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Hart District Replacement Local Plan
Site 1021 - Land South of Eversley Centre
Agricultural Land Classification
ALC Map and Report
October 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

HART DISTRICT REPLACEMENT LOCAL PLAN
SITE 1021 - LAND SOUTH OF EVERSLEY CENTRE

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 14 hectares of land at Hollybush Farm, south of Eversley Centre, Hampshire. The survey was carried out during October 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading, in connection with the Hart District Replacement Local Plan. The results of this survey supersede any previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of 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 the majority of land was in permanent pasture except for a small section in the far eastern part of the site which was in maize stubble. The area shown as 'Other Land' comprised woodland.

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 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% site area	% surveyed area
3b	12.7	87.6	100.0
Other Land	1.8	12.4	-
Total surveyed area	12.7	-	100.0
Total site area	14.5	100.0	-

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 10 borings and two soil pits were described.

8. The soils generally comprise well drained medium sandy loam topsoils overlying similar or lighter subsoils (loamy medium sand and/or medium sand). Many of the soils are impenetrable to the auger at shallow depths as they are moderately or very stony. Occasional profiles are less stony and not as well drained.

The combination of soil textures, structures, and stone contents acts to restrict the amount of profile available water for crops. As a result the level and consistency of crop yields is restricted. All of the agricultural land on this site has been classified as Subgrade 3b (moderate quality), the key limitation being soil droughtiness.

Factors Influencing ALC Grade

Climate

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

10. 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 788 615
Altitude	m, AOD	56
Accumulated Temperature	day°C	1463
Average Annual Rainfall	mm	668
Field Capacity Days	days	140
Moisture Deficit. Wheat	mm	112
Moisture Deficit. Potatoes	mm	106

11. 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.

12. 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 (ATO, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. The site is climatically Grade 1. The site is believed to be rather frost prone (Met Office 1971).). However, there was no evidence of this at the site so it was not taken into account in the survey. Exposure is not believed to have a significant adverse effect on the site.

Site

14. The agricultural land at this site lies at an altitude of 55-56m AOD. The majority of the land at the site is flat or very gently sloping with slight undulations. Nowhere does gradient or microrelief affect agricultural land quality.

Geology and soils

15. The published geological information for the site (B.G.S., 1971) shows the whole site to be underlain by valley gravels.

16. The most recently published soil information for the area (SSEW, 1983) shows the Efford 1 Association mapped across the site. These soils are described as 'well drained fine loamy soils over gravel, associated with similar permeable soils variably affected by groundwater.' (SSEW, 1983).

17. Detailed field survey broadly confirms the existence of such soils but with slightly coarser textural classes. Well drained slightly to moderately stony sandy loam and loamy sand profiles predominate at this site.

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 III.

SubGrade 3b

20. Land of moderate quality has been mapped across the survey area. The principal limitation is soil droughtiness.

21. The topsoils consist of non-calcareous, very slightly stony (4% total, 0% > 2cm flint) to moderately stony (20% total, 12% > 2cm flint) medium sandy loams. The upper and lower subsoils dominantly consist of medium sandy loam or loamy sand textures and have similar stone contents to the topsoils which range between 2-55% total flint. The soils have moderate or good structures. In places, the subsoil shows signs of slight seasonal waterlogging (from directly below the topsoil) in the form of gleying. Despite this, these soils are assessed as Wetness Class I due to their coarse textured and relatively freely draining nature. Very occasionally, at depth, the soils become heavier which may contribute to the signs of seasonal waterlogging shown further up the profile.

22. The soils are in places impenetrable to the auger at variable depths but the pits 1P and 2P (see Appendix III) indicate that this was caused by a high number of flints in the soil. Due to the combination of soil characteristics and the local climate regime, these soils have restricted amounts of water in the profile, such that the land suffers a moderate droughtiness limitation and crop growth and yield will be adversely affected.

Sharron Cauldwell,
Resource Planning Team,
Guildford Statutory Centre,
ADAS, Reading.

SOURCES OF REFERENCE

British Geological Survey (1971) Sheet 284, 1:50,000 Scale.

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.

Met. Office (1971). *Meteorological Survey on NE Hampshire an W Surrey with parts of S Berkshire and W Sussex (OS Map 169).* Unpublished data records. Bracknell.

