AGRICULTURAL LAND CLASSIFICATION
OXFORDSHIRE MINERALS PLAN
LAND SOUTH OF A40, WITNEY

RESOURCE PLANNING TEAM
GUILDFORD STATUTORY GROUP
ADAS READING

ADAS Ref: 3302/93/92
MAFF Ref: EL33/00017

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1. SUMMARY

1.1 In October 1992, an Agricultural Land Classification (ALC) survey was carried out on approximately 56 ha of land to the south-east of Witney, Oxfordshire. ADAS was commissioned by MAFF to determine the quality of land affected by proposals to include this site in the Oxfordshire Minerals Plan.

1.2 The survey was undertaken at a semi-detailed level of approximately one boring per 2 hectares. A total of 43 borings and 2 soil inspection pits was described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land, (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long term limitations to its agricultural use.

1.3 The distribution of the grades and sub-grades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement may be misleading.

Table 1 : Distribution of Grades and Sub-grades

Grade	Area (ha)	% total agricultural land
2	2.62	5
3a	13.10	25
3b	36.53	70
Total agricultural area	52.25	100
Non agricultural	3.60	
Total area of site	55.85 ha	

1.4 The site comprises very good to moderate quality agricultural land. The Grade 2 land comprises deep, well drained clayey soils which suffer from minor workability and/or droughtiness restrictions. Across much of the remainder of the site, clayey soils rest over gravel at variable depths. Where slowly permeable horizons occur at shallow depths, land has been graded 3b on the basis of soil wetness. Where there is no slowly permeable horizon, land has generally been graded 3a or 3b as a result of workability and/or droughtiness restrictions, the grading being dependent on the relative severity of the limitation.

2. Climate

The climatic criteria are considered first when classifying land. Climate can be over-riding in the sense that a severe limitation will restrict land to low grades irrespective of favourable soil or site conditions.

The main parameters used in the assessment of the climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of the locality.

A detailed assessment of the prevailing climate has been made by interpolation from a 5 km gridpoint dataset. The details are presented in the table below and show that there is no overall climatic limitation affecting the site. In addition, no local climatic factor is significant. The site is climatically Grade 1.

Table 2 : Climatic Interpolation

Grid Reference	SP 365081	SP 367087
Altitude (m)	76	84
Average Annual Rainfall (mm)	693	701
Accumulated Temperature (° days)	1429	1420
Field Capacity (days)	151	152
Moisture Deficit, Wheat (mm)	105	103
Moisture Deficit, Potatoes (mm)	97	95

3. Agricultural Land Classification

3.1 Grade 2

A small area of this grade has been identified in the east of the survey area and one soil pit, Pit 2, has been described in this map unit. These soils experience a workability limitation due to the presence of Heavy Clay Loam topsoils. The profiles are deep clayey soils with no evidence of profile wetness and are therefore placed in Wetness Class I (ie. the soil profile is not wet within 70 cm depth for more than 30 days in most years). The subsoil horizons exhibit moderate structural conditions, they are typically moderately developed coarse subangular blocky and friable.

3.2 Subgrade 3A

The two map units of this grade identify soils with more significant workability limitations than the Grade 2 profiles. The difference relates to the presence of Clay topsoil textures which restricts the number of days when the soil will be in a suitable condition for cultivation, trafficking by machinery or grazing by livestock at the prevailing field capacity level (ie. >150 days). These profiles may exhibit some evidence of wetness in particular horizons, in the form of gleying, but the structures are such as to prohibit the development of slowly permeable layers.

3.3 Subgrade 3B

The majority of the site has been placed in this grade and includes all of the land adjacent to the river Windrush. Pit 1 is typical of these soils which experience a severe wetness limitation. Clay topsoil textures overlie Clay subsoils which exhibit clear evidence of shallow gleying caused by the presence of shallow slowly permeably layers. These soils are placed in Wetness Class IV (ie. the soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years). As a result, these soils have a severe restriction on the number of days when they are in a suitable condition for agricultural operations.

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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: 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.

