

## AGRICULTURAL LAND CLASSIFICATION

LAND EAST OF A.34 ADJOINING MOTORWAY SERVICE AREA, CHIEVELEY, BERKS

## 1. BACKGROUND

- 1.1 Land on this 3.08 ha site was inspected on 25 April 1989 in connection with proposals for the development of new hotel. At the time of survey the land was in a grass ley.

## 2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

- 2.1 Site specific interpolated meteorological data for the site (Met. Office, 1989) indicates an average annual rainfall of 699 mm with an estimated accumulated temperature (a measure of the relative warmth of a locality) of 1404 day degrees (Jan-June) above 0°C. Field capacity day data (a measure of climatic wetness) indicates an average value of 152 days with crop adjusted moisture deficits for wheat and potatoes of 107 mm and 99 mm respectively (Met. Office, 1989).

Relief

- 2.2 The site lies at altitudes of 105-110 m A.O.D. with overall slopes in a westerly direction. Gradients are typically 3-4° or less but a steeper bank (8°) occurs on the margin of a small hollow believed to be the location of a former chalk pit. Apart from the small area of steep slopes outlined above gradients are not a significant factor in the assessment of land quality on this site.

Geology and Soils

- 2.3 The geology of the site is shown as Upper Chalk and Reading Beds on the published Geological map Sheet No 267 (Hungerford) (Geol. Surv. England and Wales, 1947). Detailed survey of the site indicates the whole area is probably underlain by the Reading Beds, which comprise interbedded clays and sands.
- 2.4 The soils on the site reflect the variable lithology of the Reading Beds formation. Topsoils are typically sandy clay loams or occasionally heavy clay loam, clay and sandy loam. Subsoils are commonly of sandy clay loam passing into clay at depth but alternatively may comprise clay passing to sandy clay loam. On parts of the higher ground on the site subsoils comprise sandy loam and loamy sand passing to sand. The variability of soil characteristics results in a range of drainage status from well drained to poorly drained (Wetness classes I-IV) with some soils being drought-prone. At some locations in the northwest of the site the soils have the appearance of having been disturbed.

### 3. AGRICULTURAL LAND CLASSIFICATION

3.1 A breakdown of the area and extent of the ALC grades is given below:

	ha	%
Grade 3a	1.77	57
Grade 3b	1.31	43
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TOTAL	3.08	
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A definition of the grades is included at Appendix A.

#### Grade 3

##### Subgrade 3a

3.2 Land of this quality is located towards the eastern half of the site and represents two main soil types. Firstly on the higher land are coarser textured soils of sandy loam topsoil texture passing into progressively lighter loamy sand and sand. This land is well drained but suffers from droughtiness, given the moisture deficits at this location. The second type of land comprises deep sandy clay loams which may pass into clay at depth. These typically have slowly permeable subsoils and fall into wetness class III but at sporadic locations drainage is improved to give pockets of slightly higher quality land.

##### Subgrade 3b

3.3 Subgrade 3b land occurs towards the western half of the site and includes those areas which are believed to have been subject to past disturbance. Topsoils are of sandy clay loam, heavy clay loam or clay texture overlying slowly permeable clay subsoils. Such soils typically fall within wetness class IV and given the range of field capacity days for this location are appropriately placed in grade 3b due to wetness/workability limitations. At one location, the steep face at the margin of a small hollow had a gradient of 8° which limits this small area to a maximum grading of 3b.

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Sources of Reference:

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1947)

1:63360 scale drift edition geology map sheet No. 267 (Hungerford).

MAFF (1988) Agricultural Land Classification of England and Wales.

Revised guidelines and criteria for grading the quality of agricultural land.

METEOROLOGICAL OFFICE (1989) Climatological data for Agricultural Land Classification.

## DESCRIPTION OF THE GRADES AND SUBGRADES

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 physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in 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 Grade 1.

### **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 (eg 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 agricultural land**

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

#### **Descriptions of other land categories used on ALC maps**

##### **Urban**

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

##### **Non-agricultural**

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: golf courses, private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

##### **Woodland**

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

##### **Agricultural buildings**

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

##### **Open water**

Includes lakes, ponds and rivers as map scale permits.

##### **Land not surveyed**

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

## FIELD ASSESSMENT OF SOIL WETNESS CLASS

### SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six revised soil wetness classes (Hodgson, in preparation) are identified and are defined in Table 11.

Table 11 Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging <sup>1</sup>
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years <sup>2</sup> .
II	The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31 and 90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

<sup>1</sup> The number of days specified is not necessarily a continuous period.

