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Test Valley Borough Local Plan Review
Site 3 Land East of Barton Stacey
Hampshire
Agricultural Land Classification
ALC Map and Report
July 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT
TEST VALLEY BOROUGH LOCAL PLAN REVIEW
SITE 3 LAND EAST OF BARTON STACEY HAMPSHIRE

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 6.5 ha of land on the eastern side of the village of Barton Stacey. The survey was carried out in July 1996.

2 The survey was commissioned by Ministry of Agriculture Fisheries and Food (MAFF) Land Use Planning Unit (Reading) in connection with the Test Valley Borough Local Plan Review. This survey supersedes previous ALC surveys on this land.

3 The work was conducted under sub contracting arrangements by NA Duncan and Associates and was supervised by members of the Resource Planning Team in the Guildford Statutory Group in ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF 1988). A description of the ALC grades and subgrades is given in Appendix I.

4 At the time of survey all the land was under grass and being grazed by sheep.

Summary

5 The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000; it is accurate at this scale but any enlargement would be misleading.

6 The fieldwork was conducted at an average density of 1 boring per hectare. A total of 7 borings and 2 soil pits were described.

7 The whole site (6.5 ha) has been classified as Subgrade 3a, good quality agricultural land. The soils on the site comprise silty clay loams overlying chalk at both shallow and moderate depths. Soil pit observations show that plant roots extend into the underlying chalk for at least 30 cm. Moisture balance calculations indicate that under the prevailing climatic conditions the soils will be slightly to moderately droughty depending on the depth to the underlying chalk and consequently the land has been restricted to Subgrade 3a.

FACTORS INFLUENCING ALC GRADE

Climate

8 Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

9 The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met Office 1989)

Table 2 Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SU 440 410
Altitude	m AOD	85
Accumulated Temperature	day°C	1447
Average Annual Rainfall	mm	788
Field Capacity Days	days	169
Moisture Deficit Wheat	mm	102
Moisture Deficit Potatoes	mm	94

10 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

11 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR) as a measure of overall wetness and accumulated temperature (AT0 January to June) as a measure of the relative warmth of a locality

12 The combination of rainfall and temperature at this site mean that under this warm and relatively moist climate wetness and workability limitations may be enhanced on the heavier textured soils In addition soils will need a moderately high available water capacity to avoid droughtiness limitations There is however no overall climatic limitation in this area the site is climatically Grade 1

Site

13 The altitude of the site ranges from approximately 90 m AOD at the south eastern corner falling to 75 m AOD at the western end Gradients on the site range from very gently sloping land 0.2 at the top and bottom of the field with steeper slopes of 5-6° on the midslopes The land generally falls in a north westerly direction There are therefore no site factors which are limiting to the ALC grading of the site

Geology and soils

14 The published geological information for the area (BGS 1975) shows the site to be underlain by Upper Chalk which is described as soft chalk with many flint nodules

15 There is no detailed soil survey map for the area but the reconnaissance soil map (SSEW 1983) shows the area to comprise soils of the Andover 1 association These soils are described as shallow well drained calcareous silty soils over chalk on the slopes and crests with deep calcareous and non calcareous fine silty soils in the valley bottoms

Agricultural Land Classification

16 The details of the classification of the site are shown on the attached ALC map

17 The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III

Grade 3a

18 The whole site has been classified as Subgrade 3a, with the main limitation being due to droughtiness. The soil observations on the site indicate that the majority of the area comprises moderately shallow soils overlying chalk with some shallow profiles occurring locally. The deeper profiles comprise a heavy silty clay loam topsoil overlying a similar textured chalky subsoil overlying chalk below 37.48 cm depth. Soil pit 2 on the deeper soils shows that the subsoil structure is strongly developed fine and medium subangular blocky and that plant roots extend approximately 30 cm into the underlying fissured chalk. Moisture balance calculations indicate that these soils will be slightly droughty especially for the deeper rooting crops restricting the land quality to Subgrade 3a. Some shallower profiles were found with the topsoil directly overlying the fissured chalk and roots extending at least 30 cm into the underlying chalk (see Pit 1). Moisture balance calculations indicate that these soils will be moderately droughty restricting them to Subgrade 3b. However as these profiles tended to be localised they have not been delineated separately and consequently the whole site has been mapped as Subgrade 3a.

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for the Resource Planning Team
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ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1946) *Sheet No 299 Winchester (Drift)* BGS London

Ministry of Agriculture Fisheries and Food (1988) *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land* MAFF London

Met Office (1989) *Climatological Data for Agricultural Land Classification*
Met Office Bracknell

Soil Survey of England and Wales (1983) *Sheet 6 South East England* SSEW Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW Harpenden

APPENDIX I

DESCRIPTIONS 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.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

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.

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

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land* (MAFF 1988).

