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STATEMENT OF PHYSICAL CHARACTERISTICS

LAND AT FIFIELD, BERKSHIRE

Reconnaissance Survey

STATEMENT OF PHYSICAL CHARACTERISTICS

LAND AT FIFIELD, BERKSHIRE - RECONNAISSANCE SURVEY

1. BACKGROUND

1.1 The site lies to the north-east of Bracknell and to the south of Maidenhead in Berkshire, being located approximately mid-way between these two settlements. The A330 passes to the west of the site, south of Braywood side. The site is bounded by woodland to the east, south and partially to the south-west. A minor road marks the northern boundary and the western boundary comprises field drains and a farm track.

1.2 The area was surveyed on 28th November 1990 using 110 cm and 120 cm Dutch soil augers, with samples being taken at approximately 200 m intervals. In addition one soil inspection pit was examined to allow more detailed soil description.

Land-use

1.3 At the time of survey the site was under oilseed rape.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

2.1 The altitude of the site varies between 40m A.O.D. and 60 m A.O.D. with the highest land occurring towards the south of the area and falling north towards a drain through the centre of the site. In the far south-western part of the site, gradients of 7.5°-8.5° represent a limitation to agricultural land-use, although across much of the area gradient is not a significant factor in terms of land quality.

Climate

2.2 Estimates of climatic variables were obtained by interpolation from a 5 km grid database (Met. Office, 1989) for a representative location in the survey area.

Climatic Interpolation

Grid Ref.	SU 48871745
Altitude (m)	45
Accumulated temperature, (° days, Jan-June)	1467
Annual average rainfall (mm)	662
Field capacity days	139
Moisture deficit, wheat (mm)	115
Moisture deficit, potatoes (mm)	109

2.3 The important parameters in assessing an overall climatic limitation are, average annual rainfall, (a measure of overall wetness) and accumulated temperature, (a measure of the relative warmth of a locality). Although average annual rainfall is relatively low in both regional and national terms, there is no overall climatic limitation affecting the land quality of this site.
However, climatic factors do affect interactive limitations between soil and climate, namely soil wetness and droughtiness.

Geology and Soils

2.4 British Geological Survey, Sheet 269, Windsor, (1981) shows the site to be underlain by Tertiary London Clay deposits.

2.5 Soil Survey of England and Wales, Soils of Berkshire, (1975), shows the site to comprise one mapping unit - the Wickham association. These soils are described as 'typical stagnogley soils which are clayey or loamy over Eocene clays with impeded drainage at moderate depths by an impermeable layer.

2.6 Detailed field examination broadly confirms this with one soil type being identified on the site.

2.7 Profiles typically comprise heavy clay loam or heavy silty clay loam, or occasionally medium clay or medium silty clay topsoils, overlying gleyed and slowly permeable (medium or heavy), clay or silty clay in the subsoil. Gleying is commonly evident between 15 and 35 cm depth and becomes more pronounced with depth. These soils are poorly drained due to the impermeable nature of the underlying clay and are thus assigned to wetness class IV. The soils are generally free of stones and non-calcareous.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The ALC grading of the survey area is primarily determined by interactions between climate and soil factors, notably wetness. ALC grade 3b has been mapped as indicated below:

	Area (ha)	% of total agricultural land
Grade 3b	24.95	100
Non-Ag.	0.4	
Total area	25.35	

3.2 Appendix 1 gives a general description of the grade identified in this survey.

3.3 The entire site has been graded as 3b.
The soils typically have heavy clay loam or heavy silty clay loam, or occasionally medium clay or medium silty clay topsoils which are stonefree and non-calcareous. These overlie clay subsoils which have (medium or heavy) clay or silty clay textures and which are gleyed and slowly permeable. The slow permeability of these subsoils causes them to be poorly drained as evidenced by prominent mottling and gleying from about 15-35 cm depth. Such poor drainage status results in these soils being assigned to wetness class IV.

The primary limitation to agricultural land-use on this site is soil wetness resulting from the combination of climatic conditions, soil water regime and soil textural characteristics at this locality. The land will have workability and cultivation restrictions.

A small area towards the far south-western part of the site is also limited by gradient, having slopes of 7.5-8.5°, but this is not significant across the majority of the site.

4. SOIL RESOURCES

Soil Units: Consideration for Restoration

4.1 Topsoils and subsoils on the site can be allocated to one unit as described below. It is emphasized that these descriptions are merely an illustration of the soil resources which are available for restoration, and should not necessarily be viewed in terms of soil stripping. Soils were sampled to a maximum depth of 100-120 cm; useful soil forming materials may extend below this depth.

4.2 Topsoil

This comprises an average 26.4 cm, (with a range of 15-32 cm), of brown, (10YR 4/3 and 5/3), heavy clay loam, heavy silty clay loam, or occasionally, (medium), clay or silty clay. Topsoils are generally free of stones and non-calcareous.

4.3 Subsoil

The unit comprises a minimum of 93.6 cm, (with a range of 88-105 cm) of dominantly grey, (10YR 5/1, 6/1, 5/2 and 6/2), and ochreous, (10YR 5/6 and 5/8 or 7.5YR 5/6, 5/8 and 6/8), medium or heavy clay or silty clay. These subsoils are slowly permeable and have imperfect drainage as evidenced by prominent mottling and gleying throughout. Profiles are typically non-calcareous and stonefree, or occasionally very slightly gritty.

These soils have poor structure being composed of strongly developed coarse and very coarse angular blocky peds tending to strongly developed coarse and very coarse prismatic peds below about 40-60 cm. The peds have a firm consistence and poor porosity, having <0.5% biopores >0.5 mm.

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SOURCES OF REFERENCE

BRITISH GEOLOGICAL SURVEY (1981), Sheet 269, Windsor

MAFF, (1988) Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

METEOROLOGICAL OFFICE, (1989). Climatological datasets for agricultural land classification.

SOIL SURVEY OF ENGLAND AND WALES (1975) Soils of Berkshire.

SOIL SURVEY OF ENGLAND AND WALES (1983), Sheet 6 - Soils of South-East England.

APPENDIX 1

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 and horticultural crops can usually be grown but on some land in the 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.

Grade 3 – good to moderate quality agricultural land

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

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: golf courses, private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six revised soil wetness classes (Hodgson, in preparation) are identified and are defined in Table 11.

Table 11 Definition of Soil Wetness Classes

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 not wet within 40 cm depth for more than 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 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 and 90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years *or*, if there is no slowly permeable layer 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.

[1] The number of days specified is not necessarily a continuous period.

[2] 'In most years' is defined as more than 10 out of 20 years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.