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Horsham District Local Plan
Site 12 : Small Dole, Henfield
ALC Map and Report
January 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

HORSHAM DISTRICT LOCAL PLAN SITE 12 : SMALL DOLE, HENFIELD

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 Horsham district of West Sussex. The work forms part of MAFF's statutory input to the Horsham District Local Plan.
- 1.2 Site 12 comprises 5.6 hectares of land to the south of New Hall Lane and to the west of Shoreham Road in Small Dole, West Sussex. An Agricultural Land Classification (ALC) survey was carried out during January 1995. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 7 borings and two soil inspection pits were described 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 a long term limitation 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 in arable use. Land mapped as urban comprises a pumping station; land shown as non-agricultural comprises a track and roadside verge.
- 1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent 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.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
2	5.0	89.3	100.0 (5.0 ha)
Urban	<0.1		
Non-agricultural	<u>0.6</u>	<u>10.7</u>	
Total area of site	5.6	100.0	

- 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 All of the agricultural land on the site has been classified as Grade 2, very good quality, because of minor soil droughtiness limitations. Soils on the site are typically deep, well drained and slightly stony clay loams. In the south-west of the site more stony soils, derived from weathered sandstone, also occur. The interaction between these soil properties and the prevailing local climate, which is relatively dry in a regional context, acts to impart a slight soil droughtiness limitation. This may lead to the soil available water being insufficient to fully meet crop needs.

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 (degree days Jan-June), 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. However climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. The field capacity days are relatively high at this locality due to the warm, moist climate which prevails. High field capacity days increase the likelihood of soil wetness restrictions.

Table 2 : Climatic Interpolation

Grid Reference	TQ 213 132
Altitude (m)	10
Accumulated Temperature (degree days, Jan-June)	1527
Average Annual Rainfall (mm)	823
Field Capacity (days)	173
Moisture Deficit, Wheat (mm)	111
Moisture Deficit, Potatoes (mm)	107
Overall Climatic Grade	1

2.4 No local climatic factors such as exposure or frost risk are believed to affect the site.

3. Relief

3.1 Adjacent to the northern site boundary the land is flat and lies at approximately 15 m AOD. The land then falls gently through gradients of 2-3° to lie at about 9 m AOD along the southern site boundary. Nowhere on the site does gradient or relief impose any limitation to the agricultural land quality.

4. Geology and Soil

- 4.1 British Geological Survey (1984), Sheet 318/333 shows the site to be underlain by Lower Greensand with narrow strips of head, and first and second river terrace deposits adjacent to the southern and northern site boundaries respectively.
- 4.2 Soil Survey of England and Wales (1983), Sheet 6, shows the entire site to comprise soils of the Fyfield 1 association. These soils are described as 'well drained coarse and fine loamy soils over interbedded sands and sandstones. Similar fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging' (SSEW, 1983).
- 4.3 Detailed field examination found well drained sandy and loamy textured soils, which sometimes contain moderate amounts of weathered sandstone.

5. Agricultural Land Classification

- 5.1 Table 1 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 All of the agricultural land surveyed has been classified as Grade 2, very good quality, because of minor soil droughtiness limitations. Topsoils comprise medium sandy loams, medium clay loams and sandy clay loams. These are very slightly stony, containing 2% total flints by volume. These are underlain by similarly textured, or occasionally heavy clay loam, upper subsoils. These soil textures either extend to depth or sometimes pass into clay lower subsoils. These profiles are well drained (Wetness Class I). Across most of the site the subsoils are very slightly stony, containing 2-3% total flints by volume. Such profiles are represented by Pit 1, which was found to have moderate subsoil structures. The interaction between these soil textures, stone contents and subsoil structures with the prevailing local climate means that this land is likely to have slightly reduced profile available water. Consequently there is a minor risk of drought stress for those crops which are grown. Thus this land can be classified as no higher than Grade 2. To the south of the track in the west of the site, the soil profiles are of similar texture but have moderately stony subsoils, containing 20-25% total weathered sandstone by volume. These profiles are typified by Pit 2. In comparison with soil, crop roots are able to extract less moisture from sandstone. Consequently, this land has slightly lowered amounts of profile available water. However, given the local climatic conditions (i.e., regionally average values for the soil moisture deficits) such land is still eligible to be assigned to Grade 2.

ADAS Ref: 4205/001/95
MAFF Ref: EL42/130

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1984), Sheet No. 318/333, Brighton and Worthing, 1:50,000 Series (solid and 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), Climatological Data for Agricultural Land Classification.

Soil Survey of England and Wales (1983), Sheet 6, Soils of South East England, 1:250,000 accompanying legend.

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 (eg. 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 (eg. 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, eg. 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

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

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.

Definition of Soil Wetness Classes

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.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

¹The number of days specified is not necessarily a continuous period.

