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**Milton Keynes Local Plan
Potential Development Area 14**

**Agricultural Land Classification
ALC Map and Report**

June 1997

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

MILTON KEYNES LOCAL PLAN, POTENTIAL DEVELOPMENT AREA 14

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 22.5 ha of land on the northern fringe of Milton Keynes, Buckinghamshire, adjacent to the M1. The survey was carried out during June 1997.
2. The survey was carried out by the Farming and Rural Conservation Agency (FRCA) *on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with its statutory input to the Milton Keynes Local Plan.* The results of this survey supersede any previous ALC information for this land.
3. The work was conducted under sub-contracting arrangements by NA Duncan of NA Duncan & Associates, and was supervised 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 all the agricultural land on the site was under permanent grass and used for grazing horses. The areas mapped as 'Other land' include a lorry park associated with the service station on the M1, farm buildings and offices and an access road on the eastern side of the site and a former industrial area on the western side.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000; it is accurate at this scale but any enlargement would be misleading.
6. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 10 borings and 1 soil pit were described.
7. All the agricultural land on the site (10.3 ha) has been mapped as Grade 2, very good quality agricultural land. The soils are typically fine loamy over clayey and have a minor wetness and workability limitation during the wetter parts of the year and a minor droughtiness limitation during the summer months, restricting the land quality to Grade 2.

FACTORS INFLUENCING ALC GRADE

Climate

8. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

9. The key climatic variables used for grading this site are given in Table 1 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 1: Climatic and altitude data

Factor	Units	Values	
		SP 856 435	SP 860432
Grid reference	N/A	SP 856 435	SP 860432
Altitude	m, AOD	65	65
Accumulated Temperature	day°C (Jan-June)	1415	1415
Average Annual Rainfall	mm	628	627
Field Capacity Days	days	129	128
Moisture Deficit, Wheat	mm	111	111
Moisture Deficit, Potatoes	mm	104	104
Overall climatic grade	N/A	Grade 1	Grade 1

10. 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.

11. 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.

12. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation affecting the site. The area is, however, relatively warm and dry and, consequently, the soils will need a moderately high available water capacity to avoid drought stress affecting the crops. The site is not particularly exposed or prone to increased frost risk and consequently there are also no local climatic restrictions to the grading of this land. The site is climatically Grade 1.

Site

13. The site lies at an altitude of approximately 65 m AOD. Gradients on the site are relatively gentle and nowhere on the site are limiting to agricultural use.

Geology and soils

14. The published geological map for the area (BGS, 1970) shows the site to comprise Head overlying Oxford Clay surrounded in places by Chalky Head and Upper Lias deposits.

15. The 1:250,000 scale reconnaissance soil survey map for the area (SSEW, 1983) shows the entire site to comprise soils of the Hanslope association. These soils which are developed in chalky till are described as "slowly permeable calcareous clayey soils, with some slowly permeable non-calcareous clayey soils". The soils found during the survey were calcareous

fine loamy over clayey and relate more closely to the Chalky Head referred to by the Geological Survey.

AGRICULTURAL LAND CLASSIFICATION

16. The details of the classification of the site are shown on the attached ALC map. 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

17. All the agricultural land on the site has been mapped as Grade 2 having minor droughtiness and wetness/workability limitations. The soils on the site typically have a very slightly stony clay loam topsoil, with the western side being a calcareous heavy clay loam whilst to the east the topsoil is more typically non-calcareous medium clay loam. The upper subsoil is a yellowish brown heavy clay loam with manganese concretions and moderate structure. Below approximately 60 cm depth the subsoil becomes a pale yellowish brown clay with common ochreous mottles and chalky fragments. The soil pit showed that the lower subsoil has a coarse platy structure breaking to medium angular blocky and as such is considered to be slowly permeable. The soils therefore have been assessed as Wetness Class II which, associated with the topsoil textures and calcium carbonate content, means that they will be susceptible to structural damage if trafficked, cultivated or grazed during the wetter parts of the year. Furthermore, in this relatively low rainfall area these soils also have a minor droughtiness restriction. Moisture balance calculations indicate that they are slightly droughty for deeper rooting crops restricting the land quality to Grade 2.

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SOURCES OF REFERENCE

British Geological Survey (1970) *Milton Keynes, 1:25,000 scale solid and drift geology*.
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) *Sheet6, South East England*
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 descriptions

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

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

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

4. **GLEYS/SPL:** Depth in centimetres (cm) to gleying and/or slowly permeable layers.

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

6. **MB (WHEAT/POTS):** Moisture Balance. (Crop adjusted AP - crop adjusted MD)

7. **DRT:** Best grade according to soil droughtiness.

8. 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		

9. **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

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
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)

2. **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	FSST:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	CH:	chalk
MSST:	soft, medium grained sandstone	GS:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock	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

SOIL PIT DESCRIPTION

Site Name : MILTON KEYNES AREA 14 Pit Number : 1P

Grid Reference: SP85704330 Average Annual Rainfall : 627 mm
 Accumulated Temperature : 1415 degree days
 Field Capacity Level : 128 days
 Land Use : Permanent Grass
 Slope and Aspect : 01 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	HCL	10YR43 00	1	2	HR					Y
28- 50	HCL	10YR55 00	0	1	HR	F	MDCSAB	FM	M	Y
50- 70	C	10YR65 00	0	2	CH	F	MDCSAB	FM	M	Y
70-120	C	25Y 63 00	0	3	CH	C	WKCP	FM	P	Y

