

AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF SOIL CHARACTERISTICS, LAND SOUTH OF BAWTRY ROAD, MISSON, NOTTINGHAMSHIRE

1.0 BACKGROUND

- 1.1 The site covers an area of 107.3 ha, and is the subject of an application for mineral extraction.
- 1.2 ADAS Statutory Resource Planning Team undertook a detailed Agricultural Land Classification (ALC) and soil physical characteristics survey of the site during February 1995. Soil inspections using a hand held dutch auger were made on a 100 m grid basis and 3 soil pits were dug to assess subsoil conditions. Approximately 35 ha were under water and could not be surveyed and pits could only be dug on the northern part of the site as in other areas the water table was within 10 cm of the soil surface.
- 1.3 At the time of the survey most of the land to the north west of Slaynes Lane was being ploughed apart from one area of approximately 2 ha which had emergent winter cereals. Much of the remainder was flooded but there was evidence of post harvesting of potatoes.
- 1.4 The areas which were previously flooded were surveyed in April 1995 and 3 soil pits were dug to assess subsoil conditions.

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 (Meteorological Office, 1989). This indicates that for an average site altitude of 3 m AOD the annual average rainfall is 568 mm

(22.4”) and the accumulated temperature (ATO) is 1423 days °C. Also the field capacity days are 110, and moisture deficits are 115 mm and 108 mm for wheat and potatoes respectively. These climatic characteristics do not impose any climatic limitation on the ALC grading of the site.

Altitude and Relief

- 2.2 The site lies to the south of the Bawtry-Misson Road and extends to the embankment along the River Idle. The area is flat and at an altitude of 3 m AOD throughout apart from the north western corner where the land rises to 5 m AOD. The site is bisected by Slaynes Lane and accompanying drainage ditch in a south west/north east direction. The 5 m AOD river embankment follows the course of the river except in the south east corner where it cuts across in a north easterly direction to rejoin the river leaving an area of approximately 10 ha in a southerly loop which is not protected. Gradient and altitude do not constitute limitation to the ALC grade.

Flood risk

- 2.3 NRA supplied data and local knowledge shows the flood risk in winter to be of rare frequency and of long duration. These conditions impose a limitation on the grading of the land and restrict it to subgrade 3a. Land between the river and the flood bank in the south east of the site shows the risk to be frequent and of long duration restricting the land to grade 4.

Geology and Soils

- 2.4 The published 1:63 360 scale drift edition geology map, sheet 88 (Geological Survey of England and Wales, 1969) shows the area to be covered with predominantly peat, with a small area in the south west of alluvium and an area in the north west of 1st Terrace and Older River Gravels.

- 2.5 No detailed soil map exists for the area but the reconnaissance 1:250 000 scale soil map "Soils of Eastern England" (Soil Survey of England and Wales, 1983) shows the vast majority of the area to be covered by Altcar 2 Association (*1) soils with a small area in the north west of Newport 1 Association (*2) soils. The current survey identified three soil types. ☉

Soil Type 1 (see Appendix 1 and soil types map)

- 2.6 Soil type 1 runs in a broad sweep along the northern, eastern and southern parts of the site. Profiles typically comprise stoneless loamy peat/peaty loam topsoils over stoneless amorphous/semi fibrous peat to 120 cm+ depth. In some areas strongly acid peat was encountered at 45/50 cms (pH <4.5) whereas in other areas the profile was uniformly slightly acid at pH 6.0 in the subsoil. In the acidic profiles root matting was encountered at the commencement of the acid layer. In some parts at 60/80 cms layers of remnant silver birch were encountered. Wetness class was assessed as I, or II where groundwater was met at moderate depths.

Soil Type 2 (see Appendix 1 and soil types map)

- 2.7 Soil type two is concentrated in the centre of the site with an offshoot to the north west. Profiles typically comprised stoneless peaty loam/loamy peat topsoils over stoneless medium sandy loam/occasionally peat upper subsoil.

(*1) Altcar 2 Association - Deep peat soils, in parts very acid. Flat land. Groundwater levels often controlled by ditches and pumps, some undrained areas. Risk of wind erosion.

(*2) Newport 1 Association - Deep well drained sandy and coarse loamy soils. Some sandy soils affected by groundwater. Risk of wind and water erosion.

☉ Occasionally sporadic pockets, too small to map, of different soil types may occur within the mapped area of each soil type.

Lower subsoils comprise stoneless loamy medium sand/medium sand. These soils have been assessed as wetness class I.

Soil Types 3 (see Appendix 1 and soil types map)

- 2.8 Soil type three occurs at the western and north western parts of the site. Profiles typically comprise non calcareous, very slightly stony loamy medium sand/occasionally medium sandy loam topsoil over non calcareous very slightly stony loamy medium sand upper subsoil. Lower subsoils comprise stoneless medium sand. The soils are free draining and were assessed as wetness class I.

3.0 AGRICULTURAL LAND CLASSIFICATION

- 3.1 The breakdown of Agricultural Land Classification (ALC) grades in hectares and percentage terms is shown below.

