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East Hampshire Local Plan
Site 1098: Land At Barnfield Road,
East of Petersfield.
Agricultural Land Classification,
ALC Map and Report.
March 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

EAST HAMPSHIRE LOCAL PLAN
SITE 1098: LAND AT BARNFIELD ROAD, EAST OF PETERSFIELD.

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 East Hampshire District. The work forms part of MAFF's statutory input to the preparation of the East Hampshire Local Plan.

1.2 The site comprises 6.4 hectares of land to the east of Petersfield in Hampshire. An Agricultural Land Classification (ALC) survey was carried out during February 1995. The survey was undertaken at a detailed level of approximately one boring per hectare of agricultural land surveyed. A total of 5 borings and one soil inspection pit 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.

1.4 At the time of the survey the land was vacant and not being for agricultural purposes. Recently developed land borders the site to the west (housing estate) and the east (a school). The small area of woodland shown comprises an area of newly planted trees.

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. Part of the site was previously surveyed by ADAS in 1981 in connection with previous development proposals around Petersfield (Ref: 1502/14/81). This recent survey supersedes the 1981 work which was undertaken prior to the ALC revision in 1988.

Table 1: Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
2	6.2	96.9
Woodland	0.2	3.1
Total area of site	6.4ha	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 The agricultural land at this site has been classified as very good quality (Grade 2). The principal limitation to land quality is slight soil wetness. There was some

variation in the soils over the site and as such the lowest common grade is mapped for the whole site. The soils encountered were predominantly coarse loamy, and were commonly affected by wetness as indicated by gleying at moderate depths due to fluctuating groundwater.. The coarse loamy topsoils are an advantage in the comparatively moist climate regime of the Petersfield area. However slight soil wetness may restrict opportunities for landwork and/or 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. The site is comparatively wet in a regional context.

Table 2: Climatic Interpolation

Grid Reference	SU763235
Altitude, (m, AOD)	55
Accumulated Temperature (day degrees C., Jan.-June)	1481
Average Annual Rainfall (mm)	940
Field Capacity Days	207
Moisture deficit, wheat (mm)	96
Moisture deficit, potatoes (mm)	87
Overall Climatic Grade	1

3. Relief

3.1 The site lies between approximately 50 and 55 AOD. Overall the site falls slightly from south to north east. Nowhere in this area does relief or gradient affect agricultural land quality. As such it is unlikely that the area suffers from soil erosion.

4. Geology and Soils

4.1 The published geological information (BGS, 1981), shows the site to be underlain by Cretaceous Sandgate Beds, part of the Lower Greensand group of deposits.

4.2 The published soils information (SSEW, 1983), shows the site to be underlain by soils of the Fyfield 4 Association. The legend accompanying the map describes these as, 'deep well drained often stoneless sandy and coarse loamy soils. Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging and some slowly permeable seasonally waterlogged fine loamy over clayey soils. Risk of water erosion.' (SSEW, 1983). Soils encountered at this site were commonly deep permeable and virtually stone free. They were affected by slight soil wetness and comprised sandy and coarse loamy textures.

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.

Grade 2

5.3 Land of very good quality is mapped over the whole of the agricultural area at this site. The principal limitation is slight soil wetness, although occasional observations were limited by slight soil droughtiness. Profiles typically comprise a very slightly stony (approximately 2% v/v flints) medium sandy loam topsoil, passing to a similar upper subsoil. This commonly overlies a deep, gleyed very slightly stony (up to 5% v/v flints) medium sandy loam or sandy clay loam lower subsoil horizon. Occasionally the lower subsoil comprises a saturated stoneless loamy medium sand passing to sandy clay loam at 100cm. Gleying is considered to occur at this location as a result of a seasonally elevated water table in the area, as indicated by certain observations becoming saturated at relatively shallow depths, artificial drainage into Tilmore Brook to the north of the site may serve to improve this situation. The relatively wet nature of the local climate leads this normally drought prone soil type to have sufficient reserves of water for plant growth, such that soil droughtiness is not an extensive problem. However the depth to gleying in association with finer textured sandy clay loam horizons, leads to Wetness Class II being applied and subsequently Grade 2 is appropriate given the prevailing local climate and topsoil texture. The degree of soil wetness at this location has the effect of very slightly limiting the opportunities for cultivation and/or grazing without causing structural damage to the soil. Some observations, such as pit 1 (see Appendix III) were found to be of slightly better quality, but due to the small size of the site and the variability of the soils encountered, these have not been mapped as a separate unit.

