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Winchester District Local Plan
Site 125 Forest Road,
Denmead
Agricultural Land Classification Report
July 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

WINCHESTER DISTRICT LOCAL PLAN SITE 125 FOREST ROAD DENMEAD

1 Summary

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the Winchester District of Hampshire. The work forms part of MAFF's statutory input to the preparation of the Winchester District Local Plan.
- 1.2 Site 125 comprises 3.6 hectares of land to the south of Denmead in Hampshire. An Agricultural Land Classification (ALC) survey was carried out during July 1994. The survey was undertaken at a detailed level of approximately one boring per hectare of agricultural land surveyed. A total of 4 borings and two soil inspection pits were described 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 a long term limitation on its use for agriculture.
- 1.3 At the time of the survey the land use was permanent pasture.
- 1.4 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent are given in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but any enlargement would be misleading.

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
3b	<u>3.6</u>	<u>100.0</u>	100.0 (3.6 ha)
Total area of site	3.6	100.0	

- 1.5 Appendix I 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.
- 1.6 The site comprises poorly drained clayey soils which are affected by severe soil wetness and workability limitations. The utilisation of the land in terms of the opportunities for cultivations or grazing is restricted and soil wetness may adversely affect crop growth and development.

2 Climate

- 2 1 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 Estimates of climatic variables relevant to the assessment of agricultural land quality were obtained by interpolation from a 5 km grid point dataset (Met Office 1989) for a representative location in the survey area

Table 2 Climatic Interpolation

Grid Reference	SU658111
Altitude (m, AOD)	44
Accumulated Temperature (degree days Jan June)	1502
Average Annual Rainfall (mm)	816
Field Capacity (days)	175
Moisture Deficit Wheat (mm)	107
Moisture Deficit Potatoes (mm)	101

- 2 3 The details given in the table above show that there is no overall climatic limitation affecting the site. In addition no local climatic factors such as exposure or frost risk affect land quality at this locality
- 2 4 Climatic factors do however interact with soil properties to influence soil wetness and droughtiness limitations. At this locality the climate is relatively moist in regional terms thereby enhancing the likelihood of soil wetness problems

3 Relief

- 3 1 The site is relatively low lying and only very gently sloping being at an altitude of 40-45 m AOD. Land falls gently from west to east. Nowhere on the site does gradient or microrelief affect land quality

4 Geology and Soil

- 4 1 British Geological Survey (1971) Sheet 316 Fareham shows the entire site to be underlain by deposits of London Clay
- 4 2 Soil Survey of England and Wales (1983) Sheet 6 shows the site to comprise soils of the Windsor Association. These are described as slowly permeable seasonally waterlogged clayey soils (SSEW 1984)
- 4 3 Detailed field examination of the soils on the site found them to be consistent with both London Clay geology and the soils described by the Soil Survey. Deep poorly drained clayey soils were observed which are affected by seasonal waterlogging

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 Moderate quality land has been mapped across all of the agricultural land surveyed. The land is affected by significant soil wetness and workability limitations. Profiles typically comprise non calcareous heavy (silty) clay loam topsoils which are generally stone free. These pass directly to clay subsoils which are poorly structured and slowly permeable. Due to impeded drainage through the clay subsoils and the resultant seasonal waterlogging, profiles are mottled and gleyed to the surface. These drainage characteristics equate to a wetness class of IV. The land is thereby graded 3b on the basis of severe soil wetness limitations. The opportunities for cultivations and grazing by livestock will be significantly restricted whilst crop growth and yields may be adversely affected by waterlogged soils.

ADAS Ref 1513/116/94
MAFF Ref EL15/594

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1971) Sheet 316 Fareham

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

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 of this 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 land.

Grade 3 Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the 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.

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 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 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 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 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 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

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 soil wetness classes are identified and are defined in the table below.

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 or if there is no slowly permeable layer within 80 cm depth it is wet within 70 cm for more than 90 days but only wet within 40 cm depth for 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 present within 80 cm depth, it is wet within 70 cm for more than 180 days but only wet within 40 cm depth for between 31-90 days in most years
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years or if there is no slowly permeable layer present 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

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.

