Shirenewton









Shirenewton

Agricultural Land ClassificationFebruary 2025



ADAS GENERAL NOTES

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Author

Thea Niemann BSc
Technical reviewer
Technical reviewer
Technical reviewer
Soil Sci, C Sci, FACTS

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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 Powells Rural to undertake an Agricultural Land Classification survey of 7.7 hectares (ha) at Shirenewton, NP16 6RG (herein referred to as 'the site').

The survey has identified light to medium textured, red soils over occasional heavy textured soils at depth. These soils form agricultural land of Subgrade 3a (7.7 ha, 100%) quality.

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The principal limitation to the agricultural use of the land is soil wetness.

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1 INTRODUCTION

ADAS have been instructed by Powells Rural to undertake an Agricultural Land Classification (ALC) survey. This report provides information on the soils and agricultural quality of 7.7 ha of land at Shirenewton, NP16 6RG. The report is based on a survey of the land undertaken in February 2025.

1.1 Site Environment

The site is located at the western outskirts of Shirenewton, Monmouthshire. The site comprises of one agricultural field which measures a total area of 7.7 ha. It is bounded by Earlswood Road to the south, a residential area to the east, woodland to the north, and more agricultural fields to the north-east and west.

The site slopes from 165 m in elevation at the south-western corner to approximately 150 m at the north-eastern corner.

The site is in a Low Flood Risk Zone. This zone is deemed to be at lowest risk of flooding from rivers or sea, with less than 1 in 1000 annual probability of flooding in any year $(<0.1\%)^1$.

1.2 Agricultural Use

The site is currently utilised for arable crop production with a winter cereal growing at the time of surveying.

1.3 Published Information

1.3.1 Geology

1:50,000 scale BGS information² records three geological units which underlie the site:

- Tintern Sandstone Formation Sandstone. Sedimentary bedrock formed between 372.2 and 346.7 million years ago during the Devonian and Carboniferous periods.
- Quartz Conglomerate Formation (forest Of Dean) Sandstone and conglomerate, interbedded. Sedimentary bedrock formed between 372.2 and 358.9 million years ago during the Devonian period.
- Brownstones Formation Sandstone. Sedimentary bedrock formed between 419.2 and 393.3 million years ago during the Devonian period.

No superficial geology has been recorded.

-

¹ Natural Resources Wales – Flood Risk Assessment Wales Map. Online resource at https://naturalresources.wales/flooding/check-your-flood-risk-on-a-map-flood-risk-assessment-wales-map/?lang=en

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

1.3.2 Soils

One soil has been mapped on the 1:250,000 scale National Soil Map (Sheet 2 Wales)³. The mapping records the site as belonging to the following soil association:

 Oglethorpe Association – These soils are described as deep well drained reddish coarse and fine loamy soils. Some similar but shallower soils over gravel. The soils are permeable, naturally well drained (Wetness Class I) and readily absorb winter rainwater.

The survey results do not closely match this description; fine loamy red soils were present, but the soils were found not to be as well draining.

1.3.3 Previous Agricultural Land Classification

The Welsh Government Predictive Agricultural Land Classification (ALC) Map⁴ shows the survey area as Grade 2 with small areas of Subgrade 3b and Grade 4.

2 METHODOLOGY

A detailed soil survey was carried out in February 2025. The survey was based on observations at intersects of a 100 m grid, giving a sampling density of at least one observation per hectare. During the survey soils were examined via a combination of auger borings and soil description pits to a maximum depth of 1.2 m. A map showing the location of each observation point is attached to this report as Appendix 1 and a log of the details of each observation point is attached to this report as Appendix 3.

Two soil description pits were dug at this site (Pit 1 and 2 at auger borings 6 and 5). Soil pits were assessed following the methodology detailed in The Soil Survey Field Handbook⁵. A topsoil sample of each pit was submitted to NRM laboratories for particle size distribution analysis by the pipette methodology to confirm site findings. The results of this analysis are given in Section 3 and in Appendix 4.

³ Rudeforth et al (1984). Soils and Their Use in Wales. Soil Survey of England and Wales Bulletin 11, Harpenden (available to purchase from https://www.landis.org.uk/publications)

⁴ Agricultural land classification: predictive map | GOV.WALES

⁵ Soil Survey Field Handbook, Hodgson, J.M. (1974)

SOILS

3.1 **Soil Types**

Two soil types are found across the survey area. The survey area was found to be either medium clay loam topsoils over either medium clay loam, sandy clay loam or sandy loam upper subsoils over heavy textured lower subsoil or medium clay loam topsoils over sandy clay loam or medium clay loam subsoils to depth. One observation point (Auger 9) had medium sandy loam at depth.

