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NEWBURY LOCAL PLAN
SITE 44 : LAND AT MARSH LANE,
HUNGERFORD
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
JANUARY 1994

**NEWBURY LOCAL PLAN
SITE 40 : LAND AT MARSH LANE, HUNGERFORD
AGRICULTURAL LAND CLASSIFICATION REPORT**

1.0 Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on a number of sites in the Newbury District in Berkshire. The work forms part of MAFF's statutory input to the preparation of the Newbury Local Plan.

1.2 Approximately 5 hectares of land relating to site 44 adjacent to Marsh Lane near Hungerford was surveyed in January 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 3 soil auger borings and 1 soil inspection pit were assessed 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 longterm limitations on its use for agriculture.

1.3 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of the survey the land use on the western part of the site was cereals. In the east of the site the land use can best be described as rough grassland.

1.5 The distribution of grades and subgrades 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 1:5,000. It is accurate at this scale, but any enlargement would be misleading. This map supersedes any previous survey information for this site.

Table 1 : Distribution of Grades and Subgrades

<u>Grade</u>	<u>Area (ha)</u>	<u>% of Agricultural Area</u>
1	1.4	29.8
4	<u>3.3</u>	<u>70.2</u>
Total area of site	<u>4.7</u>	<u>100.0</u> (4.7 ha.)

1.6 Appendix 1 gives a general description of the grades, subgrades and land use categories identified in the survey. 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.

1.7 The land on the site has been classified as Grades 1 and 4, with soil wetness as the main limitation on the Grade 4 land. The soils in the Grade 1 mapping unit in the west of the site comprise medium clay loam topsoils overlying heavier and very slightly stony subsoils. These soils show no signs of any limitation to agricultural use and may therefore be classified as Grade 1, excellent quality agricultural land. The land in the east of the site is classified as Grade 4 as it shows definite signs of a severe wetness limitation. The soils are waterlogged for long periods of time, this is evident due to the abundance of hydrophilic plant species such as Juncus sp. rushes on this parcel of land. The waterlogged nature of this land renders it unsuitable for most agricultural operations and for use by grazing livestock. Therefore, the versatility and productive capacity of this land is severely restricted, allowing it to be classified as no better than Grade 4.

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 an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (degree days Jan-June), 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 (Met. Office 1989). 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. However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations.

Table 2 : Climatic Interpolation

Grid Reference :	SU 332 685
Altitude (m) :	100
Accumulated Temperature (days) :	1420
Average Annual Rainfall (mm) :	749
Field Capacity (days) :	169
Moisture Deficit, Wheat (mm) :	103
Moisture Deficit, Potatoes (mm) :	93
Overall Climatic Grade :	1

3.0 Relief

3.1 The site is generally flat and lies at an altitude of 100 metres. The area of land comprising the eastern portion of the site is slightly lower lying than that in the west, this may be a contributory factor to the waterlogged state of the land in this portion of the site.

4.0 Geology and Soil

4.1 The published geological sheet for the site (BGS Sheet 267: Hungerford 1971) shows the underlying geology to be Alluvium across much of the site, with a small area of River and Valley Gravel in the far south-eastern corner.

4.2 The published soils information for the area (SSEW Sheet 6: Soils of South East England 1983) shows the soils on the site to be of the Frome association. These are described as 'shallow calcareous and non-calcareous loamy soils over flint gravel affected by groundwater' (SSEW, 1983). Detailed field examination broadly confirms that soils in the east of the site suffer from groundwater problems. This is not the case for the soils in the west which tend to be well drained and relatively stoneless clay loams.

