Craig Y Perthi Solar Farm Resubmission

Environmental Statement

Appendix 3.4 Statement Regarding Agricultural Land Classification

Prepared for

RWE Renewables UK

August 2026
5576-01-ES03-012

Document Control

Revision	Date	Prepared By	Reviewed / Approved By
5576-01-ES03-012	August 2026	Amet Property	Steve Harding

Well House Barns, Chester Road, Bretton, Chester, CH4 0DH
1st Floor, Barfield House, Alderley Road, Wilmslow, SK9 1PL
Maling Exchange, Studio 305, Hoults Yard, Walker Road, Newcastle Upon Tyne, NE6 2HL

T: 0344 8700 007
enquiries@axis.co.uk
www.axis.co.uk

Agricultural Land Classification
Craig Y Perthi Solar Farm

Client: RWE Renewables UK
Project: Craig Y Perthi Solar Farm
Date: 1st June 2026 – Issue 5
Issued By: James Fulton MRICS FAAV

Contents

1. Executive Summary

1.1 This report assesses the Agricultural Land Classification (ALC) grading of 195.7Ha, or thereabouts, of agricultural land at Bishton, Gwent.

1.2 The limiting factor is found to be soil wetness, a combination of the climatic regime, soil water regime and texture of the top 25cm of the soil.

1.3 The land is graded as follows:

Grade 3b:	**31.1 hectares**
Grade 4:	**163.6 hectares**
Non-Agricultural:	**1 hectare**

1.4 Following updates to the scheme the total site area has been reduced so that agricultural land within the application red line is 164.8 hectares graded as follows:

Grade 3b:	**22.6 hectares**
Grade 4:	**142.2 hectares**

2. Introduction

2.1 Amet Property Ltd have been instructed by JBM Solar Projects 25 Limited to produce an Agricultural Land Classification (ALC) report on a 195.7-hectare site to the east and west of the village of Bishton in Gwent, north of the Llanwern steel works in support of a planning application for a solar farm and associated development (the Proposed Development).

2.2 The report's author is James Fulton BSc (Hons) MRICS FAAV who has worked as a chartered surveyor, agricultural valuer, and agricultural consultant since 2004, has a degree in agriculture which included a number of modules on soils and over 10 years' experience in producing agricultural land classification reports.

2.3 The report is based on site visits conducted in October and November 2021. During site visits conditions ranged from full sunshine to overcast and showery. During the inspection 4 trial pits were dug to a depth of 120cm (where possible). In addition to the trial pits an augur was used to take a minimum of one sample per hectare on the proposed development site to a depth of 120cm (where possible) with smaller trial pits at some of these locations to confirm soil structure and colour where it was not clear from the augur samples. A plan of augur points and trial pit locations can be found at ***appendix 1***. The trial pit locations were selected as they were representative of the soils found on site.

2.4 The survey area is made up of approximately 50 land parcels (depending on what you treat as a field boundary). The land rises from approximately 4m AOD at the southern boundary of the site where it meets the railway to 60m AOD at its highest point.

2.5 At the time of the survey the land use was permanent pasture, temporary grass, and arable cropping.

2.6 Further information has been obtained from the MAGIC website, the Soil Survey of England and Wales, the British Geological Survey, the Meteorological Office and The Predictive ALC Map for Wales.

2.7 The collected information has been judged against the Ministry of Agriculture Fisheries and Food Agricultural Land Classification of England and Wales revised guidelines and criteria for grading the quality of agricultural land.

2.8 The principal factors influencing agricultural production are climate, site and soil and the interaction between them [MAFF (1988) & Natural England (2012)].

MAFF (1988) - *Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land*. MAFF Publications

Natural England (2012) - *Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land*, Second Edition

3. Published Information

3.1 The British Geological Survey 1:50,000 scale map shows there to be a range of basal geology and various overlying deposits.

Land to the South-East of Bishton is shown to be Mercia Mudstone Group – Mudstone. The superficial deposits are either not recorded or recorded as tidal flat deposits – clay and silt.

Land to the south of Bishton Road to the west of Bishton, a 400m wide strip to the west of Bishton and to the east and northeast of Bishton is shown as being St Mary's Well Bay Member – Limestone and Mudstone with superficial deposits listed as tidal flat deposits – clay and silt or with no superficial deposits recorded.

Land to the north of Bishton road, west of Bishton is shown as Lavernock Shales Member – mudstone with no superficial deposits recorded.

3.2 The national soils map shows a variety soil types across the site.

Land running in a strip to the east of Bishton and curling north around the woodland is recorded as belonging to the Worcester association described as slowly permeable non-calcareous and calcareous reddish clayey soils over mudstones.

Land to the northeast, northwest and west of Bishton is recorded as being in the Denchworth association described as being slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

Land to the south of Bishton road west of Bishton is recorded as being in the Newchurch 2 association described as deep, stoneless mainly calcareous clayey soils.

Land to the far southeast of the application site is recorded as being in the Midelney association described as stoneless clayey soils mostly overlying peat.

3.3 The predictive ALC map for Wales shows the land to the southeast of Bishton, the northeast of Bishton and immediately to the west and southwest of Bishton as being Grade 4. The map shows the land running in a strip to the east of Bishton and then curving north and a second area to the north and west of Bishton up to Waltwood Hill and across to Llanwern Park as being subgrade 3b.

4. CLIMATE

4.1 Climate has a major, and in places overriding, influence on land quality affecting both the range of potential agricultural uses and the cost and level of production.

4.2 There is published agro-climatic data for England and Wales provided by the Meteorological Office, such data for the subject site is listed in the table below.

Figure 2.1 Agro-Climatic Data – Details at ***appendix 2***

Grid Reference	338877 187917
Altitude (ALT)	20.42
Average Annual Rainfall (AAR)	971.35
Accumulated Temperature - Jan to June (ATO)	1524.11
Duration of Field Capacity (FCD)	201.09
Moisture Deficit Wheat	91.07
Moisture Deficit Potatoes	75.76

4.3 The main parameters used in assessing the climatic limitation are average annual rainfall (AAR), as a measure of overall wetness; and accumulated temperature, as a measure of the relative warmth of a locality.

4.4 The Average Annual Rainfall and Accumulated Temperature provide no climatic limitation to grade.

4.5 The site is shown as either Flood Zone A – considered to be at little or no risk of fluvial or coastal/tidal flooding or Zone C1 – served by significant infrastructure, including flood defences. It is therefore not considered that flooding will impact on land grade.

5. STONINESS

5.1 The majority of the site was stoneless. Where there were stones in the topsoil they never exceeded 10% and very rarely exceeded 5% and with very few exceptions were too small to be retained by a 2cm grid. Where stone content was less than 5% it was not recorded. Stoniness is not considered a limiting factor to land grade.

6. GRADIENT

6.1 At its steepest the gradient found on the site on a small number of locations including the field directly to the west of Castle Farm, and to the south of craig Y Perthi wood reached 7.5 degrees which limits the land grade at this point to grade 3b. Gradient was never the most limiting factor and so does not impact land grade.

7. SOILS

7.1 As would be expected by the variety of soil types shown by the national soils map there were a range of soils found across the site. While the boundaries between soil types shown on the available mapping do not tally completely with soils found on site they are very close.

Land running in a strip to the east of Bishton and curling north around the woodland recorded as belonging to the Worcester association is found to be predominantly reddish soils with heavy silty clay loam topsoil over a well-structured clay first subsoil and a slowly permeable second subsoil with substantial evidence of gleying.

Land to the northeast, northwest and west of Bishton recorded as being in the Denchworth association is found to be largely a brown or dark greyish brown organic clay or heavy clay loam subsoil over a light olive brown to grey slowly permeable clay subsoil with evidence of gleying found very near to the surface. In some areas soils are relatively shallow over rock or in the case of the hill to the north-east of Bishton there is a layer of hard flat stones at between 40 and 70cm depth above a very defined medium platy clay.

Land to the south of Bishton Road west of Bishton recorded as being in the Newchurch 2 association is found to be largely a brown or greyish brown organic clay topsoil over a slowly permeable (course prismatic or massive) grey organic clay subsoil. Soils found to be shallow over a hard rock layer in a small number of locations. Evidence of gleying found at shallow depths across most of this area. Not found to be calcareous when tested with Hydrochloric Acid.

Land to the far southeast of the application site recorded as being in the Midelney found to be organic clay topsoils over slowly permeable grey organic clay subsoils with peat found in a number of locations. Evidence of gleying found at shallow depths across most of this area.

Interactive Factors

8. Wetness

8.1 An assessment of the wetness class of each sample point was made based on the flow chart at Figure 6 in the MAFF guidance. The wetness class and topsoil texture were then assessed against Table 7 of the MAFF guidance to determine the ALC grade according to wetness. The wetness assessment can be found at ***appendix 4***.

8.2 Wetness is largely the most limiting factor to the grade of the land. Where there is a gleyed horizon within 40cm of the surface and a slowly permeable layer starting at 40-50cm the assessment gives a wetness class of IV. Where the slowly permeable layer starts deeper of the gleyed horizon starts at between 40 and 70cm the assessment gives wetness class III. Where there is no slowly permeable layer the assessment gives wetness class I.

8.3 The topsoil is organic clay, organic heavy clay loam, or heavy silty clay loam. Organic clay and wetness class I limit the land to Grade 3b. Heavy silty clay loam or organic heavy clay loam topsoil and wetness class III limit the land to grade 3b. Heavy silty clay loam, organic clay or organic heavy clay loam topsoil and wetness class IV limit the land to Grade 4.

9. Droughtiness

9.1 Droughtiness limits are defined in terms of moisture balance for wheat and potatoes using the formula:

MB (Wheat) = AP (Wheat) - MD (Wheat)

and

MB (Potatoes) = AP (Potatoes) - MD (Potatoes)

Where:
MB = Moisture Balance
AP = Crop Adjusted available water capacity
MD = Moisture deficit

9.2 Moisture deficit for wheat and potatoes can be found in the agro-climatic data and are as follows:

MD (Wheat) = 91.07
MD (Potatoes) = 75.76

9.3 The level of rainfall and soil type mean that droughtiness is not a limiting factor anywhere on the site.

10. Agricultural Land Classification

10.1 The Agricultural Land Classification provides a framework for classifying land according to which its physical or chemical characteristics impose long-term limitations on agricultural use. The limitations can operate in one or more of four principle ways: they may affect the range of crops that can be grown, the level of yield, the consistency of yield and the cost of obtaining it.

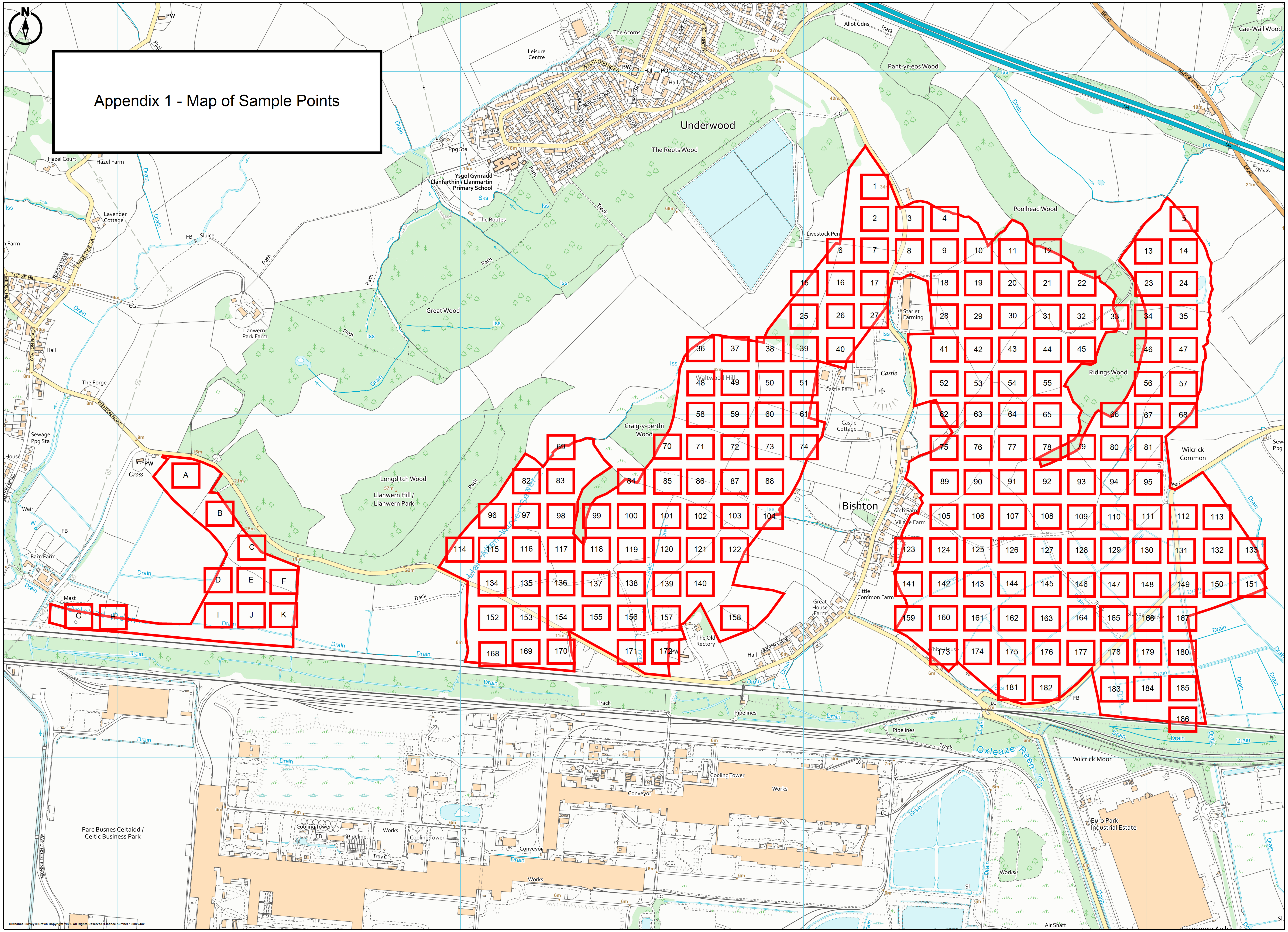
10.2 The principle physical factors influencing agricultural production are climate, site and soil and the interactions between them which together form the basis for classifying land into one of 5 grades; grade 1 being of excellent quality and grade 5 being land of very poor quality. Grade 3 land, which constitutes approximately half of all agricultural land in the United Kingdom is divided into 2 subgrades – 3a and 3b. A full definition of all of the grades can be found at ***appendix 5.***

10.3 This assessment sets out that while no one factor limits the grade of the land, the interaction between climate and soil result in a wetness assessment that limits the land to grade 3b or grade 4:

Grade 3b:	**31.1 hectares**
Grade 4:	**163.6 hectares**
Non-Agricultural:	**1 hectare**

10.4 A plan of the land grading can be found at ***appendix 6***.

Appendix 1 - Map of Sample Points



Plotted Scale - 1:7500. Paper Size - A2

APPENDIX 2 – AGRO-CLIMATIC DATA

Site Details: Craig Y Perthi Solar Farm

Grid reference (centre of site): 338877 187917

Altitude: Mean 20.42

Climatic data from surrounding locations:

Grid Reference	ALT	AAR	LR_AAR	ASR	ATO	ATS	MDW	MDP	FCD
33501850	4	966	0.6	445	1545	2467	93	84	200
34001850	4	930	0.1	430	1544	2468	96	87	195
33501900	65	1031	1.1	475	1473	2387	82	69	211
34001900	59	1000	0.2	460	1479	2395	85	73	205

Altitude Adjusted

Grid Reference	AAR	ATO	FCD	MDW	MDP	Proximity Adjustment
33501850	975.85	1526.28	201.42	90.63	80.40	10.40%
34001850	931.64	1525.28	195.24	94.20	84.07	29.40%
33501900	981.96	1523.82	203.91	90.01	70.77	13.51%
34001900	992.28	1522.98	203.88	89.50	70.93	46.69%

Site Average Annual Rainfall: 971.35

Site Accumulated Temperature January to June: 1524.11

Site Field Capacity Days: 201.09

Moisture Deficit Wheat: 91.07

Moisture Deficit Potatoes: 75.76

Appendix 3a - Survey Data

		Topsoil						Subsoil 1						Subsoil 2						Subsoil 3					
Sample No	Altitude	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure
1	5	0-25	Org C	10YR 3/2	5%		WFSAB	30-40	C	2.5Y 5/3		FOB	MAB	40-120	C	2.5Y 5/1		MO	M						
2	5	0-25	Org C	10YR 3/2	5%		WFSAB	30-40	C	2.5Y 5/3		FOB	MAB	40-120	C	2.5Y 5/1		MO	M						
3	14	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	C	2.5Y 5/3		FOB	MAB	70-120	C	2.5Y 5/1		MO	M						
4	28	0-25	Org C	10YR 3/2	5%		WFSAB	25-70	C	2.5Y 5/3		FOB	MAB	70-120	C	2.5Y 5/1		MO	M						
5	36	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
6	7	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	C	2.5Y 5/3		FOB	MAB	70-120	C	2.5Y 5/1		MO	M						
7	8	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	C	2.5Y 5/3		FOB	MAB	70-120	C	2.5Y 5/1		MO	M						
8	8	0-30	Org C	10YR 3/2	5%		WFSAB	30-50	C	2.5Y 5/3		FOB	MAB	50-120	C	2.5Y 5/1		MO	M						
9	7	0-30	Org C	10YR 3/2	5%		WFSAB	30-50	C	2.5Y 5/3		FOB	MAB	50-120	C	2.5Y 5/1		MO	M						
10	6	0-25	Org C	10YR 3/2	5%		WFSAB	30-40	C	2.5Y 5/3		FOB	MAB	40-120	C	2.5Y 5/1		MO	CAB						
11	4	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	40	IMP										
12	16	0-25	Org C	10YR 3/2	10%		WFSAB	50-50	C	2.5Y 5/3		MOBG	MAB	50-120	C	2.5Y 5/1		MO	M						
13	28	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
14	50	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
15	7	0-25	Org C	10YR 3/1		FO	WFSAB	25-80	C	2.5Y 5/3		O	MAB	80-120	C	2.5Y 5/1		MO	M						
16	62	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	C	2.5Y 5/3		FOB	MAB	70-120	C	2.5Y 5/1		MO	M						
17	16	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	C	2.5Y 5/3		FOB	MAB	70-120	C	2.5Y 5/1		MO	M						
18	7	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	40	IMP										
19	8	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	40	IMP										
20	4	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	45-50	Stone					50-80	C	2.5Y 5/1		MO	M Platy
21	4	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	40	IMP										
22	6	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	40	IMP										
23	55	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
24	43	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
25	7	0-25	Org C	10YR 3/1		FO	WFSAB	25-80	C	2.5Y 5/3		O	MAB	80-120	C	2.5Y 5/1		MO	CAB						
26	7	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	C	2.5Y 5/3		FOB	MAB	70-120	C	2.5Y 5/1		MO	CAB						
27	6	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	C	2.5Y 5/3		FOB	MAB	70-120	C	2.5Y 5/1		MO	CAB						
28	4	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	40	IMP										
29	10	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	40	IMP										
30	7	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	40	IMP										
31	17	0-25	Org C	10YR 3/2	5%		WFSAB	25-45	C	2.5Y 5/3		MOBG	MAB	40	IMP										
32	4	0-25	Org C	10YR 3/2	5%		WFSAB	25-35	C	2.5Y 5/3		MOBG	MAB	35	IMP										
33	54	0-30	Org C	10YR 3/2	5%		WFSAB	30-60	StC	2.5Y 5/3		MOBG	FAB	60-120	C	2.5Y 5/1		MO	M						
34	9	0-30	HZCL	5YR 3/3			WMSAB	30-50	C	5YR 4/2			F Prism	50-120	C	2.5YR 4/3		BG	C PRISM						
35	8	0-30	HZCL	5YR 3/3			WMSAB	30-50	C	5YR 4/2			F Prism	50-120	C	2.5YR 4/3		BG	C PRISM						
36	31	0-25	Org C	10YR 3/2			WFSAB	25-40	C	2.5Y 5/3			MAB	40-75	C	2.5Y 5/1		MO	CAB	75	IMP				
37	26	0-25	Org C	10YR 3/2			WFSAB	25-40	C	2.5Y 5/3			MAB	40-75	C	2.5Y 5/1		MO	CAB	75	IMP				
38	4	0-25	Org C	10YR 3/2			WFSAB	25-50	C	2.5Y 5/2		MO	MAB	50	IMP										
39	6	0-25	Org C	10YR 3/2			WFSAB	25-60	C	2.5Y 5/2			MAB	60-120	C	2.5Y 5/1		MO	CAB						
40	7	0-25	Org C	10YR 3/2			WFSAB	25-60	C	2.5Y 5/2			MAB	60-75	C	2.5Y 5/1		MO	CAB	75	IMP				
41	6	0-30	Org C	10YR 3/2	5%		WFSAB	30-50	C	2.5Y 5/3		MOBG	MAB	50-80	C	2.5Y 5/1		MO	CAB	80	IMP				
42	8	0-30	Org C	10YR 3/2	5%		WFSAB	30-50	C	2.5Y 5/3		MOBG	MAB	50-80	C	2.5Y 5/1		MO	CAB	80	IMP				
43	4	0-25	Org C	10YR 3/2	5%		WFSAB	30-40	C	2.5Y 5/3		FOB	MAB	40-120	C	2.5Y 5/1		MO	CAB						
44	14	0-35	Org C	10YR 3/2	5%		WFSAB	35-50	C	2.5Y 5/3		MOBG	MAB	50	IMP										
45	22	0-30	Org C	10YR 3/2	5%		WFSAB	30-60	StC	2.5Y 5/3		MOBG	FAB	60-120	C	2.5Y 5/1		MO	M						
46	63	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
47	44	0-35	Org C	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
48	4	0-25	Org C	10YR 3/2			WFSAB	25-40	C	2.5Y 5/3		MO	MAB	40-120	C	2.5Y 5/1		MO	M						
49	12	0-30	Org C	10YR 3/2			WFSAB	30-50	C	2.5Y 5/3			MAB	50-120	C	2.5Y 5/1		MO	M						
50	10	0-30	Org C	10YR 3/2			WFSAB	30-50	C	2.5Y 5/3			MAB	50-120	C	2.5Y 5/1		MO	M						
51	5	0-25	Org C	10YR 3/2			WFSAB	25-50	C	2.5Y 5/3			MAB	50-120	C	2.5Y 5/1		MO	M						
52	9	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	StC	2.5Y 5/3		MOBG	MAB	70-90	C	2.5Y 5/1		MO	CAB	90	IMP				
53	4	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	StC	2.5Y 5/3		MOBG	MAB	70-90	C	2.5Y 5/1		MO	CAB	90	IMP				
54	5	0-30	Org C	10YR 3/2	5%		WFSAB	30-60	StC	2.5Y 5/3		MOBG	FAB	60-120	C	2.5Y 5/1		MO	M						
55	4	0-30	Org C	10YR 3/2	5%		WFSAB	30-60	StC	2.5Y 5/3		MOBG	FAB	60-120	C	2.5Y 5/1		MO	M						
56	56	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
57	5	0-30	HZCL	7.5YR 3/3			WMSAB	30-40	C	5YR 4/2			F Prism	40-120	C	10YR 5/1		MO	M						
58	5	0-25	Org C	10YR 5/3			WFSAB	25-40	C	2.5Y 5/3		MO	MAB	40-120	C	2.5Y 5/1		MO	M						
59	36	0-25	Org C	10YR 3/2			WFSAB	25-40	C	2.5Y 5/3		MO	MAB	40-120	C	2.5Y 5/1		MO	M						
60	9	0-30	Org C	10YR 3/2			WFSAB	30-50	C	2.5Y 5/3			MAB	50-120	C	2.5Y 5/1		MO	M						
61	26	0-25	Org C	10YR 3/2			WFSAB	25-50	C	2.5Y 5/3		MOB	MAB	50-120	C	2.5Y 5/1		MO	M						
62	6	0-30	Org C	10YR 3/2	5%		WFSAB	30-70	StC	2.5Y 5/3		MOBG	MAB	70-90	C	2.5Y 5/1		MO	CAB	90	IMP				

