STATEMENT OF PHYSICAL CHARACTERISTICS

AND AGRICULTURAL LAND CLASSIFICATION

PITHOUSE WEST EXTENSION, ASTON

Proposed Opencast Coal Site

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SECTION 1. STATEMENT OF PHYSICAL CHARACTERISTICS: PITHOUSE WEST, ASTON, SOUTH YORKSHIRE

1.1 LOCATION AND SURVEY METHOD

The site is located around National Grid Reference SK 466835, approximately 11 km south east of Sheffield city centre. It covers 19.0 hectares, 81.0 per cent of which is in agricultural use.

Survey work was carried out in January 1990 when soils were examined by hand auger borings at 100 metre intervals, at points pre-determined by the national grid.

Details soil descriptions and sampling for laboratory analyses were carried out in an inspection pit located at a representative point on the site. Additional shallow pits were dug where necessary to assess variations in soil morphology and structure.

All assessments of agricultural land quality were made 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 CLIMATE

Average Annual Rainfall (AAR) is approximately 665 mm. Accumulated temperature (ATO) above 0°C between January and June is 1334 day°C and the land is at field capacity for 147 days per year. There are thus no overall climatic limitations on ALC grade.

1.3 RELIEF

The site is at a mean altitude of 90 metres above Ordnance Datum. Relief is gentle and does not restrict the use of agricultural machinery.

1.4 LAND USE

Most of the agricultural land was devoted to winter cereals during the 1989-90 season except for a small area of grassland in the south western corner.

Non agricultural land consists of a sports ground in the north and a woodland shelter belt along part of the western boundary.

1.5 GEOLOGY

The area has been worked previously for opencast coal and restored middle Carboniferous Coal Measures, consisting mainly of compacted weathering shale and clay, cover most of the site.

1.6 SOIL PROPERTIES

Only one soil type occurs on the site.

RESTORED FINE LOAMY OVER CLAYEY SOIL

SOIL CHARACTERISTICS

This soil consists of heavy clay loam or clay topsoils over compacted clay subsoils passing occasionally into shaly overburden at depth. Subsoil horizons have been mixed due to restoration and may include occasional patches of buried heavy textured topsoil.

A soil inspection pit showed the topsoil to have a moderately developed medium sub angular blocky, structure. Subsoil structure is moderately developed coarse angular blocky and very compacted becoming massive at depth (full description is given in Table 1).

All profiles are stoneless to slightly stony, except in a small area in the north where some moderately stony to bouldery medium textured subsoil occurs (see Table 1A). The distribution of this is limited making it impractical to separate on the accompanying soil resource maps.

SOIL RESOURCES

Soil resources, along with soil depth information, are shown on the accompanying resource maps.

i. Topsoil Resources

Topsoils have been separated into 3 sub units (T1, T1A and T1B) because of differences in topsoil thickness of 25 cm, 20 cm and 15 cm respectively.

ii. Upper Subsoil Resources

Sub units U1 and U1A (mean thicknesses 45 cm and 40 cm respectively) consist of heavy textured subsoil overlying restored coal measures. These sub units are identified as upper subsoil resources to separate them from underlying low quality shaly overburden (sub units S1 and S1A) that occurs in these areas below about 65 to 70 cm depth.

iii. Lower Subsoil Resources

Sub unit S1C consists of heavy textured material with a mean thickness of 80 cm. Although it is a thicker resource, it is texturally and structurally similar to the upper subsoil sub units U1 and U1A.

Sub units S1 and S1A consist of very compact shaly overburden. This material underlies sub units U1 and U1A. It is highly compacted and often impenetrable to a soil auger.

Sub unit S1B occurs on non agricultural land (sports ground) in the north. Subsoils are highly disturbed even though they occur on land which does not appear to have been previously opencasted. Although very variable, this material consists mainly of mixed clay, cinders and coal fragments which becomes impenetrable at depth.

SECTION 2. AGRICULTURAL LAND CLASSIFICATION GRADES

The ALC grades occurring on the site are as follows.

Grade/Subgrade	Hectares	Per cent of total site area
Subgrade 3b	15.5	81.0
Non Agricultural	3.5	19.0
Total	19.0	100%

2.1 Subgrade 3b

All the agricultural land is placed within this subgrade. Soils fall within Wetness Class IV and consist of heavy clay loam or clay topsoils over compacted clay. Soil wetness and workability problems are the main restriction on ALC grade.

2.2 Non Agricultural

This consist of the sports field in the north and woodland along part of the western site boundary.

SECTION 3. SOIL PROFILE DESCRIPTIONS

TABLE 1. RESTORED FINE LOAMY OVER CLAYEY SOIL

LAND USE: WINTER CEREALS
SLOPE: 2° WEST
WETNESS CLASS 4

HORIZON	DEPTH	DESCRIPTION
1	0-34	Dark greyish brown (10YR 4/2) heavy clay loam with few light yellowish brown (10YR 6/4) clay subsoil inclusions; unmottled; very slightly stony; few medium and large sub angular sandstones; moderately developed medium sub angular blocky structure; very moist; medium packing density; slightly porous; moderately firm soil strength; very sticky; very plastic; many fine fibrous roots; some grass ploughed under to plough depth; non calcareous; abrupt to clear wavy boundary.
2	34-100	Mixed dark greyish brown (10YR 4/2) heavy clay loam and pale yellow (5Y 7/3) clay; common distinct medium and coarse yellowish red (5YR 4/6) mottles in clay loam peds and reddish yellow (75YR 6/8) mottles in the clay; very slightly stony; few medium and large sub angular blocky sandstones; slightly moist; moderately developed coarse angular blocky structure becoming massive with depth; very high packing density (compacted); very slightly porous; very few fine macropores; very strong soil strength; very sticky; very plastic; few very fine fibrous roots; non calcareous.