3.1.1 Soil Type 1

These soils have medium clay loam topsoil with either sandy loam or sandy clay loam upper subsoils and silty/sandy clay lower subsoil. They are very slightly stony and gleyed within 40 cm of the surface, but do not have slowly permeable layers.

An example soil profile is described below from the pit 1.

Pit 1

0-26 cm Reddish brown (5YR4/3) medium

clay loam; very slightly stony (4%); moderately-developed angularblocky structure; friable; few fine fibrous roots; porosity >0.5% greater than 0.5mm diameter.

26-42 cm

Reddish brown (5YR4/4 and 5YR5/3) medium sandy loam; very slightly stony (5%); moderately developed medium subangularblocky structure; friable; porosity >0.5% greater than 0.5mm

diameter; common mottles.

42-100 cm Reddish brown (25YR5/3) silty

clay; very slightly stony (5%); moderately developed coarse subangular-blocky structure; firm; porosity >0.5% greater than 0.5mm diameter; common

distinct ochrous mottles.

The soil profile is in a location with 216 FCDs. It is an imperfectly draining profile and falls into Wetness Class III due to gleying within 40 cm of the profile surface. This profile is limited to Subgrade 3a because of a wetness limitation resulting from the high rainfall in combination

Photograph 1: Pit 1

with imperfect drainage, which leads to the gleyed horizons.

3.1.2 Soil Type 2

These soils have medium clay loam, borderline sandy clay loam, topsoil with sandy clay loam subsoils to depth. They are very slightly stony, imperfectly draining and deep.

An example soil profile is described below from the pit 2.

Pit 2

0-26 cm

Reddish brown (5YR4/3) medium clay loam/sandy clay loam; very slightly stony (4%); moderately-developed angular-blocky structure; friable; few fine fibrous roots; porosity >0.5% greater than 0.5mm diameter.

26-100 cm

Reddish brown and reddish grey (5YR4/4 and 5YR5/2) sandy clay loam; very slightly stony (4%); moderately developed medium subangular-blocky structure; friable; porosity >0.5% greater than 0.5mm diameter; common mottles.

The soil profile is in a location with 216 FCDs. It is an imperfectly draining profile and falls into Wetness Class III due to gleying within 40 cm of the profile surface. This profile is limited to Subgrade 3a because of a wetness limitation resulting from high rainfall in



Photograph 2: Pit 2

combination with imperfect drainage, which leads to gleyed horizons.

3.2 Laboratory Analysis

A sample representative of the top 25 cm of the soil profile was taken from the pits 1 and 2 (Pit 1 TS, Pit 2 TS). Furthermore, subsoil samples for each subsoil horizon of pit 1 were taken (Pit 1 USS, Pit 1 LSS). These soils were submitted to NRM Laboratories for particle size distribution (PSD) analysis by the pipette methodology. The laboratory report is given in Appendix 4, the laboratory textures are given in the table below.

Table 3.2: PSD analysis results

Observation	PSD Analysis
Pit 1 TS	Medium clay loam
Pit 1 USS	Sandy loam
Pit 1 LSS	Silty clay
Pit 2 TS	Sandy clay loam/ medium clay loam

3.3 Erosion

Parts of the site are moderately sloping (4-7°), and signs of surface water run-off were observable during the survey. This can pose a risk of topsoil erosion, as evidenced by the rills shown in photographs 3 and 4 below.



Photograph 4: Surface water run-off at northern edge



Photograph 3: Surface water run-off at eastern edge

4 AGRICULTURAL LAND CLASSIFICATION

The Agricultural Land Classification (ALC) system 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 158 m AOD is given below.

Table 4.1: Agro-climatic variables

	ST 475 940
Altitude(m)	158
Average Annual Rainfall (AAR)	1068 mm
January-June Accumulated Temperature (AT0)	1363 day °C
Field Capacity Days (FCD)	216
Field Capacity Period	Early October – early May
Moisture Deficit Wheat (MDW)	68 mm
Moisture Deficit Potatoes (MWP)	50 mm
Climate (upper grade limit)	2

The site has a climate limitation which limits the land to ALC Grade 2.