		Topsoil						Subsoil 1						Subsoil 2						Subsoil 3					
Sample No	Altitude	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure
63	5	0-20	Org C	10YR 3/2	5%		WFSAB	20-60	StC	2.5Y 5/3		MOBG	MAB	60-90	StC	2.5Y 4/1		MO	M	90	IMP				
64	10	0-25	Org C	10YR 3/2	10%		WFSAB	25-50	StC	2.5Y 5/3		MOB	FAB	50-90	C	2.5Y 5/1		MO	M	90	IMP				
65	17	0-25	Org C	10YR 3/2	10%		WFSAB	25-50	StC	2.5Y 5/3		MOB	FAB	50-90	C	2.5Y 5/1		MO	M	90	IMP				
66	4	0-30	HZCL	5YR 3/3			WMSAB	30-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
67	18	0-30	HZCL	7.5YR 3/3			WMSAB	30-40	C	5YR 4/2			F Prism	40-120	C	10YR 5/1		MO	M						
68	5	0-30	HZCL	7.5YR 3/3			WMSAB	30-40	C	5YR 4/2			F Prism	40-120	C	10YR 5/1		MO	M						
69	4	0-25	Org C	10YR 5/3			WMSAB	25-75	C	2.5Y 5/3		MO	MAB	75-120	C	2.5Y 5/1		MO	M						
70	4	0-25	Org C	10YR 3/2			WFSAB	25-70	C	2.5Y 4/1		MO	MAB	70	IMP										
71	6	0-25	Org C	10YR 3/2			WFSAB	25-70	C	2.5Y 5/3			MAB	70-120	C	2.5Y 5/1		MO	M						
72	4	0-25	Org C	10YR 3/2			WFSAB	25-70	C	2.5Y 5/3			MAB	70-120	C	2.5Y 5/1		MO	M						
73	8	0-25	Org C	10YR 3/2			WFSAB	25-50	C	2.5Y 5/3			MAB	50-120	C	2.5Y 5/1		MO	M						
74	5	0-30	Org C	10YR 3/2			WFSAB	30-60	C	2.5Y 5/3			MAB	60-75	C	2.5Y 5/1		MO	CAB	75	IMP				
75	5	0-25	Org C	10YR 3/2	5%		WFSAB	30-40	C	2.5Y 5/3		FOB	MAB	40-120	C	2.5Y 5/1		MO	CAB						
76	7	0-20	Org C	10YR 3/2	5%		WFSAB	20-60	StC	2.5Y 5/3		MOBG	MAB	60-90	StC	2.5Y 4/1		MO	M	90	IMP				
77	20	0-30	Org C	10YR 3/2	5%		WFSAB	30-60	StC	2.5Y 5/3		MOBG	FAB	60-120	C	2.5Y 5/1		MO	M						
78	20	0-30	Org C	10YR 3/2	5%		WFSAB	30-60	StC	2.5Y 5/3		MOBG	FAB	60-120	C	2.5Y 5/1		MO	M						
79	5	0-30	HZCL	5YR 3/3			WMSAB	30-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
80	4	0-30	HZCL	5YR 3/3			WMSAB	30-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/2		BG	C PRISM						
81	4	0-30	HZCL	7.5YR 3/3			WMSAB	30-40	C	5YR 4/2			F Prism	40-120	C	10YR 5/1		MO	M						
82	5	0-25	Org C	10YR 5/3			WMSAB	25-75	C	2.5Y 5/3		MO	MAB	75-120	C	2.5Y 5/1		MO	M						
83	4	0-25	Org C	10YR 5/3			WMSAB	25-75	C	2.5Y 5/3		MO	MAB	75-120	C	2.5Y 5/1		MO	M						
84	26	0-25	Org C	10YR 3/2			WFSAB	25-40	C	2.5Y 5/1		MO	WMAB	40-65	C	2.5Y 5/3		MO	CAB	65	IMP				
85	5	0-25	Org C	10YR 3/2			WFSAB	25-80	C	2.5Y 5/3		MOB	MAB	70-120	C	2.5Y 5/1		MO	M						
86	4	0-25	Org C	10YR 3/2			WFSAB	25-80	C	2.5Y 5/3			MAB	70-120	C	2.5Y 5/1		MO	M						
87	4	0-25	Org C	10YR 3/2			WFSAB	25-80	C	2.5Y 5/3			MAB	70-120	C	2.5Y 5/1		MO	M						
88	4	0-25	Org C	10YR 3/2			WFSAB	25-35	C	2.5Y 5/3		MOB	MAB	35	IMP										
89	35	0-30	Org C	10YR 3/2			WFSAB	30-70	C	2.5Y 4/1		MOB	CAB	70-80	S	5YR 3/4		MO	M	80	IMP				
90	54	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
91	44	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
92	46	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
93	4	0-30	HZCL	5YR 3/3			WMSAB	30-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
94	11	0-30	HZCL	7.5YR 3/3			WMSAB	30-40	C	5YR 4/2			F Prism	40-120	C	10YR 5/1		MO	M						
95	10	0-30	HZCL	7.5YR 3/3			WMSAB	30-40	C	5YR 4/2		MO	CAB	40-120	C	10YR 5/1		MO	M						
96	4	0-25	Org C	10YR 5/3			WMSAB	25-75	C	2.5Y 5/3			MAB	75-120	C	2.5Y 5/1		MO	M						
97	4	0-25	Org C	10YR 5/3			WMSAB	25-75	C	2.5Y 5/3			MAB	75-120	C	2.5Y 5/1		MO	M						
98	38	0-25	Org C	10YR 5/3			WMSAB	25-75	C	2.5Y 5/3			MAB	75-120	C	2.5Y 5/1		MO	M						
99	4	0-25	Org C	10YR 3/2			WFSAB	25-70	C	2.5Y 5/3			MAB	70-120	C	2.5Y 5/1		MO	M						
100	4	0-25	Org C	10YR 3/2			WFSAB	25-70	C	2.5Y 5/3			MAB	70-120	C	2.5Y 5/1		MO	M						
101	4	0-25	Org C	10YR 3/2			WFSAB	25-70	C	2.5Y 5/3			MAB	70-120	C	2.5Y 5/1		MO	M						
102	4	0-25	Org C	10YR 3/2			WFSAB	25-70	C	2.5Y 5/3			MAB	70-120	C	2.5Y 5/1		MO	M						
103	5	0-25	Org C	10YR 3/2			WFSAB	25-50	C	2.5Y 5/3			MAB	50-120	C	2.5Y 5/1		MO	M						
104	11	0-25	Org C	10YR 3/2			WFSAB	25-50	C	2.5Y 5/3			MAB	50-120	C	2.5Y 5/1		MO	M						
105	30	0-35	Org C	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
106	56	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
107	49	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
108	59	0-35	HZCL	5YR 3/3			WMSAB	35-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
109	55	0-30	HZCL	5YR 3/3			WMSAB	30-60	C	5YR 4/2			F Prism	60-120	C	2.5YR 4/3		BG	C PRISM						
110	15	0-20	Org C	10YR 5/1		MO	WCSAB	20-40	C	10YR 5/1		MO	MAB	40-120	P	10YR 5/1			M						
111	23	0-20	Org C	10YR 5/1		MO	WCSAB	20-40	C	10YR 5/1		MO	MAB	40-120	P	10YR 5/1			M						
112	35	0-40	Org C	10YR 4/1		MO	WCSAB	40-120	P	10YR 3/1			M												
113	46	0-40	Org C	10YR 4/1		MO	WCSAB	40-120	P	10YR 3/1			M												
114	4	0-25	Org C	10YR 5/3			WMSAB	25-40	C	2.5Y 5/3			MAB	40-70	C	2.5Y 5/1		MO	M	70	IMP				
115	14	0-25	Org C	10YR 5/3			WMSAB	25-50	C	2.5Y 5/3			MAB	50-120	C	2.5Y 5/1		MO	M						
116	13	0-25	Org C	10YR 5/3			WMSAB	25-50	C	2.5Y 5/3			MAB	50-120	C	2.5Y 5/1		MO	M						
117	9	0-25	Org C	10YR 5/3			WMSAB	25-50	C	2.5Y 5/3		MO	MAB	50-120	C	2.5Y 5/1		MO	M						
118	10	0-30	Org C	10YR 3/2			WFSAB	30-75	C	2.5Y 4/1		MO	CAB	75-120	C	2.5Y 5/1		MO	M						
119	33	0-35	Org C	10YR 3/2			WFSAB	25-75	C	2.5Y 4/1		MO	CAB	75-120	C	2.5Y 5/1		MO	M						
120	4	0-25	Org C	10YR 3/2			WFSAB	25-75	C	2.5Y 4/1		MOB	CAB	75-120	C	2.5Y 5/1		MO	M						
121	4	0-25	Org C	10YR 3/2			WFSAB	25-75	C	2.5Y 4/1		MOB	CAB	75-120	C	2.5Y 5/1		MO	M						
122	4	0-25	Org C	10YR 3/2			WFSAB	25-75	C	2.5Y 4/1		MOB	CAB	75-120	C	2.5Y 5/1		MO	M						
123	51	0-35	Org C	7.5YR 3/3			WMSAB	35-50	C	10YR 5/3		MO	CAB	50-120	C	10YR 5/3		MO	M						
124	28	0-35	Org C	7.5YR 3/3			WMSAB	35-50	C	10YR 5/3		MO	CAB	50-120	C	10YR 5/3		MO	M						
125	33	0-35	Org C	7.5YR 3/3			WMSAB	35-50	C	10YR 5/3		MO	CAB	50-120	C	10YR 5/3		MO	M						

		Topsoil						Subsoil 1						Subsoil 2						Subsoil 3					
Sample No	Altitude	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure
126	27	0-35	Org C	7.5YR 3/3			WMSAB	30-120	C	10YR 5/3		MO	CAB												
127	60	0-35	Org C	7.5YR 3/3			WMSAB	35-50	C	10YR 5/3		MO	MAB	50-120	C	10YR 5/3		MO	M						
128	52	0-20	Org C	10YR 5/1		MO	WCSAB	20-40	C	10YR 5/1		MO	MAB	40-120	P	10YR 5/1			M						
129	41	0-20	Org C	10YR 5/1		MO	WCSAB	20-40	C	10YR 5/1		MO	MAB	40-120	P	10YR 5/1			M						
130	38	0-20	Org C	10YR 5/1		MO	WCSAB	20-40	C	10YR 5/1		MO	MAB	40-120	P	10YR 5/1			M						
131	29	0-40	Org C	10YR 4/1		MO	WCSAB	40-120	P	10YR 3/1			M												
132	24	0-40	Org C	10YR 4/1		MO	WCSAB	40-120	P	10YR 3/1			M												
133	45	0-40	Org C	10YR 4/1		MO	WCSAB	40-120	P	10YR 3/1			M												
134	15	0-25	Org C	10YR 5/3			WMSAB	25-40	C	2.5Y 5/1		MO	WMAB	40-120	C	2.5Y 5/1		MO	M						
135	4	0-25	Org C	10YR 3/2			WMSAB	25	IMP																
136	29	0-25	Org C	10YR 3/2			WMSAB	25-40	C	2.5Y 5/3		MO	MAB	40-75	C	2.5Y 5/1		MO	CAB	75	IMP				
137	23	0-30	Org C	10YR 3/2			WFSAB	30-70	C	2.5Y 5/3		MO	MAB	70-120	C	2.5Y 5/1		MO	M						
138	6	0-25	Org C	10YR 3/2			WFSAB	25-70	C	2.5Y 5/3		MOB	MAB	70-120	C	2.5Y 5/1		MO	M						
139	4	0-25	Org C	10YR 3/2			WFSAB	25-70	C	2.5Y 5/3		MOB	MAB	70-120	C	2.5Y 5/1		MO	M						
140	4	0-25	Org C	10YR 3/2			WFSAB	25-50	C	2.5Y 5/3		MOB	MAB	50	IMP										
141	42	0-35	Org C	7.5YR 3/3			WMSAB	35-50	C	10YR 5/3		MO	WMAB	50-120	C	10YR 5/3		MO	M						
142	33	0-35	Org C	7.5YR 3/3			WMSAB	35-50	C	10YR 5/3		MO	WMAB	50-120	C	10YR 5/3		MO	M						
143	37	0-35	Org C	7.5YR 3/3			WMSAB	35-50	C	10YR 5/3		MO	WMAB	50-120	C	10YR 5/3		MO	M						
144	42	0-35	Org C	7.5YR 3/3			WMSAB	35-50	C	10YR 5/3		MO	WMAB	50-120	C	10YR 5/3		MO	M						
145	49	0-30	Org C	10YR 3/2		O	WMSAB	30-70	C	2.5YR 5/1		MO	C PRISM	70-120	P	10YR 2/1			M						
146	44	0-20	Org C	10YR 4/3		MO	WCSAB	20-70	C	10YR 5/1		MO	C PRISM	70-120	P	10YR 2/1			M						
147	38	0-20	Org C	10YR 4/3		MO	WCSAB	20-70	C	10YR 5/1		MO	C PRISM	70-120	P	10YR 2/1			M						
148	56	0-20	Org C	10YR 4/3		MO	WCSAB	20-50	C	10YR 5/1		MO	C PRISM	50-120	P	10YR 2/1			M						
149	29	0-40	Org C	10YR 4/1		MO	WCSAB	40-120	P	10YR 3/1			M												
150	32	0-40	Org C	10YR 4/1		MO	WCSAB	40-120	P	10YR 3/1			M												
151	10	0-40	Org C	10YR 4/1		MO	WCSAB	40-120	P	10YR 3/1			M												
152	29	0-25	Org C	10YR 3/2			WMSAB	25-40	C	2.5Y 5/1		MO	C PRISM	40-75	C	2.5Y 5/1		MO	CAB	75	IMP				
153	4	0-25	Org C	10YR 3/2			WMSAB	25-40	C	2.5Y 5/3		MO	WMAB	40-75	C	2.5Y 5/1		MO	CAB	75	IMP				
154	6	0-25	Org C	10YR 3/2			WMSAB	25	IMP																
155	7	0-25	Org HCL	10YR 3/2			WMSAB	25-50	C	2.5Y 5/1		MO	C PRISM	50	IMP										
156	34	0-30	Org C	10YR 3/2			WFSAB	30-75	C	2.5Y 5/3		MOB	WMAB	75	IMP										
157	39	0-25	Org C	10YR 3/2			WFSAB	30-40	C	2.5Y 5/3		MOB	WMAB	40-120	C	2.5Y 5/1		MO	M						
158	4	0-25	Org C	10YR 3/2			WFSAB	25-45	C	2.5Y 5/3		MO	WMAB	45-120	C	2.5Y 5/1		MO	M						
159	37	0-35	Org C	10YR 3/3			WMSAB	35-75	C	2.5Y 4/2		MO	C PRISM	75-120	P	10YR 2/1			M						
160	39	0-35	Org C	10YR 3/3			WMSAB	35-90	C	2.5Y 4/2		MO	C PRISM	90-120	P	10YR 2/1			M						
161	59	0-30	Org C	10YR 3/2		O	WMSAB	30-60	C	2.5YR 5/1		MO	C PRISM	60-120	P	10YR 2/1			M						
162	18	0-30	Org C	10YR 3/2		O	WMSAB	30-60	C	2.5YR 5/1		MO	C PRISM	60-120	P	10YR 2/1			M						
163	50	0-30	Org C	10YR 3/2		O	WMSAB	30-60	C	2.5YR 5/1		MO	C PRISM	60-120	P	10YR 2/1			M						
164	4	0-35	Org HCL	5YR 3/3			WMSAB	35-60	C	2.5YR 3/1		MO	CAB	60-120	P	10YR 2/1			M						
165	37	0-20	Org C	10YR 4/1		MO	WMSAB	20-40	C	10YR 5/1		MO	C PRISM	40-120	P	10YR 2/1			M						
166	58	0-20	Org C	10YR 4/1		MO	WMSAB	20-40	C	10YR 5/1		MO	C PRISM	40-120	Org C	10YR 3/1			M						
167	47	0-20	Org C	10YR 4/1		MO	WMSAB	20-40	C	10YR 5/1		MO	C PRISM	40-120	Org C	10YR 3/1			M						
168	41	0-25	Org C	10YR 3/2			WMSAB	25-40	C	2.5Y 5/1		MO	C PRISM	40-120	C	2.5Y 5/1			M						
169	24	0-25	Org C	10YR 3/2			WMSAB	25-40	C	2.5Y 5/3		MO	CAB	40-120	C	2.5Y 5/1			M						
170	27	0-25	Org C	10YR 3/2			WMSAB	25-40	C	2.5Y 5/3		MO	CAB	40-120	C	2.5Y 5/1			M						
171	31	0-25	Org C	10YR 3/2			WMSAB	25-40	C	2.5Y 5/3		MO	CAB	40-120	C	2.5Y 5/1			M						
172	58	0-30	Org C	10YR 3/2			WMSAB	30-45	C	2.5Y 5/3		MO	CAB	45	IMP										
173	5	0-35	Org HCL	5YR 3/3			WMSAB	35-90	C	2.5YR 3/1		MO	C PRISM	90-120	P	10YR 2/1			M						
174	43	0-35	Org C	10YR3/2			WMSAB	35-50	C	2.5YR 4/2		MO	C PRISM	50-120	C	2.5YR 4/2		MO	M						
175	21	0-35	Org C	5YR 3/3			WMSAB	35-120	C	2.5YR 3/1		MO	C PRISM												
176	16	0-35	Org HCL	5YR 3/3			WMSAB	35-75	C	2.5YR 3/1		MO	C PRISM	75-120	P	10YR 2/1			M						
177	26	0-35	Org C	5YR 3/3			WMSAB	35-90	C	5YR 4/2		MO	C PRISM	90-120	Org C	2.5YR 3/1			M						
178	25	0-20	Org C	10YR 4/1		MO	WMSAB	20-40	C	10YR 5/1		MO	C PRISM	40-120	Org C	10YR 3/1			M						
179	24	0-20	Org C	10YR 4/1		MO	WMSAB	20-40	C	10YR 5/1		MO	C PRISM	40-120	Org C	10YR 3/1			M						
180	28	0-20	Org C	10YR 4/1		MO	WMSAB	20-40	C	10YR 5/1		MO	C PRISM	40-120	Org C	10YR 3/1			M						
181	38	0-35	Org C	5YR 3/3			WMSAB	30-120	C	2.5YR 3/1		MO	C PRISM												
182	37	0-35	Org C	5YR 3/3			WMSAB	30-120	C	2.5YR 3/1		MO	C PRISM												
183	23	0-20	Org C	10YR 4/1		MO	WMSAB	20-40	C	10YR 5/1		MO	C PRISM	40-120	Org C	10YR 3/1			M						
184	6	0-30	Org C	10YR 4/1			WCSAB	30-120	C	10YR 5/1		MO	M												
185	4	0-30	Org C	10YR 4/1			WCSAB	30-120	C	10YR 5/1		MO	M												
186	4	0-30	Org C	10YR 4/1			WCSAB	30-120	C	10YR 5/1		MO	M												
A	11	0-25	Org C	10YR 5/2			WMSAB	25-40	C	2.5Y 5/1		MO	WMAB	40-120	C	2.5Y 5/1		MO	M						
B	10	0-25	Org C	10YR 5/3			WMSAB	25-40	C	2.5Y 5/1		MO	WMAB	40-120	C	2.5Y 5/1		MO	M						

		Topsoil						Subsoil 1						Subsoil 2						Subsoil 3					
Sample No	Altitude	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure
C	9	0-25	Org C	10YR 5/2			WMSAB	25-35	C	2.5Y 5/1		MO	WMAB	35	IMP										
D	10	0-25	Org C	10YR 5/2			WMSAB	25-35	C	2.5Y 5/1		MO	WMAB	35	IMP										
E	10	0-25	Org C	10YR 5/2			WMSAB	25-35	C	2.5Y 5/1		MO	WMAB	35	IMP										
F	15	0-25	Org C	10YR 5/2			WMSAB	25-35	C	2.5Y 5/1		MO	WMAB	35	IMP										
G	5	0-15	Org C	10YR 5/2			WMSAB	15-90	C	2.5Y 5/1		MO	C PRISM	90-120	P	10YR 2/1			M						
H	5	0-15	Org C	10YR 5/2			WMSAB	15-90	C	2.5Y 5/1		MO	C PRISM	90-120	P	10YR 2/1			M						
I	5	0-15	Org C	10YR 5/2			WMSAB	15-120	C	2.5Y 5/1		MO	C PRISM												
J	5	0-15	Org C	10YR 5/3			WMSAB	15-40	C	2.5Y 5/1		MO	C PRISM	40-120	C	2.5Y 5/1		MO	M						
K	6	0-15	Org C	10YR 5/3			WMSAB	15-40	C	2.5Y 5/1		MO	C PRISM	40-120	C	2.5Y 5/1		MO	M						

Appendix 3b - Trial Pit Descriptions

Sample point 20:

Horizon 1: 0-25cm Very dark greyish brown (10YR 3/2) organic clay with a weak fine subangular blocky structure

Horizon 2: 25-45cm Light Olive Brown (2.5Y 5/3) clay with a medium angular blocky structure and many ochreous black and grey mottles. Friable to firm consistence and biopores present, some quite large

Horizon 3: 45-50cm a layer of dark, hard, flat rocks, slightly overlapping which prevent penetration with an augur but are small enough to be moved when dug with a spade

Horizon 4: Grey (2.5Y 5/1) clay with a medium platy structure and many ochreous mottles. Firm consistence and less than 0.5% biopores. (Gleyed SPL)

Sample Point 80:

Horizon 1: 0-30cm Dark reddish brown (5YR 3/3) heavy silty clay loam with a weak medium sub angular blocky structure and some small areas with a course platy structure (likely caused by mechanical compaction and easily remedied)

Horizon 2: 30-60cm Dark reddish grey (5YR 4/2) clay with a fine prismatic structure. Friable to firm consistence and >0.5% biopores

Horizon 3: 60-120cm Weak (2.5YR 4/2) clay with a course prismatic structure with common black and grey mottles, firm consistence and <0.5% biopores (Gleyed SPL)

Sample Point 114:

Horizon 1: 0-25cm Brown (10YR 5/3) organic clay with a weak medium subangular blocky structure

Horizon 2: 25-40cm Light olive brown (2.5Y 5/3) clay with a medium angular blocky structure, friable to firm consistence very little mottling and >0.5% biopores

Horizon 3: 40-70cm Grey (2.5Y 5/1) clay with a course massive structure and many ochreous mottles, very firm consistence and <0.5% biopores (Gleyed SPL)

Horizon 4: 70cm very dense, hard layer of rock that could not be moved – totally impenetrable with either augur or spade

Sample Point 178

Horizon 1: Dark grey (10YR 4/1) organic clay with a weak medium subangular blocky structure and many ochreous mottles

Horizon 2: 20-40cm Grey (10YR 5/1) organic clay with a very course prismatic structure and many ochreous mottles, firm consistence and <0.5% biopores (Gleyed SPL)

Horizon 3: 40-120cm Very dark grey organic clay with a massive structure, firm consistence and <0.5% biopores (Gleyed SPL)

Standing water at sample point 178

ANALYTICAL REPORT

Report Number	**72656-21**	**W250**	**AMET PROPERTY**
Date Received	**18-OCT-2021**		**HENWICK BARN**
Date Reported	**25-OCT-2021**		**BULWICK**
Project	**SOIL**		**CORBY**
Reference	**AMET PROPERTY**		**NORTHANTS**
Order Number			**NN17 3DU**

Laboratory Reference		**SOIL531511**	**SOIL531512**	**SOIL531513**	**SOIL531514**						
Sample Reference		**148**	**23**	**40**	**146**						
Determinand	**Unit**	**SOIL**	**SOIL**	**SOIL**	**SOIL**						
Sand 2.00-0.063mm	% w/w	15	13	7	1						
Silt 0.063-0.002mm	% w/w	41	53	37	18						
Clay <0.002mm	% w/w	44	34	56	81						
Organic Matter LOI	% w/w	10.6	6.9	10.5	17.5						
Textural Class **		O-C	HZCL	O-C	O-C						

Notes

Analysis Notes	The sample submitted was of adequate size to complete all analysis requested.
	The results as reported relate only to the item(s) submitted for testing.
	The results are presented on a dry matter basis unless otherwise stipulated.
Document Control	**This test report shall not be reproduced, except in full, without the written approval of the laboratory.**

** Please see the attached document for the definition of textural classes.

Reported by *Myles Nicholson*

Natural Resource Management, a trading division of Cawood Scientific Ltd.
Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS
Tel: 01344 886338
Fax: 01344 890972
email: enquiries@nrm.uk.com

ADAS (UK) Textural Class Abbreviations

The texture classes are denoted by the following abbreviations:

Class	**Code**
Sand	S
Loamy sand	LS
Sandy loam	SL
Sandy Silt loam	SZL
Silt loam	ZL
Sandy clay loam	SCL
Clay loam	CL
Silt clay loam	ZCL
Clay	C
Silty clay	ZC
Sandy clay	SC

For the *sand, loamy sand, sandy loam* and *sandy silt loam* classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

vf Very Fine (more than 2/3's of sand less than 0.106 mm)
f Fine (more than 2/3's of sand less than 0.212 mm)
c Coarse (more than 1/3 of sand greater than 0.6 mm)
m Medium (less than 2/3's fine sand and less than 1/3 coarse sand).

The subdivisions of *clay loam* and *silty clay loam classes* according to clay content are indicated as follows:

M medium (less than 27% clay)
H heavy (27-35% clay)

Organic soils i.e. those with an organic matter greater than 10% will be preceded with a letter O.

Peaty soils i.e. those with an organic matter greater than 20% will be preceded with a letter P.

