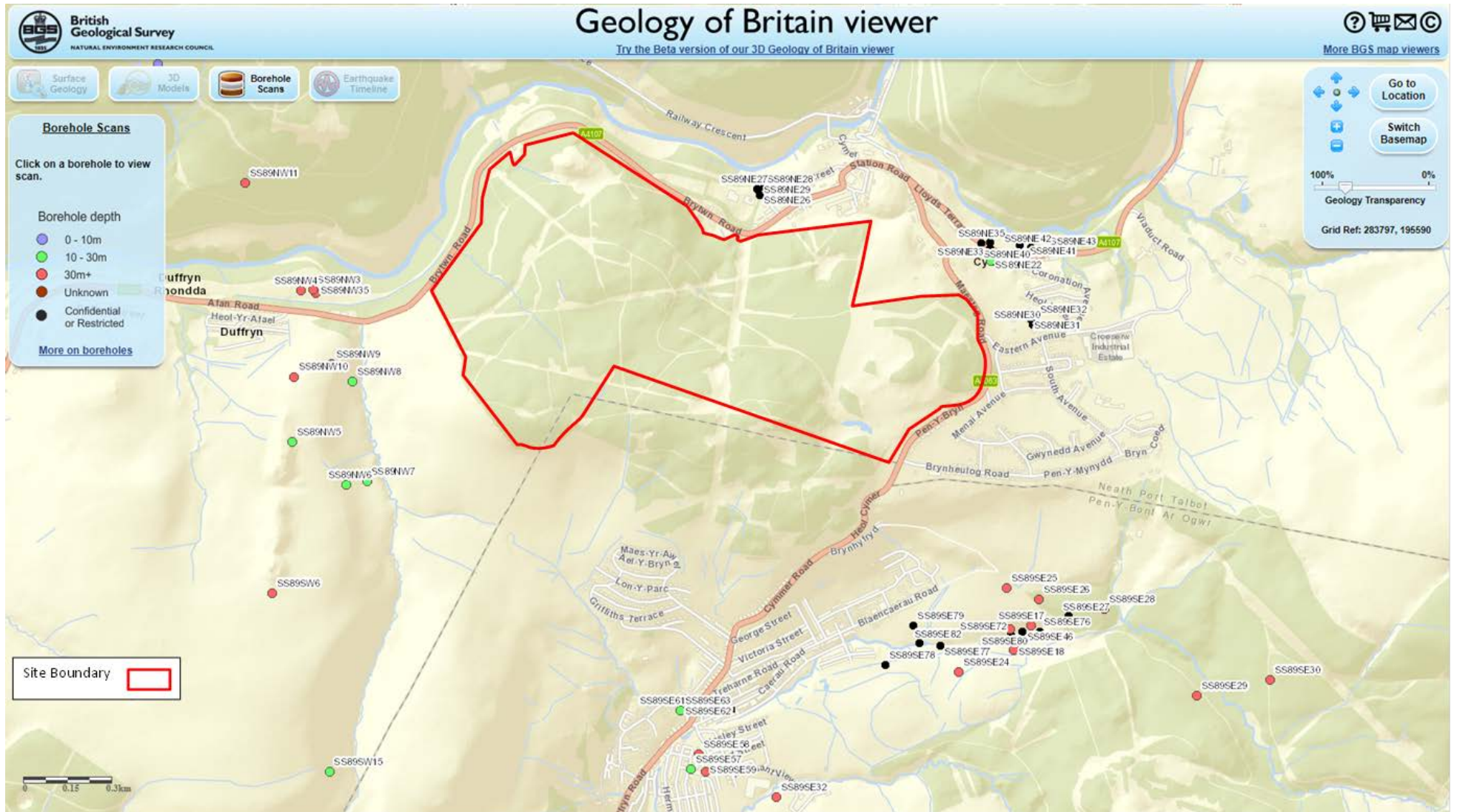
L14 facing north -west



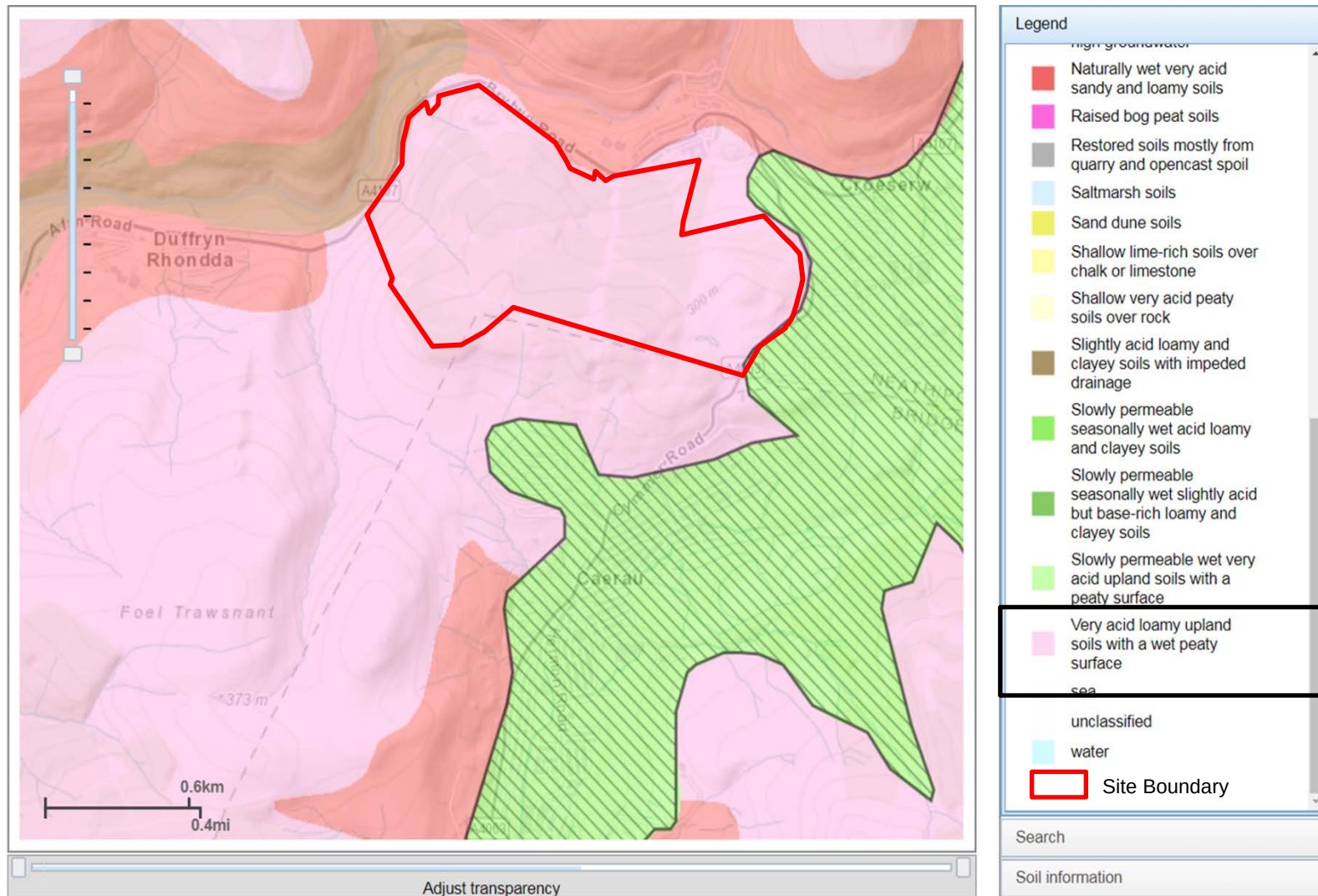
L19 Water resevoir



Appendix B Borehole Location Plan



Appendix C Soilscape Mapping

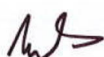
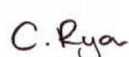


Summary of Findings in Relation to Peat Survey

Afan Valley Adventure Resort

17 May 2018

Quality information

Prepared by	Checked by	Verified by	Approved by
			
Ron McLean Project Manager	Jonathan Edwards	Conna Ryan	Ron McLean

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Prepared for:

Afan Valley Ltd

Prepared by:

Ron McLean
Project Manager
T: 029 2067 4600
M: 07912 476979
E: ron.mclean@aecom.com

