MAFF Ministry of Agriculture Fisheries and Food

STATEMENT OF PHYSICAL CHARACTERISTICS AND AGRICULTURAL LAND CLASSIFICATION HUMBLEBURN, STANLEY, COUNTY DURHAM PROPOSED EXTENSION TO EXISTING OPEN CAST COAL SITE

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PROPOSED EXTENSION TO EXISTING OPEN CAST COAL SITE
HUMBLEBURN, STANLEY, CO. DURHAM

SUMMARY

Land covering a total of 5.9 ha was surveyed at Humbleburn, Stanley. All of this is in agricultural use, of which 4.9 ha has been classified as Subgrade 3b and 1.0 ha as Grade 4.

Subgrade 3b land occurs over most of the site and consists typically of medium clay loam topsoils overlying slowly permeable subsoils of sandy clay loam, heavy clay loam or clay. Poor drainage leads to a soil wetness limitation. Grade 4 land occurs in the north western part of the site and consists mainly of heavy clay loam topsoils overlying poorly drained slowly permeable subsoils formed of sandy clay loam, heavy clay loam or clay. The combination of poor drainage and heavy clay loam topsoil imposes a severe wetness limitation on this land. Disturbed soil profiles containing severely compacted layered subsoil horizons with widely differing textures are common in parts of the site. These are probably associated with previous coal workings in the area and are an additional limiting factor on land quality.

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1. INTRODUCTION AND STATEMENT OF PHYSICAL CHARACTERISTICS

1.1 Location and Survey Methods

The site at Humbleburn is located around Grid Reference NZ225507, approximately 300 m south of the B.6313 and adjacent to Humbleburn Lane. It covers an area of approximately 5.9 ha, all of which is in agricultural use.

Survey work was carried out in September 1992 when soils were examined by hand auger borings at 100 m intervals predetermined by the National Grid. The land quality was assessed using the methods described in "Agricultural Land Classification of England and Wales" (MAFF, 198).

1.2 Land Use and Relief

At the time of the survey all land on the site was in arable use. A crop of Oilseed Rape had been removed earlier in the year leaving stubble.

The site is mostly gently undulating except in the west, where there are some south easterly gradients of 8 - 9°.

1.3 Climate

Grid Reference:	NZ225507
Altitude (m):	150
Accumulated Temperature above °C (January - June):	1197 day °C
Average Annual Rainfall (mm):	717
Climatic Grade	2
Field Capacity Days:	179
Moisture Deficit (mm) Wheat:	83
Moisture Deficit (mm) Potatoes:	65

1.4 Geology, Soils and Drainage

The site is underlain by Carboniferous Coal Measures over which there is a thin covering of boulder clay.

Topsoils consist of medium clay loam over most of the site but become heavier in the north west where they consist of heavy clay loam. Subsoil textures vary from medium to heavy throughout the site and consist of sandy clay loam, heavy clay loam, or clay. Profiles in some parts of the site often show signs of severe compaction and stratification indicating previous disturbance probably by coal workings. Soils are generally poorly drained (Wetness Class IV) over the whole site.

1.5 Soil Properties

Two main soil types occur on the 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:- Medium topsoil over medium to heavy subsoil, Unit T1/S1
(Full description in Section 2, Table 1)

This consists of moderately or weakly structured medium clay loam topsoils approximately 25 cm thick over a variable subsoil, formed of either clay or sandy clay loam over clay. Stoniness increases with depth and consists of rounded or sub-rounded medium sized soft sandstones. Structures vary from angular blocky to prismatic or thick platy where severe compaction is present.

b) Soil Type 2:- Heavy topsoil over medium to heavy subsoil, Unit T2/S1a
(Full description in Section 2, Table 2).

This consists of a heavy clay loam topsoil approximately 35 cm thick over a variable subsoil, consisting of either clay or sandy clay loam over clay. Stoniness increases with depth and consists of rounded or sub-rounded medium sized medium soft sandstones. Structure varies from angular blocky to prismatic or thick platy where severe compaction is present.

1.6 Soil Resources

a) Topsoils

Units T1 and T2.

Topsoil resources over most of the site consist mainly of medium textured material, usually medium clay loam (Unit T1). In the north western part of the site, however, topsoils are formed of heavier material (heavy clay loam) and here a heavier textured unit (T2) has been separated. The median thicknesses of the topsoil units are:- T1 25 cm, T2 35 cm.

b) Subsoils

Subsoil resources over the whole site are formed of variable textured material consisting of sandy clay loam, heavy clay loam or clay. Units S1 and S1a differ only in thickness. The optimum thickness of unit S1 is 75 cm and unit S1a 65 cm.