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

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

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 that 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 that restricts 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:

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. **GLEY/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 dolomitic 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 **ST**: strongly developed	**MD**: moderately developed
ped size	**F**: fine **C**: coarse	**M**: medium **VC**: very coarse
ped shape	**S** : single grain **GR**: granular **SAB**: sub-angular blocky **PL**: platy	**M:** massive **AB**: angular blocky **PR**: prismatic

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 : HART LP, SITE 1021 Pit Number : 1P

Grid Reference: SU78606140 Average Annual Rainfall : 668 mm
Accumulated Temperature : 1463 degree days
Field Capacity Level : 140 days
Land Use : Rough Grazing
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 33	MSL	10YR31 32	3	9	HR					
33- 48	LMS	10YR52 64	0	2	HR	C	MDCSAB	VF	G	
48- 55	LMS	25 Y63 00	0	38	HR	C			M	
55- 60	LMS	25 Y63 00	0	50	HR	C			M	

Wetness Grade : 1 Wetness Class : I
Gleying :033 cm
SPL : cm

Drought Grade : 3B APW : 069mm MBW : -43 mm
APP : 071mm MBP : -35 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : HART LP, SITE 1021 Pit Number : 2P

Grid Reference: SU78906150 Average Annual Rainfall : 668 mm
Accumulated Temperature : 1463 degree days
Field Capacity Level : 140 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 35	MSL	10YR31 00	6	23	HR					
35- 43	LMS	10YR44 00	0	50	HR				M	
43-120	MS	10YR44 00	0	55	HR				M	

Wetness Grade : 1 Wetness Class : I
Gleying : cm
SPL : cm

Drought Grade : 3B APW : 066mm MBW : -46 mm
APP : 058mm MBP : -48 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SAMPLE NO.	GRID REF	USE	ASPECT		--WETNESS--		-WHEAT-		-POTS-		M.REL	EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEY	SPL CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1	SU78606150	RGR			1	1	060	-52	060	-46	4				DR 3B	IMP 40
1P	SU78606140	RGR		033	1	1	069	-43	071	-35	3B				DR 3B	PIT TO 60CM
2	SU78706150	RGR			1	1	052	-60	052	-54	4				DR 3B	IMP35 SEE PIT2
2P	SU78906150	PGR			1	1	066	-46	058	-48	3B				DR 3B	ASS TO 120CM
3	SU78806150	PGR			1	1	053	-59	053	-53	4				DR 3B	IMP35 SEE PIT2
4	SU78906150	PGR			1	1	056	-56	056	-50	4				DR 3B	IMP40 SEE PIT2
5	SU79006150	STB			1	1	066	-46	066	-40	3B				DR 3B	IMP50 SEE PIT2
6	SU78606140	RGR		028	1	1	068	-44	068	-38	3B				DR 3B	IMP53 SEE PIT1
7	SU78706140	RGR		045	1	1	079	-33	081	-25	3B				DR 3B	IMP60 SEE PIT1
8	SU78806140	RGR			1	1	055	-57	055	-51	4				DR 3B	IMP35 SEE PIT2
9	SU78906140	RGR			1	1	055	-57	055	-51	4				DR 3B	IMP30 SEE PIT2
10	SU79006140	STB			1	1	074	-38	074	-32	3B				DR 3B	IMP 50

COMPLETE LIST OF PROFILES 25/11/96 HART LP, SITE 1021

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-33	msl	10YR42 00						0	0	HR	10							
	33-40	csl	10YR44 00						0	0	HR	20		M					
1P	0-33	msl	10YR31 32						3	0	HR	9							
	33-48	lms	10YR52 64	75YR58 00	C		00FE00 00	Y	0	0	HR	2	MDCSAB	VF G					
	48-55	lms	25 Y63 00	75YR58 00	C			Y	0	0	HR	38		M					
	55-60	lms	25 Y63 00	75YR58 00	C			Y	0	0	HR	50		M					
2	0-30	msl	10YR42 00						0	0	HR	10							
	30-35	msl	10YR43 44						0	0	HR	20		M					
2P	0-35	msl	10YR31 00						6	0	HR	23							
	35-43	lms	10YR44 00						0	0	HR	50		M					
	43-120	ms	10YR44 00						0	0	HR	55		M					
3	0-32	msl	10YR42 00						0	0	HR	10							
	32-35	msl	10YR44 00						0	0	HR	25		M					SEE PIT 2
4	0-30	msl	10YR41 42						0	0	HR	15							
	30-40	msl	10YR44 00						0	0	HR	20		M					SEE PIT 2
5	0-35	msl	10YR42 00						12	0	HR	20							
	35-50	msl	10YR44 00						0	0	HR	25		M					SEE PIT 2
6	0-28	msl	10YR32 00						0	0	HR	6							
	28-53	msl	10YR52 64	75YR56 58	C			Y	0	0	HR	3		G					SEE PIT 1
7	0-30	msl	10YR32 00						0	0	HR	4							
	30-45	msl	10YR42 53	75YR58 00	F				0	0	HR	4		M					
	45-60	lms	10YR62 63	75YR46 58	C			Y	0	0	HR	5		M					SEE PIT 1
8	0-30	msl	10YR31 32						0	0	HR	6							
	30-35	msl	10YR53 63						0	0	HR	7		M					SEE PIT 2
9	0-35	msl	10YR31 32						0	0	HR	8							SEE PIT 2
10	0-33	msl	10YR32 00						3	0	HR	10							
	33-40	scl	10YR44 00						0	0	HR	15		M					
	40-50	c	10YR44 58						0	0	HR	10		M					