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

4.2 Results

The results of the soil survey described in Section 3 were used in conjunction with the agroclimatic 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 Subgrade 3a quality. The principal limitation to agricultural use of the land is soil wetness.

Grade 1

No land of this quality has been mapped.

Grade 2

No land of this quality has been mapped.

Subgrade 3a

The entire survey area of 7.7 ha is of Subgrade 3a quality. The land is formed of imperfectly draining, deep, red soil. These soils belong to Wetness Class III due to gleying being present within 40 cm of the surface and a high number of FCDs (216). Part of the land could be prone to slight topsoil erosion through surface water run-off. This is not in itself expected to impact the ALC Grade.

The principal limitation to the agricultural use of the land is soil wetness.

Subgrade 3b

No land of this quality has been mapped.

Grade 4

No land of this quality has been mapped.

Grade 5

No land of this quality has been mapped.

Non-agricultural

No land of this quality has been mapped.

Urban

No land of this quality has been mapped.

Not Surveyed

All land was surveyed.

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

4.3 Summary of grade areas

The boundaries between the different grades of land are shown in Appendix 2. 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	7.7	100 %			
Subgrade 3b	-	-			
Grade 4	-	-			
Grade 5	-	-			
Non-agricultural	-	-			
Urban	-	-			
Not Surveyed	-	-			
Total	7.7	100 %			

5 **CONCLUSION**

The survey has identified light to medium textured soils over occasional heavy textured soils at depth. These soils form agricultural land of Subgrade 3a (7.7 ha, 100%) quality.

The principal limitation to the agricultural use of the land is soil wetness.



Appendix 1: **Observation Location** Мар

Project

Shirenewton

Client

Powells Rural

Augers

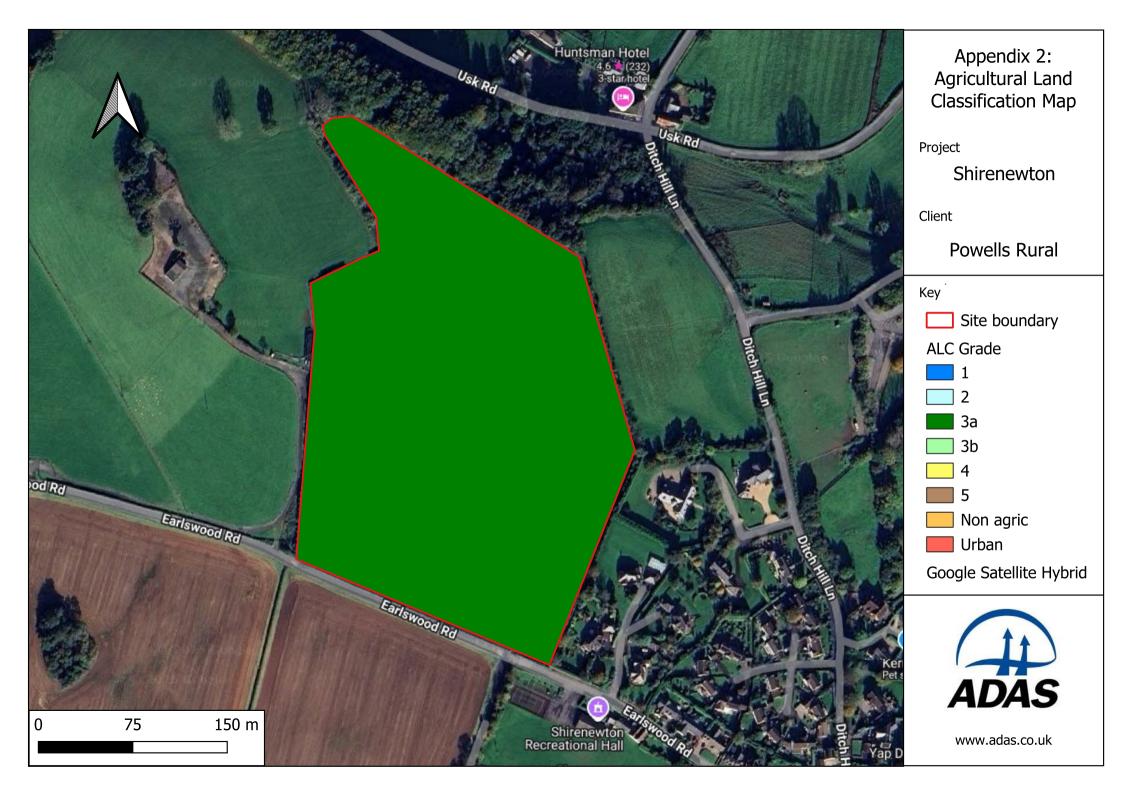


Site boundary

Google Satellite Hybrid



www.adas.co.uk





APPENDIX 3 – ALC SURVEY DETAILS

Key to auger records:

