

**BARHAM, NEAR IPSWICH,
SUFFOLK.**

**Agricultural Land Classification and Soil
Physical Characteristics Report**

August 1997

**Resource Planning Team
Eastern Region
FRCA Cambridge**

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AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS REPORT

Barham, Nr Ipswich, Suffolk

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 12ha of land at Barham, Nr Ipswich in Suffolk. The survey was carried out during August 1997.
2. The survey was carried out by the Farming and Rural Conservation Agency (FRCA) for the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with an application by Redland Sand and Gravel to extend the adjacent quarry.
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). This survey supersedes previous ALC information for this site. A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey the majority of the site was cereal stubble. The old open quarry in the south-west has been classed as other land.

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	2.1	22.6	17.5
3b	7.2	77.4	60.0
Other land	2.7	N/A	22.5
Total site area	12.0	N/A	100.0

7. The fieldwork was conducted at an average density of 1 auger boring per hectare. A total of 11 auger borings and 3 soil pits was described.
8. The majority of the site has been graded 3b (moderate quality agricultural land). The very slightly to slightly stony (occasionally moderately stony) coarse textured soils over clay at depth have low available water capacity. This, in combination with the high expected soil moisture deficits for this area, represents a significant drought risk.

9. A small area in the north-east of the site has been graded 3a (good quality agricultural land). This better land is comprised of very slightly to slightly stony coarse loamy topsoils and upper subsoils over boulder clay. In combination with the expected soil moisture deficits, these soils represent a moderate drought risk.

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. These 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	TM 135 515
Altitude	m, AOD	47
Accumulated Temperature	day°C (Jan-June)	1403
Average Annual Rainfall	mm	589
Field Capacity Days	days	108
Moisture Deficit, Wheat	mm	122
Moisture Deficit, Potatoes	mm	117
Overall climatic grade	N/A	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 the site is relatively warm and dry and therefore has no climatic limitation. Accordingly, it has a climatic grade of 1.

Site

15. The site is situated north of the village of Barham. To the west is the old quarry, to the north and east lie Broomwalk Wood and Queech Wood respectively whilst the southern boundary abuts open farm land. The land slopes gently in a southerly direction from 49m AOD, adjacent to Queech Wood, to 40m AOD at the southern boundary, where a shallow dry valley exists. Nowhere on the agricultural land do slopes exceed 4°. Gradient or altitude do not therefore impose any limitation to the land quality.

Geology and soils

16. At a scale of 1:50 000 geology sheet 207 (British Geological Survey of England and Wales, 1990) maps the majority of the site as glacial sand and gravel or Kesgrave sand and gravel (undifferentiated). In the north-east an area of boulder clay is shown.

17. At a reconnaissance scale of 1:250 000 the Soil Survey of England and Wales, (Sheet 4, Soils of Eastern England, 1983) shows the majority of the site as the Ludford Association. A small area in the north-east of the site, corresponding to the area of boulder clay, is mapped as the Beccles 3 Association. These two Associations are briefly describes as follows:-

- Ludford: Deep well drained fine loamy, coarse loamy and sandy soils, locally flinty and in places over gravel. Slight risk of water erosion.
- Beccles 3: Slowly permeable seasonally waterlogged fine loamy over clayey soils and similar soils with only slight seasonal waterlogging. Some calcareous clayey soils especially on steeper slopes.

18. The current survey identified two main soil types.

19. The first soil type (soil type I) comprises approximately 30cm depth of very slightly stony medium sandy loam topsoil. This either directly overlies chalky boulder clay or is separated from the boulder clay by a 15/30cm upper subsoil layer comprised of very slightly or slightly stony medium sandy loam or sandy clay loam.

20. The second soil type (soil type II) typically comprises a very slightly/slightly stony loamy medium sand or medium sandy loam topsoil. This overlies a slightly to moderately stony loamy medium sand or medium sand upper subsoil extending typically to 50/80cm. Lower subsoils are similarly stony with sandy clay or clay (occ. medium sand) texture.

