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**WYCOMBE DISTRICT LOCAL PLAN
Land to the north-east of Princes Risborough,
Buckinghamshire**

**Agricultural Land Classification
ALC Map and Report**

April 1999

**Resource Planning Team
Eastern Region
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**AGRICULTURAL LAND CLASSIFICATION REPORT
WYCOMBE DISTRICT LOCAL PLAN
LAND NORTH-EAST OF PRINCES RISBOROUGH, BUCKINGHAMSHIRE**

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 18.3 ha of land to the north-east of Princes Risborough, Buckinghamshire. The survey was carried out during April 1999.
2. The work was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF). The survey was carried out in connection with MAFF's statutory input to the Wycombe District Local Plan. This survey supersedes any previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey the land use was horse paddocks and ploughed land. The areas mapped as 'Other land' include gardens, woodland, a water pumping station and a trackway.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:15,000. It is accurate at this scale but any enlargement would be misleading.
6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	15.1	100	82.5
Other land	3.2	N/A	17.5
Total surveyed area	15.1	100	100
Total site area	18.3	-	100

7. The fieldwork was conducted at an average density of 1.5 borings per hectare of agricultural land. A total of 10 borings and 1 soil pit was described.
8. The agricultural land at this site has been classified as Grade 2 (very good quality). The principle limitation is soil droughtiness with soil workability being equally restricting on occasions. Soils comprise well drained medium silty clay loam topsoils over heavy clay loams

¹ FRCA is an executive agency of MAFF and the Welsh Office

or clays in the lower subsoils. Horizons become increasingly stony with depth. The amount of water available in these soils will be insufficient to meet crop demands throughout the growing season. As a result, the level and consistency of yields will be slightly restricted. In places, the presence of heavier topsoils produces an additional workability limitation. This will slightly restrict the number of days when the land is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock.

FACTORS INFLUENCING ALC GRADE

Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.
10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values	
		SP 815 047	SP 817 044
Grid reference	N/A	SP 815 047	SP 817 044
Altitude	m, AOD	115	125
Accumulated Temperature	day°C (Jan-June)	1376	1365
Average Annual Rainfall	mm	688	700
Field Capacity Days	days	151	154
Moisture Deficit, Wheat	mm	103	101
Moisture Deficit, Potatoes	mm	93	91
Overall climatic grade	N/A	Grade 1	Grade 1

11. 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.
12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.
13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. The site is not believed to be frost prone or suffer from exposure. As such, the site may be considered to be climatically Grade 1. Climatic factors do, however, interact with soil properties to influence soil wetness and soil droughtiness.

Site

14. The survey area lies between 107 and 130m AOD and falls through gentle gradients from south-east to north-west. The site is not affected by any site restrictions, such as gradient, microrelief or flooding.

Geology and soils

15. The most detailed published geological information for this site (IGS, 1994) show the majority of the survey area to be underlain by Lower Chalk with some Chalky younger head deposits running across the centre.
16. The most recent published soils information covering the area (SSEW, 1983) shows the survey area to comprise soils from the Coombe 1 Association in the south-east of the site and soils from the Coombe 2 Association over the rest of the site. Soils of the Coombe 1 Association are described as 'well drained calcareous fine silty soils, deep in valley bottoms, shallow to chalk on valley sides in places'. Soils of the Coombe 2 Association are described as 'well drained calcareous fine silty soils over chalk or chalk rubble. Shallow soils in places on brows and steeper slopes'. Soils encountered across the survey area are generally consistent with these descriptions although the soils overlie silt rock rather than chalk.

AGRICULTURAL LAND CLASSIFICATION

17. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.
18. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix II.

Grade 2

19. Grade 2, very good quality, land occurs throughout the area surveyed. The land was found to have a minor droughtiness limitation. The soil profiles are predominantly well drained (Wetness Class I) and calcareous throughout. They typically comprise a very slightly stony (2% flint and 3% chalk by volume) medium silty clay loam topsoil. This overlies a clay upper subsoil containing 15% by volume silt rock before passing into a similarly textured lower subsoil containing 33% by volume silt rock. This overlies further lower subsoil horizons containing 45 and 55% silt rock respectively before passing into silt rock at approximately 90cm. The combination of soil textures, stone contents and structures, together with the local climatic regime, means that profiles often have restricted reserves of water. This leads to a slight risk of drought in most years and means that this land can be classified no better than Grade 2.
20. In places where topsoils are heavy silty clay loams, an additional workability limitation is produced. This will restrict the timing of cultivations as trafficking by agricultural machinery or grazing by livestock would cause structural damage at particular times of the season.

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SOURCES OF REFERENCE

British Geological Survey (1994) *Sheet No.237, Thame, 1:50,000, Soild & Drift.*
BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.*
MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*
Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South-East England, 1:250,000.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW: Harpenden

APPENDIX I

DESCRIPTIONS 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 (e.g. 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.

APPENDIX II

SOIL DATA

Contents:

Sample location map

Soil abbreviations - explanatory note

Soil pit and soil boring descriptions (boring and horizon levels)

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

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

Boring Header Information

- GRID REF:** national 100 km grid square and 8 figure grid reference.
- 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	OTH:	Other
DCW:	Deciduous woodland	BOG:	Bog or marsh	SAS:	Set-Aside
HTH:	Heathland	HRT:	Horticultural crops	PLO:	Ploughed

- GRDNT:** Gradient as estimated or measured by a hand-held optical clinometer.
- GLEYSPL:** Depth in centimetres (cm) to gleying and/or slowly permeable layers.
- AP (WHEAT/POTS):** Crop-adjusted available water capacity.
- MB (WHEAT/POTS):** Moisture Balance. (Crop adjusted AP - crop adjusted MD)
- DRT:** Best grade according to soil droughtiness.
- If any of the following factors are considered significant, 'Y' will be entered in the relevant column:

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

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

OC:	Overall Climate	AE:	Aspect	ST:	Topsoil Stoniness
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
EX:	Exposure				

Soil Pits and Auger Borings

- 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
ZL:	Silt 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 the following 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)

- MOTTLE COL:** Mottle colour using Munsell notation.