SOURCES OF REFERENCE

British Geological Survey (1975), Sheet 300, Alresford, Drift Edition. 1:50,000

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 (1983), Sheet No.6, Soils of South-East England, 1:250,000, and Accompanying Legend.

Soil Survey of England and Wales (1984), Bulletin No.15, Soils and their use in South-East England.

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 :

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 Name : E HANTS LP SITE 1098 Pit Number : 1P

Grid Reference: SU76302350 Average Annual Rainfall : 940 mm
Accumulated Temperature : 1481 degree days
Field Capacity Level : 207 days
Land Use : Rough Grazing
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MSL	10YR43 00	0	2	HR					
25- 55	MSL	10YR44 00	0	2	HR		MDCSAB	FR	M	
55-120	MSL	10YR52 53	0	5	HR	C	MDCSAB	FR	M	

Wetness Grade : 1 Wetness Class : I
Gleying : 55 cm
SPL : cm

Drought Grade : 1 APW : 152mm MBW : 56 mm
APP : 107mm MBP : 20 mm

FINAL ALC GRADE : 1
MAIN LIMITATION :

SAMPLE No.	GRID REF	ASPECT USE	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	DRT	M.REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SU76402370	RGR		50		2	2	148	52	109	22	1				WE	2	
1P	SU76302350	RGR		55		1	1	152	56	107	20	1					1	
2	SU76302360	RGR		60		2	2	147	51	108	21	1				WE	2	
3	SU76402360	RGR				1	1	155	59	109	22	1					1	
4	SU76302350	RGR		65		1	1	122	26	106	19	2				DR	2	SL GLEYED 25
5	SU76302340	RGR		60		1	1	131	35	103	16	1					1	SATURATED 60+

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	0-28	msl	10YR43 00						0	0	HR	2						
	28-50	msl	10YR44 00						0	0	HR	2		M				
	50-120	scl	10YR42 00	10YR46 00	C			Y	0	0	HR	2		M				
1P	0-25	msl	10YR43 00						0	0	HR	2						
	25-55	msl	10YR44 00						0	0	HR	2	MDCSAB	FR M				
	55-120	msl	10YR52 53	10YR56 00	C			Y	0	0	HR	5	MDCSAB	FR M				
2	0-30	msl	10YR43 00						0	0		0						
	30-60	msl	10YR44 00						0	0	HR	5		M				
	60-120	scl	10YR52 00	10YR58 00	C			Y	0	0	HR	5		M				
3	0-30	msl	10YR43 00						0	0	HR	2						
	30-50	msl	10YR44 00						0	0	HR	2		M				
	50-120	msl	10YR53 00						0	0	HR	2		M				
4	0-25	msl	10YR44 00						0	0		0						
	25-65	msl	10YR54 00	10YR56 00	C			S	0	0		0		M				
	65-90	lms	10YR53 52	10YR56 00	C			Y	0	0		0		M				
	90-120	lms	10YR53 00	10YR56 00	C			Y	0	0	HR	5		M				
5	0-30	msl	10YR44 00						0	0		0						
	30-60	msl	10YR54 56						0	0		0		M				
	60-100	lms	10YR53 00	10YR56 00	C			Y	0	0		0		M				
	100-120	scl	10YR53 00	10YR56 00	C			Y	0	0		0		M				