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LAND AT CARTERTON
WEST OXFORDSHIRE LOCAL PLAN
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
MAY, 1993

LAND AT CARTERTON, WEST OXFORDSHIRE LOCAL PLAN AGRICULTURAL LAND CLASSIFICATION REPORT

1.0 Summary

1.1 In May, 1993, a semi-detailed Agricultural Land Classification (ALC) was made on approximately 105 hectares of land on the north-eastern edge of Carterton near Brise Norton in West Oxfordshire.

1.2 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS in response to a commission by MAFF's Land Use Planning Unit to provide information on the quality of agricultural land affected by possible inclusion in the Local Plan for the area.

1.3 All of the agricultural land (99.6 ha) has been classified as Sub-grade 3B. A number of soil limitations restrict the land to this low grade - topsoil stone contents, soil droughtiness and soil wetness.

1.4 The details of the site are shown on the attached ALC map at a scale of 1:10,000. Any enlargement from this base would be misleading. This map supercedes any previous ALC information for this site.

1.5 The classification has been made using MAFF's revised guidelines and criteria for grading the quality of agricultural land. These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture.

1.6 The fieldwork was carried out with an observation density of approximately one per two hectares. A total of 49 borings and 3 soil pits was examined.

1.7 At the time of survey the land use on the site was a mixture of cereals on the larger eastern fields and permanent pasture in the smaller western areas. Woodland covers 1.6 ha, Non-agricultural land use covers 1.7 ha and urban land uses account for 2.4 ha.

1.8 A general description of the grades and sub-grades is provided as an appendix. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

2.0 Climate

2.1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

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

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset. The details are given in the table below and these show that there is no overall climatic limitation affecting the site.

2.4 No local climatic factors such as exposure or frost risk affect the site.

Table 2 : Climatic Interpolations

Grid Reference : SP284081
Altitude (m) : 100
Accumulated Temperature (days) : 1403
Average Annual Rainfall (mm) : 729
Field Capacity (days) : 159
Moisture Deficit, Wheat (mm) :99
Moisture Deficit, Potatoes (mm) : 89
Overall Climatic Grade : 1

3.0 Relief

3.1 Gradient is not a local limitation on the site. The topography is either flat or gently sloping.

4.0 Geology and Soil

4.1 The relevant geological sheet for the site shows the underlying geology to be a mixture of Jurassic Cornbrash and Forest Marble. The majority of the soils are either very stony on the surface or are impenetrable to the auger at shallow depths in the upper subsoil due to stony horizons.

5.0 Agricultural Land Classification

5.1 The attached ALC map shows all the agricultural land to be classified as Sub-grade 3B.

5.2 The location of the soil observation points is shown on the attached auger sample point map.

5.3 Sub-grade 3B : The 3 soil pits indicate the range of soils that exist on the site. Pit 1 is typical of those soils with a soil wetness limitation. A shallow slowly permeable layer places the soil in Wetness Class IV (see Appendix III for definition) and this, in combination with the clay topsoil texture and the prevailing Field Capacity Day level, limits the soil to a poor grade. Pit 2 represents those soils with a stoniness limitation. The topsoil stone percentage greater than 2 cm is just in excess of 15% at this pit but parts of the site, particularly the south-east, have stone percentages well above this cut-off. Pit 3 represents those soils with a droughtiness limitation. Heavy Clay Loam topsoils overlie Clay subsoils with hard rock from approximately 55 cm. Stone contents in the subsoil are over 25% and there is little evidence of any significant root penetration into the rock below. This creates a significant restriction on the amount of water available in the profile for extraction by roots.

5.5 The areas marked as Urban include houses and parking facilities.

5.6 The areas marked as Non-agricultural include playing fields.

ADAS Reference : 3305/60/93
MAFF Reference : EL33/225

Resource Planning Team
Guildford Statutory Group

APPENDIX I

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 or horticultural crops can usually be grown but on some land on 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. When more demanding crops are grown yields are generally lower or more variable than on land in grades 1 and 2.

Sub-grade 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.

Sub-grade 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 the 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.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture : 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.

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, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

REFERENCES

- * MAFF (1988), Agricultural Land Classification of England And Wales : revised guidelines and criteria for grading the quality of agricultural land.
- * Meteorological Office (1989), Climatological Data for Agricultural Land Classification.
- * British Geological Survey (1982), Sheet No. 236, Witney, 1:50,000

APPENDIX III

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40cm depth for more than 335 days in most years.

(The number of days is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.)

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil profile and pit information obtained during ALC surveys is held on a database. This has commonly used notations and abbreviations as set out below.

BORING HEADERS

1. GRID REF : National grid square followed by 8 figure grid reference.
2. USE : Land-use at the time of survey.
The following abbreviations are used.

ARA - arable	PAS/PGR - permanent pasture
WHT - wheat	RGR - rough grazing
BAR - barley	LEY - ley grassland
CER - cereals	CFW - coniferous woodland
OAT - Oats	DCW - deciduous woodland
MZE - maize	SCR - scrub
OSR - Oilseed rape	HTH - heathland
BEN - field beans	BOG - bog or marsh
BRA - brassicae	FLW - fallow
POT - potatoes	PLO - ploughed
SBT - sugarbeet	SAS - set-aside
FCD - fodder crops	OTH - other
FRT - soft and top fruit	LIN - linseed
HOR/HRT - horticultural crops	

