

## PHYSICAL CHARACTERISTICS REPORT INCORPORATING AGRICULTURAL LAND CLASSIFICATION

## MILTON LANDFILL EXTENSION, CAMBRIDGE

## 1.0 INTRODUCTION

A survey was carried out over 48ha of land at Milton in connection with an application for an extension to the existing landfill site. The site is located to the northwest of the existing landfill area and is bounded to the north by Butt Lane, to the west by an old Drove Road and to the south partly by open farmland and also rough grassland. The rough grassland which is outside the survey site forms an area of disturbed land with much concrete and bricks evident.

A total of 47 observations were made over the site, using a spade and dutch auger to a depth of 1.2m where possible. In addition 4 soil pits were dug to help characterise the subsoil conditions of the individual soil types. The field work was carried out on 8, 11 and 12 March 1991. At the time of survey part of the land was under winter cereals and the remainder ploughed. There are a number of well maintained deep ditches on the site splitting it into 4 main enclosures. At the southern boundary of the site a 40m wide strip of woodland has been newly planted.

## 2.0 AGRICULTURAL LAND CLASSIFICATION

2.1 The site has been classified in accordance with the guidelines of the Agricultural Land Classification of England and Wales (MAFF 1988). A breakdown of the individual grades and areas is given below:

ALC grade	Area ha	%
2	16.2	33.9
3a	29.4	61.5
Woodland	2.2	4.6
	_____	_____
Total	47.8	100
	_____	_____

2.2 There are two major limiting factors on this site, wetness and droughtiness. All the soils have heavy clay loam topsoils restricting the land at best to Grade 2.

2.3 Where the topsoil is underlain by strongly mottled clay at depth, downward water movement is restricted and wetness and workability limitations will result. The underlying clay was generally slowly permeable but where chalk was present in the clay the soil became more permeable. However it was not possible to map these differences and therefore all these soils were limited to Grade 3a.

Where the soils were underlain by sands and gravels, droughtiness was the main limitation and the land was restricted to Grade 3a.

2.4 A full description of the site and soil physical characteristics is given below.

### 3.0 SITE PHYSICAL CHARACTERISTICS

#### Climate

3.1 Area specific climate data has been obtained by interpolating information contained in the 5km grid data set produced by the Meteorological Office (Met Office, 1989).

3.2 The annual average rainfall is approximately 564mm which is low by national standards. Soils are likely to be at field capacity for a relatively short period of approximately 93 days.

3.3 The accumulated temperature for this site is approximately 1453 degrees Celsius. This parameter indicates the cumulative build up of warmth available for crop growth, and in conjunction with rainfall has an influence on the development of soil moisture deficits and susceptibility to drought. The moisture deficits for wheat and potatoes on this site are 119 and 115 respectively, which are slightly higher than average for lowland England.

3.4 There is no overall climatic limitation to the agricultural use of this land, although some soils are susceptible to drought.

#### Relief

3.5 The site lies at an altitude of approximately 12m AOD. It is generally level with very minor localised undulations and hence there is no limitation to the agricultural land quality. The site is crossed and bounded by a series of deep well maintained ditches to aid land drainage.

### 4.0 SOIL PHYSICAL CHARACTERISTICS

#### Parent Material/Geology

4.1 The area has been mapped by the Geological Survey (Geol Surv 1981) and is shown as being underlain mainly by Gault Clay and a small area of 4th Terrace River Gravels on the western boundary. Soil observations generally confirmed this general description.

#### Soils

4.2 The area has been mapped by the Soil Survey of England and Wales (Soil Surv, 1963) and is shown to comprise mainly the St Lawrence and Milton series with a small area of Landbeach series. The present survey confirms the presence of these three soil series and three soil mapping units have been delineated. Mapping unit A generally correlates with the St Lawrence series, mapping unit B with the Milton series and mapping unit C with the Landbeach series. Each mapping unit is described in detail below.

4.3 The heavy topsoils which occur on the site are susceptible to structural damage particularly under arable cultivation. Some profiles showed evidence of panning at the base of the topsoil, the result of cultivations under adverse conditions.

SOIL MAPPING UNIT A (21.4ha)

Dark grey brown heavy clay loam with 4-6% small flints over brown mottled clay loam, over light grey calcareous clay.

