

AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF SOIL CHARACTERISTICS, LAND AT BOZEAT, NORTHAMPTONSHIRE

1.0 BACKGROUND

- 1.1 The site covers an area of 51.0 hectares 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 March 1996. Information was collated from 50 auger borings, spaced at 100 m intervals to a depth of 120 cm or shallower if an impenetrable layer was encountered near the surface. Subsoil conditions were assessed from six inspection pits and supplementary auger borings were carried out to confirm the boundaries of soil types.
- 1.3 On the published provisional 1:63 360 scale ALC map, sheet 133 (MAFF, 1974) the majority of the site is mapped grade 2 with grade 3 occurring near the south west boundary. However, this map is of a reconnaissance nature and the current detailed survey was undertaken to provide site specific details.
- 1.4 At the time of the survey part of the site was under winter cereals with the remainder still under post harvest stubble awaiting cultivation.

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 climate 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 show that there is no overall climatic limitation affecting this site.

Table 1 : Climatic Interpolation

Grid Reference	SP 898602
Altitude (m, AOD)	65
Accumulated Temperature Day °C, Jan-June	1406
Average Annual Rainfall (mm)	607
Moisture Deficit, Wheat (mm)	111
Moisture Deficit, Potatoes (mm)	104
Field Capacity Days	123
Overall Climatic Grade	1

Altitude and Relief

- 2.3 A gently undulating ridge at 70-75 m AOD runs north to south through the eastern part of the site. From the ridge the land slopes in a westerly and south-westerly direction to a low point of 60 m AOD. The slopes are less than 7° and are therefore not limiting in ALC terms.

Geology and Soils

- 2.4 The 1:50 000 scale geology map (GSGB, 1974) show the eastern part of the site to be Pleistocene Glacial Boulder Clay overlying Jurassic Great Oolite Clay. Westwards occur respectively bands of Pleistocene Sand and Gravel, Jurassic Lower Estaurine Series (localised, in southern half) and Jurassic Upper Lias Clay.

- 2.5 The reconnaissance (1:250 000 scale) soil survey map for the area (SSEW, 1983) shows the site to comprise soils of the Hanslope Association (*1).
- 2.6 The current survey of the site shows the presence of 2 soil types, the physical characteristics of which are shown in Appendix 1.
- 2.7 Soil Type 1 typically comprises non-calcareous very slightly stony clay or occasionally heavy clay loam topsoil with non calcareous, stoneless clay upper subsoil. Lower subsoil comprises very slightly stony clay with chalky boulder clay occurring at 80 cm depth or below. In the majority of profiles gleying occurs at 30/35 cm and soils are assessed as wetness class III. In the remainder the upper subsoil was a brown clay and gleying occurs at 50/55 cm giving rise to wetness class II.
- 2.8 Soil Type 2 typically comprises non calcareous, very slightly stony medium sandy loam (occasionally medium clay loam) topsoil with non calcareous, very slightly stony loamy medium sand (occasionally sandy clay loam) upper subsoil. Lower subsoil comprises very slightly stony loamy medium sand (occasionally medium sand). These soils are well drained and assessed as wetness class I.

3.0 AGRICULTURAL LAND CLASSIFICATION

- 3.1 The breakdown of Agricultural Land Classification (ALC) grades in hectares and percentages terms is shown in Table 2.

(*1) Hanslope Association: Slowly permeable calcareous clayey soils. Some slowly permeable non-calcareous clayey soils, slight risk of water erosion.

Table 2 : Agricultural Land Classification

AGRICULTURAL LAND CLASSIFICATION		
Grade	ha	%
2	10.9	21.4
3a	12.7	24.9
3b	27.4	53.7
TOTAL	51.0	100.0

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

Grade 2

- 3.2 Land assessed as grade 2 occurs in a north/south strip in the west-central part of the site and is associated with Soil Type 2 as described in paragraph 2.8. The soil profiles are mainly coarse loamy throughout and well drained giving rise to a slight droughtiness restriction.

Subgrade 3a

- 3.3 Land assessed as Subgrade 3a occurs on the majority of the western boundary and a small area in the south central part. The soil profiles are mainly coarse loamy with sandy soils nearer to the surface giving rise to more severe droughtiness. Also some profiles are associated with the moderately well drained soils (wetness class II) as described in paragraph 2.7 and are limited to subgrade 3a due to a wetness and workability limitation.