Wetness Grade : 2 Wetness Class : II
 Gleying : 070 cm
 SPL : 070 cm

Drought Grade : 2 APW : 135mm MBW : 24 mm
 APP : 116mm MBP : 12 mm

FINAL ALC GRADE : 2

MAIN LIMITATION : Soil Wetness/Droughtiness

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB					
1	SP85604340	PGR W	04	070 070	2	3A	137	26 115	11	2			WE	3A	Border WCI WG2
1P	SP85704330	PGR W	01	070 070	2	2	135	24 116	12	2			WD	2	Calc hcl tsoil
2	SP85704340	PGR W	02	050 050	2	2	104	-7 109	5	3A			WD	2	Impen80 stone
3	SP85604330	PGR W	03	050 050	2	2	132	21 110	6	2			WD	2	Calc hcl tsoil
4	SP85704330	PGR		060 060	2	2	133	22 111	7	2			WD	2	Calc hcl tsoil
7	SP86004330	PGR		045 045	2	2	128	17 106	2	2			WD	2	Calc hcl tsoil
8	SP85804320	PGR		060 060	2	2	134	23 110	6	2			WD	2	Ncalc medtsoil
9	SP85904320	PGR SE	01	070 070	2	2	131	20 113	9	2			WD	2	Ncalc medtsoil
10	SP86004320	PGR E	03	060 060	2	2	131	20 110	6	2			WD	2	Ncalc medtsoil
11	SP85804310	PGR SE	01	055 055	2	2	131	20 107	3	2			WD	2	Ncalc medtsoil
12	SP85904310	PGR SE	02	055 055	2	2	133	22 110	6	2			WD	2	Ncalc medtsoil

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----			PED		-----STONES-----			STRUCT/	SUBS	STR	POR	IMP	SPL	CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH								TOT
1	0-28	hc1	10YR43 00						2	0	HR	3							
	28-70	hc1	10YR55 00	00MN00	00	F			0	0	HR	2		M			Y		
	70-120	c	25Y 64 00	10YR66	62	C			Y	0	0	HR	2		P		Y	Y	+ 5% chalk
1P	0-28	hc1	10YR43 00						1	0	HR	2						Y	
	28-50	hc1	10YR55 00	00MN00	00	F			0	0	HR	1	MDCSAB	FM	M			Y	
	50-70	c	10YR65 00	10YR66	00	F			0	0	CH	2	MDCSAB	FM	M			Y	
	70-120	c	25Y 63 00	10YR66	71	C			Y	0	0	CH	3	WKCP	FM	P	Y	Y	Y
2	0-27	hc1	10YR43 00						1	0	HR	2						Y	
	27-50	hc1	10YR53 00	00MN00	00	F			0	0	HR	3		M				Y	+ 2% chalk
	50-80	c	25Y 64 00	10YR66	00	C			Y	0	0	HR	3		P		Y	Y	+ 5% chalk
3	0-28	hc1	10YR43 00						1	0	HR	2						Y	
	28-50	c	10YR55 00						0	0	HR	2		M				Y	+ 2% chalk
	50-120	c	10YR64 00	10YR66	00	C			Y	0	0	HR	2		P		Y	Y	+ 3% chalk
4	0-28	hc1	10YR43 00						2	0	HR	4						Y	
	28-60	hc1	10YR55 00	00MN00	00	F			0	0	HR	3		M				Y	+ 3% chalk
	60-120	c	25Y 63 00	10YR66	00	C	25Y 62 00	Y	0	0	HR	3		P		Y	Y	Y	+ 5% chalk
7	0-25	hc1	10YR43 00						2	0	HR	5						Y	
	25-45	hc1	10YR55 00						0	0	HR	4		M				Y	
	45-120	c	25Y 64 62	10YR66	00	C			Y	0	0	HR	2		P		Y	Y	+ 4% chalk
8	0-27	mc1	10YR43 00						2	0	HR	4							
	27-45	hc1	10YR55 00						0	0	HR	4		M					
	45-60	hc1	10YR54 00	10YR56	00	F	00MN00 00		0	0	HR	4		M				Y	
	60-120	c	25Y 64 00	10YR66	62	C			Y	0	0	CH	8		P		Y	Y	+ 2% flints
9	0-24	mc1	10YR43 00						1	0	HR	4							
	24-50	hc1	10YR55 00	00MN00	00	F			0	0	HR	4		M					
	50-70	c	10YR54 00	00MN00	00	C			S	0	0	HR	3		M				S1 gleyed
	70-120	c	25Y 64 00	10YR66	00	C			Y	0	0	HR	3		P		Y	Y	+ 4% chalk
10	0-16	mc1	10YR33 00						0	0	HR	2							
	16-45	hc1	10YR55 00						0	0	HR	2		M					
	45-60	c	10YR65 64	10YR66	00	F			0	0	CH	7		M				Y	
	60-120	c	25Y 64 61	10YR66	00	C			Y	0	0	HR	2		P		Y	Y	+ 5% chalk
11	0-28	mc1	10YR43 00						1	0	HR	3							
	28-55	hc1	10YR56 00						0	0	HR	10		M				Y	+ 3% chalk
	55-80	c	25Y 64 00	10YR66	00	C			Y	0	0	HR	2		P		Y	Y	+ 5% chalk
	80-120	c	25Y 64 00	10YR56	61	C			Y	0	0	CH	5		P		Y	Y	
12	0-25	mc1	10YR43 00						2	0	HR	3							
	25-55	hc1	10YR54 00	10YR56	00	C	00MN00 00	S	0	0	HR	2		M				Y	S1 gleyed
	55-120	c	25Y 64 00	10YR66	62	C			Y	0	0	CH	5		P		Y	Y	