

AGRICULTURAL LAND CLASSIFICATION
BERKSHIRE MINERALS PLAN
SITE 19 HORTON

1. BACKGROUND

- 1.1. The 92.2 hectare site lies to the north east of Windsor and to the south west of Slough,. It is bounded to the north by residential housing, to the east by Colne Brook and to the south partially by a farm track and partially by farm buildings. The western boundary is formed by Horton Road, adjacent to the Queen Mother Reservoir.
- 1.2. The site was surveyed in July and October 1991 using 120 cm Dutch soil augers with samples being taken at approximately 100 m intervals across the site. In addition two soil pits were examined to enable more detailed soil descriptions.

1.3. Land-use

At the time of survey the site was under wheat, oil seed rape and horticultural crops (ie Potatoes, cabbage and beetroot), with a small area towards the north east under grass.

- 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

Relief

- 2.1. The altitude of the site is approximately 20m AOD. Nowhere on the site does gradient or altitude represent a significant limitation to agricultural 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 Reference	TQ 019 765
Altitude m A.O.D.	20
Accumulated temperature (°days Jan-June)	1492
Annual average rainfall (mm)	664
Field capacity days	137
Moisture deficit wheat (mm)	118
Moisture deficit potatoes (mm)	114

- 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 the 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 Flood-plain Gravels with a small area towards the west underlain by Alluvium.
- 2.5. The Soil Survey of England and Wales, Sheet 6 Soils of South east England, (1983) shows the site to comprise soils of the Waterstock Association. These are described as "fine loamy gleyic argillic brown earths with ochreous mottling in the subsoil" (SSEW, 1984).
- 2.6. Detailed field examination of the soil indicates that there are two broad soil types.
- 2.7. The first group of soils occur throughout most of the site. Profiles typically comprise medium or heavy clay loam topsoils over similar textures, or medium clay between about 38 and 58 cm. Mottling and Gleying (evidence of impeded drainage), frequently occur in, or immediately above the clay, indicative of its slow permeability. These soils are assigned to wetness class II and III accordingly.

Occasional profiles were found to be impenetrable (to soil auger due to gravelly horizons between c.32-100 cm.

- 2.8. The second group of soils, were located towards the east of the site. Profiles typically comprise medium clay loam topsoils, over slowly permeable clay below 25 cm. Evidence of imperfect drainage in the form of gleying, frequently occurs in, or immediately above the clay, indicative of its slow permeability. These soils are appropriately assigned to wetness class IV.

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. In accordance with criteria for grading agricultural land (MAFF 1988). The availability of irrigation water has been taken into account (see para 1.4). The extent to which the grading has been modified in this way is not considerable, mainly because much of the land also has a slight wetness limitation, which prevents it from rising into a higher grade, despite the availability of adequate soil moisture reserves. Where drought risk is the principal limitation it may be partially off set by the availability of adequate irrigation water, and is thus reflected in the grading of this site, albeit to a limited extent.
- 3.2. ALC grades 2, 3a, 3b and 4 have been mapped and a break down of these grades in terms of area and extent is given.

<u>Grade</u>	<u>Area (ha)</u>	<u>% of total agricultural land</u>
2	12.8	14
3a	57.6	63
3b	16.7	18
4	4.3	5
Non Agricultural	0.5	
Urban	0.3	
Total Agricultural Area	91.4	
Total Area of the site	92.2	

- 3.3. Appendix 1 gives a generalised description of the grades and subgrades identified in this survey.

Grade 2

- 3.4. Grade 2 land on this site occurs in two situations. Firstly, towards the north of the site profiles typically comprise medium clay loam topsoils over heavy clay loam or medium clay in the subsoil with c. 1-2% v/v angular flints throughout. Profiles commonly become impenetrable (to soil auger) due to gravelly horizons between about 55 and 100 cm.

Land is assigned to this grade as a result of slight drainage imperfections caused by a slowly permeable clay horizon in the lower subsoil. Such profiles qualify for wetness class II. This land may also be prone to a slight droughtiness limitation as a result of the depth over the underlying geology.

Secondly soil profiles across the remaining area grade 2. Typically comprise medium or heavy clay loam topsoils, over heavy clay loam subsoils, which become impenetrable (to soil auger) due to gravelly horizons between about 40 and 66 cm. Typically these soils are well drained (wetness class I), although occasional profiles were found to have slowly permeable lower subsoils, thereby being assigned to wetness class II, as a result of slightly imperfect drainage.

The main limitation to this land is droughtiness due to these profiles becoming impenetrable at relatively shallow depths over gravelly horizons. This limitation is partially overcome as a result of the availability of irrigation water, which increases the soil moisture reserves, and results in these profiles being eligible for grade 2 when they would normally be graded 3a in the absence of adequate irrigation water.

- 3.5. Grade 3a

Land of this quality is mapped across the majority of the site. Profiles typically comprise medium or heavy clay loam topsoils with c. 1-3% v/v angular flints, over similar textures in the subsoil or slowly permeable clay between about 38-58 cm. These soils are assigned to wetness class II and III depending on the depth of gleyic features, and slowly permeable horizons. Commonly these profiles become impenetrable (to soil augers between about 40 and 80 cm due to gravelly horizons.

Occasional profiles were gleyed at various depths, but there were no slowly permeable horizons present, and they were thus assigned to wetness class I or II.

Land is assigned to this grade as a result of slight wetness, workability and/or droughtiness limitations. In this situation considerable drought problems may be partially off-set by the availability of irrigation water. Thus enabling some profiles to be eligible for grade 3a, where they would not otherwise have been. However where slight wetness limitations occur, in addition to droughtiness the availability of irrigation water is not a significant factor. Consequently these profiles have not been upgraded.

3.6. Grade 3b

Land of this quality is mapped as three mapping units across the centre of the site. Profiles typically comprise medium and heavy clay loam topsoils with c. 1-2% v/v flints over similar textures or medium clay in the subsoil, which becomes impenetrable (to soil auger) due to gravelly horizons between about 45 and 92 cm. All profiles exhibit strong evidence of gleyic features (usually within 42 cm of the surface) and are typically slowly permeable within 48 cm. They are thus assigned to wetness class III and IV.

Land is placed in this grade as a result of wetness and workability limitations. Although the additional limitation of slight droughtiness may be offset by the availability of irrigation water, the drainage imperfections are such, as to prevent the land rising to a higher grade.

3.7. Grade 4

Land of this quality occurs in a small block towards the east of the site. Profiles typically comprise medium clay loam topsoils over medium clay or sandy clay becoming impenetrable (to soil auger) due to gravel horizons between 65 and 78 cm. Occasional profiles were found not to be impenetrable over gravelly horizons, and comprise clay to depth. All profiles exhibit strong evidence of gleying (usually within 28 cm of the surface) and are typically slowly permeable within 28 cm. They are thus assigned to wetness class IV.

A combination of wetness and workability impose a limitation upon this land. However the land is assigned to grade 4 on the basis of high, groundwater and/or slow permeability. It is thought that under drainage is unlikely to be effective due to lack of sufficient outfalls. As a result grade 4 is considered appropriate.

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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 No 6. Soils of South east England.

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