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Ministry of
Agriculture
Fisheries
and Food

STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION WOODBINE OCCS EXTENSION SOUTH YORKSHIRE MARCH 1996

ADAS
Leeds Statutory Group

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SUMMARY

A detailed Agricultural Land Classification (ALC) and Statement of Physical Characteristics survey of 6.2 ha of land near Dearne ("Woodbine OCCS Extension") was carried out in three stages, in August 1993, January 1995 and March 1996. At the time of the most recent survey 5.7 ha of the site was in agricultural use and 4.7 ha of this falls in Subgrade 3a. The soils vary between well and imperfectly drained, with light to medium-textured topsoils and upper subsoils overlying medium to heavy-textured lower subsoils. The soils are generally gleyed within 40 cm depth and slowly permeable layers occur in places below 40 cm depth. Soil wetness and a pattern limitation restrict these areas to Subgrade 3a.

Subgrade 3b land covers 1.0 ha of the site. In the north-east the soils are shallow and overlie weathering sandstone. Soil droughtiness and slopes of 8° limit ALC grade in this area. In the west the soils are variable but a number of poorly drained profiles prevent any areas of better quality land being mapped. Thus soil wetness and a pattern limitation limit this land to Subgrade 3b.

Other land on this site consists of part of the existing opencast coal site and covers 0.5 ha.

In terms of soil resources, two main soil types are found. The first consists of shallow light to medium-textured topsoils (median depth 35 cm) overlying weathering sandstone bedrock. The second soil type is more variable, but typically consists of a light to medium-textured topsoil (median depth 30 cm) and upper subsoil (mean depth 26 cm) overlying a medium to heavy-textured lower subsoil (mean depth 64 cm).

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STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION REPORT ON THE PROPOSED WOODBINE OCCS EXTENSION, SOUTH YORKSHIRE

1. INTRODUCTION AND SITE CHARACTERISTICS

1.1 Location and Survey Methods

This site lies approximately 1½ Km west of Dearne, directly south of the A635. A detailed Agricultural Land Classification (ALC) survey of the site had been carried out in two stages, in January 1995 and August 1993, and additional field work was done in March 1996 to collect further information on the soil resources on site. The overall density of hand auger borings was just over one per hectare at points predetermined by the O.S. National Grid, and two soil pits were dug to allow full profile descriptions to be made. The 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).

1.2 Land Use and Relief

At the time of the March 1996 survey all of the land was growing winter cereals, with the exception of 0.5 ha in the west which were occupied by the existing open cast coal site.

Site altitude varies from 35 m AOD in the north-east to 25 m AOD in the south-west and the land is moderately to strongly sloping (6 - 8°) in the north-east, but level (0 - 1°) elsewhere.

1.3 Climate

Grid Reference	: SE447040
Altitude (m)	: 30
Accumulated Temperature above 0°C (January - June)	: 1393 day °C
Average Annual Rainfall (mm)	: 628
Climatic Grade	: 1
Field Capacity Days	: 131
Moisture Deficit (mm) Wheat	: 107
Moisture Deficit (mm) Potatoes	: 98

1.4 Geology, Soils and Drainage

The area is underlain by Middle Coal Measures consisting of interbedded sandstones and shales. With the exception of locally derived Head deposits there is no drift cover on the site and the soils are derived from weathering sandstone (in the north-east), or weathering shale and Head deposits (over the remainder of the site). In the north-east the soils are well drained (Wetness Class I), with light to medium-textured topsoils directly overlying weathering sandstone. Elsewhere the soils vary between well drained (Wetness Class I) and poorly drained (Wetness Class IV), with light to medium-textured topsoils and upper subsoils overlying medium to heavy-textured lower subsoils.

The soils on the site correspond to the Bardsey association as mapped by the Soil Survey and Land Research Centre.

1.5 Soil Properties

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

(a) Soil Type 1:- Shallow light to medium-textured soils (Unit T1/Sandstone)
(Full Profile Description, Table 1)

This soil, formed on Coal Measures sandstone, occurs in the north-east of the site. It is characterised by a slightly stony topsoil directly overlying weathering sandstone bedrock.

(b) Soil Type 2:- Light to medium-textured topsoils and upper subsoils overlying medium to heavy-textured lower subsoils (Unit T2/U1/L1)
(Full Profile Description, Table 2)

This soil, derived from Coal Measures shales and light-textured Head deposits, occurs over most of the site. It is variable, but is characterised in most cases by a very slightly stony light to medium-textured topsoil and upper subsoil overlying a medium to heavy-textured lower subsoil.

1.6 Soil Resources

(i) Topsoils

Unit T1 occurs in the north-east of the site. It is light to medium-textured, consisting of medium sandy loams or medium clay loams, and is slightly stony, with around 8% very small to medium sandstones. This topsoil has a weakly developed medium and coarse subangular blocky structure and directly overlies weathering sandstone bedrock. Median unit depth is 35 cm.

Unit T2 occurs over the remainder of the site. It is very similar to Unit T1, consisting of medium sandy loam or medium clay loam, but is only very slightly stony, with 1 - 2% very small to medium sandstones. The median unit depth of Unit T2 is 30 cm.

