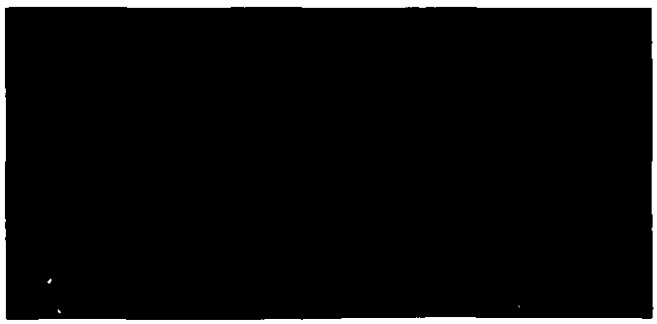

MAFF Ministry of Agriculture Fisheries and Food

STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION

HOWBROOK OCCS,
SHEFFIELD,
SOUTH YORKSHIRE.
JULY 1994.

ADAS
Leeds Statutory Group

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SUMMARY

An Agricultural Land Classification of 47ha. of land at Howbrook was carried out in two stages in February 1992 and July 1994. 98% of the site is in agricultural production of which 5.6ha. falls in Grade 2. Profiles are well drained, with medium silty clay loam or sandy clay loam topsoils and medium sandy loam subsoils overlying weathering sandstone at around 70cm depth. This land is limited to Grade 2 by the climate of the area and by slight soil droughtiness.

2.2ha. of Subgrade 3a land occurs in the west of the site. The soils are either well drained, with weathering sandstone bedrock occurring at around 50cm depth (in which case soil droughtiness limits the land to Subgrade 3a) or imperfectly drained, with medium-textured topsoils and upper subsoils overlying gleyed and slowly permeable heavy-textured lower subsoils at around 60cm depth (in which case soil wetness restricts the A.L.C grade).

37.5ha. of the site has been mapped as Subgrade 3b. Some of this land has been disturbed during previous opencasting but all profiles are poorly drained, with medium to heavy-textured topsoils overlying similar subsoils. This land is limited to Subgrade 3b by soil wetness and topsoil workability restrictions.

0.6ha. of Grade 4 land occurs in the east where slopes of around 13° limit the use of agricultural machinery.

The remainder of the site (1.1ha) consists of Non Agricultural land lying alongside watercourses in the centre and north.

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1. INTRODUCTION AND SITE CHARACTERISTICS

1.1 Location and Survey Methods

The site lies approximately 11Km NNW of Sheffield city centre and covers a total area of 47ha. A detailed Agricultural Land Classification survey of most of the site had been carried out in February 1992 when soils were examined at 100m intervals predetermined by the National Grid. Three areas in the south and west of the site unsurveyed in 1992 were subject to a detailed survey in July 1994, and the topsoil/subsoil resources across the whole site were assessed to allow a Statement of Physical Characteristics to be drawn up. Three soil pits were dug to allow full profile descriptions to be made.

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 July 1994 survey 98% of the site was in agricultural use (cereals or pasture), the remainder being Non Agricultural land.

Site altitude varies from 155m A.O.D in the west to 115m A.O.D in the east and the land is generally gently to moderately sloping (2-5°) with an easterly espect. However, some areas of strongly to moderately steepy sloping land (10-13°) alongside How Brook are limited to Subgrade 3b and Grade 4.

1.3 Climate

Grid Reference	: SK331 983
Altitude (m)	: 135
Accumulated Temperature above 0°C (January - June)	: 1279 day °C
Average Annual Rainfall (mm)	: 768
Climatic Grade	: 2
Field Capaacity Days	: 180
Moisture Deficit (mm) Wheat	: 84
Moisture Deficit (mm) Potatoes	: 68

1.4 Geology, Soils and Drainage

The site is underlain by Carboniferous Coal Measures consisting of interbedded sandstones and shales. With the exception of localised Head deposits there is no drift cover and weathering sandstone bedrock occurs within one metre of the soil surface in parts of the north and west of the site.

Parts of the centre of the site have been opencasted previously and the soils in this area are compacted and poorly drained, with medium to heavy-textured topsoils overlying similar subsoils. The soils formed over sandstone are generally well drained with medium-textured topsoils over light-textured subsoils, and weathering sandstone bedrock typically occurs at around 70cm depth. Where the soils have formed in weathering shale profiles are generally poorly drained with medium to heavy-textured topsoils overlying heavy-textured subsoils.

1.5 Soil Properties

Three 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: Disturbed soils (Unit T1/S1)
(Full Profile Description, Table 1)

This soil, disturbed during previous opencasting, occurs in the centre of the site. It is characterised by a compacted medium to heavy-textured topsoil overlying a similar subsoil.

