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South Oxfordshire District Local Plan
Site 364 Land West of the Oval Didcot
Agricultural Land Classification
ALC Map and Report
December 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

SOUTH OXFORDSHIRE DISTRICT LOCAL PLAN
SITE 364 LAND WEST OF THE OVAL DIDCOT

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 South Oxfordshire district The work forms part of MAFF s statutory input to the South Oxfordshire District Local Plan

1 2 Site 364 comprises approximately 4 1 hectares of land to the south west of Didcot in Oxfordshire An Agricultural Land Classification (ALC) survey was carried out in November 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 land was under winter cereals

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
3a	3 6	87 8
3b	0 5	12 2
Total area of Site	4 1ha	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 land at this site has been classified Subgrade 3a good quality and Subgrade 3b moderate quality with soil wetness and topsoil workability as principal limitations Soil wetness affected the majority of observations where slowly permeable moderately structured clay horizons between 28 and 49cm depth were encountered These cause drainage to be slightly to severely impeded dependant on depth to the clay horizon such that the classifications are appropriate given the local climatic regime Poorly drained soils can inhibit plant and root development and may be more susceptible to structural damage through trafficking by machinery or poaching by grazing livestock In some observations soil workability affects the final grading as the topsoil has a clay content sufficient to lead to further restrictions on cultivation and stocking if structural damage to the soil is to be avoided

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 No local climatic factors such as exposure or frost risk are believed to affect the site However climatic and soil factors interact to influence soil wetness and droughtiness limitations

Table 2 Climatic Interpolation

Grid Reference	SU512908	SU512906
Altitude (m AOD)	75	80
Accumulated Temperature (days Jan June)	1434	1429
Average Annual Rainfall (mm)	585	588
Field Capacity Days	123	124
Moisture deficit wheat (mm)	114	113
Moisture deficit potatoes (mm)	108	108
Overall Climatic Grade	1	1

3 Relief

3 1 The site lies at approximately 75 80m AOD rising from the northern boundary towards the south of the site Nowhere on the site does relief or gradient affect agricultural land quality

4 Geology and Soils

4 1 The published geological information (BGS 1971) shows the majority of the site to be underlain by Cretaceous Upper Greensand A small area to the north of the site is shown as head and younger coombe deposits as drift over the Upper Greensand

4 2 The published soils information (SSEW 1971 & 1983) shows the majority of the site to be underlain by Harwell Series soils These are briefly described as a loamy brown earth over grey fine sandstone siltstone or silty marl (SSEW 1971) Towards the north of the site where head and younger coombe deposits are mapped (BGS 1971) Hendred series soils are shown These are briefly described as surface water gley soils fine silty or clayey silty clays (SSEW 1971) Soils over the site were commonly found to be fine loamy over clayey slowly permeable horizons in the subsoil

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

Subgrade 3a

5 3 Land of good quality is mapped for the majority of the site Principal limitations include topsoil workability soil wetness and soil droughtiness

5 4 Topsoil workability restrictions occur towards the north of this area where clay topsoils were encountered Within the local climatic parameters these heavy topsoils may be prone to structural damage during wetter periods if the land is trafficked by machinery or utilised for grazing These restrictions apply regardless of other limitations i e soil wetness and soil droughtiness

5 5 Towards the south of the site soil wetness predominates as the principal limitation Soil profiles were variable in this area typically comprising a very slightly stony (up to c 5% v/v soft fine sandstone fragments) medium silty clay loam topsoil passing to a similarly stony clay upper subsoil with a moderate structural

condition This overlies a slightly stony (c 10%) moderately structured slowly permeable clay horizon passing to a moderately stony (c 25%) heavy clay loam from approximately 75cm to depth as shown in Pit 1 (see Appendix III) Within the prevailing local climate the drainage impedance that the clay causes is sufficient to restrict this land to Wetness Class II (see Appendix II) This causes a slight restriction on the timings of cultivations and stocking if structural damage to the soil is to be avoided

5 6 Towards the south of this mapping unit the slowly permeable clay horizon is absent from the profile such that the moderately stony heavy clay loam horizon is present from approximately 60cm with slightly stony (c 10% v/v fine sandstone) medium silty clay loam in the upper subsoil This leads to a moderate soil droughtiness limitation as the stone content reduces plant available water and may affect plant growth and yield

Subgrade 3b

5 7 Land of moderate quality is mapped for a small proportion of the site towards the north on the land of lowest altitude The principal limitation in this area is soil wetness due to impeded drainage Typically profiles comprise a very slightly stony (c 3% v/v soft fine sandstone) clay topsoil over a stoneless gleyed poorly structured slowly permeable clay subsoil Within the local climatic parameters a profile of this nature is assigned to Wetness Class III (see Appendix II) Due to the heavy topsoils and associated workability limitations a classification of Subgrade 3b is appropriate These wetness and workability factors lead to severe restrictions on the versatility of the land principally in terms of the timing of cultivations and stocking if structural damage to the soil is to be avoided

SOURCES OF REFERENCE

British Geological Survey (1971) Sheet 253 Abingdon 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) Climatic datasets for Agricultural Land Classification

Soil Survey of England and Wales (1971) Sheet 253 Abingdon Map scale 1 63 360

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 fro 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 **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 **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 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	**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 N me S OXON LP SITE 364 P t N be 1P

Gr d Ref enc SU51209070 A e ag A l R fall 585 mm
Acc m l ted Tempe at 1434 deg ee day
F ld Capac ty Le el 123 d ys
La d Use Ce eal
Slope and Aspect 01 deg ees N

HORIZON	TEXTURE	COLOUR	STONES 2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 34	MZCL	25Y 41 42	0	3	FSST					
34 49	C	05Y 61 62	0	5	FSST	F	MDCSAB	FR	M	
49 73	C	05Y 61 62	0	10	FSST	C	WKCSAB	FR	M	
73 88	HCL	05Y 62 00	0	25	FSST	F		FR	M	

W t es G ad 2 Wet ess Cl ss II
Gl y g 49 cm
SPL 49 cm

Dro ght Grade 3A APW 117mm MBW 3 mm
APP 118mm MBP 10 mm

FINAL ALC GRADE 2
MAIN LIMITATION So l Wet ess/D o ght ess

MPLE	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	WETNESS CLASS	WHEAT GRADE	WHEAT AP	WHEAT MB	POTS AP	POTS MB	M REL DRT	EROSN FLOOD	FROST EXP	CHEM DIST	ALC LIMIT	COMMENTS
1	SU51309090	CER	N	01	28	28	3	3B		0		0					WE 3B	SPL 28
1P	SU51209070	CER	N	01	49	49	2	2	117	3	118	10	3A				WD 2	PIT 88 AUG 120
2	SU51209080	CER	N	02			1	3A	139	25	105	3	2				WK 3A	CLAY TOPSOIL
3	SU51209070	CER	N	02	45	45	2	2	146	32	118	10	1				WE 2	SPL 45
4	SU51209060	CER	N	01			1	1	109	5	117	9	3A				DR 3A	IMP SANDST 75

1

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	PED GLEY	STONES 2	STONES 6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
1	0 28	c	25Y 41 00						0	0	FSST	3							
	28 70	c	05Y 52 61	10YR58	00	C	00MN00	00 Y	0	0		0		P			Y		
1P	0 34	mzcl	25Y 41 42						0	0	FSST	3							
	34 49	c	05Y 61 62	10YR46	00	F			0	0	FSST	5	MDCSAB	FR	M	Y			
	49 73	c	05Y 61 62	10YR58	00	C		Y	0	0	FSST	10	WKCSAB	FR	M	Y	Y		
	73 88	hcl	05Y 62 00	10YR58	00	F			0	0	FSST	25		FR	M				
2	0 23	c	25Y 41 00						0	0	FSST	5							
	23 120	hcl	05Y 62 00	10YR46	00	F			0	0	FSST	15		M				Y	
3	0 25	mzcl	25Y 42 00						0	0	FSST	5							
	25 45	c	05Y 51 62	10YR46	00	F			0	0		0		M					
	45 75	c	05Y 51 62	10YR46	56	C		Y	0	0		0		M			Y		
	75 120	hcl	05Y 62 00	10YR58	00	F			0	0	FSST	15		M					
4	0 35	mzcl	25Y 41 00						0	0	FSST	5							
	35 60	mzcl	25Y 51 00	10YR66	00	F			0	0	FSST	10		M					
	60 75	hcl	25Y 51 00	10YR66	00	F			0	0	FSST	25		M					IMP SAND/SILT ST 75