



Appendix I.2

Agricultural Land Classification Report

**AGRICULTURAL QUALITY
OF LAND NEAR BODELWYDDAN**

Report 2408/3

11th July 2025

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**AGRICULTURAL QUALITY
OF LAND NEAR BODELWYDDAN**

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Report 2408/3
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11th July 2025

SUMMARY

An agricultural land quality survey has been undertaken of 172.1 ha of land near Bodelwyddan, Denbighshire during 2024 and 2025.

The land mainly has wetness limitations giving Subgrade 3b quality, with limited areas of Subgrade 3a where soils are lighter.

1.0 Introduction

- 1.1 This report provides information on the agricultural quality of 172.1 ha of land near Bodelwyddan, Denbighshire. The report is based on a survey of the land between July 2024 and May 2025.

SITE ENVIRONMENT

- 1.2 The main site area (165.6 ha) comprises fields to the north and south of Rhuddlan Road. The land is mainly level, at an elevation of approximately 10 m AOD. Most of the land is under grass, either used as silage meadow or for cattle grazing. Some areas are under arable cropping (winter cereal rotation).
- 1.3 A separate smaller area of approximately 6.5 ha to the south of Bodelwyddan is also included. This comprises two fields, bordered to the north and south by access tracks, to the north-east by an electrical substation and on other sides by adjoining agricultural land. The land is under grass used for cattle grazing. This area is gently undulating, at an average elevation of approximately 50 m AOD.

PUBLISHED INFORMATION

- 1.4 British Geological Survey 1:50,000 scale information records the underlying solid geology as Kinnerton Sandstone Formation and Warwickshire Group mudstone, but entirely overlain by superficial drift deposits: these mainly comprise tidal flat deposits (marine alluvium) with Devensian glacial till recorded in parts of the south of the site, including all of the area south of Bodelywyddan.
- 1.5 The National Soil Map (published at 1:250,000 scale) records most of the land as Wallasea 1 Association, mainly comprising groundwater-affected alluvial clays. In the south Salop Association is recorded: mainly fine loams over slowly permeable clay, formed in reddish glacial till¹.
- 1.6 The Welsh Government Predictive Agricultural Land Classification map² shows most of the land as Subgrade 3b. Areas in the south of the main site (those recorded as Salop Association soils) are predicted to be of Subgrade 3a quality.

¹ Ragg, J.M., *et al.*, (1984). *Soils and their Use in Midland and Western England*, Soil Survey of England and Wales Bulletin No. 12, Harpenden.

² [New map | DataMapWales \(gov.wales\)](#)

2.0 Soils

- 2.1 A soils and agricultural land quality survey was carried out between July and October 2024 in accordance with MAFF (1988) Agricultural Land Classification guidelines³. It was based on observations at intersects of a 100 m grid, giving a density of one observation per hectare. One observation (point 5 of Map 1) was on a field boundary and was relocated. During the survey, soils were examined by hand augerings and pits to a maximum depth of 1.2 m. A log of the sampling points and a map (Map 1) showing their location is in an appendix to this report.
- 2.2 The Cable Corridor has not been subject to soil survey. The majority of the Cable Corridor follows field boundaries, existing tracks and roads. The cable trench is relatively narrow (approximately 750mm in width) and detailed ALC survey of fields places sample points at 100m intervals which are too widely spaced to monitor soil variation within the soil to be excavated from the trench.
- 2.3 The soils were found to vary, mainly according to changes in the underlying geology. The main soil types are described below.

ALLUVIAL CLAY SOILS

- 2.4 These soils occupy the majority of the main site area, where the soils are formed in clayey marine alluvium. They dominantly comprise stoneless silty clay or clay topsoil (occasionally silty clay loam, sandy clay loam or clay loam) over clay or silty clay subsoils. The subsoils show evidence of seasonal waterlogging (greyish colours with ochreous mottles) to shallow depth. The subsoils are moderately porous and permeable at depth in places, but the upper layers are mainly weakly structured (dense) and slowly permeable.
- 2.5 In places more silty permeable soils were found. These are mainly interpreted as infilled tidal creek channels occurring in narrow isolated strips; in some patches in the north-west and south of the main site area, these areas are more extensive.

Assessment of drainage

- 2.6 Although this type of marine alluvial soils are often naturally permeable, in this locality (as in many others) the historical drainage of the land for intensive agriculture has resulted in subsoil structural deterioration and the soils were mainly found to be slowly

³MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

permeable at shallow depth (Soil Wetness Class IV).

- 2.7 In some places more permeable soils are found and the Soil Wetness Class needs to be judged according to the effectiveness of measures to improve drainage. This land is originally groundwater-affected coastal marshland. Historically this land was reclaimed through arterial drainage, comprising a network of ditches, which controlled previous tidal flooding and lower groundwater levels through pump drainage. In some parts of the country (such as East Anglia) intensive drainage management effectively removed the groundwater influence from this type of land and little residual drainage issue remains. However, in wetter western districts such as North Wales, less intensive drainage and higher rainfall mean that drainage problems remain and this type of land is relatively wet. At the site locality, the drainage network was observed to be only partially effective, with some ditches silted and ditch water levels often close to the land surface, even in summer and autumn at the time of survey. It is therefore judged that this land is at least seasonally waterlogged and it is not realistic that further drainage improvements would be made: land with permeable subsoils is judged as Soil Wetness Class III.

FINE LOAMS OVER CLAY FORMED IN GLACIAL TILL

- 2.8 This land occurs on inland areas, where the underlying geology changes from marine alluvium to glacial till. These areas comprise southern sections of the main site and the entirety of the smaller survey to the south of Bodelwyddan. The soils chiefly comprise very slightly stony medium clay loam or sandy clay loam topsoil and upper subsoil, over slowly permeable clay. The subsoils show (greyish or pale colours with ochreous mottles) at shallow depth and the slowly permeable clay typically occurs at less than 45 cm depth: these soils are judged poorly-draining under the local climate (Soil Wetness Class IV).

3.0 Agricultural land quality

3.1 To assist in assessing land quality, the Ministry of Agriculture, Fisheries and Food (MAFF) developed a method for classifying agricultural land by grade according to the extent to which physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF ALC system classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

3.2 The agricultural climate is an important factor in assessing the agricultural quality of land and has been calculated using the Climatological Data for Agricultural Land Classification⁴.

