LACKFORD WASTE MANAGEMENT FACILITY, LACKFORD, SUFFOLK

Agricultural Land Classification & Soil Physical Characteritics Maps and Report

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Resource Planning Team
Eastern Region
FRCA Cambridge

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AGRICULTURAL LAND CLASSIFICATION & SOIL PHYSICAL CHARACTERISTICS REPORT

LACKFORD WASTE MANAGEMENT FACILITY, LACKFORD, SUFFOLK

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 21.7 ha of land at Lackford. The survey was carried out during December 1998 in conjunction with proposals to extend the existing landfill site.

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 a proposal to extend the Lackford landfill site. This survey supersedes previous ALC information for this land.

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). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey the land use on the site was winter stubble with sheep grazing.

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)	% site area
Subgrade 3a	5.0	23
Subgrade 3b	16.7	77
Total site area	21.7	100

7. The fieldwork was conducted at an average density of one boring per hectare. A total of 25 borings and 3 soil pits was described.

8. The majority of the site has been graded 3b (moderate quality agricultural land). The limitation to the agricultural use of the land is droughtiness. A small area in the south of the site has been graded 3a (good quality agricultural land) where the land is slightly less droughty.

FACTORS INFLUENCING ALC GRADE

Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5 km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: *Climatic and altitude data*

Factor	Units	Values
Grid reference	N/A	TL 795 690
Altitude	m, AOD	35
Accumulated Temperature	day°C (Jan-June)	1416
Average Annual Rainfall	mm	592
Field Capacity Days	days	109
Moisture Deficit, Wheat	mm	114
Moisture Deficit, Potatoes	mm	109
Overall climatic grade	N/A	Grade 1

11. 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.

12. 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.

13. The combination of rainfall and temperature at this site mean that there is no climatic limitation to the agricultural use of the land. Hence the climatic grade is 1.

Site

14. The site occupies one large field which is surrounded by agricultural land on three sides. The existing landfill site lies immediately to the north east. The site is very gently sloping with a small hill in the central northern part of the site. The maximum altitude on site is approximately 40 m AOD along the northern boundary. Land falls to a minimum altitude of 34 m AOD in a shallow valley feature in the north west corner. The southern part of the site is almost flat. Nowhere on the site is gradient or altitude a limiting factor.

Geology and soils

15. The 1:50 000 solid and drift geology map (Geological Survey of Great Britain, 1982) shows Cretaceous Upper Chalk in the south western half of the site. The remainder of the site

has been covered by various drift deposits. In the north east glacial sand and gravels are mapped. In the shallow valley feature in the north west head deposits are shown and in the centre of the site a very small area of boulder clay is mapped.

16. The soils have been mapped on two occasions by Soil Survey.

17. In 1991 the soils were mapped in detail, at a scale of 1:25 000. This shows a complex soil pattern. Five principal soil series have been identified. In the central southern section Swaffham Prior/Worlington soils are mapped. These are described as permeable, calcareous coarse loamy or sometimes sandy soils with chalk and flint stones over chalk rubble at 40-70 cm depth, interspersed with non-calcareous sandy soils which overlie chalk rubble within 80 cm. Worlington soils are mapped along the south western edge and in the north central area. These are similar to the soils described above with chalk rubble encountered between 50-100 cm. Newport soils are shown in the valley feature in the north west corner. These are deep, permeable variably flinty non-calcareous sandy soils, sometimes over chalk rubble or chalky material below 70 cm. In the north east, Maxted/Ebstree soils are mapped. Again similar top and upper subsoils overlie sand, locally gravel within 80 cm or clay below 100 cm. The final soils shown occur in a small area in the south east. These are the Moulton/Worlington soils which are briefly described as permeable , non calcareous coarse loamy and sandy soils with flinty sandy caly loam below 40 cm, overlying chalky material at between 60-100 cm.

18. In 1983, the reconnaissance scale soils map (SSEW) shows the area to be summarised as the Newport 4 Association. This is briefly described as; deep well drained sandy soils. Some very acid soils with bleached subsurface horizon especially under heath or in woodland. Risk of wind erosion.

