

**BACKSTONE GILL LANE, WIKE
LEEDS, WEST YORKSHIRE**

**Agricultural Land Classification (ALC)
and Statement of Physical Characteristics
Report and Maps**

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**Resource Planning Team
Northern Region
FRCA, Leeds**

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AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF PHYSICAL CHARACTERISTICS REPORT

BACKSTONE GILL LANE, WIKE, LEEDS

INTRODUCTION

1. This report presents the findings of a detailed Statement of Physical Characteristics and Agricultural Land Classification (ALC) survey of 17.8 ha of land lying on the eastern edge of the village of Wike. The field survey work was carried out during August 1998.
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 the proposal to build a golf course on the land. This survey and report supersede any previous ALC information relating to this land.
3. The work was conducted by members of the Resource Planning Team in the Northern 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 all under permanent grass. In addition, there were a number of areas of immature coniferous woodland which appeared to provide cover for pheasants.

SUMMARY

5. The findings of the survey are shown on the enclosed Topsoil/Subsoil Resource and ALC maps. The maps have been drawn at a scale of 1:5,000. They are accurate at this scale but any enlargement would be misleading.
6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
1			
2			
3a	9.4	63.1	52.8
3b	5.5	36.9	30.9
4			
5			
Agricultural land not surveyed		N/A	
Other land	2.9	N/A	16.3
Total surveyed area	14.9	100	-
Total site area	17.8	-	100

7. The fieldwork was conducted at an average density of one boring per hectare. A total of seventeen borings and five soil pits were described.

8. Subgrade 3a, good quality agricultural land, covers a total of 9.4 ha. In most areas medium sandy loam topsoils overlie sandy loam, sandy silt loam or loamy sand subsoils, although subsoil horizons of heavy clay loam or heavy silty clay loam occur in places. These profiles are well drained. Weathering fine and medium-grained sandstone typically begins at between 40 cm and 50 cm depth and soil droughtiness is the grade-limiting factor. In the south-west of the site medium clay loam or medium sandy loam topsoils and upper subsoils overlie gleyed and slowly permeable clay at between 50 cm and 70 cm depth. These profiles are moderately well or imperfectly drained. In this case the land is restricted to Subgrade 3a by a slight soil wetness limitation.

9. Subgrade 3b, moderate quality agricultural land, covers a total of 5.5 ha in the centre and north-west of the site. Most of this land consists of slightly to moderately stony sandy loam topsoils and moderately to very stony sandy loam or sandy clay loam subsoils. Weathering medium-grained sandstone begins at between 45 cm and 60 cm depth and although the soils are well drained, the ALC grade is limited by topsoil stoniness and/or soil droughtiness. In a small area north of the main block of woodland in the centre of the site the soils are poorly drained, with thin medium clay loam topsoils overlying gleyed and slowly permeable clay subsoils. Soil wetness is the grade-limiting factor in this case. In the north-west and south-east two small blocks of Subgrade 3b land occur where slopes of between 7° and 10° are the main limitation.

10. Other, non-agricultural, land consists of blocks of immature coniferous woodland.

11. In terms of soil resources, two main soil types were identified on the site. The first is typically light-textured and has been subdivided into one unit consisting of slightly stony sandy loam topsoils (mean thickness 25 cm) and moderately stony sandy loam or sandy silt loam subsoils (mean thickness 25 cm), and one unit consisting of moderately stony sandy loam topsoils (mean thickness 15 cm) and moderately stony sandy loam or sandy silt loam subsoils (mean thickness 50 cm). The second main soil type consists of medium clay loam or medium sandy loam topsoils (mean thickness 20 cm) and upper subsoils (mean thickness 30 cm) overlying clay (mean thickness 50 cm). Both the main soil types are underlain by weathering sandstone, at between 40 cm and 120 cm depth in most cases.

FACTORS INFLUENCING ALC GRADE

Climate

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

13. 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

Factor	Units	Values
Grid reference	N/A	SE 341 424
Altitude	m, AOD	115
Accumulated Temperature	day°C (Jan-June)	1282
Average Annual Rainfall	mm	747
Field Capacity Days	days	188
Moisture Deficit, Wheat	mm	86
Moisture Deficit, Potatoes	mm	71
Overall climatic grade	N/A	Grade 2

14. 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.

15. 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 (AT0, January to June), as a measure of the relative warmth of a locality.

16. The combination of rainfall and temperature at this site means that there is an overall climatic limitation to Grade 2.

Site

17. The land on this site is level to strongly sloping (1-10°) with variable aspect. Where the slopes exceed 7° (in the south-east and north-west) the land is limited by its gradient to Subgrade 3b. Where the slopes are less than 7° there is no gradient limitation and neither flood risk nor relief are grade-limiting factors on this site.

