

**AGRICULTURAL QUALITY AND USE OF
LAND OFF ROCKFIELD ROAD,
MONMOUTH**

Report 615/1

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1.0 Introduction

- 1.1 This report provides information on the agricultural quality and use of 4.3 ha of land adjacent to Rockfield Road, Monmouth. The report is based on a soil and agricultural desk study and a survey of the land in March 2008.

1.2 SITE ENVIRONMENT

- 1.2.1 The site comprises a single 4.27 ha agricultural field that abuts the Kingswood Road housing estate and Rockfield Road. The northern and western boundaries are to agricultural fields, and a property 'Newbolds Paddock' sits adjacent to the north-east corner. A perennial stream runs alongside the eastern side, between the field and the road. The field rises gently from an elevation of 25 m on the roadside to almost 30 m midway along the northern edge.

1.3 LAND USE

- 1.3.1 The field is part of a nearby farm and is sown to ryegrass used for the production of animal fodder. A public footpath crosses the site from south to north and is well used for dog walking, etc. Dog walkers have also established a circular path around the field.

1.4 PUBLISHED INFORMATION

- 1.4.1 A published soil survey at a scale of 1:250,000¹ shows the site covered by soils of the Bromyard association, a sequence of reddish mainly silty soils over interbedded silty shales, siltstones and occasional fine sandstones.

¹ *Soils and their Use in Wales*. Rudeforth, C.C. et al. (1984). Bulletin No 11. Soil Survey of England and Wales, Harpenden.

- 1.4.2 Reconnaissance agricultural land classification mapping carried out in the 1970s² shows the site and the undisturbed agricultural land immediately around it to be grade 3.

² *Provisional Agricultural Land Classification, 1:63,360 series: Sheet 142.* Ministry of Agriculture Fisheries and Food 1975.

2.0 Agricultural Quality

2.1 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 its physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF Agricultural Land Classification (ALC) system classifies land into five grades numbered 1 to 5, with grade 3 divided into two sub-grades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

2.2 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 Classification*³. The relevant data for the locality is given below.

- Average annual rainfall: 815 mm
- January-June accumulated temperature >0°C 1503 day°
- Field capacity period 182 days
(when the soils are fully replete with water) mid Oct-mid May
- Summer moisture deficits for: wheat: 103 mm
potatoes: 95 mm

2.3 A detailed land classification survey was carried out on 19th March 2008, based on a 50 m grid and giving a sampling density of almost 3 per hectare. During the survey, soils were examined by a combination of pits and augerings to a maximum depth of 1.1 m. A log of the sampling points and a map (Map 2) showing their location is in an appendix to this report. The results of the survey were used in conjunction with the agroclimatic data above to classify the site using the revised guidelines

³ *Climatological Data for Agricultural Land Classification*. Meteorological Office, 1989

for agricultural land classification issued in 1988 by the Ministry of Agriculture, Fisheries and Food⁴.

2.5 SURVEY RESULTS

2.5.1 The land grades encountered are described below.

2.6 Grade 2

2.6.1 This grade accounts for the majority of the field. Topsoils are in most places of medium silty clay loam texture and typically 24 cm thick, though somewhat thinner around the field margins. They are over permeable reddish brown subsoils of medium silty clay loam, medium clay loam or, occasionally fine sandy loam. Mottles are rare above a depth of about 70 cm though some contain a few ferri-manganiferous concentrations. Below 70 cm there is a slight increase in clay content and density and ferri-manganiferous concentrations can become more common. In some places the soils pass to a weathering fringe of micaceous siltstones and fine sandstones within 1 m of the surface.

2.6.2 A typical soil profile from the Grade 2 land from observation 11 is described below:

0-24 cm	Dark brown (7.5YR 3/4) medium silty clay loam to clay loam; rare stones; moderately developed fine and medium subangular blocky structure with 5% medium macropores; many fine fibrous roots; sharp even boundary to:
24-65 cm	Reddish brown (5YR 4/4) medium silty clay loam to clay loam; rare stones; weakly developed medium and coarse subangular blocky structure with 5% medium macropores; permeable; common fine fibrous roots; clear even boundary to:
65-95 cm	Reddish brown (5YR 4/4) stoneless medium clay loam; structureless but with 2% macropores; permeable; a few fine fibrous roots; abrupt even boundary to:
80-105 cm	Reddish brown (2.5YR 4/4) heavy silty clay loam with a few fragments of soft siltstone; weak very coarse prismatic structure with 2% macropores; common ferrimanganiferous concretions; permeable.

2.6.3 This land is limited only slightly in agricultural use by restricted workability as a result of the long field capacity period.

