AGRICULTURAL QUALITY
OF LAND AT
CEFN MEIRIADOG

Report 1943/5

28th April 2025

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Report 1943/5
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28th April 2025

SUMMARY

An agricultural land quality survey has been undertaken of 35.3 ha of land at Cefn Meiriadog, St Asaph.

The site comprises heavy slowly permeable soils, giving land of Subgrade 3b agricultural quality, limited by wetness.

1.0 Introduction

1.1 This report provides information on the agricultural quality of 35.3 ha of land at Cefn Meiradog, St Asaph, Denbighshire. The report is based on a survey of the land in January 2022, with additional surveys in September 2023 and December 2024. The surveyed land covers a wider area than the current boundary.

SITE ENVIRONMENT

1.2 The survey area comprises two blocks, either side of a road: the western block comprises four fields, bordered to the north by a farm track and on other sides by adjoining grassland; the eastern block comprises four larger fields. This block is bordered to the west by a stream and road, to the east and north-west by woodland and on other sides by adjoining grassland.

1.3 The land is very gently sloping, at an average elevation of approximately 60 m AOD.

PUBLISHED INFORMATION

1.4 1:50,000 scale BGS information records the underlying geology of the land as Devensian glacial till over mixed Permo-Triassic sedimentary rocks.

1.5 The National Soil Map (published at 1:250,000 scale) records the land as within the Salop Association, mainly comprising slowly permeable seasonally waterlogged fine loams over clay and fine loams, formed in reddish drift[1].

1.6 The Welsh Government Predictive Agricultural Land Classification Map estimates all of the land to be of Subgrade 3b quality.

[1]Rudeforth, C. C., *et al*., 1984. *Soils and their use in Wales.* Soil survey of England and Wales, Bulletin No. 11, Harpenden.

2.0 Soils

2.1 A detailed soils and agricultural quality survey was carried out in accordance with MAFF (1988) guidelines[2]. It was based on observations at intersects of a 100 m grid, giving a density of one observation per hectare. During the survey, soils were examined by a combination of pits and augerings 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 soils were found to be highly uniform across the site, mainly comprising medium clay loam topsoil over dense slowly permeable reddish clay, usually with a thin moderately permeable clay loam upper subsoil. Slight variations comprised heavy rather than medium clay loam topsoil at a small number of points, and occasionally a deeper permeable upper subsoil layer (see sampling logs).

2.3 A typical profile is described from a pit excavation at observation point 41 (see Map 1).

0-26 cm	Very dark greyish brown (10YR 3/2) medium clay loam; stoneless; moderately developed coarse sub-angular blocky structure; friable; many fine and very fine fibrous roots; smooth clear boundary to:
26-40 cm	Light brownish grey (10YR 6/2) heavy clay loam/sandy clay loam with 20% distinct fine yellowish brown (10YR 5/6) mottles; stoneless; moderately developed coarse sub-angular blocky structure; firm; common medium fissures; medium packing density; <0.5% macro-pores; common fine fibrous roots; smooth gradual boundary to:
40-86 cm	Reddish brown (10YR 5/4) clay with reddish grey (5YR 5/1) coarse mottles and ped faces and 10% faint fine yellowish red (5YR 5/8) mottles; stoneless; weakly developed very coarse prismatic structure; very firm; very few fine fissures; high packing density; no visible macro-pores; smooth diffuse boundary to:
86-120 cm	Yellowish red (5YR 5/8) clay with 20% coarse reddish grey (5YR 5/1) mottles; stoneless; structureless (massive); very firm; high packing density; no visible macro-pores; calcareous.

DRAINAGE ASSESSMENT

2.4 All of the soils were found to show evidence of seasonal waterlogging (greyish colours and ochreous mottles) at shallow depth. The subsoils have slowly permeable poorly-structured clay layers at shallow depth (typically around 35 to 45 cm depth). Under the local climate (178 field capacity days) these soils will stand waterlogged for long periods in winter and spring in an average year even with the installation of artificial drainage: They are judged to be dominantly of Soil Wetness Class IV. Occasional greater depth of permeable subsoil occurs in minor areas (Soil Wetness Class III).

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

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 Classification3. The relevant site data for central grid reference SJ 026,728 and an average elevation of 60 m is given below.