¹ The number of days is not necessarily a continuous period

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

APPENDIX III

SOIL DATA

Contents

Sample location map

Soil abbreviations Explanatory Note

Soil Pit Descriptions

Soil boring descriptions (boring and horizon levels)

Database Printout Horizon Level Information

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 **GLEYS/SPL** 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		

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 GLEY 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)

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 grain **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 1EST VALLEY BLP SITE 3 Pit Number 1P

Grid Reference SU43904090 Average Annual Rainfall 788 mm
 Accumulated Temperature 1447 degree days
 Field Capacity Level 169 days
 Land Use Permanent Grass
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0-26	HZCL	10YR53 00	0		10	CH					Y
26-60	CH	10YR81 00	0		0					P	

Wetness Grade 1 Wetness Class I
 Gleying cm
 SPL cm

Drought Grade 3B APW 78mm MBW 24 mm
 APP 81mm MBP 13 mm

FINAL ALC GRADE 3B
 MAIN LIMITATION Drought

SOIL PIT DESCRIPTION

Site Name 1EST VALLEY BLP SITE 3 Pit Number 2P

Grid Reference SU44104110 Average Annual Rainfall 788 mm
 Accumulated Temperature 1447 degree day
 Field Capacity Level 169 days
 Land Use Permanent Grass
 Slope and Aspect 02 degrees NW

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0-27	MZCL	10YR43 00	2		3	HR					Y
27-45	HZCL	10YR54 00	0		2	HR		STMSB	FR	G	Y
45-55	HZCL	10YR54 00	0		90	CH				M	Y
55-70	CH	10YR81 00	0		0					P	

Wetness Grade 1 Wetness Class I
 Gleying cm
 SPL cm

Drought Grade 3A APW 106mm MBW 4 mm
 APP 113mm MBP 19 mm

FINAL ALC GRADE 3A
 MAIN LIMITATION Drought

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	
1	SU43904110	PGR MW	02		1	1			0	0				DR 3A	CHALK 48
1P	SU43904090	PGR			1	1			78	24	81	13	3B	DR 3B	CHALK 26
2	SU44004110	PGR MW	05		1	1			81	21	84	10	3B	DR 3B	CHALK 30
2P	SU44104110	PGR MW	02		1	1			106	4	113	19	3A	DR 3A	CHALK 45
3	SU44104110	PGR N	06		1	1			90	12	90	4	3A	DR 3A	CHALK 45
4	SU43904100	PGR W	05		1	1			0	0				DR 3B	CHALK 30
5	SU44004100	PGR W	05		1	1			87	15	88	6	3A	DR 3A	CHALK 37
6	SU44104100	PGR N	03		1	1			83	19	83	11	3A	DR 3A	CHALK 37
7	SU44104090	PGR			1	1			0	0				DR 3B	CHALK 27

SAMPLE	DEPTH	TEXTURE	COLOUR	-MOTTLES			PED		STONES			STRUCT/		SUBS		SPL	CALC
				COL	ABUN	CONT	COL	GLEY	2	6	LITH	TOT	CONSIST	STR	POR		
1	0 28	mz 1	10YR43 00						2	0	HR	3					Y
	28 48	h c1	10YR54 00						0	0	CH	5					Y
	48 50	h	10YR81 00						0	0		0					
1P	0 26	hzc1	10YR53 00						0	0	CH	10					Y
	26 60	ch	10YR81 00						0	0		0		P			
2	0 30	h c1	10YR53 00						1	0	CH	11					Y
	30 60	ch	10YR81 00						0	0		0		P			
2P	0 27	mz 1	10YR43 00						2	0	HR	3					Y
	27 45	hzc1	10YR54 00						0	0	HR	2	STMSB	FR	G		Y
	45 55	h c1	10YR54 00						0	0	CH	90			M		Y
	55 70	ch	10YR81 00						0	0		0		P			
3	0 26	hzc1	10YR43 00						1	0	HR	3					Y
	26 45	c	75YR55 00						0	0	CH	12			G		Y
	45 50	ch	10YR81 00						0	0		0		P			
4	0 30	mzc1	10YR53 00						2	0	HR	3					Y
	30 48	ch	10YR81 00						0	0		0					Y
5	0 25	h c1	10YR53 00						0	0	CH	5					Y
	25-37	hzc1	10YR64 00						0	0	CH	10			G		Y
	37 55	ch	10YR81 00						0	0		0		P			
6	0 26	h c1	10YR43 00						0	0	HR	3					Y
	26 37	hz 1	75YR55 00						0	0	CH	12			G		Y
	37 50	ch	10YR81 00						0	0		0		P			
7	0 27	hzc1	10YR53 00						0	0	HR	2					Y
	27 35	ch	10YR81 00						0	0		0					