Appendix 4 - Wetness Assessment

	Wetness Assesment			Grade
	Depth to		Wetness	According to
Sample No	SPL	Gley	Class	Wetness
1	40	<40	IV	4
2	40	<40	IV	4
3	70	<40	III	4
4	70	<40	III	4
5	60	40-70	III	3b
6	70	<40	III	4
7	70	<40	III	4
8	50	<40	IV	4
9	50	<40	IV	4
10	40	<40	IV	4
11	45	<40	IV	4
12	50	<40	IV	4
13	60	40-70	III	3b
14	60	40-70	III	3b
15		<40	III	4
16	70	<40	III	4
17	70	<40	III	4
18	45	<40	IV	4
19	45	<40	IV	4
20	50	<40	IV	4
21	45	<40	IV	4
22	45	<40	IV	4
23	60	40-70	III	3b
24	60	40-70	III	3b
25		<40	III	4
26	70	<40	III	4
27	70	<40	III	4
28	45	<40	IV	4
29	45	<40	IV	4
30	45	<40	IV	4
31	45	<40	IV	4
32	40	<40	IV	4
33	60	<40	III	4
34	50	40-70	III	3b
35	50	40-70	III	3b
36	40	40-70	III	4
37	40	40-70	III	4
38	55	<40	III	4
39	60	40-70	III	4
40	60	40-70	III	4
41	50	<40	IV	4
42	50	<40	IV	4
43	40	<40	IV	4
44	55	<40	III	4
45	60	<40	III	4
46	60	40-70	III	3b
47	60	40-70	III	4
48	40	<40	IV	4
49	50	40-70	III	4
50	50	40-70	III	4

	Wetness Assesment			Grade
	Depth to		Wetness	According to
Sample No	SPL	Gley	Class	Wetness
51	50	40-70	III	4
52	70	<40	III	4
53	70	<40	III	4
54	60	<40	III	4
55	60	<40	III	4
56	60	40-70	III	3b
57	40	<40	IV	4
58	40	<40	IV	4
59	40	<40	IV	4
60	50	40-70	III	4
61	50	<40	IV	4
62	70	<40	III	4
63	60	<40	III	4
64	50	<40	IV	4
65	50	<40	IV	4
66	60	40-70	III	3b
67	40	<40	IV	4
68	40	<40	IV	4
69	75	<40	III	4
70		<40	III	4
71	70	40-70	III	4
72	70	40-70	III	4
73	70	40-70	III	4
74	60	40-70	III	4
75	40	<40	IV	4
76	60	<40	III	4
77	60	<40	III	4
78	60	<40	III	4
79	60	40-70	III	3b
80	60	40-70	III	3b
81	40	<40	IV	4
82	75	<40	III	4
83	75	<40	III	4
84	35	<40	IV	4
85	70	<40	III	4
86	70	<40	III	4
87	70	<40	III	4
88		<40	III	4
89	35	<40	IV	4
90	60	40-70	III	3b
91	60	40-70	III	3b
92	60	40-70	III	3b
93	60	40-70	III	3b
94	40	<40	IV	4
95	35	<40	IV	4
96	75	40-70	III	4
97	75	40-70	III	4
98	75	40-70	III	4
99	70	40-70	III	4
100	70	40-70	III	4
101	70	40-70	III	4

	Wetness Assesment			Grade
	Depth to		Wetness	According to
Sample No	SPL	Gley	Class	Wetness
102	70	40-70	III	4
103	50	40-70	III	4
104	50	40-70	III	4
105	60	40-70	III	4
106	60	40-70	III	3b
107	60	40-70	III	3b
108	60	40-70	III	3b
109	60	40-70	III	3b
110	40	<40	IV	4
111	40	<40	IV	4
112	40	<40	IV	4
113	40	<40	IV	4
114	40	40-70	III	4
115	50	40-70	III	4
116	50	40-70	III	4
117	50	<40	IV	4
118	35	<40	IV	4
119	35	<40	IV	4
120	35	<40	IV	4
121	35	<40	IV	4
122	35	<40	IV	4
123	35	<40	IV	4
124	35	<40	IV	4
125	35	<40	IV	4
126	35	<40	IV	4
127	50	<40	IV	4
128	50	<40	IV	4
129	40	<40	IV	4
130	40	<40	IV	4
131	40	<40	IV	4
132	40	<40	IV	4
133	40	<40	IV	4
134	35	<40	IV	4
135			I	3b
136	40	<40	IV	4
137	70	<40	III	4
138	70	40-70	III	4
139	70	40-70	III	4
140	55	<40	III	4
141	35	<40	IV	4
142	35	<40	IV	4
143	35	<40	IV	4
144	35	<40	IV	4
145	35	<40	IV	4
146	35	<40	IV	4
147	35	<40	IV	4
148	35	<40	IV	4
149	40	<40	IV	4
150	40	<40	IV	4
151	40	<40	IV	4
152	35	<40	IV	4

	Wetness Assesment			Grade
	Depth to		Wetness	According to
Sample No	SPL	Gley	Class	Wetness
153	35	<40	IV	4
154			I	3b
155	35	<40	IV	4
156	35	<40	IV	4
157	35	<40	IV	4
158	35	<40	IV	4
159	35	<40	IV	4
160	35	<40	IV	4
161	35	<40	IV	4
162	35	<40	IV	4
163	35	<40	IV	4
164	35	<40	IV	4
165	35	<40	IV	4
166	35	<40	IV	4
167	35	<40	IV	4
168	35	<40	IV	4
169	35	<40	IV	4
170	35	<40	IV	4
171	35	<40	IV	4
172	35	<40	IV	4
173	35	<40	IV	4
174	35	<40	IV	4
175	35	<40	IV	4
176	35	<40	IV	4
177	35	<40	IV	4
178	35	<40	IV	4
179	35	<40	IV	4
180	35	<40	IV	4
181	35	<40	IV	4
182	35	<40	IV	4
183	35	<40	IV	4
184	35	<40	IV	4
185	35	<40	IV	4
186	35	<40	IV	4
A	35	<40	IV	4
B	35	<40	IV	4
C		<40	III	4
D		<40	III	4
E		<40	III	4
F		<40	III	4
G	35	<40	IV	4
H	35	<40	IV	4
I	35	<40	IV	4
J	35	<40	IV	4
K	35	<40	IV	4

APPENDIX 5 - DESCRIPTION OF ALC GRADES

Grade 1 - excellent quality agricultural land Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 - very good quality agricultural land Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

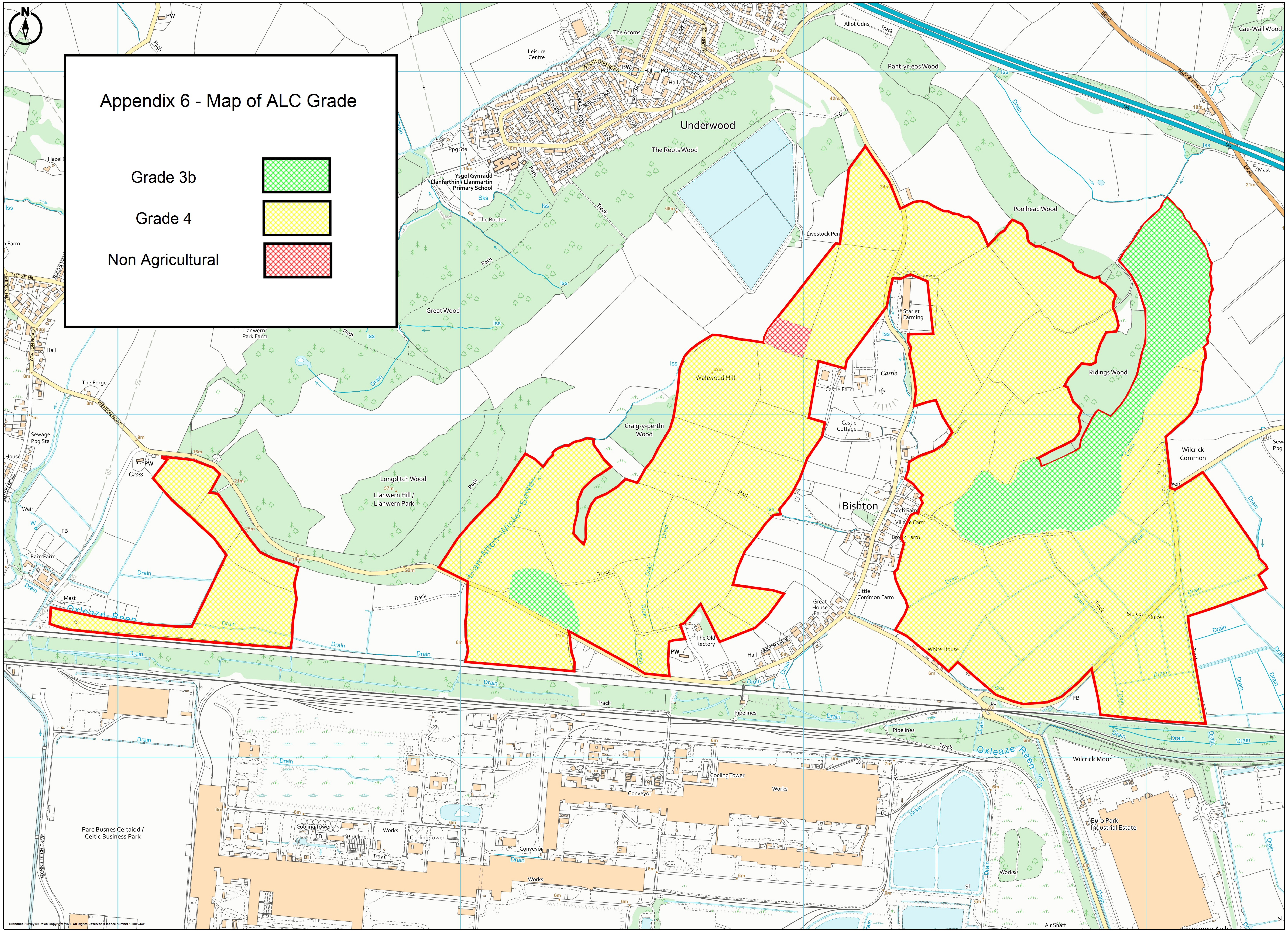
Grade 3 - good to moderate quality agricultural land Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a - good quality agricultural land Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b - moderate quality agricultural land Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 - poor quality agricultural land Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor-quality agricultural land Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.



Plotted Scale - 1:7500. Paper Size - A2

Outline Soil Management Plan:

Craig Y Perthi Solar Farm, Newport

Prepared for:
RWE Renewables UK, part of the RWE Group

Prepared by:
R W Askew BSc (Hons) MSc F.I. Soil Sci CSci
Askew Land & Soil Limited

Date:
31st July 2026

Project Number:
C1429

Contract/Proposal No:	C1429
Issue:	1
Author:	Rob Askew
Date:	31st July 2026

Version Control Record			
Issue	**Description of Status**	**Date**	**Initials**
A	First draft	30/07/2026	RWA
1	First issue to Client	31/07/2026	RWA

CONTENTS

1 INTRODUCTION

1.1 Background

1.1.1 This outline Soil Management Plan (OSMP) was commissioned by RWE Renewables UK, part of the RWE Group, to set out a methodology for identifying and safeguarding the soil resources (topsoil and subsoil) on land required for the construction, operation, and decommissioning of the proposed Craig Perthi Solar Farm, Newport ('the Site'). The approximate centre of the Site is located at British National Grid (BNG) reference ST388879. The location, boundary, and proposed layout of the Site are shown on the location map given in **Appendix 1**.

1.1.2 This report utilises relevant information that is given in a separate *'Agricultural Land Classification - Craig Perthi Solar Farm'* that was prepared by Amet Property on the 9th of June 2026 (henceforth referred to as the 'ALC Report'). The Amet Property ALC Survey Report has been accepted by the Welsh Government as an accurate reflection of the agricultural land quality at the Site.

1.2 Background

1.2.1 RWE Renewables UK ('the Applicant'), a part of the RWE Group, is proposing to develop a solar farm and associated development ('the Proposed Development') on land to the east of Newport near the Craig Y Perthi Wood and the village of Bishton. The site is west of the Magor Brewery, south of the M4 motorway, northwest of the Tesco Distribution centre, and north of Llanwern steelworks, separated by the South Wales Main Line.

1.2.2 The Proposed Development would be classed as a Development of National Significance ('DNS'), as it relates to an electricity generating station that has an installed generating capacity of between 10 and 350 MW[1]. Any application for the Proposed Development would be determined by Planning and Environment Decisions Wales ('PEDW'), with a decision being made by the Welsh Ministers.

1.2.3 The Applicant is part of the largest power producer in Wales, and the country's number one renewable energy producer with over 1 GW of renewable energy generation, responsible for around a quarter of Wales' renewable energy production. The Applicant is a major Welsh employer, with around 300 people working out of their dedicated offices in Baglan, Port of Mostyn and Dolgarrog.

1.3 Competency

1.3.1 This OSMP has been prepared by a Chartered Scientist (CSci), who is a Fellow (F.I. Soil Sci) of the British Society of Soil Science (BSSS). The author meets the requirements of the BSSS Professional Competency Standard (PCS) scheme for '*ALC*' and '*Soil Science in Soil Handling and Restoration*', which is endorsed, amongst others, by the Welsh Government, the Science

Council, and the Institute of Environmental Assessment and Management (IEMA) (see BSSS PCS Document 2 and 4)[2].

1.4 Aims and Objectives

1.4.1 The aim of the OSMP is to maintain the quality and quantity of soil resources (i.e., topsoil and subsoil) at the Site in its current physical condition (e.g., soil depth, soil texture, soil structure, soil drainage status), chemical condition, e.g., pH level, nutrient status and soil organic matter (SOM) content, in order to maintain soil functions (see Section 1.5 below) during (i) the construction, (ii) operational, and (iii) decommissioning phases of the proposed solar farm.

1.4.2 Post-consent, the OSMP Plan will require updating in accordance with approved documentation by the appointed contractor prior to any construction commencing on-site. A detailed **Construction Phase Soil Management Plan (CPSMP)** would be submitted to the Local Planning Authority (LPA)/Determining Authority for approval prior to the start of construction, and this will sit alongside, or be part of, a Construction Environmental Management Plan (CEMP), or similar.

1.4.3 Prior to decommissioning, a final **Decommissioning Soil Management Plan (DSMP)** would be submitted to the LPA/Determining Authority for approval, and this would sit alongside, or be part of, a Decommissioning Plan or similar. Prior to the end of decommissioning works, an **Aftercare Soil Management Plan** would be submitted to the LPA/Determining Authority for approval. The ‘Aftercare period’ means a period of five years from compliance with the decommissioning condition or such other maximum period after compliance with that condition as may be prescribed by the LPA.

1.4.4 The objectives of this OSMP are to set out appropriate methodology to:

(i) Determine the location, extent and quality of in-*situ* soil resources (topsoil and subsoil) at the Site prior to construction (i.e., baseline soil status); this involved a desk-based assessment of published information on climate, geology, soils, an Agricultural Land Classification (ALC) and Soil Resource Survey (SRS) reported in the ALC Report;

(ii) Determine types (units) of soil according to their resilience to damage (e.g., compaction) during soil handling prior to the commencement of construction;

(iii) Produce maps showing the location and extent of soil resources (topsoil and subsoil) in separate units identified in (ii) prior to the commencement of construction;

(iv) Ensure vehicular traffic over the land is restricted to farm tracks, haul roads or on agricultural land in appropriate weather conditions and soil-wetness state during the construction, operational and decommissioning phases;

(v) Where necessary, to strip, store and respread soil resources in appropriate weather conditions and soil-wetness state during the construction and decommissioning phases;

(vi) Produce an outline plan for an appropriate level and period of Aftercare following decommissioning of the soil panels and infrastructure. This is to help ensure the agricultural land is reinstated and handed back to the landowner/farmer in its former quality, i.e., a similar condition to the baseline soil conditions described in the ALC Report.

1.5 Soil Functions

1.5.1 Following an Ecosystem Services[3] approach, soil functions[4] are general capabilities of soils that are important for various agricultural, environmental, nature protection, landscape architecture and urban applications. Six key soil functions are:

- Food and other biomass production;
- Environmental Interaction: storage (including carbon sequestration), filtering, and transformation;
- Biological habitat and gene pool;
- Source of raw materials;
- Physical and cultural heritage; and
- Platform for man-made structures: buildings, highways.

1.6 Soil Receptor Sensitivity/Resilience

1.6.1 When considering soil as a growing medium for food and biomass production (i.e., the land at the Site is mainly in agricultural production), and a habitat which supports microbial, plant, and animal life, its sensitivity to change is largely dependent on its **resilience to structural damage** during cultivation and soil handling (i.e., soil stripping, storing in stockpiles, and re-spreading). As detailed in numerous guidelines for soil handling, including the Code of Practice for Sustainable Management of Soil on Construction Sites (2009)[5], the key to understanding soil resilience to structural damage during soil handling is the interaction between **soil texture** and **soil moisture,** and the effect of this interaction on **soil structure**.

I. Soil Texture

1.6.2 Soil texture describes how the mineral element of soil comprises a mixture of mineral particles of different sizes, and a different **texture class** can be ascribed according to the proportion of (according to the British Standards Institution):

- clay (<0.002mm);
- silt (0.002mm to 0.06mm);
- sand
  - fine sand (0.06mm to 0.2mm);
  - medium sand (0.2mm to 0.6mm); and
  - coarse sand (0.6mm to 2.0mm).

II. Soil Moisture

1.6.3 The amount of moisture in the soil is known to affect key soil properties[6], including:

- **soil strength** (i.e., cohesion, internal friction). This is an important feature of soils in relation to their response to soil handling, and importantly to their resistance to fracture, compression, smearing, moulding and compaction; and

- **soil consistency**. This is commonly used to describe the 'feel' of the soil and includes properties such as friability, plasticity, stickiness and resistance to compression and shear. Changes in consistency are sometimes described in terms of various limits (for which there are British Standards Institute (BSI) methodologies):

  - The Plastic Limit (or Lower Plastic Limit), i.e., the moisture content at which the soil changes from friable to plastic and is taken to be the minimum moisture content at which the soil can be puddled. This can be measured in a laboratory under BS1377:1990 '*Methods of test for soils for civil engineering purposes'* by rolling threads of soil that shear longitudinally and transversely at approximately 3mm diameter; and

  - The Liquid Limit (or Upper Plastic Limit), i.e., the water content at which soil cohesion is so reduced that the soil mass will flow when a force is applied

III. Soil Structure

1.6.4 The most important structural features of soils are the size, shape, and stability of the peds (soil aggregates), which influence how the soil is penetrated by water, air and roots. In general terms, a soil with a good structure is well drained and well aerated and is conducive to soil flora and fauna.

1.6.5 When a soil is handled when it is too wet (i.e., the moisture content is at or exceeds the lower plastic limit), then soil strength is reduced, and it becomes prone to structural damage, i.e., it has less resistance to compression and shear. By introducing a force, such as a mechanical excavator, the wet (or plastic) soil can lose its structure and become compacted.

1.6.6 In the worst-case scenario, a well-structured and aerated soil can become poorly structured (even massive) by soil handling when it is too wet (plastic). If it is stored in this state, it can become anaerobic, with distinctive grey colouration and associated 'sour' smell. Poor drainage and anaerobic conditions cause stress and often death to plants (crops) and soil fauna.

1.6.7 The Ministry of Agriculture, Fisheries and Food (MAFF) '*Agricultural Land Classification (ALC) of England and Wales*' system has developed a methodology for assessing the interaction between soil texture and soil moisture, and, in part, classifies agricultural land quality according to soil wetness (i.e. the interaction between soil topsoil texture, soil wetness class

(WC)[7], and the number of days that the soil profile is predicted to be at field capacity (i.e., the maximum amount of water a soil profile can hold following free drainage).

1.6.8 For the purpose of OSMP, the methodology for assessing soil wetness should be utilised to place the different soil types at the Site into one of three soil handling units which have different resilience (i.e., high resilience, medium resilience and low resilience) to structural damage according to their respective soil cohesion and soil strength and resistance to compression and smear at different soil moisture contents. These three categories of resilience should be related to the prevailing climate, namely Field Capacity Days, as set out in Table 1.1 below.

Table 1.1: Soil Handling Units

Soil Handling Unit	Resilience to structural damage during soil handling	Soil Texture Class
A (Green)	High	Light textured soils: sand (S), loamy sands (LS), sandy loam (SL), sandy silt loams (SZL); where fewer than 225 Field Capacity Days (FCD) (Average Annual Rainfall (AAR) less than 1000mm).
B (Orange)	Medium	Above textures where there are 225 FCD 0r more (AAR 1000mm or greater). Medium textured soils with less than 27% clay content: silt loam (ZL), medium silty clay loam (MZCL), medium clay loam (MCL), sandy clay loam (SCL); where there are 225 FCD or fewer (AAR 1000mm or less). Heady textures below (i.e., more than 27% clay content) where fewer than 150 FCD (AAR less than 700mm).
C (Red)	Low	Medium textures above where there are more than 225 FCD (AAR greater than 1000mm). Heavy textures soils with more than 27% clay content: heavy silty clay loams (HZCL), heavy clay loam (HCL), sandy clay (SC) silty clay (ZC) clay (C); where FCD are 150 or more (AAR 700mm or greater). Organic and peaty soils.

1.7 Soil health and best practice guidance

1.7.1 This OSMP has drawn on best practice guidance set out in the key documents below:

(i) The Institute of Civil Engineers (ICE) provides guidance on assessing agricultural land quality and soil in the '*Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities*'**Error! Bookmark not defined.**.

(ii) The Institute of Environmental Assessment and Management (IEMA) has produced a '*New Perspective on Land and Soil in Environmental Assessment*'**Error! Bookmark not defined.**, encouraging a new approach to assessing soil functions, ecosystem services and natural capital provided by land and soils.

(iii) The Department for Environment, Food and Rural Affairs (DEFRA) for England has a '*Code of Practice for the Sustainable Use of Soils on Construction Sites*'[8].

(iv) BS 3882:2015 '*Specification for topsoil*'[9].

(v) This project also follows best practice published by the British Society of Soil Science on '*Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction*'[10].

(vi) Best practice will also be followed for soil handling published by the Institute of Quarrying (2021) '*Good Practice for Handling Soils in Mineral Workings*' (Sheets A to E are mainly relevant to this assessment)[11].

(vii) This SMP also considers recent guidance produced by the Soils in Planning Construction Task Force (Lancaster University *et al*) regarding '*Building on soil sustainability: Principles for soils in planning and construction*' (September 2022)[12]. This report contains guidance for local authorities, contractors, clients, developers, and design teams on managing soil in construction and planning. This guidance for conserving soil resources on-site follows the principles of sustainable development and the circular economy (defined as '*The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the* ***life cycle of products is extended.*** *In practice, it implies* ***reducing waste*** *to a minimum. When a product ends its life, its materials are kept within the economy wherever possible. These can be productively used repeatedly, thereby* ***creating further value***'[13].

1.8 Structure of the Remainder of this Report

1.8.1 The remainder of this report is structured as follows:

- Section 2 – Soil Resource Assessment;
- Section 3 – Outline Soil Management Plan; and
- Section 4 – Conclusion.

2 SOIL RESOURCE ASSESSMENT

2.1 Background

2.1.1 This section of the OSMP sets out relevant published information on climate, topography, geology, soil, and Agricultural Land Classification (ALC). As described in Section 1.1, this report utilises relevant information given in a separate *'Agricultural Land Classification - Craig Perthi Solar Farm'* that was prepared by Amet Property on the 9th of June 2026 (the 'ALC Report'), plus soil information given in a National Soil Resource Institute (NSRI) Soil Site Report covering the Site (see **Appendix 2**).

2.2 Site Characteristics and Soil Resources

2.2.1 This part of the report describes site characteristics which are pertinent to soil management, as follows:

- Climate (e.g., opportunity for soil handling in suitably dry conditions);
- Topography and gradient (e.g., to help identify potential risks of soil erosion by wind and/or water); and
- Published information on geology and soils.

I. Climate

2.2.2 Interpolated climate data relevant to the determination of the Agricultural Land Classification (ALC) grade of land and soil handling for a range of altitudes at the Site (i.e., lowest at 3m and highest at 59m) is given in Table 2.1.

Table 2.1: Interpolated Climate Data for ALC at Craig Y Perthi Solar Farm, Newport

Climate Parameter	Data for ST373874 (Southwest)	Data for ST385877 (Central/South)	Data for ST387881 (Central/North)	Data for ST396875 (Southeast)
Average Altitude (m)	3	28	59	4
Average Annual Rainfall (mm)	961	973	989	961
Accumulated Temperature above 0˚C (January – June)	1545	1516	1480	1543
Field Capacity Days (FCD)	200	201	204	199
Moisture Deficit (mm) Wheat	93	90	86	94
Moisture Deficit (mm) Potatoes	84	80	74	84
ALC Grade According to Climate	1	1	1	1

2.2.3 Of relevance to soil handling, the Site receives an **Average Annual Rainfall (AAR)** of between **961mm and 989mm**.

2.2.4 In addition, the soil is predicted to be at field capacity (i.e., the amount of soil moisture or water content held in the soil after excess water has drained away) for between **199 and 204 Field Capacity Days (FCD) per year**.

II. Topography and Gradient

2.2.5 The land at the site is uneven, with elevations ranging from approximately 3 meters (m) above Ordnance Datum (AOD) at the lowest point in the southwest to approximately 59 meters AOD at the highest point in the central northern area. From the Amet Property ALC report, the gradient of the slope to the west of Castle Farm (approximate grid reference ST389881) is 7.5°. In general, the land slopes from north to south, which could increase the risk of soil erosion by water (e.g., rainfall), especially during soil stripping and soil storage during the construction phase.

III. Soil

2.2.6 The Soil Survey of England and Wales (SSEW) soil map of Wales (Sheet 2) at a scale of 1:250,000 and accompanying Bulletin No. 11 '*Soils and their Use in Wales*'[14], and a National Soil Resources Institute (NSRI) Soil Site Report for Craig Y Perthi Solar Farm (copy given as **Appendix 2**)[15], reports that land at the Site is covered by soils grouped into three soil associations as follows:

- The predominant soil association at the Site is the Denchworth association (NSRI Reference 712b) which occurs on higher ground (>10m AOD) to the northwest and northeast of Bishton. The Denchworth association consists of slowly permeable and seasonally waterlogged clayey soils with some fine (clay or silty) loams over clayey soils;

- The next most common soil association is the Midelney association (NSRI refence 813a) which consists of stoneless clayey soils mostly overlying peat, on low ground (i.e., >10m AOD) to the southeast of Bishton;

- Finally, a strip of land to the east of Bishton and curling north around Ridings Wood is recorded as having soils belonging to the Worcester association (NSRI Reference 431). This association consists of slowly permeable non-calcareous and calcareous reddish clayey soils over mudstones. These soils can be shallow on steep slopes.

IV. Topsoil Particle Size Analysis

2.2.7 To substantiate topsoil texture determined during the SRS/ALC survey by hand-texturing, four samples of topsoil were collected over the Site (i.e., auger bore locations 23, 40, 146, and 148, as shown in Figure 1 of Amet Property's ALC Report. The topsoil samples were sent to an accredited laboratory for analysis of particle size distribution (PSD), based on the British Standards Institution particle size grades. A certificate of analysis is provided as Appendix 3 in Amet Property's ALC Report. The findings of the PSD analysis are reproduced in Table 2.2 below:

Table 2.2: Topsoil Texture (re Table 10, ALC Guidelines)

Topsoil Sample Location (See Fig. 1)	% sand 0.063-2.0 mm	% silt 0.002-0.063 mm	% clay <0.002 mm	Organic Matter (Loss on Ignition)	ALC Soil Texture Class
23	13	53	34	6.9	Heavy Silty Clay Loam
40	7	37	56	10.5	Organic Clay
146	1	18	81	17.5	Organic Clay
148	15	41	44	10.6	Organic Clay

2.2.8 The Amet Property ALC Report determined that the texture of the topsoil ranges from heavy silty clay loam (HZCL) to organic clay (C).

2.3 Soil Handling Units

2.3.1 By applying the criteria set out in Table 1.1 '*Soil Handling Units*' against the climate data (i.e., FCD and AAR) and soil associations described above (and as shown in **Appendix 2**), the soils at Craig Y Perthi Solar Farm may be assigned to soil handling units as set out in Table 2.3 below, and as shown on **Figure 1**.

