

**A1**  
**Basingstoke & Deane Local Plan**  
**Site 10: Land at Highclere**  
**Agricultural Land Classification**  
**ALC Map & Report**  
**January 1994**

**BASINGSTOKE AND DEANE LOCAL PLAN  
SITE 10 : LAND AT HIGHCLERE  
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 Highclere, Hampshire. The work forms part of MAFF's statutory input to the Basingstoke and Deane Local Plan.
- 1.2 Approximately 1 hectare of land was surveyed in December 1993. The survey was undertaken at a detailed level of approximately two borings per hectare. A total of 2 soil auger borings and one 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 long term 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 land use 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 Agricultural Area</u>
2	0.4	44.4
3b	0.5	55.6
Total area of site	0.9	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 land has been classified very good (Grade 2) and moderate (Subgrade 3b) quality. The land is principally limited by soil workability and wetness. The area of very good quality, experiences a workability limitation caused by the combination of a clayey topsoil texture and the local relatively moist climatic regime leading to slightly restricted versatility. The moderate quality land, experiences a severe drainage impedance due to the presence of a slowly permeable, poorly structured, clay subsoil. The resultant soil wetness has the effect of restricting crop growth, grazing by livestock and machinery trafficking opportunities.

## 2. Climate

- 2.1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.
- 2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality.
- 2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site. However climatic and soil factors interact to influence soil wetness and droughtiness. Within this locality, the relatively high Field Capacity Days and low Moisture Deficits, in a regional context, lead to a lower probability of a drought limitation, and a correspondingly increased risk of a wetness limitation.
- 2.4 No local climatic factors such as exposure or frost risk affect the site.

Table 2 : Climatic Interpolations

Grid Reference :	SU439605	SU437605
Altitude (m) :	120	130
Accumulated Temperature (days) :	1398	1387
Average Annual Rainfall (mm) :	807	814
Field Capacity (days) :	178	179
Moisture Deficit, Wheat (mm) :	95	94
Moisture Deficit, Potatoes (mm) :	84	82
Overall Climatic Grade :	1	1

## 3. Relief

- 3.1 The site lies between 120m and 130m AOD, gently sloping from west to east. At no point does gradient or microrelief affect land quality.

## 4. Geology and Soil

- 4.1 The British Geological Survey published map, Sheet 283, Andover (1:50,000, 1975), shows the western section of the site to be underlain by Eocene Bracklesham Beds (sand and loam). The eastern section is mapped as Eocene Lower Bagshot Beds (sand). The border between these two geological deposits corresponds to a soil unit change (see paras 5.3 and 5.4).
- 4.2 The Soil Survey of England and Wales published map, Sheet 6, Soils of South East England (1:250,000, 1983) shows the site to be underlain by soils from the Wickham 3 Association. The accompanying bulletin (SSEW, 1984) describes these soils as 'slowly permeable seasonally waterlogged fine loamy over clayey and coarse loamy over clayey soils, and similar more permeable soils with slight waterlogging.

Some deep coarse loamy soils affected by ground water'. Soils of this general nature were encountered at the site.

## 5. Agricultural Land Classification

- 5.1 Table 1 provides the details of the area measurements of 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.

### Grade 2

- 5.3 Land of very good quality is shown across approximately one third of the site. Soils were found to typically comprise a very slightly stony (c.5% flints by volume) medium silty clay loam topsoil. This passes to a moderately structured (from Pit 1, Appendix III) slightly stony (c.10% flints by volume) medium clay loam upper subsoil overlying a gleyed moderately stony (c.25% flints by volume) medium clay loam horizon. The lower subsoil is similar although more stony (c.35% flints by volume). These soils, within the local relatively moist climatic regime, are limited by workability, due to the moderate clay content of the topsoil, retaining sufficient water in most years, to slightly affect opportunities for machinery trafficking and livestock grazing. Land of this quality could be expected to produce high yields of a wide range of agricultural and horticultural crops, but with some loss of versatility in the production of more demanding crops such as winter harvested vegetables and arable root crops.

