



Land off Rhigos Road, Rhigos, Hirwaun,
Rhondda Cynon Taff
Agricultural Land Classification

ADAS GENERAL NOTES

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Title: Land off Rhigos Road, Rhigos, Hirwaun, Rhondda Cynon Taff - Agricultural Land Classification

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK ADAS Ltd.

EXECUTIVE SUMMARY

ADAS have been instructed by Regener8 Power to undertake an agricultural land classification survey of 15.9 ha of land off Rhigos Road, Rhigos, Hirwaun, Rhondda Cynon Taff. The survey covers a block of several agricultural fields to the west of the A4061 road and south of the Rhigos Road (minor road). At the time of the survey the land was supporting grass for sheep grazing.

The survey has identified land with medium clay loam, heavy clay loam and heavy silty clay loam topsoils over clay subsoil.

These soils form agricultural land of Grade 5 (15.9 ha, 100%). The main limitation to the agricultural use of the land is soil wetness

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1 INTRODUCTION

RSK ADAS has been instructed by LUC to undertake an agricultural land classification survey. This report provides information on the soils and agricultural quality of 15.9 ha of land off Rhigos Road, Rhigos, Hirwaun, Rhondda Cynon Taff. The report is based on a survey of the land undertaken in June 2022.

1.1 Site Environment

The survey covers a block of several agricultural fields. There is a history of mining activity at the site and restoration was completed in 1995¹.

The elevation rises from about 220 m Above Ordnance Datum (AOD) to about 240 m at the southern boundary.

At the time of survey, the land was supporting grassland being used for sheep grazing.

1.2 Published Information

1.2.1 Geology

1:50,000 scale BGS information² records the basal geology of the site as mudstones, siltstones and sandstones, of the South Wales Lower Coal Measures Formation, a sedimentary bedrock formed 318 to 319 million years ago. With the exception of a limited area in the centre of the site there are superficial deposits of Till (Devensian) covering the site.

1.2.2 Soils

The national soils map, published at 1:250,000 scale³, records the site as belonging to the Neutral Restored Opencast soil association, where the land has been restored following opencast coal workings. The soils are described as being slowly permeable seasonally waterlogged compacted fine loamy and clayey disturbed soils. The soils may be stony and have thin topsoils.

The Welsh Government Predictive ALC map⁴ show the site as Grade 5.

¹ Information from applicant's Environmental Search

² British Geological Survey, 2019. *Geology of Britain viewer*. Online resource:
<http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>

³ Soils of England and Wales Sheet 2 Wales. Cranfield University

⁴ Welsh Government. https://datamap.gov.wales/layers/inspire-wg:wg_predictive_alc2

2 METHODOLOGY

A detailed soil survey was carried out in June 2022. The survey was based on observations at intersects of a 100 m grid, giving a sampling density of one observation per hectare. During the survey soils were examined via a combination of auger borings and a soil description pit to a maximum depth of 1.2 m. A log of the details of each observation point is attached to this report as Appendix 3. A map showing the location of each observation point is attached to this report as Appendix 1.

One soil description pit was dug at this site. A topsoil sample representative of the top 25 cm was taken in the vicinity of observation point 8 and submitted to NRM laboratories for particle size distribution analysis by the pipette methodology, to confirm site findings. The results of these analyses are given in Section 3 and in Appendix 4.

3 SOILS

3.1 Soil Types

The soils are formed in restored opencast coal workings. One soil type is identified. The soils profiles are clayey with stone, coal fragments and weathered sandstone present in the topsoil.

3.1.1 Clayey soils

The soils have either a medium clay loam, a heavy clay loam or heavy silty clay loam topsoil. In many places augering to depth was prevented by either the presence of stone or a compact layer of coal fragments. In places where augering below a depth of 35 cm from the surface was possible the upper subsoil was clay. The stone content of the topsoil was 16-35% (moderately stony) and the stone content of the upper subsoil was 36-70% (very stony).