Table 2.3: Soil Handling Units (see Figure 1)

Soil Handling Unit	Resilience to structural damage during soil handling	Soil Association (see Appendix 2)
1	Low	Denchworth association. This group of soils comprises heavy silty clay loam (HZCL) and clay (C) topsoil over slowly permeable and seasonally waterlogged clay subsoil. As per Table 1.1, these heavy textured soils have a low resilience (or high susceptibility) to structural damage by vehicles trafficking over them, or during soil handling operations, in a climate area with more than 150 FCD and an AAR of more than 700mm.
2	Low	Midelney association. This group of soils comprises heavy silty clay loam (HZCL) and clay (C) topsoil over slowly permeable and

		seasonally waterlogged clay subsoil. As per Table 1.1, these heavy textured soils have a low resilience (or high susceptibility) to structural damage by vehicles trafficking over them, or during soil handling operations, in a climate area with more than 150 FCD and an AAR of more than 700mm.
3	Low	Worcester association. This group of soils comprises heavy silty clay loam (HZCL) and clay (C) topsoil over slowly permeable and seasonally waterlogged clay subsoil. As per Table 1.1, these heavy textured soils have a low resilience (or high susceptibility) to structural damage by vehicles trafficking over them, or during soil handling operations, in a climate area with more than 150 FCD and an AAR of more than 700mm.

2.3.2 It has been determined in Table 2.1 that heavy textured soils in **Soil Handling Units 1, 2, and 3 have a low resilience to structural damage during soil handling.** Accordingly, they should only be handled during suitably dry weather conditions when the soils are friable, i.e., the moisture content of these soils is above the Plastic Limit.

3.0 OUTLINE SOIL MANAGEMENT PLAN (OSMP)

3.1 Introduction

3.1.1 This section outlines general requirements for vehicular traffic over agricultural land, and where necessary soil handling, i.e., soil stripping, storage and placement/re-spreading, during the construction, operational and decommissioning phases of the proposed solar farm.

3.1.2 Best practice for solar farm design and layout and good practice in construction set out in the BRE National Solar Centre's (2014) '*Agricultural Good Practice Guidance for Solar Farms*' (Editor J Scurlock) should be followed[16].

3.2 Supervision

3.2.1 Throughout the construction phase, a routine of inspections will be provided by a suitably experienced Soil Adviser alongside any programme/works-specific supervision requirements. In particular, the Soil Adviser will advise on the appropriate location, height, and vegetative cover for soil storage bunds on site, following the guidelines in the remainder of this section of the OSMP.

3.2.2 As a minimum, inspections will check for compliance with the agreed SMP, such as the depth of material stripped for areas of track, confirmation of soil handling and trafficking over land being stopped when soil has wetted to a plastic consistency, and condition of soil material in storage bunds.

3.2.3 The use of a Soil Adviser to inform requirements, monitor, and verify compliance will be implemented for the construction phase. This function will also be taken forward through the decommissioning phases where appropriate. An example would be looking for areas of subsoil compaction that have developed where operation and maintenance (O&M) vehicles have been used off the access track routes, specifying appropriate subsoil cultivation, and assessing the effectiveness of that cultivation.

3.3 General Requirements for Soil Handling

3.3.1 The quality and quantity of soil resources (topsoil and subsoil) within the Site shall be maintained by following the approach of the DEFRA '*Code of Practice for the Sustainable Management and Use of Soil on Construction Sites*' (Defra, September 2009)[17]. This is to achieve the following principal objectives:

(i) The avoidance of unnecessary damage to all soil layers, especially by compaction and smearing;

(ii) The maintenance of a reasonable degree of fissuring, drainage and aerobic conditions in stored soils;

(iii) The reasonable replication of the original sequence of textural horizons and permeability of the soil profile when the materials are reinstated, based on a target restoration profile (i.e., the original/baseline soil profile determined in the SRS prior to commencement of construction);

(iv) The preservation of soil biodiversity and Soil Organic Matter (SOM).

3.3.2 All soil and soil forming materials shall be handled in accordance with the Institute of Quarrying's Good Practice Guide for Handling Soil (2021), Sheets A – E (handling soil using backacters and dumptrucks)[18].

3.3.3 All soil shall only be moved when in a dry and friable condition. For all soil types, no soil handling should proceed during and shortly after significant rainfall, and/or when there are any puddles on the soil surface. An appropriate method for determining soil moisture content for soil handling is given in **Appendix 3**. Alternatively, the Plastic Limit (see Section 1.5 (III) above) of the different soil types/units should be determined in a laboratory to British Standard 1377: 1990 '*Methods of test for soils for civil engineering purposes*'. Soil handling should cease when the Plastic Limit is exceeded, and not recommenced until the land/soil has at least 24 hours after rainfall has ceased.

3.3.4 When a soil is handled when it is too wet (i.e., the moisture content is at or exceeds the lower plastic limit), then soil strength is reduced, and it becomes prone to structural damage, i.e., it has less resistance to compression and shear. By introducing a force, such as a mechanical excavator, the wet (or plastic) soil can lose its structure and become compacted. As described in Best Practice produced by the Institute of Quarrying (see '*Supplementary Note 4 – Soil Wetness'* given as **Appendix 3**) '*…The degree of effect due to soil handling is likely to vary between the soil textural class, structural condition, and organic matter content, the local climate and daily weather conditions, but also between the types and size of machinery used and handling practice adopted. The primary cause of compaction arises from the compression caused by trafficking by the machinery and stockpiling of soil in storage*. *Whilst some degree of remedial actions might be possible, experience has demonstrated that minimising compaction by handling soil in a dry condition is the more effective and reliable, and likely most cost-effective option.'*

3.3.5 Guidance is given in **Appendix 3** on the general timing of operations. A field-based determination of when the actual operations should start, cease or restart based upon actual soil wetness is provided. The CPSMP and DSMP should carefully consider the timing of (i) vehicles trafficking over the land and soil, and (ii) land-work and soil handling operations. The CPSMP and DSMP should provide mitigation measures to avoid or reduce damage to soil structure, especially when the soil is wet, including a method for determining when land-work and soil handling operations should start, cease and restart based upon actual soil wetness. This may include determination of the Plastic Limit of the different soil types/units should be determined in a laboratory to British Standard 1377: 1990 '*Methods of test for soils for civil engineering purposes*'[19].

3.3.6 From an '*Indicative on-average months when vegetated mineral soils might be in a sufficiently dry condition according to geographic location, depth of soil and clay content*' (Table 4.1, **Appendix 3**), the soil at the Site is predicted to be in a sufficiently dry condition as follows (Note: this is a predicted period over the year when the soil is most likely to be suitable for handling. However, guidance above for ceasing and restarting work during this period):

- Soil Handling Units 1-3 (Low Resilience to Soil Handling): More than 27% clay in Climate Zone 1 = Late May to Early October.

3.3.7 Throughout the period of working, restoration and Aftercare, the operator shall take all reasonable steps to ensure that drainage from areas adjoining the Site is not impaired or rendered less efficient by the permitted operations.

3.3.8 Where relevant, handling peaty/organic soils should aim to maintain peatland ecosystem services (such as carbon sequestration), minimise risks to ecosystem services (such as the loss of habitat, water quality, storage or ground stability, and retain excavated peat in storage as close to the point of extraction as practicable.

3.3.9 The operator shall take all reasonable steps, including the provision of any necessary works, to prevent damage by erosion, silting or flooding and to make proper provision for the disposal of all water entering, arising on or leaving the Site during the permitted operations.

3.3.10 Any oil, fuel, lubricant, paint or solvent within the site shall be so stored as to prevent such material from contaminating topsoil, subsoil, soil forming material, or reaching any watercourse.

3.3.11 Throughout the period of working, restoration and aftercare, the operator shall have due regard to the need to adhere to the precautions for preventing the spread of plant and animal diseases'[20].

3.4 Stop Conditions

3.4.1 This section outlines general requirements for stop conditions for vehicular traffic over agricultural land and soil handling, i.e., soil stripping, storage, and placement/re-spreading during the construction phase of the Scheme.

3.4.2 As described in Section 1.6 and **Appendix 3**, when soil is handled when it is too wet (i.e., the moisture content is at or exceeds the lower plastic limit), soil strength is reduced, and it becomes prone to structural damage, i.e., less resistance to compression and shear. Wet (or plastic) soil can lose its structure and become compacted when subjected to a force, such as that of a mechanical excavator. As described in Best Practice produced by the Institute of Quarrying (see '*Supplementary Note 4 – Soil Wetness*' given as **Appendix 3**):

'…The degree of effect due to soil handling is likely to vary between the soil textural class, structural condition, and organic matter content, the local climate and daily weather conditions, but also between the types and size of machinery used and handling practice adopted. The primary cause of compaction arises from the compression caused by trafficking by the machinery and stockpiling of soil in storage. Whilst some degree of remedial actions might be possible, experience has demonstrated that minimising compaction by handling soil in a dry condition is the more effective and reliable, and likely most cost-effective option.'

3.4.3 Advice is given in **Appendix 3** on the general timing of operations. A field-based determination of when the actual operations should start, cease or restart based upon actual soil wetness is provided in **Table 4.2 of Appendix 3**, and is reproduced below. The stop conditions will be applied to the timing of vehicles trafficking over the land and soil, and land-work and soil handling operations. Soil should only be handled when in a suitably dry and friable state, i.e., when it passes the test set out in **Table 4.2 of Appendix 3**, and as described below.

"***Table 4.2: Field Tests for Suitably Dry Soils***
Soil tests are to be undertaken in the field. Samples shall be taken from at least five locations in the soil handling area and at each soil horizon to the full depth of the profile to be recovered/replaced. The tests shall include visual examination of the soil and physical assessment of the soil consistency.

i) Examination

- *If the soil is wet, films of water are visible on the surface of soil particles or aggregates (e.g. clods or peds) and/or when a clod or ped is squeezed in the hand it readily deforms into a cohesive 'ball' means no soil handling to take place.*
- *If the samples are moist (i.e. there is a slight dampness when squeezed in the hand) but they do not significantly change colour (darken) on further wetting, and clods break up/crumble readily when squeezed in the hand rather than forming into a ball, it means soil handling can take place.*
- *If the sample is dry, it looks dry and changes colour (darkens) if water is added, and it is brittle means soil handling can take place.*

ii) ***Consistency***

First test

Attempt to mould soil sample into a ball by hand:

- *impossible because soil is too dry and hard or too loose and dry means soil handling can take place.*
- *Impossible because the soil is too loose and wet means no soil handling to take place.*
- *Possible - Go to second test.*

Second test

Attempt to roll ball into a 3mm diameter thread by hand:

- *Impossible because soil crumbles or collapses means soil handling can take place.*
- *Possible means no soil handling can take place.*

N.B.: It is possible to roll most coarse loamy and sandy soils into a thread even when they are wet. For these soils, the Examination Test alone is to be used.”

3.4.4 An *‘Indicative on-average months when vegetated mineral soils might be in a sufficiently dry condition according to geographic location, depth of soil and clay content’* is given in **Appendix 3**. The Site is in Climate Zone 1 (taken from the Institute of Quarrying’s Supplementary Note on Soil Wetness).

3.4.5 In general, soil handling should normally be minimised during October to March unless it is in a suitable dry and friable condition, even during the Spring and Summer months (i.e., April to September), following the two-step test described in paragraph 3.4.3, and Table 4.2, given in **Appendix 3**. Following the Institute of Quarrying’s advice in **Appendix 3**, soil handling operations should generally be completed no later than the end of September to allow a vegetation cover to be established on the replaced soils of storage mounds before the winter months.

3.4.6 Regarding adverse weather conditions:

(i) Soil handling operations in light rain soil handling must cease after 15 minutes;

(ii) Soil handling operations must stop immediately if there is heavy rain (e.g. heavy showers, slow moving depressions);

(iii) Soil handling must be suspended and not restarted until the ground has had at least a full day to dry, or the soil moisture is below the plastic limit, if there is sustained heavy rainfall of more than 10mm in 24 hours; and

(iv) Soil will not be handled or trafficked over/driven on immediately after heavy rainfall (or snow/hail) in a waterlogged condition, or when there are standing pools of water on the soil surface.

(v) After work has been stopped due to the adverse weather conditions above, the soil should be tested for plasticity to ensure that soil handling does not restart until the soil is in a suitably dry and friable condition following the two-step test described in paragraph 3.4.3 and Table 4.2 in **Appendix 3**.

3.5 Drainage

3.5.1 The SMP will follow the hydrological management requirements set out in the Drainage Management Plan/CEMP. Accordingly, throughout construction activity, the Principal

Contractor shall take all reasonable steps to ensure that drainage from areas within and adjoining the Site is not impaired or rendered less efficient by construction activities.

3.5.2 The Principal Contractor shall take all reasonable steps, including the provision of any necessary works, to prevent damage by erosion, silting, or flooding and to make proper provision for the disposal of all water entering, arising on, or leaving the Site during the permitted operations.

3.6 Accidental Spillages

3.6.1 Any oil, fuel, lubricant, paint or solvent within the Site shall be so stored as to prevent such material from contaminating topsoil, subsoil, soil-forming material, or reaching any watercourse. See the separate CEMP also.

3.7 Biosecurity

3.7.1 The SMP will follow guidance on biosecurity set out in the Landscape Management Plan and/or the CEMP for Biodiversity. Accordingly, throughout the period of working, and restoration, the Principal Contractor shall have due regard to the need to adhere to the precautions for preventing the spread of plant and animal diseases published by the Government online[21].

3.8 Ground Preparation

3.8.1 All undisturbed areas where no construction activities or vehicles are allowed, will be clearly marked out and signposted.

3.8.2 Underground utilities or services crossing the area of soil stripping will be surveyed, and their depth and position will be clearly marked to ensure soil stripping works do not impact them. The utility or service location may require cordoning/fencing off.

3.8.3 Any trees, hedgerows, or valuable habitats that are to be retained will be marked out with barrier tape and subsequently protected and managed following the Landscape Management Plan and the CEMP for Biodiversity.

3.8.4 Prior to stripping agricultural topsoil (e.g., access roads, ancillary buildings, cable trenches, and the Grid Connection Infrastructure), all above-ground vegetation will be cleared in the areas to be stripped, so that the amount of vegetation within the topsoil strip is minimised (this is to minimise the amount of anaerobic decomposition of vegetation / organic matter that will occur within the topsoil stockpiles).

3.10 Temporary Access Tracks and Compounds

3.10.1 Heavy goods vehicles (HGV) delivering construction materials, will not be permitted to traffic over agricultural land and will be restricted to public highways, internal access tracks, and dedicated construction compounds.

3.10.2 For the construction of temporary access tracks and compounds, the topsoil (i.e., 25cm layer) will be removed by Low Ground Pressure (LGP) or tracked machinery and stored in a low bund of 1m to 3m maximum height alongside the track/compound. A geotextile membrane will then be laid down to prevent stones mixing with the soil. On top of this is placed a mix of as-dug stone, topped if needed, with the smaller stone placed and rolled level. At the end of the construction phase, the stone is dug up and removed, the membrane is removed, a subsoiler or plough loosens the area, and the topsoil is spread back over before being harrowed with standard agricultural machinery. It can then be reseeded.

3.10.3 Construction machinery such as piling machines and telehandlers will not traffic over agricultural land which is left in-situ (i.e., where the topsoil has not been stripped) when the soil is too wet. This is to avoid vehicles trafficking over soils when they are too wet, causing soil structural damage by compaction and smearing, and to avoid creating ruts/vehicle wheelings at the ground surface. See '*General Requirements for Soil Handling*' above for guidance on appropriate soil moisture content for soil handling in paragraph 3.4.3, and Table 4.2 in **Appendix 3**.

3.10.4 The use of temporary access road systems is recommended where ground conditions dictate, i.e., by following the 'Stop Conditions' set out in Section 3.5. This should involve stripping and storing the topsoil in a suitably dry and friable condition (as per Stop Conditions in Section 3.5, and procedures for soil stripping, storing and restoring in the remainder of this section) along the access track as per paragraph 3.10.2, and covering the exposed subsoil with a heavy-duty composite plastic trackway system on a thin layer of stone, or no stone, e.g., GroundGuards Xtreme Mats 4mx2m Large Mats[22], or SignaRoad 3mX2m Large Mats[23], or other similar geotextile material. No plastic trackway systems or mats, etc, should be placed directly on top of topsoil. If a thin layer of stones is used as a basal below a composite plastic trackway system, or for the mats, a geotextile membrane should be placed over the exposed subsoil before the stones are placed on top to avoid the stones being mixed in the subsoil, and to facilitate removing the stones when the temporary access tracks are dismantled and removed, and before the topsoil is replaced. The period during which the temporary access road systems are in use should be limited to the minimum number of days or weeks required to complete the construction works in that part of the site. The temporary access road systems should be removed and the land restored by replacing the topsoil as soon as practicably possible to avoid structural damage and subsoil compaction.

3.10.5 Where a peaty/organic layer is present, construction machinery, e.g., piling machines and telehandlers, will not traffic directly over such land in any weather. Such areas must be demarcated with appropriate barriers put in place to prevent vehicle tracking. In the unlikely event that the use of such land is deemed necessary, the SMP will govern any such use and would stipulate the specifications of a temporary haul road system to prevent structural damage, shrinkage, or erosion of the peat/SOM. No routing of this ilk would be supported by the final SMP without the Soil Advisor being satisfied that the objectives of peat/SOM safeguarding could be achieved.

3.11 Underground cable installation and other trenches

3.11.1 Cabling will be connected once the solar PV panels are installed. This is done mostly with either a mini-digger or a trenching machine. Trenches will mostly be at depths of 0.8m where soil depth permits, although the CCTV trenching around the periphery will be shallower, i.e., 50cm depth.

3.11.2 LGP or tracked mechanical diggers will be used to minimise soil compaction (see also appropriate trenching machinery in BRE National Solar Centre '*Agricultural Good Practice Guidance for Solar Farms*' (2014).

3.11.3 Topsoil will be stripped and stored next to one side of the trench. Subsoil will then be stripped to the required depth and stored on the opposite side of the trench to the topsoil.

3.11.4 Topsoil and subsoil that is excavated for cable trenches within the Site will be restored to their original position, i.e., topsoil at the top, and thickness as soon as the cable is laid. This eliminates the need to store soil in storage bunds for an extended period.

3.11.5 The restored trenches are narrow, and the grass in the restored topsoil will recover rapidly. Where necessary, additional grass seed will be spread on restored ground that remains bare after a few weeks.

3.11.6 While these procedures set out the methodology that will apply to cable trenching, they will be applied to any other works involving excavations for the implementation of ancillary structures or SuDS infrastructure. Cable trenching should only be carried out when the soil is suitably dry and friable, following the two-step test in paragraph 3.4.3, and Table 4.2 in Appendix 3.

3.12 Grid connection infrastructure

3.12.1 Grid Connection Infrastructure shall be constructed as follows:

(i) The topsoil (i.e., 25cm (250mm) layer) will be stripped in a soil bund (see '*Soil storage*' below) adjacent to any concrete pad and/or secondary security fence around the fixed external electrical equipment;

(ii) A stone base will then be added, and formwork (shuttering) will be put around before concrete is poured to create the pad to the desired thickness. The fixed equipment will then be located on the concrete pad once it has set;

(iii) Security fencing around the fixed equipment may be added once the cabling and connections are complete;

(iv) For restoration, the stone and matting will be removed where it is not forming a permanent feature of the external electrical equipment area. For areas that will be returned to grassland, the Soil Advisor will revisit the area once the matting has been removed. The Soil Adviser will advise whether any loosening of the area is necessary before the topsoil is replaced over the top. The area will then be harrowed with standard agricultural spring-tine harrows or a power harrow to loosen the topsoil and level the area. The area can then be sown to grass; and

(v) Areas where long-term fixed equipment is to be placed, typically on a concrete pad, need to be built with future restoration in mind. The key consideration is to strip the topsoil and set it aside in a suitable bund, ensuring it remains in an aerobic condition for spreading when the area is restored in the future.

3.13 Soil Stripping

3.13.1 Soil stripping on site should only take place by following the best practice guidance set out in the Institute of Quarrying's '*Good Practice for Handling Soils in Mineral Workings*'; Sheets A to E are mainly relevant to this assessment[11]. Before any part of the Site is excavated or is built upon, or used for the stacking of topsoil, subsoil or overburden, or as a machinery dump or plant yard, or for the construction of a road, all available topsoil and subsoil will be stripped from that part, only when the soil is suitably dry and friable, following the two-step test in paragraph 3.4.3, and Table 4.2 in **Appendix 3**.

3.14 Soil Storage

3.14.1 Soil storage on site should only take place by following the best practice guidance set out in the Institute of Quarrying's '*Good Practice for Handling Soils in Mineral Workings*'; Sheets A to E are mainly relevant to this assessment[11]. Bunds for the storage of soils shall conform to BS 3882:2015 '*Specification for Topsoil*'[9] and the following criteria.

(i) Topsoil shall only be placed into storage when the soil is suitably dry and friable, following the two-step test in paragraph 3.4.3, and Table 4.2 in **Appendix 3**;

(ii) Topsoil and subsoil (often referred to as overburden) in the different soil handling units will be stored separately;

(iii) Where continuous bunds are used, dissimilar soils will be separated by a third material;

(iv) Materials will be stored like upon like, so topsoil shall be stripped from beneath subsoil bunds;

(v) All storage bunds containing soils intended to remain in situ for more than 6 months or over the winter period will be grassed over and weed control and other necessary maintenance will be carried out. The seed mixture should include a deep-rooted grass, such as Italian ryegrass (*Lolium multiflorum*).

(vi) All topsoil and subsoil shall be retained on the Site.

3.15 Soil Restoration

3.15.1 This section of the OSMP sets out general measures related to soil restoration, which may be applicable for the construction phase and decommissioning phase of the Scheme. The main objective of restoring agricultural land is to reinstate it to its original (pre-development) ALC grade (see the ALC and SRS report). In summary, an Agricultural Land Classification (ALC) survey determined that the approximately 170.2ha Site comprises approximately 13.3ha of Subgrade 3b (or 13.3% of the Site), approximately 144.7ha of Grade 4 (or 85.0% of the Site), and approximately 2.9ha of Non-agricultural land (or 1.7% of the Site), as shown on the map given in Appendix 6 of the ALC Report.

3.15.2 Maintaining the quality and quantity of soils is a key objective of land and soil restoration. Where required, restoration will be achieved by reestablishing the soil profiles in the correct sequence of horizons, i.e., topsoil at the top. The topsoil will be levelled, cultivated, and reseeded as agreed with the landowner/occupier.

3.15.3 The soils to be restored should only be moved when they are suitably dry and friable, following the two-step test described in paragraph 3.4.3 and Table 4.2 of **Appendix 3**.

3.15.4 To restore agricultural land to its former quality, it will be necessary to restore a 25cm layer of topsoil recovered on Site, over the in-situ subsoil. This would produce a restored soil profile with a total rootable depth of 120cm, i.e., taken to be the maximum rooting depth of winter wheat in the MAFF ALC Guidelines (October 1988). There are sufficient soil resources available for reuse on Site.

3.15.5 In areas where land compaction occurs at the Site it may be necessary to undertake subsoil restoration techniques to restore the structure of the subsoil and to assist with land drainage, as per Sheets D and O of the Institute of Quarrying's guidance[11].

3.15.6 The Principal Contractor will clear all temporary working areas and accesses as the work proceeds and when they are no longer required for the works. On completion of the construction activities, all plant, materials, and temporary works/structures will be removed.

3.15.7 Throughout the soil restoration phase, regular inspections should be made by a suitably experienced Soil Adviser. Inspections will check for compliance with this SMP.

3.16 Aftercare Scheme

3.16.1 Following the decommissioning of the solar farm, removal of the solar panels and associated infrastructure, and restoration of land and soil to agriculture, there shall be a period of Aftercare. The Operator shall prepare a schedule of Aftercare maintenance, including soil testing appropriate to the target for soil restoration, for a period up to five years.

3.16.2 On completion of the restoration works the restored soils will be in a fragile condition. The objectives of the Aftercare period are to:

(i) Soil cultivation and establishment of vegetation cover with a good rooting system such as grass as soon as possible after reinstatement of the soils (year 1);

(ii) At the end of year 1, the land should be checked for settlement and any hollows should be infilled by scraping back the topsoil and infilling with subsoil compatible with the subsoil beneath, before reinstating the topsoil;

(iii) Soil cultivation and vegetation management (year 2-5). This is to check the condition of the soil and grass (or other crop); and amelioration work is undertaken as necessary, e.g., infilling of settlement hollows, subsoiling to improve soil structure and to correct any patchy areas of poor growth; and

(iv) Consideration of the drainage of the restored agricultural land to prevent flooding.

3.16.3 Throughout the period of working, restoration and Aftercare, the operator shall take all reasonable steps to ensure that drainage from areas adjoining the Site is not impaired or rendered less efficient by the permitted operations.

3.16.4 Throughout the Aftercare phase, regular inspections should be made by a suitably experienced Soil Adviser. Inspections will check for compliance with this OSMP and subsequent SMPs, identify any areas requiring specific remediation work, and ensure that any such remediation work has been completed successfully. An example would be looking for any areas of subsoil compaction that have developed where service vehicles have been used off the access track routes, specifying appropriate subsoil cultivation, and assessing its effectiveness.

4.0 CONCLUSION

4.1.1 Through implementation of the measures set out in the SMP during the construction phase, the outcomes of soil management measures will support the success of the Site's landscape and ecological enhancement strategy. This strategy will be implemented and managed via a LEMP and a CEMP for Biodiversity.

4.1.2 The Scheme will follow best practice guidance set out in the SMP for:

(i) Supervision;
(ii) Review and update of SMP;
(iii) General requirements for soil handling;
(iv) Stop conditions;
(v) Drainage;
(vi) Accidental spillages;
(vii) Biosecurity;
(viii) Ground preparation;
(ix) Temporary access tracks and compounds;
(x) Underground cable installation and other trenches;
(xi) Grid connection infrastructure;
(xii) Soil stripping;
(xiii) Soil storage;
(xiv) Soil restoration; and
(xv) Aftercare.

4.1.3 The best practice measures and outcomes supported by the OSMP and SMP during the construction phase will be taken forward during the future decommissioning phase.