		Prin	cipal limitation(s) to		
	Texture		Agriculture		Stone lithology
С	clay	CL	climate	1	hard rocks or stones
ZC	silty clay	DE	depth	2	soft, medium or coarse-grained sandstones
SC	sandy clay	DR	droughtiness	3	soft 'weathered' igneous or metamorphic rocks or stones
ZCL	clay loam (H - heavy, M - medium)	ER	erosion	4	soft oolitic or dolomitic limestones
SCL	silty clay loam (H - heavy, M - medium)	FL	flooding	5	soft fine-grained sandstones
SZL	sandy silt loam (F - fine, M - medium, C - coarse)	GR	gradient	6	soft, argillaceous or silty rocks or stones
ZL	silty loam	MR	microrelief	7	chalk or chalk stones
SL	sandy loam (F - fine, M - medium, C - coarse)	ST	stoniness	8	gravel with non-porous stones
LS	sand (F - fine, M - medium, C - coarse)	TX	texture	9	gravel with porous stones
S	sand (F - fine, M - medium, C - coarse)	WE	wetness		
Org	organic				
Pty	peaty				
Pt	peat (S - sandy, L - loamy, H - humified, SF - semi-fibrous, F – fibrous)				
R	bedrock				

	Droughtiness Calculation		CaCO3		Other abbreviations
MDW	moisture deficit wheat [mm]	non	non-calcareous	SPL	slowly permeable layer
MDP	moisture deficit potatoes [mm]	v sl ca	very slightly calcareous	FMCs	ferri-manganiferous concretions
MBW	moisture balance wheat [mm]	sl ca	slightly calcareous		
MBP	moisture balance potatoes [mm]	ca	calcareous		
Grade W	droughtiness grade for wheat	v ca	very calcareous		
Grade P	droughtiness grade for potatoes				

Appendix 3: Auger Boring Log

Soil Profile									Agricultural Land Classification							
Auger	Depth	Texture	Primary Colour	Mottling	FMCs	Gleying	SPL	CaCO ₃	Ston	nes (%)	Slope (°)	WE Class	WE	DR	Overall	Limit(s)
	(cm)					<u> </u>			Total	Litho'			Grade	Grade	Grade	
1	0 - 31	MCL	5yr43 (reddish brown)	None	None	No	-	non	4	1	2-3°	III	3a	1	3a	WE
Latitude:	31 - 80	SCL	5yr53 (reddish brown)	Few	Few	Yes	No	non	0				Droughtin	ess Calcula	tion	
51.64376333											MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											68	50	84.2	62.2	1	1
-2.75992																
2	0 - 28	MCL	5yr43 (reddish brown)	None	None	No	-	non	4	1	2-3°	III	3a	1	3a	WE
Latitude:	28 - 57	SCL	5yr53 (reddish brown)	Few	Common	Yes	No	non	0				Droughtin	ess Calcula	tion	
51.64298	57 - 90	ZC	5yr52 (reddish grey)	Common	Common	Yes	No	non	0		MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											68	50	70.9	61.5	1	1
-2.759896667																
3	0 - 23	MCL	5yr43 (reddish brown)	None	None	No	-	non	4	1	2-3°	III	3a	1	3a	WE
Latitude:	23 - 42	SCL	5yr53 (reddish brown)	Few	Common	Yes	No	non	0				Droughtin	ess Calcula	tion	
51.643215	42 - 90	С	5yr52 (reddish grey)	Common	Common	Yes	No	non	0		MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											68	50	69.1	63.1	1	1
-2.758685																
4	0 - 29	MCL	5yr43 (reddish brown)	None	None	No	-	non	4	1	2-3°	III	3a	1	3a	WE
Latitude:	29 - 61	SCL	5yr53 (reddish brown)	Few	Common	Yes	No	non	0				Droughtin	ess Calcula	tion	
51.64232	61 - 90	SCL	5yr52 (reddish grey)	Common	Many	Yes	No	non	0		MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											68	50	83.7	61.7	1	1
-2.760155																
5	0 - 27	MCL	75yr43 (brown)	None	None	No	-	non	4	1	4-7°	Ш	3a	1	3a	WE
Latitude:	27 - 47	MSL	5yr52 (reddish grey)	Few	Few	Yes	No	non	3	1			Droughtin	ess Calcula	tion	
51.64235	47 - 80	ZC	5yr53 (reddish brown)	Common	Common	Yes	No	non	3	1	MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											68	50	66.7	59.5	1	1
-2.758573333																
6	0 - 31	MCL	5yr43 (reddish brown)	None	None	No	-	non	4	1	2-3°	III	3a	1	3a	WE
Latitude:	31 - 100	SCL	5yr52 (reddish grey)	Few	Common	Yes	No	non	0				Droughtin	ess Calcula	tion	
51.64143333											MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											68	50	84.2	62.2	1	1
-2.760095																
7	0 - 31	MCL	75yr43 (brown)	None	None	No	-	non	4	1	2-3°	III	3a	1	3a	WE
Latitude:	31 - 62	SCL	5yr43 (reddish brown)	Common	None	Yes	No	non	0				Droughtin	ess Calcula	tion	
51.64144333	62 - 120	SC	25yr53 (reddish brown)	Common	Few	Yes	No	non	1	3	MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											68	50	83.7	62.1	1	1
2.75955667																
-2.758556667																