The roots in the grass formed a dense mat within a depth of 4cm from the surface with prominent root mottling present.

An example soil profile is described below from the pit at observation 8. The pit was hand dug to 20cm and augered below this depth (see Map 1).

- | | |
|----------|--|
| 0-10 cm | Dark grey (2.5Y3/1) medium clay loam; moderately stony (25%) with stones >10 cm in length; weakly developed medium subangular blocky structure; firm; coal fragments; common fine fibrous roots. |
| 10-40 cm | Dark grey (2.5Y3/1) medium clay loam; moderately stony (25%) with small stones; weakly developed medium subangular blocky structure; firm; few less than 0.5% biopores greater than 0.5mm. |
| 40cm + | Very stony (50%) with small angular stones. |

The soils are placed in Wetness Class VI due to the climatic regime of the area (Field Capacity Days figure of 358 days).

3.1.2 Laboratory Analysis

Soil subsamples representative of the top 25 cm of the soil profile were taken in the vicinity of observation point 8. These subsamples were bulked to make up the soil sample that was submitted to NRM Laboratories for particle size distribution (PSD) analysis by the pipette method. The texture are given in the table below.

Table 3.2: PSD analysis results

Observation	PSD Analysis
8	Medium clay loam

4 AGRICULTURAL LAND CLASSIFICATION

The Agricultural Land Classification (ALC) system⁵ provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use for food production. The limitations can operate in one or more of four principal ways; they may affect the range of crops which can be grown, the level of crop yield, the consistency of crop yield, and the cost of obtaining a crop.

The classification system gives considerable weight to flexibility of cropping, whether actual or potential, however the ability of some land to produce consistently high yields of a narrower range of crops is also taken into account.

The Agricultural Land Classification (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 by the then Ministry of Agriculture, Fisheries and Food (MAFF) in the 1960s and revised in 1988. A description of the grades used in the ALC system is attached to this report as Appendix 5.

4.1 Climate

The agricultural climate is an important factor in assessing the agricultural quality of land, and the agricultural climate of this site has been calculated using the Climatological Data for Agricultural Land Classification⁶. The relevant site data for an average elevation of 230 m AOD (Grid Reference SN 934 056) is given below.

⁵ Agricultural Land Classification of England and Wales, Revised guidelines and criteria for grading the quality of agricultural land, MAFF 1988 (now a Natural England/Defra publication)

⁶ Meteorological Office, (1989). Climatological Data for Agricultural Land Classification.

Table 4.1: Agro-climatic variables

Average Annual Rainfall (AAR)	1934mm
January-June Accumulated Temperature (AT0)	1287 day °C
Field Capacity Days (FCD)	358
Field Capacity Period	January- December
Moisture Deficit Wheat (MDW)	22mm
Moisture Deficit Potatoes (MWP)	2mm
Climate (upper grade limit)	4

The combination of rainfall and temperature at this site mean that there is an overall climatic limitation to the agricultural use of the land. The site cannot be classified higher than Grade 4.

4.2 Results

The results of the soil survey described in section 3 were used in conjunction with the agro-climatic data above to classify the land according to the revised guidelines for Agricultural Land Classification issued in 1988 by the Ministry of Agriculture, Fisheries and Food (now Defra)⁷.

This report has identified agricultural land of Grade 5 quality. The principal limitation to agricultural use of the land is soil wetness.

4.2.1 Grade 1

No land of this quality has been mapped.

4.2.2 Grade 2

No land of this quality has been mapped.

4.2.3 Subgrade 3a

No land of this quality has been mapped.

4.2.4 Subgrade 3b

No land of this quality has been mapped.

⁷ MAFF, (1988). *Agricultural Land Classification for England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land*.

4.2.5 Grade 4

No land of this quality has been mapped.