AECOM Limited
1 Callaghan Square
Cardiff CF10 5BT
United Kingdom

T: +44 29 2067 4600
aecom.com

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1. Introduction

- 1.1 Following receipt of comments from Natural Resources Wales (NRW), on-site survey work was carried out by Terra Firma (Wales) Ltd to assess the presences of peat on the site of the proposed Afan Valley Adventure Resort.
- 1.2 This summary report highlights the main findings of the site investigation and includes the output document produced by Terra Firma (Wales) Ltd.
- 1.3 In summary, the report recognises that there is a limited presence of peat on site which exceeds the 50cm limit set out in NRW's response to the Scoping Report submitted to Neath Port Talbot Council, identifying the location of these areas and outlining the next steps.

2. Summary of findings

Following the commentary of Natural Resources Wales (NRW) in relation to establishing the presence of peat on the proposed Afan Valley Adventure Resort, Terra Firma (Wales) Ltd, a Geotechnical and Geo-Environmental Engineering and Site Investigation Consultancy were engaged to carry out soil probing and trial pitting across the site to identify the presence or absence of peat soils, greater in depth than 0.5m.

The site based exercise followed the production of an initial desk based assessment completed by AECOM dated December 2017.

The results of this site based review have now been received and indicate that of the whole site an isolated area of deep peaty soils has been identified around the existing water course to the South East of the site, as shown on the site plan below.

