

A1
Basingstoke & Deane Local Plan
Site 11 : Land North of "The Jolly
Farmer", Cliddesden
Agricultural Land Classification
ALC Map Report
February 1994

**BASINGSTOKE AND DEANE LOCAL PLAN
SITE 11 : LAND NORTH OF "THE JOLLY FARMER", CLIDDESSEN
AGRICULTURAL LAND CLASSIFICATION REPORT**

1. Summary

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on an area of land at Cliddesden, Hampshire. The work forms part of MAFF's statutory input to the Basingstoke and Deane Local Plan.
- 1.2 Approximately 2 hectares of land was surveyed in December 1993. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 2 soil auger borings and 1 soil inspection pit were assessed in accordance with MAFF's 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 longterm limitations on its use for agriculture.
- 1.3 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.
- 1.4 At the time of the survey the landuse on the site was permanent grassland.
- 1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:5,000. It is accurate at this scale, but any enlargement would be misleading. This map supersedes any previous survey information for this site.

Table 1 : Distribution of Grades and Subgrades

<u>Grade</u>	<u>Area (ha)</u>	<u>% of Site</u>	<u>% of Agricultural Area</u>
3b	1.3	76.5	100% (1.3 ha)
Urban	0.3	17.6	
Non-Agricultural	<u>0.1</u>	<u>5.9</u>	
Total area of site	1.7	100%	

- 1.6 Appendix 1 gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.
- 1.7 The entire site has been classified as Subgrade 3b with soil droughtiness being the key limitation. Shallow soils rest over chalk which restricts soil depth and rooting by crops. The resulting reduction in crop available water causes a moderate risk of drought stress such that Subgrade 3b is appropriate.

2. Climate

- 2.1 Estimates of climatic variables relevant to the assessment of agricultural land quality were obtained by interpolation from a 5km grid point dataset (Met. Office, 1989) for a representative location in the survey area.

Climatic Interpolation

Grid Reference	SU631494
Altitude, (m, AOD)	125
Accumulated Temperature (°days, Jan-June)	1393
Average Annual Rainfall (mm)	820
Field Capacity Days	178
Moisture deficit, wheat (mm)	95
Moisture deficit, potatoes (mm)	84

- 2.2 Climatic factors are considered first when classifying land since climate can be overriding in the sense that adverse climatic conditions may restrict land quality irrespective of favourable site and soil conditions. The details in the table above show that there is no overall climatic limitation affecting this site. In addition, no local climatic factors such as exposure or frost risk affect the land quality.
- 2.3 However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. At this locality, average annual rainfall and field capacity days are relatively high in regional terms, whilst moisture deficits are correspondingly low. The effect of this is an increased likelihood of soil wetness/workability restrictions with a reduced chance of droughtiness problems.

3. Relief

- 3.1 The site lies at an altitude of 120-125 m, falling moderately from west to east. Nowhere on the site do relief or gradient affect agricultural land quality.

4. Geology and Soils

- 4.1 British Geological Survey, (1981) Sheet 284, Basingstoke shows the entire site to be underlain by deposits of Cretaceous Upper Chalk.
- 4.2 Soil Survey of England and Wales, (1983) Sheet 6, Soils of South-East England shows the site to comprise soils of the Carstens association. These are described as, 'fine silty over clayey typical paleo-argillic brown earths', (SSEW, 1984).
- 4.3 Detailed field examination of the soils on the site indicates that they are more consistent with soils of the Andover 1 association, 'variably flinty and chalky silty brown rendzinas over chalk', (SSEW, 1984). This association is shown in the vicinity of the site by the Soil Survey.

5. Agricultural Land Classification

- 5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.
- 5.2 The location of the soil observation points are shown on the attached sample point map.

Subgrade 3b

- 5.3 The agricultural land on the site has been assigned entirely to Subgrade 3b, moderate quality land, on the basis of a soil droughtiness limitation. Profiles typically comprise calcareous medium clay loam topsoils which may contain between 1 and 5% chalk stones or flints. These overlie extremely chalky clay loam or silty clay loam upper subsoils which pass to pure hard rubbly chalk between 26 and 52 cm depth. Rooting into the chalk appeared relatively shallow at the time of survey (ie, to a depth of approximately 55-65 cm). The combination of shallow soil depth and restricted rooting into the chalk substrate, causes profile available water to be significantly reduced. At this locality, the relationship between these soil characteristics and the prevailing climatic factors will give rise to the likelihood of drought stress and consequently depressed crop yields. The land cannot be graded higher than Subgrade 3b as a result.

ADAS Ref: 1501/153/93
MAFF Ref: EL15/144

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

- * British Geological Survey (1981) Sheet 284, Basingstoke.
- * MAFF (1988) Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.
- * Meteorological Office (1989) Climatic datasets for Agricultural Land Classification.
- * Soil Survey of England and Wales (1983) Sheet 6, Soils of South-East England.
- * Soil Survey of England and Wales (1984) Bulletin 15, Soils and their use in South-East England.

APPENDIX I

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: 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.

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging ¹
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years ² .
II	The soil profile is wet within 70 cm depth for 31-90 days in most years <u>or</u> , 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 <u>or</u> , 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 <u>or</u> , 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.

¹ The number of days specified is not necessarily a continuous period.