4.2.6 Grade 5

Land of this quality is found across the whole site and the main limitation to the agricultural use of the land is soil wetness. For ALC purposes the soil wetness assessment takes account of the climatic regime, the soil water regime and the texture of the top 25 cm of the soil. The Field Capacity Days figure at the site is 358. The agroclimatic parameter of median duration of Field Capacity Days (FCD) is used to estimate the duration of the period when the soil moisture deficit is zero. When assessing the Wetness Class for this site where a soil profile is wet within 40 cm depth for more than 335 days in most years (more than 10 out of 20 years) the soils are placed in Wetness Class VI. The climatic regime overrides the texture of the top 25 cm of the soil and the grade according to soil wetness is Grade 5.

4.2.7 Non-agricultural

No land of this quality has been mapped.

4.2.8 Urban

No land of this quality has been mapped.

4.3 Summary of grade areas

The Agricultural Land Classification grade of land is shown in Appendix . The area occupied by each grade is shown below.

Table 4.3: Grade areas

Grade/subgrade	Area (ha)	Area (%)
Grade 1	-	-
Grade 2	-	-
Subgrade 3a	-	-
Subgrade 3b	-	-
Grade 4	-	-
Grade 5	15.9	100
Non-agricultural		
Urban	-	-
Total	15.9	100

5 CONCLUSION

The survey has identified land with either a medium clay loam, a heavy clay loam or a heavy silty clay loam topsoil over clay subsoil. The Field Capacity Day figure of 358 places the site in Wetness Class VI and Grade 5.

These soils form agricultural land of Grade 5 (15.9 ha, 100%).

Appendix 1 – Agricultural Land Classification and Location of Observations



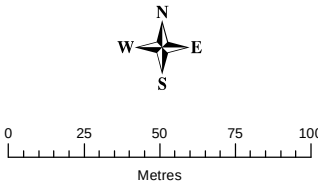
LUC

Rhigos Road, Hirwaun.
Solar Site

Appendix 1 ALC and Auger Bore Plan

- Option area
- 2
- 3a
- 3b
- 4
- 5
- Non-ag
- Urban
- Auger point
- Soil pit

Drawn by Paul Taylor 18/07/2022, Verified by Ruth Metcalfe 18/07/2022



Scale 1:2,500 at A3 size

Imagery taken from Microsoft Virtual Earth (Bing).
July 2022.

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Appendix 2 – ALC Survey Details

Key

o – unmottled soil;

x – a few (<2%) ochreous mottles;

xx – common (2-20%) to many (20-40%) ochreous mottles OR greyish or pale soil, typically with a few ochreous mottles;

xxx – greyish or pale colours dominant in matrix and/or ped faces and common to very many (>40%) ochreous mottles OR if reddish colours are dominant in the matrix, > 2% greyish, brownish or ochreous mottles or ferri-manganiferous concentrations, and dominantly pale coloured ped faces (gleyed horizon);

xxxx – dominantly grey soil, often with some ochreous mottles (gleyed horizon).

MUNSELL SOIL COLOURS

2.5Y3/1-very dark grey

2.5Y4/1- dark grey

5Y3/1- very dark grey

5Y4/1- dark grey

7.5YR4/4- brown

Appendix 3 – ALC SOIL OBSERVATIONS

											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	Stones (%)			Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)	
						Total	>2cm	>6cm								Litho'
1	25	2.5Y3/1	HZCL	xx		15			hr	difficult to auger >30cm stone	<7	VI	5	1	5	WE
	30	7.5YR4/4	C		yes	30			hr		Droughtiness Calculation					
											APw	APp	MBW	MBP	Droughtiness grade	
											92	80	70	78	1	
2	25	5Y3/1	HZCL	o		15			hr	coal fragments	<7	VI	5		5	WE
											Droughtiness Calculation					
											MDW	MDP	MBW	MBP	Droughtiness grade	
3	35	2.5Y3/1	HCL	o		15			hr	coal fragments; weathered sandstone						
	50	5Y4/1	C	o	yes						<7	VI	5		5	WE
											Droughtiness Calculation					
											APw	APp	MBW	MBP	Droughtiness grade	
4	10	2.5Y4/1	MZCL	xxx						stone stopped auger						
											<7	VI	5		5	WE
											Droughtiness Calculation					
											APw	APp	MBW	MBP	Droughtiness grade	