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

²In 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 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
ZL	Silt 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 the following 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 using Munsell notation
- 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 using Munsell notation

- 6 **GLEYS** If the soil horizon is gleyed a **Y** will appear in this column If slightly gleyed an **S** will appear

- 7 **STONE LITH** Stone Lithology One of the following is used

HR	all hard rocks and stones	SLST	soft oolitic or dolimitic limestone
CH	chalk	FSST	soft fine grained sandstone
ZR	soft argillaceous or silty rocks	GH	gravel with non porous (hard) stones
MSST	soft medium grained sandstone	GS	gravel with porous (soft) stones
SI	soft weathered igneous/metamorphic rock		

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

SOIL PROFILE DESCRIPTIONS EXPLANATORY NOTE

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

Boring Header Information

- 1 **GRID REF** national 100 km 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	FLW Fallow
PGR Permanent Pasture	LEY Ley Grass	RGR Rough Grazing
SCR Scrub	CFW Coniferous Woodland	DCW Deciduous Wood
HTH Heathland	BOG Bog or Marsh	FLW Fallow
PLO Ploughed	SAS Set aside	OTH Other
HRT Horticultural Crops		
- 3 **GRDNT** Gradient as estimated or measured by a hand held optical clinometer
- 4 **GLEYSPL** Depth in centimetres (cm) to gleying and/or slowly permeable layers
- 5 **AP (WHEAT/POTS)** Crop adjusted available water capacity
- 6 **MB (WHEAT/POTS)** Moisture Balance (Crop adjusted AP crop adjusted MD)
- 7 **DRT** Best grade according to soil droughtiness
- 8 If any of the following factors are considered significant 'Y' will be entered in the relevant column

MREL Microrelief limitation	FLOOD Flood risk	EROSN Soil erosion risk
EXP Exposure limitation	FROST Frost prone	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 Erosion Risk	WD Soil Wetness/Droughtiness
ST Topsoil Stoniness		

- 8 **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 gran **M** massive
 GR granular **AB** angular blocky
 SAB sub angular blocky **PR** prismatic
 PL platy

- 9 **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

- 10 **SUBS STR** Subsoil structural condition recorded for the purpose of calculating profile droughtiness **G** good **M** moderate **P** poor

- 11 **POR** Soil porosity If a soil horizon has less than 0.5% biopores >0.5 mm a 'Y' will appear in this column

- 12 **IMP** If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon

- 13 **SPL** Slowly permeable layer If the soil horizon is slowly permeable a 'Y' will appear in this column

- 14 **CALC** If the soil horizon is calcareous a 'Y' will appear in this column

- 15 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 WINCHESTER LP SITE 125 P t Nu be 1P

Grid Reference SU65901110 A erage A 1 Rai fall 816 mm
 Accumulated Tempe at 1502 degree day
 Field Capacity Le el 175 day
 Land Use Perma e t G a s
 Slope a d Aspect 01 degrees N

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0	18	HZCL	10YR51 00	0	0		C				
18	34	C	25 Y60 00	0	0		M	STVCAB	FM	P	
34	55	C	25 Y53 00	0	0		M	WKCOAB	FM	P	

Wetness Grade 3B Wetness Class IV
 Gleying 0 cm
 SPL 018 cm

Drought Grade APW mm MBW 0 mm
 APP mm MBP 0 mm

FINAL ALC GRADE 3B
 MAIN LIMITATION Wet s

SAMPLE NO	GRID REF	ASPECT		GRDNT	GLEYS	SPL	WETNESS		WHEAT		POTS		M REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS	
		USE					CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD						
1	SU65901120	PGR	NE	01	0	022	4	3B			0	0						WE	3B	
1P	SU65901110	PGR	N	01	0	018	4	3B			0	0						WE	3B	
2	SU65801110	PGR	NE	01	0	020	4	3B			0	0						WE	3B	
3	SU65901110	PGR			0	026	4	3B			0	0						WE	3B	
4	SU65901100	PGR	N	01	0	010	4	3B			0	0						WE	3B	ORGANIC TOP?

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES			PED		STONES			STRUCT/		SUBS			
				COL	ABUN	CONT	COL	GLE	2	6	LITH	TOT	CONSIST	STR	POR	IMP	SPL
1	0 22	hzc1	10YR53 00	10YR58 00	M			Y	0	0	0						
	22 60	c	10YR61 00	75YR68 00	M			Y	0	0	0		P				Y
1P	0 18	hzc1	10YR51 00	75YR46 00	C			Y	0	0	0						
	18 34	c	25 Y60 00	75YR56 00	M			Y	0	0	0	STVCAB	FM	P	Y		Y
	34 55	c	25 Y53 00	75YR58 00	M		10YR71 00	Y	0	0	0	WKCOAB	FM	P	Y		Y
2	0 20	hc1	10YR61 00	75YR56 00	C			Y	0	0	0						
	20 70	c	25 Y53 00	75YR58 00	M		10YR71 00	Y	0	0	0		P				Y
3	0 26	hzc1	10YR52 00	10YR46 00	M			Y	0	0	HR	1					
	26 40	c	25Y 53 00	10YR56 00	M			Y	0	0	HR	1		P			Y
	40 60	zc	10YR61 00	75YR68 00	M			Y	0	0	0		P				Y
4	0 10	ohc1	10YR41 00	75YR46 00	C			Y	0	0	0						
	10 65	c	10YR62 00	75YR68 00	M		25 Y70 00	Y	0	0	0		P				Y