STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION REPORT BOOTHAM LANE LANDFILL SITE HATFIELD, DONCASTER SOUTH YORKSHIRE

NOVEMBER 1995

ADAS
Leeds Statutory Group

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SUMMARY

A detailed Agricultural Land Classification and Statement of Physical Characteristics survey of 39.8ha of land north of Hatfield (Bootham Lane Landfill Site) was carried out in June 1995. Further survey work was carried out in November 1995. This report revises and supersedes that produced in June 1995.

16.3ha of the site was agricultural land. 13.0ha of this falls in Subgrade 3b. These soils are imperfectly drained, consisting of heavy topsoils overlying heavy textured, slowly permeable subsoils. Wetness and workability restrictions limit this land to Subgrade 3b.

The remaining 3.3ha of agricultural land surveyed falls within Subgrade 3a. Soil profiles are moderately well drained, consisting of heavy topsoils over gleyed, medium to heavy textured upper subsoils, and medium to light textured lower subsoils. Moderate soil wetness and workability restrictions limit this land to Subgrade 3a.

The southern part of the site (23.4ha) was part of the existing refuse tip, and classed as Urban land.

0.1ha of land on the farmstead of Holmefield is classed as Agricultural Buildings.

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MAPS

STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION SURVEY OF PROPOSED LANDFILL SITE AT BOOTHAM LANE, HATFIELD, SOUTH YORKSHIRE

1. INTRODUCTION AND STATEMENT OF PHYSICAL CHARACTERISTICS

1.1 Introduction

This site was first surveyed by ADAS Leeds Statutory Group in June 1995. At that time, the eastern part of the site was not surveyed, as access was refused by the landowner. This land was subsequently surveyed in November 1995. The earlier survey results have now been reinterpreted in using this additional information. Soil Physical Characteristics and Agricultural Land Classification (ALC) of the whole site are described in this report, which supersedes the June 1995 report.

1.2 Location and Survey Methods

The site lies approximately 1km north of Hatfield, to the east of Bootham Lane. It is centred around National Grid Reference SE 659 112. Soils were examined by hand auger borings (to a depth of 120cm) at 100m intervals, predetermined by the National Grid. Two pits were dug to allow full soil profile descriptions. Land quality was assessed using the methods described in 'Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land' (MAFF, 1988).

1.3 Land Use and Relief

The southern part of the site is in urban use as a waste tip. Land in the north-east of the site, around Holmefield, is classed as Agricultural Buildings. The remaining land on the site was in agricultural use for winter cereals, potatoes and grassland.

The northern part of the site is level, lying at approximately 4m AOD. Where the site has been used as a refuse tip, the land rises to approximately 12m AOD. Some mounds of soil material are present to the north-west of the refuse tip.

1.4 Climate

Grid Reference	: SE659 112
Altitude (m)	: 4
Accumulated Temperature above 0°C (January - June)	: 1414 day °C
Average Annual Rainfall (mm)	: 578
Climatic Grade	: 1
Field Capacity Days	: 118
Moisture Deficit (mm) Wheat	: 115
Moisture Deficit (mm) Potatoes	: 109

1.5 Geology, Soils and Drainage

The site is underlain by Sherwood Sandstone which is completely covered by thick alluvial drift. This consists of laminated clays, silts and fine sands of varying thickness.

Soils in the west consist of heavy clay loam or heavy silty clay loam topsoils, overlying heavy clay loam, heavy silty clay loam, clay or silty clay subsoils. Thin lenses of lighter-textured material occasionally occur within the subsoil, but subsoils are slowly permeable. These soils are imperfectly drained, falling within Wetness Class III.

Soils in the east are similar, but have better differentiated subsoils, with discrete, light textured horizons. Topsoils consist of heavy clay loam or heavy silty clay loam. Gleyed sandy clay loam, heavy clay loam or heavy silty clay loam upper subsoils overlie find sandy loam, fine sandy silt loam or heavy silty clay loam lower subsoils. Slowly permeable layers occur at variable depth. These soils are moderately well drained (Wetness Class I) or imperfectly drained (Wetness Class III), depending on the depth at which slowly permeable layers occur.

1.6 Soil Properties

Two main soil types occur on this site, descriptions of which are given below. Topsoil and subsoil resources are shown on the accompanying maps along with soil thickness and volume information.

a) Soil type 1

Heavy textured soils (Unit T1, S1).

This soil is formed in alluvial clay and occurs in the west of the site. It is characterised by heavy textured topsoils overlying heavy-textured, gleyed, slowly permeable subsoils.

b) Soil type 2

Heavy textured topsoils, medium to heavy textured upper subsoils, medium to light lower subsoils (Unit T1, U1, L1).

This soil formed in sandy and silty alluvium occurs across the east of the site. It is characterised by a heavy topsoil and medium to heavy-textured, gleyed upper subsoil, overlying medium to light textured lower subsoils which are gleyed and occasionally slowly permeable. Lenses of clay sometimes occur within the lower subsoil.

Soils in the south of the site have been disturbed by tipping. Where present, soils consist of thin, moderately stony sandy loam topsoils (contaminated with refuse) over fill. However, a number of soil mounds lie to the north-west of the refuse site. These resources should be fully utilised in any restoration programme.

1.7 Soil Resources

a) Topsoils

Unit T1 occurs over all agricultural land surveyed on the site. It is stoneless and heavy textured (heavy clay loam or heavy silty clay loam). It has a moderately developed medium prismatic structure and a mean thickness of 30cm.

b) Upper Subsoils

Unit S1 occurs in the west of the site. It is heavy textured, consisting of heavy clay loam, heavy silty clay loam, clay or silty clay, and is stoneless. It has a coarse prismatic structure, and is slowly permeable. Mean thickness is 90cm.

