

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

## **PROPOSED EXTENSION TO COSSINGTON SAND AND GRAVEL QUARRY, COSSINGTON, LEICS**

### **1.0 BACKGROUND**

1.1 An area of land of approximately 9.1 ha in extent centred on grid reference SK 602 134 to the west of the village of Cossington in Leicestershire has been proposed as a possible extension area to the existing sand and gravel workings.

1.2 At the time of the survey all fields were under grass with pony grazing within the most southerly field.

1.3 On the published 1:63 360 scale Agricultural Land Classification (ALC) map (MAFF, 1971) the site is mapped as Grade 4. However, this map is only of a reconnaissance nature and hence the current detailed survey was carried out to provide site specific ALC and soils information.

1.4 The site was surveyed on a 100 m grid basis using a dutch auger to a depth of 1.2 m wherever possible. In addition two soil pits were dug to assess subsoil structure in more detail.

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

#### **Climate**

2.1 Climatic criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climatic limitation are average

annual rainfall, as a measure of overall wetness, and accumulated temperature (day °C Jan-June), as a measure of the relative warmth of an area.

- 2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and these show that there is no overall climatic limitation affecting the site.

Grid Reference	SK 602 134
Altitude (m, AOD)	45
Accumulated Temperature Day °C, Jan-June	1413
Average Annual Rainfall (mm)	638
Moisture Deficit, Wheat (mm)	109
Moisture Deficit, Potatoes (mm)	101
Field Capacity Days	147
Overall Climatic Grade	1

#### Altitude and Relief

- 2.3 Land within the site is generally level with slight undulations within the fields. There is a slight fall from the maximum altitude of 47 m AOD in the south east corner of the site to an altitude of 45 m AOD in the north west of the site. Altitude and relief do not therefore impose any restrictions on the land quality of the site.

#### Geology and Soils

- 2.4 The published 1:50 000 scale geological map of the area (Geol. Survey, 1975) shows the whole site to be overlaid by Alluvium.
- 2.5 The reconnaissance scale (1:250 000) soil survey map for the area (Soil

Survey, 1983) shows the whole site to comprise soils of the Fladbury 2 association\*.

- 2.6 The present detailed survey of the site shows the presence of three distinct soil types and these are described briefly in the following paragraphs.

**Soil Type 1 (Refer to Soil Types Map and Appendix 1)**

- 2.7 This soil type is found over the majority of the site and consists of a thin very slightly stony medium sandy loam textured topsoil overlying a similar upper subsoil. This in turn overlies a stoneless/very slightly stony loamy medium sandy textured mid subsoil horizon. A lower subsoil horizon of generally stoneless/very slightly stony medium sand extended beyond sample depth. However, occasionally gravel was encountered within this lower subsoil horizon.

**Soil Type 2 (Refer to Soil Types Map and Appendix 1)**

- 2.8 This soil type covered the north east corner of the site and consisted of a stoneless clay textured topsoil overlying a similar stoneless clay textured, distinctly mottled, upper subsoil. A lower subsoil of stoneless medium sand extended to beyond sampling depth.

**Soil Type 3 (Refer to Soil Types Map and Appendix 1)**

- 2.9 This soil type was very similar to Soil Type 1 (paragraph 2.7). However, a layer of mixed textured topsoil material has been overlaid on the original soil

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\* Fladbury 2 association: Stoneless clayey soils variably affected by groundwater, some with sandy subsoils. Some similar fine loamy soils. Flat land. Risk of flooding.

profile. This material was slightly stony but contained some debris such as house bricks and consisted predominantly of sandy loam and sandy clay loam textured materials with some clay inclusions. The extent of this soil type was limited to approximately one third of the field in the north east of the site.

### 3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The breakdown of the various Agricultural Land Classification (ALC) grades within the site are shown in Table 2. The definition of the ALC grades is given in Appendix 2.

**Table 2: Distribution of grades and subgrades**

#### AGRICULTURAL LAND CLASSIFICATION

Grade	Area (ha)	% of Site
3a	6.9	75.8
3b	2.1	23.1
Other land	0.1	1.1
<b>TOTAL</b>	<b>9.1</b>	<b>100.0</b>

#### Subgrade 3a

3.2 Land of Subgrade 3a quality corresponds to areas of Soil Type 1 and Soil Type 3 (paragraphs 2.7 and 2.9). Soil profiles in these areas are free draining, but may be affected by groundwater. The main limiting factor for land quality of these soil types is droughtiness with plant available soil moisture being limited within these coarse textured soil profiles.