5.0 Agricultural Land Classification

5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

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

5.3 Grade 1 An area of land (1.4 ha.) in the east of the site has been classified as Grade 1, excellent quality land, showing no limitations for agricultural use. Soil profiles comprise medium clay loam topsoils, heavy clay loam upper subsoils and clay lower subsoils. At auger sample point no. 2, the clay subsoil showed signs of being slightly gleyed below a depth of 62 cm, probably caused by a fluctuating groundwater table. A soil inspection pit (Pit 1) was dug in this mapping unit to assess the structural conditions of the subsoils. It was found that the subsoils have a moderate substructural condition, and are very slightly stony (1-5% total hard rock) throughout. Consequently a calculation of the profile available water, taking into account these factors along with soil textures and the local climatic regime, showed that these soils contain sufficient reserves of water for plant growth, to be able to sustain consistently high yields. Furthermore, the soils are well drained and are assigned to Wetness Class I, which in combination with topsoil texture and the field capacity days for the site results in a classification of Grade 1. There is no evidence of any limitation, either soil related or otherwise, to the agricultural use of this land.

5.4 Grade 4 Land in the west of the site has been classified as Grade 4, poor quality agricultural land, with soil wetness as the main limitation. This land is lower-lying than the Grade 1 land, and shows signs of problems associated with a high groundwater table. A large proportion of this land was waterlogged at the time of survey, showing evidence of saturation, with a predominance of hydrophilic plant species suggesting that these soils are waterlogged for long periods throughout the year. The low lying nature of this parcel of land, adjacent to a watercourse, means that these soils are difficult to drain due to insufficient outfalls. A Wetness Class has been assigned on this evidence as a soil observation in the east showed there to be no signs of either soil gleying or the presence of a slowly permeable layer. Accordingly the waterlogged nature of these soils, a situation which can be attributed to high groundwater levels, means that it is appropriate to assign Wetness Class V. When considered alongside the topsoil texture and the field capacity days for the site, the resultant classification is Grade 4. Waterlogged soils inhibit plant development, particularly rooting, and restrict the use of machinery and density of grazing livestock that can utilise the land.

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Resource Planning Team
Guildford Statutory Group
ADAS Reading

APPENDIX I

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.

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging ¹
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years ² .
II	The soil profile is wet within 70 cm depth for 31-90 days in most years <u>or</u> , if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years <u>or</u> , if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31 and 90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years <u>or</u> , if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

¹ The number of days specified is not necessarily a continuous period.

² 'In most years' is defined as more than 10 out of 20 years.

REFERENCES

- * British Geological Survey (1971), Sheet No.267, Hungerford, 1:63,360
- * 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.
- * Soil Survey of England and Wales (1982), Sheet No.6, Soils of South East England, 1:250,000, and accompanying legend.

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

- Contents :
- * Soil Abbreviations : Explanatory Note
 - * Soil Pit Descriptions
 - * Database Printout : Boring Level Information
 - * Database Printout : Horizon Level Information

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a database. This has commonly used notations and abbreviations as set out below.

Boring Header Information

1. GRID REF : national grid square and 8 figure grid reference.

2. USE : Land use at the time of survey. The following abbreviations are used.

ARA : Arable WHT : Wheat BAR : Barley CER : Cereals OAT : Oats MZE : Maize OSR : Oilseed rape
BEN : Field Beans BRA : Brassicae POT : Potatoes SBT : Sugar Beet FCD : Fodder Crops LIN : Linseed
FRT : Soft and Top Fruit HRT : Horticultural Crops PGR : Permanent Pasture LEY : Ley Grass RGR : Rough Grazing
SCR : Scrub CFW : Coniferous Woodland DCW : Deciduous Woodland HTH : Heathland BOG : Bog or Marsh
FLW : Fallow PLO : Ploughed SAS : Set aside OTH : Other

3. GRDNT : Gradient as measured by a hand-held optical clinometer.

4. GLEY/SPL : Depth in cm to gleying or slowly permeable layers.

5. AP (WHEAT/POTS) : Crop-adjusted available water capacity.

6. MB (WHEAT/POTS) : Moisture Balance.

7. DRT : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, an entry of 'Y' will be entered in the relevant column.

MREL : Microrelief limitation FLOOD : Flood risk EROSN : Soil erosion risk EXP : Exposure limitation FROST : Frost
DIST : Disturbed land CHEM : Chemical limitation

