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**PROOF OF EVIDENCE**  
**AGRICULTURAL LAND**  
**CLASSIFICATION**  
**LAND AT KENNETT**  
**CAMBRIDGESHIRE**

TOWN AND COUNTRY PLANNING ACT 1990

LAND AT KENNETT, CAMBRIDGESHIRE

PUBLIC INQUIRY

PROOF OF EVIDENCE

BY

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ON BEHALF OF

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD

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RESOURCE PLANNING TEAM  
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## **1.0 INTRODUCTION**

1.1 My name is Sarah Escott. I am a consultant for the Huntingdon Statutory Centre of ADAS. I have a BSc (Honours) Degree in Ecological Science awarded by the University of Edinburgh. I have been employed by the Ministry of Agriculture, and latterly ADAS, for eight years working in the Cambridge area. Throughout this time a large proportion of my work has been concerned with the classification of agricultural land for land use planning purposes.

## **2.0 PLANNING CONSULTATION**

2.1 I am attending this inquiry at the request of the Ministry of Agriculture, Fisheries and Food to provide information on agricultural land quality at Kennett, Cambridgeshire. The results of this survey are contained in this proof (sections 3.0 to 7.0) with a summary in section 8.0.

## **3.0 THE MAFF AGRICULTURAL LAND CLASSIFICATION SYSTEM**

3.1 The MAFF Agricultural Land Classification (ALC) system assesses land quality based on its long term physical potential. Land is assigned to an ALC grade according to the degree to which its inherent physical characteristics impose long term limitations on agricultural use.

3.2 The main physical factors which are taken into account in assessing ALC grade are climate, site and soil. These may act singly, or in combination to result in varying degrees of constraint on agricultural production. The ALC grade is determined by the most limiting factor present.

3.3 Five main grades of land are recognised ranging from grade 1 land of excellent quality to grade 5 land of very poor quality. Other issues, such as the location of farms, the standard of fixed equipment and the accessibility of land do not affect grading although they may influence land use decisions. The definitions of the five ALC grades are included in Annex 1.

## **4.0 BACKGROUND TO THE SITE**

4.1 This 188.9 hectare site was inspected during May and June 1991. Recently in November 1992 an additional area to the north west was surveyed following a

revision of the application area. A total of 194 soil inspections were made on site supplemented by information from eight soil inspection pits. At the time of the survey the land was under arable cropping which included cereals, sugar beet, potatoes and daffodils.

- 4.2 On the provisional 1 inch to 1 mile published ALC map sheet 135 (MAFF 1971), the area is shown as mainly grade 3, with a narrow strip of grade 4 along the northern boundary. Since this map is of a reconnaissance nature designed primarily for strategic planning purposes, the current survey was undertaken to provide more detailed information on land quality for the site.

## 5.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

### Climate

- 5.1 Site specific climate data has been obtained by interpolating information contained in the 5 km grid dataset produced by the Meteorological Office (Met Office, 1989).
- 5.2 This shows that the Kennett area has an average annual rainfall of approximately 585 mm (23.8"), which is low by national standards. Soils are at field capacity for a relatively short period of about 106 days.
- 5.3. The accumulated temperature for this area is approximately 1425° Celsius. This parameter gives an indication of the cumulative build up of warmth and in conjunction with rainfall influences the development of soil moisture deficits (SMD)\* and hence susceptibility to drought. The soil moisture deficits for wheat and potatoes are calculated as 117 mm and 112 mm respectively.
- 5.4. These climatic characteristics do not impose any climatic limitations on the ALC grading of the site.

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\* SMD represents balance between rainfall and evapotranspiration which occurs during the growing season. For ALC purposes the SMD's developing under a winter wheat and maincrop potato cover are considered. These "reference" crops have been selected because they are widely grown and in terms of their susceptibility to drought, are representative of a wide range of crops.

## Altitude and Relief

- 5.5. The land forms a gently undulating plateau area between the A11, A45 and B1085 roads. Within the plateau (altitude range 26-28m AOD) a shallow valley feature runs northwards from Halfmoon Plantation. Gradient and altitude do not constitute limitations to the ALC grade.

## **6.0 GEOLOGY AND SOILS**

- 6.1. The published 1:50,000 scale drift edition geology map sheets 188 and 189 show the survey area to comprise mainly Middle Chalk with fourth terrace gravel deposits along the northern edge of the site. In addition a small area of boulder clay is shown to the west of Dane Hill and an area of Head deposits is shown towards the south western corner of the site.
- 6.2. The Soil Survey of England and Wales have mapped the area on two occasions firstly, in 1971, at a scale of 1:63,360 and secondly, in 1983, at a reconnaissance scale of 1:250,000. These maps broadly agree and indicate that the soils on site are likely to be derived mainly from Chalk deposits. The current detailed survey identified four main soil types.
- 6.3. To the south east chalk rubble derived soils predominate. Profiles are freely draining (Wetness Class I) and droughty. Typical profiles comprise deep, very slightly or occasionally slightly stony medium sandy loam topsoils which overlie rootable chalky subsoils. At depth the subsoils are commonly impenetrable to roots.
- 6.4. To the south west and through the centre of the site deeper chalk derived soils predominate. Consequently the soils are less droughty. Typical profiles comprise very slightly stony medium sandy loam topsoils over similar upper subsoils which merge into rootable chalk material at depth.
- 6.5. Adjacent to the northern edge of the site and south of Dane Hill lighter textured and/or stonier non chalky soils outcrop. They are freely draining and typically significantly droughty. In general profiles comprise very slightly to moderately stony medium sandy loam topsoils over sandy subsoils. Heavier textured subsoil lenses (ie. sandy clays or sandy clay loams) may be encountered at depth.