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

(i) TEXTURE:-

Soil texture classes are denoted by the following abbreviations (all Upper case*):

S	Sand
LS	Loamy Sand
SL	Sandy Loam
SZL	Sand Silt Loam
ZL	Silt Loam
MZCL	Medium Silty Clay Loam
MCL	Medium Clay Loam
SCL	Sandy Clay Loam
HZCL	Heavy Silty Clay Loam
HCL	Heavy Clay Loam
SC	Sandy Clay
ZC	Silty Clay
C	Clay

For the sand, loamy sand, sandy loam and sandy silt loam classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

F	fine (more than $\frac{2}{3}$ of sand less than 0.2 mm)
C	coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M	medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:-

M	medium (less than 27% clay):
H	heavy (27-35% clay)

Other possible texture classes include:

P	Peat
SP	Sandy Peat
LP	Loamy Peat
PL	Peaty Loam
PS	Peaty Sand
MZ	Marine Light Silts

* There are two exceptions to the Upper Case rule:-

- The prefix "Calc" is used to identify naturally calcareous soils containing more than 1% Calcium Carbonate
- For organic mineral soils, the texture of the mineral fraction is prefixed by "Org".

(ii) STRUCTURE:-

Nature and size of structural units are denoted by the following abbreviations:

SAB	Subangular Blocky
AB	Angular Blocky
P	Prismatic

(single grain, granular and platy are not abbreviated)

F	Fine
M	Medium
C	Coarse
VC	Very Coarse

eg Weak **MSAB** = Weakly developed medium subangular blocky

(iii) OTHER

f =	few	=	less than 2% of the matrix or surface described
c =	commom	=	2-20% of the matrix or surface described
m =	many	=	20-40% of the matrix or surface described
vm =	very many	=	+40% of the matrix or surface described

f =	faint	=	indistinct mottles, evident only on close examination
d =	disinct	=	although not striking, the mottles are readily seen
p =	prominent	=	the mottles are conspicuous, and the mottling is one of the outstanding features of the horizon

gm = grey mottling
om = ochreous mottling

eg **cdom** = common distinct ochreous mottles

rrc = rusty root channels
ppf = pale ped faces
mn = manganese

st = stones 6 cm
sst = stones 2-6 cm
vsst= stones 2 cm

WC = Wetness Class (use Roman numerals, eg WC IV)
SPL = Slowly Permeable Layer
WT = Water Table
I = Impenetrable if used in Depth Column
IMP = Impenetrable if used in soil profile notes
(IMP 2 x 40 cm = 2 additional borings, both impenetrable at 40 cm)
ASP = Auger Sample Point

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IMP =	Impenetrable if used in soil profile notes

(**IMP 2 x 40 cm** = 2 additional borings, both impenetrable at 40 cm)

ASP =	Auger Sample Point

SOIL PIT DESCRIPTION

Site Name : OMP, S OF A40, WITNEY Pit Number : 1P

Grid Reference: SP36500813
Average Annual Rainfall : 701 mm
Accumulated Temperature : 1429 degree days
Field Capacity Level : 152 days
Land Use : Bare Soil
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 20	C	25Y 52 00	0	0		
20- 55	C	25Y 62 00	0	0	M	MCP

Wetness Grade : 3B
Wetness Class : IV
Gleying :020 cm
SPL :020 cm

Drought Grade : 3B
APW : 077mm MBW : -28 mm
APP : 080mm MBP : -17 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : OMP, S OF A40, WITNEY Pit Number : 2P

Grid Reference: SP36840840
Average Annual Rainfall : 701 mm
Accumulated Temperature : 1429 degree days
Field Capacity Level : 152 days
Land Use : Bare Soil
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	HCL	10YR42 00	0	0		
25- 52	C	75YR44 00	0	0		MCSAB
52- 55	HCL	10YR54 00	0	0		MCSAB
55- 85	C	10YR54 00	0	10		

Wetness Grade : 2
Wetness Class : I
Gleying :000 cm
SPL : No SPL

Drought Grade : 2
APW : 111mm MBW : 6 mm
APP : 115mm MBP : 18 mm

FINAL ALC GRADE : 2
MAIN LIMITATION :