19. During the current detailed survey three soil types have been identified.

Soil Type I (4.3ha)

20. This soil type is found in two locations on the site. Firstly in the small valley feature in the north west and also along the eastern boundary. Topsoils typically comprise non-calcareous, very slightly to slightly stony loamy medium sand to 30 cm depth. Upper subsoils are typically similar or occasionally lighter in texture (medium sand) to a depth of 40/55 cm. Lower subsoils are generally medium sand (occasionally loamy medium sand) with a variable stone content, ranging from 3-10% but gravel is sometimes encountered. Soils are free draining.

Soil type II (5.1ha)

21. This soil type is mapped in the central southern part of the site. Topsoils are typically 30 cm deep, variably calcareous, very slightly stony loamy medium sand. Upper subsoils comprise loamy medium sand or sandy clay loam which are calcareous and contain small amounts of flint and soft chalk. Below 45/55 cm the lower subsoil becomes predominantly sandy clay loam (occasionally heavy clay loam) which is calcareous and contains a combination of flint and chalk (6-20% in total). Stone content tends to increase with depth.

Soil type III (12.3 ha)

22. This soil type is most extensive and covers the remainder of the site. Topsoils are variably calcareous, very slightly stony and loamy medium sand in texture. Depth of topsoil is typically 30 cm. Upper subsoils tend to be similar or lighter in texture, typically non-calcareous and slightly stony (5-15% flint). Below 55/70 cm the lower subsoils are variable, comprising sandy clay loam, or a mix of medium sandy loam, sandy clay and sandy clay loam. Stone content is variable with a combination of flint and/or chalk totalling 2-20%. Soils are also variably calcareous.

AGRICULTURAL LAND CLASSIFICATION

23. 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.

24. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix II.

Subgrade 3a

25. Subgrade 3a land is mapped in the central southern section of the site, covering about a quarter of the area and corresponds to the soils described in soil type II (paragraph 21). Subsoils are typically more moisture retentive than elsewhere on the site. Thus these soils retain better reserves of water for crop growth. This land is graded 3a due to a moderate droughtiness limitation.

Subgrade 3b

26. Subgrade 3b land is mapped over the majority of the site and corresponds to soils described in paragraphs 20 and 22. Both soil types have medium sandy soils to a depth which results in less moisture being retained for crop growth, especially for shallow rooting crops such as potatoes. This land is limited to this grade due to a significant droughtiness limitation.

Roger Orpin
Resource Planning Team
Eastern Region
FRCA Cambridge

SOURCES OF REFERENCE

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Met. Office (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

Soil Survey of England and Wales (1991) *Sheet TL76E/86W (Risby), Soil Survey Record No. 107.* SSEW: Harpenden.

Soil Survey of England & Wales (1983) *Sheet 4, Soils of Eastern England,* SSEW: Harpenden

Soil Survey of England and Wales (1983) *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

LACKFORD WASTE MANAGEMENT FACILITY, LACKFORD, SUFFOLK

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE 1

Topsoil	Texture	:	loamy medium sand
	Colour	:	10YR 4/3
	Stone	:	typically very slightly stony, occasionally slightly stony
	Roots	:	many fine and very fine roots
	$CaCO_3$	:	non-calcareous
	Depth	:	typically 30 cm (range 25/35 cm)
	Boundary	:	abrupt, wavy
Upper subsoil	Texture	:	loamy medium sand, occasionally medium sand
	Colour	:	10YR4/4 and 5/6
	Mottles	:	none
	Concretions	:	none
	Stone	:	typically very slightly to slightly stony (3-7%), occasionally very stony (40%)
	Structure	:	weakly developed medium angular blocky
	Consistence	:	very friable
	Structural condition	:	moderate
	Pores	:	>0.5%
	Roots	:	common fine and very fine
	$CaCO_3$	:	non calcareous
	Depth	:	typically 40/55cm, occasionally 80 cm+
	Boundary	:	clear, wavy
Lower subsoil	Texture	:	medium sand, occ. loamy medium sand
	Colour	:	variable, 10YR5/4, 10YR6/6, 7.5YR5/6
	Mottles	:	none
	Concretions	:	none
	Stone	:	typically very slightly to slightly stony (3-10%) occasionally very stony (40%+)
	Structure	:	weakly developed medium angular blocky
	Consistence	:	very friable, loose
	Structural condition	:	moderate
	Pores	:	>0.5%
	Roots	:	few fine and very fine roots
	$CaCO_3$	:	non calcareous
	Depth	:	120 cm (occasionally impenetrable to auger 55/60 cm)
Wetness Class:		:	I
Comment		:	occasionally at about 100 cm sandy clay encountered.

