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Land West of Park Lane,
Charvil, Berkshire
ALC Map and Report
December, 1993

AGRICULTURAL LAND CLASSIFICATION REPORT

LAND WEST OF PARK LANE, CHARVIL, BERKSHIRE

Introduction

- 1.1 In December, 1993, a detailed Agricultural Land Classification (ALC) was made on 13.4 hectares of land west of Park Lane on the edge of Charvil in Berkshire.
- 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 an ad hoc planning application. The application area affects four discrete areas, but only the southern block contains agricultural land.
- 1.3 The classification has been made using 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 on its use for agriculture.
- 1.4 The fieldwork was carried out with an observation density of approximately one per hectare. A total of ten borings and one soil pit was examined.

Table 1 : Distribution of the Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Area
3a	7.4	55.2	84.1
3b	1.4	10.4	<u>15.9</u>
Non-agric	0.2	1.5	100% (8.8 ha)
Woodland	2.1	15.7	
Urban	<u>2.3</u>	<u>17.2</u>	
Total	13.4 ha	100%	

- 1.5 The majority of the agricultural land has been classified as Subgrade 3a (good quality) with a limited area of Subgrade 3b (moderate quality). Soil droughtiness and topsoil stoniness are the main physical limitations on the Subgrade 3a land developed on Valley Gravel deposits that have given rise to light textured and stony profiles. Soil wetness is the key limitation on

the Subgrade 3b land where shallow waterlogging of the soil is related to poorly structured subsoil horizons.

- 1.6 The north-western block of land is classified as Urban, where preparation for building work has already started. The small north-eastern blocks are classified as Non-agricultural, relating to an area of public open space, and Urban which defines the garden of a house. Part of the southern block is classified as Woodland.
- 1.7 The ALC information is shown on the attached map at a scale of 1:5,000. It is accurate at this level but any enlargement may be misleading. This map supercedes any previous ALC information for this site.
- 1.8 At the time of survey, the land use on the agricultural land was permanent grass.
- 1.9 A general description of the grades, subgrades and land use categories is provided in Appendix I. 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.

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 5 kilometre 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.

Table 2 : Climatic Interpolations

Grid Reference	SU775752
Altitude (m)	45
Accumulated Temperature (°days)	1470
Average Annual Rainfall (mm)	677
Field Capacity (days)	142
Moisture Deficit, Wheat (mm)	114
Moisture Deficit, Potatoes (mm)	109
Overall Climatic Grade	1

Relief

- 3.1 The site occupies gentle east and south-east facing slopes between approximately 40-50 metres. Park Lane marks a topographic boundary onto flatter land to the east.

Geology and Soils

- 4.1 The relevant geological sheet for the site shows the majority of the area to be underlain by Valley Gravel deposits with some Chalk on the eastern fringe.
- 4.2 The published soils information for the site (Soil Survey, 1968) shows the general soils type to be of the Wickham series, loamy soils over clay. The more detailed ALC survey showed a variation in soil types.

Agricultural Land Classification

- 5.1 The ALC information is provided on the attached ALC map and the location of the soil observation points is shown on the sample point map.

Subgrade 3a

- 5.2 The majority of the agricultural land on the site has been placed in this grade with topsoil stoniness and soil droughtiness as the most limiting physical factors. Pit 1 is typical of the soils that occur in this grade and describes a Medium Sandy Loam topsoil overlying an upper subsoil of similar texture which changes into a lower subsoil of Loamy Sand texture from approximately 50 cm. The topsoils contain over 10% hard rock

greater than 2cm in diameter and the soils cannot therefore be graded better than Subgrade 3a due to the effect that the stones have on wear and tear to machinery and crop growth. The lower subsoil of Pit 1 becomes stony at depth and the soil has only been described to 105 cm. Taking the droughtiness calculation to this depth produces a value that is just in Subgrade 3b. However a final droughtiness grade of 3a has been given to this land as roots were observed to 105 cm and it is believed that they should be able to exploit available water down to 120 cm. There is also a range of textures on the site with the topsoils and upper subsoils often exhibiting a Medium Clay Loam texture which will hold more available water than the sandier soils found at the pit. The droughtiness limitation in these soils acts to reduce the range of crops that can tolerate such conditions.

Subgrade 3b

- 5.4 A small area of this grade has been mapped in the south of the site. This area of poorer quality has been downgraded due to a soil wetness limitation. The soils are clearly gleyed within the top 40 cm and often have standing water in patches on the surface. The wetness in the profile is related to the presence of slowly permeable Clay subsoils at shallow depths although there may be patches of more permeable Clay. Given these characteristics, the soils are placed in Wetness Class IV which, in combination with the Medium Clay Loam topsoil texture and the prevailing Field Capacity level (142 days), limits the land to Subgrade 3b. The wetness limitation acts to reduce the number of days when the land is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock and also restricts the range of crops that can tolerate such conditions.

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Resource Planning Team
Guildford Statutory Group

APPENDIX I

DESCRIPTION OF THE GRADES AND SUBGRADES

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 of this 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 land.

Grade 3 : Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the 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.

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 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 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 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. 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, 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

British Geological Survey , Sheet Number 268, Reading, 1:50,000.

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 (1968), Soils of the Reading District, 1:63,360.

APPENDIX III

DEFINITION OF SOIL WETNESS CLASS

Wetness Class I

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

Wetness Class II

The soil profile is wet within 70 cm depth for 31-90 days in most years or, 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 31-90 days in most years.

Wetness Class III

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

Wetness Class IV

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 or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.