3.3 The relevant data for the main site area at an average elevation of 10 m and a central point at grid reference SH 985,771 is given below.

- Average annual rainfall: 702 mm
- January-June accumulated temperature >0°C 1462 day°
- Field capacity period 168 days
- Summer moisture deficits for: wheat: 107 mm
potatoes: 98 mm

3.4 The relevant data for the southern area at an average elevation of 50 m and a central point at grid reference SH 985,771 is given below.

- Average annual rainfall: 741 mm
- January-June accumulated temperature >0°C 1417 day°
- Field capacity period 176 days
- Summer moisture deficits for: wheat: 99 mm
potatoes: 89 mm

3.5 The survey described in the previous section was used in conjunction with the agro-climatic data above to classify the site using the revised guidelines for ALC issued in 1988 by MAFF⁵. There are no overriding climatic limitations at this locality.

⁴Meteorological Office, (1989). *Climatological Data for Agricultural Land Classification*.

⁵MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

SURVEY RESULTS

- 3.6 The agricultural quality of the land is primarily determined by wetness limitations. Other factors have been assessed but do not affect the land grade. Land of Grade 3 has been identified.

Subgrade 3a

- 3.7 This land has moderately high topsoil clay content (medium loams) and imperfect drainage (Soil Wetness Class III). This combination means that the land is often too wet for winter and early spring machinery land access, although late spring (as well as autumn sowings) are usually possible.

Subgrade 3b

- 3.8 This land has high topsoil clay content and restricted drainage (Soil Wetness Class III or IV). Under the local climate this means that the land is usually too wet for spring machinery land access, and arable cropping is therefore largely limited to autumn sowings.

Other land (non-agricultural)

- 3.9 This comprises ditches and other water bodies.

Grade areas

- 3.10 The land grades are shown on Map 2 and the areas occupied shown below.

Table 1: Areas occupied by the different land grades (ha)

Grade/subgrade	Main site area (ha)	Southern area (ha)	Total area (ha)
Subgrade 3a	11.3	0	11.3
Subgrade 3b	148.0	6.5	154.5
Other land	6.3	0	6.3
Total	165.6	6.5	172.1

APPENDIX
DETAILS OF OBSERVATIONS
MAPS
LABORATORY TESTING

Land near Bodelwyddan: Soils and ALC survey – Details of observations at each sampling point