### Subgrade 3b

- 5.4 Land of moderate quality is mapped across the remaining two thirds of the site. Soils here are principally limited by wetness. Profiles were found to typically consist of a slightly stony (c.10% flints by volume) medium clay loam topsoil over a moderately structured, moderately stony (c.20% flints by volume) medium clay loam upper subsoil. This passes to a similar gleyed horizon, overlying a poorly structured slowly permeable clay lower subsoil. The relative depths of gleyed and slowly permeable layers are such that drainage is severely impeded, such that within the relatively moist local climatic regime Wetness Class IV (see Appendix II) is appropriate and subsequently Subgrade 3b is assigned to this land.

Soil wetness adversely affects seed germination and survival and inhibits the development of a good root system, limiting the crops which can tolerate such conditions. In addition, restrictions are imposed on cultivations, grazing by livestock and machinery trafficking. Land of this quality could be expected to produce moderate yields of a narrow range of crops, principally cereals and grass.

ADAS Reference : 1501/152/93  
MAFF Reference : EL15/144

Resource Planning Team  
Guildford Statutory Group  
ADAS Reading

## SOURCES OF REFERENCE

- \* British Geological Survey (1975) Sheet 283, Andover, 1:50,000 Drift Edition.
- \* 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.
- \* Soil Survey of England and Wales (1983) Sheet No. 6, Soils of South East England, 1:250,000.
- \* Soil Survey of England and Wales (1984), Soils and their use in South East England. Bulletin No. 15.

## APPENDIX I

### DESCRIPTION OF THE GRADES AND SUB-GRADES

#### **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 or horticultural crops can usually be grown but on some land on 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. When 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.

#### **Sub-grade 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 the 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.

## **Urban**

Built-up or 'hard' uses with relatively little potential for a return to agriculture : 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.

## **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, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

## APPENDIX II

### DEFINITION OF SOIL WETNESS CLASSES

#### Wetness Class I

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

#### Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

#### Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

#### Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

#### Wetness Class V

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

#### Wetness Class VI

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

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



## APPENDIX III

### SOIL PIT AND SOIL BORING DESCRIPTIONS

- Contents :**
- \* Soil Abbreviations : Explanatory Note
  - \* Soil Pit Descriptions
  - \* Database Printout : Boring Level Information
  - \* Database Printout : Horizon Level Information

## SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a database. This has commonly used notations and abbreviations as set out below.

### Boring Header Information

1. **GRID REF** : national grid square and 8 figure grid reference.

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

**ARA** : Arable    **WHT** : Wheat    **BAR** : Barley    **CER** : Cereals    **OAT** : Oats    **MZE** : Maize    **OSR** : Oilseed rape  
**BEN** : Field Beans    **BRA** : Brassicae    **POT** : Potatoes    **SBT** : Sugar Beet    **FCD** : Fodder Crops    **LIN** : Linseed  
**FRT** : Soft and Top Fruit    **HRT** : Horticultural Crops    **PGR** : Permanent Pasture    **LEY** : Ley Grass    **RGR** : Rough Grazing  
**SCR** : Scrub    **CFW** : Coniferous Woodland    **DCW** : Deciduous Woodland    **HTH** : Heathland    **BOG** : Bog or Marsh  
**FLW** : Fallow    **PLO** : Ploughed    **SAS** : Set aside    **OTH** : Other

3. **GRDNT** : Gradient as measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in cm to gleying or slowly permeable layers.

5. **AP (WHEAT/POTS)** : Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)** : Moisture Balance.

7. **DRT** : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, an entry of 'Y' will be entered in the relevant column.

**MREL** : Microrelief limitation    **FLOOD** : Flood risk    **EROSN** : Soil erosion risk    **EXP** : Exposure limitation    **FROST** : Frost  
**DIST** : Disturbed land    **CHEM** : Chemical limitation

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

**OC** : Overall Climate    **AE** : Aspect    **EX** : Exposure    **FR** : Frost Risk    **GR** : Gradient    **MR** : Microrelief  
**FL** : Flood Risk    **TX** : Topsoil Texture    **DP** : Soil Depth    **CH** : Chemical    **WE** : Wetness    **WK** : Workability  
**DR** : Drought    **ER** : Soil Erosion Risk    **WD** : Combined Soil Wetness/Droughtiness    **ST** : Topsoil Stoniness

### Soil Pits and Auger Borings

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

**S** : Sand    **LS** : Loamy Sand    **SL** : Sandy Loam    **SZL** : Sandy Silt Loam    **CL** : Clay Loam    **ZCL** : Silty Clay Loam  
**SCL** : Sandy Clay Loam    **C** : Clay    **SC** : Sandy Clay    **ZC** : Silty Clay    **OL** : Organic Loam    **P** : Peat    **SP** : Sandy Peat  
**LP** : Loamy Peat    **PL** : Peaty Loam    **PS** : Peaty Sand    **MZ** : Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of prefixes.