- 6.6. The fourth soil type identified is better bodied, less droughty and typically less stony than the soils described in paragraph 6.5. These profiles occupy small areas, typically in the western half of the site, and generally comprise very slightly to slightly stony medium sandy loam topsoils over similar subsoils. Similar to the soils described in paragraph 6.5 heavier textured lower subsoil lenses may be encountered at depth.

## **7.0 AGRICULTURAL LAND CLASSIFICATION (refer to ALC map, C39)**

- 7.1. The definition of the Agricultural Land Classification (ALC) grades are included in Annex 1. The site is mainly graded 2 and 3a, with smaller areas of 3b and Non Agricultural land. A full description of the ALC grades mapped on site is provided in paragraphs 7.3 to 7.9.

### Irrigation

- 7.2 The entire site, except a small area to the south of the A45 road, is irrigated. The irrigation facility enhances the potential of the agricultural land (on site) for crop production. Consequently the ALC grades mapped take into account the reduction in drought risk afforded by the irrigation.

### Grade 2

- 7.3 To the south west and through the centre of the site the land is shown as grade 2. The majority of this land is associated with the soils described in paragraph 6.4. A few borings of the soil described in paragraph 6.6 are also found in this area.
- 7.4 The availability of irrigation water enhances the water available for crop growth in these chalk derived soils and as a result profiles are slightly droughty. Locally topsoil stone content (>2cm size) may also limit the land to grade 2. Slight droughtiness (and occasionally topsoil stone content) is the main limitation to the ALC grade.

### Subgrade 3a

Two main situations occur.

- 7.5 The area towards the south east of the site is mainly associated with the shallower chalk derived soils described in paragraph 6.3. Regular irrigation enhances the water

water holding capacity of these drought prone soils and as a result the land has been graded 3a.

- 7.6 The remaining area of land graded 3a, located in the north west, is mainly associated with the less stony variant of the soil described in paragraph 6.5. This area is also associated with the slightly stonier variant of the soils described in paragraph 6.6. The reduced drought risk afforded by irrigation within the area results in the land being mapped as grade 3a (good quality agricultural land). Moderate droughtiness restrictions are the chief limitation to the ALC grade. Locally topsoil stone (>2cm) may also prevent this land from being a higher grade.
- 7.7 Within the subgrade 3a areas less droughty individual borings of grade 2 were encountered. However, these borings are isolated and sporadically located, therefore it is not possible to delineate them separately at this survey scale.

#### Subgrade 3b

- 7.8 The three small areas of subgrade 3b land are associated with the stony, light textured soils described in paragraph 6.5. In these areas the topsoil stone content (<2cm) is the main limitation to the ALC grade. A relatively high topsoil stone content can increase production costs by causing extra wear and tear to farm implements and tyres. Stones may also impair crop establishment and reduce the nutrient capacity of the soil. Consequently these areas have been graded 3b.

#### Non Agricultural

- 7.9 Woodland has been mapped as Non Agricultural land.

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## 8.0 SUMMARY: AGRICULTURAL LAND CLASSIFICATION

Land at Kennett (refer to Agricultural Land Classification Map, C39)

- 8.1 The site is predominantly graded 2 and 3a, with smaller areas of 3b and Non Agricultural land. A breakdown of land quality in hectares and percentages is provided below.

AGRICULTURAL LAND CLASSIFICATION		
Grade	ha	%
2	70.0	37
3a	100.0	53
3b	11.4	6
Non Agricultural	<u>7.5</u>	<u>4</u>
TOTAL	<u>188.9</u>	<u>100</u>

- 8.2 Details of the MAFF agricultural land classification system, the methodology used and the chief limitations to agricultural land quality are provided in sections 3.0 to 7.0 of this proof.

## REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1981 & 1982). Solid and Drift geology map sheets 188 and 189, Scale 1:50,000.

MAFF (1988). Agricultural Land Classification of England and Wales. Revised Guidelines and Criteria for Grading the quality of Agricultural Land. Alnwick.

METEOROLOGICAL OFFICE. Data extracted from the published agroclimatic dataset.

SOIL SURVEY OF ENGLAND AND WALES (1971). Soils of Cambridge and Ely, Sheet 135, Scale 1:63,360.

SOIL SURVEY OF ENGLAND AND WALES (1983). Map entitled 'Soils of Eastern England'. Sheet 4, 1:250,000 Scale.

## **ANNEX 1**

### **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 include 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 crops. The level of yields 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 winter 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 levels of yields. It is mainly suited to grass with occasional arable crops (eg. cereals and forage crops) the yield of which are variable. In most 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.