(b) Soil Type 2: Light to medium textured soils (Unit T2/S2)
(Full Profile Description, Table 2)

This soil formed over weathering sandstone occurs in the north and west of the site. It is characterised by a medium-textured topsoil overlying a light-textured subsoil, with weathering sandstone occurring at around 70cm depth.

(c) Soil Type 3: Medium to heavy textured soils (Unit T3/S3)
(Full Profile Description, Table 3)

This soil, formed over weathering shale, occurs in the east and west of the site. It is characterised by a medium to heavy-textured topsoil overlying a heavy-textured subsoil.

1.6 Soil Resources

(i) Topsoils

Unit T1 occurs in the centre of the site. It has been disturbed by previous opencasting and typically consists of a very slightly stony medium clay loam, medium silty clay loam or heavy silty clay loam. It has a weakly developed coarse angular and coarse subangular blocky structure and a median thickness of 25cm.

Unit T2 occurs in the north and west of this site. It is medium-textured (consisting of medium clay loam or sandy clay loam) and is generally very slightly stony containing around 5% medium subangular sandstones. Unit T2 has a moderately developed fine subangular blocky structure and a median thickness of 30cm.

Unit T3 occurs in the east and west and is medium to heavy textured, consisting of medium clay loam, medium silty clay loam or heavy silty clay loam. It has a moderately developed coarse angular blocky structure and is stoneless to very slightly stony (containing up to 4% sandstone, argillaceous stones and fragments of coal). It has a median unit depth of 25cm.

(ii) Subsoils

Unit S1 occurs in the centre of the site and is medium to heavy textured, consisting of medium silty clay loam, heavy silty clay loam or silty clay. It is stoneless to slightly stony, containing up to 12% medium-grained soft sandstones and argillaeceous stones, the latter being derived from overburden. Unit S1 has a massive to weakly developed course angular blocky structure and a mean depth of 96cm.

Unit S2 occurs in the north and west and is typically light-textured (consisting of medium sandy loam) and very slightly to slightly stony, containing 5 - 15% medium-grained soft sandstones. It has a well developed fine subangular blocky structure and a mean depth of 41cm.

Unit S3 occurs in the east and west of the site. It is heavy-textured (generally silty clay or heavy silty clay loam) and stoneless to very slightly stony, with up to 3% medium-grained soft sandstones and argillaceous stones. Unit S3 has a weakly developed coarse angular to medium prismatic structure and a mean depth of 94cm.

2. SOIL PROFILE DESCRIPTION

2.1 Table 1 Disturbed soil, T1/S1

Profile Pit 1 (Near auger boring 21).

Slope:- 2°E
Land Use:- CEREALS
Weather:-BRIGHT AND VERY WARM

Depth (cm)	Horizon Description
0 - 20	Very dark greyish brown (10YR3/2) heavy clay loam: few indistict yellowish brown (10YR5/6) mottles: very slightly stony, containing approximately 3% very small to medium-sized subangular sandstones, shales and fragments of coal; dry: weakly developed coarse subangular and angular blocky structure; very hard soil strength; high packing density; slightly porous; many fine and very fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; smooth abrupt boundary.
20 - 56	Grey (N5) silty clay; many distinct reddish yellow (7.5YR6/8) and light grey (10YR5/2) mottles; slightly stony (containing approximately 8% very small to large subangular sandstones, shales and fragments of coal); dry; weakly developed coarse angular blocky structure; very hard soil strength; high packing density; very slightly porous; common fine and very fine fibrous roots; moderately sticky; very plastic; non-calcareous; smooth abrupt boundary.
56 - 81	Dark grey (10YR4/1) medium silty clay loam; common indistinct dark yellowish brown (10YR4/4) mottles; very slightly stony (containing approximately 3% very small and small subangular sandstones and fragments of coal and shale); moist; massive; medium packing density; slightly porous; no roots; moderately sticky; moderately plastic; non-calcareous; smooth abrupt boundary.
81 - 120	Very dark grey (10YR3/1) colliery overburden; common dark grey (10YR4/1) and black (10YR2/1) mottles; moist; massive; medium packing density; slightly porous; no roots; moderately sticky; moderately plastic; non-calcareous.