Figures

Key

Study Area

Low Resilience to Structural Damage During Soil Handling

Figure 1:

Soil Handling Units

Project Name:
Craig Y Perthi Solar Farm, Newport

Client:
RWE Renewables UK,
part of the RWE Group

Project Number:

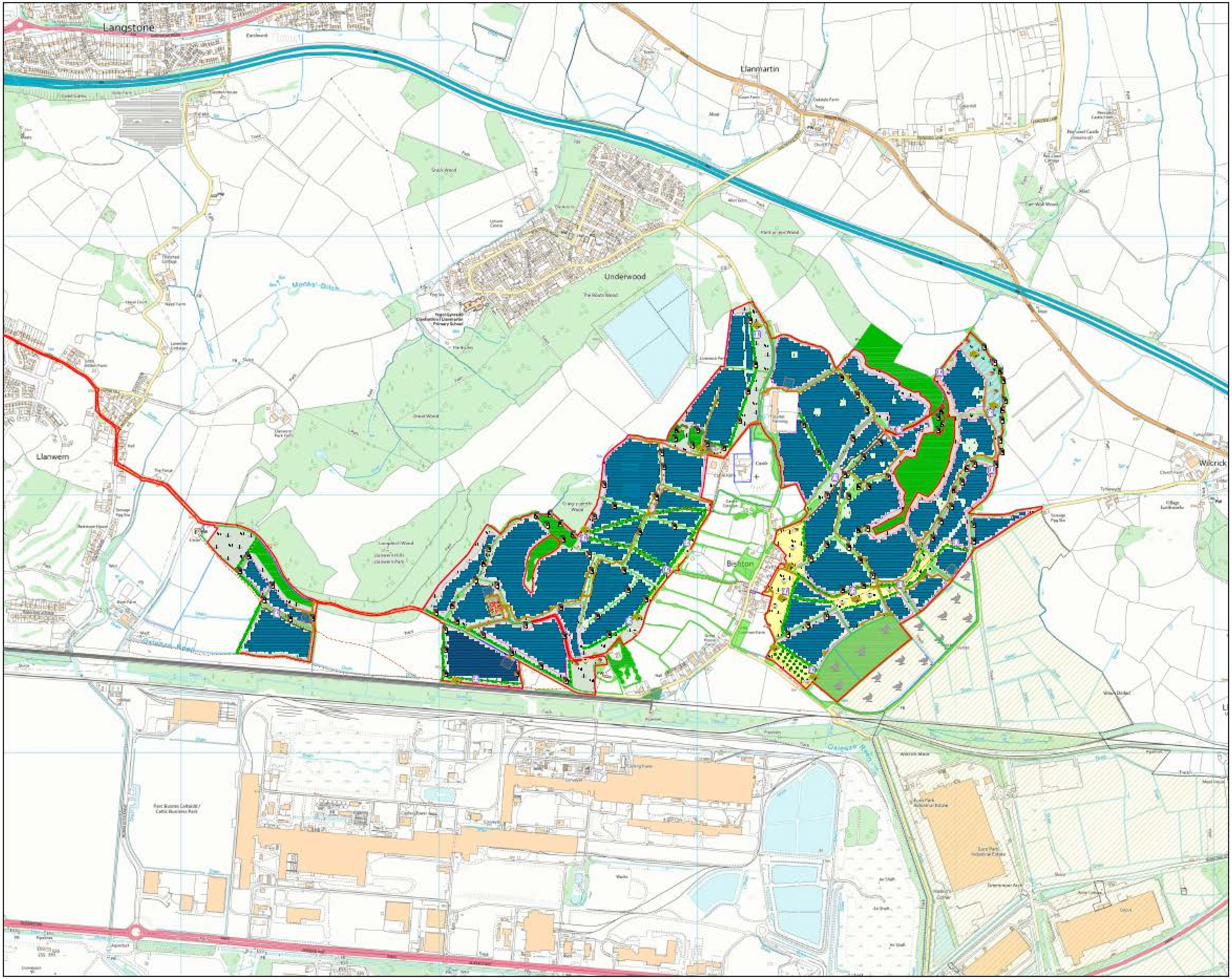
C1429

Date: 31/07/2026

Drawn By: RWA

ASKEW LAND+SOIL

Appendix 1:
Site Location



NOTES

1. All details are indicative only.
2. Dimensions are in metres unless stated otherwise.
3. Refer to HSE document "Avoiding danger from overhead power lines – Guidance Note GS6" to ensure safe operation of machinery in proximity to overhead power lines.

LEGEND

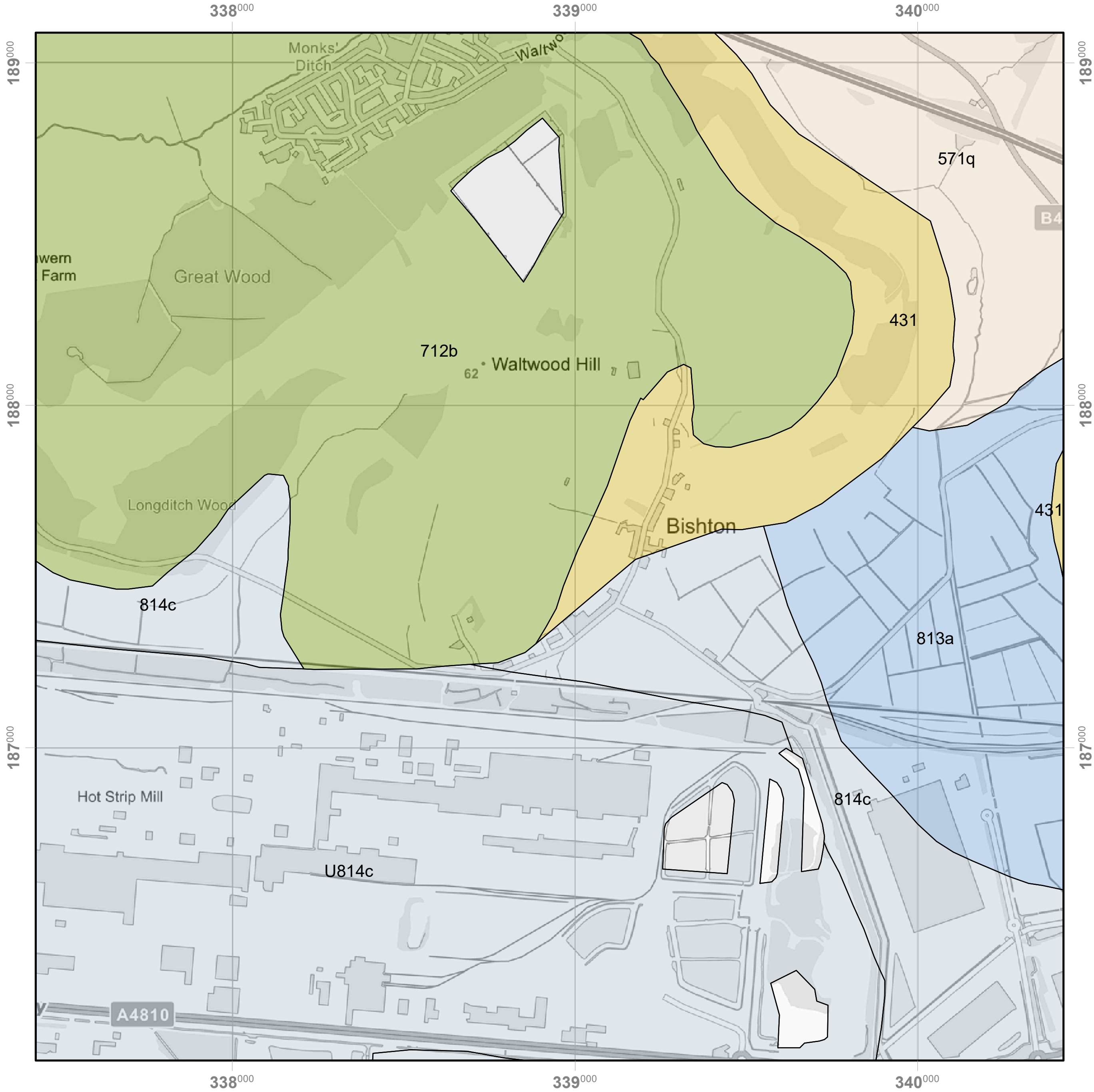
- Planning Red Line
- Landowners Property
- Access track
- Solar panels
- Solar panels subject to freeboard
- Deer Fence
- Existing Hedges
- Proposed Hedge Planting
- Grazing Grassland
- Wildflower EM2 or similar enhanced with Shrill Carder Food Plants
- Wildflower EM10 enhanced with Shrill Carder Food Plants
- Existing Woodland
- Nesting Bird Habitat
- Nesting Bird Habitat in SSSI (Secured via condition or S106)
- Gwent Levels – Redwick and Llandevenny SSSI
- Wetland Meadow EM8 or similar
- Transformer Container
- Spares Container
- Customer Switch Gear Container
- CCTV
- Access Gate
- Temporary Construction Compound
- Public Rights Of Way
- Permissive Path
- Native Tree Planting
- Orchard Tree Planting
- Substation
- 132kV Cable Route
- Inland Drains
- Outdoor Classroom
- Picnic Bench
- Bird Box
- Bat Box
- Bee Hotel
- Information Board
- Reptile Hibernacula

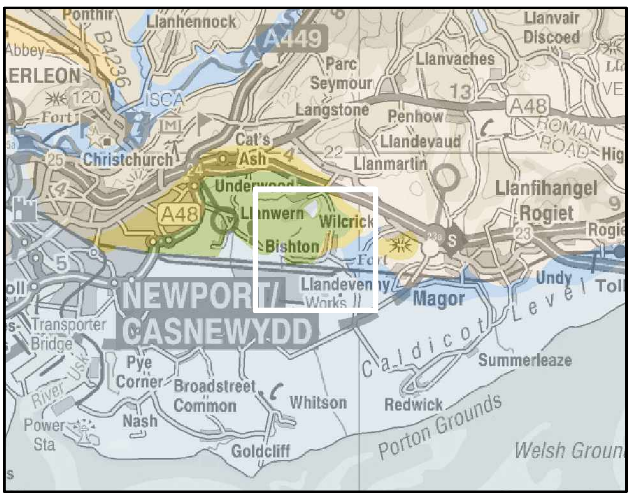
DETAILS

TITLE	Craig-Y-Perthi Solar
LABEL	Figure 2
DATE	14 May 2026
STATUS	Fixed design
REVISION	14

Appendix 2:
NSRI Soil Site Report
Craig Y Perthi Solar Farm
(Soil Associations)

1a Soils - Spatial Distribution





Soils - Spatial Distribution Key

431 WORCESTER
Slowly permeable non-calcareous and calcareous reddish clayey soils over mudstone, shallow on steeper slopes.

571q ESCRICK 2
Deep well drained often reddish coarse loamy soils.

712b DENCHWORTH
Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

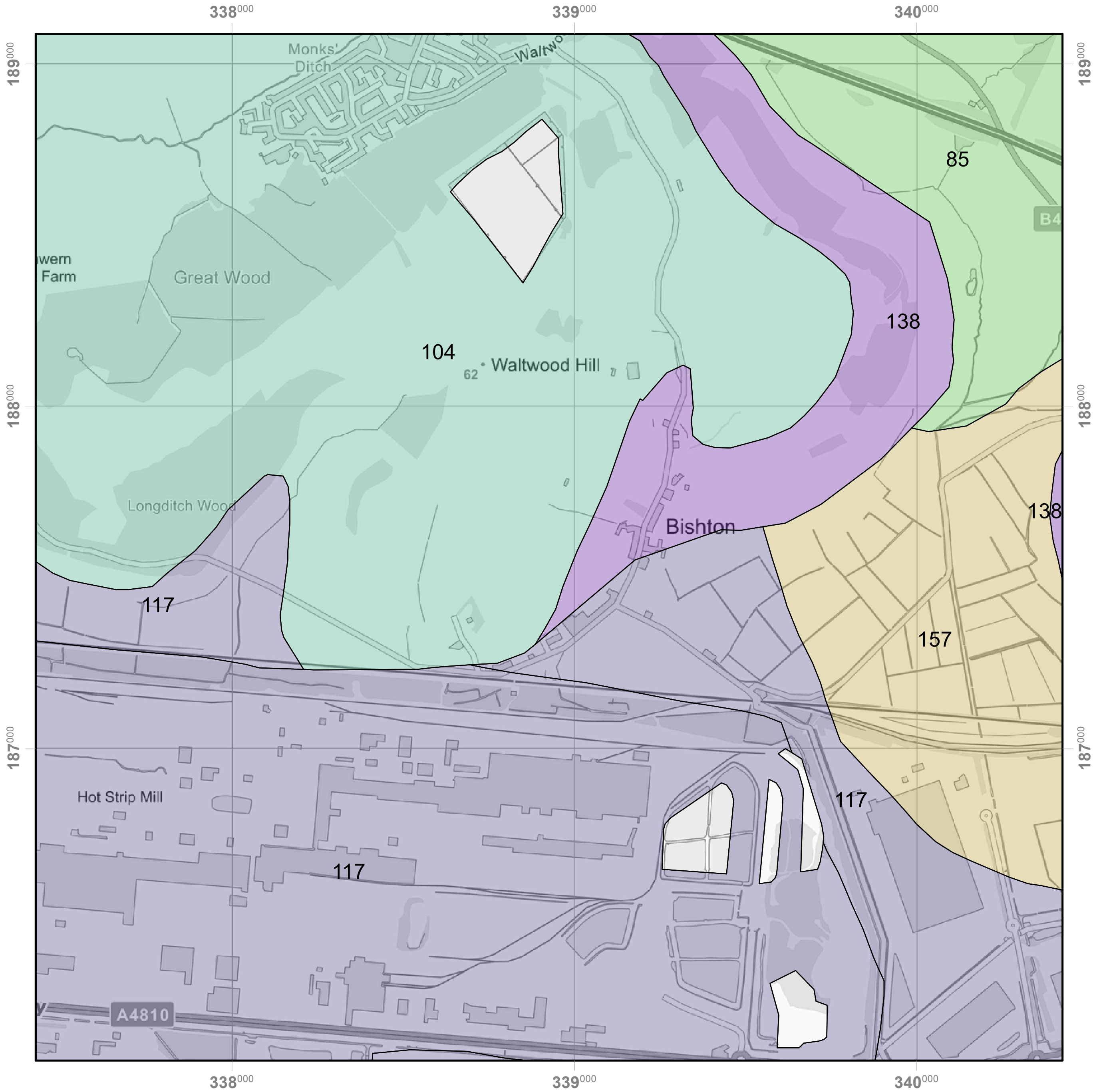
813a MIDELNEY
Stoneless clayey soils mostly overlying peat.

814c NEWCHURCH 2
Deep stoneless mainly calcareous clayey soils.

SOIL ASSOCIATION DESCRIPTION

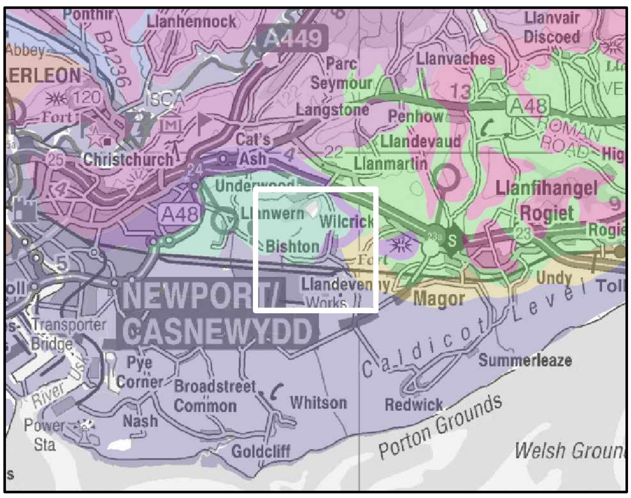
Soil associations represent a group of soil series (soil types) which are typically found occurring together, associated in the landscape (Avery, 1973; 1980; Clayden and Hollis, 1984). Soil associations may occur in many geographical locations around the country where the environmental conditions are comparable. For each of these soil associations, a collection of soil types (or soil series) are recorded together with their approximate proportions within the association. Soil associations have codes as well as textual names, thus code '554a' refers to the 'Frilford' association. Where a code is prefixed with 'U', the area is predominantly urbanised (e.g. 'U571v'). The soil associations for your location, as mapped above, are described in more detail in Section 2: Soil Association Descriptions.

1b Soil Parent Material



Soils Data © Cranfield University (NSRI) and for the Controller of HMSO 2024

Contains OS data © Crown Copyright and database right 2017



Soil Parent Material Key

85 Glaciofluvial drift

104 Jurassic and Cretaceous clay

117 Marine alluvium

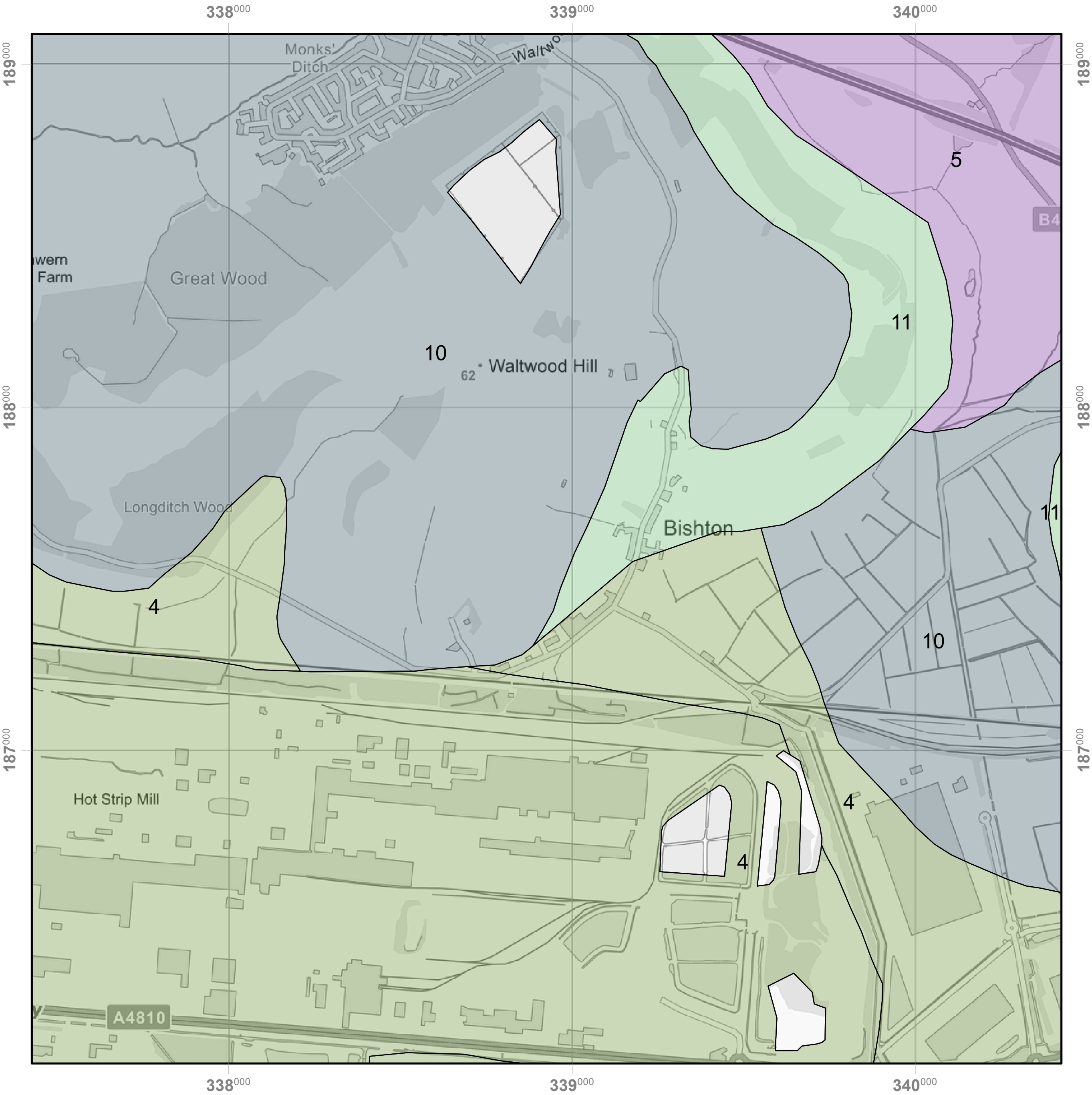
138 Permo-Triassic reddish mudstone

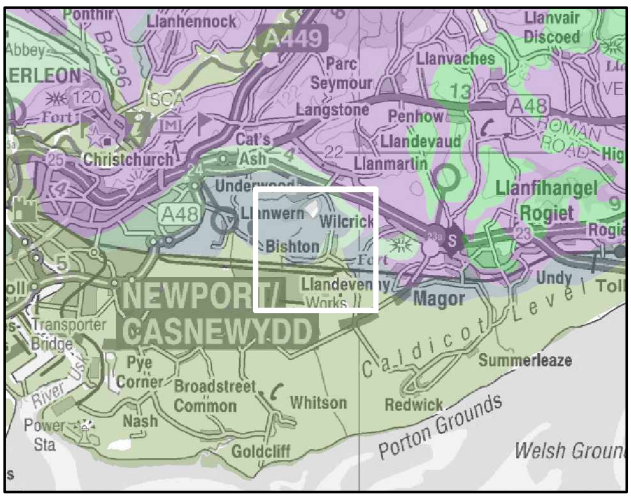
157 River alluvium over peat

SOIL PARENT MATERIAL DESCRIPTION

Along with the effects of climate, relief, organisms and time, the underlying geology or 'parent material' has a very strong influence on the development of the soils of England and Wales. Through weathering, rocks contribute inorganic mineral grains to the soils and thus exhibit control on the soil texture. During the course of the creation of the national soil map, soil surveyors noted the parent material underlying each soil in England and Wales. It is these general descriptions of the regional geology which is provided in this map.

1c Natural Soil Fertility





Natural Soil Fertility Key

4 Lime-rich to moderate

5 Low

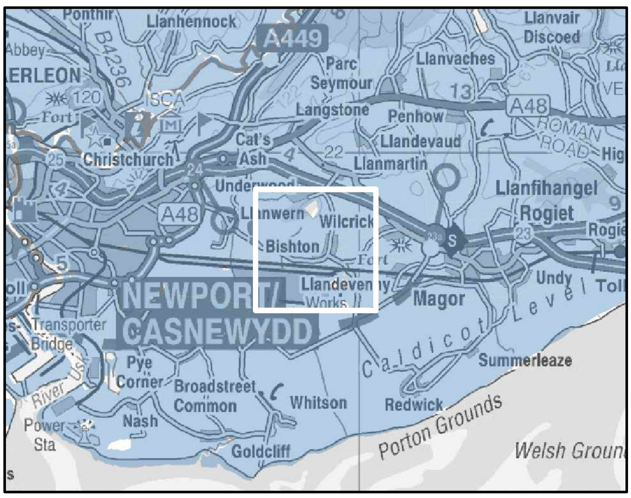
10 Moderate

11 Moderate to high

NATURAL SOIL FERTILITY DESCRIPTION

Soil fertility can be greatly altered by land management especially through the application of manures, lime and mineral fertilisers. What is shown in this map, however, is the likely natural fertility of each soil type. Soils that are very acid have low numbers of soil-living organisms and support heathland and acid woodland habitats. These are shown as of very low natural fertility. Soils identified as of low natural fertility are usually acid in reaction and are associated with a wide range of habitat types. The moderate class contains neutral to slightly acid soils, again with a wide range of potential habitats. Soil of high natural fertility are both naturally productive and able to support the base-rich pastures and woodlands that are now rarely encountered. Lime-rich soils contain chalk and limestone in excess, and are associated with downland, herb-rich pastures and chalk and limestone woodlands.

