137/94

CUCKOOPEN BARN, BIRDLIP

AGRICULTURAL LAND CLASSIFICATION

CONTENTS

CUCKOOPEN BARN, BIRDLIP, GLOUCESTER

AGRICULTURAL LAND CLASSIFICATION SURVEY

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in response to an ad-hoc application to carry out landfill on the site. The fieldwork at Cuckoopen Barn, Birdlip, Gloucester was completed in December 1994 at a scale of 1:10,000. Data on climate, soils and geology was used and is presented in the report. The distribution of grades is shown on the accompanying ALC map and summarised below. Information is correct at this scale but could be misleading if enlarged.

Distribution of ALC grades: Cuckoopen Barn, Birdlip

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
3b	2.3	100	100
TOTAL			

The entire site was graded as 3b. The centre of the site consists of heavy soils with a wetness limitation. The rest of the site is well drained with a high stone content, being downgraded to 3b due to topsoil stoniness.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in December 1994 at Cuckoopen Barn, Birdlip, Gloucester on behalf of MAFF as part of its statutory role in response to an ad-hoc planning application for a landfill site. The fieldwork covering 2.3 ha of land was conducted by ADAS at a scale of 1:10,000 with approximately one boring per hectare of agricultural land. A total of 3 auger borings were examined and one soil profile pit used to assess subsoil conditions.

The published provisional one inch to the mile ALC map of this area (MAFF 1962) shows the grades of the site at a reconnaissance scale to be non-agricultural.

The recent survey supersedes this map having been carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120 cm of the soil profile. A description of the grades used in the ALC system can be found in Appendix 2.

2. CLIMATE

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to a lower grade despite other favourable conditions.

Estimates of climatic variables were interpolated from the published agricultural climate dataset (Meteorological Office 1989). The parameters used for assessing overall climate are accumulated temperature, a measure of the relative warmth of a locality, and average annual rainfall, a measure of overall wetness. The results shown in Table 1 indicate there is an overall climatic limitation which restricts the land to Subgrade 3a.

Table 1: Climatic Interpolations: Cuckoopen Barn, Birdlip

Grid Reference		SO 943158
Altitude (m)		277
Accumulated Temperature (day °)		1206
Average Annual Rainfall (mm)		881
Overall Climatic Grade		3a
Field Capacity Days		191
Moisture deficit (mm):	Wheat	68
	Potatoes	48

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat and potatoes are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections.

3. RELIEF AND LANDCOVER

The site has a shallow depression running east-west and overall slopes gently to the west. Gradients are gentle and are not limiting.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:50,000 scale solid and drift geology map, sheet 234, British Geological Survey 1975.

The site is underlain by upper inferior oolite to the east and lower inferior oolite to the west.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000.

The site is mapped as having soils of the Sherborne Association which are described as shallow, well drained brashy calcareous clayey soils over limestone, associated with slowly permeable calcareous clayey soils.

The soils found during the recent survey were consistent with this description.

5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades is shown in Table 2 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 2: Distribution of ALC grades: Cuckoopen Barn, Birdlip

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
3b	2.3	100	100
TOTAL			

The entire site was graded as Subgrade 3b. The north and south of the site consisted of well drained stony soils with 25% stones in the topsoil and 60% stones below 18 cm. The combination of this high stone content, the clayey matrix texture and the climatic conditions led to a droughtiness grade of 3a. However, the content of stones exceeding 2 cm diameter in the top 25 cm led to a final grade of 3b.

The depression running across the middle of the site from east to west consisted of clayey soils with gleying and a slowly permeable layer (SPL) occurring below 40 cm. This, in conjunction with the high Field Capacity Day value (191 FCD) leads to a Wetness Class III (see Appendix 3) and a final ALC grade of 3b.

Resource Planning Team
Taunton Statutory Unit
13 January 1995

APPENDIX 1

REFERENCES

BRITISH GEOLOGICAL SURVEY (1975) Solid and Drift Edition, Sheet 234, 1:50,000 scale.

MAFF (1962) Agricultural Land Classification Map, Sheet 144, Provisional 1:63,360 scale.

MAFF (1988) Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for grading the quality of agricultural land), Alnwick.

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

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5, Soils of South West England, 1:250,000 scale.

APPENDIX 2

DESCRIPTION OF GRADES AND SUBGRADES

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 include 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 most 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: private park land, 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.

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 landcover types, eg buildings in large grounds, and where may be shown separately. Otherwise, the most extensive cover type will usually be shown.

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

APPENDIX 3

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class 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.

Wetness Class 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.

Wetness Class 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.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

Notes: The number of days specified is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.

Source: Hodgson, J M (in preparation), Soil Survey Field Handbook (revised edition).

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Cuckoopen Barn	1P	1°	Arable	Av Rainfall: 881 mm ATO: 1206 day °C FC Days: 191 Climatic Grade: 3a Exposure Grade: 1	Oolite
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
137/94	21/12/94	SO 914157	P R Woode		PRW/132

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	18	MZCL	75YR4/4	8% >2cm 17% <2cm 25% HR sieved	None	None	-	Friable	Moderate	Many	Many Fine	Yes	Abrupt Smooth
2	40	C	75YR4/6	45% >2cm 14% <2cm 60% HR sieved	None	None	Controlled by stone content	Friable	Moderate	Many	Common Fine	Yes	Clear Smooth
3	60+	SC	10YR6/4	70% HR Visual estimate	None	None	"	Friable	Moderate	Many	Few Fine	Yes	-

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 2

Available Water Wheat: 70 mm

Potatoes: 57 mm

Moisture Deficit Wheat: 68 mm

Potatoes: 48 mm

Moisture Balance Wheat: 2 mm

Potatoes: 9 mm

Droughtiness Grade: 3a (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Stoniness

Remarks:

8% stones >2cm in top 18 cm
45% stones >2cm in 18-25 cm
Weighted average = 18% stones >2cm in top 25 cm (3b)

SOIL PLASTICITY RECORDING SHEET

ANNEX 2

SITE DATA

Grid Ref	SO 914157		Site Name	CUCKOOPEN BARN		LPA			
AAR	881	ATO	1206	FCD	191	MD (wheat)	68	MD (potatoes)	48

SOIL PIT DATA

	PIT ONE SOIL SERIES Sherborne			PIT TWO SOIL SERIES			PIT THREE SOIL SERIES		
DEPTH	TEXTURE	PLASTIC Y/N	COMMENTS	TEXTURE	PLASTIC Y/N	COMMENTS	TEXTURE	PLASTIC Y/N	COMMENTS
10 cm	MZCL	Y							
20 cm	C	Y							
30 cm	C	Y							
40 cm	C	Y							
50 cm	C	Y							
60 cm	C	Y							