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**BUCKLESHAM QUARRY,
SUFFOLK**

**Agricultural Land Classification Report
& Statement of Soil Physical
Characteristics**

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**Resource Planning Team
Eastern Region
FRCA Cambridge**

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AGRICULTURAL LAND CLASSIFICATION REPORT & STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

BUCKLESHAM QUARRY, SUFFOLK

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 68.9 ha of land partly adjacent to the A14, southeast of the village of Bucklesham in Suffolk. The survey was carried out during October 1997.
2. The survey was carried out by the Farming and Rural Conservation Agency (FRCA) for the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with an application to extract sand and gravel from the site. This survey supersedes previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey the agricultural land on the site was under a mixture of arable uses with sugar beet, fodder beet, cereal stubble and bare soil ready for planting. The areas mapped as 'Other Land' comprised small areas of new woodland in the south, northeast and north of the site and a garden around a bungalow in the north of the site.

Irrigation

5. The site is irrigated and is considered to have an adequate and reliable supply of water to enhance the productive capability and flexibility of the agricultural land. In accordance with Planning Policy Guidance Note 7 (PPG7, February 1997) the site has been graded without reference to the availability of irrigation. Annex B, paragraph B11 of PPG7 gives guidance on comparisons to be made in connection with irrigated and non-irrigated land. Attention is therefore drawn to the importance and increased agricultural significance that should be afforded to the Bucklesham Quarry site relative to comparable but non-irrigated land in the locality.

SUMMARY

6. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10 000; it is accurate at this scale but any enlargement would be misleading.
7. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.
8. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 70 borings and 3 soil pits was described.

Table 1: Area of grades and other land B.S.D.

Grade/Other land	Area (hectares)	% surveyed area	% site area
3a	48.7	75	71
3b	16.3	25	23
Other land	3.9	N/A	6
Total surveyed area	65.0	100	-
Total site area	68.9	-	100

9. The majority of the land at the site has been graded 3a (good quality agricultural land) due to a moderate droughtiness limitation. Smaller discrete areas of land located throughout the site have been graded 3b (moderate quality agricultural land) due to significant droughtiness imperfections.

FACTORS INFLUENCING ALC GRADE

Climate

10. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

11. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5 km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data B.S.D.

Factor	Units	Values
Grid reference	N/A	TM 350405
Altitude	m, AOD	25
Accumulated Temperature	day°C (Jan-June)	1430
Average Annual Rainfall	mm	581
Field Capacity Days	days	102
Moisture Deficit, Wheat	mm	127
Moisture Deficit, Potatoes	mm	125
Overall climatic grade	N/A	Grade 1

12. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

13. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (ATO, January to June), as a measure of the relative warmth of a locality.

14. The combination of rainfall and temperature at this site mean it is relatively warm and dry. Therefore, the climatic grade for this site has been assessed as 1.

Site

15. The site occupies ~~virtually flat~~ land which ^{drops} very gently slopes in a southeasterly direction from high ground in the north and west of the site. The site ranges in altitude from 25 m AOD in the east, to 30 m AOD in the north and west. Therefore, neither gradient nor altitude constitute a limitation to the ALC grade.

Geology and soils

16. The published 1:50 000 scale geology map, sheet 207, Ipswich, (Geological Survey of Great Britain, 1990) shows the site to comprise mainly glacial and Kesgrave sand and gravels, with a very small area of boulder clay south of Redhouse Farm. These deposits overlie a solid geology of Norwich and Red Crag.

17. On the 1:250 000 ^{reconnaissance} scale published soils map, sheet 4, Soils of Eastern England (Soil Survey of England and Wales, 1983) the site is shown as consisting entirely of soils of the Wick 3 Association. These soils are briefly described as deep well drained coarse loamy often stoneless soils. Some similar sandy soils. Complex pattern locally.

18. During this survey a more detailed inspection of the soils was carried out and two soil types were identified, the distribution of these is shown on the accompanying soil resources map. ~~The soil resources map is not necessarily a soil stripping map but illustrative of the soil resources available for restoration at the site.~~ Say it again in para 25.

Soil Type I (53.7 hectares)

19. This soil type occurs over the majority of the site. Profiles typically comprise very slightly stony medium sandy silt loam or medium sandy loam topsoils, over medium sandy loams or occasionally sandy silt loams. At depth soil textures typically become slightly lighter, with loamy medium sand present which generally becomes medium sand at depths below 60 cm. Both upper and lower subsoils range from being ^{are typically} generally very slightly or slightly stony to ^(occasionally) rarely moderately stony. These soils are typically free draining throughout.

Soil Type II (11.3 hectares)

20. The second soil type occurs in small areas sporadically throughout the east of the site. Soils typically comprise medium sandy loam topsoils over similar textured or occasionally loamy medium sand upper subsoils. Below 50 cm depth medium sands are typically encountered. Topsoils are typically very slightly stony, with both upper and lower subsoils being very slightly or slightly stony. Profiles are typically free draining throughout. ^{and in a small area in the west}

AGRICULTURAL LAND CLASSIFICATION

21. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.2.

22. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix II.