- Average annual rainfall: 737 mm
- January-June accumulated temperature >0°C 1417 day°
- Field capacity period (when the soils are fully replete with water) 176 days
- Summer moisture deficits for: wheat: 99 mm, potatoes: 89 mm

3.3 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 MAFF[4]. There are no overriding climatic limitations at this locality.

SURVEY RESULTS

3.4 The agricultural quality of the land is primarily limited by wetness. Other factors were assessed but were not found to have an overall effect on the grading. Land of grade 3 has been identified.

Subgrade 3b

3.5 This Subgrade comprises all of the agricultural land within the site. The moderately high clay content of the topsoils combined with poor drainage (Soil Wetness Class IV) means that access to land is rarely possible with machinery during winter and spring. Arable use of the land is usually limited to autumn-sown combinable crops.

3.6 A small number of observations displayed greater or lesser degrees of wetness limitation (see appended observation logs). While these differences are sufficient to affect the land

[3]Meteorological Office, (1989).*Climatological Data for Agricultural Land Classification*.
[4]MAFF, (1988).*Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

grade, it is judged that these represent patches of variation within land of the same type and grade, rather than systematic variation which could be mapped. This land is therefore included in this Subgrade.

Other land (non-agricultural)

3.7 This comprises roads, water bodies, wooded areas and hard standings.

Grade areas

3.8 The land grade is shown on Map 2 and the area occupied is shown below.

Table 1: Areas occupied by the different land grades

Grade/subgrade	*Area (ha)*	*% of the land*
Subgrade 3b	32.4	92
Other land	2.9	7
Total	35.3	100

APPENDIX
DETAILS OF OBSERVATIONS
MAPS

Cefn Meiriadog: Soils and ALC survey – Details of observations at each sampling point

	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-29	SCL	<5	29-37	HCL	xxx	37-90+	C(r)	xxx	1	IV	3b	W
2	0-25	MCL	<5	25-40	HCL(r)	xxx	40-90+	C(r)	xxx	2	IV	3b	W
3	0-25	SCL	<5	25-38	SCL(r)	xxx	38-70 70+	C(r) Wet (stopped)	xxx	2	IV	3b	W
4	0-24	MCL	<5	24-42	HCL	xxx	42-55 55-90+	HCL C(r)	xxx xxx	1	IV	3b	W
5	0-25	MCL/SCL	<5	25-38	HCL	xxx	38-80+	C(r)	xxx	1	IV	3b	W
6	0-27	HCL	<5	27-44	HCL(r)	xxx	44-80+	C(r)	xxx	0	IV	4/3b	W
7	0-25	MCL	<5	25-40	HCL(r)	xxx	40-90+	C(r)	xxx	2	IV	3b	W
8	0-26	HCL	<5	26-80+	C(r)	xxx				2	IV	3b/4	W
9	0-30	MCL	<5	30-40	HCL(r)	xxx	40-80+	C(r)	xxx	3	IV	3b	W
10	0-28	MCL/HCL	<5	28-38	HCL	xxx	38-52 52-90+	C C(r)	xxx xxx	1	IV	3b	W
11	0-25	MCL	<5	25-60+	C(r)	xxx				2	IV	3b	W
12	0-32	MCL	<5	32-46	HCL	xxx	46-80+	C	xxx	3	IV/III	3b/3a	W
13	0-28	MCL	<5	28-45	HCL	xxx	45-80+	C(r)	xxx	2	IV/III	3b/3a	W
14	0-27	SCL	<5	27-70	SCL	xxx	70-90+	C	xxx	1	III	3a	W
15	0-26	MCL	<5	26-40	MCL	xxx	40-80+	C(r)	xxx	2	IV	3b	W
16	0-30	MCL	<5	30-38	MCL	xxx	38-90+	C(r)	xxx	1	IV	3b	W
17	0-29	MCL	<5	29-41	HCL(r)	xxx	33-60+	C(r)	xxx	2	IV	3b	W
18	0-30	SCL	<5	30-40	HCL(r)	xxx	40-90+	C(r)	xxx	0	IV	3b	W
19	0-32	MCL	<5	32-90	C(r)	xxx				0	IV	3b	W
20	0-24	MCL	<5	24-45	HCL	xxx	45-90+	C(r)	xxx	0	IV	3b	W
21	0-33	MCL	<5	33-52	SCL	xxx	52-90+	C(r)	xxx	2	III	3a	W
22	0-30	MCL	<5	30-43	HCL	xxx	43-90+	C(r) fmn	xxx	2	IV	3b	W
23	0-27	MCL	<5	27-46	HCL	xxx	46-90+	C(r) fmn	xxx	2	IV	3b	W
24	0-34	HCL	<5	34-47	HCL	xxx	47-90+	C(r) fmn	xxx	0	IV/III	3b/3a	W
25	0-22	MCL	<5	22-35	HCL	xxx	35-90+	C(r)	xxx	2	IV	3b	W
26	0-20	MCL	<5	20-27	HCL	xxx	27-90+	C(r)	xxx	1	IV	3b	W
27	0-22	MCL	<5	22-35	C	xxx	35-90+	C(r)	xxx	1	IV	3b	W
28	0-30	MCL	<5	30-80+	C(r)	xxx				2	IV	3b	W

