CITY OF SUNDERLAND UDP
(Land north of A1290)

Agricultural Land Classification
September 1996

Resource Planning Team
Leeds Statutory Group
ADAS Leeds

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AGRICULTURAL LAND CLASSIFICATION REPORT

CITY OF SUNDERLAND UDP
(LAND NORTH OF A1290), TYNE AND WEAR

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 161.4 ha of land between the A1290 and the River Don in Sunderland. The survey was carried out during September 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Northallerton in connection with the Sunderland UDP. This survey supersedes any previous ALC surveys on this land

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 generally under cereal stubble, recently sown winter cereals and oilseed rape, or permanent grass. A number of fields had been recently ploughed in preparation for sowing.

Summary

5. 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.

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
Grade 2	20.1	12.5	12.7
Subgrade 3a	11.5	7.1	7.3
Subgrade 3b	127.0	78.7	80.0
Other land	2.8	1.7	-
Total surveyed area	158.6	-	100
Total site area	161.4	100	-

7. The fieldwork was conducted at an average density of one boring per hectare. A total of one hundred and fifty seven borings and three soil pits were described.

8. Grade 2, very good quality agricultural land, occurs in the north-west of the site. The soils here are well or moderately well drained and consist of light to medium-textured topsoils and subsoils, although gleyed and slowly permeable heavy-textured horizons occur below 60 cm depth in many places. The ALC grade of this land is limited by very slight soil wetness or, where the subsoils are at least moderately stony, very slight soil droughtiness.

Subgrade 3a, good quality agricultural land, also occurs in the north-west. These soils are imperfectly drained, typically consisting of medium-textured topsoils overlying light to medium-textured upper subsoils and, at between 45 cm and 65 cm depth, gleyed and slowly permeable heavy-textured lower subsoils. The grade-limiting factor in this case is soil wetness.

Subgrade 3b, moderate quality agricultural land, covers most of the site. The soils consist of medium-textured topsoils overlying gleyed and slowly permeable heavy-textured subsoils at around 30 cm depth. The profiles are poorly drained and soil wetness is the factor which restricts the land to this subgrade.

Other land on the site consists of buildings and woodland.

Factors Influencing ALC Grade

Climate

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

10. 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 330591
Altitude	m, AOD	40
Accumulated Temperature	day°C (Jan-June)	1317
Average Annual Rainfall	mm	633
Field Capacity Days	days	156
Moisture Deficit, Wheat	mm	97
Moisture Deficit, Potatoes	mm	84

11. 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.

12. 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.

13. The combination of rainfall and temperature at this site means that there is no climatic limitation to ALC grade.

Site

14. The centre and south of the site are level but in the north the topography is more undulating, with slopes of 1-2°. As all slopes on the site are less than 7° there is no limitation on ALC grade. Equally, neither micro-relief nor flood risk limit the ALC grade at any point on the site.

Geology and soils

15. This site is underlain by Upper and Middle Coal Measures over which lie deep deposits of laminated flow till (Pelaw Clay) and, in a few areas, alluvium (BGS Sheet 21, Sunderland). Although the Pelaw Clay generally consists of silty clay, lenses of sandy material occur in parts of the north of the site.

16. The soils on the site have been mapped by the Soil Survey of England and Wales (Sheet 1, Northern England) as belonging to the Foggathorpe 1 association. However, some of the lighter-textured soils in the north of the site appear to correspond to the Arrow association.

Agricultural Land Classification

17. 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.

Grade 2

18. Grade 2, very good quality agricultural land, occurs in the north-west of the site. The soils in this area are well or moderately well drained, falling in Wetness Classes I and II (see Appendix II) and typically consist of medium sandy loam or medium clay loam topsoils overlying medium sandy loam, medium clay loam or sandy clay loam subsoils. In many cases gleyed and slowly permeable horizons of heavy clay loam or clay begin at between 60 cm and 80 cm depth. The ALC grade of this land is limited by very slight soil wetness or, where the upper subsoils are moderately stony, very slight soil droughtiness.

Subgrade 3a

19. Subgrade 3a, good quality agricultural land, also occurs in the north-west. Generally the soils are imperfectly drained, falling in Wetness Class III, and consist of medium clay loam or sandy clay loam topsoils overlying medium sandy loam, medium clay loam or sandy clay loam upper subsoils (which are generally gleyed) and heavy clay loam, clay or silty clay lower subsoils (which are both gleyed and slowly permeable). The lower subsoils begin at between

45 cm and 65 cm depth and soil wetness is the factor which restricts this area of land to Subgrade 3a.

Subgrade 3b

20. Most of the site has been mapped as Subgrade 3b, moderate quality agricultural land. The soils are poorly drained (Wetness Class IV) and typically consist of medium clay loam or heavy clay loam topsoils overlying gleyed and slowly permeable heavy clay loam or clay subsoils at between 25 cm and 35 cm depth. The combination of soil wetness and topsoil workability is the factor which restricts this land to Subgrade 3b.

Other land

21. Land in this category occurs in five small areas across the site and consists of buildings at West Moor Farm, North Moor and Hylton Bridge, and two blocks of deciduous woodland.

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SOURCES OF REFERENCE

British Geological Survey (1978) *Sheet No. 21, Sunderland (Solid and Drift), 1:50,000.* 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.* 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[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years.[2]
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).

[1] The number of days is not necessarily a continuous period.
[2] 'In most years' is defined as more than 10 out of 20 years.