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Winchester District Local Plan
Site 133 Land at Kingsgate Kings Worthy
Agricultural Land Classification
ALC Map and Report
July 1994

AGRICULTURAL LAND CLASSIFICATION, REPORT

WINCHESTER DISTRICT LOCAL PLAN SITE 133 LAND AT KINGSGATE KINGS WORTHY

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 Winchester District Local Plan.
- 1.2 Site 133 comprises approximately 5 hectares of land to the south east of the village of Kings Worthy in Hampshire. An Agricultural Land Classification (ALC) survey was carried out in July 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 4 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 carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.
- 1.4 At the time of the survey the agricultural land was in permanent unmanaged grass. The remainder of the site was mature mixed woodland and hedgerows.
- 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 1:10,000. It is accurate at this scale but any enlargement would be misleading. This map supersedes any previous ALC survey information for this site.

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
2	1.9	58.8
Woodland	<u>3.0</u>	<u>61.2</u>
Total area of Site	4.9ha	100%

- 1.6 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.
- 1.7 The agricultural land at this site has been classified as very good quality (Grade 2). The principal limitation is soil workability. Soil workability restrictions occur here because of local climatic parameters which could cause the moderately textured

topsoils found at this site to be prone to structural damage during wetter periods if the land were stocked or cultivations required. Soil profiles are typically slightly stony and well drained such that soil wetness and soil droughtiness are not limiting factors at this site.

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.
- 2.4 According to unpublished Met Office data (1971) the site is shown as being frost prone. However climatic and soil factors interact to influence soil wetness, workability and droughtiness limitations which are of greater significance to land quality than frost such that this does not affect the final classification.

Table 2 Climatic Interpolation

Grid Reference	SU495327
Altitude (m AOD)	49
Accumulated Temperature (°days Jan June)	1490
Average Annual Rainfall (mm)	805
Field Capacity Days	176
Moisture deficit wheat (mm)	105
Moisture deficit potatoes (mm)	98
Overall Climatic Grade	1

3 Relief

- 3.1 The site lies at an altitude of approximately 47.55 m AOD, falling gently from north west to south east. Nowhere on the site does relief or gradient affect agricultural land quality.

4 Geology and Soils

- 4.1 The published geological information (BGS 1975) shows the entire site to be underlain by Cretaceous Upper Chalk, comprising soft white chalk with many flint nodules.

- 4 2 The published soils information (SSEW 1983) shows the site to be included in the urban area of Winchester. Immediately to the east of the site soils of the Andover 1 Association are shown. The legend accompanying the map describes these as Shallow well drained calcareous silty soils over chalk on slopes and crests. Deep calcareous and non calcareous fine silty soils in valley bottoms. Soils from the deeper calcareous phases of the association were encountered at the site. Briefly they comprise silty clay loam topsoil and subsoil horizons containing variable proportions of flints and chalk passing to chalky drift and solid chalk at depth.

5 Agricultural Land Classification

- 5 1 Paragraph 1.5 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.

Grade 2

- 5 3 Land of very good quality has been mapped for the agricultural land at this site. The principal limitation is soil workability. Profiles typically comprise a slightly to moderately stony (c. 2-20% v/v flints max. 8% > 2cm and up to 5% weathered chalk) medium silty clay loam topsoil over a similarly stony medium silty clay loam upper subsoil passing to a similarly textured horizon containing c. 5% flints. This overlies a further slightly stony (c. 5-10% v/v flints and up to c. 5% weathered chalk) medium silty clay loam horizon which commonly became impenetrable to the soil auger between 65 and 92cm. However in the pit observation (1p Appendix III) this horizon was found to pass to a shallow layer of chalky drift (a periglacial deposit derived from solid chalk) overlying solid chalk at 115cm. Within the pit roots were observed to 92cm which is sufficient with the moisture retentive soils at this site to place these soils in Grade 1 given the local climatic parameters. However due to the prevailing relatively wet nature of the local climate and the medium workability status of the topsoils this area is very slightly restricted by soil workability as during wetter periods the topsoil could be prone to structural damage were trafficking of stock or machinery to take place.

