

Revised

A1
**East Hampshire Local Plan
Site 1083: Budgetts Farm,
Four Marks
Agricultural Land Classification,
ALC Map and Report
March 1995**

AGRICULTURAL LAND CLASSIFICATION REPORT

EAST HAMPSHIRE LOCAL PLAN

SITE 1083: BUDGETTS FARM, FOUR MARKS

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 of Hampshire. The work forms part of MAFF's statutory input to the East Hampshire Local Plan.
- 1.2 Site 1083 comprises 8.5 hectares of land to the east of Lymington Bottom and to the south of Blackberry Lane in Four Marks, east 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. A total of 8 borings, one soil inspection pit and topsoil stone content measurements 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 under permanent pasture. Land mapped as Urban comprises a driveway and an area associated with new development. Land shown as Non-agricultural comprises extended gardens and an overgrown disused pit.
- 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
3a	1.2	14.0	19.0 (1.2 ha)
3b	5.1	59.2	81.0 (5.1 ha)
Urban	0.1	1.2	
Non-agricultural	<u>2.2</u>	<u>25.6</u>	
Total area of site	8.6	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 surveyed has been classified as Subgrade 3b, moderate quality. The entire site is subject to moderate soil wetness limitations. These arise from clay subsoils which are present either directly below the topsoil or at shallow depths within the soil profile. This results in moderately well or imperfectly drained soil profiles. Given the relatively wet prevailing local climate this land is thus subject to restrictions on the flexibility of cropping, stocking and cultivations.

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 Table 2 and these show that there is an overall climatic limitation which will prevent this site from being classified any higher than Grade 2. This limitation arises from the comparatively moist and cool climatic conditions at this locality which are caused by the high altitude of the site. Climatic factors also interact with soil properties to influence soil wetness and droughtiness limitation. The high average annual rainfall (and therefore high field capacity days), in combination with low crop adjusted soil moisture deficits, increase the likelihood of soil wetness limitations whilst decreasing soil droughtiness restrictions.

Table 2 : Climatic Interpolations

Grid Reference	SU 667 344	SU 668 342
Altitude (m)	180	170
Accumulated Temperature (degree days, Jan-June)	1336	1348
Average Annual Rainfall (mm)	934	929
Field Capacity (days)	203	202
Moisture Deficit, Wheat (mm)	80	82
Moisture Deficit, Potatoes (mm)	66	68
Overall Climatic Grade	2	2

2.4 Climatic reports from the Meteorological Office (Met. Office, 1971) suggest this area to be rather exposed. However, at the time of survey exposure was not felt to have significant impact on the site. No other local climatic factors, such as frost risk, are believed to affect the site.

3. Relief

- 3.1 The site occupies a dry valley, rising from approximately 170 m AOD in the base to 185 m AOD in the north of the site. Nowhere on the site do gradient or relief impose any limitation to agricultural land quality.

4. Geology and Soil

- 4.1 The relevant geological sheet (BGS, 1975) shows the site to be underlain by Upper Chalk which is overlain by drift deposits of clay-with-flints and tertiary debris in the north of the site.
- 4.2 The published Soil Survey map (SSEW, 1983) maps soils of the Carstens Association across the entire site. These soils are described as 'well drained fine silty soils over clayey, clayey and fine silty soils often very flinty' (SSEW, 1983).
- 4.3 Detailed field examination found soils to be broadly similar to those described in paragraph 4.2, though at this site soils are typically moderately well drained and slightly stony.
- 4.4 Nowhere on the site was the Upper Chalk encountered within 1.2 m from the surface.

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.

Subgrade 3b

- 5.3 Most of the agricultural land surveyed has been classified as Subgrade 3b, moderate quality. The principal restrictions are soil wetness and workability. Non-calcareous medium silty clay loam topsoils overlie clay and, occasionally, medium or heavy silty clay loam upper subsoils. These generally pass into reddish clay lower subsoils at approximately 50-60 cm depth. From Pit 1, which represents such soils, it could be seen that these lower subsoils have pale ped faces and common mottles; they are thus gleyed. These horizons are poorly structured, from the point of view of the soil droughtiness calculation, and are slowly permeable. The moist prevailing climate (203 field capacity days) means that the profiles are either imperfectly or poorly drained (Wetness Class III or IV), depending on the depth to gleying. The interaction between the medium textured topsoils and these soil drainage characteristics with the moist local climate mean that this land is subject to moderate restrictions on the flexibility of cropping, stocking and cultivations.