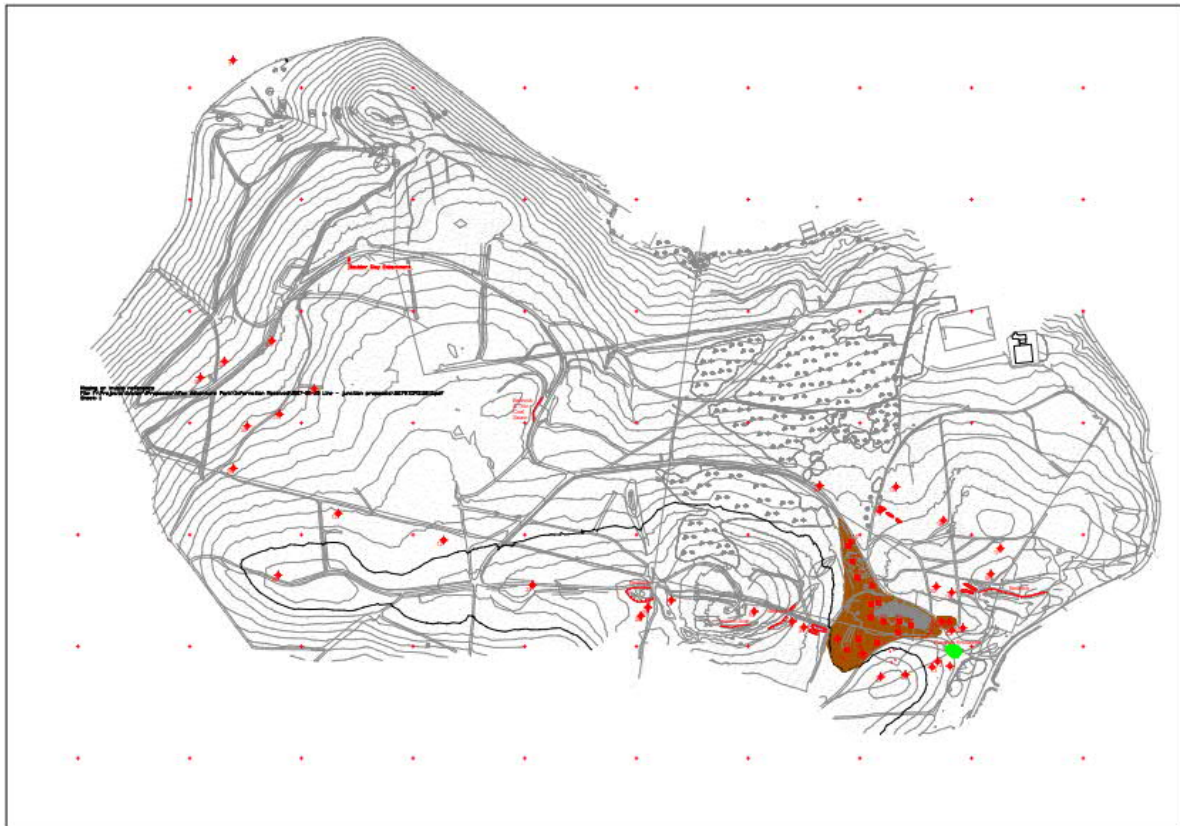


Fig. 1 Locations of trial pits and probing and area containing deep peaty soils

The locations of the trial pits and probing are set out in Fig. 1 above and in more detail in Fig 5 below. Whilst there is evidence of peat in the area shaded brown on the site plan, In summary, the only deep peaty soil was encountered in these four locations highlighted below. These locations are shown on the extract below in Fig. 2.

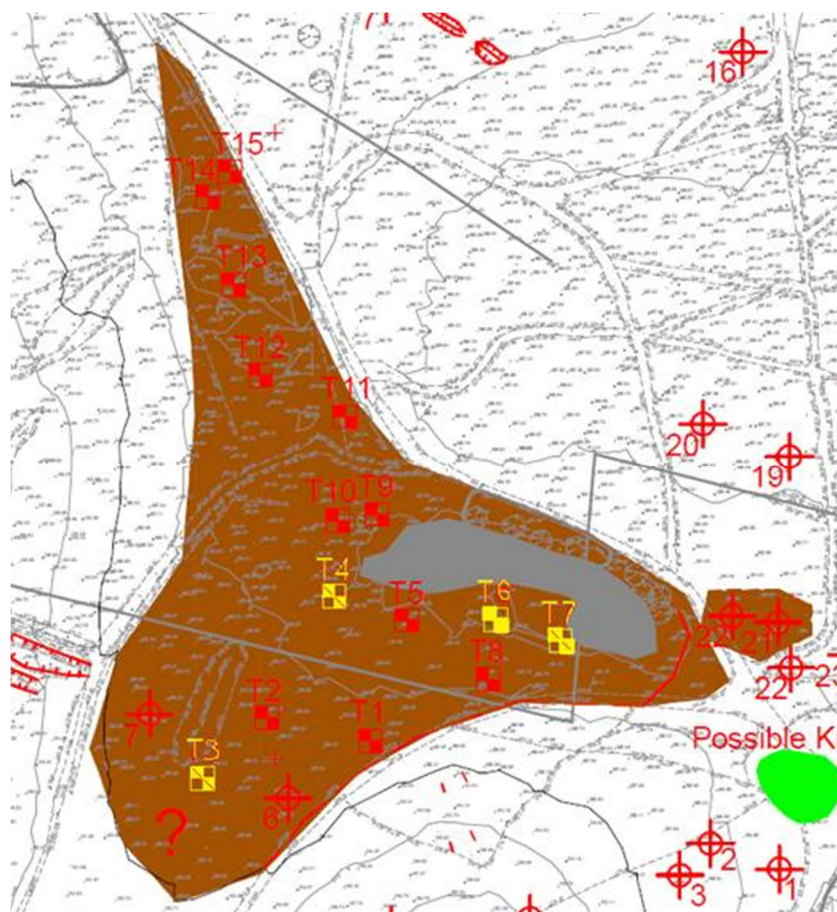


Fig. 2 Location indicating deep peaty soils (yellow)

The remainder of probes and trial pits across the site did not indicate the presence of deep peaty soils greater than 0.4m deep.

Of the samples taken, Total Organic Content of all five samples was in excess of 20% (please see Fig. 3 below) we have assumed all organic soils 0.1m or greater in thickness but less than 0.4m in thickness to be a Shallow Peaty Soil (**SPS**). Samples S1 through S5 came from different positions to the numbered locations.

