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NORTH-WEST LEICESTERSHIRE
LOCAL PLAN
LAND SOUTH OF EAST
MIDLANDS AIRPORT (Site No 6597)
Agricultural Land Classification
June 1996

Resource Planning Team
Huntingdon Statutory Group
ADAS Cambridge

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AGRICULTURAL LAND CLASSIFICATION

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INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 139.0 hectares at Diseworth. The site is enclosed by the A453 road and East Midlands Airport to the north, the A42 road to the east, the B5401 road to the south and Diseworth village and open farmland to the west.

2. The survey was commissioned by the Land Use Planning Unit (LUPU) of the Ministry of Agriculture, Fisheries and Food (MAFF) in connection with the North West Leicestershire Local Plan. The site was surveyed and mapped in detail in May 1996 by the Resource Planning Team (RPT) of the ADAS Huntingdon Statutory Group, Cambridge. The present report now supersedes previous ALC surveys at the site, notably the provisional 1:63 360 scale ALC map (MAFF, 1971) which showed all the site to be Grade 3.

3. At the time of survey the majority of the site was cereals, ley grassland and permanent grass. Other, non-agricultural, land which was not surveyed includes Hyam's Lane and Long Holden tracks.

4. The land has been classified in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

SUMMARY

5. The land classification was established by a total of 137 soil auger borings (i.e. approximately 1 per hectare) to a depth of 120 cm or to impenetrable stony layers. Subsoil conditions were assessed from four inspection pits and the stone content of the moderately stony soils was established by sieving. The location of the pits and the auger borings is shown on the accompanying Sample Point Map.

6. The results of the ALC survey are summarised in Table 1 and the distribution of the grades and subgrades is shown on the accompanying ALC map. The map is accurate at the scale of 1:10 000 but any enlargement would be misleading.

Table 1: Areas of grades and other land

Grade/Other land	Area (hectares)	% surveyed
3a	15.3	11
3b	121.7	87
Other land	2.3	2
Total agricultural land	137.1	98
Total survey area	139.3	100

7. Most of the site is of moderate (Subgrade 3b) agricultural quality on the basis of moderately severe wetness, topsoil stoniness or gradient limitations. Most of the Subgrade 3b land is associated with slowly permeable clay soils but there are smaller areas of stony, sandy clay loam soils and localised areas where slopes exceed 7° or that have uneven microtopography. Good quality (Subgrade 3a) agricultural land is mapped across the centre of the site, where soils are less stony, less clayey and better drained.

FACTORS INFLUENCING ALC GRADE

Climate

8. Climate criteria are considered first when classifying land because severe climatic limitations will restrict land to low grades irrespective of favourable site or soil conditions. The overall climate itself may affect grading, or grading may be affected through climatic factors interacting with soil properties to influence soil wetness and droughtiness.

9. The main parameters used in the assessment of the overall climate limitation for ALC purposes are average annual rainfall as a measure of wetness and accumulated temperature as a measure of the relative warmth of an area. Estimates of these variables were obtained from the published 5 km grid datasets using the standard interpolation methods (Met. Office, 1989). The results of this analysis are given in Table 2 and show that the combination of rainfall and temperature at the site present no limitation for agricultural use.

Table 2: Climatic and altitude data

Parameter	Value
Grid reference	SK 461 246
Altitude (m, AOD)	75
Accumulated Temperature (day °C, Jan.–June)	1377
Average Annual Rainfall (mm)	651
Field Capacity Days	141
Moisture Deficit, Wheat (mm)	103
Moisture Deficit, Potatoes (mm)	93
Overall Climatic Grade	1

Site

10. The northern part of the site comprises an east-to-west ridge at 80 / 93 m AOD. From this high ground the land slopes southwards and south-westwards towards, respectively, Diseworth Brook and a small tributary near the western edge of the site. The lowest ground is at 53 m AOD in the south, alongside Diseworth Brook. Gradients across the site are usually less than 4° and are therefore not limiting in ALC terms. The exception to this is in the very north-west corner of the site, where slopes of 9° were measured. This land cannot be classified better than Subgrade 3b because such slopes reflect an increasing risk to the safe and efficient operation of certain farm machinery. In the same area, and also in a small area in the south-east near Wood Nook Farm, the ground is hummocky and stony, possibly indicating previous disturbance.

Geology and soils

11. The published 1:50 000 scale geology map (Geol. Survey, 1976) shows the majority of the site to be underlain by Triassic Keuper Red Marl with beds of sandstone and bands of gypsum. The higher land towards the north of the site is shown to be capped by Pleistocene Sand and Gravel and a strip of Recent Alluvium occurs in the south of the site alongside Diseworth Brook.

