

## **AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF SOIL PHYSICAL CHARACTERISTICS**

### **LAND SOUTH OF NORTON BIG WOOD, NORTON DISNEY, LINCS**

#### **1.0 BACKGROUND**

- 1.1 The site covers an area of 32.9 ha, and is the subject of an application by Butterley Aggregates Ltd, for the extraction of sand and gravel. Proposed restoration is to water with smaller areas of woodland.
- 1.2 ADAS Resource Planning Team undertook a detailed Agricultural Land Classification (ALC) and soil physical characteristics survey of the site during July 1993. Soil inspections using a hand held Dutch auger were made on a 100 m grid basis and four soil pits were dug to assess subsoil conditions.
- 1.3 On the published 1:63,360 scale ALC map, sheet 113 (MAFF 1968) the northern two thirds of the site have been mapped as grade 4 with the remainder of the site graded 3.
- 1.4 At the time of the survey the whole area was under wheat, with evidence of potatoes being grown previously.

#### **2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY**

##### Climate

- 2.1 Climate data for the site was interpolated from data contained in the published *agricultural climatic dataset* (Met Office 1989). This indicates that for the site's average altitude of 15 m AOD the annual average rainfall is 592 mm (23.3"). This data also indicates that the field capacity days are 115 and moisture deficits are 114 mm for wheat and 108 mm for potatoes respectively. The climatic characteristics do not impose any climatic limitation on the ALC grading of the survey site.

##### Altitude and Relief

- 2.2 The survey area comprises a fairly level area of 15 m AOD in altitude. Gradient and altitude do not constitute limitations to the ALC grade.

## Geology and Soils

- 2.3 The published 1:50,000 solid and drift edition geology map, sheet 114 (Geological Survey of England and Wales, 1973) shows the area to comprise Pleistocene and recent river sand and gravel deposits.
- 2.4 No detailed soil map exists of the area but the reconnaissance 1:250,000 scale soil map "Soils of Eastern England" (Soil Survey of England and Wales 1983), shows almost the whole site to be covered by Blackwood Association soils (\*1). In the extreme south western corner a small area of Wickham 2 Association soils (\*2) is mapped.
- 2.5 Detailed field survey work identified one variable soil type which corresponds well with the description given below of Blackwood soils.
- 2.6 Over the whole of the site profiles typically comprise loamy medium sand or medium sandy loam topsoils over loamy medium sand (occasionally medium sand or sandy clay loam) upper subsoils. These overlie similar or heavier lower subsoils. Profiles are mainly well drained, (wetness class I) with occasional wetness class II identified in association with slightly heavier textured subsoils. In some areas evidence of previously higher groundwater was noted in the form of iron cemented gravel pans at depths of 70 to 95 cms. Topsoils are typically very slightly stony to slightly stony (5-12% total stone), with subsoil stoniness typically in the range of 10-20% of soil volume. However locally more or less stony subsoils occur. Within subsoils narrow stony bands are occasionally encountered, which may be iron cemented, (see Appendix 2 for full profile description).

### 3.0 AGRICULTURAL LAND CLASSIFICATION

- 3.1 The definitions of the Agricultural Land Classification (ALC) grades are included in Appendix 1. The whole site has been graded 3a (good quality agricultural land).

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Blackwood Association (\*1). Deep permeable sandy and coarse loamy soils. Groundwater controlled by ditches.

Wickham 2 Association (\*2). Slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils. Small areas of slowly permeable calcareous soils on steeper slopes.

### Irrigation

- 3.2 The whole site can be irrigated. The irrigation facility enhances the potential of the land for crop production and consequently the ALC grade mapped take into account the reduction in drought risk afforded by the irrigation.

### Subgrade 3a

- 3.3 The entire site has been graded 3a and comprises variably stony light textured sandy soils with a moderate droughtiness imperfection which is partly offset by the presence of an irrigation water supply. Although more or less droughty soils do occur sporadically within the mapping unit they occupy too small an area to separately delineate.

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## Appendix 1

### **Grade 1 - excellent quality agricultural land**

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly include top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

### **Grade 2 - very good quality agricultural land**

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable crops. The level of yields is generally high but may be lower or more variable than Grade 1.

### **Grade 3 - good to moderate quality agricultural land**

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

### **Subgrade 3a - good quality agricultural land**

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

### **Subgrade 3b - moderate quality agricultural land**

*Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of winter range of crops or high yields of grass which can be grazed or harvested over most of the year.*

**Grade 4 - poor quality agricultural land**

Land with severe limitations which significantly restrict the range of crops and/or levels of yields. It is mainly suited to grass with occasional arable crops (eg. cereals and forage crops) the yield of which are variable. In most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

**Grade 5 - very poor quality agricultural land**

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

## Appendix 2

### STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

Topsoil	Texture	:	loamy medium sand or medium sandy loam
	Colour	:	typically 10YR3/1, 3/2 and 10YR4/2 (very dark grey, very dark greyish brown and dark greyish brown).
	Stone	:	typically 5-12% small to medium, rounded and subrounded flints.
	Depth	:	30-35 cm
	Structure	:	cultivation zone - not applicable
	Boundary	:	abrupt and smooth
	Roots	:	<i>many fine and very fine</i>
	Upper Subsoil	Texture	:
Colour		:	variable, typically 10YR6/3, 10YR6/4 and 2.5Y7/4 (pale brown, light yellowish brown and pale yellow).
Stone		:	in the range 3-35%, typically 5-20% rounded and subrounded flints. Occasionally narrow bands of stone sometimes iron cemented forming a pan.
Depth		:	variable range 40-95 cms
Structure		:	Weakly developed coarse and medium subangular blocky.
Consistence		:	friable/very friable
Porosity		:	> 0.5% biopores
Boundary		:	typically clear and wavy
Roots		:	common fine and very fine *
Lower Subsoil		Texture	:
	Colour	:	variable 10YR5/6 and 6/6 with 10YR6/1 and 10YR5/8 (yellowish brown and brownish yellow with grey and yellowish brown).
	Stone	:	heavy textured soils typically 2-10% rounded and subrounded flints, light textured soils more variable in the range of 5-50% flint.
	Depth	:	120 cm +
	Structure	:	typically moderately developed coarse subangular blocky in heavier textured soils. Structureless (single grain) in light textured soils.
	Consistence	:	typically firm (loose in light textured soils)
	Porosity	:	< 0.5% biopores in heavier textured soils
	Roots	:	few fine and very fine roots

### Other Notes

Soils are generally freely draining wetness class I occasionally wetness class II.

Soils are non calcareous throughout.

Organic matter of topsoils ranges from 1-4%.

- \* Where thick iron cemented gravel layers occur and are continuous rooting is stopped (noted at 95 cms).

## REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN (England and Wales) 1973 Solid and Drift Edition Sheet 114 1:50,000.

MAFF 1968 Agricultural Land Classification Map Sheet 113 Provisional 1:63,360.

MAFF 1988 Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for grading the quality of Agricultural Land) Alnwick.

METEOROLOGICAL OFFICE 1989 Published climatological data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES 1983 Soils of Eastern England Sheet 4 1:250,000.

SOIL SURVEY OF ENGLAND AND WALES 1984 Soils and their use in Eastern England by C.A.H. Hodge, R.G.O. Burton, W.M. Corbett, R. Evans and R.S. Seale. Harpenden.