

AGRICULTURAL LAND CLASSIFICATION

Berkshire Minerals Plan
Water Oakley, Site 18.



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BERKSHIRE MINERALS PLAN - SITE 18

LAND AT WATER OAKLEY

1. BACKGROUND

- 1.1 In April 1991 a survey of 45.3 ha of land at Water Oakley, near Maidenhead, Berkshire was carried out. This was in response to a request by Berkshire County Council in connection with the Berkshire Minerals Plan.
- 1.2 The site was surveyed using 120 cm Dutch soil augers with sampling densities of approximately 1 per 100 m intervals across the site, on a grid basis. In addition soil pits were inspected to enable more detailed soil descriptions.

Land-use

- 1.3 At the time of survey the land was predominantly under cabbage with smaller areas of permanent grass, cereals and nursery trees. A small area towards the north east was under plastic sheeting and was not surveyed.
- 1.4 Irrigation water is currently available from the River Thames. Correspondence with the National Rivers Authority (Thames Region) indicates that the abstraction licence permits sufficient quantities of water to be abstracted for intensive horticultural cropping of the whole site.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

2.1 Relief

The site lies between 23 and 27 m AOD, falling very gently to the east. Gradient is not a significant limitation on this site.

2.2 Climate

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 Reference	SU 917 774
Altitude (m, AOD)	25
Accumulated Temperature (°days, Jan - June)	1488
Average Annual Rainfall (mm)	665
Field Capacity Days	139
Moisture Deficit Wheat (mm)	117
Moisture Deficits Potatoes (mm)	112

- 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 a national context, 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 The British Geological Survey, Sheet 269, Windsor (1981) indicates that the site is underlain by River Terrace Deposits, namely Flood Plain Gravels, recent drift deposits from the Quaternary Period.

- 2.5 The Soil Survey of England and Wales, Sheet 6 (1983) Soils of South East England, shows the site to comprise soils of the Sutton 2 Association. These are described as "well drained, often stony, loamy typical argillic brown earths, usually over gravel at moderate depths." (SSEW 1984).
- 2.6 Detailed field examination indicated that there were three broad soil types across the site.
- 2.7 The most widespread soil type consists of a non calcareous, slightly or non flinty (0-5% v/v flints), sandy clay loam, medium clay loam or occasionally heavy clay loam topsoil, which passes to sandy clay loam, medium or heavy clay loam upper subsoils, (often gleyed), over gleyed and slowly permeable sandy clay or clay subsoils at about 30 to 75 cm. The subsoils are slightly flinty, (less than 5%), but this often increases in the lower subsoil to about 40%. Gravel may be found below 60 cm. The soils are assigned to wetness classes II-IV, depending on the depth to gleyed or slowly permeable subsoil.
- 2.8 The second group of soils were found across the north of the site, east of Guild House, and comprise very slightly calcareous, stoneless medium silty clay loam or medium clay loam topsoils. These pass to gleyed, medium silty clay loam or fine sandy silt loam upper subsoils, which contain calcareous fragments. The soil is slightly heavier below 50 cm with gleyed, calcareous, medium or heavy clay loam and heavy silty clay loam textures. Slowly permeable sandy clay or clay subsoils may occur below about 90 cm. These soils are typically assigned to wetness class II.
- 2.9 The third group of soils are predominantly sandy and occur in localised areas towards the centre of the site, and typically comprise non or slightly calcareous medium clay loam or sandy clay loam topsoils, over sandy clay loam, which may be gleyed in the upper subsoil. These overlie sandy loam or sandy clay in the lower subsoil. Profiles may become impenetrable, (to soil auger), due to gravels at depth. These soils are assigned to wetness class I and II.

3. AGRICULTURAL LAND CLASSIFICATION

- 3.1 The ALC grading of the site is primarily determined by interactions between climate and soil factors, namely wetness and droughtiness. However the availability of irrigation water was considered to be an important factor in grading some areas of land at this site.
- 3.2 The extent and relative proportions of the ALC grades and subgrades are as follows:

<u>Grade</u>	<u>Area (ha)</u>	<u>% of total agricultural area</u>
2	23.82	55
3a	4.58	11
3b	14.6	34
Not Surveyed	2.3	
Total Agricultural Area	43.0	
Total Area Surveyed	45.3	

- 3.3 Appendix 1 gives a generalised description of the grades and sub-grades which occur.

Grade 2

- 3.3 This grade occupies approximately 55% of the site. Profiles of all three soil groups described in sections 2.7-2.9, were found to occur within this grade.

Soil wetness and/or droughtiness are the principal limitations that cause profiles to be assigned to grade 2. Slowly permeable subsoils were present below 55 cm in a number of profiles with associated gleyic features below about 40 cm. As a result these soils are assigned to wetness class II. Some profiles were found to contain slowly permeable horizons but were gleyed above 40 cm indicating slightly imperfect drainage. Wetness class II is thus appropriate.

Profiles that were not affected by a soil wetness limitation were limited by droughtiness, either through shallow soil depths (due to impenetrable gravel horizons below 80 cm), subsoil stoniness, poorly structured subsoils or subsoil textures, such as sandy loams which have relatively low available water capacities for plant growth. Many of these soils therefore are slightly droughty. However, where drought risk is the principal limitation, it can be partially off set by the availability of adequate irrigation water. In this case land graded 3a which is affected principally by drought may be upgraded to 2 as a result of additional soil moisture reserves affected by irrigation water.

Grade 3a

- 3.4 Land of this quality occupies 11% of the site. Profiles principally comprise soil groups described in section 2.7 and 2.9.

Soil wetness is the main limitation to land in this grade. Evidence of soil drainage imperfections (ie mottling and gleying) are found in many of the profiles above 40 cm and a slowly permeable horizon of sandy clay or clay occurs between about 35 and 56 cm. Wetness Class III is thereby assigned to these profiles.

Occasional profiles were found to be principally limited by droughtiness as a result of gravelly horizons occurring towards the base of the profile between about 60 cm and 95 cm, thus limiting the available water of the soil for plant requirements. This land can not be graded any higher than 3a.

3.5 Grade 3b

This grade comprises approximately 34% of the site. The soils are predominantly those described in section 2.7.

Soil wetness is the major limitation to land in this grade. Drainage imperfections caused by slowly permeable clay horizons below about 37 cm result in the allocation of these profiles to wetness class IV. This land cannot be graded higher than 3b.

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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 (1988) Climatological datasets of agricultural land classification.

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

SOIL SURVEY OF ENGLAND AND WALES (1984), Soils and their use in South East England, Bulletin 15.

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.