

Combs 98/92

**AGRICULTURAL LAND CLASSIFICATION
AND SOIL PHYSICAL CHARACTERISTICS
NOTTINGHAMSHIRE MINERALS PLAN,
SITE 4 HOVERINGHAM**

**AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL
CHARACTERISTICS
NOTTINGHAMSHIRE MINERALS PLAN, SITE 4, HOVERINGHAM**

1.0 BACKGROUND

- 1.1 The site, an area of 64 ha, is the subject of an application by Tarmac Roadstone Limited for the extraction of sand and gravel from land near Hoveringham, Notts. ADAS surveyed the site in November 1992 to assess the agricultural land quality and soil physical characteristics.
- 1.2 On the published Agricultural Land Classification (ALC) Map sheet number 112 (Provisional, scale 1:63,360, MAFF 1970), the site is shown as Grade 2 in the east and Grade 3 in the west. The current survey was undertaken to provide a more detailed ALC of the site.
- 1.3 Auger boring observations at a density of approximately one per hectare were supplemented by information from two soil pits. At the time of survey the land was in cereals, sugar beet, ley grassland and plough.

2.0 SITE PHYSICAL FACTORS

Climate

- 2.1 Climate data for the site was obtained from the published agricultural climatic dataset (Met Office, 1989). This indicates that the annual average rainfall for the site is 564mm (22.2"). This data also shows that field capacity days are 118.
- 2.2 The accumulated temperature for this area is approximately 1427 day Degrees Celsius. This parameter indicates the cumulative build up of warmth available for crop growth and in conjunction with rainfall has an influence on the development of soil moisture deficits (SMD)* and susceptibility to drought;

*SMD represents the balance between rainfall and potential evapotranspiration occurring during the growing season. For ALC purposes the soil moisture deficits developing under a winter wheat and maincrop potato cover are considered. These 'reference' crops have been selected because they are widely grown, and in terms of their susceptibility to drought, are representative of a wide range of crops.

soil moisture deficits of 118mm and 113mm are recorded for wheat and potatoes respectively.

- 2.4 These climatic characteristics do not impose a limitation on the ALC grade.

Altitude and Relief

- 2.5 The site comprises an area adjacent to the existing Hoveringham Quarry workings. The land is level and lies at an altitude of approximately 18m AOD. Neither gradient nor altitude limit the ALC grade.

3.0 AGRICULTURAL LAND CLASSIFICATION

- 3.1 The definitions of the Agricultural Land Classification (ALC) grades are included in Appendix 1.
- 3.2 The survey area has been graded as relatively equal proportions of 3a and 3b with a small area of urban land associated with the lane. The table below shows the breakdown of ALC grades in hectares and percentage terms.

AGRICULTURAL LAND CLASSIFICATION

Grade	ha	%
3a	31.7	49
3b	31.3	49
Urban	<u>1.0</u>	<u>2</u>
TOTAL	<u>64.0</u>	<u>100</u>

Subgrade 3a

Land graded 3a is associated principally with Soil Type 2 (see para 4.3)

- 3.3 Profile pit observations indicate that the light to medium textured subsoils are typically well-drained (ie Wetness Class I) but are slightly to moderately stony. The combination of coarse textured soils and subsoil stoniness has a moderate limiting affect on the available reserves of water for crop growth and consequently the land is limited to Subgrade 3a (good quality agricultural land) by soil droughtiness.

Subgrade 3b

Land graded 3b is principally associated with Soil Types 1 and 3.

- 3.4 The Subgrade 3b land in the north and west of the site is associated with Soil Type 1 (see para 4.2). The heavy clay loam and clay upper subsoils are slowly permeable directly below the topsoil (ie Wetness Class III) and the topsoil textures are heavy and non-calcareous. These three factors combine to impose a significant limitation on the agricultural potential of this land, consequently this area is restricted to Subgrade 3b (moderate quality agricultural land).
- 3.5 The Subgrade 3b land in the east of the site is principally associated with Soil Type 3 (see para 4.4). Upper and lower subsoils typically consist of loamy medium sands which are very slightly to moderately stony. The stoniness and light texture of the subsoils severely limit the water holding capacity of the soil and the land is thus, restricted to Subgrade 3b by soil droughtiness.

Urban

- 3.6 A road running through the middle of the site has been classified as urban land.

4.0 SOIL PHYSICAL CHARACTERISTICS

- 4.1 The published 1:50,000 scale solid and drift edition geology sheet 126 (Nottingham, Geological Survey of England and Wales 1972) shows the site to consist mainly of alluvium with deposits of gravel in the south and east. These drift deposits are underlain at depth by Triassic mudstones. The current detailed inspection of the site shows that three key soil types are derived from the above deposits.