Geology and soils

18. The site is underlain by Carboniferous Millstone Grit which outcrops to within one metre of the surface over most of the site. Although drift cover is absent over most of the site there is a thin layer of till over the south-western corner (BGS Sheet 70).

19. The soils on the site have been mapped as belonging to the Dunkeswick, Wike and Kirkby Overblow series (Soils of the Leeds District). In addition to these, the field survey suggests that soils of the Swindon Bank series occur in the centre and north of the site.

AGRICULTURAL LAND CLASSIFICATION

20. 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.

Subgrade 3a

21. Land in this subgrade accounts for almost 53% of the total site area. Two main soil types occur within this subgrade. The first consists of well drained (Wetness Class I) soils where medium sandy loam topsoils overlie medium sandy loam, medium sandy silt loam or

loamy medium sand subsoils. Subsoil horizons of heavy clay loam or heavy silty clay loam occur in places and weathering fine or medium-grained sandstone typically begins at between 40 cm and 50 cm depth. Topsoils are slightly stony (typically containing between 6% and 12% sandstones) while subsoils are moderately to very stony, containing between 25% and 45% sandstones. Soil droughtiness is the grade-limiting factor in this case. In the south-west of the site the soils are moderately well or imperfectly drained (Wetness Classes II and III), with medium sandy loam or medium clay loam topsoils and upper subsoils overlying gleyed and slowly permeable clay at between 50 cm and 70 cm depth. A soil wetness limitation is the grade-limiting factor in this case.

Subgrade 3b

22. Most of the land falling within this subgrade consists of well drained (Wetness Class I) soils where medium sandy loam topsoils overlie medium sandy loam or sandy clay loam subsoils. The topsoils are moderately stony (containing 20-35% very small to very large sandstones, 12-25% >2 cm, 5-15% >6 cm) and the subsoils are moderately to very stony (containing 35% to 45% very small to very large sandstones). Weathering sandstone bedrock begins at between 45 cm and 60 cm depth and the ALC grade of the land is limited by soil droughtiness and/or topsoil stoniness. In a small area in the centre of the site the soils are poorly drained (Wetness Class IV), with thin medium clay loam topsoils overlying gleyed and slowly permeable clay at around 20 cm depth. Soil wetness is the grade-limiting factor in this case. Elsewhere, in the north-west and south-east respectively, slopes of between 7° and 10° occur which limit small areas to Subgrade 3b.

Other land

23. Other, non-agricultural, land on this site consists of a number of small blocks of immature coniferous woodland.

STATEMENT OF PHYSICAL CHARACTERISTICS

24. Two main soil types were identified on the site, descriptions of which are given below. Topsoil and subsoil resources are shown on the accompanying maps along with soil thickness and volume information. Representative pit descriptions are given in Appendix II.

a. Soil Type 1 (T1/U1/Sandstone), Light-textured soil

25. This soil type occurs over almost 65% of the site and consists of medium sandy loam topsoils overlying medium sandy loam or medium sandy silt loam subsoils in most cases, although loamy sand, sandy clay loam, medium clay loam, heavy clay loam or heavy silty clay loam subsoils occur in places. This soil type has been subdivided into units T1A/U1A and T1B/U1B which are distinguished by differences in stone size and content. This soil type is underlain by weathering sandstone at between 45 cm and 65 cm depth.

b. Soil Type 2 (T2/U2/L1/Sandstone), Light to medium-textured soil over clay

26. The soil type occurs in the south-west of the site and consists of medium clay loam or medium sandy loam topsoils and upper subsoils in most cases, overlying clay at between 50 cm and 70 cm depth. This soil type is underlain by weathering sandstone at around 100 cm depth.

Topsoils

27. Topsoil T1 occurs in the north, centre and east. Typically it has a moderately to strongly developed fine and medium subangular blocky structure and consists of medium sandy loam. Unit T1A is slightly stony, containing between 6% and 12% very small to medium sandstones, while Unit T1B is moderately stony, containing between 20% and 35% very small to very large sandstones. Unit T1A has a mean thickness of 25 cm while Unit T1B has a mean thickness of 15 cm.

28. Topsoil T2 occurs in the south-west of the site. It consists of medium sandy loam or medium clay loam and has a moderately developed fine and medium subangular blocky structure. It is stoneless to slightly stony, containing up to 8% very small to medium sandstones, and has a mean thickness of 20 cm.

Upper Subsoils

29. Upper subsoil U1 underlies topsoil T1 and overlies weathering fine and medium-grained sandstone. Although typically light-textured, consisting of medium sandy loam or medium sandy silt loam, the texture is somewhat variable and horizons of loamy sand, medium clay loam, sandy clay loam, heavy clay loam and heavy silty clay loam also occur. Typically this subsoil type has a moderately developed fine and medium subangular blocky structure. It is subdivided into Unit U1A, which is very stony (containing approximately 45% very small to medium sandstones), and Unit U1B which is also very stony, but contains around 45% very small to very large sandstones. Unit U1A has a mean thickness of 25 cm and Unit U1B has a mean thickness of 50 cm.