Appendix 3: Auger Boring Log

Soil Profile											Agr	icultural L	and Class	ification		
Auger	Depth (cm)	Texture	Primary Colour	Mottling	FMCs	Gleying	SPL	CaCO ₃	Ston Total	nes (%) Litho'	Slope (°)	WE Class	WE Grade	DR Grade	Overall Grade	Limit(s)
8	0 - 27	MCL	75yr43 (brown)	None	None	No	-	non	4	1	2-3°	III	3a	1	3a	WE
Latitude:	27 - 55	SCL	75yr52 (brown)	Common	Common	Yes	No	non	0		Droughtiness Calculation					
51.64181667	55 - 120	ZC	25yr53 (reddish brown)	Common	Common	Yes	No	non	0		MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											68	50	70.3	61.3	1	1
-2.757461667																
9	0 - 27	MCL	5yr43 (reddish brown)	None	None	No	-	non	4	1	2-3°	III	3a	1	3a	WE
Latitude:	27 - 53	SCL	5yr46 (yellowish red)	Common	None	Yes	No	non	1	1	Droughtiness Calculation					
51.64057333	53 - 80	MSL	5yr54 (reddish brown)	Common	None	Yes	No	non	1	1	MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											68	50	88.9	60.7	1	1
-2.758641667																



APPENDIX 4 – LABORATORY ANALYSIS



ANALYTICAL REPORT												
Report Number	78920-25		L129 THEA NIEMANN									
Date Received	13-FEB-2025		RSK ADAS LTD									
Date Reported	24-FEB-2025			ADAS ROSEMA	AUND							
Project	SHIRENEWTON			PRESTON WY	NNE							
Reference	THEA NIEMANN			HEREFORD								
Order Number				HR1 3PG								
Laboratory Reference		SOIL737619	SOIL737620	SOIL737621	SOIL737622							
Sample Reference		PIT 1 TS	PIT 1 USS	PIT 1 LSS	PIT 2 TS							
Determinand	Unit	SOIL	SOIL	SOIL	SOIL							
Sand 2.00-0.063mm	% w/w	41	55	7	50							
Silt 0.063-0.002mm	% w/w	37	29	55	29							
Clay <0.002mm	% w/w	22	16	38	21							
Textural Class **		MCL SL ZC SCL/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.

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Reported by

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



^{**} Please see the attached document for the definition of textural classes.

Technical Information



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	С
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 Ω

Peaty soils i.e. those with an organic matter greater than 20% will be preceded with a letter P.

For further information on all analyses and services available from NRM Laboratories contact us on: Tel: 01344 886 338 Fax: 01344 890 972 Email: enquiries@nrm.uk.com Website: www.nrm.uk.com

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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. The 'best and most versatile agricultural land' falls into grades 1, 2 and subgrade 3a – which collectively comprises about one-third of the agricultural land in England and Wales. About half the land in England and Wales 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.

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 Grade 1.

Grade 3 – good to moderate quality 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.