	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
29	0-30	MCL	<5	30-40	HCL	xxx	40-90+	C(r) fmn	xxx	2	IV	3b	W
30	0-32	MCL	<5	32-38	HCL	xxx	38-90+	C	xxx	0	IV	3b	W
31	0-28	MCL	<5	28-40	MCL/ HCL	xxx	40-90+	C(r)	xxx	3	IV	3b	W
32	0-25	MCL	<5	25-31	HCL	xxx	42-80+	C(r)	xxx	1	IV	3b	W
33	0-30	MCL	<5	30-38	MCL	xxx	42-90+	C(r)	xxx	1	IV	3b	W
34	0-25	MCL	<5	25-33	MCL	xxx	33-60	C(r) Wet (stopped)	xxx	2	IV	3b	W
35	0-25	MCL	<5	25-67	C(r)	xxx	67+	Stopped on stones		2	IV	3b	W
36	0-33	MCL	<5	33-42	HCL	xxx	42-80+	C(r)	xxx	1	IV	3b	W
37	0-24	MCL	<5	24-42	HCL(r)	xxx	42-90+	C(r)	xxx	1	IV	3b	W
38	0-33	MCL	<5	33-46	HCL	xxx	46-90+	C(r)	xxx	0	IV	3b	W
39	0-25	MCL	<5	25-36	HCL	xxx	36-80+	C(r)	xxx	2	IV	3b	W
40	0-27	MCL	<5	27-45	HCL	xxx	45-63 63-90+	HCL C(r)	xxx xxx	2	IV	3b	W
41	0-26	MCL	<5	26-42	MCL	xxx	42-80+	C(r)	xxx	1	IV	3b	W
42	0-26	MCL	<5	26-38	MCL	xxx	38-90+	C(r)	xxx	1	IV	3b	W
43	0-26	MCL	<5	26-43	MCL	xxx	43-62 62-90+	HCL(r) C(r)	xxx xxx	1	IV	3b	W
44	0-29	MCL	<5	29-90+	C(r)	xxx				0	IV	3b	W
45	0-23	MCL	<5	23-40	HCL	xxx	40-80+	C(r)	xxx	2	IV	3b	W
46	0-27	MCL (dist)	<5	27-40	HCL	xxx	40-80+	C(r)	xxx	0	IV	3b	W
47	0-31	MCL	<5	31-43	HCL	xxx	43-90+	C(r)	xxx	1	IV	3b	W
48	0-26	MCL	<5	26-38	HCL	xxx	38-90+	C(r)	xxx	1	IV	3b	W
49	0-31	HCL	<5	32-90+	C(r)	xxx				1	IV	3b	W
50	0-27	HCL	<5	27-80+	C(r)	xxx				1	IV	3b	W
51	0-28	MCL	<5	28-37	HCL(r)	xxx	37-80+	C(r)	xxx	1	IV	3b	W

Soil log key

Gley indicators[1]

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 f-m concentrations (gleyed horizon)
xxxx	dominantly blueish matrix, often with some ochreous mottles (gleyed horizon)

Texture[2]

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

Limitations:

W - wetness/workability
D - droughtiness
De - depth
F - flooding
St – stoniness
Sl – slope
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)
(very slightly, slightly, moderately, very, extremely) calcareous[7]

Slowly permeable layers[4]

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

A wavy underline (e.g. <u>50</u> indicates the top of a layer borderline to slowly permeable

Wetness Class[5]

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

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

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

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

[3] Occasionally recorded in the texture box

[4]Permeability 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)