	S1	S2	S3	S4	S5
Organic matter%	23	> 25	22	21	> 25

Fig. 3 Chemical analysis of soil samples

In line with the current master plan, and whilst the area of peat identified is a very small percentage of the overall site, the intention will be to preserve the areas of deep peaty soils where possible and minimise disruption to this area of peat. This has to be seen in the context of the wider site development and the economic benefits of the scheme and where disruption is unavoidable we will liaise with NPTC/NRW prior to any works being carried out. Below in Table 01 the soils have been classed based on the minimum thickness of Peat/Topsoil/Organic Soil. Anything less than 0.1m thick is considered a mineral soil (**MS**). We have assumed that soils <0.4m are considered Shallow Peaty Soil in accordance with English / Welsh classification.

The areas indicating deep peaty soils are identified in the table below.

Table 01. Summary of Findings			
Hand Dug Pits			
Location	Peat/Topsoil/Organic Soil	Class	Underlying Strata
1	0.00 - 0.05 Soft, black, sandy gravelly organic SILT/CLAY	MS	0.05 – 0.20 Light brown, slightly gravelly sandy CLAY
2	0.00 – 0.28 Soft, black, organic SILT/CLAY	SPS	0.28 – 0.35 Orange-brown, slightly gravelly sandy SILT/CLAY
3	>0.40 Soft, black, organic SILT/CLAY	DPS	-
4	0.00 – 0.50 Soft, black, organic sandy SILT/CLAY	DPS	0.50 – Obstruction (Sandstone Gravel - Cobble)
5	0.00 – 0.15 Soft, black, organic SILT/CLAY	SPS	0.15 – 0.20 Orange-brown, slightly gravelly sandy SILT/CLAY
6	>0.40 Very soft, black to dark brown, clayey PEAT	DPS	-
7	>0.40 Very soft, black to dark brown, clayey PEAT	DPS	-
8	0.0 - 0.05 Soft, black, organic SILT/CLAY	MS	0.05 - 0.20 Brown, sandy gravelly CLAY
9	0.00 - 0.08 Soft, black, organic CLAY/SILT	MS	0.08 – 0.20 Brown, sandy gravelly CLAY
10	0.00 – 0.10 Soft, black, slightly gravelly sandy organic CLAY/SILT	SPS	0.10 – 0.20 Brown, slightly gravelly sandy SILT/CLAY
11	Ground covered with forest debris. 0.00 – 0.20 Soft, black, slightly gravelly sandy organic CLAY/SILT	SPS	0.20 – 0.25 Brown, slightly gravelly sandy SILT/CLAY
12	0.00 – 0.20 Very soft, black, slightly sandy organic CLAY/SILT	SPS	0.20 – 0.30 Brown, sandy slightly gravelly SILT/CLAY
13	0.00 – 0.18 Very soft, black, slightly sandy clayey PEAT	SPS	0.18 – 0.30 Brown slightly gravelly, sandy SILT/CLAY
14	0.00 - 0.10 Soft, black, organic SILT/CLAY	SPS	0.10 – 0.60 Grey, occasionally gravelly, very sandy SILT/CLAY
15	0.00 – 0.18 Soft, black, organic SILT/CLAY	SPS	0.18 – 0.25 Light brown sandy CLAY with gravel to cobbles.
16	0.00 – 0.24 Soft, black, organic SILT/CLAY	SPS	0.24 – 0.30 Orange-brown, very sandy CLAY with occasional gravel
17	0.00 - 0.11 Soft, black, organic SILT/CLAY	Obstruction	0.11 Obstruction: Sandstone
18	0.00 – 0.15 Firm, black, very sandy organic SILT/CLAY	Obstruction	0.15 Obstruction: Sandstone
19	0.00 – 0.17 Dark-brown to black, sandy organic SILT/CLAY	SPS	0.17 – 0.25 Light orange-brown, very sandy CLAY with occasional gravel to cobble
20	0.00 – 0.18 Very soft, black, slightly clayey PEAT	Obstruction	0.18 Obstruction Sandstone Cobble
21	0.00 – 0.20 Very soft, black sandy clayey PEAT	Obstruction	0.20 Obstruction Sandstone Cobble
22	0.00 – 0.30 Very soft, black sandy clayey PEAT	Obstruction	0.30 Obstruction Sandstone Cobble
23	0.00 – 0.25 Dark-brown, very sandy CLAY/SILT	Obstruction	0.25 Obstruction Sandstone Cobble
24	0.00 – 0.28 Soft, black, organic SILT/CLAY	SPS	0.28 – 0.35 Orange-brown, slightly gravelly sandy SILT/CLAY
25	0.00 – 0.13 Very soft, black, slightly gravelly sandy clayey PEAT	SPS	0.13 – 0.16 Brown, clayey GRAVEL of sandstone
26	0.00 – 0.20 Very soft, brown, very gravelly CLAY	SPS	0.20 - Obstruction Sandstone Cobble
27	0.00 – 0.15 Black, sandy organic SILT/CLAY	SPS	0.15 – 0.20 Grey-brown, very sandy GRAVEL to COBBLE of sandstone.
28	0.00 – 0.05 Very soft, black, slightly gravelly organic SILT/CLAY	MS	0.05 – 0.20 orange-brown, very sandy clayey GRAVEL to gravelly CLAY.
29		N/A	Clayey sandy GRAVEL to COBBLE of sandstone with occasional boulder in felled tree roots
30	0.00 – 0.20 Soft, brown to black, organic SILT/CLAY	SPS	0.20 – 0.25 Brown GRAVEL of sandstone
31	0.00 – 0.30 Dark brown to yellow-brown, slightly sandy organic rich SILT/CLAY	SPS	0.30 – 0.40 Light brown, sandy GRAVEL of sandstone
32			In Cutting: Sandy, very gravelly CLAY
33	In Cutting: Black organic SILT/CLAY	N/A	>0.25 Orange-brown to grey, very gravelly CLAY with cobbles and boulders
34	0.00 – 0.18 Black to brown, organic SILT/CLAY	SPS	0.18 – 0.25 Grey-brown sandy CLAY
35	0.00 – 0.25 Black to brown, organic SILT/CLAY	SPS	0.25 – 0.50 Grey-brown sandy CLAY
36	0.00 – 0.18 Black to brown, organic SILT/CLAY	SPS	0.18 – 0.30 Grey-brown sandy CLAY