⁴ *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*. MAFF, 1988.

2.7 Sub-grade 3a

2.7.1 This sub-grade accounts for 15% of the site, mainly in the eastern end adjacent to the stream. Topsoils and the upper part of the subsoils are very similar to the grade 2 land described except that the upper subsoil is somewhat heavier. However at a depth of 45-65 cm below the surface a reddish brown heavy clay loam or silty clay is encountered. Mottling is subdued but the density and slightly greyer structure faces confirm the slow permeability of this layer. There are also bands with many ferrimanganiferous concretions. Sub-grade 3a land in the south-west corner of the field is an area borderline to rushy ground in the adjacent field, land possibly affected by high groundwater.

2.7.2 This land is limited in agricultural use by restricted workability as a result of temporary waterlogging above the clay (Wetness Class III).

2.8 Grade areas

2.8.1 The boundaries between the different grades of land are shown on Map 1 and the areas occupied by each are shown below.

Table 1. Areas occupied by the different land grades

GRADE/SUBGRADE	AREA (HA)	% OF SITE
Grade 2	3.6	85
Sub-grade 3a	0.7	15
Total	4.3	100

3.0 Soil resources

- 3.1 One of the aims of The First Soil Action Plan for England 2004-2006 is to protect soils in the planning system, particularly their ability to store, transform and regulate various processes such as rainfall infiltration, gas exchange with the atmosphere, and degradation and transformation of nutrients and wastes. A Code of Practice for the Sustainable Use and Management of Soils on Construction Sites has recently been prepared by Defra and the former Dti and is expected to be published during 2008.
- 3.2 The site not only contains good quality re-usable topsoils but also permeable subsoils. If development proceeds, construction operations should aim to re-use all topsoils either on- or off-site and also maintain subsoil permeability in gardens and green spaces in order to regulate run-off.

4.0 Conclusions

- 4.1 A survey of the agricultural land quality adjacent to Rockfield Road, Monmouth shows that the site is all 'best and versatile land' mainly grade 2.
- 4.2 The field is used for grass production by a local farm and is also well used by dog walkers from the adjacent housing estate.
- 4.3 Good quality topsoils should be re-used if development proceeds and subsoil permeability should be maintained under gardens and landscape areas in order to help regulate run-off.

APPENDIX
LOCATION AND DETAILS OF OBSERVATIONS

Land off Rockfield Road, Monmouth - Details of observations at each sampling point

Obs No	Topsoil			Upper subsoil			Lower subsoil			Slope (°)	Wetness Class	ALC grade	Main limitation
	Depth (cm)	Texture	Stones > 2 cm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling				
1	0-24	MZCL	0	24-48	MZCL	o	48-105	ZC	xx(x)+mn	0	III	3a	W
2	0-24	MZCL	0	24-75	MCL	o	<u>75-105</u>	MZCL	x	1	I	2	W
3	0-25	MZCL	0	25-55	HZCL	x	<u>55-90</u> 90+	ZC stopped	xx(x)+mn o	1	III	3a	W
4	0-24	MZCL	0	24-65	MZCL/MCL	o	65-85 85-105	MCL MZCL	xx x	½	I	2	W
5	0-24	MZCL	0	24-70	MZCL/MCL	o	70-105	HZCL + sdst & zst	x (mn)	1	I	2	W
6	0-24	MZCL	1	24-40	HZCL	o	40-65 <u>65-105</u>	HCL ZC +sdst	xx xxx	½	III	3a	W
7	0-23	MZCL	0	23-70	MZCL	x(x) mn	70-105	MZCL	xx	½	I	2	W
8	0-27	MZCL	0	27-70	MCL	o	70-105	FSL	o	1	I	2	W
9	0-24	MZCL	0	24-70	M/HZCL	o	70-95 95+	ZCL +sdst & zst stopped	x	½	I	2	W
10	0-17	MZCL	0	17-55	MZCL	o	55-75 75-105	HZCL MZCL	o xx	½	I	2	W
11	0-24	MZCL/CL	0	24-65	MZCL/MCL	o	65-95 95-105	MCL HZCL (mica)	o xx	½	I	2	W
12	0-20	MZCL	0	20-50	FSZL	xx	50-75 75-105	MZCL MZCL	xx xxx	1	II	2-3a	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)
mn	ferrimanganiferous concretions or concentrations dominate

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
zst, sdst	- siltstone, sandstone

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

Limitations:

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

Texture suffixes & prefixes:

ca	- calcareous
org	- organic
st	- stony
r	- reddish
gy	- grey

Land off Rockfield Road Monmouth
Figure 1 - Agricultural land quality