Unit U1 occurs in the east of the site. It is medium to heavy textured and stoneless, consisting of sandy clay loam, heavy clay loam, or heavy silty clay loam. It is gleyed, with a medium prismatic structure. Mean thickness is 30cm.

c) Lower subsoils

Unit L1 lies below Unit U1. It consists of stoneless fine sandy loam, sandy silt loam or medium silty clay loam, with an angular or subangular blocky structure. Lenses of clay sometimes occur within this unit. It is gleyed and occasionally slowly permeable. Mean thickness is 60cm.

In the area affected by tipping activity, soils are generally thin, stony and contaminated with refuse. However, mounds of soil material are present in the north-west of this part of the site. This material should be fully utilised in any restoration programme.

2. SOIL PROFILE DESCRIPTIONS

Table 1 - Heavy textured soils (T1/S1)

Profile 1 between auger borings 11 and 12.

Land Use	Arable
Slope and Aspect	Level
Weather	Dry and sunny

Depth cm	**Horizon Description**
21	Dark grey (7.5YR4/1) heavy silty clay loam; stoneless; dry; moderately developed, medium prismatic structure; very firm; abundant fine fibrous roots; medium packing density; slightly porous; non-calcareous; very sticky; very plastic; abrupt, smooth boundary to:
55	Light grey (7.5YR6/1) heavy silty clay loam; many reddish yellow (7.5YR6/8) mottles; stoneless; dry; few fine fibrous roots; weakly developed medium prismatic structure; very firm; very sticky; very plastic; high packing density; slightly porous (<0.5% biopores >0.5m diameter); non-calcareous; clear smooth boundary to:
120	Bluish grey (5B4/1) silty clay; many reddish yellow (7.5YR6/8) and grey (7.5YR6/1) mottles; stoneless; slightly moist; few fine fibrous roots; weakly developed coarse prismatic structure; very sticky; very plastic; high packing density; slightly porous (<0.5% biopores >0.5mm diameter); non-calcareous.

Table 2 - Heavy textured topsoil over medium to heavy upper subsoil, and medium to light lower subsoil (T1/U2/L1).

Profile 2 between auger borings 4 and 9.

Land use	Arable
Slope and Aspect	Level
Weather	Warm and sunny

Depth cm	**Horizon Description**
23	Dark grey (7.5YR4/1) heavy clay loam; few light grey (7.5YR6/2) and reddish yellow (7.5YR6/8) mottles; stoneless; dry; moderately developed, medium prismatic structure; very firm; medium packing density; slightly porous; abundant fine fibrous roots; very sticky; very plastic; non-calcareous; abrupt, wavy boundary to:
42	Light grey (7.5YR7/1) sandy clay loam; many reddish yellow (7.5YR6/8) and dark grey (7.5YR4/1) mottles; stoneless; dry; moderately developed, medium prismatic structure; very firm; medium packing density; slightly porous; common fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; clear smooth boundary to:
68	Light grey (7.5YR7/1) becoming reddish yellow (5YR5/6) towards base, fine sandy loam; common reddish yellow mottles (7.5YR6/6); stoneless; slightly moist; moderately developed medium subangular blocky structure; firm; few fine fibrous roots; slightly sticky; moderately plastic; medium packing density; very porous; non-calcareous, abrupt irregular boundary to:

120	Grey (7.5YR6/1) medium sandy silt loam; abundant reddish brown (5YR5/3) and reddish yellow (5YR5/6) mottles; stoneless; slightly moist; moderately developed coarse, subangular blocky structure; firm; high packing density; moderately porous; few fine fibrous roots; moderately sticky; very plastic; non-calcareous.

3. AGRICULTURAL LAND CLASSIFICATION

The ALC grades occurring on this site are as follows:

Grade/Subgrade	Hectares	Percentage of Total Area
1		
2		
3a	3.3	8.3
3b	13.0	32.7
4		
5		
(Sub total)	(16.3)	(41.0)
Urban	23.4	58.8
Non Agricultural		
Woodland		
Agricultural Buildings	0.1	0.2
Open Water		
Land not surveyed		
(Sub total)	(23.5)	(59.0)
TOTAL	39.8	100

3.1 Subgrade 3a

Land of this quality is confined to the east of the northern part of the site. The soils are moderately well drained, falling within Wetness Class II. Soil profiles generally consist of heavy clay loam or heavy silty clay loam overlying gleyed medium to light textured lower subsoils (fine sandy loam, fine sandy silt loam or medium silty clay loam). The lower subsoils are sometimes slowly permeable below 58cm. The land is limited to this subgrade by moderate soil wetness and workability restrictions.

3.2 Subgrade 3b

The remaining agricultural land on the site is of Subgrade 3b quality. Soil profiles are imperfectly drained (Wetness Class III), generally consisting of heavy clay loam or heavy silty clay loam topsoils overlying gleyed, slowly permeable subsoils of heavy clay loam, heavy silty clay loam, clay or silty clay. Medium to light textured horizons sometimes lie below the slowly permeable layer. This land is restricted to Subgrade 3b by a more severe wetness and workability limitation.

3.3 Urban Land

Land in the south of the site affected by the existing refuse tip is classed as Urban.

3.4 Agricultural Buildings

The farmstead at Holmefield is classed as Agricultural Buildings.

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