#### Subgrade 3b

3.3 Land of Subgrade 3b quality corresponds to the area in the north east of the site covered by Soil Type 2 (paragraph 2.8). The upper clay textured subsoil having a coarse prismatic structure constitutes a slowly permeable layer

immediately below the topsoil. Wetness class is assessed as IV and hence wetness and workability restrict the quality of land in this area to Subgrade 3b.

#### Other Land

- 3.4 A very small area in the north west of the site consisting of a pond was mapped as other land.

February 1996

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## REFERENCES

- GEOLOGICAL SURVEY OF GREAT BRITAIN (ENGLAND AND WALES),  
1975. Sheet 156, Leicester, 1:50 000 scale.
- MAFF, 1971. Agricultural Land Classification Map. Provisional. Scale 1:63 360  
Sheet 121.
- MAFF, 1988. Agricultural Land Classification of England and Wales (Revised  
Guidelines and Criteria for grading the quality of agricultural land). Alnwick.
- METEOROLOGICAL OFFICE, 1989. Climatological Data for Agricultural Land  
Classification. Bracknell.
- SOIL SURVEY OF ENGLAND AND WALES, 1983. Sheet 3, "Soils of Midland and  
Western England". 1:250 000 scale.

## Appendix 1

### STATEMENT OF SOIL PHYSICAL CHARACTERISTICS SOIL TYPE 1

Topsoil	Texture	: medium sandy loam
	Colour	: dark brown (7.5YR3/2)
	Stone	: very slightly stone (2%)
	Boundary	: smooth, abrupt
	Roots	: many fine
	Depth	: 12 cm
Upper Subsoil	Texture	: medium sandy loam, occasionally loamy medium sand.
	Matrix colour	: dark brown (7.5YR4/2)
	Stone	: very slightly stony (2%)
	Structure	: weakly developed coarse and medium subangular blocky.
	Consistence	: friable
	Porosity	: 1% biopores
	Boundary	: abrupt, wavy
	Roots	: many fine
	Depth	: 34 cm
Lower Subsoil (1)	Texture	: loamy medium sand
	Matrix colour	: brown (7.5YR5/4, 10YR5/3), yellowish brown (10YR5/4)
	Stone	: stoneless - very slightly stony (2%)
	Structure	: weakly developed coarse subangular blocky.
	Consistence	: very friable
	Porosity	: 1% biopores
	Roots	: common, fine
	Depth	: 64 cm
Lower Subsoil (2)	Texture	: medium sand
	Matrix colour	: yellowish brown (10YR5/6), brownish yellow (10YR6/6)
	Stone	: stoneless - very slightly stony (2%), occasionally gravel encountered deep in profile.
	Structure	: single grain
	Consistence	: loose
	Roots	: common, fine
	Depth	: 120 cm+

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS  
SOIL TYPE 2

Topsoil	Texture	:	clay
	Colour	:	dark greyish brown (10YR4/2)
	Stone	:	stoneless - very slightly stony (1%)
	Boundary	:	smooth, abrupt
	Roots	:	many fine
	Depth	:	23 cm
	Upper Subsoil	Texture	:
Matrix colour		:	greyish brown (10YR5/2)
Stone		:	stoneless
Structure		:	moderately developed coarse prismatic
Consistence		:	firm
Porosity		:	<0.5% biopores
Roots		:	many fine
Depth		:	58 cm
Lower Subsoil	Texture	:	medium sand
	Matrix colour	:	brownish yellow (10YR6/6)
	Stone	:	stoneless
	Structure	:	single grain
	Consistence	:	loose
	Roots	:	common, fine
	Depth	:	120 cm+



**STATEMENT OF SOIL PHYSICAL CHARACTERISTICS  
SOIL TYPE 3**

Topsoil - overtipped  
on original soil  
profile

Texture	:	mix of medium sandy loam, sandy clay loam and clay.
Colour	:	dark brown (7.5YR3/2 + 7.5YR4/3)
Stone	:	slightly stony (10%), small-large, mix of rubble and stones.
Boundary	:	abrupt, smooth
Roots	:	many, fine
Depth	:	25 cm

Remainder of soil profile for Soil Type 3 is as for Soil Type 1.

Comments: Soil Type 3 is an area in which the original soil profile has been buried by the addition of mixed topsoil.

## Appendix 2

### DEFINITIONS OF ALC GRADES

#### **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.