Fig. 4 Trial pit results

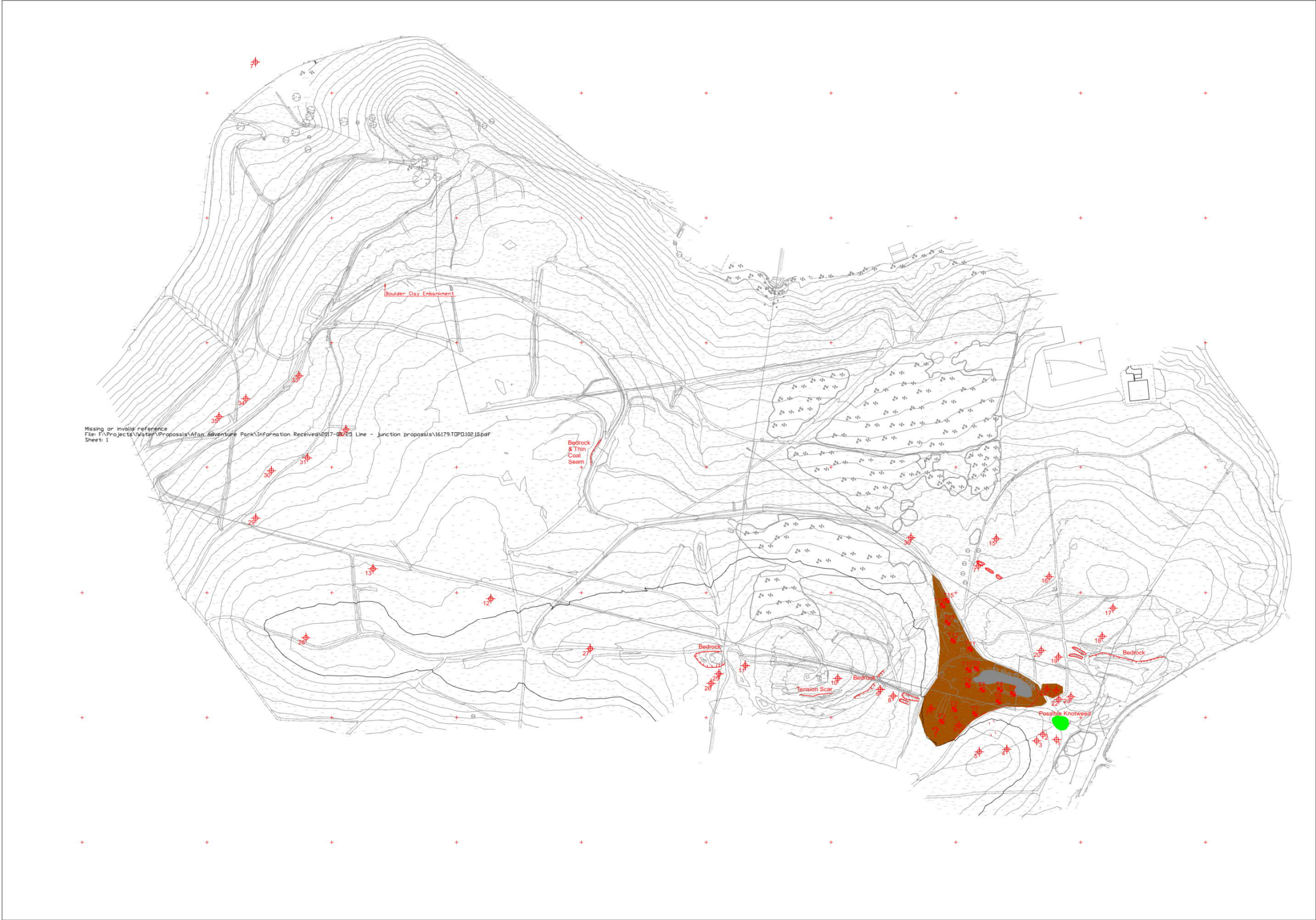


Fig. 5 Trial pit and probe locations

Table 01. Summary of Findings		
Hand Dug Pits		
Location	Peat/Topsoil/Organic Soil	Underlying Strata
1	0.00 - 0.05 Soft, black, sandy gravelly organic SILT/CLAY	0.05 - 0.20 Light brown, slightly gravelly sandy CLAY
2	0.00 - 0.28 Soft, black, organic SILT/CLAY	0.28 - 0.35 Orange-brown, slightly gravelly sandy SILT/CLAY
3	>0.40 Soft, black, organic SILT/CLAY	-
4	0.00 - 0.50 Soft, black, organic sandy SILT/CLAY	0.50 - Obstruction (Sandstone Gravel - Cobble)
5	0.00 - 0.15 Soft, black, organic SILT/CLAY	0.15 - 0.20 Orange-brown, slightly gravelly sandy SILT/CLAY
6	>0.40 Very soft, black to dark brown, clayey PEAT	-
7	>0.40 Very soft, black to dark brown, clayey PEAT	-
8	0.0 - 0.05 Soft, black, organic SILT/CLAY	0.05 - 0.20 Brown, sandy gravelly CLAY
9	0.00 - 0.08 Soft, black, organic CLAY/SILT	0.08 - 0.20 Brown, sandy gravelly CLAY
10	0.00 - 0.10 Soft, black, slightly gravelly sandy organic CLAY/SILT	0.10 - 0.20 Brown, slightly gravelly sandy SILT/CLAY
11	Ground covered with forest debris. 0.00 - 0.20 Soft, black, slightly gravelly sandy organic CLAY/SILT	0.20 - 0.25 Brown, slightly gravelly sandy SILT/CLAY
12	0.00 - 0.20 Very soft, black, slightly sandy organic CLAY/SILT	0.20 - 0.30 Brown, sandy slightly gravelly SILT/CLAY
13	0.00 - 0.18 Very soft, black, slightly sandy clayey PEAT	0.18 - 0.30 Brown slightly gravelly, sandy SILT/CLAY
14	0.00 - 0.10 Soft, black, organic SILT/CLAY	0.10 - 0.60 Grey, occasionally gravelly, very sandy SILT/CLAY
15	0.00 - 0.18 Soft, black, organic SILT/CLAY	0.18 - 0.25 Light brown sandy CLAY with gravel to cobbles.
16	0.00 - 0.24 Soft, black, organic SILT/CLAY	0.24 - 0.30 Orange-brown, very sandy CLAY with occasional gravel
17	0.00 - 0.11 Soft, black, organic SILT/CLAY	0.11 Obstruction: Sandstone
18	0.00 - 0.15 Firm, black, very sandy organic SILT/CLAY	0.15 Obstruction: Sandstone
19	0.00 - 0.17 Dark-brown to black, sandy organic SILT/CLAY	0.17 - 0.25 Light orange-brown, very sandy CLAY with occasional gravel to cobble
20	0.00 - 0.18 Very soft, black, slightly clayey PEAT	0.18 Obstruction Sandstone Cobble
21	0.00 - 0.20 Very soft, black sandy clayey PEAT	0.20 Obstruction Sandstone Cobble
22	0.00 - 0.30 Very soft, black sandy clayey PEAT	0.30 Obstruction Sandstone Cobble
23	0.00 - 0.25 Dark-brown, very sandy CLAY/SILT	0.25 Obstruction Sandstone Cobble
24	0.00 - 0.28 Soft, black, organic SILT/CLAY	0.28 - 0.35 Orange-brown, slightly gravelly sandy SILT/CLAY
25	0.00 - 0.13 Very soft, black, slightly gravelly sandy clayey PEAT	0.13 - 0.16 Brown, clayey GRAVEL of sandstone