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-28	HZCL	0	28-90+	ZC	xxx				0	IV	3b	W
2	0-27	HZCL	0	27-37	HZCL	xxx	37-90+	ZC	xxx	0	IV	3b	W
3	0-22	HZCL	0	22-33	HZCL	xxx	33-90+	ZC	xxx	0	IV	3b	W
4	0-25	ZC	0	25-90+	ZC	xxx				0	IV	3b	W
5	0-31	ZC	0	31-90+	ZC	xxx				0	IV	3b	W
6	0-32	ZC	0	32-90+	ZC	xxx				0	IV	3b	W
7	0-30	ZC	0	30-100+	ZC	xxx				0	IV	3b	W
8	0-29	ZC	0	29-90+	ZC	xxx				0	IV	3b	W
9	0-26	ZC	0	26-90+	ZC	xxx				0	IV	3b	W
10	0-31	HZCL	0	31-39	HZCL	xxx	39-90+	ZC	xxx	0	IV	3b	W
11	0-19	ZC	0	19-90+	ZC	xxx				0	IV	3b	W
12	0-32	ZC	0	33-90+	ZC	xxx				0	IV	3b	W
13	0-29	ZC	0	29-90+	ZC	xxx				0	IV	3b	W
14	0-29	ZC	0	29-90+	ZC	xxx				0	IV	3b	W
15	0-30	ZC	0	30-90+	ZC	xxx				0	IV	3b	W
16	0-30	ZC	0	30-90+	ZC	xxx				0	III	3b	W
17	0-38	ZC	0	38-90+	ZC	xxx				0	IV	3b	W
18	0-22	ZC	0	22-90+	ZC	xxx				0	IV	3b	W
19	0-20	HZCL	0	20-38	HZCL	xxx	38-90+	ZC	xxx	0	IV	3b	W
20	0-31	ZC	0	31-90+	ZC	xxx				0	IV	3b	W
21	0-28	ZC	0	28-90+	ZC	xxx				0	IV	3b	W
22	0-31	ZC	0	31-90+	ZC	xxx				0	IV	3b	W
23	0-25	ZC	0	25-35	ZC	xxx	35-90+	ZC	xxx	0	IV	3b	W
24	0-28	ZC	0	28-58	ZC	xxx	58-72 72-90+	HZCL FZSL	xxx xxx	0	IV	3b	W
25	0-27	ZC	0	27-90+	ZC	xxx				0	IV	3b	W
26	0-20	ZC	0	20-90+	ZC	xxx				0	IV	3b	W
27	0-27	ZC	0	27-90+	ZC	xxxx				0	IV	3b	W
28	0-26	ZC	0	26-90+	ZC	xxxx				0	IV	3b	W
29	0-22	ZC	<5	22-90+	ZC	xxx				0	IV	3b	W
30	0-31	ZC	0	31-100+	ZC	xxx				0	III	3b	W
31	0-28	ZC	0	28-90+	ZC	xxx				0	IV	3b	W
32	0-23	HZCL	0	23-90+	ZC	xxx				0	IV	3b	W
33	0-27	ZC	0	27-90+	ZC	xxx				0	IV	3b	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
34	0-24	ZC	0	24-90+	ZC	xxx				0	IV	3b	W
35	0-23	ZC	0	23-90+	ZC	xxx				0	IV	3b	W
36	0-22	ZC	0	22-90+	ZC	xxx				0	IV	3b	W
38	0-29	ZC	<5	29-90+	ZC	xxx				0	III	3b	W
39	0-31	ZC	0	31-90+	ZC	xxx				0	IV	3b	W
40	0-23	ZC	0	23-90+	ZC	xxx				0	IV	3b	W
41	Outside boundary												
42	0-22	ZC	0	22-90+	ZC	xxx				0	IV	3b	W
42	0-31	ZC	5-10	30-90+	ZC	xxx				0	IV	3b	W
43	0-30	ZC	<5	30-90+	ZC	xxx				0	IV	3b	W
44	0-30	ZC	0	30-90+	ZC/C	xxx				0	IV	3b	W
45	0-26	ZC	<5	26-90+	ZC/C	xxx				0	IV	3b	W
46	Disturbed												
47	0-20	ZC	<5	20-90+	ZC/C	xxx				0	IV	3b	W
48	0-26	ZC	0	26-90+	C	xxx				0	IV	3b	W
49	0-32	/ZC	0	32-90+	C	xxx				0	IV	3b	W
50	0-27	ZC	0	27-75	HZCL	xxx	75-90+	ZC	xxx	0	III	3b	W
51	0-26	C	0	26-100+	C	xxx				0	IV	3b	W
52	0-24	C	0	24-100+	C	xxx				0	IV	3b	W
53	0-26	ZC	0	26-35	ZC (pan)	xxx	35-90+	ZC	xxx	0	III	3b	W
54	0-18	ZC(org)	0	18-42	ZC	xxx	42-90+	C	xxx	0	IV	3b	W
55	0-29	C	0	27-41	C	xxx	41-76 76-100+	HZCL HZCL	xxx xxx	0	III	3b	W
56	0-24	ZC	0	24-60	C	xxx	60-90+	C	xxx	0	IV	3b	W
57	0-35	C/ZC	0	35-60	C	xxx	60-90+	ZC	xxx	0	IV	3b	W
58	0-27	ZC	0	27-53	C	xxx	53-90+	C	xxx	0	III	3b	W
59	0-25	ZC	0	25-60	ZC	xxx	60-90+	C	xxx	0	III	3b	W
60	0-23	HCL	0	23-57	HCL	xxx	57-90+	HCL	xxx	0	III	3b	W
61	0-26	SCL	0	26-48	SCL/HCL	xxx	48-90+	HCL	xxx	0	III	3a	W
62	0-26	ZC	0	26-57	C	xxx	57-120	C	xxx	0	IV	3b	W
63	0-26	HCL	0	26-39	HCL	xxx	39-100+	C	xxx	0	IV	3b	W
64	0-30	ZC	0	30-45	ZC	xxx	45-90+	C	xxx	1	III/IV	3b	W
65	0-27	SCL	0	27-45	SCL	xxx	45-90+	C(r) fm	xxx	2	III/IV	3a/3b	W
66	0-26	SCL	0	26-39	SCL	xxx	39-90+	C(r) fm	xxx	2	IV	3b	W
67	0-30	slstSCL	<5	30-56+	SCL(dist)	-				1	-	-	-
68	0-60+	MCL/SCL(dist)	0							1	-	-	-
69	0-57	MCL(dist)	0	57-72	MSL(wet)	-	72-90+	SC	xxx	0	III	3a	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
70	0-22	mstHCL	5-10	22-45	HZCL	xxx	45-80+	C	xxx	1	III/IV	3b	W
71	0-25	HZCL	0	25-34	ZC	xxx	34-90+	C	xxx	0	IV	3b	W
72	0-25	ZC	0	25-44	ZC	xxx	44-68 68-90+	C HZCL	xxx xxx	0	III	3b	W
73	0-22	C	0	22-47	C	xxx	47-90+	HZCL	xxx	0	IV	3b	W
74	0-22	ZC	0	22-50+	C(wet)	xxx				1	IV	3b	W
75	0-28	ZC	0	22-34	ZC	xxx	34-80+	C	xxx	1	IV	3b	W
76	0-28	ZC	0	28-42	ZC	xxx	42-80+	C	xxx	1	IV	3b	W
77	0-26	ZC	0	26-70+	C	xxx				0	IV	3b	W
78	0-27	HZCL	0	27-80+	ZC	xxx				1	IV	3b	W
79	0-21	MZCL	0	21-45	HZCL	xxx	45-90+	ZC	xxx	0	III/IV	3a/3b	W
80	0-22	C	0	22-57	C	xxx	57-90+	ZC	xxx	0	IV	3b	W
81	0-15	C	0	15-51	C	xxx	51-70 70-90+	HZCL HZCL	xxx xxx	0	IV	3b	W
82	0-15	C	0	15-49	C	xxx	49-90+	ZC	xxx	0	IV	3b	W
83	0-30	HCL	<5	30-47	HCL	xxx	47-90+	C	xxx	1	III/IV	3b	W
84	0-29	MCL	<5	29-47	HCL(r)	xxx	47-90+	HCL(wet)	xxx	0	IV/III	3b/3a	W