12. There is no detailed published soils information for the site. The relevant reconnaissance soil map and legend (Soil Survey, 1983) shows the occurrence of three soil associations. Most of the site is mapped as slowly permeable, reddish, clayey soils of the Worcester association, but more loamy soils with a slowly permeable subsoil (Hodnet association) are shown in the north of the site and the alluvium shown adjacent to Diseworth Brook is described as reddish, clayey soils affected by groundwater and with a risk of flooding (Compton association).

13. The detailed survey carried out on the site has identified two distinct soil types. In addition, a small area of very heterogeneous soils occurs across the centre of the site. The most extensive soil type, occurring over the whole southern half of the site as well as in the north-east, is a virtually stoneless, non-calcareous, reddish, clayey soil that is slowly permeable immediately below the topsoil. The topsoil is a brown or dark brown medium or heavy clay loam, or clay, and it overlies, at about 30 cm, a reddish brown or dusky red clay, or heavy clay loam over clay, with gleyed ped faces and prismatic structures. Especially in the north of the site, the lower subsoil may contain discontinuous lenses of greenish grey weathering siltstone or lenses of sandy material. The soil has been assessed as Wetness Class IV.

14. The second main soil type occurs on the highest land in the north-east of the site, around Hyam's Lane, and near Wood Nook Farm in the south-east. A brown sandy clay loam topsoil to 30/35 cm overlies a brown or reddish brown sandy clay loam subsoil. The topsoil typically contains 20-25% small to large rounded pebbles and angular flints, of which more than 15% exceed 2 cm in size. The subsoil is even more stony, containing about 35% flints and pebbles. The soil has been assessed as Wetness Class I.

15. In the north-west of the site and running across the centre, to the south of the aforementioned ridge (paragraph 10), occurs a band of very variable, slightly or very slightly

stony soils. Profiles include deep, brown and yellowish brown, fine loamy soils assessed as Wetness Classes I, II or III depending on the depth and severity of gleying and whether the subsoil is slowly permeable. Also included in this area are loamy over strongly mottled light olive brown loamy over slowly permeable clay profiles (Wetness Class III) and brown, mottled, slowly permeable clays assessed as Wetness Class IV.

AGRICULTURAL LAND CLASSIFICATION

Grades, Subgrades

16. The Agricultural Land Classification of the land is shown on the attached ALC Map and the areas of each subgrade have been given in Table 1. Within any subgrade small areas of land of better or poorer quality may occur but cannot be delineated separately at the scale of survey.

Subgrade 3a

17. Much of the area of heterogeneous soils (paragraph 15) has been mapped as Subgrade 3a. This area contains a mix of predominantly Subgrade 3a with inclusions of Grade 2 land. Wetness is the limitation which primarily determines the grading of the land. The lower subsoil is typically slowly permeable and the upper subsoil is frequently gleyed, resulting in a Wetness Class III assessment. Care will be needed with cultivations to avoid structural damage to the soils. Less gleyed profiles and profiles lacking a slowly permeable subsoil (Wetness Classes I and II) constitute the Grade 2 inclusions in the unit. These profiles are also limited by minor droughtiness. Occasional Subgrade 3b inclusions are associated with the mottled, slowly permeable clays assessed as Wetness Class IV.

Subgrade 3b

18. Most of the site has been mapped as Subgrade 3b, either because of a wetness / workability limitation or because of a stony topsoil or because of gradient / microtopography constraints.

19. The reddish, slowly permeable clay soils (paragraph 13) and the mottled, slowly permeable clays (paragraph 15) have been assessed as Wetness Class IV and suffer from a moderately severe wetness and workability limitation. The land is likely to be intractable for considerable periods during the wetter parts of the year and cultivations and harvesting, therefore, will need to be carefully controlled to prevent serious structural damage to the soils, thereby affecting the range of crops that can be successfully grown.

20. The stony soils in the north-east of the site (paragraph 14) and near Wood Nook Farm suffer from a high topsoil stone content. Topsoil stones larger than 2 cm exceed 15% and act as a moderately severe impediment to cultivation, harvesting and crop growth and restricts this land to a Subgrade 3b classification.

21. The land in the north-west corner of the site with slopes above 7° and the uneven ground in the vicinity of Wood Nook Farm is classified as Subgrade 3b. Gradients and microtopography here present moderately severe limitations to the safe and efficient use of certain farm machinery.

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SOURCES OF REFERENCE

GEOLOGICAL SURVEY OF GREAT BRITAIN (1976) *Sheet 141, Loughborough, Solid and Drift edition, 1:50 000 scale.*

MAFF (1971) *Agricultural Land Classification Map, Sheet 121, Provisional, 1:63 360 scale.*

MAFF (1988) *Agricultural Land Classification of England and Wales. Revised Guidelines and Criteria for Grading the Quality of Agricultural Land.* MAFF: London.

METEOROLOGICAL OFFICE (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

SOIL SURVEY OF ENGLAND AND WALES (1983) *Soils of England and Wales, Sheet 3, Midland and Western England, 1:250 000 scale map and legend.* Soil Survey of England and Wales: 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.