30. Upper subsoil U2 underlies topsoil T2 in the south-west. It consists of medium sandy loam or medium clay loam in most cases and has a moderately developed medium and coarse subangular blocky structure. Unit U2 is stoneless to slightly stony, containing up to 12% sandstones, and has a mean thickness of 30 cm.

Lower Subsoils

31. Lower subsoil L1 underlies topsoil T2 and upper subsoil U2. It consists of stoneless to very slightly stony clay, which contains up to 5% very small to medium sandstones. It has a weakly developed medium prismatic structure and a mean thickness of 50 cm. This lower subsoil is underlain by weathering sandstone at around 100 cm depth.

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SOURCES OF REFERENCE

British Geological Survey (1974) *Sheet No. 70, Leeds. Solid Geology, 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 1, Soils of Northern England, 1:250,000 scale.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in Northern England*
SSEW: Harpenden.

Soil Survey of England and Wales (1970) *Soils of the Leeds District*
SSEW: Harpenden.

[ALC Map]

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

SOIL PROFILE DESCRIPTIONS

Soil Type 1: T1A/U1A/Sandstone (slightly to moderately stony, light-textured soil)

Location: Grid reference: SE 3409 4227

Land Use: Permanent grass

Slope: 2°S

Recent Weather: Showery, overcast

Depth (cm)	Horizon Description
0-19	Brown (10YR 4/3) medium sandy loam; no mottles; slightly stony, containing around 6% very small to medium sandstones; dry; moderately to strongly developed fine and medium subangular blocky structure; firm; very porous; abundant very fine fibrous roots; non-calcareous; clear, wavy boundary.
19-52	Brownish yellow (10YR 6/6) medium sandy loam; no mottles; very stony, containing around 45% very small to medium sandstones; dry; moderately developed medium and coarse subangular blocky structure; firm; very porous; common very fine fibrous roots; non-calcareous; clear, smooth boundary.
52-71	Brownish yellow (10YR 6/6) medium sandy loam; no mottles; very stony, containing around 45% very small to medium sandstones; dry; weakly developed coarse platy structure; firm; very porous; few very fine fibrous roots; non-calcareous; smooth boundary.
71+	Weathering Millstone Grit.

Soil Type 1: T1B/U1B/Sandstone (moderately stony, light-textured soil)

Location: Grid reference: SE 3401 4229

Land Use: Permanent grass

Slope: 2°S

Recent Weather: Showery, overcast

Depth (cm) Horizon Description

0-20 Dark brown (10YR 3/3) medium sandy loam; no mottles; moderately stony, containing around 35% very small to very large angular sandstones (28% >2 cm, 20% >6 cm); dry; strongly developed fine and medium subangular blocky structure; firm; very porous; abundant fine and very fine fibrous roots; non-calcareous; clear, wavy boundary.

20-62 Brownish yellow (10YR 6/8) sandy clay loam; no mottles; moderately stony, containing around 35% very small to very large angular sandstones; dry; weakly developed medium prismatic structure; very firm; moderately porous (>0.5% pores >0.5 mm); many fine and very fine fibrous roots; non-calcareous; gradual wavy boundary merging to:-

62+ Shattered Millstone Grit.

Soil Type 2: T2/U2/L1 (light to medium-textured soil over clay)

Location: Grid reference: SE 3380 4230

Land Use: Permanent grass

Slope: 0°

Recent Weather: Showery, overcast

Depth (cm) Horizon Description

0-22 Dark greyish brown (10YR 4/2) medium sandy loam; no mottles; slightly stony, containing around 6% very small to medium sandstones (3% >2 cm); dry; moderately developed fine and medium subangular blocky structure; firm; very porous; many very fine fibrous roots; non-calcareous; clear, smooth boundary.

22-56 Dark greyish brown (10YR 4/2) and brown (10YR 4/3) medium clay loam; no mottles; slightly stony, containing approximately 10% very small to large sandstones; dry; moderately developed medium and coarse subangular blocky structure; firm to very firm; moderately porous; common very fine fibrous roots; non-calcareous; abrupt smooth boundary.

56-75 Grey (7.5YR 6/1) and pale brown (10YR 6/3) clay with many reddish yellow (7.5YR 6/8) and brownish yellow (10YR 6/6) mottles; very slightly stony, containing around 5% very small to medium sandstones; moist; weakly developed medium prismatic structure; extremely firm; slightly porous (<0.5% pores >0.5 mm); few very fine fibrous roots; non-calcareous; clear, smooth boundary.

75+ Weathering Millstone Grit.