85	0-22	HZCL	0	22-70+	C(wet)	xxx				1	IV	3b	W
86	0-31	HZCL	0	31-90+	C	xxx				1	IV	3b	W
87	0-25	HZCL	0	25-80+	ZC	xxx				0	IV	3b	W
88	0-25	HZCL	0	25-80+	C(wet)	xxx				1	IV	3b	W
89	0-25	HZCL	0	25-30	HZCL	xxx	30-90+	C	xxx	0	IV	3b	W
90	0-20	C	0	20-100+	C	xxx				0	IV	3b	W
91	0-24	MCL	0	24-39	MCL	xx	39-90+	C(r)	xxx	1	IV	3b	W
92	0-24	MCL	0	24-38	MCL	xxx	38-90+	C(r)	xxx	1	IV	3b	W
93	0-60+	MCL(dist)	<5							1	-	-	-
94	0-28	HCL	<5	28-37	HCL	xxx	37-90+	C(r) fmn	xxx	2	IV	3b	W
95	0-22	C	<5	22-60+	C(wet)	xxx				0	IV	3b	W
96	0-28	MZCL	0	28-37	HCL	xxx	37-90+	HZCL	xxx	0	III	3a	W
97	0-22	MCL	0	22-38	HCL	xxx	38-90+	C	xxx	1	IV	3b	W
98	0-23	HZCL	0	23-52	C	xxx	52-90+	ZC	xxx	0	III/IV	3b	W
99	0-21	ZC	0	21-90+	C	xxx				0	IV	3b	W
100	0-20	C	0	20-90+	C	xxx				0	IV	3b	W
101	0-24	ZC	0	24-90+	ZC	xxx				0	IV	3b	W
102	0-22	ZC	0	22-90+	ZC	xxx				0	IV	3b	W
103	0-20	HCL	<5	20-70+	C(r)	xxx				1	IV	3b	W
104	0-34	MCL	<5	34-41	MCL	xxx	41-90+	C(r)	xxx	2	IV	3b	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
105	0-60+	MCL(dist)	<5							1	-	-	-
106	0-35	MCL	<5	35-49	MCL	xxx	49-70+	C	xxx	0	III	3a	W
107	0-21	MCL	<5	21-90+	MCL	xxx				0	II	2	W
108	0-23	HZCL	0	23-50	HZCL	xxx	50-90+	ZC	xxx	0	III	3b	W
109	0-25	ZC	0	25-90+	C	xxx				0	IV	3b	W
110	pond												
111	0-25	HZCL	0	25-61	C	xxx	61-90+	C	xxx	0	IV	3b	W
112	0-25	C	0	25-90+	C	xxx				0	IV	3b	W
113	0-25	ZC	0	25-90+	C	xxx				0	IV	3b	W
114	0-31	ZC	0	31-90+	ZC	xxx				0	IV	3b	W
115	0-27	MCL	<5	27-47	MCL	xx	47-80+	C(r)	xxx	2	III/IV	3a/3b	W
116	0-24	MCL	0	24-55+	C(wet)					1	IV	3b	W
117	0-22	HZCL	0	22-90+	C	xxx				0	IV	3b	W
118	0-26	ZC	0	26-43	ZC	xxx	43-90+	C	xxx	0	IV	3b	W
119	0-23	ZC	0	23-30	ZC	xxx	30-90+	C	xxx	0	IV	3b	W
120	0-23	ZC	0	23-90+	ZC	xxx				0	IV	3b	W
121	0-25	ZC	0	25-90+	ZC	xxx				0	IV	3b	W
122	0-26	HZCL	0	26-90+	C	xxx				0	IV	3b	W
123	0-28	ZC	0	28-90+	ZC	xxx				0	IV	3b	W
124	0-28	ZC	0	28-90+	ZC	xxx				0	IV	3b	W
125	0-28	ZC	0	28-90+	ZC	xxx				0	IV	3b	W
126	0-19	ZC	0	19-63	ZC	xxx	63-77 77-90+	SCL/HCL ZC	xxx xxx	0	IV	3b	W
127	0-22	ZC	0	22-90+	ZC	xxx				0	IV	3b	W
128	0-21	ZC	0	21-90+	ZC	xxx				0	IV	3b	W
129	0-23	ZC	0	23-53	ZC	xxx	53-88 88-100+	FSZL MZCL	xxx xxx	0	II/III	3b	W
130	0-25	ZC	0	25-45	ZC	xxx	45-90+	C	xxx	0	IV	3b	W
131	0-21	ZC(org)	0	21-80+	ZC	xxx				0	IV	3b	W
132	0-28	HZCL	0	28-90+	ZC	xxx				0	IV	3b	W
133	0-23	HZCL(org)	0	23-30	ZC	xxx	30-53 53-90+	ZC ZC	xxx xxx	0	IV	3b	W
134	0-27	HZCL	0	27-45	HZCL	xxx	45-63 63-90+	HZCL/ZC ZC	xxx xxx	0	III	3b	W
135	0-16	ZC(org)	0	16-26	ZC	xxx	26-120	ZC	xxx	0	IV	3b	W
136	0-28	HZCL	0	28-54	ZC	xxx	54-80+	ZC	xxx	0	III	3b	W
137	0-24	MZCL	0	24-50	MZCL	xxx	50-64 64+	ZC Waterlogged	xxx	0	III	3a	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
138	0-24	MZCL	0	24-46	HZCL	xxx	46-80+	ZC	xxx	0	III/IV	3a	W
139	0-24	SCL	<5	24-63	MCL/SCL	xxx	63-90+	ZC	xxx	0	III	3a	W
140	0-23	HZCL(org)	0	23-54	ZC	xxx	54-90+	ZC	xxx	0	IV	3b	W
141	0-20	HZCL(org)	0	20-90+	C	xxx				0	IV	3b	W
142	0-27	HCL	0	27-40	HCL	xxx	40-90+	C	xxx	0	IV	3b	W
143	0-25	slstMCL(org)	0	25-40	slstSCL	xxx	40-90+	HCL	xxx	0	IV	3b	W
144	0-30	slstSCL	0	30-48	SCL(r)	xxx	48-90+	HCL(r)	xxx	0	III/IV	3a/3b	W
145	0-24	HZCL	0	24-40	ZC	xxx	40-90+	ZC(r)	xxx	0	IV	3b	W
146	0-24	SCL	0	24-52	SCL	xxx	52-90+	HCL/C (r)	xxx	0	III	3a	W
147	0-22	HCL	<5	22-30	C(r) frn	xxx	30-90+	C(r)	xxx	3	IV	3b	W
148	0-28	MCL	<5	28-40	HCL	xxx	40-90+	C(r)	xxx	2	IV	3b	W
149	0-23	MCL	<5	23-33	HCL	xxx	33-110+	C(r)	xxx	1	IV	3b	W
150	0-23	MCL/SCL	<5	23-33	SCL	xxx	33-90+	C(r)	xxx	2	IV	3b	W
151	0-28	MCL	<5	28-36	HCL	xxx	36-90+	C(r)	xxx	2	IV	3b	W
152	0-23	MCL	<5	23-42	MCL	xxx	42-90+	C(r)	xxx	2	IV	3b	W
153	0-27	MCL	<5	27-39	HCL(r)	xxx	39-80+	HCL(r)	xxx	0	IV	3b	W
154	0-26	MCL	<5	26-44	MCL	xxx	44-90+	C(r)	xxx	1	IV/III	3b/3a	W
155	0-26	MCL	<5	26-40	SCL	xxx	40-80+	C(r)	xxx	2	IV	3b	W
156	0-26	MCL	<5	26-40	MCL	xx	40-46 46-80+	MCL C(r)	xxx xxx	1	III/IV	3a/3b	W
157	0-26	MCL/SCL	<5	26-80+	C(r)	xxx				1	IV	3b	W
158	0-26	MCL	<5	26-39	MCL	xxx	39-58 58-90+	HCL(r) C(r)	xx xx	1	IV/III	3b/3a	W
159	0-30	MCL	<5	30-45	HCL/C(r)	xxx	45-90+	C(r)	xx	4	IV/III	3b/3a	W
160	0-25	MCL	<5	25-65	SCL(r)	xxx	65-90+	C(r)	xxx	2	III	3a	W