(ii) Subsoils

The subsoils on the site are variable, but typically consist of a light to medium-textured upper subsoil and a medium to heavy-textured lower subsoil. However, in some cases either light-textured or heavy-textured subsoils begin below the topsoil and extend to 120 cm depth.

Unit U1 (the upper subsoil) consists of medium sandy loam or medium clay loam in most cases, although heavy clay loam or heavy silty clay loams occur in places. Typically this soil unit has a moderately developed coarse angular blocky or medium prismatic structure, and is very slightly stony, with around 3% sandstones. The mean depth of Unit U1 is 26 cm.

Unit L1 (the lower subsoil) generally consists of sandy clay loam, heavy clay loam or heavy silty clay loam, but medium sandy loam occurs in some areas. The soil structure is weakly developed coarse angular blocky to massive and Unit L1 is very slightly to slightly stony, with up to 8% sandstones. Mean unit depth is 64 cm.

2. SOIL PROFILE DESCRIPTIONS

Table 1 Shallow light to medium-textured soil, T1/Sandstone.

Profile Pit 1 (Near auger boring 2)

Slopes:- 8°SW

Land Use:- Winter cereals

Weather:- Cold and overcast

Depth cm	Horizon Description
0 - 38	Dark greyish brown (2.5Y4/2) medium silty clay loam; no mottles; slightly stony, with around 8% total very small to medium sandstones (6% >2 cm); moist; weakly developed medium and coarse subangular blocky structure; firm; moderately porous; many fine and very fine fibrous roots; slightly sticky, moderately plastic; non-calcareous; clear smooth boundary.
38 +	Light olive brown (2.5Y5/3) platy weathering sandstone, with approximately 20% medium silty clay loam in interstices; common very fine fibrous roots.

Table 2 Light to medium-textured topsoils and upper subsoils overlying medium to heavy-textured lower subsoils T2/U1/L1.

Profile Pit 2 (Near auger boring 5)

Slope:- 0°

Land Use:- Winter cereals

Weather:- Cold and overcast.

Depth cm	Horizon Description
0 - 35	Dark greyish brown (10YR4/2) medium clay loam; no mottles; very slightly stony, with around 2% very small to medium sandstones; moist; moderately developed coarse angular blocky structure; firm; moderately porous; common very fine fibrous roots; slightly sticky; moderately plastic; non-calcareous; clear smooth boundary.
35 - 45	Brown (10YR5/3) medium sandy loam; many yellowish brown (10YR5/8) and common greyish brown (2.5Y5/2) mottles; very slightly stony, with around 2% very small to medium sandstones; moist; moderately developed coarse angular blocky and medium prismatic structure; firm; very porous; common very fine fibrous roots; slightly sticky; moderately plastic; non-calcareous; wavy smooth boundary.
45 - 67	Brown (10YR5/2) medium sandy loam with many reddish yellow (10YR6/6) mottles; slightly stony, with around 8% very small to medium sandstones and many manganese concretions; moist; massive; firm; moderately porous, but <0.5% pores >0.5 mm; few very fine fibrous roots; slightly sticky; slightly plastic; non-calcareous; wavy smooth boundary.

Depth cm	Horizon Description
67 - 120	Grey/light grey (10YR6/1) heavy silty clay loam; common brown (2.5Y5/3) and strong brown (7.5YR5/8) mottles; slightly stony, with around 8% very small to medium sandstones and common manganese concretions; slightly moist; weak coarse angular blocky to massive structure; very firm; slightly porous (<0.5% pores >0.5 mm); no roots; moderately sticky; very plastic; non-calcareous.

3. AGRICULTURAL LAND CLASSIFICATION

The ALC grades occurring on this site are as follows:

Grade/Subgrade	Hectares	% of Total Area
1		
2		
3a	4.7	75.8
3b	1.0	16.1
4		
5		
(Sub total)	(5.7)	(91.9)
Other Land	0.5	8.1
TOTAL	6.2	100

3.1 Subgrade 3a

Most of the site falls in Subgrade 3a. The soils vary between well and imperfectly drained (Wetness Classes I to III) and consist of medium clay loam topsoils overlying medium sandy loam, sandy clay loam, medium clay loam, heavy clay loam or heavy silty clay loam subsoils. The profiles are generally gleyed within 40 cm depth and slowly permeable layers occur in places below this level. Although some profiles meet the requirements for Grade 2, they cannot be accurately mapped together as a separate unit, and soil wetness restricts the ALC grade of other areas.

3.3 Subgrade 3b

Land in this subgrade occurs in the north-east and west of the site. In the north-east light to medium-textured topsoils overlie weathering sandstone at around 35 cm depth. Soil droughtiness and, in some places, slopes of 8° limit this land to Subgrade 3b. In the west the soils are variable but a number of poorly drained (Wetness Class IV) profiles alongside the drain prevent any areas of better quality land being mapped. Thus soil wetness and a pattern limitation restrict the ALC grade in this area.

3.3 Other Land

This occurs in the north-west, and consists of part of the existing open cast coal site.

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MAPS