2.2 Table 2 Light to medium textured soil, T2/S2

Profile Pit 2 (Near auger boring4)

Slope:- 2°SE
Land Use:- LEY GRASS
Weather:- RECENTLY VERY DRY AND HOT

Depth (cm)	Horizon Description
0 - 24	Dark greyish brown (10YR4/2) sandy clay loam; no mottles; very slighty stony (containing 5% medium subangular sandstones); dry; moderately developed fine subangular blocky structure; moderately hard soil strength; medium packing density; moderately porous; many fine and very fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; clear wavy boundary.
24 - 60	Light yellowish brown (10YR6/4) medium sandy loam; no mottles; moderately stony (containing approximately 16% medium and large subangular sandstones); dry; well developed fine subangular blocky structure; moderately hard soil strength; medium packing density; very porous; common fine fibrous roots; non-sticky; non-plastic; non-calcareous; gradual irregular boundary.
60+	Weathering sandstone bedrock.

2.3 Table 3 Medium to heavy textured soil, T3/S3

Profile Pit 3 (Near auger boring 42)

Slope:- 3°E
Land Use:- CEREALS
Weather:- BRIGHT AND WARM

Depth (cm)	Horizon Description
0 - 25	Very dark greyish brown (10YR4/2) medium silty clay loam; no mottles; very slightly stony (containing approximately 2% sandstones and fragments of coal and shale); dry; moderately developed coarse subangular blocky structure; moderately hard soil strength; medium packing density; slightly porous; many fine and very fine fibrous roots; slightly sticky; moderately plastic; non-calcareous; smooth abrupt boundary.
25 - 43	Pale yellow (2.5Y7/3) heavy silty clay loam; common distinct brownish yellow (10YR6/6) mottles; very slightly stony (containing approximately2% small and medium subangular sandstones); dry; weakly developed coarse angular to medium prismatic structure; very hard soil strength; medium packing density; slightly porous (<0.5% pores >0.5mm); common very fine fibrous roots; moderately sticky; moderately plastic; non-calcareous; clear smooth boundary.
43 - 120	Light grey (10YR7/2) silty clay; common distinct reddish yellow (7.5YR6/8) mottles; very slightly stony (containing around 4% small and medium subangular sandstones); slightly moist; weakly developed coarse angular to medium prismatic structure; very hard soil strength; high packing density; very slightly porous (<0.5% pores>0.5mm); few very 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	5.6	11.9
3a	2.2	4.7
3b	37.5	79.8
4	0.6	1.3
5		
(Sub total)	(45.9)	(97.7)
Urban		
Non Agricultural	1.1	2.3
Woodland - Farm		
- Commercial		
Agricultural Buildings		
Open Water		
Land not surveyed		
(Sub total)	(1.1)	(2.3)
TOTAL	47.0	100

3.1 Grade 2

Grade 2 land occurs in the north and south of this site. Profiles are well drained (Wetness Class I) with sandy clay loam or medium silty clay loam topsoils overlying medium sandy loam subsoils. Weathering sandstone bedrock occurs at around 70cm depth and both topsoils and subsoils are very slightly to slightly stony, containing 5 - 10% subangular sandstones. This land is limited to Grade 2 by the climate of the area and, in places, by slight soil droughtiness.

3.2 Subgrade 3a

Subgrade 3a land occurs in the west of the site. Profiles are either well drained (Wetness Class I) with medium clay loam topsoils and medium sandy loam subsoils overlying weathering sandstone bedrock at around 50cm depth (in which case soil droughtiness limits the land to Subgrade 3a) or imperfectly drained (Wetness ClassIII) with medium clay loam topsoils and upper subsoils overlying gleyed and slowly permeable silty clay subsoils at around 60cm depth(in which case soil wetness limits the land to this subgrade).

3.3 Subgrade 3b

Most of this site falls in Subgrade 3b although there are two main soil types. The first occurs in the centre of the site where the soils have been disturbed by previous opencasting. These soils are poorly drained (Wetness Class IV) with compacted upper horizons. Generally compacted medium clay loam, medium silty clay loam or heavy silty clay loam topsoils overlie compacted medium silty clay loam, heavy silty clay loam or silty clay subsoils. Horizons of colliery overburden or coal occur in places.
The second soil type is undisturbed but also poorly drained (Wetness Class IV) and consists of medium clay loam, medium silty clay loam or heavy silty clay loam topsoils overlying gleyed and slowly permeable heavy silty clay loam or silty clay subsoils at around 25cm depth. In both cases soil wetness is the factor which limits the ALC grade of the land.

3.4 Grade 4

Grade 4 land occurs in the east of the site where slopes of around 13° limit the use of agricultural machinery.

3.5 Non Agricultural

Three areas of Non Agricultural land occur in the centre and north of the site alongside watercourses.

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MAPS