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**Milton Keynes Local Plan
Potential Development Area 13**

**Agricultural Land Classification
Semi-Detailed Survey
ALC Map and Report**

July 1997

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

MILTON KEYNES LOCAL PLAN, POTENTIAL DEVELOPMENT AREA 13

SEMI-DETAILED SURVEY

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of approximately 42 hectares of land at Stantonbury Farm, Stantonbury, to the north of Milton Keynes. The survey was carried out in July 1997.
2. The survey was undertaken 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 by members of the Resource Planning Team in the Eastern Region of the 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 was in permanent grass being grazed by sheep or horses. Areas of the site mapped as 'Other Land' comprise dwellings and farm buildings associated with Stantonbury Farm.

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 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
3a	23.5	57.5	55.3
3b	17.4	42.5	40.9
Other land	1.6	N/A	3.8
Total surveyed area	40.9	100	-
Total site area	42.5	-	100

7. The fieldwork was conducted at an average density of 1 boring every 1.5 hectares of agricultural land. A total of 31 borings and 3 soil pits were described.

8. The agricultural land on this site has been assigned to Subgrade 3a, good quality land, and Subgrade 3b, moderate quality. The soils are derived from a complex pattern of underlying geology, including solid deposits of Jurassic limestone and glacial sand and gravel or Boulder Clay. Much of the site is underlain by the glacial deposits, with limestone outcropping across the south-western part of the site.

9. The land on the site has been classified on the basis of soil wetness and/or soil droughtiness restrictions. Chalky Boulder Clay soils give rise to land classified as Subgrades 3a and 3b. In these instances, the principal limitation to agricultural use is soil wetness/workability. Clayey subsoil horizons, which impede soil drainage, occur at moderate and shallow depth in the profile, the relative depth determining the severity of the soil wetness problem and, therefore, the ALC grade. Where heavy topsoil textures occur, the soil wetness problem is compounded by a workability restriction. Elsewhere within the Subgrade 3a and 3b mapping units, soils are derived from limestone. Profiles rest over brashy limestone at variable depths. The combination of profile stoniness and restricted rooting means that profile available water may not be sufficient to meet plant demands, such that there is a risk of soil droughtiness. The depth to brashy limestone determines the severity of the restriction and, therefore, the ALC grade.

FACTORS INFLUENCING ALC GRADE

Climate

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

11. 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	Values
Grid reference	N/A	SP 844 423	SP 841 421
Altitude	m, AOD	75	80
Accumulated Temperature	day°C (Jan-June)	1405	1399
Average Annual Rainfall	mm	639	642
Field Capacity Days	days	134	134
Moisture Deficit, Wheat	mm	109	108
Moisture Deficit, Potatoes	mm	101	100

12. 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.

13. 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.

14. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation (Climatic Grade 1). However, climatic factors do interact with soil properties to influence soil wetness and droughtiness. The climate at this locality is relatively dry in regional and national terms, thereby enhancing the likelihood of soil droughtiness restrictions.

15. Local climatic factors such as frost risk and exposure are not believed to affect agricultural land use on this site.

Site

16. The land on this site ranges from 75-80m AOD. The highest land is found across the middle of the site, falling to the north and west towards the Grand Union Canal. Micro-relief and gradient do not affect agricultural land quality across the site.

17. Flooding does not appear to be limiting on this site despite its proximity to the canal.

Geology and soils

18. The published geological sheet for the area (BGS, 1971) shows there to be a complex pattern of geological deposits underlying the site. Solid deposits of Jurassic age (Blisworth Limestone, Blisworth Clay and Cornbrash) are exposed at the surface around the periphery of the site on the mid and lower slopes, particularly to the east and west of the survey area. Elsewhere on the site, i.e., on the higher land, the solid geology is overlain by glacial drift deposits of Boulder Clay, whilst glacial sand and gravel outcrop towards the north of the survey area. Field survey work found little evidence of the presence of glacial sand and gravel.