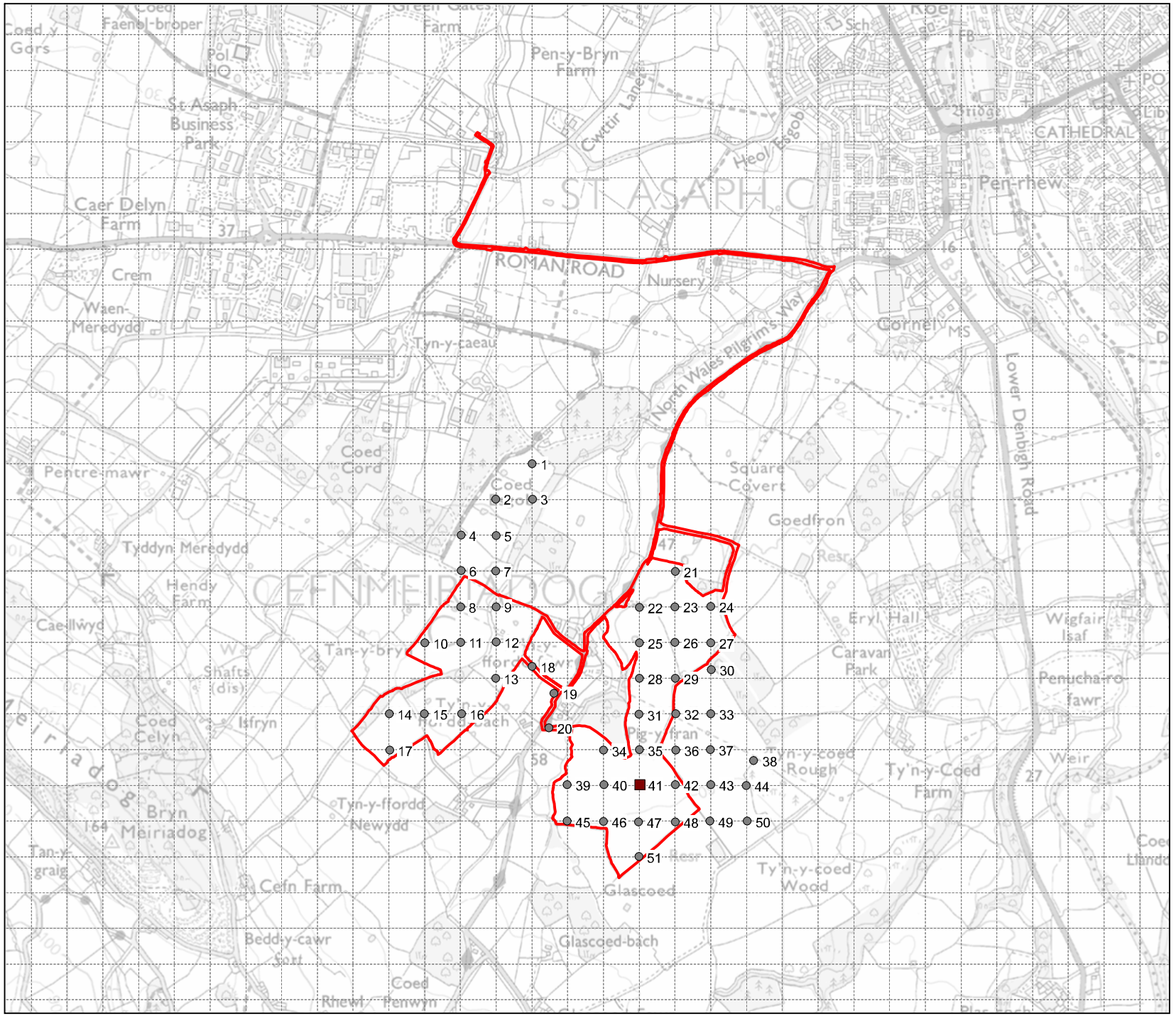
[5]Soil Wetness Classes are defined in Hodgson (1997)

[6]stoniness classes as defined in Hodgson (1997)

[7]calcareous classes as defined in Hodgson (1997)

Grades in brackets eg. (3a) raised by one grade due to calcareous topsoil

Observations close to or on grade boundaries are sometimes recorded as borderline e.g. 3a/3b. In these cases the former grade shows the estimated grading according to the criteria