Topsoil: Texture: heavy clay loam, occasionally clay  
CaCO<sub>3</sub>: non calcareous or very slightly calcareous  
Colour: dark greyish brown (10YR3/2 and 4/2)  
Stone: typically 3-8%, comprising mainly small and very small angular flints  
Depth: 27-30 cm  
Structure: Ploughed, occasional compact zones at base of horizon  
Roots: common fine and very fine  
Boundary: sharp smooth lower boundary

Subsoil 1 Texture: heavy clay loam or clay  
CaCO<sub>3</sub>: slightly calcareous  
Colour: brown or greyish brown (10YR5/3 and 2.5Y5/3)  
Mottles: few to common faint and occasionally distinct ochreous  
Stone: 3-5% small angular flints  
Depth: 45-75 cm, typically 50-55 cm  
Structure: moderately developed coarse and very coarse subangular blocky  
Consistence: friable  
Porosity: generally 1% biopores, common very fine pores  
Roots: few to common fine and very fine roots  
Boundary: abrupt smooth lower boundary

Subsoil 2 Texture: clay  
CaCO<sub>3</sub>: very calcareous  
Stone: stoneless to slightly stony, mainly small chalk stones 3-5% and calcareous nodules, occasionally 2-3% very small angular flints  
Depth: 120 cm +  
Structure: strong medium prismatic and coarse angular blocky  
Consistence: firm  
Porosity: less than 0.5% biopores, common very fine pores  
Roots: few/common fine and very fine roots  
Additional data: Wetness class II. Where there is much chalk in the deep subsoil, the soil structure is finer and the soil more porous, making the soil wetness class I.

SOIL MAPPING UNIT B (17.3ha)

Dark brown slightly stony heavy clay loam, over faintly mottled yellowish brown clay loam over mottled sandy clay loam.

Topsoil: Texture: heavy clay loam  
CaCO<sub>3</sub>: non or very slightly calcareous  
Colour: dark greyish brown (10YR3/2 and 4/2)  
Stone: 3-7%, comprising small and very small angular flints  
Depth: in the range 27-30 cm, typically 28 cm  
Structure: Ploughed  
Roots: common fine and very fine roots  
Boundary: sharp wavy lower boundary

Subsoil 1 Texture: clay loam  
CaCO<sub>3</sub>: slightly calcareous to calcareous  
Colour: yellowish brown (10YR5/4)  
Mottles: few to common faint ochreous  
Stone: slightly stony 3-5% small angular flints  
Depth: in the range 40-75 cm, typically 60 cm  
Structure: moderate coarse and very coarse subangular blocky  
Consistence: friable  
Porosity: 1% biopores, many very fine pores  
Roots: common fine and very fine roots  
Boundary: clear smooth lower boundary

Subsoil 2 Texture: sandy clay loam, sandy loam and loamy sand  
CaCO<sub>3</sub>: calcareous  
Colour: yellowish brown to light yellowish brown (10YR5/5 and  
6/5)  
Mottles: few to common faint ochreous mottles  
Stone: ranging from stoneless to slightly stony typically  
5-10% occasionally up to 20% small flints  
Depth: 120 cm +  
Structure: moderate very coarse subangular blocky becoming  
massive with depth  
Consistence: friable  
Porosity: 1% biopores, common very fine pores  
Roots: common fine and very fine roots  
Additional data: Wetness class I

MAPPING UNIT C (9.1ha)

Dark grey brown slightly stony heavy clay loam over yellowish brown slightly mottled clay loam over gravelly loamy sand and sand.

Topsoil: Texture: heavy clay loam  
CaCO<sub>3</sub>: non or very slightly calcareous  
Colour: dark greyish brown (10YR3/2 and 4/2)  
Stone: in range 3-8%, typically 5% small angular flints  
Depth: typically 28 cm  
Structure: Ploughed  
Roots: common fine and very fine roots  
Boundary: sharp smooth lower boundary

Subsoil 1 Texture: clay loam  
CaCO<sub>3</sub>: slightly calcareous  
Colour: yellowish brown (10YR5/3 to 5/5)  
Mottles: few to common faint ochreous mottles  
Stone: 5-10% small angular flints  
Depth: in the range 40 to 65 cm, typically 45 to 50 cm  
Structure: moderate developed medium and coarse subangular blocky  
Consistence: friable  
Porosity: 1% biopores, common very fine pores  
Roots: common fine and very fine roots  
Boundary: clear wavy lower boundary

Subsoil 2 Texture: loamy sand and sand  
CaCO<sub>3</sub>: calcareous  
Colour: brownish yellow (10YR6/6)  
Stone: 20-30% small flint gravels  
Depth: 120 cm +  
Structure: weakly medium medium subangular blocky or massive  
Consistence: very friable  
Porosity: very porous  
Roots: very few fine roots  
Additional data: Wetness class I

References:

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| Geological Survey (1981)                 | 1:50,000 Solid and Drift Geology Map sheet 188.        |
| MAFF (1988)                              | Agricultural Land Classification of England and Wales. |
| Meteorological Office (1989)             | Climatological Data for Land Classification            |
| Soils Survey of England and Wales (1966) | Soils of the District around Cambridge                 |