

**AGRICULTURAL QUALITY
OF LAND AT BRYN RODYN
OLD COLWYN**

Report 1669/1

28th February, 2020

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SUMMARY

An agricultural land quality survey has been undertaken of 10.7 ha of land at Bryn Rodyn, Dolwyn Road, Old Colwyn, LL29 8UU.

The land has fine loamy soils of variable depth and drainage. Agricultural land quality is mainly limited to subgrade 3b, 4 and 5 by slope gradient and wetness, with a small area of subgrade 3a (limited by wetness).

1.0 Introduction

- 1.1 This report provides information on the agricultural quality of 10.7 ha of land at Bryn Rodyn, Dolwyn Road, Old Colwyn, LL29 8UU. The report is based on the findings of a detailed survey of the site in February 2020.

SITE ENVIRONMENT

- 1.2 The site comprises six fields, bordered to the west by Dolwen Road, to the north by a stream, to the east by historic landfill and to the south by adjoining grassland.
- 1.3 The land slopes steeply to the north and east, from a summit in the south at an elevation of approximately 115 m AOD.

AGRICULTURAL USE

- 1.4 At the time of survey the land was under grass grazed by sheep and ponies.

PUBLISHED INFORMATION

- 1.5 1:50,000 scale BGS information records the geology of the land as Devensian glacial till over Elwyn Formation mudstone.
- 1.6 A reconnaissance detail soil map of the area (published at 1:250,000 scale) shows the land as Denbigh 1 Association, comprising mainly moderately shallow fine loamy soils over slate and mudstone. Cegin Association (slowly permeable fine silty and loamy soils formed in glacial till) are also recorded in the locality¹.
- 1.7 The Welsh Government Predictive Agricultural Land Classification Map estimates the grade of the land as subgrade 3b on the steeper slopes, and subgrade 3a elsewhere. No detailed survey of the land has previously been published.

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 soil resource and agricultural quality survey was carried out in February 2020. It was based on observations at intersects of a 100 m grid, giving a sampling density of four observations 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 Soils at the site were found to be medium to fine loamy (heavy and medium silty clay loams and clay loams) with evidence of seasonal waterlogging (greyish and ochreous mottled *gley* colouration) in the subsoil to shallow depth. Depth over bedrock varies from 60-70 cm on steeper slopes to over 120 cm on lower slopes. In most places poorly-structured slowly permeable lower subsoil layers are present (Soil Wetness Class III); where soils are shallower and stonier, they are moderately permeable (Soil Wetness Class II) and in places on lower slopes, slowly permeable subsoil occurs immediately below the topsoil (Soil Wetness Class IV).

2.3 An average profile is described below from a pit at observation 7 (Map 1).

0-24 cm	Very dark greyish brown (10YR 3/2) medium silty clay loam; slightly stony (10% small and medium hard siltstone); well developed medium and coarse sub-angular blocky structure; friable; smooth clear boundary to:
24-33 cm	Light greyish brown (10YR 6/2) medium silty clay loam with common distinct fine yellowish brown (10YR 5/8) mottles; slightly stony; moderately developed coarse sub-angular blocky structure; friable; porous; smooth gradual boundary to:
33-70 cm	Grey (10YR 6/1) heavy silty clay loam with common distinct reddish yellow (7.5YR 6/8) mottles; moderately stony (25% medium and coarse siltstone); weakly developed coarse angular blocky structure; firm; <1% macro-pores; uneven diffuse boundary to:
70 cm+	Broken slatey siltstone.

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 Classification². The relevant site data for an average elevation of 80 m is given below.

- Average annual rainfall: 913 mm
- January-June accumulated temperature >0°C 1388 day°
- Field capacity period 206 days
(when the soils are fully replete with water) mid Oct-early May
- Summer moisture deficits for: wheat: 85 mm
potatoes: 70 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 MAFF³.

SURVEY RESULTS

3.4 The agricultural quality of the land is determined by wetness, slope and depth. Land of grades 3, 4 and 5 has been identified.

Subgrade 3a

3.5 This subgrade includes land on the gentler slopes. The soils have slightly impeded drainage (Soil Wetness Class II to III) and medium loamy topsoil. Under the local climate these soils are too wet to cultivate in winter and early spring, although late spring, as well as autumn-sowings are usually possible.