Subgrade 3a

- 5.4 Along the south-eastern boundary, an area of Subgrade 3a has been mapped. The main limitation to agricultural land quality in this soil unit is soil wetness. Profiles are typically lighter in texture than those in the Subgrade 3b unit, comprising medium silty clay loam topsoils and subsoils. The absence of a slowly permeable layer means that they are moderately well drained, typically falling into Wetness Class II. Additionally, parts of the higher land and midslopes of the site are restricted by topsoil stone content. Flints larger than 2 cm in the topsoil act to impede cultivation, harvesting and crop growth.

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Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1975), Sheet No. 300, Alresford, 1:50,000 Series (drift edition).

MAFF (1988), Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

Meteorological Office (1971), Unpublished Climate Data.

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 and accompanying legend.

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.

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

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. **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

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	DIST	
1	SU66703440	PGR W	3	60 20	4	3B	101	0	109	0			WE	3B	RED SOIL
1S	SU66923428	PGR S	1				41	0	41	0			ST	3A	TOPSOIL STONE
2	SU66953440	PGR S	3	50 50	3	3A	129	0	107	0			WE	3A	SL.GLEY 25
2S	SU66833416	PGR SW	1				41	0	41	0			ST	2	TOPSOIL STONE
3	SU66803415	PGR S	1		1	2	56	0	56	0			DR	3A	IMP35
4	SU66803430	PGR S	1	45 45	3	3A	133	0	110	0			WE	3A	
5	SU66903430	PGR S	3	28 28	4	3B	88	0	96	0			WE	3B	
6	SU67003430	PGR		50	2	3A	124	0	123	0			WE	3A	SL.GLEY 30
7	SU66803420	PGR S	3	25 25	4	3B	98	0	103	0			WE	3B	RED SOIL
8	SU66903420	PGR SW	2	30 30	4	3B	92	0	103	0			WE	3B	RED SOIL
1P	SU66903430	PGR S	3	27 27	4	3B	81	0	91	0			WE	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----			PED		-----STONES-----			STRUCT/	SUBS	CALC			
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH				TOT	CONSIST	STR
1	0-20	HCL	05YR56						6	0	HR	8				RED SOIL	
	20-60	C	05YR56						0	0	HR	5	M		Y	RED SOIL	
	60-80	C	75YR42 43	05YR58	M	D	COM MN	Y	0	0	HR	10	M		Y		
1S	0-25	MZCL	10YR43						11	0	HR	14				TOPSOIL STONES	
2	0-25	MZCL	10YR43						5	0	HR	8					
	25-50	HZCL	10YR54	10YR56	C	D		S	0	0	HR	10	M				
	50-120	C	05YR58	75YR56	C	D	COM MN	Y	0	0	HR	5	P		Y		
2S	0-25	MZCL	10YR43						6	0	HR	14				TOPSOIL STONES	
3	0-25	MZCL	10YR44						5	0	HR	8					
	25-35	MZCL	10YR44						0	0	HR	30	M				
4	0-25	HCL	10YR43						6	0	HR	8					
	25-45	C	75YR53						0	0	HR	5	M				
	45-120	C	75YR43	05YR56	M	D	COM MN	S	0	0	HR	5	M		Y	see1502/115/95	
5	0-28	MZCL	10YR43						13	0	HR	16					
	28-50	C	05YR58						0	0	HR	5	M		Y	RED SOIL	
	50-65	C	05YR58	75YR56	C	D	COM MN	Y	0	0	HR	10	P		Y	RED SOIL	
6	0-30	MZCL	10YR43						0	0	HR	2					
	30-50	MZCL	10YR54	10YR56	C	D		S	0	0	HR	1	M				
	50-85	MZCL	10YR53	10YR56	M	D	COM MN	Y	0	0	HR	1	M				
7	0-25	MZCL	10YR44						1	0	HR	5					
	25-50	C	05YR44 54				MANY MN	Y	0	0	HR	1	P		Y	RED SOIL	
	50-80	C	05YR44 54				MANY MN	Y	0	0	HR	3	P		Y	RED SOIL	
8	0-30	MZCL	10YR44						3	0	HR	6					
	30-60	C	05YR44				MANY MN	Y	0	0	HR	5	P		Y	RED SOIL	
	60-70	C	05YR44 54				MANY MN	Y	0	0	HR	8	P		Y	RED SOIL	
1P	0-27	MZCL	10YR44 54						13	0	HR	16					
	27-60	C	05YR58	75YR56	C	D	75YR53	Y	0	0	HR	15	MDCAB	FM	P	Y	RED SOIL
	60-70	C	05YR58	75YR56	C	D	COM MN	Y	0	0	HR	20		P		Y	see1502/115/95