AGRICULTURAL LAND CLASSIFICATION

21. 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.

22. The location of the auger borings and pits is shown on the attached sample location map and the soil physical characteristics data are presented in Appendix II

Subgrade 3a

23. Land of subgrade 3a is confined to the northern corner of the site and is constrained by a droughtiness limitation associated with the soils described in paragraph 19. The moderate available water capacity of these soils combines with the local climatic conditions to impose a moderate droughtiness limitation to the land, therefore precluding it from a higher grade.

Subgrade 3b

24. The majority of the site is constrained to subgrade 3b by a droughtiness limitation associated with the soils described in paragraph 20. The coarse textures of the soils, combined with profile stone content and the high expected moisture deficits prevalent in the area, impose a significant drought risk, which restricts the land to this subgrade.

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SOURCES OF REFERENCE

British Geological Survey of England and Wales (1990) *Sheet 207, Ipswich*
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 4, Soils of Eastern England*.
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in Eastern 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

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

Soil type I.

Topsoil	Texture	medium sandy loam
	Colour	10YR 4/3
	Stone content	3-4% flints
	Roots	many very fine and fine
	Calcium carbonate	calcareous, (occ. very calcareous)
	Boundary form	abrupt, smooth
	Depth	30cm
Upper subsoil	Texture	medium sandy loam (occ. sandy clay loam, or clay)
	Colour	10YR 4/4
	Stone content	typically 5-10% flints
	Structure	weakly developed, very coarse and coarse sub angular blocky
	Consistence	friable
	Porosity	>0.5% pores >0.5mm
	Roots	common very fine and fine
	Calcium carbonate	non calcareous or very slightly calcareous
	Concretions	none
	Boundary form	abrupt, irregular
	Depth	45/60cm
Lower subsoil	Texture	clay (chalky boulder clay)
	Colour	10YR 5/4 & 6/4
	Stoniness	typically 5-15% flints and 5% chalk
	Structure	coarse sub angular blocky
	Consistence	firm
	Porosity	>0.5% pores >0.5mm
	Roots	common becoming few very fine and fine
	Calcium carbonate	very calcareous
	Concretions	none
	Depth	120cm

Notes: Profiles have been assessed as Wetness Class I

Typically profiles become impenetrable to auger at 80cm depth, probably becoming more flinty.

Soil type II.

Topsoil	Texture	loamy medium sand or medium sandy loam
	Colour	10YR 4/3
	Stone content	5-10% flints
	Roots	many very fine and fine
	Calcium carbonate	variable, non calcareous to very calcareous
	Boundary form	abrupt, smooth/wavy
	Depth	30cm
Upper subsoil	Texture	loamy medium sand (occ. medium sand)
	Colour	10YR 4/4, 5/4 (occ. 7.5YR 4/6, 5/6)
	Stone content	variable, (range 5-35%) flints
	Structure	weakly developed, coarse angular blocky/sub angular blocky
	Consistence	friable
	Porosity	>0.5% pores >0.5mm
	Roots	common/many very fine and fine
	Calcium carbonate	non calcareous or very slightly calcareous
	Concretions	none
	Boundary form	clear/gradual, wavy
Depth	typically 50/80cm (range 40/90cm)	
Lower subsoil	Texture	sandy clay or clay (occ. medium sand)
	Colour	7.5YR 5/4 or 10YR 4/4, 5/6
	Stoniness	variable, typically 10-20% (range 5-30%) flints
	Structure	weakly developed, adherent, coarse/very coarse sub angular blocky
	Consistence	firm
	Porosity	<0.5% pores >0.5mm
	Roots	common/few very fine and fine
	Calcium carbonate	non calcareous or very slightly calcareous
	Concretions	few/common
Depth	120cm	

Notes: Profiles have been assessed as Wetness Class I or II
Depth to the clayey lower subsoil is very variable