Soil Type 1 (refer to Appendix 2 and Soil Types Map)

- 4.2 The heavy-textured soils formed in deposits of alluvium cover much of the north and west of the site, extending over 23.4 ha. Topsoils are formed typically of heavy clay loam and overlie slowly permeable heavy clay loam or clay subsoils. In many places a lower subsoil consisting of a slightly stony medium sandy loam or loamy medium sand occurs below about 50/60cm.

Soil Type 2 (refer to Appendix 2 and Soil Types Map)

- 4.3 This soil type occurs in the centre of the site and is formed in deposits of river sand and gravel, covering a total of 32.2 ha. Topsoils are typically formed of medium sandy loam or medium clay loam and are slightly stony. Upper subsoils typically consist of medium sandy loam, medium clay loam or sandy clay loam. These are slightly to moderately stony. Below this occur loamy medium sand or medium sand lower subsoils which are very slightly stony.

Soil Type 3 (refer to Appendix 2 and Soil Types Map)

- 4.4 This soil type, covering 7.4 ha, is similar to Soil Type 2 except that the upper subsoils are less stony and lighter in texture being formed typically of loamy medium sand. In addition the lower subsoils tend to be stonier.

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Appendix 1

Grade 1 - excellent quality agricultural land

Land with no over 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 reduction of more demanding crops such as winter harvested vegetables and arable crops. The levels 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 with 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 level of yields. It is mainly suited to grass with occasional arable crops (eg cereal and forage crops) the yields of which are variable. In moist 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 occasionally pioneer forage crops.

Appendix 2

SOIL PHYSICAL CHARACTERISTICS

NOTTINGHAMSHIRE MINERALS PLAN

SITE 4, HOVERINGHAM

SOIL TYPE 1 (23.4 ha)

Topsoil	Texture:	heavy clay loam or occasionally medium clay loam.
	Depth:	30cm

Upper Subsoil	Texture:	heavy clay loam or clay, organic lenses in places.
	Structure:	moderately developed medium and coarse prisms.
	Consistence:	very firm
	Depth:	50/60 cm but in places to 120cm

Lower Subsoil	Texture:	medium sandy loam or loamy medium sand
	Stone:	approximately 15% small, medium and large rounded hard stones.
	Structure:	weakly developed medium subangular blocky
	Consistence:	friable / very friable
	Depth:	120cm

SOIL TYPE 2 (32.2 ha)

Topsoil	Texture:	medium sandy loam or medium clay loam, occasionally sandy clay loam.
	Stone:	6-8% small and medium rounded hard stones
	Depth:	30cm

Upper Subsoil	Texture:	medium sandy loam or medium clay loam, occasionally sandy clay loam.
	Stone:	15-20% small, medium and large rounded hard stones.
	Structure:	weakly developed medium subangular blocky
	Consistence:	friable
	Depth:	typically 60/80cm

Lower Subsoil Texture: loamy medium sand or medium sand
Stone: 4-6% small and medium rounded hard stones
Structure: weakly developed medium angular blocky,
 tending to structureless- single grain.
Consistence: very friable
Depth: 120cm

SOIL TYPE 3 (7.4 ha)

Topsoil Texture: medium sandy loam, medium clay loam or sandy
 clay loam.
Stones: 6% small and medium rounded hard stones
Depth: 30cm

Upper Subsoil Texture: loamy medium sand
Stones: 4-8% small, medium and large rounded hard
 stones.
Structure: weakly developed medium angular blocky
Consistence: very friable
Depth: 50/70cm, occasionally 120cm

Lower Subsoil Texture: loamy medium sand
Stones: 15-20% small, medium and large rounded hard
 stones.
Structure: weakly developed medium subangular blocky
Consistence: very friable
Depth: 120cm

REFERENCES

- GEOLOGICAL SURVEY OF ENGLAND AND WALES (1972). Solid and drift edition geology map 126, Nottingham 1:50,000.
- MAFF, (1970). Agricultural Land Classification Map 112, 1:63,000 scale.
- MAFF, (1988). Agricultural Land Classification of England and Wales (Revised Guidelines and criteria for grading the quality of Agricultural Land) Alnwick.
- METEOROLOGICAL OFFICE (1989). Climate data extracted from the published agricultural climatic dataset.

HOVERINGHAM

MAP 1: AGRICULTURAL LAND CLASSIFICATION
MAP 2: SOIL TYPES