SOIL TYPE II

Topsoil	Texture	:	loamy medium sand
	Colour	:	10YR 4/3
	Stone	:	typically very slightly stony, range 2-5%
	Roots	:	abundant fine and very fine roots
	$CaCO_3$	:	variably calcareous
	Depth	:	typically 30 cm (range 30/35 cm)
	Boundary	:	abrupt, wavy
Upper subsoil	Texture	:	loamy medium sand or sandy clay loam
	Colour	:	10YR5/4, 5/6 & 10YR8/2
	Mottles	:	none
	Concretions	:	none
	Stone	:	typically very slightly to slightly stony (3-7%) flint and soft chalk
	Structure	:	weakly developed medium angular blocky for LMS, moderately developed medium subangular blocky for SCL
	Consistence	:	very friable/firm
	Structural condition	:	moderate/good
	Pores	:	>0.5%
	Roots	:	common fine and very fine
	$CaCO_3$	:	calcareous
	Depth	:	typically 45/55cm
	Boundary	:	abrupt, irregular
Lower subsoil	Texture	:	sandy clay loam, occasionally heavy clay loam
	Colour	:	variable, 10YR5/6, 10YR6/4, 10YR8/2 and 8/3
	Mottles	:	none
	Concretions	:	none
	Stone	:	typically slightly to moderately stony (6-20%) combination of flints and soft chalk. Becomes stonier with depth.
	Structure	:	moderately developed coarse sub-angular blocky
	Consistence	:	friable to firm
	Structural condition	:	moderate
	Pores	:	>0.5%
	Roots	:	few very fine roots
	$CaCO_3$	:	calcareous
	Depth	:	120 cm (occasionally impenetrable to auger 50/85 cm)
Wetness Class:		:	I

SOIL TYPE III

Topsoil	Texture	:	loamy medium sand
	Colour	:	10YR 4/3
	Stone	:	very slightly stony, range 2-6%
	Roots	:	abundant fine and very fine roots
	$CaCO_3$	:	variably calcareous
	Depth	:	typically 30 cm (range 25/35 cm)
	Boundary	:	clear/wavy
Upper subsoil	Texture	:	loamy medium sand or medium sand
	Colour	:	7.5YR5/4, 4/6 & 10YR5/6
	Mottles	:	none
	Concretions	:	none
	Stone	:	typically slightly stony (5-15%) flint
	Structure	:	weakly developed medium angular blocky.
	Consistence	:	very friable
	Structural condition	:	moderate
	Pores	:	>0.5%
	Roots	:	common fine and very fine
	$CaCO_3$	:	typically non calcareous
	Depth	:	typically 55/70cm
	Boundary	:	clear, irregular
Lower subsoil	Texture	:	sandy clay loam, or mix of medium sandy loam, sandy clay and sandy clay loam
	Colour	:	variable, 7.5YR5/6, 10YR6/6, 10YR8/2 and 8/3
	Mottles	:	None
	Concretions	:	None
	Stone	:	typically very slightly to moderately stony (2-20%) combination of flints and soft chalk.
	Structure	:	moderately developed coarse sub-angular blocky
	Consistence	:	friable to firm
	Structural condition	:	moderate
	Pores	:	>0.5%
	Roots	:	few very fine roots
	$CaCO_3$	:	variably calcareous
	Depth	:	120 cm (occasionally impenetrable to auger 80/90 cm)
Wetness Class:		:	I
Comment		:	lower subsoil comprises a mix of textures