19. The most recently published soils information for this area (SSEW, 1983) maps the Hanslope soil association across the entire site. These soils are described as 'Slowly permeable calcareous clayey soils, with some non-calcareous clayey soils.' (SSEW, 1983).

20. Detailed field examination of the soils on the site broadly confirms the presence of variably drained clayey soils across parts of the site, notably the central higher land, interspersed with brashy soils over limestone, particularly towards the west and east.

AGRICULTURAL LAND CLASSIFICATION

21. 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.

22. 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.

Subgrade 3a

23. Good quality agricultural land has been mapped across the central part of the site, the classification being determined by soil droughtiness and/or wetness restrictions.

24. Towards the south and central parts of the mapping unit, where soils are derived from deposits of Chalky Boulder Clay, the principal limitation is one of soil wetness/workability. Soil pit 2 is representative of these soils. They typically comprise non-calcareous heavy clay loam topsoils which may contain up to 2% total hard stones (flints and limestone fragments). These overlie similar upper subsoils with up to 18% flints + limestone fragments, and pass to clay lower subsoils which are very slightly to slightly stony. Profiles are imperfectly drained, as evidenced by the presence of common mottling in the lower subsoils. These clay subsoils were found to be the cause of impeded drainage, arising from their poor structural condition. Such drainage characteristics are consistent with a wetness class of II. The restriction which results from this degree of soil wetness is exacerbated by the heavy topsoil textures, such that *Subgrade 3a* is appropriate. Seasonal waterlogging will affect crop growth and development, and thereby yield, whilst heavy topsoils will restrict the number of days when the land is in a suitable condition for cultivations or grazing.

25. Elsewhere within the *Subgrade 3a* mapping unit, soil droughtiness is the principal limitation, where soils are derived from deposits of limestone. In terms of soil characteristics relevant to soil droughtiness, soil pit 3 is typical of these soils. Profiles comprise non-calcareous heavy clay loam topsoils which may be very slightly stony, containing up to 5% total flints + hard limestone fragments. Similar upper subsoils were typically found to be impenetrable (to soil auger) over brashy limestone at depths between 30 and 65 cm. The excavation of soil pit 3 proved the existence of a clay lower subsoil containing 20-50% brashy limestone. These well drained soils (wetness class I, see Appendix II), have insufficient reserves of soil moisture due to the combination of textures, stone contents and the prevailing climate. The resulting droughtiness restriction is consistent with a *Subgrade 3a* classification. The level and consistency of crop yields may be adversely affected, especially in drier years.

Subgrade 3b

26. Moderate quality land has been mapped in conjunction with soil droughtiness or wetness restrictions. Soils are similar to those described above but are either shallower over slowly permeable clay or shallower over brashy limestone, in the subsoil. The resultant soil wetness or droughtiness restrictions are therefore more severe than for land classified as *Subgrade 3a*.

27. Where soil wetness/workability is the overriding restriction soils comprise non-calcareous heavy clay loam topsoils, which sometimes overlie a thin upper subsoil of heavy clay loam, or they may pass directly to gleyed and slowly permeable clay horizons, which significantly impede drainage. Soil pit 1 is typical of these soils. The shallow depth to gleyed and slowly permeable horizons gives rise to a wetness class of III. The combination of soil drainage status, prevailing climatic conditions, and heavy topsoil textures results in a land classification of *Subgrade 3b* on the basis of soil wetness/workability. This will adversely affect yield potential and the opportunities for cultivations and/or grazing.

28. Subgrade 3b land affected by soil droughtiness comprises soils which are shallow over limestone deposits. Heavy clay loam topsoils overlie similar or slightly heavier subsoils which were found to be impenetrable to the soil auger at shallow depth (between 30 and 40 cm). Such shallow soils have severely restricted reserves of soil moisture due to high stone contents in the subsoil and restricted rooting. The level and consistency of crop yields is likely to be adversely affected as a result of plants being under significant drought stress at critical periods of the growing season.

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet No. SP 83 + parts of SP 73, 74, 84, 93 & 94, Milton Keynes*, 1:25,000 scale, Solid & 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.