1d Simple Topsoil Texture



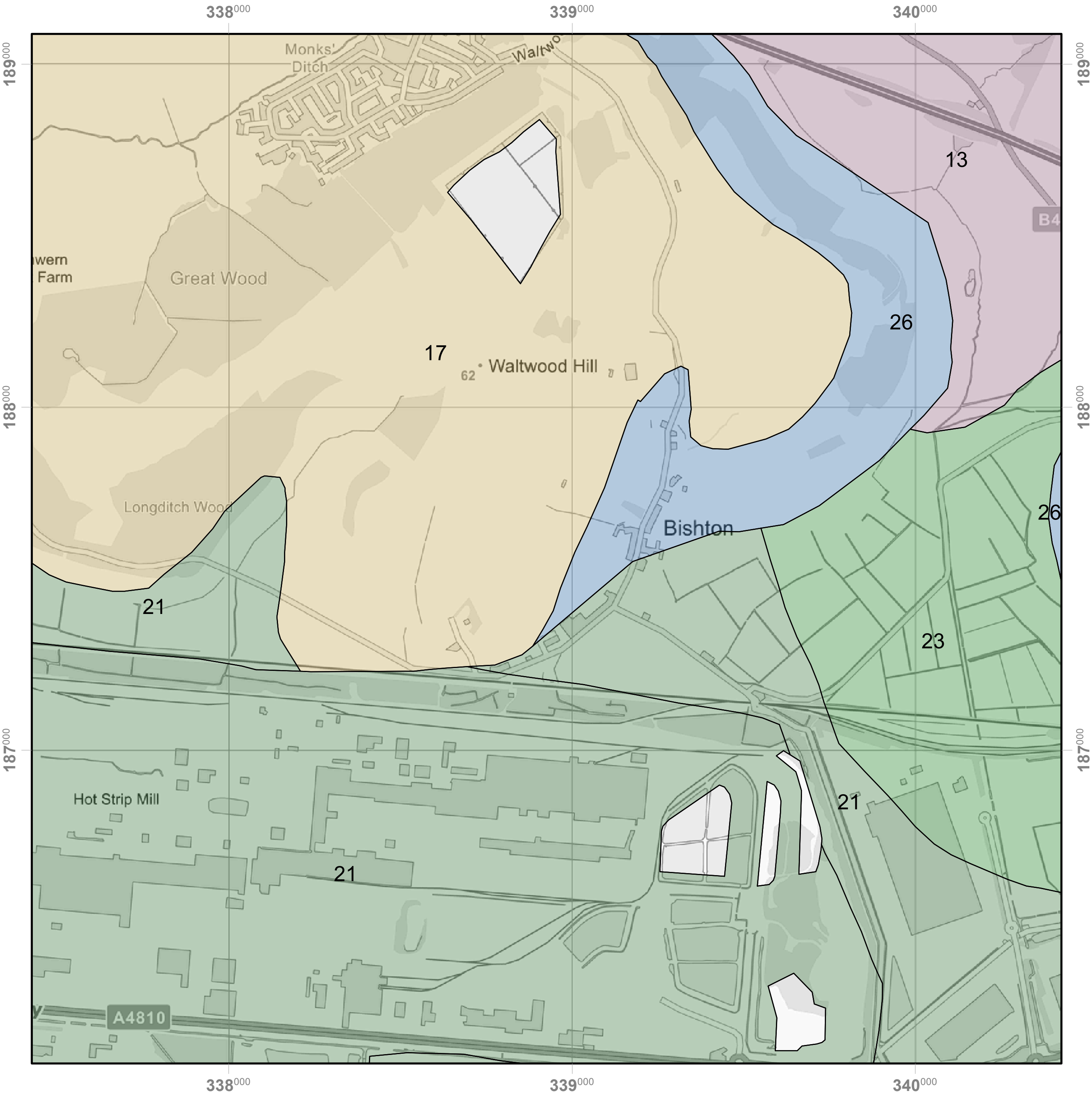
Simple Topsoil Texture Key

2 Loamy

SIMPLE TOPSOIL TEXTURE DESCRIPTION

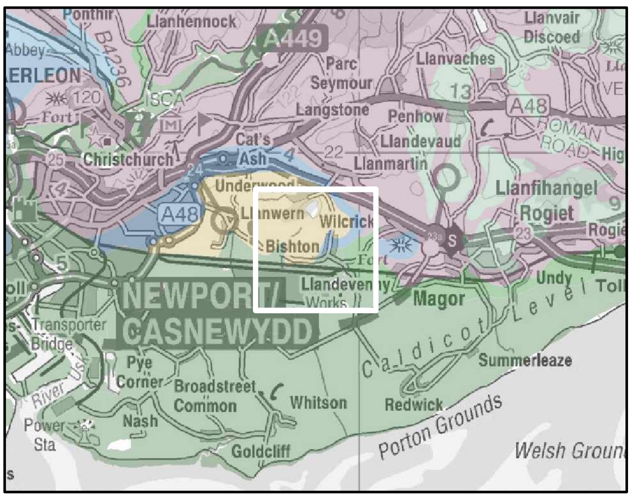
Soil texture is a term used in soil science to describe the physical composition of the soil in terms of the size of mineral particles in the soil. Specifically, we are concerned with the relative proportions of sand, silt and clay. Soil texture can vary between each soil layer or horizon as one moves down the profile. This map indicates the soil texture group of the upper 30 cm of the soil. Loamy soils have a mix of sand, silt and clay-sized particles and are intermediate in character. Soils with a surface layer that is dominantly organic are described as Peaty. A good understanding of soil texture can enable better land management.

1e Typical Habitats



Soils Data © Cranfield University (NSRI) and for the Controller of HMSO 2024

Contains OS data © Crown Copyright and database right 2017



Typical Habitats Key

13 Neutral and acid pastures and deciduous woodlands; acid communities such as bracken and gorse in the uplands

17 Seasonally wet pastures and woodlands

21 Wet brackish coastal flood meadows

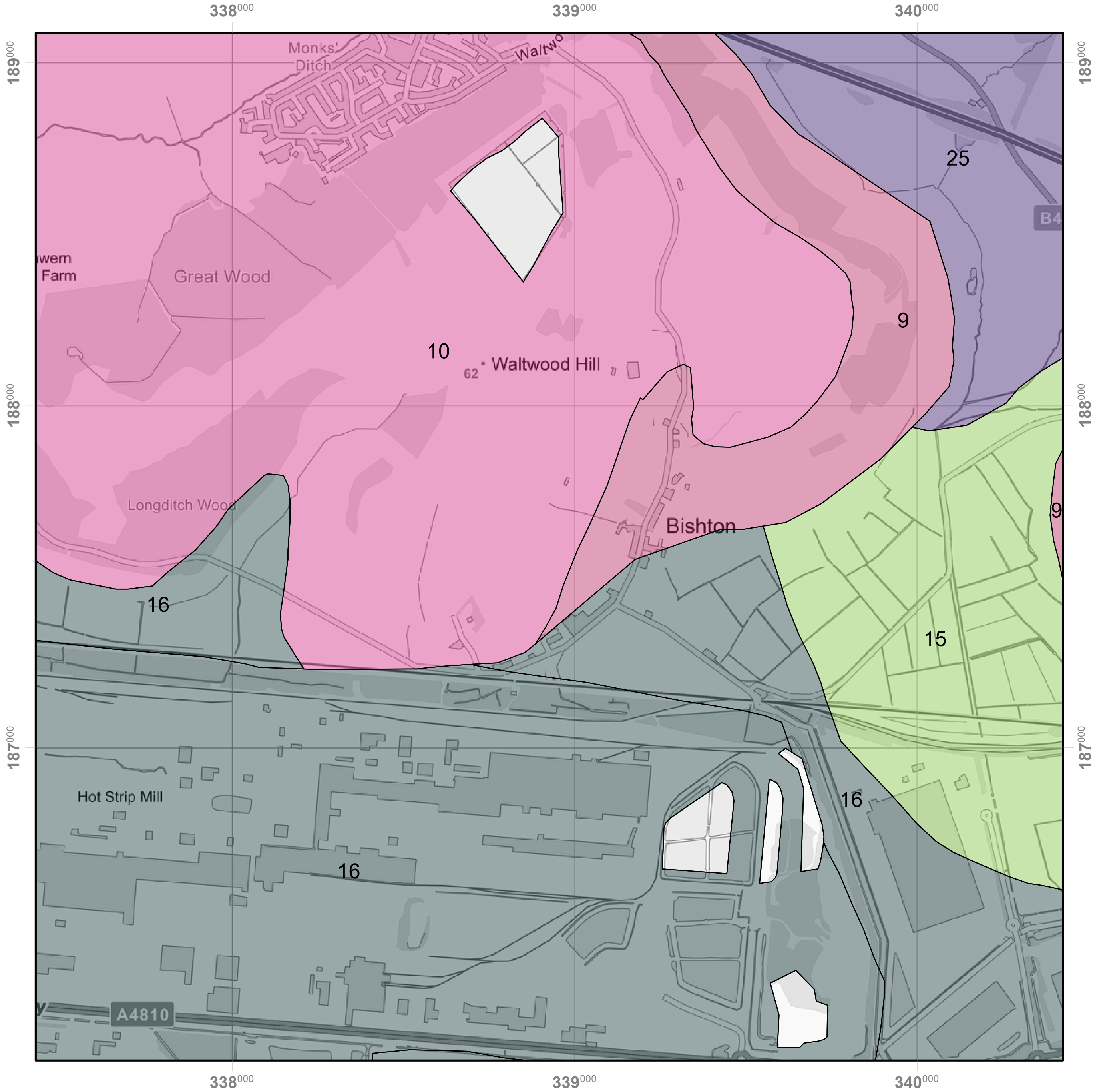
23 Wet flood meadows with wet carr woodlands in old river meanders

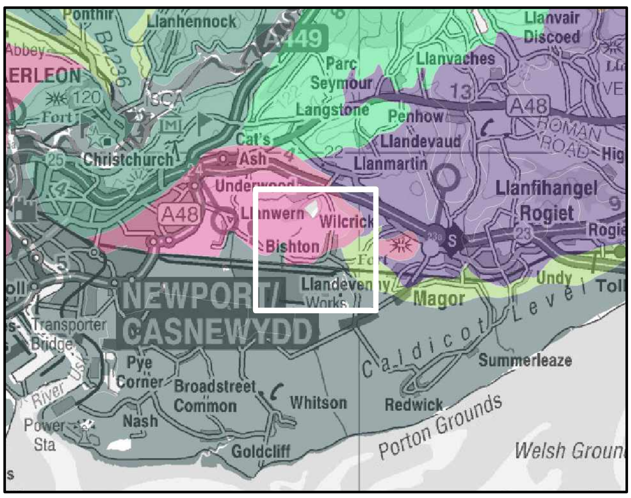
26 Wide range of pasture and woodland types

TYPICAL HABITATS DESCRIPTION

There is a close relationship between vegetation and the underlying soil. Information about the types of broad habitat associated with each soil type is provided in this map. Soil fertility, pH, drainage and texture are important factors in determining the types of habitats which can be established. Elevation above sea level and sometimes even the aspect, the orientation of a hillslope, can affect the species present. This map does not take into account the recent land management, but provides the likely natural habitats assuming good management has been carried out.

1f Hydrogeological Rock Type





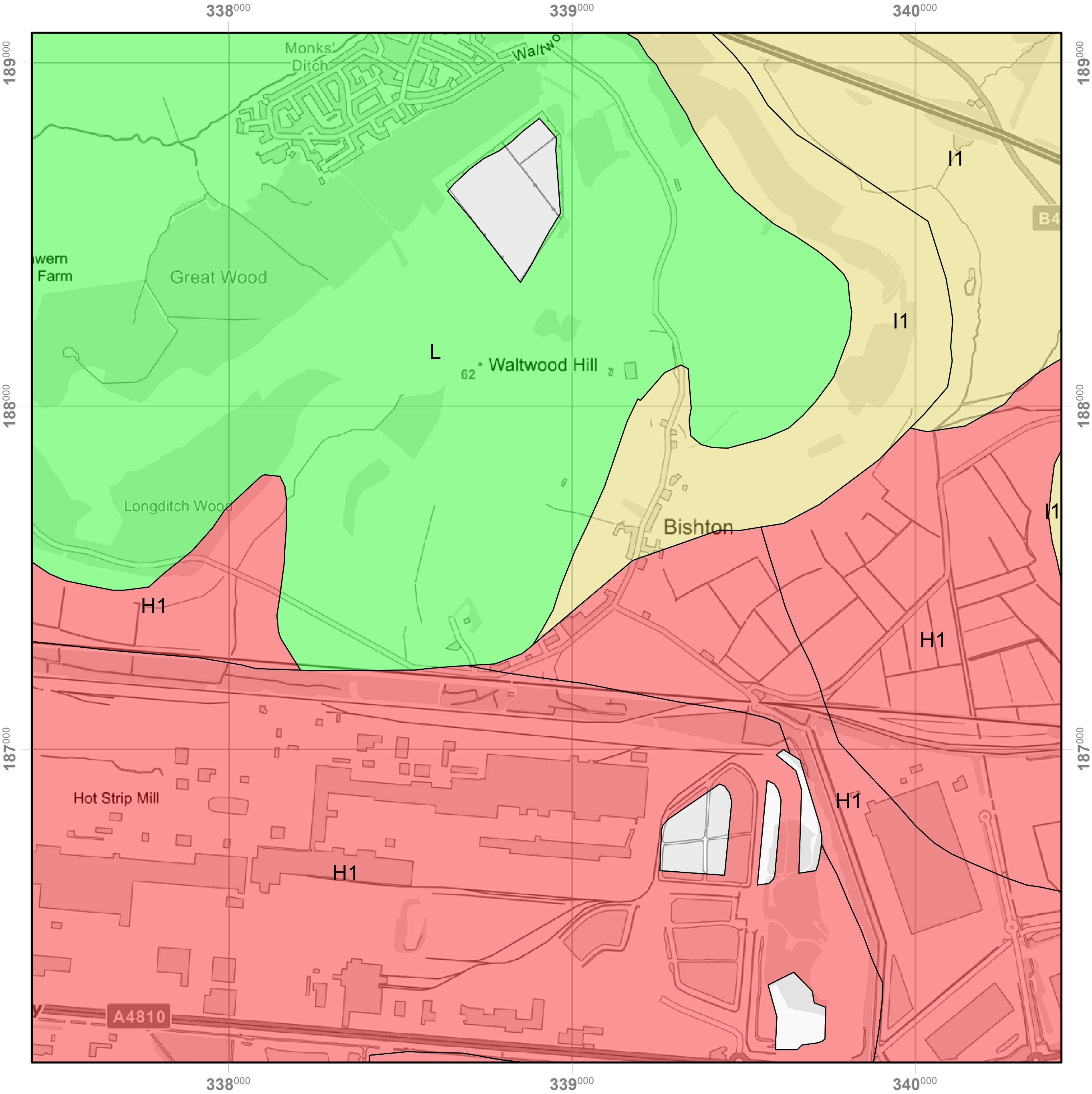
Hydrogeological Rock Type Key

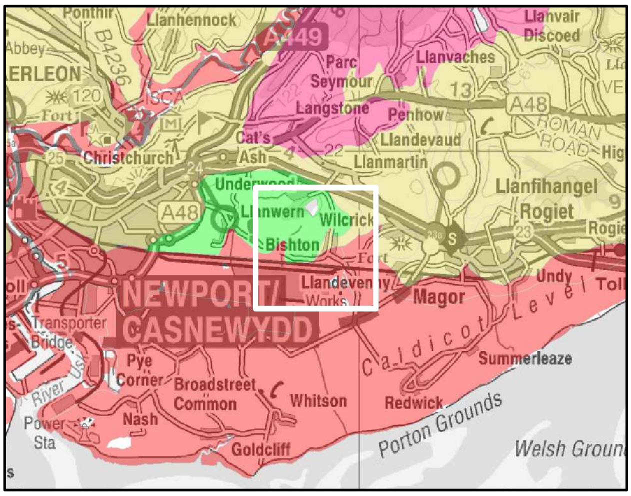
- 9 very soft reddish blocky mudstones (marls)
- 10 very soft massive clays
- 15 river alluvium
- 16 marine alluvium
- 25 loamy drift

HYDROGEOLOGICAL ROCK TYPE DESCRIPTION

The hydrogeological classification of the soil parent materials provides a framework for distinguishing between soil substrates according to their general permeability and whether they are likely to overlie an aquifer. Every soil series has been assigned one of the 32 substrate classes and each of these is characterised according to its permeability (being characterised as permeable, slowly permeable or impermeable). For further information, see Boorman et al (1995).

1g Ground Water Protection Policy (GWPP)





Ground Water Protection Policy (GWPP) Key

H1 Soils of high leaching potential, which readily transmit liquid discharges because they are either shallow, or susceptible to rapid bypass flow directly to rock, gravel or groundwater

I1 Soils of intermediate leaching potential which have a moderate ability to attenuate a wide range of diffuse source pollutants but in which it is possible that some non-adsorbed diffuse source pollutants and liquid discharges could penetrate the soil layer

L Soils in which pollutants are unlikely to penetrate the soil layer either because water movement is largely horizontal or because they have a large ability to attenuate diffuse source pollutants

GWPP LEACHING CLASS DESCRIPTION

The Ground Water Protection Policy classes describe the leaching potential of pollutants through the soil (Hollis, 1991; Palmer et al, 1995). The likelihood of pollutants reaching ground water is described. Different classes of pollutants are described, including liquid discharges adsorbed and non-adsorbed pollutants.

2. Soil Association Descriptions

The following pages describe the following soil map units, (soil associations), in more detail.

WORCESTER 431
Slowly permeable non-calcareous and calcareous reddish clayey soils over mudstone, shallow on steeper slopes.

ESCRICK 2 571q
Deep well drained often reddish coarse loamy soils.

DENCHWORTH 712b
Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

MIDELNEY 813a
Stoneless clayey soils mostly overlying peat.

NEWCHURCH 2 814c
Deep stoneless mainly calcareous clayey soils.

The soil associations are described in terms of their texture and drainage properties and potential risks may be identified. The distribution of the soils across England and Wales are provided. Further to this, properties of each association's component soil series are described in relation to each other. Lastly, schematic diagrams of each component series are provided for greater understanding and in-field verification purposes. Further information on the soil associations and soil series can be found at the LandIS Soils Guide

WORCESTER (431)

Slowly permeable non-calcareous and calcareous reddish clayey soils over mudstone, shallow on steeper slopes.

a. General Description

Slowly permeable non-calcareous and calcareous reddish clayey soils over mudstone, shallow on steeper slopes.Associated with similar non-calcareous fine loamy over clayey soils.
The major landuse on this association is defined as Permanent and short term grassland with dairying and stock rearing; some winter cereals in drier districts.

b. Distribution (England and Wales)

The WORCESTER association covers 979 km² of England and Wales which accounts for 0.65% of the landmass. The distribution of this association is shown in figure 2. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

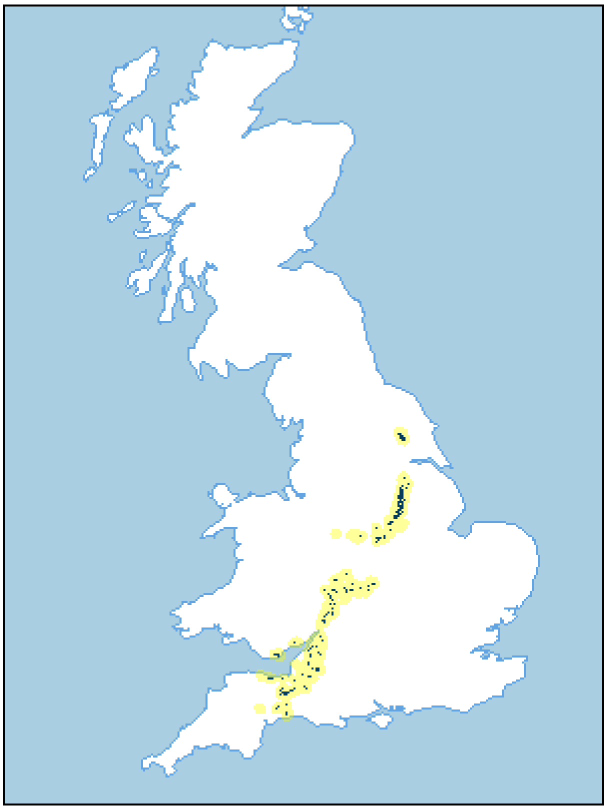


Figure 2: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the WORCESTER association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 1.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

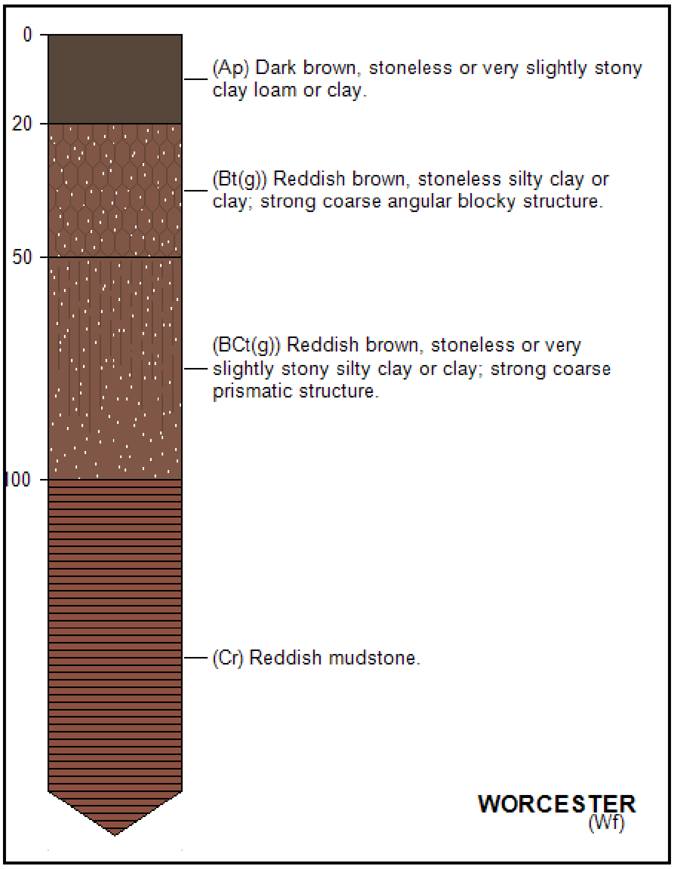
Table 1: The component soil series of the WORCESTER soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

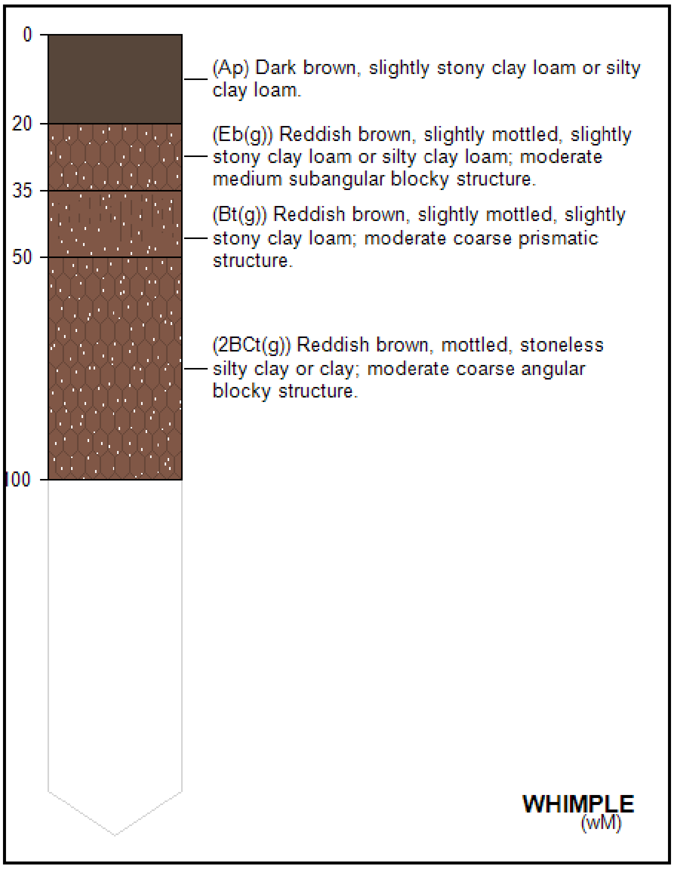
Soil Series	Description	Area %
WORCESTER (Wf)	reddish clayey material passing to clay or soft mudstone	45%
WHIMPLE (wM)	medium loamy or medium silty drift over reddish clayey material passing to clay or soft mudstone	20%
CLAYWORTH (C)	reddish clayey material passing to clay or soft mudstone	15%
OTHER	other minor soils	20%

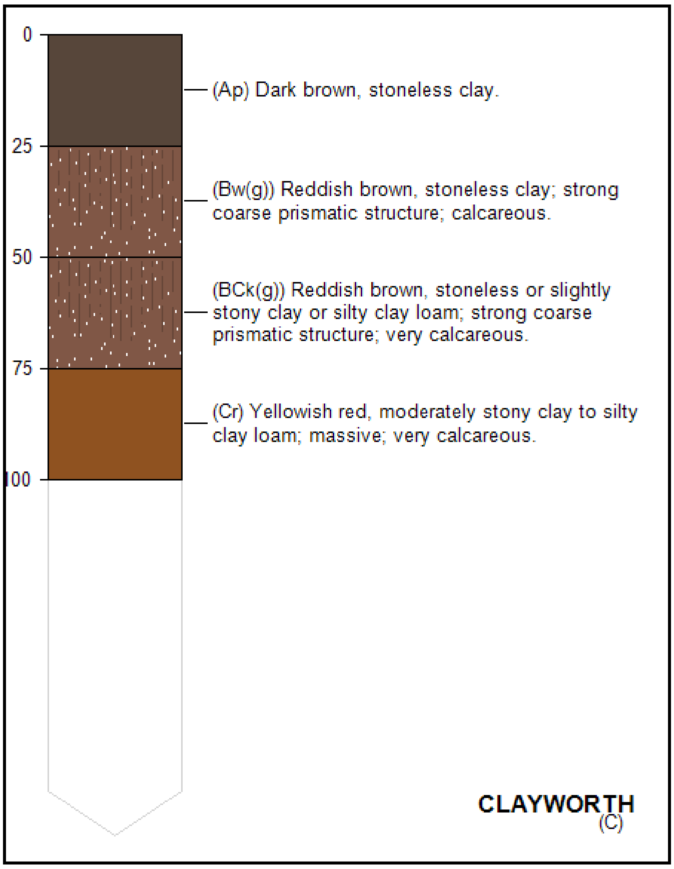
WORCESTER (431)

Slowly permeable non-calcareous and calcareous reddish clayey soils over mudstone, shallow on steeper slopes.

d. WORCESTER Component Series Profiles







ESCRICK 2 (571q)

Deep well drained often reddish coarse loamy soils.

a. General Description
Deep well drained often reddish coarse loamy soils.Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging.
The major landuse on this association is defined as Cereals, potatoes and sugar beet; some permanent grassland.

b. Distribution (England and Wales)
The ESCRICK 2 association covers 192 km² of England and Wales which accounts for 0.13% of the landmass. The distribution of this association is shown in figure 3. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series
Multiple soil series comprise a soil association. The soil series of the ESCRICK 2 association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 2.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