Soil log key

Gley indicators¹

o	unmottled
x	1-2% ochreous mottles and brownish matrix (or a few to common root mottles (topsoils)) ³
xx	>2% ochreous mottles and brownish matrix and/or dull structure faces (slightly gleyed horizon)
xxx	>2% ochreous mottles and greyish or pale matrix (gleyed horizon) or reddish matrix and >2% greyish, brownish or ochreous mottles and pale ped faces mottles or fmn concentrations (gleyed horizon)
xxxx	dominantly blueish/greenish matrix, often with some reddish mottles (gleyed horizon)

Slowly permeable layers⁴

a depth underlined (e.g. 50) indicates
the top of a slowly permeable layer

A wavy underline (e.g. 50) indicates
the top of a layer borderline to slowly permeable

Texture²

C	clay
ZC	silty clay
SC	sandy clay
CL	clay loam (H-heavy, M-medium)
ZCL	silty clay loam (H-heavy, M-medium)
SZL	sandy silt loam (F-fine, M-medium, C-coarse)
LS	loamy sand (F-fine, M-medium, C-coarse)
SL	sandy loam (F-fine, M-medium, C-coarse)
S	sand (F-fine, M-medium, C-coarse)
SCL	sandy clay loam
P	peat (H-humified, SF-semi-fibrous, F-fibrous)
LP	loamy peat; PL - peaty loam

Wetness Class⁵

I (freely drained) to VI (very poorly drained)

Limitations:

W	wetness/workability
D	droughtiness
De	depth
F	flooding
St	stoniness
G	gradient
T	topography/microrelief
C	Climate

Suffixes & prefixes:

o - organic

(vsl, sl, m, v, x)**st** – (very slightly, slightly,
moderately, very, extremely) **stony**⁶

(vsl, sl, m, v, x)**ca**
(very slightly, slightly,
moderately, very, extremely) **calcareous**⁷

Other abbreviations

fmn - ferri-manganiferous concentrations
dist - disturbed soil layer; chky - chalky
R – bedrock (CH – chalk, SST – sandstone)
LST – limestone, MST – Mudstone)
r-reddish, gn – greenish

¹Gley indicators in accordance with Hodgson, J.M., 1997. Soil Survey Field Handbook (third edition). Soil survey technical monograph No. 5

²Texture in accordance with particle size classes in Hodgson (1997)

³ Occasionally recorded in the texture box

⁴Permeability is estimated for auger borings and must be confirmed by full pit observations in accordance with the definitions in:
Revised Guidelines for grading the quality of Agricultural Land (Maff 1988)

⁵Soil Wetness Classes are defined in Hodgson (1997)

⁶stoniness classes as defined in Hodgson (1997)

⁷calcareous classes as defined in Hodgson (1997)

Grades shown as intergrade e.g. **3a/3b** are close to the grade boundary. The estimate of which side of the boundary the grading falls is the shown first (in bold here)
grades in brackets eg. (3a) raised by one grade due to calcareous topsoil

SOIL PIT DESCRIPTIONS

Observation 23 (Topsoil sample B)

0-30 cm	Dark greyish brown (10YR 4/2) silty clay; stoneless; moderately developed very coarse sub-angular blocky structure; firm; many fine fibrous roots; smooth gradual boundary to:
30-110 cm+	Blueish grey (10B 5/1) clay with 10% fine strong brown (7.5YR 6/8) mottles; stoneless; strongly developed coarse prismatic structure, becoming moderately developed coarse angular blocky below 80 cm depth; very firm; <0.5% macropores; few fine fibrous roots in ped fissures. Droughtiness: AP Wheat = 126 mm, AP Potatoes = 103 mm MB Wheat = 19.0; MB Potatoes = 5.0 Soil Wetness Class IV

Observation 30 (Topsoil sample D)

0-31 cm	Greyish brown (10YR 5/2) silty clay; stoneless; strongly developed coarse sub-angular blocky structure; moderately strong (dry); few fine fibrous roots; smooth clear boundary to:
31-100 cm+	Light blueish grey (10B 7/1) silty clay with many fine yellowish reddish yellow (7.5YR 6/8) mottles; stoneless; moderately developed medium sub-angular blocky structure; moderately strong; common pores and worm channels Droughtiness: AP Wheat = 124.5 mm, AP Potatoes = 99.5 mm MB Wheat = 17.5; MB Potatoes = 1.5; Soil Wetness Class III

Observation 62 (Topsoil sample A)

0-26 cm	Dark greyish brown (10YR 4/2) silty clay with 5% very fine strong brown (7.5YR 4/6) root channel mottles; stoneless; moderately developed very coarse sub-angular blocky structure; firm; common fine fibrous roots; smooth gradual boundary to:
26-57 cm	Grey (7.5YR 6/1) clay with 5-10% distinct fine strong brown (7.5YR 4/6) mottles; stoneless; strongly developed very coarse prismatic structure with polished ped faces; very firm; <0.5% macropores; few fine fibrous roots in ped fissures; smooth gradual boundary to:
30-110 cm+	Blueish grey (10B 5/1) clay with 5% strong brown (7.5YR 4/6) mottles on ped faces; stoneless; weakly developed very coarse angular blocky structure; very firm dry; firm to friable wet; <0.5% macropores; water table at c. 85 cm. Droughtiness: AP Wheat = 122 mm, AP Potatoes = 97 mm MB Wheat = 15.0; MB Potatoes = -1.0; Soil Wetness Class IV

Observation 102 (Topsoil sample E)

- 0-22 cm Dark greyish brown (10YR 4/2) silty clay with 10% very fine reddish yellow (7.5YR 6/8) root channel mottles; stoneless; moderately developed very coarse sub-angular blocky structure; firm; many fine fibrous roots; wavy clear boundary to:
- 22-100 cm+ Light blueish grey (10B 7/1) silty clay with common yellowish red (5YR 5/6) mottles; stoneless; strongly developed very coarse angular blocky structure; very firm; <0.5% macropores; very few fine fibrous roots
- Droughtiness: AP Wheat = 120 mm, AP Potatoes = 95 mm
- MB Wheat = 13.0; MB Potatoes = -3.0;
- Soil Wetness Class IV

Observation 92 (Topsoil sample F)