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

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

Soil Survey of England and Wales (1984) *Soils and their Use in South East England, Bulletin No. 15* SSEW: Harpenden.

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 that 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 that restricts 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)

Database Printout - Horizon Level Information

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 grass	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. **GLEYSPL:** 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

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	FM: firm	EH: extremely hard
VF: very friable	VM: very firm	
FR: friable	EM: extremely firm	

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 UDP AREA13 Pit Number : 1P

Grid Reference: SP84104210 Average Annual Rainfall : 640 mm
 Accumulated Temperature : 1405 degree days
 Field Capacity Level : 134 days
 Land Use : Permanent Grass
 Slope and Aspect : 01 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 20	HCL	10YR33 00	0	0						
20- 38	C	10YR53 00	0	2	HR	F	MVCSAB	FM	M	
38-120	C	25 Y53 52	0	2	HR	C	MDCOAB	VM	P	Y

Wetness Grade : 3B Wetness Class : III
 Gleying : 038 cm
 SPL : 038 cm

Drought Grade : 2 APW : 127mm MBW : 18 mm
 APP : 104mm MBP : 3 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : MILTON KEYNES UDP AREA13 Pit Number : 2P

Grid Reference: SP83804220 Average Annual Rainfall : 640 mm
 Accumulated Temperature : 1405 degree days
 Field Capacity Level : 134 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- 20	HCL	10YR33 00	0	2	HR					
20- 66	HCL	25 Y32 00	0	18	HR		MDMSAB	FR	M	Y
66-120	C	25 Y42 52	0	18	HR	M			P	Y

Wetness Grade : 3A Wetness Class : II
 Gleying : 066 cm
 SPL : 066 cm

Drought Grade : 2 APW : 120mm MBW : 11 mm
 APP : 101mm MBP : 0 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : MILTON KEYNES UDP AREA13 Pit Number : 3P

Grid Reference: SP83804200 Average Annual Rainfall : 640 mm
 Accumulated Temperature : 1405 degree days
 Field Capacity Level : 134 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- 22	HCL	10YR33 00	0	0						Y
22- 40	HCL	10YR34 00	0	10	HR		MDCSAB	FR	M	Y
40- 65	C	25 Y52 00	0	20	HR	C			P	Y
65-120	C	25 Y52 00	0	50	HR	C			P	Y

Wetness Grade : 3B Wetness Class : III
 Gleying : 040 cm
 SPL : 040 cm

Drought Grade : 3A APW : 105mm MBW : -4 mm
 APP : 096mm MBP : -5 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS		IMP	SPL	CALC
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT			
1	0-28	hc1	10YR32 00					0	0	0						High OM
	28-52	hc1	10YR42 00					0	0	SLST 2		M			Y	Imp Lst?
1P	0-20	hc1	10YR33 00					0	0	0						
	20-38	c	10YR53 00	10YR56 00	F			0	0	HR 2	MVCSAB	FM	M			
	38-120	c	25 Y53 52	10YR56 00	C		Y	0	0	HR 2	MDCOAB	VM	P	Y	Y	Y
2	0-32	hc1	10YR42 00					0	0	0						
	32-40	hc1	10YR43 44					0	0	SLST 5		M			Y	
	40-50	c	10YR54 56					0	0	SLST 25		M			Y	Imp Lst?
2P	0-20	hc1	10YR33 00					0	0	HR 2						Flints+Lst
	20-66	hc1	25 Y32 00					0	0	HR 18	MDMSAB	FR	M		Y	Flints+Lst
	66-120	c	25 Y42 52	10YR56 00	M		Y	0	0	HR 18			P	Y	Y	QDisturbed
3	0-28	msz1	10YR43 00					0	0	0						
	28-65	mc1	10YR44 54					0	0	HR 10		M				
	65-80	hc1	10YR44 54					0	0	HR 15		M				Imp Lst?
3P	0-22	hc1	10YR33 00					0	0	0						Y
	22-40	hc1	10YR34 00					0	0	HR 10	MDCSAB	FR	M			Y
	40-65	c	25 Y52 00	10YR56 00	C		Y	0	0	HR 20			P	Y	Y	Y
	65-120	c	25 Y52 00	10YR56 00	C		Y	0	0	HR 50			P		Y	Y
4	0-25	msz1	10YR43 00					0	0	0						
	25-35	mc1	10YR43 44					0	0	HR 5		M			Y	Imp Lst
5	0-32	hc1	10YR53 54					12	0	HR 20					Y	Imp Lst
6	0-25	hc1	10YR54 00					7	0	HR 15						Y
	25-40	c	10YR56 00					0	0	SLST 10		M			Y	Imp Lst
7	0-30	hc1	10YR33 00					0	0	0						
	30-45	hc1	10YR33 00					0	0	0		M				
	45-75	c	25 Y53 00	10YR56 00	C		Y	0	0	0			P		Y	Y
8	0-32	hc1	10YR33 00					0	0	0						
	32-40	hc1	10YR34 00					0	0	0		M				Imp Lst?
9	0-20	mc1	10YR33 00					0	0	0						
	20-50	mc1	10YR44 00					0	0	HR 1		M				Imp Lst?
10	0-30	hc1	10YR43 00					0	0	0						
	30-60	hc1	10YR44 54					0	0	HR 2		M				
	60-65	hc1	10YR44 00					0	0	SLST 5		M			Y	Imp Lst
11	0-30	hc1	10YR43 00					0	0	0						
	30-40	c	10YR44 00					0	0	0		M				
	40-60	c	25 Y53 52	10YR56 00	C		Y	0	0	SLST 5		P		Y	Y	Imp Lst