3. GRDNT : Gradient as measured by optical reading clinometer.
4. GLEY/SPL : Depth in centimetres (cm) to gleyed and/or slowly permeable horizons.
5. AP (WHEAT/POTS) : Crop-adjusted available water capacity. The amount of soil water (in millimetres) held in the soil profile that is available to a growing crop (wheat and potatoes are used as reference crops).
6. MB (WHEAT/POTS) : The moisture balance for wheat and potatoes obtained by subtracting the soil moisture deficit from the crop-adjusted available water capacity.
7. DRT: Grade according to soil droughtiness assessed against soil moisture balances.
8. M REL : Micro-relief)
FLOOD : Flood risk) If any of these factors are considered
EROSN : Soil erosion) significant in terms of the assessment
EXP : Exposure) of agricultural land quality, a y will
FROST : Frost prone) be entered in the relevant column.
DIST : Disturbed land)
CHEM : Chemical limitation)

9. LIMIT : Principal limitation to agricultural land quality.
The following abbreviations are used:

OC - overall climate	CH - chemical limitations
AE - aspect	WE - wetness
EX - exposure	WK - workability
FR - frost	DR - drought
GR - gradient	ER - erosion
MR - micro-relief	WD - combined soil wetness/soil droughtiness
FL - flooding	ST - topsoil stoniness
TX - soil texture	
DP - soil depth	

PROFILES & PITS

1. TEXTURE : Soil texture classes are denoted by the following abbreviations:

S	- sand
LS	- loamy sand
SL	- sandy loam
SZL	- sandy silt loam
ZL	- silt loam
MZCL	- medium silty clay loam
MCL	- medium clay loam
SCL	- sandy clay loam
HZCL	- heavy silty 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.

F	- fine (more than $\frac{2}{3}$ of the 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:

OL	- organic loam
P	- peat
SP	- sandy peat
LP	- loamy peat
PL	- peaty loam
PS	- peaty sand
MZ	- marine light silts

2. MOTTLE COL : Mottle colour

3. MOTTLE ABUN : Mottle abundance

F - few - less than 2% of matrix or surface described

C - common - 2-2% of the matrix

M - many - 20-40% of the matrix

VM - very many - 40% + of the matrix

4. MOTTLE CONT : Mottle continuity

F - faint - indistinct mottles, evident only on close examination

D - distinct - mottles are readily seen

P - prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. PED.COL : Ped face colour

6. STONE LITH : Stone lithology. One of the following is used.

HR - all hard rocks or stones

MSST - soft, medium or coarse grained sandstone

SI - soft weathered igneous or metamorphic

SLST - soft oolitic or dolomitic limestone

FSST - soft, fine grained sandstone

ZR - soft, argillaceous, or silty rocks

CH - chalk

GH - gravel with non-porous (hard) stones

GS - gravel with porous (soft) stones

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

7. STRUCT : the degree of development, size and shape of soil peds are described using the following notation.

- degree of development WK - weakly developed
MD - moderately developed
ST - strongly well developed

- ped size F - fine
M - medium
C - coarse
VC - very coarse

- ped shape S - single grain
M - massive
GR - granular
SB/SAB - sub-angular blocky
AB - angular blocky
PR - prismatic
PL - platy

8. CONSIST : Soil consistence is described using the following notation:

L - loose
VF - very friable
FR - friable
FM - firm
VM - very firm
EM - extremely firm
EH - extremely hard

9. SUBS STR : Subsoil structural condition recorded for the purpose of calculating profile droughtiness.

G - good
M - moderate
P - poor

10. POR : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'y' will appear in this column.

11. IMP : If the profile is impenetrable a 'y' will appear in this column at the appropriate horizon.

12. SPL : Slowly permeable layer. If the soil horizon is slowly permeable a y will appear in this column.

13. CALC : If the soil horizon is calcareous, a 'y' will appear in this column.

14. Other Notations

APW - available water capacity (in mm) adjusted for wheat
APP - available water capacity (in mm) adjusted for potatoes
MBW - moisture balance, wheat
MBP - moisture balance, potatoes

SOIL PIT DESCRIPTION

Site Name : CARTERTON WEST. OXON LP Pit Number : 1P

Grid Reference: SP281 084 Average Annual Rainfall : 729 mm
 Accumulated Temperature : 1403 degree days
 Field Capacity Level : 159 days
 Land Use : Cereals
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 23	C	10YR43 00	4	10		
23- 35	C	05Y 53 00	0	25	C	
35- 68	C	05Y 63 00	0	2	M	MASS

Wetness Grade : 3B Wetness Class : IV
 Gleying : 023 cm
 SPL : 035 cm

Drought Grade : 3A APW : 082mm MBW : -17 mm
 APP : 092mm MBP : 3 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CARTERTON WEST. OXON LP Pit Number : 2P

Grid Reference: SP286 084 Average Annual Rainfall : 729 mm
 Accumulated Temperature : 1403 degree days
 Field Capacity Level : 159 days
 Land Use : Cereals
 Slope and Aspect : 02 degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 20	HCL	10YR43 00	17	17		
20- 58	SCL	25Y 56 00	0	5		
58- 68	HR	00ZZ00 00	0	0		

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

Drought Grade : 3A APW : 081mm MBW : -18 mm
 APP : 086mm MBP : -3 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Topsoil Stoniness

SOIL PIT DESCRIPTION

Site Name : CARTERTON WEST. OXON LP Pit Number : 3P

Grid Reference: SP285 079 Average Annual Rainfall : 729 mm
Accumulated Temperature : 1403 degree days
Field Capacity Level : 159 days
Land Use : Cereals
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 22	HCL	10YR44 00	8	13		
22- 47	C	75YR46 00	0	18		
47- 56	C	75YR46 00	0	28		
56- 66	HR	00ZZ00 00	0	0		

Wetness Grade : 2 Wetness Class : 1
Gleying : 000 cm
SPL : No SPL

Drought Grade : 3B APW : 076mm MBW : -23 mm
APP : 080mm MBP : -9 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness