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**HAVANT BOROUGH LOCAL PLAN
Objector sites Area 1 Cowplain Hampshire**

**Agricultural Land Classification
ALC Map and Report**

June 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT
HAVANT BOROUGH LOCAL PLAN
OBJECTOR SITES AREA 1 COWPLAIN HAMPSHIRE

INTRODUCTION

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 11 hectares of land at Woodcroft farm Cowplain in Hampshire. The survey was carried out during June 1998.

2 The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ on behalf of the Ministry of Agriculture Fisheries and Food (MAFF) in connection with MAFF's statutory input to the Havant Borough local plan. This survey supersedes any previous ALC information for this land.

3 The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. 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 the agricultural land use on the site consisted entirely of permanent grassland being grazed by ponies. The areas mapped as 'Other land' include farm buildings, tracks, two disused pits and a telecommunications aerial.

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 area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
3a	1.6	17.8	15.8
4	7.4	82.2	73.3
Other land	1.1		10.9
Total surveyed area	9.0	100	89.1
Total site area	10.1		100

7 The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. In total 13 borings and 2 soil pits were described.

¹ FRCA is an executive agency of MAFF and the Welsh Office.

8 The site has been classified as mostly Grade 4 poor quality agricultural land with some Subgrade 3a good quality soil wetness is the main limitation to the land quality

9 The Subgrade 3a land comprises medium clay loam topsoils overlying heavy clay loam upper subsoils and clay lower subsoils. The lower subsoils are poorly structured and obstruct drainage through the profile giving rise to a soil wetness limitation. On the Grade 4 land heavy clay loam topsoils directly overlie poorly structured clay subsoils which give rise to a more severe wetness limitation. This in turn will restrict the range of crops that are suitable for this land and will significantly limit the number of days when the land is in a suitable condition for cultivations, grazing by livestock or trafficking by machinery.

FACTORS INFLUENCING ALC GRADE

Climate

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

11 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	
		SU 681 120	SU 685 123
Grid reference	N/A	SU 681 120	SU 685 123
Altitude	m AOD	67	70
Accumulated Temperature	day C (Jan June)	1475	1471
Average Annual Rainfall	mm	851	857
Field Capacity Days	days	184	185
Moisture Deficit Wheat	mm	103	102
Moisture Deficit Potatoes	mm	95	94
Overall climatic grade	N/A	Grade 1	Grade 1

12 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.

13 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.

14 The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors such as frost risk do not affect land quality at this location. The site is in an area which is rather exposed but no evidence of this was seen. The site is climatically Grade 1. However climatic factors do interact with soil properties to influence soil wetness and soil droughtiness. At this locality the climate is relatively warm.

and moist in regional terms. The likelihood of soil wetness problems may therefore be enhanced.

Site

15 The site lies at altitudes in the range 50-70 m AOD. The highest land occurs along the north-eastern boundary of the site with land falling with slight gradients towards Woodcroft farm. Most of the site is not affected by site restrictions (i.e. gradient or flooding). However, immediately north-east of Woodcroft farm, there is an area of disturbed ground where microrelief is now a significant limitation.

Geology and soils

16 The most detailed published geological information for the site (BGS 1971) shows it to be entirely underlain by the Reading Beds (mottled clay with sand).

17 The most detailed published soils information covering the area (SSEW 1983) shows it to comprise entirely soils of the Windsor association. These soils are described as slowly permeable seasonally waterlogged clayey soils mostly with brown subsoils. Some fine loamy over clayey and fine silty over clayey soils and locally on slopes, clayey soils with only slight seasonal waterlogging (SSEW 1983).

AGRICULTURAL LAND CLASSIFICATION

18 The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1 page 1.

19 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 II.

Subgrade 3a

20 Land of good quality is mapped on one field north-west of Woodcroft farm. It is limited by soil wetness.

21 Soils in this subgrade comprise non-calcareous medium clay loam topsoils which may contain up to 13% total flints by volume (1-6% > 2 cm in size). Topsoils overlie similar or heavy clay loam or clay upper subsoils. From approximately 30 to 43 cm, soil profiles are impenetrable to the soil auger. One soil pit was dug in this area (2P see Appendix II) and is typical of the soils in this subgrade. The pit showed that the upper subsoil horizon contained 17% total flints by volume (6% > 2 cm in size) and this combined with the dry subsoil conditions restricted access into these soils. From approximately 43 cm, the clay lower subsoils are poorly structured and slowly permeable and therefore significantly impede drainage through the profile. The depth to these slowly permeable clay subsoils and the absence of gleying in the upper subsoil results in these soils being assigned to Wetness Class III. This combination of imperfect soil drainage, medium clay loam topsoil texture and the prevailing field capacity level (184 days) gives rise to a land classification of Subgrade 3a.

22 This degree of soil wetness will adversely affect crop growth and development as well as limiting the flexibility of the land due to the reduction in the number of days when the soil is in a suitable condition for cultivation trafficking by machinery or grazing by livestock

Grade 4

23 Most of the site has been placed in this grade and represents poor quality agricultural land with soil wetness as the main limitation

24 Soils in this unit typically comprise non calcareous heavy clay loam or heavy silty clay topsoils These may contain up to 5% total flints by volume and directly overlie similarly stony clay subsoils Pit 1 is typical of these soils (see Appendix II) and reveals poorly structured clay subsoils which are slowly permeable and which cause gleying from the surface The depth to the slowly permeable layer (between 22 and 31 cm) results in these soils being assigned to Wetness Class IV This combination of poor drainage heavy topsoil textures and the local climate gives rise to a land classification of Grade 4

25 A small disturbed area probably associated with former pit workings is also included in this map unit This land now experiences a significant microrelief limitation sufficient to limit it to Subgrade 3b but is too small to map separately and has therefore been incorporated into the Grade 4 unit Small patches in the south west may also have experienced slight disturbance reducing the amount of topsoil and bringing clay horizons to the surface

26 All of these conditions give rise to land which is severely restricted in its agricultural use both in terms of the range of crops that can tolerate such conditions and the number of days when the land is in a suitable condition for cultivations trafficking by machinery or grazing by livestock

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet No 316 Fareham*
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 Soils of South East England 1 250 000*
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 DATA

Contents

Sample location map

Soil abbreviations explanatory note

Soil boring descriptions (boring and horizon levels)

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	OTH	Other
DCW	Deciduous woodland	BOG	Bog or marsh	SAS	Set Aside
HTH	Heathland	HRT	Horticultural crops	PLO	Ploughed

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	ST	Topsoil Stoniness
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
EX	Exposure				

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 subdivided 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	FSST	soft fine grained sandstone
ZR	soft argillaceous or silty rocks	CH	chalk
MSST	soft medium grained sandstone	GS	gravel with porous (soft) stones
SI	soft weathered igneous/metamorphic rock	GH	gravel with non porous (hard) stones

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		
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	FM firm	EH extremely hard
VF very friable	VM very firm	
FR friable	EM extremely firm	

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