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

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

Soil Abbreviations - Explanatory Note

Soil Pit Descriptions

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 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. **GLEYSPL** : 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. **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	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 : HORSHAM DLP, SMALL DOLE Pit Number : 1P

Grid Reference: TQ21301320 Average Annual Rainfall : 823 mm
 Accumulated Temperature : 1527 degree days
 Field Capacity Level : 173 days
 Land Use : Arable
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	MSL	10YR42 00	0	2	HR					
29- 59	MCL	10YR44 00	0	2	HR		MDCSAB	FR	M	
59-120	SCL	10YR44 00	0	3	HR	C	MDCSAB	FM	M	

Wetness Grade : 1 Wetness Class : I
 Gleying : cm
 SPL : No SPL

Drought Grade : 2 APW : 149mm MBW : 38 mm
 APP : 112mm MBP : 5 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : HORSHAM DLP, SMALL DOLE Pit Number : 2P

Grid Reference: TQ21331312 Average Annual Rainfall : 823 mm
 Accumulated Temperature : 1527 degree days
 Field Capacity Level : 173 days
 Land Use : Arable
 Slope and Aspect : 03 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	MCL	10YR43 00	0	2	HR					
29- 55	HCL	10YR54 00	0	20	MSST		MDCSAB	FR	M	
55-120	HCL	10YR54 00	0	25	MSST		MDCSAB	FR	M	

Wetness Grade : 1 Wetness Class : I
 Gleying : cm
 SPL : No SPL

Drought Grade : 2 APW : 136mm MBW : 25 mm
 APP : 105mm MBP : -2 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Droughtiness

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	TQ21301320	ARA			1	1	141	30	116	9	2			DR 2	Sl. gley 60
1P	TQ21301320	ARA			1	1	149	38	112	5	2			DR 2	Sl. gley 60
2	TQ21391318	ARA			1	1	139	28	115	8	2			DR 2	Sl. gley 40
2P	TQ21331312	ARA S	03		1	1	136	25	105	-2	2			DR 2	Weathered sst
3	TQ21201310	ARA S	03		1	1	136	25	106	-1	2			DR 2	Weathered sst
4	TQ21331312	ARA S	03		1	1	135	24	105	-2	2			DR 2	Weathered sst
5	TQ21401310	ARA S	03	085 085	1	1	137	26	117	10	2			DR 2	Sticky clay80
6	TQ21281302	ARA S	02		1	1	111	0	114	7	3A			DR 2	Impen 80 sst
7	TQ21401300	ARA S	02		1	1	150	39	113	6	2			DR 2	Pots limit Ap

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED		---STONES---			STRUCT/		SUBS		SPL	CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR		
1	0-30	mc1	10YR42 00						0	0	HR	2					sandy
	30-60	hc1	10YR44 00						0	0	HR	2		M			sandy
	60-120	c	10YR44 00 10YR58 00 C				00MN00	00 S	0	0	HR	3		M			sandy/sl. gleyed
1P	0-29	ms1	10YR42 00						0	0	HR	2					hand txd sandy mc1
	29-59	mc1	10YR44 00						0	0	HR	2	MDCSAB	FR M			hand txd sandy hc1
	59-120	sc1	10YR44 00 10YR58 00 C						S	0	0	HR	3	MDCSAB	FM M		
2	0-30	mc1	10YR42 00						0	0	HR	2					sandy
	30-40	hc1	10YR44 00						0	0	HR	2		M			sandy
	40-120	c	10YR54 44 10YR56 00 C				00MN00	00 S	0	0	HR	3		M			sandy
2P	0-29	mc1	10YR43 00						0	0	HR	2					sandy
	29-55	hc1	10YR54 00 10YR66 52						0	0	MSST	20	MDCSAB	FR M			weathrd s'stone
	55-120	hc1	10YR54 00 10YR66 52						0	0	MSST	25	MDCSAB	FR M			weathrd s'stone
3	0-30	mc1	10YR43 00						0	0	HR	2					sandy
	30-55	hc1	10YR53 00 10YR58 00						0	0	MSST	20		M			weathrd s'stone
	55-120	hc1	10YR53 00 10YR56 00						0	0	MSST	25		M			weathrd s'stone
4	0-28	mc1	10YR43 00						0	0	HR	2					sandy
	28-55	hc1	10YR53 00 10YR68 61						0	0	MSST	20		M			weathrd s'stone
	55-120	hc1	10YR53 00 10YR68 61						0	0	MSST	25		M			weathrd s'stone
5	0-30	mc1	10YR42 00						0	0	HR	2					sandy
	30-45	mc1	10YR43 00 00MN00 00 F						0	0	HR	2		M			sandy
	45-85	c	25Y 54 44 00MN00 00 F						0	0		0		M			sandy
	85-120	c	25Y 52 53 10YR58 00 M						Y	0	0	0		P		Y	sticky;not sandy
6	0-30	mc1	10YR42 00						0	0	HR	2					sandy
	30-65	mc1	25Y 54 44						0	0	HR	2		M			sandy
	65-80	hc1	10YR53 00 10YR56 62						0	0	MSST	25		M			impen 80: s'stone
7	0-30	sc1	10YR42 00						0	0	HR	2					hand txd sandy mc1
	30-50	hc1	10YR44 00						0	0	HR	2		M			sandy
	50-65	hc1	10YR54 00						0	0	HR	2		M			sandy
	65-120	mc1	10YR54 00						0	0	HR	2		M			sandy