- 0-25 cm Very dark greyish brown (10YR 3/2) medium clay loam; 3-4% small to large mixed hard rounded stones; moderately developed coarse and very coarse sub-angular blocky structure; friable; smooth clear boundary to:
- 25-40 cm Reddish brown (5YR 5/3) heavy clay loam with reddish grey (5YR 5/2) ped faces and 5% fine yellowish red (5YR 5/8) mottles; very slightly stony; moderately developed coarse sub-angular blocky structure; friable; smooth gradual boundary to:
- 40-100 cm+ Reddish brown (5YR 5/4) clay with 20% medium reddish yellow (7.5YR 6/8) mottles and 5% fine and medium ferri-manganiferous concentrations; very slightly stony; weakly developed very coarse prismatic structure; very firm; <0.5% macropores perched water above.
- Droughtiness: AP Wheat = 126 mm, AP Potatoes = 104 mm
- MB Wheat = 19.1; MB Potatoes = 6.0;
- Soil Wetness Class IV

Observation 135 (Topsoil sample C)

- 0-16 cm Brown (7.5YR 4/2) clay; stoneless; strongly developed fine sub-angular blocky structure; friable; many fine fibrous roots; smooth gradual boundary to:
- 16-26 cm Grey (7.5YR 5/1) clay with 15% fine strong brown (7.5YR 4/6) mottles; stoneless; moderately developed coarse sub-angular blocky structure; friable; common fine fibrous roots; smooth gradual boundary to:
- 26-120 cm Grey (N 6/0) clay with 30% fine and medium reddish yellow 7.5YR 6/8) mottles; stoneless; moderately developed very coarse prismatic structure; firm; 1-2% very fine biopores; <0.5% macropores; very few fine fibrous roots, mainly in ped fissures.
- Droughtiness: AP Wheat = 120 mm, AP Potatoes = 95 mm
- MB Wheat = 13.0; MB Potatoes = -3.0;
- Soil Wetness Class IV

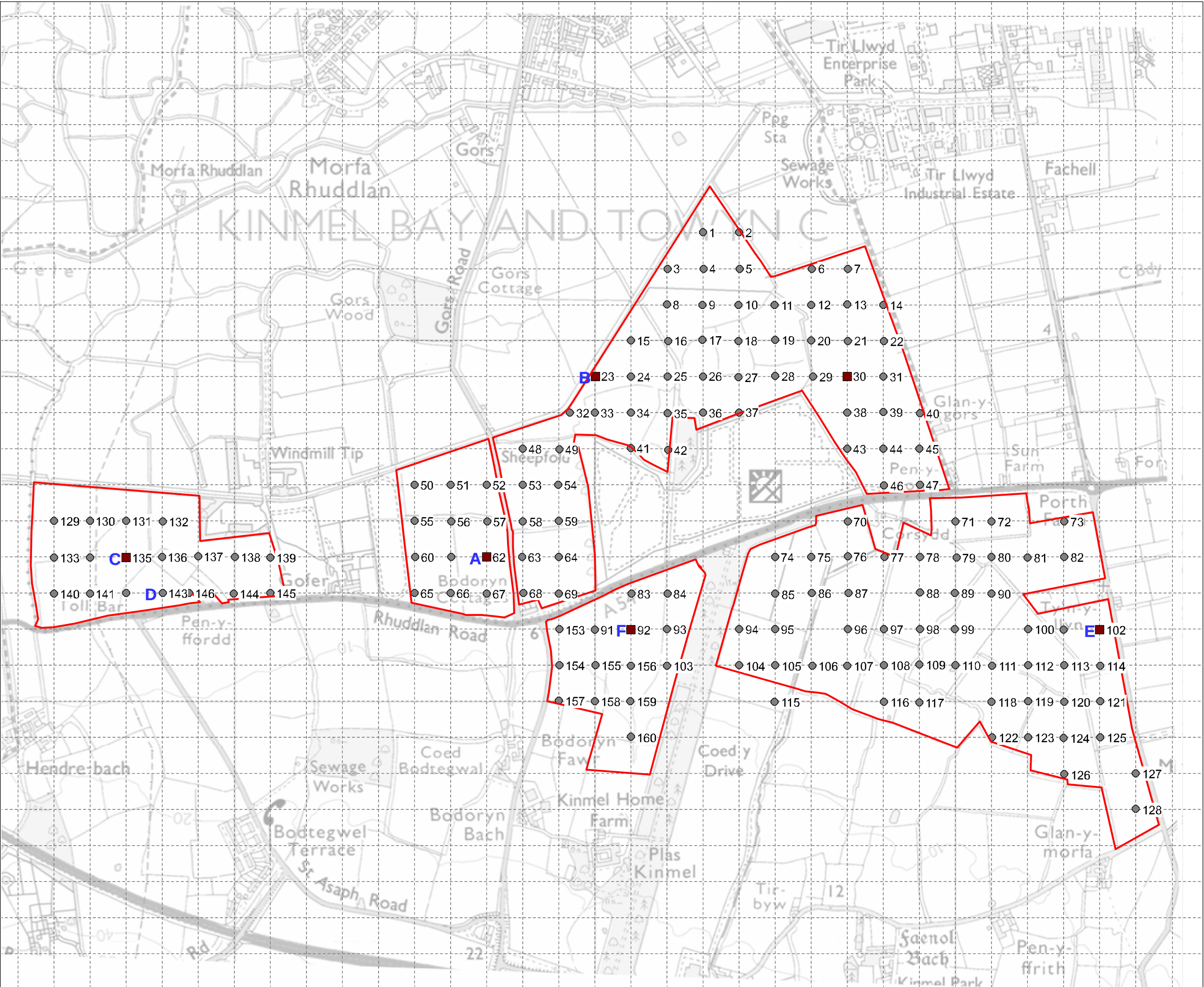
Observation 149

0-23 cm	Brown (7.5YR 5/2) medium clay loam; 1-2% hard rounded mixed stones; moderately developed medium sub-angular blocky structure; friable; common fine fibrous roots; smooth gradual boundary to:
23-33 cm	Grey (7.5YR 5/1) heavy clay loam with 10% fine strong brown (7.5YR 5/6) mottles; very slightly stony; moderately developed coarse sub-angular blocky structure; friable; common worm channels; few fine fibrous roots; smooth clear boundary to:
33-75 cm	Reddish brown (5YR 5/3) clay with 10% fine and medium grey (5YR 5/1) mottles and weak red (2.5YR 5/2) ped faces; very slightly stony; moderately developed very coarse angular blocky structure; very firm; <0.5% macropores; few fine fibrous roots; smooth clear boundary to:
33-110 cm+	Reddish brown (2.5YR 5/3) clay with 10% medium grey (7.5YR 5/1) mottles; very slightly stony; weakly developed very coarse prismatic structure to structureless (massive); very firm; <0.5% macropores.