**F** : Fine (more than 66% of the sand less than 0.2mm)

**M** : Medium (less than 66% fine sand and less than 33% coarse sand)

**C** : Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content.

**M** : Medium (< 27% clay)    **H** : Heavy (27-35% clay)

2. **MOTTLE COL** : Mottle colour

3. **MOTTLE ABUN** : Mottle abundance, expressed as a percentage of the matrix or surface described.

F : few <2%    C : common 2-20%    M : many 20-40    VM : very many 40%+

4. **MOTTLE CONT** : Mottle contrast

F : faint - indistinct mottles, evident only on close inspection    D : distinct - mottles are readily seen

P : prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL** : Ped face colour

6. **STONE LITH** : One of the following is used.

HR : all hard rocks and stones    MSST : soft, medium or coarse grained sandstone

SI : soft weathered igneous or metamorphic    SLST : soft oolitic or dolimitic limestone

FSST : soft, fine grained sandstone    ZR : soft, argillaceous, or silty rocks    CH : chalk

GH : gravel with non-porous (hard) stones    GS : gravel with porous (soft) stones

Stone contents (> 2cm, > 6cm and total) are given in percentages (by volume).

7. **STRUCT** : the degree of development, size and shape of soil peds are described using the following notation:

- degree of development    WK : weakly developed    MD : moderately developed    ST : strongly developed

- ped size    F : fine    M : medium    C : coarse    VC : very coarse

- ped shape    S : single grain    M : massive    GR : granular    AB : angular blocky    SAB : sub-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

SOIL PIT DESCRIPTION

Site Name : BASINGSTOKE LP SITE 10 Pit Number : 1P

Grid Reference: SU43826047 Average Annual Rainfall : 807 mm  
 Accumulated Temperature : 1398 degree days  
 Field Capacity Level : 178 days  
 Land Use : Permanent Grass  
 Slope and Aspect : 02 degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	MZCL	10YR42 52	0	5		
28- 45	MCL	10YR52 00	0	10		
45- 66	MCL	10YR63 00	0	25	C	
66-100	MCL	25Y 53 00	0	35	C	

Wetness Grade : 2 Wetness Class : I  
 Gleying : 045 cm  
 SPL : No SPL

Drought Grade : 2 APW : 116mm MBW : 21 mm  
 APP : 105mm MBP : 21 mm

FINAL ALC GRADE : 2  
 MAIN LIMITATION : Workability

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--				-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1	SU43756047	PGR E	01	038	045	4	3B	84	-11	93	9	3A			WE	38	SPL 45
1P	SU43826047	PGR E	02	045		1	2	116	21	105	21	2			WK	2	PIT 100 WORK
2	SU43836046	PGR E	01	065		1	2	130	35	114	30	1			WK	2	IMPST 100

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED	----STONES----			STRUCT/	SUBS	SPL	CALC
				COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT		
1	0-28	mc1	10YR42 00					0	0	HR	10			
	28-38	mc1	10YR52 00					0	0	HR	20	M		
	38-45	mc1	25Y 52 00	10YR66	00	C		Y	0	0	HR	20	M	
	45-65	c	25Y 53 00	75YR58	00	M		Y	0	0	HR	5	P	Y
1P	0-28	mzc1	10YR42 52					0	0	HR	5			
	28-45	mc1	10YR52 00					0	0	HR	10	M		
	45-66	mc1	10YR63 00	10YR56	00	C		Y	0	0	HR	25	M	
	66-100	mc1	25Y 53 00	10YR58	00	C		Y	0	0	HR	35	M	
2	0-40	mzc1	10YR42 00					0	0	HR	8			
	40-65	mc1	10YR53 00					0	0	HR	10	M		
	65-85	mc1	10YR52 00	10YR58	00	C		Y	0	0	HR	10	M	
	85-100	mc1	25Y 53 00	10YR58	00	C		Y	0	0	HR	10	M	