<sup>2</sup> 'In most years' is defined as more than 10 out of 20 years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

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## SCHEDULE OF AUGER BORINGS

Boring/Pit No and Grid Ref.	Land Use and Relief	Soil Profile Description	ALC Grade
1.A	3-4° Slope Grass Ley	0-23 cm SCL, 10 YR 4/3; faint ochreous & grey mottles	3 b
		23-30 SCL; 10 YR 5/4; faint ochreous & grey mottles	
		30-40 MSL; 10 YR 5/4; faint ochreous & grey mottles	
		40 + Impenetrable - hard and stony	
1.B	- " -	0-20 cm SCL; 10 YR 4/3 faint ochreous & grey mottles	3 b
		20-25 Chalky C; 10 YR 7/3; disturbed appearance	
		25-40 SCL; 10 YR 5/6	
		40 + Impenetrable - hard and stony	
Profiles 1.A and 1.B appear disturbed.			
2.	Rim small hollow - old pit? Grass Ley	0-25 cm HCL; 25 Y 4/2; faint ochreous mottles	3 b
		25-100 C; (some sandy inclusions) 10 YR 6/3, 2.5 Y 6/2 with mottles of 10 YR 5/6 (gleyed) common Mn concs.	
		Subsoil Structure:	
	Small pit	30-40 Weak platy struc- tures (management induced?)	
		40-60 Weak - mod. medium prismatic/co. A B; friable to firm.	

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Boring/Pit No and Grid Ref.	Land Use and Relief	Soil Profile Description	ALC Grade
3.	Gentle slopes Grass Ley	<p>Some biopores, but &lt; 0.5%. (Slowly permeable).</p> <p>Wetness Class IV</p> <p>0-25 cm FSCl; 10 YR 5/3</p> <p>25-50 FSCl; 10 YR 6/4, 2.5 Y 6/4 Mottles of 10 YR 6/6, 7.5 YR 5/8 (gleyed)</p> <p>50-70 (S)C; 2-5 Y 6/4; 2-5 Y 7/0 Mottles of 7.5 YR 5/8 (gleyed)</p> <p>70-100 ZC; 2-5 Y 6/2; mottles 7.5 YR 6/8 (gleyed)</p> <p>Wetness Class III/IV (ref borings 2 and 9)</p>	3 a/b
4.	Gentle Valley Grass Ley	<p>0-30 cm SCL; 10 YR 4/3</p> <p>30-100 SCL; 10 YR 5/4; Sl. stony</p> <p>Drought</p>	1/2
5.	Steep face of hollow - 8 <sup>a</sup> Grass Ley	<p>0-30 cm C. (some MS content); 10 YR 5/2; 10 YR 5/3</p> <p>30-70 C/SC; 10 YR 6/4; mottles of 7.5 YR 5/8; 10 YR 6/6 (gleyed); inc. chalky 50 cm +</p> <p>70-100 SCL; 10 YR 5/4; 10 YR 5/6 (mixed appearance) occ. ochreous mottles</p> <p>Profile appears disturbed. Gradient Wetness Class IV</p>	3b

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Boring/Pit No and Grid Ref.	Land Use and Relief	Soil Profile Description	ALC Grade
6.	Upper slopes Grass ley	0-30 cm SCL/MSL 10 YR 5/2; 10 YR 5/3 30-37 MSL; 10 YR 6/4; 10 YR 6/6 37-45 LMS; 10 YR 6/4; 10 YR 6/6 45-100 MS; 10 YR 8/4, 10 YR 6/6; 10 YR 6/3 (bands of varying colour down profile)  Profile virtually stoneless  Drought	3 a
7.	Gentle slopes Grass ley	0-30 cm SCL; 10 YR 5/2 30-45 SCL; 10 YR 5/4; some v. small inclusions of weathered ironstone 45-60 SCL; 10 YR 6/3, 10 YR 6/4; mottles of 7.5 YR 5/8, 5 YR 4/6 (gleyed) 60-100 C; 10 YR 7/1, mottles of 7.5 YR 5/8 and 10 YR 6/4 (gleyed)  Wetness class III (ref; boring 9)	3 a
8.	Gentle slopes Grass ley	0-30 cm SCL/FSCL; 10 YR 3/3; sl. stony est 10% flints 30-65 SCL; 10 YR 5/4, 10 YR 5/6; sl stony 65-70 SCL; 10 YR 5/4, 10 YR 5/6 v. gravelly est. 50% fine gravel 70+ impenetrable  Drought	2
9.	Gentle slopes Grass ley	0-30 cm SCL; 10 YR 4/3 30-50 SCL; 10 YR 6/4; 10 YR 6/6 possible faint ochreous mottles 45 cm+	3 a

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Boring/Pit No and Grid Ref.	Land Use and Relief	Soil Profile Description	ALC Grade
10.	Upper slopes Grass ley	50-80 SCL; 10 YR 6/4, 10 YR 6/2; 10 YR 6/6; common mottles of 7.5 YR 5/8 (gleyed) 80-100 C/SC; 10 YR 6/2; 10 YR 6/4; mottles of 7.5 YR 5/8 (gleyed)	3 a
		Small pit	
		30-50 cm weakly - moderately developed, friable - firm coarse blocky; some large biopores	
		50-70 cm weakly - moderately developed coarse blocky becoming medium prismatic; friable to firm strength; <0.5% biopores; occasional worm channels noted (slowly permeable)	
		Wetness class III	
		0-25 cm MSL; well bodied; 10 YR 5/2	
		25-40 LMS; 10 YR 6/4; 10 YR 6/6	
		40-60 MS; 10 YR 6/4; 10 YR 6/6	
		60-70 C; 10 YR 6/2 mottles of 7.5 YR 5/8	
		70-100 MS; 10 YR 6/4; 10 YR 6/6; poss. faint ochreous mottles; wet 90 cm+	
Drought			