Droughtiness: AP Wheat = 125 mm, AP Potatoes = 103 mm

MB Wheat = 25.9; MB Potatoes = 13.5

Soil Wetness Class IV



KEY

- Auger observations
- Pits
- A Lab texture topsoil sample
- Site boundary

Site:

Land near Bodelwyddan

Map title:

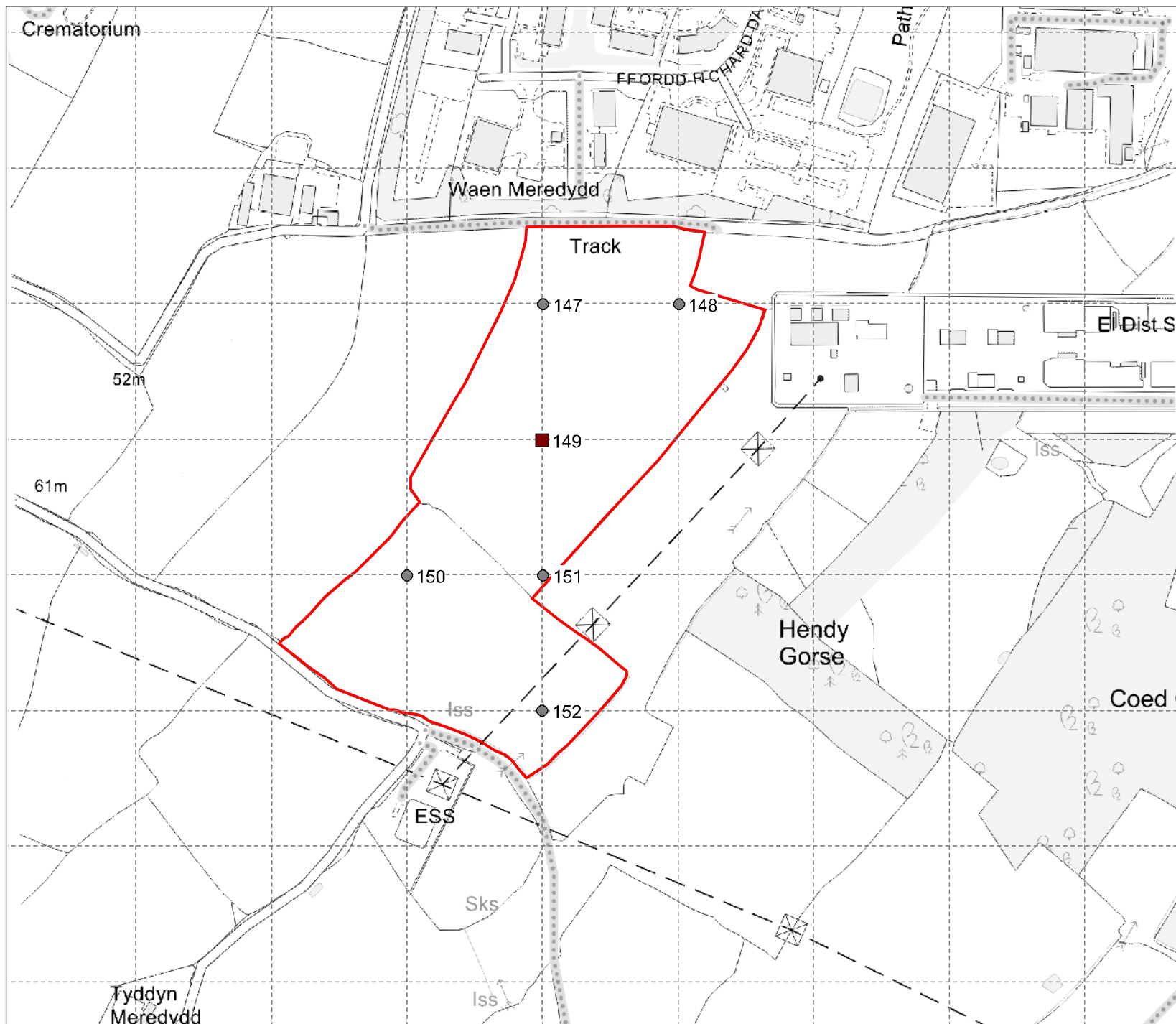
MAP 1A Observations

Land Research ASSOCIATES

Tapton Innovation Centre
Brimington Road
Chesterfield
S41 0TZ
www.lra.co.uk

Date:11/07/2025

Scale: 1:10,000



KEY

- Auger observations
- Pits
- Site boundary

Site:

Land near
Bodelywddan

Map title:

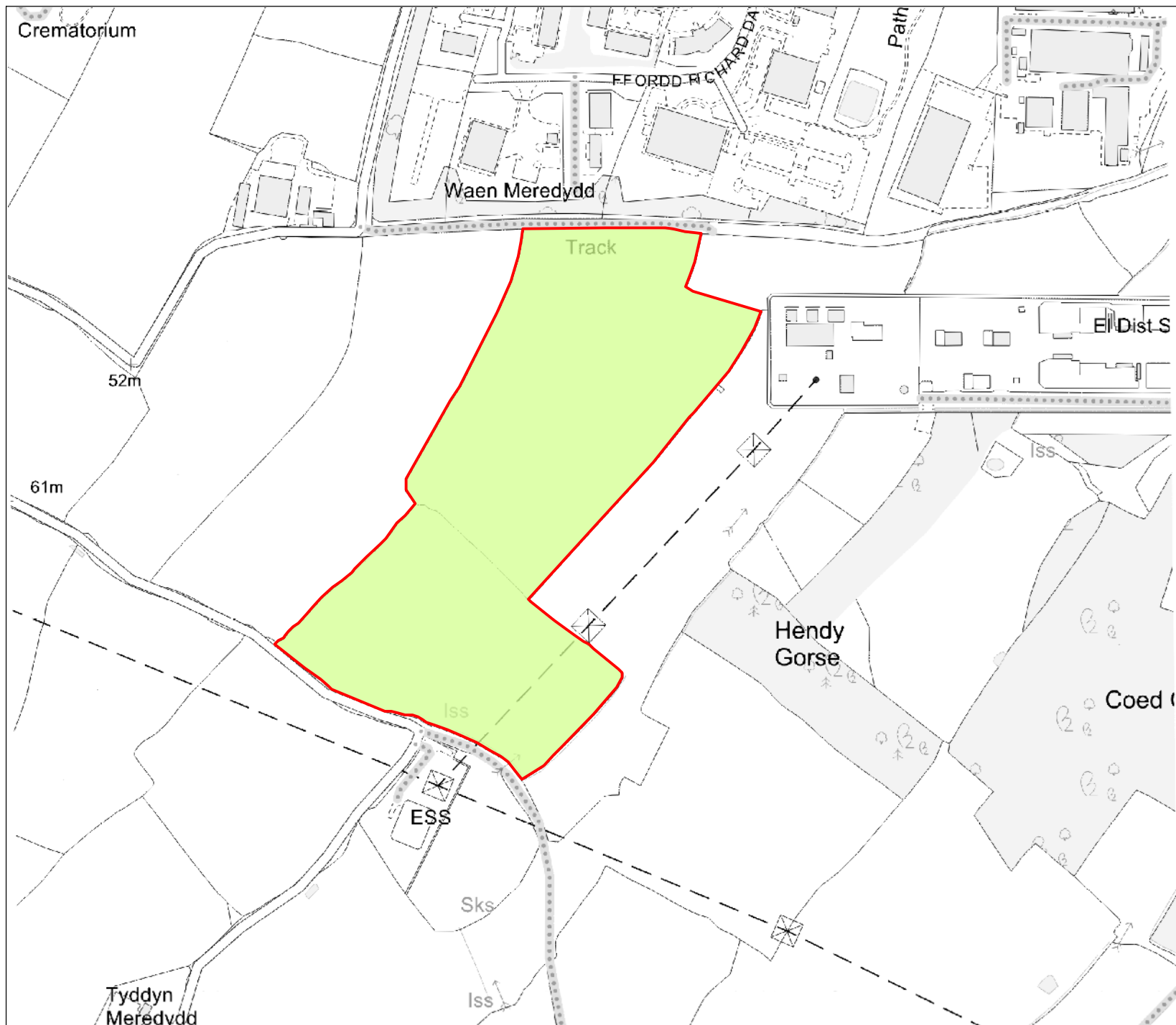
MAP 1B
Observations



Tapton Innovation Centre
Brimington Road
Chesterfield
S41 0TZ
www.lra.co.uk

Date:11/07/2025

Scale: 1:4,000



KEY

- Subgrade 3b
- Site boundary

Site:

Land near
Bodelywddan

Map title:

MAP 2B
Agricultural Land
Classification

**Land
Research**
ASSOCIATES

Tapton Innovation Centre
Brimington Road
Chesterfield
S41 0TZ
www.lra.co.uk

Date:11/07/2025

Scale: 1:4,000

ANALYTICAL REPORT									
Report Number	46506-24		H579	MR MIKE PALMER					
Date Received	06-AUG-2024		LAND RESEARCH ASSOCIATES						
Date Reported	27-AUG-2024		TAPTON PARK INNOVATION CENTRE						
Project	SOIL		BRIMINGTON ROAD						
Reference	BODELWYDDAN		CHESTERFIELD S41 0TZ						
Order Number									
Laboratory Reference			SOIL 706839	SOIL 706840					
Sample Reference			A	B					
Determinand	Unit		SOIL	SOIL					
Sand 2.00-0.063mm	% w/w		6	7					
Silt 0.063-0.002mm	% w/w		55	45					
Clay <0.002mm	% w/w		39	48					
Textural Class **			ZC	C/ZC					
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. 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.									
Document Control									
Reported by	<i>Myles Nicholson</i> 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: enquires@nrm.uk.com								

ANALYTICAL REPORT									
Report Number	52585-24		H579	MR MIKE PALMER					
Date Received	11-SEP-2024		LAND RESEARCH ASSOCIATES						
Date Reported	23-SEP-2024		TAPTON PARK INNOVATION CENTRE						
Project	SOIL		BRIMINGTON ROAD						
Reference	BODELWYDDAN		CHESTERFIELD S41 0TZ						
Order Number									
Laboratory Reference			SOIL711351						
Sample Reference			C 82						
	Determinand	Unit	SOIL						
	Sand 2.00-0.063mm	% w/w	13						
	Silt 0.063-0.002mm	% w/w	42						
	Clay <0.002mm	% w/w	45						
	Textural Class **		C						
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. 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.									
Document Control									
Reported by	<i>Gabrielle Parkes</i> 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: enquires@nrm.uk.com								

ANALYTICAL REPORT									
Report Number	50653-24		H579	MR MIKE PALMER					
Date Received	02-SEP-2024		LAND RESEARCH ASSOCIATES						
Date Reported	16-SEP-2024		TAPTON PARK INNOVATION CENTRE						
Project	SOIL		BRIMINGTON ROAD						
Reference	BODELWYDDAN		CHESTERFIELD S41 0TZ						
Order Number									
Laboratory Reference			SOIL 710071						
Sample Reference			TOPSOIL SAMPLE D						
Determinand	Unit		SOIL						
Sand 2.00-0.063mm	% w/w		38						
Silt 0.063-0.002mm	% w/w		37						
Clay <0.002mm	% w/w		25						
Textural Class **			O-MCL						
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. 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.									
Document Control									
Reported by	<i>Teresa Clyne</i> 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								

ANALYTICAL REPORT

Report Number	55662-24	H579	MR MIKE PALMER
Date Received	26-SEP-2024		LAND RESEARCH ASSOCIATES
Date Reported	10-OCT-2024		TAPTON PARK INNOVATION
Project	SOIL		CENTRE
Reference	BODELWYDDAN		BRIMINGTON ROAD
Order Number			CHESTERFIELD S41 0TZ

Laboratory Reference		SOIL713766	SOIL713767								
Sample Reference		E	F								
Determinand	Unit	SOIL	SOIL								
Sand 2.00-0.063mm	% w/w	4	42								
Silt 0.063-0.002mm	% w/w	54	38								
Clay <0.002mm	% w/w	42	20								
Textural Class **		ZC	MCL								

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.

Reported by	** Please see the attached document for the definition of textural classes. Teresa Clyne 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
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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.