2. SOIL PROFILE DESCRIPTIONS

Table 1:

Humbleburn O.C.C.S. Extension, Stanley, Co. Durham.

Soil Type 1 - Medium topsoil over medium/heavy subsoil.

Profile Pit 1:- Near Auger boring 21.

Land Use:- Arable.

Gradient:- 8° Aspect:- S.E.

Depth (cm)	Horizon Description
0 - 25	Dark greyish brown (10 YR 4/2) medium clay loam; unmottled; very slightly stony (1-5%) with very small medium soft sandstones; moist; moderately developed coarse granular and weak sub-angular blocky structure; moderately weak soil strength, slightly sticky and slightly plastic; common fine and medium fibrous roots; non calcareous; abrupt wavy boundary.
25 - 60	Light brownish grey (10 YR 6/2) sandy clay loam; with common indistinct yellowish brown (10 YR 5/8) mottles; very slightly stony with rounded medium to large medium soft sandstones; moist; weakly developed medium to coarse sub angular blocky structure; less than 0.1% very fine pores (<0.5 mm); moderately firm strength, slightly sticky and slightly plastic; many fine and medium fibrous roots; non calcareous; gradual wavy boundary.

Depth (cm)	Horizon Description (Continued)
50 - 100+	Grey (10 YR 6/1) clay; with many distinct medium to coarse brownish yellow (10 YR 6/6) mottles; stoneless; strongly developed very coarse prismatic structure; less than 0.1% very fine pores (<0.5 mm); very strong soil strength; very plastic and very sticky; few very fine fibrous roots (only on ped faces); non calcareous.

Table 2:

Humbleburn O.C.C.S. Extension, Stanley, Co. Durham

Soil Type 1 - Heavy topsoil over medium/heavy subsoil.

Pit 2:- Near Auger boring 6.

Land Use:- Arable.

Gradient:- 1° Aspect:- E.

Depth (cm)	Horizon Description
0 - 25	Dark grey (10 YR 4/1) heavy clay loam; unmottled; very slightly stony (1 - 5%) with very small medium soft sandstones and coal fragments; wet; moderately developed coarse/very coarse sub angular blocky structure; moderately firm soil strength; very sticky and very plastic; common fine and medium fibrous roots; non calcareous; abrupt wavy boundary.
25 -40	Light grey (10 YR 7/1) clay; with many prominent yellowish brown (10 YR 5/8) medium mottles; stoneless; moist; very weakly developed coarse sub angular blocky structure; less than 0.5% very fine pores (<0.5 mm); moderately weak ped strength; moderately sticky and very plastic; few very fine fibrous roots; abrupt wavy boundary.
40 - 60	Light grey (10 YR 7/2) sandy clay loam; with common indistinct reddish yellow 75 YR 6/8) mottles; slightly stony with rounded medium to large medium soft sandstones; moist; moderately developed coarse sub angular blocky structure; moderately firm/moderately

weak; less than 0.1% pores of less than 0.5 mm; slightly sticky and slightly plastic; few medium fibrous roots; abrupt wavy boundary.

60 + Light grey (10 YR 7/1) clay; with many prominent yellowish brown (10 YR 5/8) medium mottles; stoneless; moist; very weakly developed coarse sub angular blocky structure; less than 0.5% pores of less than 0.5 mm; moderately weak ped strength; moderately sticky and plastic; few very fine fibrous roots; abrupt wavy boundary.

3. AGRICULTURAL LAND CLASSIFICATION

The ALC grades occurring on the site are as follows:-

Grade/Subgrade	Hectares	Percentage of Total Area
3b	4.9	83.1
4	1.0	16.9
(Subtotal)	(5.9)	(100)
Non Agricultural	0	0
Urban	0	0
TOTAL	5.9	100

3.1 Subgrade 3b

Subgrade 3b land occurs over the majority of the site. Soils consist typically of medium clay loam topsoils overlying sandy clay loam, heavy clay loam or clay subsoils. Profiles are poorly drained, falling into Wetness Class IV and the land is limited to Subgrade 3b by soil wetness.

3.2 Grade 4

Grade 4 land occurs in a small area in the north west of the site. Soils in this area consist of heavy clay loam topsoils overlying variable textured sometimes compacted subsoils, consisting of sandy clay loam, heavy clay loam or clay. Profiles are poorly drained, falling into Wetness Class IV and the land is limited to Grade 4 by soil wetness and workability problems which because of the heavy clay loam topsoil are more severe than on the adjoining Subgrade 3b land.

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