ADAS Ref 1513/118/94
MAFF Ref EL15/594

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1975) Sheet 299 Winchester 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 (1971) Unpublished Climate data relating to 1 63 360 Sheet 168

Meteorological Office (1989) Climatic datasets for Agricultural Land Classification

Soil Survey of England and Wales (1983) Sheet No 6 Soils of South East England 1 250 000 and Accompanying Legend

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 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 (e.g. 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 (e.g. 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 e.g. 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 CLASS

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 180 days but only wet within 40 cm depth for 31-90 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 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

Wetness Class 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

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

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents

Sample Point Map

Soil Abbreviations explanatory note

Database Printout soil pit information

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	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 measured by a hand held optical clinometer
- 4 **GLEYSPL** 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	ST Topsoil Stones
CH Chemical	WE Wetness	WK Workability	
DR Drought	ER Erosion Risk	WD Soil Wetness/Droughtiness	

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 subdivided 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	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	GH gravel with non porous (hard) stones
SI soft weathered igneous/metamorphic rock	

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 WINCHESTER LP SITE 133 Pit Number 1P

Grid Reference SU49403270 Average Annual Rainfall 805 mm
 Accumulated Temperature 1490 degree days
 Field Capacity Level 176 days
 Land Use Permanent Grass
 Slope and Aspect 02 degrees SE

HORIZON	TEXTURE	COLOUR	STONES	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 19	MZCL	10YR42 00	8	20	HR					
19 70	MZCL	10YR44 54	2	5	HR		WKCSAB	FR	M	
70 92	MZCL	10YR54 00	0	10	HR		MDCSAB	FR	M	
92 115	MZCL	10YR74 81	0	50	CH				P	Y
115 120	CH	10YR81 00	0	5	HR				P	Y

Wetness Grade 2 Wetness Class I
 Gleying cm
 SPL cm

Drought Grade 1 APW 136mm MBW 31mm
 APP 111mm MBP 13mm

FINAL ALC GRADE 2
 MAIN LIMITATION Workability

SAMPLE NO	GRID REF	USE	ASPECT		WETNESS		WHEAT		POTS		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		
1	SU49433280	PGR	SE	02		1	2	108	3	120	22	3A					WK 2 IMP 72 SEE 1P
1P	SU49403270	PGR	SE	02		1	2	136	31	111	13	1					WK 2 PIT 92 AUG 120
2	SU49463264	PGR	SE	01		1	2	121	16	120	22	2					WK 2 IMP 85 SEE 1P
3	SU49403270	PGR	SE	02		1	2	118	13	111	13	2					WK 2 IMP 92 SEE 1P
4	SU49503270	PGR	SE	02		1	2	100	5	108	10	3A					WK 2 IMP 65 SEE 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES			PED		STONES			STRUCT/	SUBS	SPL	CALC
				COL	ABUN	CONT	COL	GLE	2	6	LITH	TOT	CONSIST		
1	0 25	mzc1	10YR43 00						0	0	HR	2			Y
	25 50	mzc1	10YR44 00						0	0	HR	5	M		Y
	50 68	mzc1	10YR44 54						0	0	HR	2	M		Y
	68 72	mzc1	10YR44 54						0	0	HR	10	M		Y IMP FLINTS 72
1P	0 19	m c1	10YR42 00						8	0	HR	20			+5% CHALK
	19 70	mzc1	10YR44 54						2	0	HR	5	WKCSAB FR M		
	70 92	mzc1	10YR54 00						0	0	HR	10	MDCSAB FR M		
	92 115	mzc1	10YR74 81						0	0	CH	50	P		Y CHALKY DRIFT
	115 120	ch	10YR81 00						0	0	HR	5	P		Y
2	0 25	mzc1	10YR41 42						0	0	HR	2			
	25 50	mzc1	10YR44 54						0	0	HR	3	M		+5% CHALK
	50 85	mzc1	10YR44 00						0	0	HR	5	M		+2%CH IMP FLINTS 85
3	0 25	mzc1	10YR42 00						0	0	HR	20			+5% CHALK SEE 1P
	25 70	mzc1	10YR44 54						0	0	HR	5	M		
	70 92	mzc1	10YR54 00						0	0	HR	10	M		IMP FLINTS 92
4	0 28	mzc1	10YR42 00						0	0	CH	5			Y 2% FLINTS
	28 45	mzc1	10YR44 00						0	0	HR	5	M		Y 5% CHALK
	45 58	h c1	10YR54 00						0	0	CH	25	M		Y WEATHERED CHALK 25%
	58 65	mzc1	10YR64 00						0	0	CH	70	M		Y CHALKY DRIFT