Subgrade 3b

- 3.4 Land assessed as subgrade 3b occurs on the central/eastern part and in a small area in the north western part of the site. The soil profiles are mainly clay throughout with occasional fine loamy topsoils as described in paragraph 2.7

(wetness class III) and are subject to moderately severe wetness and workability limitations, restricting the land to subgrade 3b.

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REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN (England and Wales), 1974. Sheet 186. Solid and Drift. Scale 1:50 000.

MAFF, 1974. Agricultural Land Classification map. Sheet 133. Provisional. Scale 1:63 360.

MAFF, 1983. 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. Met. Office, Bracknell.

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

Appendix 1

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE 1

Topsoil	Texture	:	clay
	Colour	:	2.5Y4/2
	Stone	:	2% small flints
	Roots	:	common, fine
	Calcareous	:	non
	Depth	:	30 cm
	Upper Subsoil	Texture	:
Colour		:	2.5Y5/3 and 2.5Y5/4
Mottles		:	common ochreous 10YR6/8
Stone		:	2% small flint
Structure		:	weakly developed, coarse angular blocky
Consistence		:	firm
Roots		:	common, fine
Calcareous		:	very slight
Depth		:	60 cm
Lower Subsoil	Texture	:	clay
	Colour	:	2.5Y5/3 and 2.5Y5/2
	Mottles	:	common, ochreous 10YR6/6
	Stone	:	2% small flint
	Structure	:	weakly developed, coarse angular blocky
	Consistence	:	very firm
	Roots	:	common, fine
	Calcareous	:	calcareous
	Depth	:	120 cm

SOIL TYPE 1 (wetness class II variant)

Topsoil	Texture	:	heavy clay loam
	Colour	:	10YR4/3
	Stone	:	2% small flints
	Roots	:	common, fine
	Calcareous	:	non
	Depth	:	30 cm
Upper Subsoil	Texture	:	heavy clay loam
	Colour	:	10YR4/4
	Mottles	:	none
	Stone	:	2% small flint
	Structure	:	moderately developed, coarse sub-angular blocky.
	Consistence	:	friable/firm
	Roots	:	common, fine
	Calcareous	:	non
	Depth	:	50 cm
Lower Subsoil 1	Texture	:	clay
	Colour	:	10YR5/3
	Mottles	:	common, ochreous 10YR5/8
	Stone	:	<1%, flints
	Structure	:	weakly developed, coarse angular blocky
	Consistence	:	firm
	Roots	:	common, fine
	Calcareous	:	slightly
Depth	:	90 cm	
Lower Subsoil 2	Texture	:	clay
	Colour	:	5YR4/1
	Mottles	:	common, ochreous 10YR5/6 and 10YR6/6.
	Stone	:	<1%, flints, 1-2% small chalks
	Structure	:	moderately developed, coarse angular blocky.
	Consistence	:	very firm
	Roots	:	common, fine
	Calcareous	:	strongly
	Depth	:	120 cm

SOIL TYPE 2

Topsoil	Texture	:	medium sandy loam
	Colour	:	7.5YR4/3
	Stone	:	2% small flints
	Roots	:	many, fine and very fine
	Calcareous	:	non
	Depth	:	32 cm
Upper Subsoil	Texture	:	loamy medium sand
	Colour	:	7.5YR5/4 and 7.5YR4/3
	Stone	:	3% small and medium
	Structure	:	weakly developed, medium and coarse sub-angular blocky.
	Consistence	:	friable
	Roots	:	few, fine and very fine
	Calcareous	:	non
	Depth	:	69 cm
Lower Subsoil 1	Texture	:	loamy medium sand
	Colour	:	7.5YR5/6
	Stone	:	<1%
	Structure	:	weakly developed, coarse sub-angular blocky.
	Consistence	:	very friable
	Roots	:	few, fine
	Depth	:	95 cm
Lower Subsoil 2	Texture	:	medium sand
	Colour	:	7.5YR5/6
	Stone	:	<1%
	Structure	:	structureless, single grain
	Consistence	:	loose
	Roots	:	non
	Calcareous	:	non
	Depth	:	120 cm