AGRICULTURAL LAND CLASSIFICATION

Grade	ha	%
3a	88.6	82.6
3b	5.4	5.0
4	10.2	9.5
Non Agricultural	1.3	1.2
Urban	1.8	1.7
TOTAL	107.3	100.0

The definitions of the ALC grades are shown in Appendix 2.

Subgrade 3a

- 3.2 The vast majority of the site has been mapped as subgrade 3a. The loamy peat/peaty loam over amorphous/semi fibrous peat soils described in paragraph 2.6 and the loamy peat/peaty loam over medium sandy loam soils described in paragraph 2.7 would normally be of a higher grade but due to the flood risk described in paragraph 2.3 the land is restricted to subgrade 3a.

The loamy medium sand over medium sand soils described in paragraph 2.8 have reduced available water for crop growth, and consequently moderate droughtiness imperfections restrict the land to subgrade 3a.

Subgrade 3b

- 3.3 Two small areas have been mapped as subgrade 3b and fall within the area of soil type three as described in paragraph 2.8. Where the medium sand subsoil is nearer to the surface the water retention capacity is significantly reduced. Consequently profiles are significantly droughty and land is precluded from a higher grade due to droughtiness restrictions.

Grade 4

- 3.4 The land in the south east between the river and the flood bank has been mapped as grade 4. The soils in this area, as described in paragraph 2.6, would normally give rise to land of a higher grade but due to the flood risk as described in 2.3 the land is restricted to grade 4.

Non-Agricultural

- 3.5 The flood bank, part of which is included within the site boundaries, has been mapped as of non-agricultural use.

Urban

- 3.6 The hard track, Slaynes Lane, running north east/south west through the centre of the site has been mapped as urban.

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REFERENCES

**GEOLOGICAL SURVEY OF GREAT BRITAIN 1969. Drift Edition, Sheet 88,
Doncaster. Scale 1:63 360.**

MAFF, 1970. Agricultural Land Classification Map, Sheet 103. Scale 1:63 360.

**MAFF, 1988. Agricultural Land Classification of England and Wales. Revised
Guidelines and Criteria for Grading the Quality of Land. MAFF, London.**

**METEOROLOGICAL OFFICE, 1989. Climatolgical data for Agriculture Land
Classification. Met. Office, Bracknell**

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

Appendix I

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

Soil Type 1 - acidic variant

Topsoil	Texture	:	loamy peat
	Colour	:	10YR2/1
	Stone	:	stoneless
	Roots	:	many, fine and very fine
	Depth	:	40 cm
	pH	:	6.5
	Subsoil	Texture	:
Colour		:	5YR2.5/2
Stone		:	stoneless
Roots		:	many, fine and very fine - root mat at 50/55 cms.
Depth		:	120 cm
pH		:	<4.5

Soil Type 1 - non-acidic variant

Topsoil	Texture	:	peaty loam
	Colour	:	10YR3/1
	Stone	:	stoneless
	Roots	:	many, fine and very fine
	Depth	:	40 cm
	pH	:	7.0
	Upper Subsoil	Texture	:
Colour		:	10YR2/2
Stone		:	stoneless
Roots		:	many, fine and very fine
Depth		:	60 cm
pH		:	6.5
Lower Subsoil		Texture	:
	Colour	:	10YR3/1
	Stone	:	stoneless
	Roots	:	many, fine and very fine
	Depth	:	120 cm
	pH	:	6.0

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

Soil Type 2

Topsoil	Texture	:	peaty loam
	Colour	:	7.5YR2.5/1
	Stone	:	stoneless
	Roots	:	many, fine and very fine
	Depth	:	32 cm
Upper Subsoil	Texture	:	medium sandy loam/loamy medium sand
	Colour	:	10YR4/1 and 10YR6/3
	Stone	:	stoneless
	Structure	:	weakly developed; coarse and very coarse sub angular blocky.
	Consistence	:	friable
	Porosity	:	>1%
	Roots	:	many, fine and very fine
Depth	:	65 cm	
Lower Subsoil	Texture	:	medium sand
	Colour	:	2.5Y6/4 and 10YR6/6
	Stone	:	stoneless
	Structure	:	apedal, granular
	Consistence	:	friable
	Porosity	:	>1%
	Roots	:	many, fine and very fine
	Depth	:	120 cm

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

Soil Type 3

Topsoil	Texture	:	medium sandy loam/loamy medium sand
	Colour	:	10YR4/2
	Stone	:	3% small and medium quartzite pebbles
	Roots	:	many, fine and very fine
	Depth	:	34 cm
Upper Subsoil	Texture	:	loamy medium sand
	Colour	:	10YR5/4
	Stone	:	2% small and medium quartzite pebbles
	Structure	:	very weakly developed medium sub-angular blocky.
	Consistence	:	very friable
	Porosity	:	>1%
	Roots	:	many, fine and very fine
Lower Subsoil	Texture	:	medium sand
	Colour	:	10YR6/6
	Stone	:	stoneless
	Structure	:	apedal, granular
	Consistence	:	loose
	Porosity	:	>1%
	Roots	:	few fine
	Depth	:	120 cm

Appendix 2

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 yield 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 a wider 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 (e.g. 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.