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

OC : Overall Climate AE : Aspect EX : Exposure FR : Frost Risk GR : Gradient MR : Microrelief
FL : Flood Risk TX : Topsoil Texture DP : Soil Depth CH : Chemical WE : Wetness WK : Workability
DR : Drought ER : Soil Erosion Risk WD : Combined Soil Wetness/Droughtiness ST : Topsoil Stoniness

Soil Pits and Auger Borings

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

S : Sand LS : Loamy Sand SL : Sandy Loam SZL : Sandy Silt Loam CL : Clay Loam ZCL : Silty Clay Loam
SCL : Sandy Clay Loam C : Clay SC : Sandy Clay ZC : Silty Clay OL : Organic Loam P : Peat SP : Sandy Peat
LP : Loamy Peat PL : Peaty Loam PS : Peaty Sand MZ : Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of prefixes.

F : Fine (more than 66% of the sand less than 0.2mm)

M : Medium (less than 66% fine sand and less than 33% coarse sand)

C : Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content.

M : Medium (< 27% clay) H : Heavy (27-35% clay)

2. MOTTLE COL : Mottle colour

3. MOTTLE ABUN : Mottle abundance, expressed as a percentage of the matrix or surface described.

F : few < 2% C : common 2-20% M : many 20-40 VM : very many 40% +

4. MOTTLE CONT : Mottle contrast

F : faint - indistinct mottles, evident only on close inspection 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 : One of the following is used.

HR : all hard rocks and stones MSST : soft, medium or coarse grained sandstone
SI : soft weathered igneous or metamorphic SLST : soft oolitic or dolimitic 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 developed

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

- ped shape S : single grain M : massive GR : granular AB : angular blocky SAB : sub-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 : NEWBURY LP SITE 44 Pit Number : 1P

Grid Reference: SU32966852 Average Annual Rainfall : 749 mm
 Accumulated Temperature : 1420 degree days
 Field Capacity Level : 169 days
 Land Use : Cereals
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 32	MCL	10YR42 00	4	5		
32- 68	HCL	10YR54 00	0	3		MDCSAB
68-120	C	10YR56 00	0	2		MDCSAB

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

Drought Grade : 1 APW : 141mm MBW : 38 mm
 APP : 113mm MBP : 20 mm

FINAL ALC GRADE : 1
 MAIN LIMITATION :

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M. REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	SU33026850	CER	1	1	140	37	116	23	1						1
1P	SU32966852	CER	1	1	141	38	113	20	1						1
2	SU32906848	CER	1	1	141	38	115	22	1						1
3	SU33406859	PGR	5	4	151	48	116	23	1				WE		4

-----MOTTLES----- PED -----STONES----- STRUCT/ SUBS

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED		---STONES---			STRUCT/	SUBS			CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	CONSIST	STR		POR
1	0-30	mc1	10YR43 00						0	0	HR	3					
	30-40	hc1	10YR46 00						0	0		0			M		
	40-120	c	10YR56 00						0	0		0			M		
1P	0-32	mc1	10YR42 00						4	0	HR	5					
	32-68	hc1	10YR54 00						0	0	HR	3	MDCSAB	FR	M		
	68-120	c	10YR56 00				75YR43 00		0	0	HR	2	MDCSAB	FR	M		
2	0-24	mc1	10YR42 00						0	0	HR	2					
	24-62	hc1	10YR56 00						0	0	HR	2			M		
	62-120	c	10YR54 00	75YR56 00	C				0	0		0			M		
3	0-35	mc1	10YR42 00						0	0		0					
	35-60	hc1	10YR43 00						0	0	HR	5			M		
	60-90	hc1	10YR44 00						0	0	HR	10			M		
	90-120	hc1	10YR54 00						0	0	HR	5			M		

water
logged