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MAFF Ministry of Agriculture Fisheries and Food

Silver Green Farm

Hempnall

Norfolk

AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS

SILVER GREEN FARM, HEMPNALL, NORFOLK

1.0 BACKGROUND

1.1 The site, an area of 60.6 hectares, is the subject of an application, by Norfolk County Council, for the disposal of waste near Hempnall, Norfolk. MAFF surveyed the site in summer 1991 to assess the agricultural land quality and the soil physical characteristics.

1.2 On the Ministry's published 1:63360 scale provisional ALC map 137 (MAFF 1973) the site is mapped as grade 4 because at the time of this reconnaissance survey poor drainage prevented arable cultivation. The current survey was undertaken to provide more detailed information on land quality for the site.

2.0 SITE PHYSICAL CHARACTERISTICS

Climate

2.1 Climate data for the site was obtained from the published agricultural climatic dataset (Met Office, 1989). This indicates that the site's annual average rainfall is 613 mm (24.1"). It also shows that field capacity days are 115 and moisture deficits are 116 mm for wheat and 110 mm for potatoes. These climatic characteristics are not a limitation to the ALC grade.

Altitude and Relief

2.2 The site comprises a fairly level plateau at 50m AOD which overlaps with the northern edge of the disused Hardwick Airfield. Gradient and altitude do not constitute limitations to the ALC grade.

3.0 AGRICULTURAL LAND CLASSIFICATION (refer to ALC map)

3.1 The majority of the site has been mapped as subgrade 3b with a smaller area of subgrade 3a to the south west. A precise breakdown of the ALC grades in hectares and % terms is provided below.

	AGRICULTURAL LAND CLASSIFICATION	
Grade	ha	%
3a	14.0	23
3b	41.1	68
Non Agricultural	5.5	9
TOTAL	60.6	100

The definitions of the ALC grades are included in Appendix 1.

Subgrade 3a

3.2 A small area at the south west corner of the site has been mapped as subgrade 3a. Profiles typically comprise calcareous clayey soils which have been mapped as Soil Type 2 (described in paragraph 4.2.2). Observations from soil pits indicate that profiles are slowly permeable directly below the topsoil (ie. wetness class III). Impeded soil drainage and relatively heavy calcareous topsoil textures combine to impose a moderate limitation on the flexibility of this land for crop growth. These restrictions limit the land to subgrade 3a (good quality agricultural land).

Subgrade 3b

3.3 The majority of the site has been graded 3b. The soils are derived from the boulder clay deposits and typically comprise clayey profiles which are decalcified in the upper horizons. Profile pit observations indicate that subsoil drainage is impeded directly below the topsoil (ie. wetness class III). Slow subsoil permeability combined with the decalcified relatively heavy topsoils impose significant wetness and workability limitations to the ALC grade. Consequently the land is excluded from a higher grade.

4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The published 1:250,000 scale geology sheet 16 (Geol. Survey 1907) shows the site to comprise boulder clay deposits.

4.2 The current detailed soil survey indicates that two types of boulder clay derived soils occur within the survey area.

Soil Type 1 (refer to Appendix 2 and Soil Types Map)

4.2.1 Decalcified boulder clay soils cover the majority of the site equating to approximately 46.2 hectares (76%). They typically comprise heavy clay loam topsoils over clay upper subsoils which become chalky from 60/75 cms depth.

Soil Type 2 (refer to Appendix 2 and Soil Types map)

4.2.2 These soils are calcareous throughout and occupy a small area to the south west, notably 14.4 hectares (24%) in extent. Topsoils generally comprise heavy clay loams or clays which overlie clay subsoils. Chalk fragments are common below depths of 50/55 cms.

January 1992

SARAH ESCOTT
Resource Planning Group
MAFF, Cambridge RO

Appendix 1

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 and horticultural crops can usually be grown but on some land in the 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.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations with affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. When more demanding crops and 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 level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yield of which are variable. In most 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 very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Appendix 2

SOIL PHYSICAL CHARACTERISTICS

SILVER GREEN FARM, HEMPNALL, NORFOLK

SOIL TYPE 1 (46.2 hectares)

TOPSOIL	Texture	: non calcareous heavy clay loam
	Depth	: 25 cm
UPPER SUBSOIL	Texture	: non calcareous clay
	Structure	: weakly developed very coarse subangular blocky tending to structureless - massive
	Consistence	: extremely firm
	Depth	: 60/75 cm
LOWER SUBSOIL	Texture	: chalky clay
	Structure	: moderately developed very coarse subangular blocky
	Consistence	: very firm
	Depth	: 120 cm

SOIL TYPE 2 (14.4 hectares)

TOPSOIL	Texture	: calcareous heavy clay loam or clay
	Depth	: 25 cm
UPPER SUBSOIL	Texture	: calcareous clay
	Structure	: moderately developed coarse subangular blocky tending to medium and coarse prisms
	Consistence	: firm
	Depth	: 50/55 cm

LOWER SUBSOIL	Texture	: chalky clay
	Structure	: moderately developed very coarse subangular blocky
	Consistence	: very firm
	Depth	: 120 cm

Additional information: drainage generally impeded at shallow depths, profiles typically wetness class III. Rooting evident throughout the soil profile of both soil types.

References

GEOLOGICAL SURVEY OF ENGLAND & WALES 1907. Drift edition geology sheet 16. Scale 1:250,000.

MAFF 1973. Agricultural Land Classification Map Sheet 137, 1:63,360 scale.

MAFF 1988. Agricultural Land Classification of England & Wales (Revised Guidelines and criteria for grading the quality of Agricultural Land) Alnwick.

METEOROLOGICAL OFFICE 1989. Climate data extracted from the published agricultural climatic dataset.

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Map 1: Agricultural Land Classification

Map 2: Soil Types