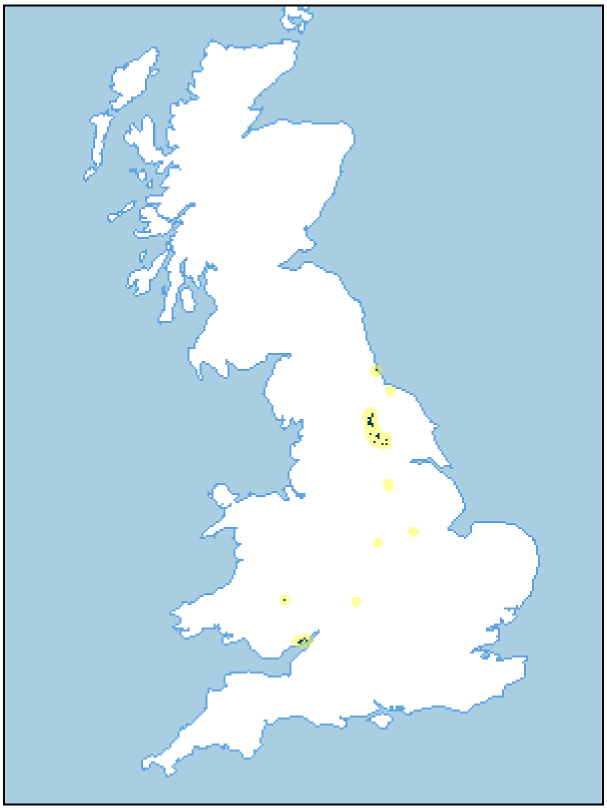


Figure 3: Association Distribution

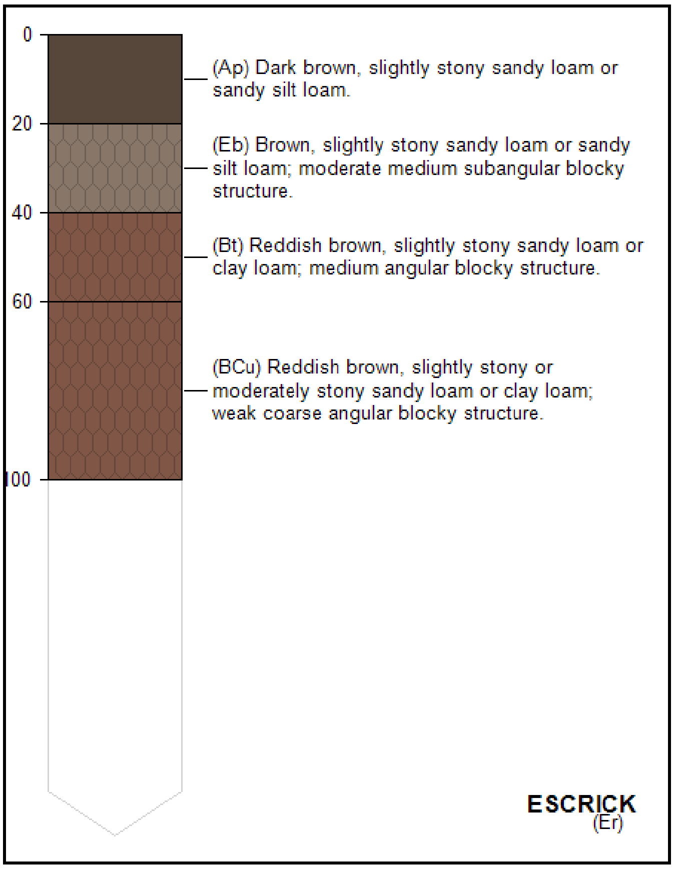
Table 2: The component soil series of the ESCRICK 2 soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

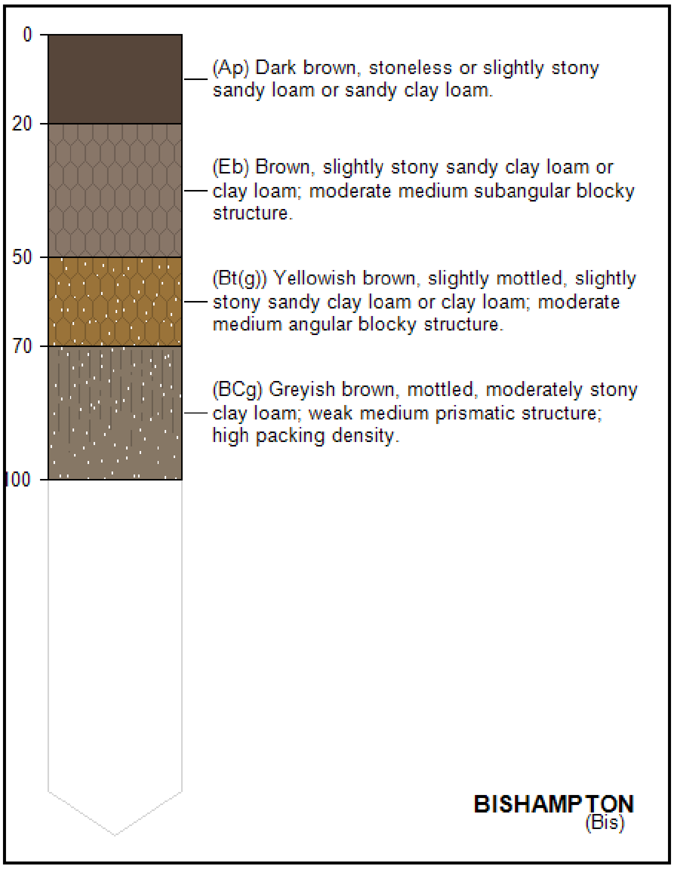
Soil Series	Description	Area %
ESCRICK (Er)	reddish light loamy drift with siliceous stones	60%
BISHAMPTON (Bis)	medium loamy drift with siliceous stones	20%
WICK (wQ)	light loamy drift with siliceous stones	20%

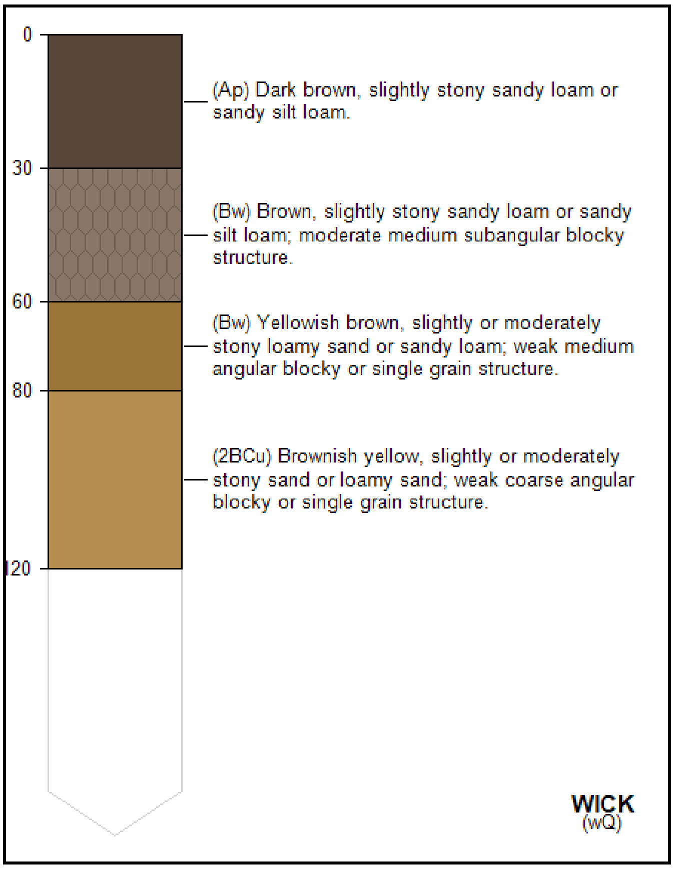
ESCRICK 2 (571q)

Deep well drained often reddish coarse loamy soils.

d. ESCRICK 2 Component Series Profiles







DENCHWORTH (712b)

Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

a. General Description

Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.Some fine loamy over clayey soils with only slight seasonal waterlogging and some slowly permeable calcareous clayey soils.
The major landuse on this association is defined as Winter cereals and short term grassland in drier lowlands; dairying on permanent grassland in moist districts.

b. Distribution (England and Wales)

The DENCHWORTH association covers 3469 km² of England and Wales which accounts for 2.29% of the landmass. The distribution of this association is shown in figure 4. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

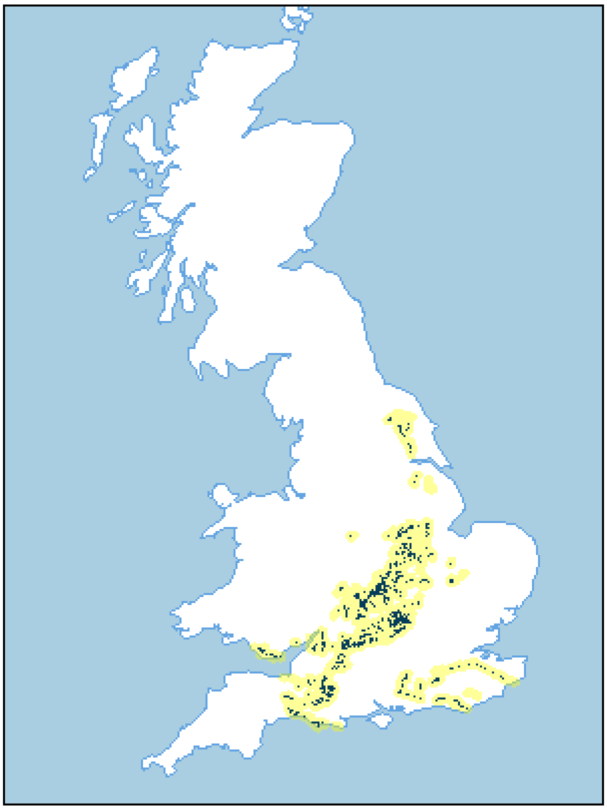


Figure 4: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the DENCHWORTH association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 3.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

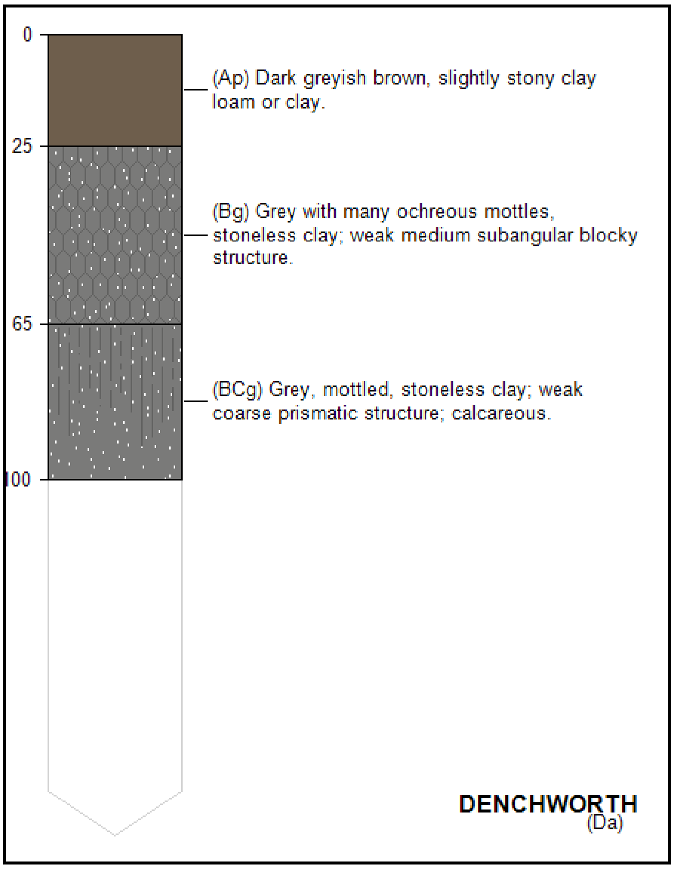
Table 3: The component soil series of the DENCHWORTH soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

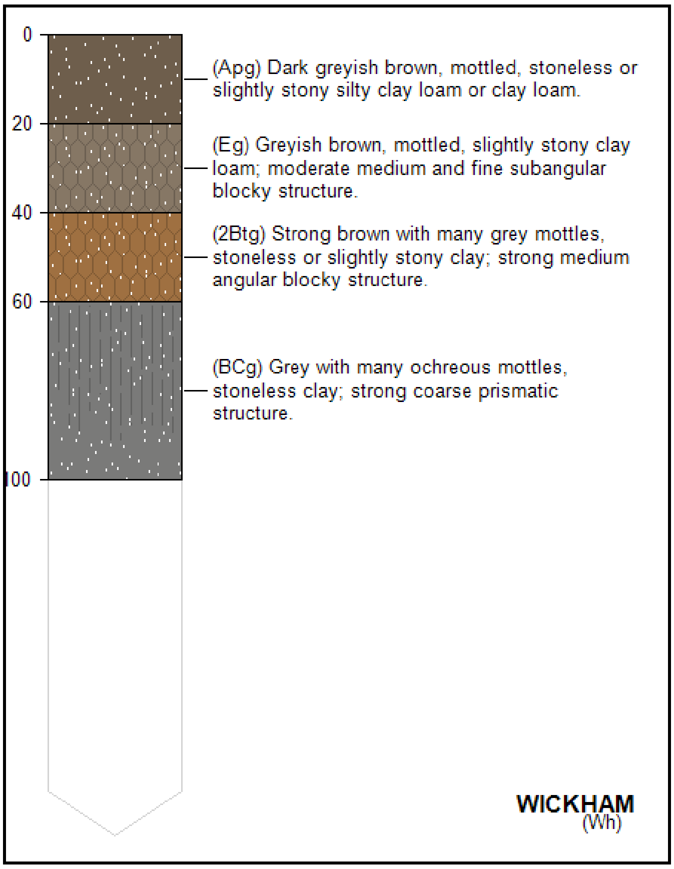
Soil Series	Description	Area %
DENCHWORTH (Da)	swelling clayey material passing to clay or soft mudstone	38%
WICKHAM (Wh)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone	19%
LAWFORD (LD)	swelling clayey drift material passing to clay or soft mudstone	15%
EVESHAM (Ea)	swelling clayey material passing to clay or soft mudstone	14%
OXPASTURE (Ox)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone	14%

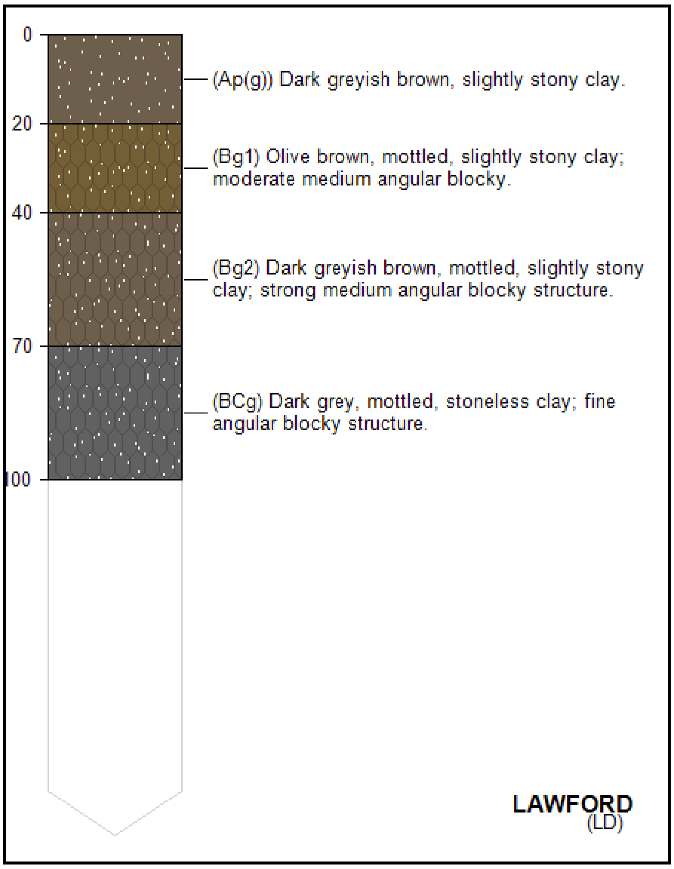
DENCHWORTH (712b)

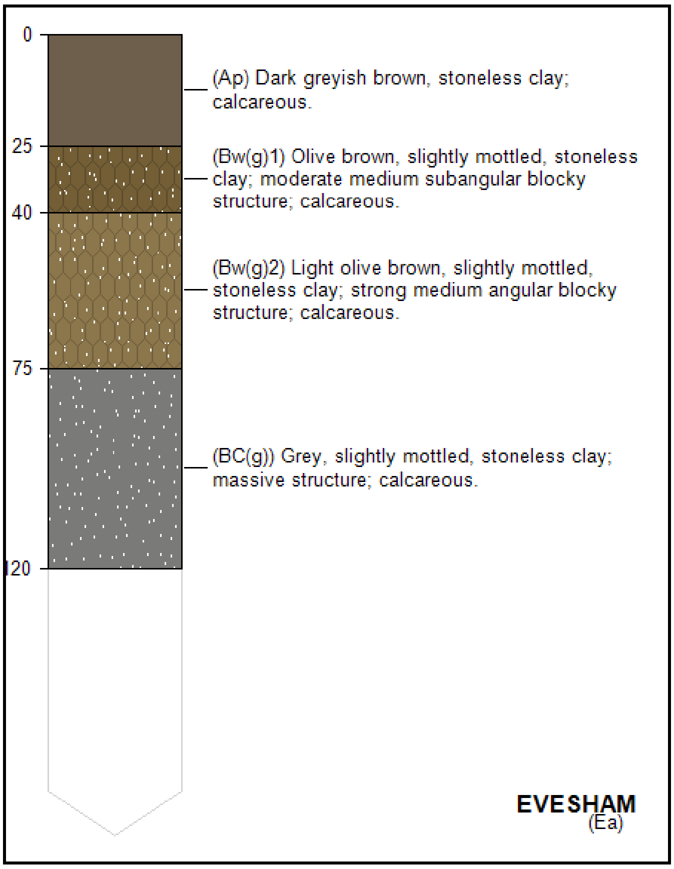
Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

d. DENCHWORTH Component Series Profiles





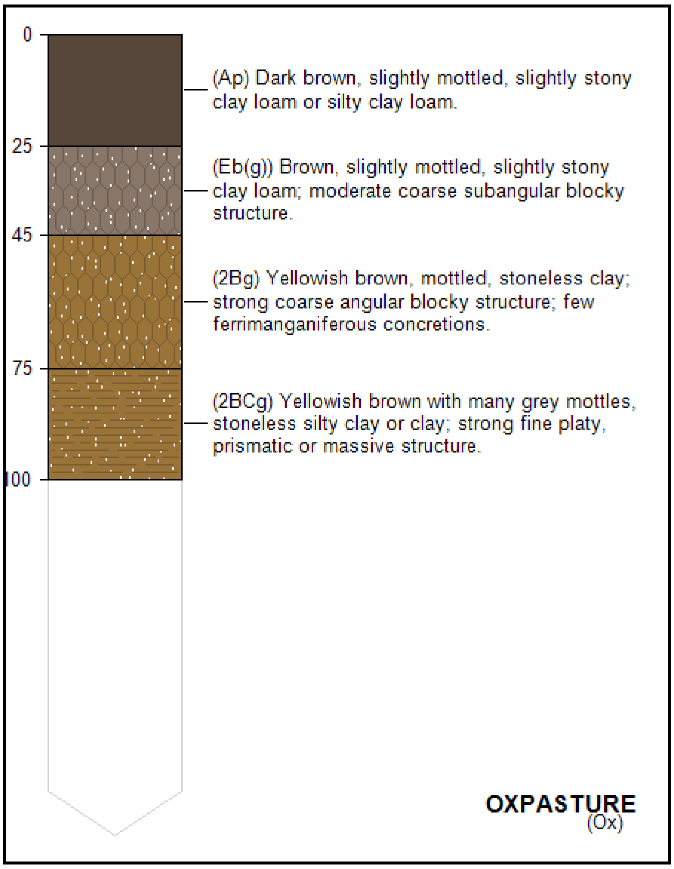




DENCHWORTH (712b)

Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

d. DENCHWORTH Component Series Profiles continued



MIDELNEY (813a)

Stoneless clayey soils mostly overlying peat.

a. General Description
Stoneless clayey soils mostly overlying peat.
The major landuse on this association is defined as Permanent grassland with dairying in Somerset; cereals, sugar beet, potatoes and field vegetables in the Fens, wetland habitats.

b. Distribution (England and Wales)
The MIDELNEY association covers 214 km² of England and Wales which accounts for 0.14% of the landmass. The distribution of this association is shown in figure 5. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series
Multiple soil series comprise a soil association. The soil series of the MIDELNEY association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 4.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

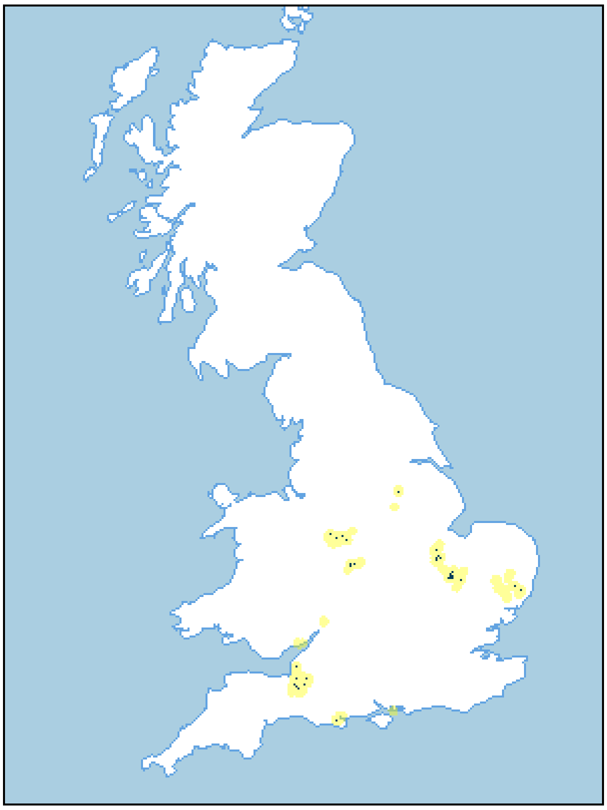


Figure 5: Association Distribution

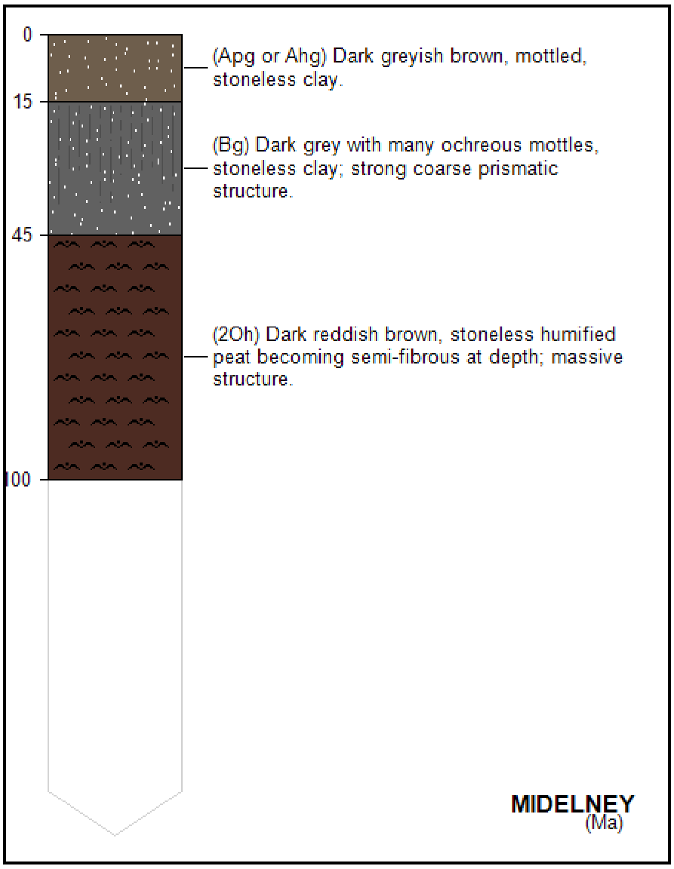
Table 4: The component soil series of the MIDELNEY soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

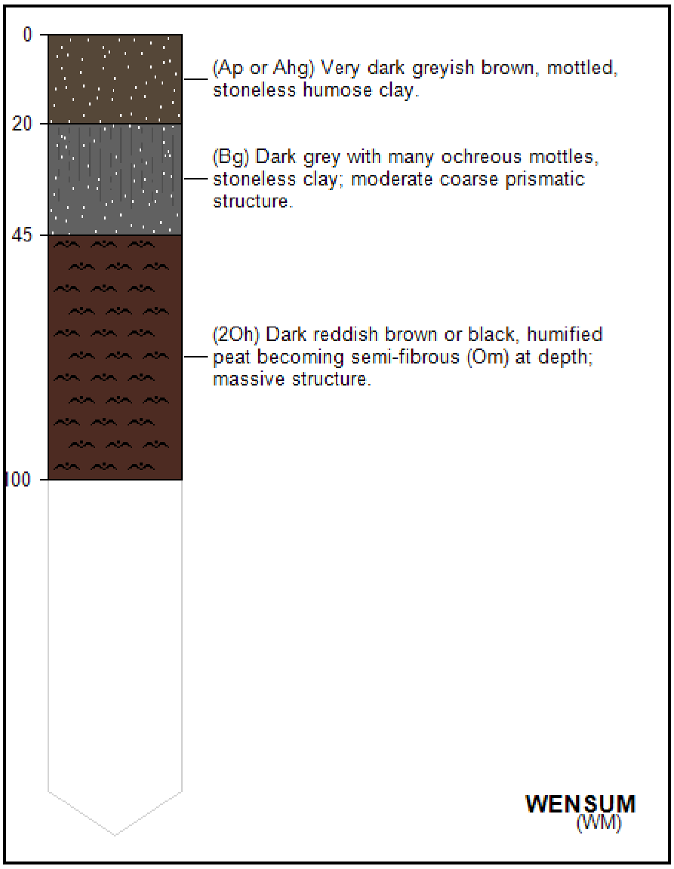
Soil Series	Description	Area %
MIDELNEY (Ma)	clayey over peaty river alluvium	55%
WENSUM (WM)	clayey over peaty river alluvium	15%
FLADBURY (Fa)	clayey river alluvium	10%
WINDRUSH (WQ)	clayey over peaty river alluvium	10%
OTHER	other minor soils	10%