² 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL BORING AND SOIL PIT DESCRIPTIONS

Contents:

- * *Soil boring descriptions*
- * *Soil pit descriptions*
- * *Soil Abbreviations : Explanatory Note*

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			SPL	CALC
				COL	ABUN	CONT		GLEY	>2	>6		LITH	TOT	STR		
1	0-20	mc1	10YR33 00					0	0	CH	1					Y
	20-30	mc1	10YR33 00					0	0	CH	70		M			Y
	30-55	chalk						0	0		0		M			Y
1P	0-17	mc1	10YR32 00					0	0	HR	5					Y
	17-26	mc1	10YR43 00					0	0	HR	2		M			Y
	26-60	chalk						0	0	HR	2		M			Y
2	0-30	mc1	10YR32 00					0	0	HR	2					Y
	30-52	mzc1	10YR74 00					0	0	CH	70		M			Y
	52-65	chalk						0	0		0		M			Y

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	SPL	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
						CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		
1	SU63104940	PGR	SE	04		1	2	71	-25	73	-12	3B					DR 3B	ROOT 55
1P	SU63114935	PGR	SE	04		1	2	74	-22	77	-8	3B					DR 3B	ROOT 60
2	SU63154930	PGR	SE	04		1	2	88	-8	93	8	3A					DR 3A	ROOT 65

SOIL PIT DESCRIPTION

Site Name : BASINGSTOKE LP(2),SITE11 Pit Number : 1P

Grid Reference: SU63114935 Average Annual Rainfall : 821 mm
Accumulated Temperature : 1393 degree days
Field Capacity Level : 178 days
Land Use : Permanent Grass
Slope and Aspect : 04 degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 17	MCL	10YR32 00	0	5		
17- 26	MCL	10YR43 00	0	2		
26- 60	CHALK		0	2		

Wetness Grade : 2 Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 3B APW : 74 mm MBW : -22 mm
APP : 77 mm MBP : -8 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil profile and pit information obtained during ALC surveys is held on a database. This has commonly used notations and abbreviations as set out below.

BORING HEADERS

1. GRID REF : National grid square followed by 8 figure grid reference.

2. USE : Land-use at the time of survey.
The following abbreviations are used.

ARA - arable	PAS/PGR - permanent pasture
WHT - wheat	RGR - rough grazing
BAR - barley	LEY - ley grassland
CER - cereals	CFW - coniferous woodland
OAT - oats	DCW - deciduous woodland
MZE - maize	SCR - scrub
OSR - oilseed rape	HTH - heathland
BEN - field beans	BOG - bog or marsh
BRA - brassicae	FLW - fallow
POT - potatoes	PLO - ploughed
SBT - sugarbeet	SAS - set-aside
FDC - fodder crops	OTH - other
FRT - soft and top fruit	LIN - linseed
HOR/HRT - horticultural crops	

3. GRDNT : Gradient as measured by optical reading clinometer.

4. GLEY/SPL : Depth in centimetres (cm) to gleyed and/or slowly permeable horizons.

5. AP (WHEAT/POTS) : Crop-adjusted available water capacity. The amount of soil water (in millimetres) held in the soil profile that is available to a growing crop (wheat and potatoes are used as reference crops).

6. MB (WHEAT/POTS) : The moisture balance for wheat and potatoes obtained by subtracting the soil moisture deficit from the crop-adjusted available water capacity.

7. DRT: Grade according to soil droughtiness assessed against soil moisture balances.

8. M REL : Micro-relief)
FLOOD : Flood risk) If any of these factors are considered
EROSN : Soil erosion) significant in terms of the assessment
EXP : Exposure) of agricultural land quality a 'y' will
FROST : Frost prone) be entered in the relevant column.
DIST : Disturbed land)
CHEM : Chemical limitation)

9. **LIMIT** : Principal limitation to agricultural land quality.
The following abbreviations are used:

OC - overall climate	CH - chemical limitations
AE - aspect	WE - wetness
EX - exposure	WK - workability
FR - frost	DR - drought
GR - gradient	ER - erosion
MR - micro-relief	WD - combined soil wetness/soil droughtiness
FL - flooding	ST - topsoil stoniness
TX - soil texture	
DP - soil depth	

PROFILES & PITS

1. **TEXTURE** : Soil texture classes are denoted by the following abbreviations:

S	- sand
LS	- loamy sand
SL	- sandy loam
SZL	- sandy silt loam
ZL	- silt loam
MZCL	- medium silty clay loam
MCL	- medium clay loam
SCL	- sandy clay loam
HZCL	- heavy silty clay loam
HCL	- heavy clay loam
SC	- sandy clay
ZC	- silty clay
C	- clay

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.

F	- fine (more than $\frac{2}{3}$ of the sand less than 0.2 mm)
C	- coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M	- medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions 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)

- ped size

F - fine
M - medium
C - coarse
VC - very coarse

- ped shape

S - single grain
M - massive
GR - granular
SB/SAB - sub-angular blocky
AB - angular blocky
PR - prismatic
PL - platy

8. **CONSIST** : Soil consistence is described using the following notation:

L - loose
VF - very friable
FR - friable
FM - firm
VM - very firm
EM - extremely firm
EH - extremely hard

9. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness.

G - good
M - moderate
P - poor

10. **POR** : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'y' will appear in this column.

11. **IMP** : If the profile is impenetrable a 'y' will appear in this column at the appropriate horizon.

12. **SPL** : Slowly permeable layer. If the soil horizon is slowly permeable a 'y' will appear in this column.

13. **CALC** : If the soil horizon is calcareous, a 'y' will appear in this column.

14. Other Notations

APW - available water capacity (in mm) adjusted for wheat
APP - available water capacity (in mm) adjusted for potatoes
MBW - moisture balance, wheat
MBP - moisture balance, potatoes