TABLE 1A. RESTORED FINE LOAMY OVER CLAYEY SOIL - STONY SUBSOIL VARIANT

LAND USE: WINTER CEREALS

SLOPE: 0°

HORIZON	DEPTH	DESCRIPTION
1	0-31	Heavy clay loam; unmottled; very slightly stony; few large angular sandstones; moderately developed coarse sub angular blocky structure; moderately weak soil strength.
2	31-60	Medium sandy clay loam with few clay inclusions; many prominent mottles; moderately stony; many very large stones and boulders; moderately developed coarse platy structure; very firm soil strength.
3	60+	Impenetrable bouldery subsoil.

SECTION 4. SCHEDULE OF SOIL AUGER BORINGS

GLOSSARY

TEXTURE

mcl	-	medium clay loam
mzcl	-	medium silty clay loam
org.mcl	-	organic medium clay loam
hcl	-	heavy clay loam
hzcl	-	heavy silty clay loam
hcl.c	-	heavy clay loam bordering clay
hcl.over	-	heavy clay loam overburden
c	-	clay
zc	-	silty clay
c.hcl	-	clay bordering heavy clay loam
c.over	-	clayey overburden
zcl.over	-	silty clay loam overburden
auger stopped	-	horizon impenetrable because of compaction

MOTTLES

O	-	Ochreous
G	-	Grey

PITHOUSE WEST EXTENSION, ASTON

SCHEDULE OF SOIL AUGER BORINGS

BORING	WET CLASS	TEXTURE	DEPTH (CM)	COLOUR	MOTTLES
001	1	hcl	0-20	10YR32	few faint O
		cinders	20-50	10YR31	
002	4	hcl.c	0-20	10YR31	
		cinders	20-25	25YR21	
		c	25-60	10YR52	many distinct OG
		c.over	60-100		
003	4	mcl	0-15	10YR32	
		mcl	15-35	10YR53	common distinct OG
		mcl	35-70	10YR53	common distinct OG
		auger stopped	70+		
004	4	org.mcl	0-10	10YR31	common faint O
		hcl	10-35	10YR63	many prominent OG
		c	35-100	10YR63	many prominent OG
005	4	hcl	0-25	10YR42	common faint O
		hcl	25-50	10YR52	many distinct OG
		c	50-100	10YR53	many prominent OG
006	4	hcl	0-30	10YR42	
		hcl.c	30-50	10YR53	many prominent OG
		zcl.over	50-70	10YR53	
		auger stopped	70+		
007	4	hcl	0-30	10YR42	
		hzcl	30-50	10YR54	many distinct OG
		auger stopped	50+		

BORING	WET CLASS	TEXTURE	DEPTH (CM)	COLOUR	MOTTLES
008	4	hcl.c	0-25	10YR42	common distinct O
		hcl	25-50	10YR42	common distinct OG
		c	50-100	10YR53	many prominent OG
009	4	hcl	0-25	10YR42	
		c.hcl	25-80	10YR52	many distinct OG
		hcl.over	80-100	10YR53	
010	4	hcl	0-25	10YR42	
		c.hcl	25-100	N6	many prominent OG
011	4	hcl	0-35	10YR42	common distinct O
		c.over	35-75	N5	many prominent OG
		zc	75-100	10YR53	
012	4	hcl	0-32	10YR42	
		c	32-70	10YR64	
		auger stopped	70+		
013	4	hcl	0-30	10YR42	
		c	30-80	10YR64	
		c.over	80-100		
014	4	c	0-32	10YRTX	few distinct O
		c	32-100	10YR53	common distinct O
015	4	hcl	0-30	10YR42	
		c	30-60	10YR64	common distinct OG
		zc	60-100	10YR64	common distinct OG
016	4	hcl	0-26	10YR42	
		c	26-100	10YR64	

BORING	WET CLASS	TEXTURE	DEPTH (CM)	COLOUR	MOTTLES
017	4	hcl	0-26	10YR42	
		c	26-55	10YR64	many prominent OG
		c.over	55-100		
018	4	c	0-10	10YR31	
		c	10-60	10YR64	
		c.over	60-80		
		auger stopped	80+		
019	4	hcl.c	0-15	10YR42	
		c	15-60	10YR64	many prominent OG
		auger stopped	60+		
020	4	hcl	0-27	10YR42	
		zc	27-60	10YR62	many prominent OG
		zc.over	60-100	10YR62	many prominent OG
021	4	mzcl	0-20	10YR32	
		hcl	20-45	10YR66	few distinct O
		c	45-80	10YR74	many prominent OG
		auger stopped	80+		

MAPS