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STATEMENT OF PHYSICAL CHARACTERISTICS

OLD KILN FARM, CHIEVELEY, NEWBURY

MAFF Ministry of Agriculture Fisheries and Food

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1. INTRODUCTION

1.1 This report is based on MAFF survey work originally undertaken in November 1983 in connection with an earlier application on approximately 30 ha of land in the same locality. The ALC grading has been updated to take account of the smaller site area (now 18·22ha)*1 and the revision of the ALC system (MAFF, 1988). Data supplied by the applicants agricultural consultants*2 has also been used to assist with the preparation of this statement.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1

Average Annual Rainfall	701 mm
Accumulated Temperature	1389 days ^{o}C above 0^{o}C
Field Capacity	151 days
Moisture Deficit - wheat	102 mm
- potatoes	93 mm

(Source : Met. Office, 1989)

Relief

2.2 Altitude over the site is about 110-120m AOD with the highest land to the north and east of the site. Gradients are gentle and do not exceed 5^{o}.

Geology and Soils

2.3 The site has been mapped by the Geological Survey of England and Wales (Sheet 267 - Hungerford) and is shown as comprising Reading Beds (mottled clays and sand) over Upper Chalk.

2.4 Published Soil Survey information at 1:250,000 scale (SSEW, 1983) indicates the Wickham 3 Soil Association being found in the general vicinity of the site. This is described as "Slowly permeable seasonally waterlogged fine loamy over clayey and coarse loamy over clayey soils, and similar more permeable soils with slight waterlogging. Some deep loamy soils affected by groundwater" (SSEW 1983).

2.5 Detailed inspection of the site indicates that deep coarse loamy and loamy over clayey soils predominate on the site. Soils typically comprise sandy loam topsoils over either a similar or increasingly coarser textured subsoil sometimes overlying sandy clay loams at depth. Towards the eastern side of the site subsoils (and occasionally topsoils) have a significantly higher clay content either immediately below the topsoil or within 40-50 cm. Droughtiness and wetness limitations either singly or in combination form the main limitations to agricultural use.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 A provisional ALC plan is attached to this report indicating a review of the original (1983) grades in the light of the revised guidelines and criteria for the assessment land quality (MAFF, 1988; see also para. 1.1). This plan cannot be absolutely definitive since

*2 Reading Agricultural Consultants

*1 Excavation area only.

insufficient soil information is available. A breakdown of the grades, as mapped, in terms of area and extent is given below:-

Grade	ha	%
2	9·43	56
3a	6·27	37
3b	1·15	7
Non-Ag		
Not Surveyed	1·37	
Total		100

Grade 2

3.2 Land of this quality is extensive over the site and comprises deep well drained (wetness Class 1) very slightly stony soils of predominantly sandy loam texture in the upper profile over either coarser textured loamy sands and sands or clay loams and clays. The main limitation is one of droughtiness caused by the high sand content of these soils. Some individual profiles within the grade 2 mapping unit are of grade 1 quality.

Grade 3a

3.3 Land graded 3a is mainly limited by droughtiness, typically comprising medium sandy loams and loamy sands in the upper profile over loamy sand, sand and coarse sands below. Occasional profiles within the 3a mapping unit are limited by wetness. These profiles comprise sandy clay loams over a gleyed clayey substratum below about 40 cm depth.

Grade 3b

3.4 Land of this quality is relatively limited in extent and occuring in the south west corner of the site. Soils typically clay loam and sandy clay loam topsoils over gleyed and slowly permeable (wetness Class IV) clay loams and clays. Wetness and workability restrictions are the main limitation to agricultural use.

4. SOIL RESOURCES

4.1 Soil resources on the site can be divided into 2 broad groups. Firstly are those soils which are deep coarse loamy and sandy in nature, and secondly those having a finer texture, namely sandy loams and sandy clay loams overlying clays and clay loams. The plan produced for the original 1983 application (attached) illustrates these two broad groupings over an area which includes the current application. Type 1 represents the heavier soil types with type 2 the coarser loamy and sandy soils.

4.2 The soil pit descriptions reproduced below are typical of the soils found on the site.

SOIL PROFILE PIT DETAILS

Grid Reference: 4842/7225

Pit Number: 1

Land Use: Cereals

Relief and Aspect: Level

Soil Profile Description:

Depth	
0-30 cms	Brown (10 YR 5/3) silty clay loam; mottles in root channels; medium subangular blocky structure; < 2% small stones; pH 7.0*; earthworms.
30-90 cms	Brownish yellow (10 YR 6/6) clay with grey (5Y 7/1) patches and distinct ochreous mottles (7.5 YR 5/8); medium subangular blocky to massive structure; no stones; pH 7.0*

Grid Reference: 4857/7282

Pit Number: 2

Land Use: Grass

Relief and Aspect: Gently sloping - south - south west aspect

Soil Profile Description:

Depth	
0-30 cms	Brown (10 YR 4/3) sandy loam; no mottles seen; weakly developed medium subangular blocky structure; < 2% small stones; pH 7.0*; many roots and earthworms.
30-75 cms	Strong brown (7.5 YR 5/6) sandy loam (with loamy sand and sandy clay loam); no mottles seen; medium subangular blocky structure; roots penetrating to depth.

* pH estimated using universal indicator in the field.

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SOURCES OF REFERENCE

GEOLOGICAL SURVEY OF ENGLAND + WALES ( )
GEOLOGICAL MAP SHEET NO. 267, HUNGERFORD

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

METEOROLOGICAL OFFICE (1989) Climatological Datasets for Agricultural Land
Classification.

APPENDIX I

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.

APPENDIX II

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.