

**THRISLINGTON QUARRY  
CORNFORTH, COUNTY DURHAM**

**Agricultural Land Classification and  
Statement of Physical Characteristics Report**

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**Resource Planning Team  
Leeds Statutory Group  
ADAS Leeds**

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# THRISLINGTON QUARRY, CORNFORTH

## AGRICULTURAL LAND CLASSIFICATION AND STATEMENT OF PHYSICAL CHARACTERISTICS REPORT

### Introduction

1. This report presents the findings of a detailed Statement of Physical Characteristics and Agricultural Land Classification (ALC) survey of 5.4 ha of land east of Cornforth in County Durham. The survey was carried out during February 1997.
2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Northallerton in connection with the proposal to use the area for an access road and site offices in connection with the existing quarry. This survey supersedes any previous surveys.
3. The work was conducted by members of the Resource Planning Team in the Leeds Statutory Group in ADAS. 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 land on the site was principally sown to oilseed rape or ley grass, although non-agricultural land consisting of recently planted deciduous woodland, a track and a grassy bank occurs in the south.

### Summary

5. The findings of the survey are shown on the enclosed ALC and topsoil/subsoil maps. They 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)	% Total site area	% Surveyed Area
Subgrade 3a	1.3	24.1	30.2
Subgrade 3b	3.0	55.5	69.8
Other land	1.1	20.4	-
Total surveyed area	4.3	-	100
Total site area	5.4	100	-

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

8. Subgrade 3a, good quality agricultural land, occurs in the west of the site. The soils are well drained and typically consist of medium silty clay loam topsoils overlying thin medium silty clay loam or heavy silty clay loam subsoils. The topsoils are very slightly to moderately stony and the subsoils are slightly to moderately stony. Weathering limestone begins at between 40 cm and 65 cm depth and the ALC grade of the land is limited by soil droughtiness.

9. Subgrade 3b, moderate quality agricultural land, covers most of the site. The soils are well drained, and typically consist of slightly to moderately stony medium clay loam or medium silty clay loam topsoils and, in places, thin upper subsoils, overlying weathering limestone at around 30 cm depth. A more severe soil droughtiness limitation further restricts the ALC grade of this land to 3b.

10. Other, non-agricultural, land consists of an access point in the north, a track, a belt of recently planted deciduous trees and a grassy bank (all in the south).

11. In terms of the soil resources on the site one main soil type was identified. This consists of a medium-textured topsoil (median thickness 30 cm) overlying either weathering limestone or, in the west, a medium-textured subsoil (mean thickness 18 cm). Where the subsoil occurs it is in turn underlain by weathering limestone.

## 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 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	NZ 322 336
Altitude	m, AOD	142
Accumulated Temperature	day°C (Jan-June)	1212
Average Annual Rainfall	mm	691
Field Capacity Days	days	175
Moisture Deficit, Wheat	mm	84
Moisture Deficit, Potatoes	mm	67

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 of Grade 2.

### **Site**

17. Generally the agricultural land is gently to moderately sloping (2-5°) although some strongly sloping land occurs in the centre of the site where slopes of 8° limit the ALC grade to Subgrade 3b. Neither microrelief nor flood risk are of significance on this site.

### **Geology and soils**

18. The area is underlain by Magnesian Limestone and, although there is a very thin drift cover, weathering limestone generally begins at between 30 cm and 65 cm depth.

19. The soils on the site have been mapped as Aberford association by the Soil Survey of England and Wales (Soils of England and Wales, Sheet 1).

### **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.

#### *Subgrade 3a*

21. Subgrade 3a, good quality agricultural land, is found in the west of the site. Typically medium silty clay loam topsoils overlie thin medium silty clay loam or heavy silty clay loam subsoils. Weathering Magnesian Limestone begins at between 40 cm and 65 cm depth. The topsoils are very slightly to moderately stony, containing 5% to 18% total limestones, of which 3% to 4% are greater than 2 cm in size. The subsoils are slightly to moderately stony, containing 5% to 25% limestones. Although the soils are well drained, falling in Wetness Class I (see Appendix II), the land is limited to Subgrade 3a by soil droughtiness.