KEY

- Auger observations
- Pits
- Site boundary

Site:

Cefn Meriadog

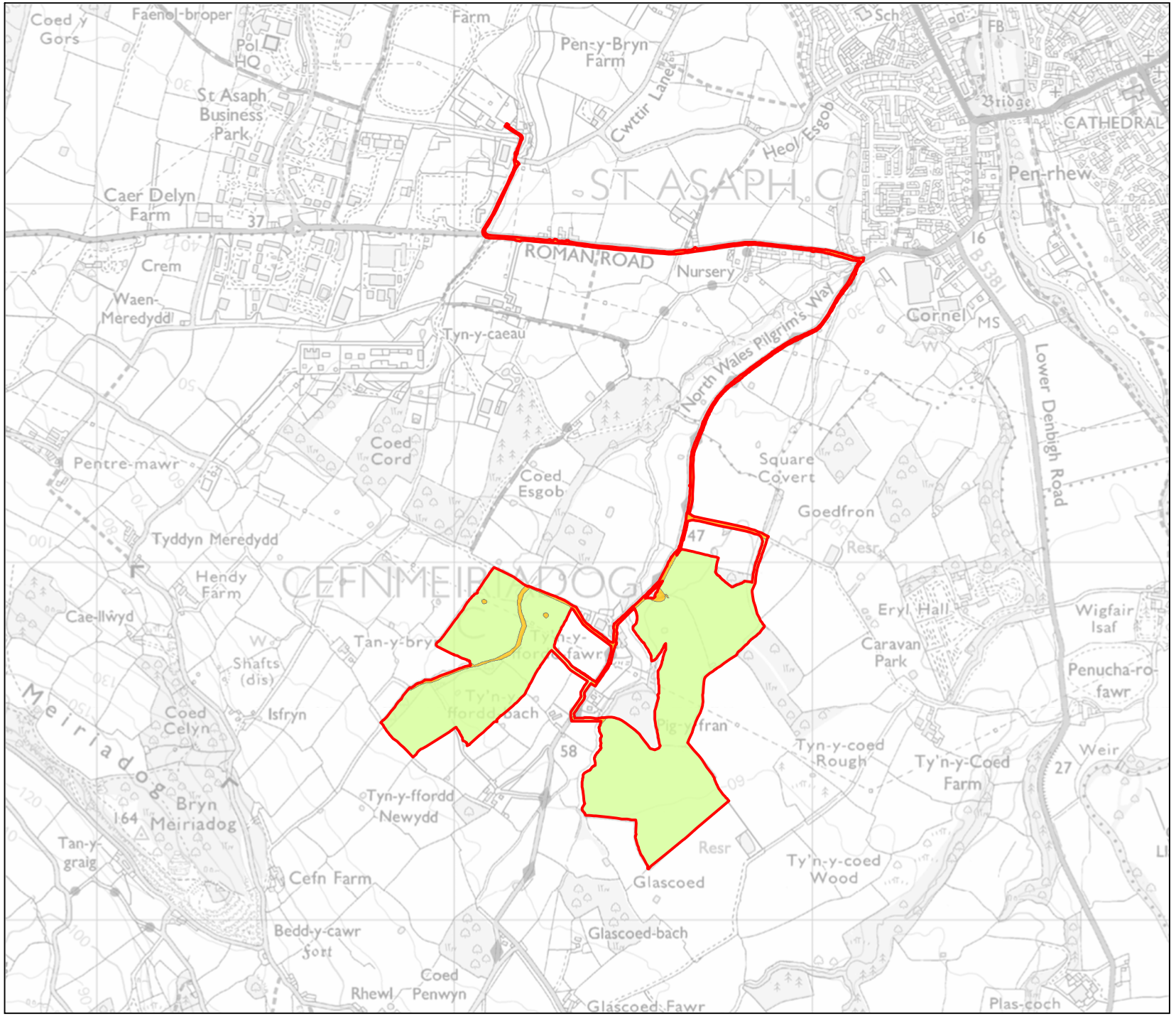
Map title:

MAP 1
Observations

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

Date: 28/04/2025

Scale: 1:15,000



KEY

- Subgrade 3b
- Other land
- Site boundary

Site:

Cefn Meriadog

Map title:

MAP 2
Agricultural Land Classification

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

Date: 28/04/2024

Scale: 1:15,000