²Meteorological Office, (1989). *Climatological Data for Agricultural Land Classification*.

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

Subgrade 3b

- 3.6 This land has slope gradients between 7 and 11 degrees, which limits the use of some agricultural machinery and increases erosion risk under cultivation.
- 3.7 Wetness resulting from the combination of moderately high topsoil clay content and poor subsoil drainage means that parts of this land is likely to be too wet to cultivate in spring, limiting potential arable use to autumn-sowings. This is an equally limiting factor to land on steeper slopes, and the most limiting factor elsewhere.

Grade 4

- 3.8 This land has slope gradients between 11 and 18 degrees, which limits the safe use of the land to improved pasture.
- 3.9 Some low-lying areas in the north and east have heavy topsoils and poor drainage (Soil Wetness Class IV) which means this land is limited by wetness, making it unsuitable for regular arable cropping.

Grade 5

- 3.10 This land has slope gradients over 18 degrees, which limits the use of the land to rough grazing.
- 3.11 Also included is an area in the east recently cleared from scrub. This land has severe wetness limitations and is deeply rutted due to the process of removal; it is only suitable for rough grazing without major investment (beyond the scope of normal agricultural recommendations).

Non Agricultural

- 3.12 This land comprises a woodland copse in the north-west and a farm track in the south-east.

Grade areas

- 3.13 The boundary of the land grades are shown on Map 2 and the areas occupied shown below.

Table 1: Areas occupied by the land grades

<i>Grade/subgrade</i>	<i>Area (ha)</i>	<i>% of the land</i>
Subgrade 3a	19	19
Subgrade 3b	55	55
Grade 4	19	19
Grade 5	4	4
Non Agricultural	2	2
Total	10.7	100

APPENDIX

MAPS AND DETAILS OF OBSERVATIONS

Land at Bryn Rodyn: ALC and soil resources survey – Details of observations at each sampling point

Obs No	Topsoil			Upper subsoil			Lower subsoil			Slope (°)	Wetness Class	Agricultural quality	
	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling			Grade	Main limitation
1	0-24	HCL	<5	24-34	HCL	xxx	<u>34-65</u> 65+	HCL waterlogged	xxx	4	IV	4	W
2	0-31	HZCL	<5	31-41	HZCL	xxx	<u>41-90+</u>	HCL	xxx	8	III	3b	W/SI
3	0-32	HCL	<5	32-80+	HCL	xxx				5	II	3a	W
4	0-30	MZCL	<5	30-45	MZCL	xxx	<u>45-64</u> 64-90+	HCL mstHCL	xxx xxx	11	III	3b	SI
5	0-30	MZCL	<5	30-90+	MCL	xxx				12	II	4	SI
6	0-18	MZCL	<5	<u>18-60</u>	HCL	xxx	60+	Waterlogged		4	IV	3b	W
7	0-24	MZCL	<5	24-33	MZCL	xxx	<u>33-70</u> 70+	HZCL R	xxx	5	III	3a	W
8	0-23	MZCL	<5	23-33	MZCL	xxx	<u>33-67</u> 67+	HCL Stopped on stones	xxx	8	III	3b	SI
9	0-30	M/HZCL	<5	30-48	HZCL	xxx	<u>48-78</u> 78+	HZCL Stopped on stones	xxx	8	IV	3b/4	W

Key to table

Mottle intensity:

- o unmottled
- x few to common rusty root mottles (topsoils) or a few ochreous mottles (subsoils)
- xx common to many ochreous mottles and/or dull structure faces
- xxx common to many greyish or pale mottles (gleyed horizon)
- xxxx dominantly grey, often with some ochreous mottles (gleyed horizon)

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

Texture:

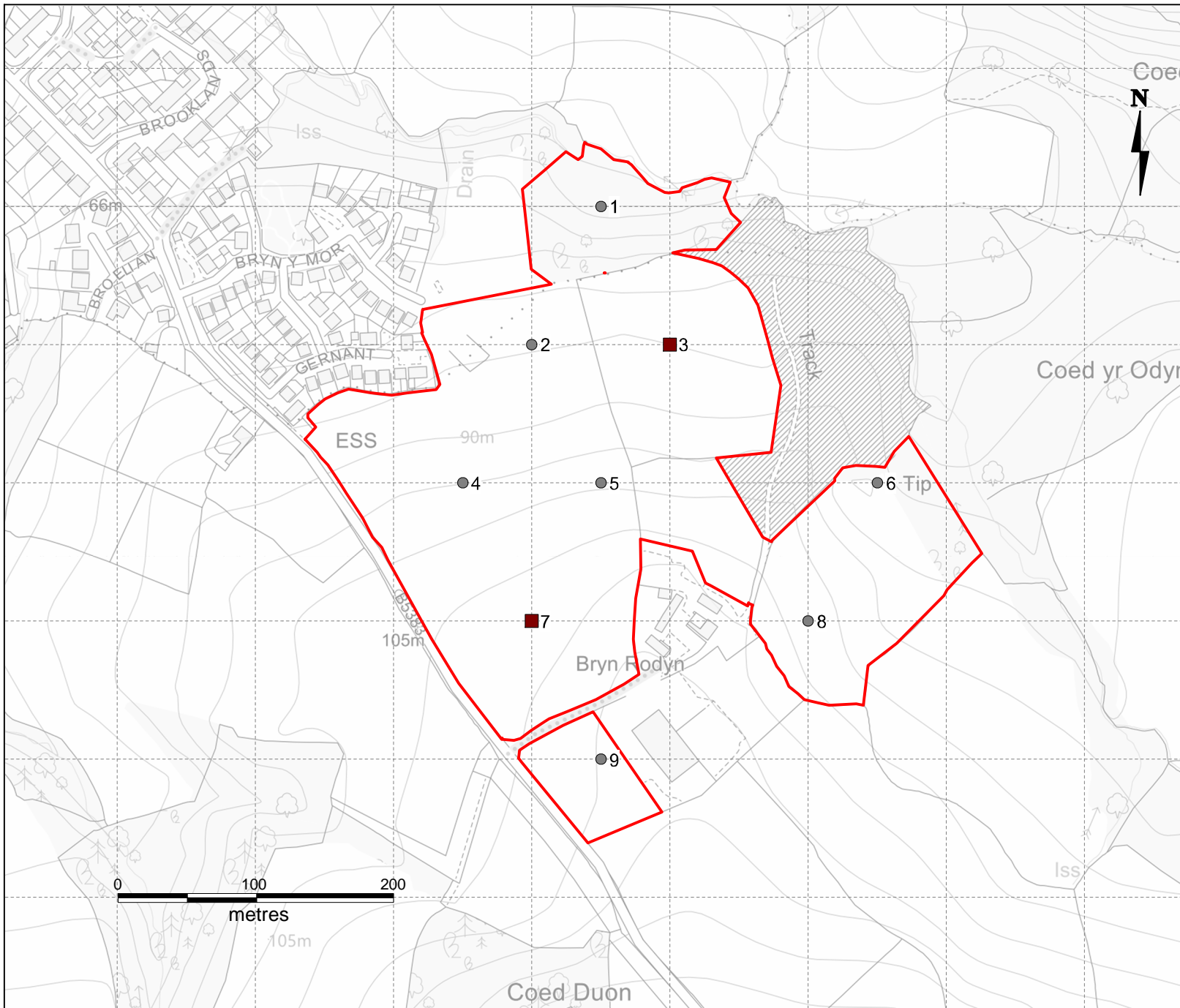
- C - clay
- ZC - silty clay
- SC - sandy clay
- CL - clay loam (H-heavy, M-medium)
- ZCL - silty clay loam (H-heavy, M-medium)
- SCL - sandy clay loam
- SZL - sandy silt loam (F-fine, M-medium, C-coarse)
- SL - sandy loam (F-fine, M-medium, C-coarse)
- LS - loamy sand (F-fine, M-medium, C-coarse)
-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

Limitations:

- W - wetness/workability
- D - droughtiness
- De - depth
- St - stoniness
- SI - slope
- F - flooding
- T - topography/microrelief

Texture suffixes & prefixes:

- ca – calcareous: x-extremely, v-very, sl-slightly (ca) marginally calcareous
- mn - ferrimanganiferous concentrations
- gn – greenish, yb – yellowish brown, rb – reddish brown
- r – reddish; (v)st – (very) stony; sdst – sandstone; lst - limestone
- dist - disturbed soil layer; mdst - mudstone



KEY

- Observation point
- Soil description pit
- Survey area

Client:

Maxi Developments

Site:

Bryn Rodyn

Map title:

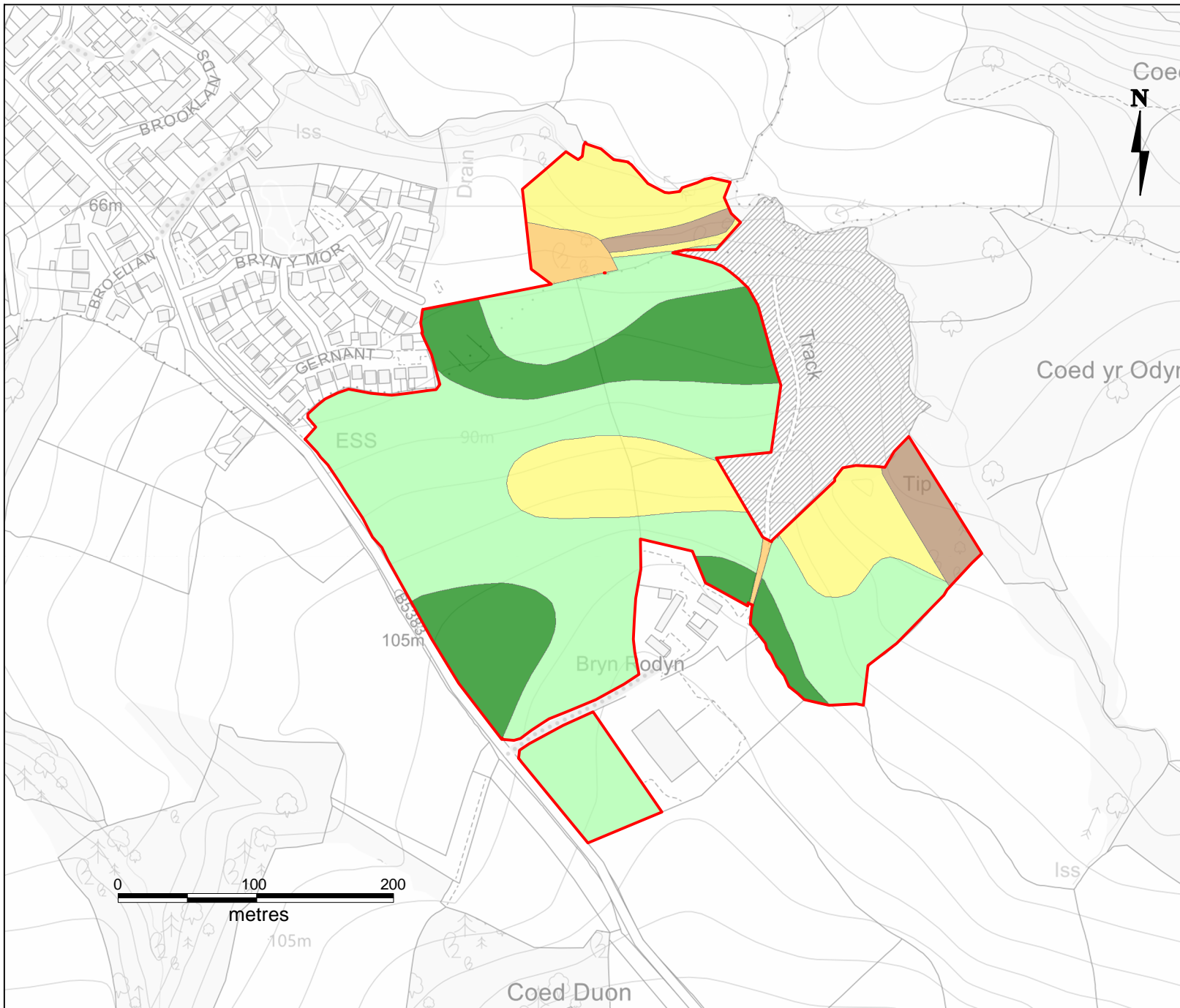
**Map 1
Observations**









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Scale: 1:4,000

Date: 27/02/2020



KEY

-  Subgrade 3a
-  Subgrade 3b
-  Grade 4
-  Grade 5
-  Non Agricultural
-  Survey area

Client:

Maxi Developments

Site:

Bryn Rodyn

Map title:

**Map 2
Agricultural Land
Classification**



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Scale: 1:4,000

Date: 27/02/2020