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 using Munsell notation.

6. **GLEYS:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH:** Stone Lithology - one of the following is used:

HR: all hard rocks and stones

ZR: soft, argillaceous, or silty rocks

MSST: soft, medium grained sandstone

SI: soft weathered igneous/metamorphic rock

FSST: soft, fine grained sandstone

CH: chalk

GS: gravel with porous (soft) stones

GH: gravel with non-porous (hard) stones

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

8. **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	
Ped shape	S: single grain	M: massive
	GR: granular	AB: angular blocky
	SAB: sub-angular blocky	PR: prismatic
	PL: platy	

9. **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

10. **SUBS STR:** Subsoil structural condition recorded for the purpose of calculating profile droughtiness:
G: good M: moderate P: poor

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

12. **IMP:** If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

13. **SPL:** Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC:** If the soil horizon is calcareous, a 'Y' will appear in this column.

15. 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

SAMPLE NO.	GRID REF	ASPECT USE	GRDNT	GLEY	SPL	--WETNESS--		-WHEAT-		-POTS-		M.REL DRT	EROSN FLOOD	FROST EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS	
						CLASS	GRADE	AP	MB	AP	MB								
1	SP81200505	PGR SE	1			1	1	131	28	106	13	1					DR 2		
3	SP81300495	RGR				1	1	89	-14	89	-4	3A					DR 3A	IMP50	
5	SP81300482	PGR				1	1	119	16	123	30	2					DR 2	IMP80	
7	SP81500480	PGR W	2			1	1	136	33	99	6	2					DR 2		
9	SP81380471	PGR NW	2			2	2	159	56	123	30	2					WE 2		
11	SP81600470	PGR W	2			1	2	130	27	101	8	2					DR 2	+WK	
13	SP81500460	PLO W	2			1	1	130	27	101	8	2					DR 2	SEE 1P	
15	SP81610449	PGR W	1			1	1	156	53	120	27	2						1	SEE 1P
17	SP81700440	PGR W	4			1	1	133	30	117	24	1						1	BORDER2/SEE1P
18	SP81600430	PGR NW	2			1	1	134	31	113	20	1					DR 2	BORDER	
1P	SP81500460	PLO W	2			1	2	117	14	111	18	2					DR 2	PITTO100/+WK	

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----		PED COL.	-----STONES-----			STRUCT/ CONSIST	SUBS			CALC		
				COL	ABUN		CONT	GLE	>2		>6	LITH	TOT		STR	POR
1	0-22	MZCL	10YR41					0	0	0				Y		
	22-35	HZCL	10YR6252					0	0	CH	2		M	Y		
	35-120	ZC	25Y62					0	0	CH	2		P	Y		
3	0-30	MZCL	10YR41					0	0	CH	2			Y		
	30-50	MZCL	10YR51					0	0	CH	8		M	Y	IMP 50	
5	0-25	MZCL	10YR32					0	0	CH	1			Y		
	25-60	HZCL	25Y62					0	0	CH	3		M	Y		
	60-80	HZCL	25Y62					0	0	CH	7		M	Y	IMP 80	
7	0-22	MZCL	10YR41					0	0	CH	1			Y		
	22-70	HZCL	25Y72					0	0	CH	1		M	Y		
	70-120	HZCL	25Y51	75YR46	F	F		0	0	CH	3		M	Y	MOIST	
9	0-20	MZCL	10YR32					0	0		0			Y		
	20-55	HZCL	10YR42	75YR56	C	D	Y	0	0	CH	1		M	Y		
	55-55	HZCL	10YR42	75YR56	C	D	Y	0	0	CH	1		M	Y	MOIST	
11	0-22	HZCL	10YR41					0	0	HR	1			Y		
	22-40	HZCL	25Y62					0	0	HR	1		M	Y		
	40-120	CH	25Y72					0	0		0		P	Y		
13	0-30	MZCL	10YR41					0	0	CH	1			Y	1P LOCATION	
	30-40	ZC	25Y61					0	0	CH	1		M	Y		
	40-120	CH	25Y72					0	0		0		P	Y		
15	0-30	MZCL	10YR51					0	0	CH	2			Y		
	30-50	ZC	25Y62					0	0	CH	2		M	Y		
	50-120	HZCL	25Y72					0	0	CH	2		M	Y		
17	0-22	MZCL	10YR6152					0	0	CH	2			Y		
	22-40	HZCL	25Y6162					0	0	CH	1		M	Y		
	40-65	ZC	25Y62					0	0	CH	4		M	Y		
	65-100	HZCL	25Y72					0	0	CH	3		M	Y		
18	0-30	MZCL	10YR51					0	0	ZR	5					
	30-45	HZCL	25Y62					0	0	ZR	15		M			
	45-60	HZCL	25Y62					0	0	ZR	20		M			
	60-90	HZCL	25Y62					0	0	ZR	33		M			
	90-120	ZC	25Y72					0	0	ZR	45		M			
1P	0-29	HZCL	10YR51					0	0	HR	2			Y		
	29-50	C	25Y 62					0	0	ZR	15	MCSAB	FR	M	Y	
	50-68	C	25Y 62					0	0	ZR	33	WKCSAB	FR	M	Y	N
	68-90	C	25Y72					0	0	ZR	45		M	Y		
	90-95	C	25Y72					0	0	ZR	50		M	Y		
	95-120	ZR	25Y72					0	0		0		P	Y	?CHALK	