Auger	Depth (cm)	Colour	Texture	Mottling	SPL	Stones (%)			Notes	Agricultural Land Classification					
						Total	>2cm	>6cm		(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
5	30	2.5Y3/1	HZCL	o		10			hr	stone and coal fragments	<7	VI	5		WE
											APw	APp	MBW	MBP	Droughtiness grade
6	30	5Y3/1	HZCL	xxx		10			hr		<7	VI	5	5	WE
											APw	APp	MBW	MBP	Droughtiness grade
7	10	2.5Y3/1	HZCL							coal fragments	<7	VI	5	5	WE
											APw	APp	MBW	MBP	Droughtiness grade
8	17	2.5Y3/1	MCL	o						stone stopped auger	<7	VI	5	5	WE
											APw	APp	MBW	MBP	Droughtiness grade
9	10	2.5Y4/1	MZCL	xxx							<7	VI	5	5	WE
											APw	APp	MBW	MBP	Droughtiness grade
10	10	2.5Y3/1	HZCL							coal fragments	<7	VI	5	5	WE
											APw	APp	MBW	MBP	Droughtiness grade

Auger	Depth (cm)	Colour	Texture	Mottling	SPL	Stones (%)				Notes	Agricultural Land Classification					
						Total	>2cm	>6cm	Litho'		(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
11	30	2.5Y3/1	HZCL	xx						coal fragments	<7	VI	5		5	WE
											Droughtiness Calculation					
											APw	APp	MBW	MBP	Droughtiness grade	
12	10	2.5Y3/1	HZCL	o		3	3		1	soil dry	<7	VI	5		5	WE
											Droughtiness Calculation					
											APw	APp	MBW	MBP	Droughtiness grade	
13	10	2.5Y3/1	HZCL								<7	VI	5		5	WE
											Droughtiness Calculation					
											APw	APp	MBW	MBP	Droughtiness grade	
14	10	5Y3/1	HZCL							gritty difficult to auger	<7	VI	5		5	WE
											Droughtiness Calculation					
											APw	APp	MBW	MBP	Droughtiness grade	
15	13	2.5Y3/1	HZCL	o		2	2		1	dry; coal fragments	<7	VI	5		5	WE
											Droughtiness Calculation					
											APw	APp	MBW	MBP	Droughtiness grade	

Appendix 4 – PSD Analysis



ANALYTICAL REPORT											
Report Number	23175-22	K740	DARREN INGRAM	Client	RHI-R METCALFE						
Date Received	28-JUN-2022		RSK ADAS LTD		SOIL 17-06-2022						
Date Reported	04-JUL-2022		PRESTON WYNNE								
Project	1010990		HEREFORD								
Reference	RHI R METCALFE		HR1 3PG								
Order Number											
Laboratory Reference	SOIL568031										
Sample Reference	s										
Determinand	Unit	SOIL									
Sand 2.00-0.063mm	% w/w	29									
Silt 0.063-0.002mm	% w/w	47									
Clay <0.002mm	% w/w	24									
Textural Class **		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. ** Please see the attached document for the definition of textural classes.											
Reported by <i>Linaben Patel</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											

Appendix 5 – Description of ALC Grades

The ALC Grades and Subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to the land's physical characteristics, for which the cut-offs are described in Section 3 of the 1988 MAFF (now Defra) ALC guidelines. The most productive and flexible land falls into Grades 1, 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is either of moderate quality (Subgrade 3b) or poor quality (Grade 4). Although less significant on a national scale, such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor-quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 on Grade 1 land.

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 agriculture land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.