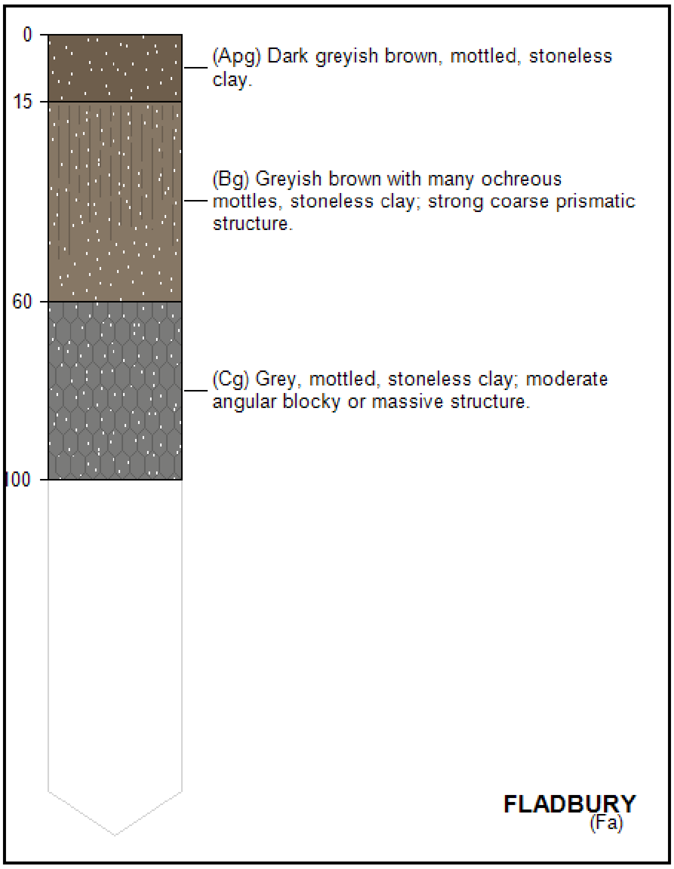
MIDELNEY (813a)

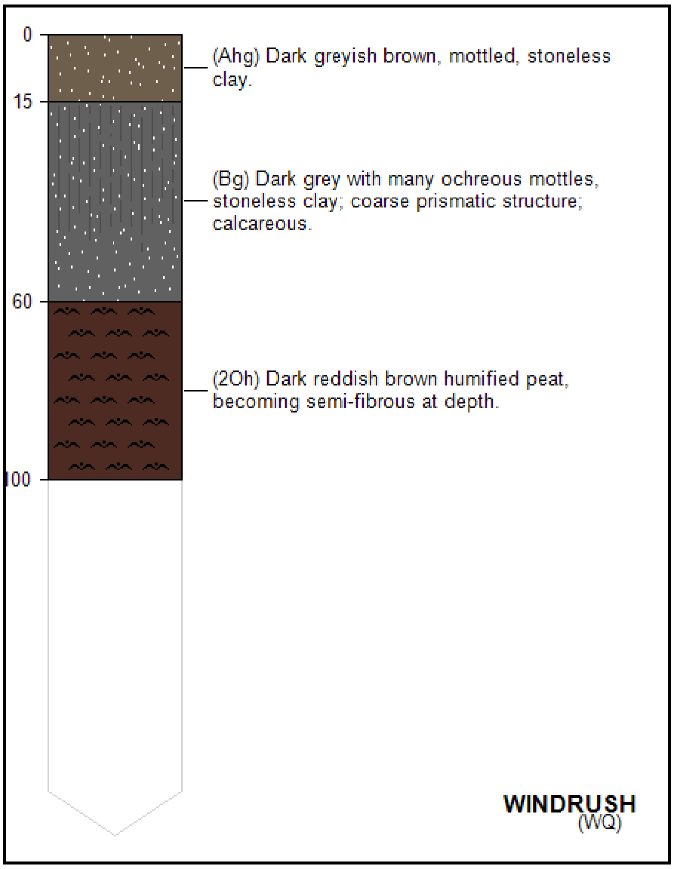
Stoneless clayey soils mostly overlying peat.

d. MIDELNEY Component Series Profiles









NEWCHURCH 2 (814c)

Deep stoneless mainly calcareous clayey soils.

a. General Description

Deep stoneless mainly calcareous clayey soils.
The major landuse on this association is defined as Permanent grassland with winter cereals in Somerset and Avon; cereals, sugar beet, potatoes and field vegetables in the Eastern Region.

b. Distribution (England and Wales)

The NEWCHURCH 2 association covers 777 km² of England and Wales which accounts for 0.51% of the landmass. The distribution of this association is shown in figure 6. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the NEWCHURCH 2 association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 5.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

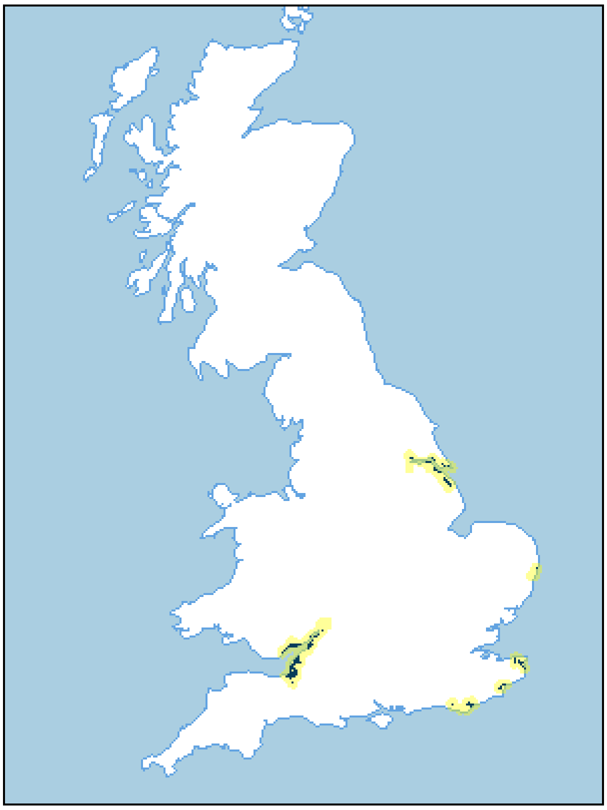


Figure 6: Association Distribution

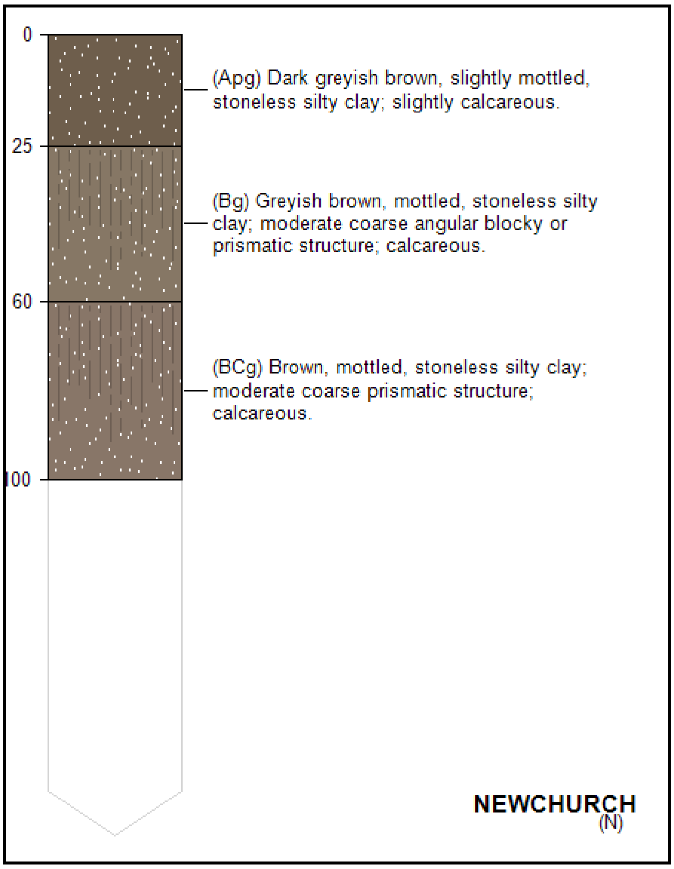
Table 5: The component soil series of the NEWCHURCH 2 soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

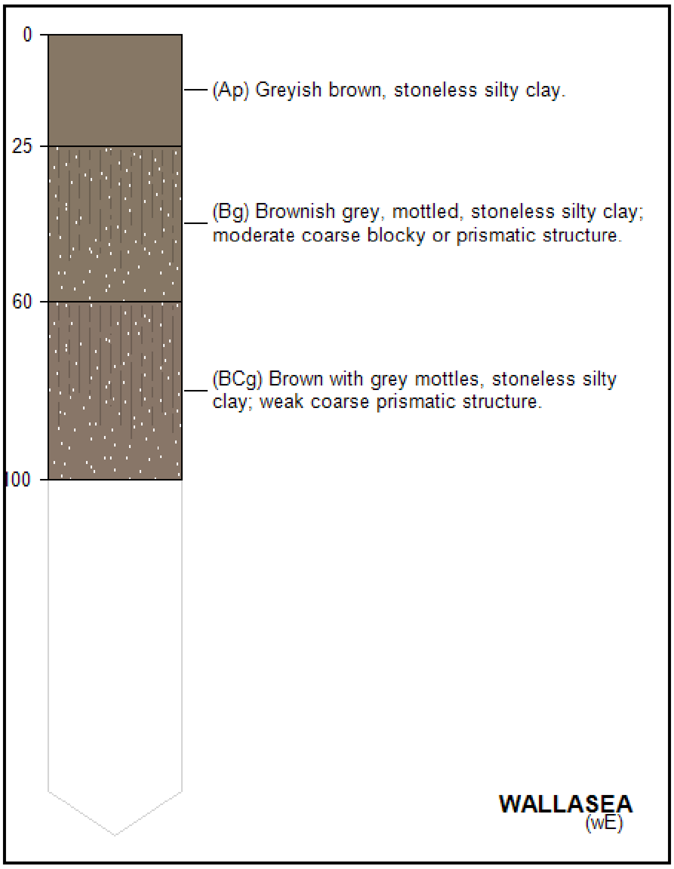
Soil Series	Description	Area %
NEWCHURCH (N)	clayey marine alluvium	60%
WALLASEA (wE)	clayey marine alluvium	30%
OTHER	other minor soils	10%

NEWCHURCH 2 (814c)

Deep stoneless mainly calcareous clayey soils.

d. NEWCHURCH 2 Component Series Profiles





REFERENCES

AVERY, B.W. (1973). Soil classification in the Soil Survey of England and Wales. Journal of Soil Science, 24, 324-338.

AVERY, B.W., (1980). Soil classification for England and Wales. Soil Survey Technical Monograph No.14, Harpenden, UK.

BOORMAN, D.B, HOLLIS, J.M. and LILLEY, A. (1995). Hydrology of Soil Types: a hydrologically-based classification of the soils of the UK. Institute of Hydrology Report No.126, Wallingford, UK.

CLAYDEN, B and HOLLIS, J.M. (1984). Critieria for Differentiating Soil Series. Soil Survey Technical Monograph No.17, pp159. Harpenden, UK.

HALLETT, S.H., KEAY, C.A., JARVIS, M.G. and JONES, R.J.A. (1994). INSURE: Subsidence risk assessment from soil and climate data. Proceedings of the Association for Geographic Information (AGI). National Conference Markets for Geographic Information. Birmingham. 16.2.1 - 16.2.7.

HOLLIS, J.M. (1991). Mapping the vulnerability of aquifers and surface waters to pesticide contamination at the national and regional scale. In: Pesticides in Soils and Water, BCPC Monograph No.47, 165-174.

HOLLIS, J.M., KEAY, C.A., HALLETT, S. H., GIBBONS, J.W. and COURT, A.C. (1995). Using CatchIS to assess the risk to water resources from diffusely applied pesticides. In: British Crop Protection Council monograph No. 62: Pesticide movement to water, 345-350

JARVIS, M.G and HEDGES, M.R. (1994). Use of soil maps to predict the incidence of corrosion and the need for iron mains renewal. Journal of the Institution of Water and Environmental Management 8, (1) 68-75.

PALMER, R.C., HOLMAN, I.P., ROBINS, N.S. and LEWIS, M.A. (1995). Guide to groundwater vulnerability mapping in England and Wales. National Rivers Authority R and D Note 578/1/ST.

Appendix 3:
Institute of Quarrying
'Supplementary Note 4 – Soil Wetness'

Supplementary Note 4
Soil Wetness

Soil wetness is a major determinant of land use, and environmental and ecosystem services in the UK. It is also a factor in the occurrence of significant compaction arising from handling soils with earth-moving machines and the practices used (Duncan & Bransden, 1986).

Relative soil wetness can range from the waterlogged to moist (mesic) or dry (xeric) depending on rainfall distribution and depth to a water-table and duration of waterlogging. In the UK, soil wetness is largely seasonal with higher evapo-transpiration rates potentially exceeding rainfall in the summer resulting in the soil profile becoming drier where there is vegetation. Whilst soil wetness is largely weather system and equinox (climate) driven, it varies with geographical and altitudinal locations, and importantly the physical characteristics of the soil profile, such as texture structure, porosity, and depth to the water-table and topography including flood risk (MAFF, 1988). The Soil Wetness Class is based on the expected average duration of waterlogging at different depths in the soil throughout the year (days per year), and can be determined by reference to soil characteristics and local climate (MAFF, 1988). The likely inherent wetness and resilience status of a soil should be indicated in the SRMP (see **Part 1, Table 2 & Supplementary Note 1**), reflecting potential risks for soil handling such as low permeability, permanently high groundwater, or a wet upland climate.

Wet soils can also be a result of other circumstances. For example, the interception of water courses, drainage ditches and field land drains. Where these occur, the provisions are to be made in the SRMP to protect the soils being handled and the operational area.

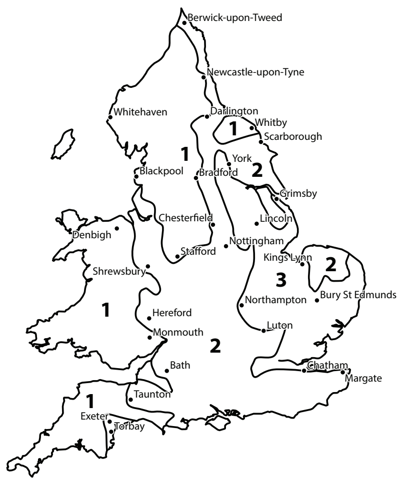
Soils, when in a wet condition generally have a lower strength and have less resistance to compression and smearing than when dry. Lower strength when soils are wet also affects the bearing capacity of soils and their ability to support the safe and efficient operation of machines than when in a dry state.

In terms of resilience and susceptibility to soil wetness, the clay content of the soil largely determines the change from a solid to a plastic state (the water content at which this occurs is called the ‘plastic limit’ (MAFF, 1982)). This is the point at which an increasing soil wetness has reduced the cohesion and strength of the soil and its resistance to compression and smearing.

Whilst coarse textured sandy soils are not inherently plastic when wet, they are still prone to compaction when in a wet condition. Hence, handling all soils when wet will have adverse effects on plant root growth and profile permeability, which may be of significance for the intended land use and the provision of services reliant on soil drainage and plant root growth. It may be less so in other circumstances where wet soil profiles, perched water tables and ponding are the reclamation objectives, though drainage control, for example to control flooding, may still be important in these contexts.

In cases of permanently wet soils, such as riverine sites, upland or deep organic soils where there is a persistent high water-table throughout the seasons within the depth of soil to be stripped and/or the soil profile remains too wet, a strategic decision has to be made to be able to proceed with the development of the mineral resource. This may mean alternative and less favourable soil handling practices have to be agreed with the planning authority.

Predicting & Determination of Soil Wetness
There are well established methods to predict and determine soil wetness of undisturbed and restored soil profiles (Reeve, 1994). The challenge has been the prediction of the best time for soil stripping. Models based on soil moisture deficits and field capacity dates for a range of soil textures can provide indicative regional summaries (**Table 4.1**) that can help with planning operations at broad scale but cannot be relied upon in practice for deciding operationally whether to proceed on the ground given the actual variation in weather events from year to year and within years.



	Climatic Zones		
Soil Clay Content	**1**	**2**	**3**
Soil Depth <30cm			
<10%	Mid Apr - Early Oct	Late Mar – Early Nov	Late Mar – Early Dec
10 -27%	Late May - Early Oct	Early May – Early Nov	Early Apr – Early Dec
Soil Depth 30-60cm			
<10%	Late Apr - Early Oct	Mid Apr – Early Nov	Early Apr – Early Dec
10-27%	Late May - Early Oct	Early May – Early Nov	Early Apr – Early Dec
>27%	Late June – Early Oct	Early June – Early Nov	Late May – Early Dec
Soil Depth >60cm			
<10%	Late Apr - Early Oct	Mid Apr – Early Nov	Early Apr – Early Dec
10-18%	Late May - Early Oct	Early May – Early Nov	Early Apr – Early Dec
18-27%	Late June – Early Oct	Early June – Early Nov	Late May – Early Dec
>27	Mid July – Mid Sept	Early July – Mid Oct	Late June – Mid Oct

Table 4.1: Indicative on-average months when vegetated mineral soils might be in a sufficiently dry condition according to geographic location, depth of soil and clay content

The timing of most soil handling operations takes place between April and September. Although in western (Zone 1) and central (Zone 2) areas it typically can be a later start in May with an earlier termination in August. Whilst the return to climatically 'excess rainfall' is later in the eastern counties (Zone 3) and can be as late as November/early December, there is a need to maintain transpiring vegetation to keep the soils being handled in a dry as possible condition and to establish new vegetation covers as soon as possible (on replaced soils and storage mounds). Hence, soil handling operations generally need to be completed no later than the end of September (Natural England, 2021), unless appropriate provisions can be assured.

Where data is available, more realistic local and real-time predictions can be made, however, because weather patterns and events differ between and within years, and soils can be vary locally in their condition. Experience has shown that the most practical approach for operations is to inspect the site and soils in question near to/ at the time when soil handling is to take place. Professional soil surveyors can advise on the best time for soil handling (stripping, storage & replacement) and carry out site assessments of soil wetness condition prior to the start of operations.

A Practical Method for Determining Soil Wetness Limitation

During the soil handling season (see Table 4.1 above), prior to the start or recommencement of soil handling soils should be tested to confirm they are in suitably dry condition (**Table 4.2**). The 'testing' during operations can be done by suitably trained site staff and reviewed periodically by the professional soil surveyors.

The method is simply the ability to roll intact threads (3mm diameter) of soil indicating the soils are in a plastic and wet condition (MAFF, 1982; Natural England, 2021). Representative samples are to be taken through the soil profile and across the area to be stripped. It is the best available indicator of soils being too wet to be handled and operations should be delayed until a thread cannot be formed. For coarse textured soils which do not roll into threads, a professional's view as to soil wetness and the risk of compaction may have to be taken.

Table 4.2: Field Tests for Suitably Dry Soils

Soil tests are to be undertaken in the field. Samples shall be taken from at least five locations in the soil handling area and at each soil horizon to the full depth of the profile to be recovered/replaced. The tests shall include visual examination of the soil and physical assessment of the soil consistency.

i) Examination
- If the soil is wet, films of water are visible on the surface of soil particles or aggregates (e.g. clods or peds) and/or when a clod or ped is squeezed in the hand it readily deforms into a cohesive 'ball' means **no soil handling to take place.**
- If the samples is moist (i.e. there is a sligh dampness when squeezed in the hand) but it does not significantly change colour (darken) on further wetting, and clods break up/crumble readily when squeezed in the hand rather than forming into a ball means **soil handling can take place.**
- If the sample is dry, it looks dry and changes colour (darkens) if water is added, and it is brittle means **soil handling can take place.**

ii) Consistency
First test
Attempt to mould soil sample into a ball by hand:
- Impossible because soil is too dry and hard or too loose and dry means **soil handling can take place.**
- Impossible becuase the soil is too loose and wet means no soil handling to take place.
- Possible - Go to second text.

Second test
Attempt to roll ball into a 3mm diameter thread by hand:
- Impossible because soil crumbles or collapses means soil handling can take place.
- Possible means no soil handling can take place.

N.B.: It is possible to roll most coarse loamy and sandy soils into a thread even when they are wet. For these soils, the Examination Test alone is to be used.

A Rainfall Protocol to Suspend & Restart Soil Handling Operations

Local weather forecasts of possible rainfall events during operations and the occurrence of surface lying water have been used to advise on a day-to-day basis if operations should stop (Natural England, 2021). Single events such as >5mm/day in spring and autumn months, and >10mm/day in the summer have been suggested as more precise triggers for determining soil handling operations (Reeve, 1994). However, in practice the following generic guidelines are often used:

- In light drizzle soil handling may continue for up to four hours unless the soils are already at/near to their moisture limit.
- In light rain soil handling must cease after 15 minutes.
- In heavy rain and intense showers, handling shall cease immediately.

In all of the above it is assumed that soils were in a dry condition. These are only general rules, and it is at the local level decisions to proceed or stop should be based on the actual wetness state of the soils being handled. After the above rain event has ceased, the soil tests in **Table 4.2** above should be applied to determine whether handling may re-start, provided that the ground is free from ponding and ground conditions are safe to do so.There can be extreme instances where soil horizons have become very dry and are difficult to handle resulting in dust and windblown losses. In these conditions the operation should be suspended. The artificial wetting of extremely dry soils is not usually a practice recommended but has been successful in some cases.

References

Duncan N A and Bransden B E, 1986. The effects on a restored soil caused by soil moving under different moisture contents. Applied Geography, 6, 3, pp 267-273

MAFF, 1982. Reference Book 441: Techniques for measuring soil physical properties. Her Majesty's Stationery Office, London

MAFF, 1988. Agricultural Land Classification Of England and Wales

Natural England, 2021. Planning and aftercare advice for reclaiming land to agricultural use

Reeve M J, 1994. Improving land restoration in Britain by better timing of soil movement, pp 28-37. In, Proceedings American Society of Mining and Reclamation. DOI: 10.21000/JASMR94030028

References

[1] The Developments of National Significance (Specified Criteria and Prescribed Secondary Consents) (Wales) Regulations 2016 (as amended), Regulation 4(1)

[2] British Society of Soil Science. Professional Competency Standard Scheme Document 2 'Agricultural Land Classification' and 4 'Soil Science in Soil Handling and Restoration'. Available online at https://soils.org.uk/education/guidance-and-science-notes/professional-competencies/ Accessed July 2026

[3] Department for Environment, Food and Rural Affairs (Defra)(2013) 'Ecosystem Services' . Available online @ https://www.gov.uk/guidance/ecosystems-services Last accessed July 2026

[4] ISRIC World Soil Information. Available online @ http://www.isric.org/about-soils/functions-soil Last accessed July 2026

[5] Department for Environment, Food and Rural Affairs (2009). Safeguarding our soils: A strategy for England'. Available online @ https://www.gov.uk/government/publications/safeguarding-our-soils-a-strategy-for-england Last accessed July 2026

[6] Landon, J. R (Editor) (1991). Chapter 6 'Soil Physics' in 'Booker Tropical Soil Manual'. Longman Scientific & Technical

[7] The Wetness Class (WC) of a soil is classified in Appendix II of Hodgson, J.M. (1977), The Soil Survey Field Handbook. Soil Survey and Land Research Centre, Technical Monograph No.5, according to the depth and duration of waterlogging in the soil profile and has six bands ranging from Wetness Class I (well drained) to Wetness Class VI (permanently waterlogged).

[8] Department for Environment, Food and Rural Affairs (September, 2009) '*Code of Practice for the Sustainable Use of Soils on Construction Sites'.* Available online @ Code of practice for the sustainable use of soils on construction sites - GOV.UK Last accessed July 2026

[9] BS 3882:2015 '*Specification for topsoil*' Available online at https://www.en-standard.eu/bs-3882-2015-specification-for-topsoil/?msclkid=03049ff849fb12c7a9dff76a40f77d79 Last accessed July 2026

[10] British Society of Soil Science (January 2022, Version 3). Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction. Available online at https://soils.org.uk/wp-content/uploads/2022/02/WWS3-Benefitting-from-Soil-Management-in-Development-and-Construction-Jan-2022.pdf Last accessed July 2026

[11] Institute of Quarrying (2021) 'Good Practice Guide for Handlings Soils in Mineral Workings'. Available online at https://www.quarrying.org/soils-guidance Last accessed July 2026

---

[12] Soils in Planning Construction Task Force (September 2022) '*Building on soil sustainability: Principles for soils in planning and construction*'. Available online at Soils-in-Planning-and-Construction-Sept-22.pdfLast accessed July 2026

[13] European Parliament (2015) Definition of a Circular Economy. Available online at *Circular economy: definition, importance and benefits | Topics | European Parliament* Last accessed July 2026

[14] C.C. Rudeforth, R. Hartnup, J.W. Lea, T.R.E. Thompson, and P.S. Wright (1984) 'Soils and their use in Wales'. Soil Survey of England and Wales Bulletin No. 11. Harpenden

[15] University (2024) Soil site report, Soil Report for location 338926E, 187588N, 3km x 3km, Cranfield University

[16] BRE National Solar Centre's (2014) '*Agricultural Good Practice Guidance for Solar Farms*' (Editor J Scurlock). Available online at https://www.bre.co.uk/filelibrary/nsc/Documents%20Library/NSC%20Publications/NSC_-Guid_Agricultural-good-practice-for-SFs_0914.pdf Last accessed July 2026

[17] Department for Environment, Food and Rural Affairs (2009). Safeguarding our soils: A strategy for England'. Available online @ https://www.gov.uk/government/publications/safeguarding-our-soils-a-strategy-for-england Last accessed July 2026

[18] Askew, R.W. Section 7.4 'Soil' and Section 7.11 'Agricultural Land; in Institute of Civil Engineers (ICE) (2021) 'Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities, Third edition'. Available online at https://www.icevirtuallibrary.com/doi/abs/10.1680/eiah3e.61415.169 Last accessed July 2026

[19] British Standard 1377: 1990 '*Methods of test for soils for civil engineering purposes*'

[20] Government (2023) *'How to stop invasive non-native plants from spreading'.* Available online at How to stop invasive non-native plants from spreading - GOV.UK (www.gov.uk) Last accessed July 2026

[21] Government Guidance (2022) 'How to stop invasive non-native plants from spreading'. Available at https://www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants Last accessed July 2026

[22] GroundGuards Xtreme Mats 4mx2m Large Mats. Available at https://www.ground-guards.co.uk/product/xtreme-4m-x-2m-mat/ Last accessed July 2026

[23] SignaRoad 3mX2m Large Mats. Available online at https://www.ground-guards.co.uk/product/signaroad/ Last accessed July 2026