Wetness Class V

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

Wetness Class VI

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

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

Sample Point Map

Soil Abbreviations - explanatory note

Database Printout - soil pit information

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	FLW : Fallow
PGR : Permanent Pasture	LEY : Ley Grass	RGR : Rough Grazing
SCR : Scrub	CFW : Coniferous Woodland	DCW : Deciduous Wood
HTH : Heathland	BOG : Bog or Marsh	FLW : Fallow
PLO : Ploughed	SAS : Set aside	OTH : Other
HRT : Horticultural Crops		

3. **GRDNT** : Gradient as measured by a hand-held optical clinometer.
4. **GLEYSPL** : 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 : Erosion Risk	WD : 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

SLST : soft oolitic or dolimitic limestone

CH : chalk

FSST : soft, fine grained sandstone

ZR : soft, argillaceous, or silty rocks

GH : gravel with non-porous (hard) stones

MSST : soft, medium grained sandstone

GH : gravel with non-porous (hard) stones

SI : soft weathered igneous/metamorphic rock

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 : LAND W.OF PARK LN CHARVL Pit Number : 1P

Grid Reference: SU77507515 Average Annual Rainfall : 681 mm
 Accumulated Temperature : 1464 degree days
 Field Capacity Level : 142 days
 Land Use : Permanent Grass
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 35	MSL	10YR43 00	12	17		
35- 50	MSL	75YR66 00	0	23		
50- 90	LMS	10YR66 00	0	0		WMSAB
90-105	LMS	10YR66 00	0	25		

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

Drought Grade : 3B APW : 092mm MBW : -21 mm
 APP : 082mm MBP : -26 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Topsoil Stoniness

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--				-WHEAT-		-POTS-		M. REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYS	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1	SU77657545	PGR			000	1	1	089	-24	095	-13	3B			DR	3A	IMP QDR
1P	SU77507515	PGR			000	1	1	092	-21	082	-26	3B			ST	3A	PITTO105
2	SU77507530	PGR			000	1	1	094	-19	099	-9	3A			DR	3A	IMP QDR
3	SU77607530	PGR	NE	04	030	2	1	156	43	115	7	2			DR	2	NO SPL
4	SU77407520	PGR			000	1	1	066	-47	066	-42	3B			DR	3B	IMPX2QDR
5	SU7750752	PGR			000	1	1	062	-51	062	-46	4			DR	3B	IMP QDR
6	SU77607520	PGR			000	2	2	131	18	114	6	2			WE	2	IMP
7	SU77707520	PGR			000	2	3A	151	38	113	5	2			WE	3A	NO SPL
8	SU77407510	PGR			000	1	1	061	-52	061	-47	4			DR	3B	IMPX2QDR
9	SU77307525	PGR			000	2	3A	100	-13	116	8	3A			WE	2	IMP
10	SU77607510	PGR			000 020	4	3B	078	-35	081	-27	3B			WE	3B	SPL

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----			PED		-----STONES-----			STRUCT/ CONSIST	SUBS				
				COL	ABUN	CONT	COL.	GLEYS	>2	>6	LITH		TOT	STR	POR	IMP	SPL
1	0-25	mc1	10YR42 00						0	0	HR	2					
	25-60	mc1	10YR43 00						0	0	HR	10			M		
1P	0-35	ms1	10YR43 00						12	0	HR	17					
	35-50	ms1	75YR66 00						0	0	HR	23			M		
	50-90	1ms	10YR66 00						0	0		0	WMSAB	VF	M		
	90-105	1ms	10YR66 00						0	0	HR	25			M		
2	0-25	ms1	10YR43 00						0	0	HR	2					
	25-60	ms1	10YR44 00						0	0	HR	2			M		
	60-65	ms1	10YR44 00						0	0	HR	20			M		
3	0-30	mc1	10YR43 00						0	0	HR	2					
	30-60	mc1	10YR53 00	000C00	00	C		Y	0	0	HR	2			M		
	60-80	ms1	10YR63 00	000C00	00	M		Y	0	0		0			M		
	80-120	hc1	10YR51 00	000C00	00	M		Y	0	0		0			M		
4	0-25	mc1	10YR42 00						0	0	HR	5					
	25-40	mc1	10YR43 00						0	0	HR	5			M		
5	0-30	ms1	10YR43 00						0	0	HR	5					
	30-40	ms1	10YR43 00						0	0	HR	10			M		
6	0-20	mc1	10YR42 00	000C00	00	M		Y	0	0	HR	2					
	20-70	mc1	10YR53 00	000C00	00	M		Y	0	0	HR	2			M		
	70-100	sc1	25Y 63 00	000C00	00	M		Y	0	0	HR	2			M		
7	0-30	hc1	10YR53 00	000C00	00	C	00ZZ00	00	Y	0	0	HR	2				
	30-48	hc1	25Y 53 00	000C00	00	C			Y	0	0	HR	2		M		
	48-80	hc1	25Y 63 00	000C00	00	M			Y	0	0	HR	10		M		
	80-120	sc1	25Y 63 00	000C00	00	M			Y	0	0	HR	2		M		
8	0-25	ms1	10YR42 00						0	0	HR	6					
	25-40	ms1	10YR43 00						0	0	HR	10			M		
9	0-28	hc1	10YR51 00	000C00	00	C		Y	0	0	HR	2					
	28-40	hc1	10YR53 00	000C00	00	M		Y	0	0	HR	2			M		
	40-70	c	25Y 63 00	000C00	00	M		Y	0	0		0			M		
10	0-20	mc1	10YR41 00	000C00	00	C		Y	0	0	HR	2					
	20-55	c	25Y 63 00	000C00	00	M		Y	0	0		0			P	Y	Y