Subgrade 3a

23. The majority of the land at the site has been graded 3a. This land occurs in conjunction with the typically free draining (wetness class I), less stony, deep, coarse loamy over medium sandy soils described in paragraph 19 (soil type I). Profile textures result in the soils having moderate reserves of water available for plant growth and as a result there is a moderate droughtiness limitation to land quality and the land is graded 3a.

Subgrade 3b

24. Sporadic areas of land throughout the site have been graded 3b and this land mainly corresponds with slightly lighter textured medium ^{coarse loamy} sandy loam over medium sandy soils described in paragraph 20 (soil type II). Small areas of subgrade 3b land also occur in conjunction with medium sandy loam dominated, stonier variants of soil type I (see paragraph 19). These soils are light textured and typically free draining (wetness class I). The light profile textures and stoniness combine to reduce the water holding capacity of the soils and therefore significant droughtiness limitations restrict the land to subgrade 3b.

Soil Resources

25. Two soil types have been identified within the site and their distribution is shown on the accompanying soil resources map which is illustrative of the soil resources within the site for restoration purposes but is not a soil stripping map for the site. A statement of the physical characteristics of Soil Types I and II is given in Appendix II. The thickness and the volume of the Soil Types is given below.

Table 3: Soil Resources *ESD*

		Area (ha)	Thickness (cm)	Volume (m ³)
Soil Type I	Topsoil	53.7	40	214 800
	Upper Subsoil	53.7	15	80 550
	Lower Subsoil	53.7	65	349 050
Soil Type II	Topsoil	11.3	35	39 550
	Upper Subsoil	11.3	15	16 950
	Lower Subsoil	11.3	70	79 100

< Centre sls. >

Higher right?

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SOURCES OF REFERENCE

Geological Survey of England and Wales (1990) *Sheet 207, Ipswich, solid and drift edition, 1:50 000 scale.*

BGS: London

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.*

MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*

Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 4, Soils of Eastern England, 1:250,000 scale.*

SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in Eastern England.*

SSEW: Harpenden

APPENDIX I

DESCRIPTIONS OF THE GRADES AND SUBGRADES

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 includes 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 or horticultural crops can usually be grown but on some land of this grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

APPENDIX II

STATEMENT OF SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE I (53.7 hectares)

Topsoil	Texture	: Medium sandy silt loam or medium sandy loam
	Colour	: Brown
	Depth	: Typically 40 cm, range 30 to 40 cm
	Stoniness	: Very slightly stony (1-5% flint)
	Calcium carbonate	: Non-calcareous
	Roots	: Common fine and very fine
	Boundary form	: Clear, wavy
Upper subsoil	Texture	: Medium sandy loam or occasionally medium or fine sandy silt loam
	Colour	: Yellowish brown or occasionally dark yellowish brown
	Depth	: Range 50 to 80 cm, typically 55/60 cm
	Stoniness	: Very slightly or slightly stony (2-15%), rarely moderately stony (25%)
	Structure	: Moderately developed coarse and very coarse angular blocky
	Consistence	: Friable or firm
	Structural condition	: Moderate
	Porosity	: >0.5%
	Calcium carbonate	: Non-calcareous
	Roots	: Common fine and very fine
	Boundary form	: Clear, irregular or wavy
Lower subsoil	Texture	: Loamy medium sand and medium sand, very occasionally medium sandy loam
	Colour	: Brownish yellow or yellowish brown
	Depth	: 120 cm +
	Stoniness	: Very slightly or slightly stony (2-15%), rarely moderately stony (25%)
	Structure	: Weakly developed coarse subangular and angular blocky
	Consistence	: Very friable or friable
	Structural condition	: Moderate or good
	Porosity	: >0.5%
	Calcium carbonate	: Non-calcareous
	Roots	: Common or few fine and very fine

Wetness Class: I

SOIL TYPE II (11.3 hectares)

Topsoil	Texture	: Medium sandy loam
	Colour	: Brown
	Depth	: Typically 35 cm, range 30 to 40 cm
	Stoniness	: Very slightly or slightly stony (2-5% flint) ?
	Calcium carbonate	: Non-calcareous
	Roots	: Common fine and very fine
	Boundary form	: Clear, wavy
Upper subsoil	Texture	: Medium sandy loam or occasionally loamy medium sand
	Colour	: Yellowish brown or occasionally dark yellowish brown
	Depth	: Range 40 to 80 cm, typically 50 cm
	Stoniness	: Very slightly or slightly stony (1-15%)
	Structure	: Moderately developed coarse and very coarse angular blocky
	Consistence	: Friable or firm
	Structural condition	: Moderate
	Porosity	: >0.5%
	Calcium carbonate	: Non-calcareous
	Roots	: Common fine and very fine
	Boundary form	: Clear, irregular or wavy
Lower subsoil	Texture	: Medium sand
	Colour	: Brownish yellow or yellowish brown
	Depth	: 120 cm +
	Stoniness	: Very slightly or slightly stony (1-10%)
	Structure	: Weakly developed coarse subangular and angular blocky
	Consistence	: Very friable or friable
	Structural condition	: Moderate or good
	Porosity	: >0.5%
	Calcium carbonate	: Non-calcareous
Roots	: Common or few fine and very fine	

Wetness Class: I