#### *Subgrade 3b*

22. Land in this subgrade, defined as moderate quality land, covers the remainder of the agricultural land on the site. Again, the profiles are well drained (Wetness Class I). They typically consist of medium clay loam or medium silty clay loam topsoils and, in places, thin upper subsoils, overlying weathering limestone at between 30 cm and 35 cm depth. A small area in the south of the site lies at the bottom of a steep bank and appears to have been restored following previous quarrying activity. All of these soils are slightly to moderately stony, containing between 12% and 18% limestones. The ALC grade of this land is also

limited by soil droughtiness. A small area to the north of the recently planted woodland is steeply sloping (8°) and this provides an additional limitation to Sugrade 3b.

### *Other land*

23. Other, non-agricultural, land on this site occurs in the north (where the site extends into a minor road) and in the south (where a belt of recently planted deciduous trees, a grassy bank apparently associated with previous quarrying, and a track occur).

### **Statement of Physical Characteristics**

One main soil type was identified on the site, a description of which is given below. Topsoil and subsoil resources are shown on the accompanying maps along with soil thickness and volume information. A representative pit description is given in Appendix III.

#### a) Soil Type 1 (T1/S1), medium-textured soil derived from limestone

This soil type occurs over the whole site with the exception of a track in the south and an access point in the north. It is characterised by its medium texture and by the presence of weathering limestone at between 30 cm and 65 cm depth.

#### *Topsoils*

Topsoil T1 covers the whole site with the exception of the two areas mentioned above. It is medium-textured, consisting of medium clay loam or medium silty clay loam, and very slightly to moderately stony, with between 5% and 18% very small to large limestones. Unit T1 has a moderately developed medium subangular blocky structure and a median thickness of 30 cm.

#### *Subsoils*

In most areas topsoil T1 directly overlies weathering limestone but in the west of the site lies an area with an identifiable subsoil resource. This subsoil (Unit S1) is generally medium-textured (medium silty clay loam) although heavy-textured (heavy silty clay loam) horizons occur in places. Unit S1 is slightly to moderately stony, containing between 5% and 25% very small to large limestones. It typically has a moderately developed medium and coarse subangular blocky structure and a mean thickness of 18 cm.

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ADAS Leeds

## SOURCES OF REFERENCE

British Geological Survey (1965) *Sheet No. 27, Durham.*, 1:63,360 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

## 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 WETNESS CLASSIFICATION

#### Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Wetness Class	Duration of waterlogging <sup>1</sup>
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years. <sup>2</sup>
II	The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

#### Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

<sup>1</sup> The number of days is not necessarily a continuous period.

<sup>2</sup> 'In most years' is defined as more than 10 out of 20 years.

### APPENDIX III

#### SOIL PROFILE DESCRIPTION

**Soil Type 1:** Shallow medium-textured soil overlying limestone (T1/S1)

**Location:** Grid Reference NZ 3225 3370

**Land Use:** Oilseed rape

**Slope:** 2° SW

**Recent Weather:** Bright and windy after recent heavy rain

<u>Depth (cm)</u>	<u>Horizon Description</u>
0-30	Dark brown (10 YR 3/3) medium silty clay loam; no mottles; moderately stony, with approximately 18% very small to medium limestones (3-4% greater than 2 cm in size); moist; moderately developed medium subangular blocky structure; firm; slightly porous; many very fine fibrous roots; slightly sticky; moderately plastic; calcareous; clear smooth boundary.
30-40 (minimum)/ 50 (maximum)	Dark yellowish brown (10 YR 4/4) medium silty clay loam; no mottles; moderately stony, with approximately 18% very small to medium limestones; moist; moderately developed medium and coarse subangular blocky structure; firm; moderately porous; common very fine fibrous roots; slightly sticky; moderately plastic; calcareous; sharp wavy boundary.
40-50+	Very soft white (2.5 YR 8/2) Magnesian Limestone, easily penetrable by spade and auger.