26	0.00 - 0.20 Very soft, brown, very gravelly CLAY	0.20 - Obstruction Sandstone Cobble
27	0.00 - 0.15 Black, sandy organic SILT/CLAY	0.15 - 0.20 Grey-brown, very sandy GRAVEL to COBBLE of sandstone.
28	0.00 - 0.05 Very soft, black, slightly gravelly organic SILT/CLAY	0.05 - 0.20 orange-brown, very sandy clayey GRAVEL to gravelly CLAY.
29		Clayey sandy GRAVEL to COBBLE of sandstone with occasional boulder in felled tree roots
30	0.00 - 0.20 Soft, brown to black, organic SILT/CLAY	0.20 - 0.25 Brown GRAVEL of sandstone
31	0.00 - 0.30 Dark brown to yellow-brown, slightly sandy organic rich SILT/CLAY	0.30 - 0.40 Light brown, sandy GRAVEL of sandstone
32		In Cutting: Sandy, very gravelly CLAY
33	In Cutting: Black organic SILT/CLAY	>0.25 Orange-brown to grey, very gravelly CLAY with cobbles and boulders
34	0.00 - 0.18 Black to brown, organic SILT/CLAY	0.18 - 0.25 Grey-brown sandy CLAY
35	0.00 - 0.25 Black to brown, organic SILT/CLAY	0.25 - 0.50 Grey-brown sandy CLAY
36	0.00 - 0.18 Black to brown, organic SILT/CLAY	0.18 - 0.30 Grey-brown sandy CLAY

Measurements in meters



TRL Probes were performed in the bog area where shallow groundwater and very soft deposits made hand digging difficult. A summary of the results is presented in Table 02.

Table 02: TRL Probe	
Penetration before Significant Resistance Encountered	
T1	0.70m
T2	>2.00m
T3	>2.00m
T4	>2.00m
T5	0.60m
T6	>2.00m
T7	0.75m
T8	0.45m
T9	0.81m
T10	>2.00m
T11	0.70m
T12	>2.00m
T13	>2.00m
T14	1.80m
T15	0.90m

Note: Cobles/boulders were occasionally encountered within the peat and these may have caused premature refusal (i.e. not necessarily the base of the peat).

It can be seen from the above data that the majority of soil profiles encountered less than 300mm of organic rich soil above a boulder clay/weathered bedrock or bedrock deposit.

Small areas of sphagnum, or sphagnum interspersed with other vegetations, were encountered across the site, as were reeds interspersed with other vegetations.

A substantial area of bog, dominated by sphagnum and reeds, with thick peat deposits (with the fibrous structure of sphagnum preserved) and or other very soft deposits, and a shallow/above ground water table, was encountered in the southeast of the site, around the pond area, as indicated by the brown shading on **Drawing 01**.

We trust that the above is to your satisfaction, however, if you have any queries or require any further information please do not hesitate to contact us. In the meantime we await your further instructions.

Yours sincerely
for: Terra Firma (Wales) Ltd

David Emanuel