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- PED			----STONES----			STRUCT/ CONSIST	SUBS			CALC					
				COL	ABUN	CONT	COL.	GLE	>2		>6	LITH	TOT		STR	POR	IMP	SPL	
12	0-25	hc1	10YR43 00																
	25-45	c	10YR44 00																
	45-65	c	25 Y53 52	10YR56 00 C			00MN00 00 Y	0	0	0			P			Y			Imp Lst?
13	0-25	mc1	10YR33 00																Y
	25-35	mc1	10YR43 00										M						Y
14	0-20	hc1	10YR43 00																
	20-30	hc1	10YR43 00										M						
	30-50	c	25 Y44 00										M						Y
15	0-20	hc1	10YR33 00																
	20-30	hc1	10YR43 00										M						
	30-45	c	10YR43 00										M						
16	0-29	hc1	10YR43 00																
	29-40	c	10YR54 00										M						Y
	40-70	c	25 Y52 56	10YR56 00 C			00MN00 00 Y	0	0	HR	2		P			Y	Y		Imp Lst?
17	0-28	hc1	10YR43 00																
	28-45	c	10YR44 00										M						
	45-120	c	25 Y53 52	10YR56 00 C				Y	0	0	0		P						Y
18	0-25	hc1	10YR42 00																
	25-52	c	25 Y54 00	10YR58 00 C				Y	0	0	SLST	5		P			Y	Y	Imp Lst
19	0-25	hc1	10YR43 53																Y
	25-42	c	25 Y53 00	10YR58 00 C				Y	0	0	SLST	15		P					Y
20	0-27	hc1	10YR42 00																
	27-40	hc1	10YR54 00	00MN00 00 F										M					Y
	40-100	c	10YR53 00	10YR58 00 C				Y	0	0	SLST	5		P					Y
21	0-30	hc1	10YR42 00																
	30-47	hc1	25 Y44 00	10YR56 00 F										M					Y
	47-100	c	25 Y53 00	10YR58 00 C				00MN00 00 Y	0	0	SLST	2		P					Y
22	0-32	hc1	10YR43 00																
	32-45	c	10YR53 54											M					
	45-55	c	25 Y54 53	10YR58 00 C				00MN00 00 Y	0	0	0			P					Y
	55-77	c	25 Y53 00	10YR58 00 C				00MN00 00 Y	0	0	SLST	2		P					Y
23	0-25	hc1	10YR42 00																Y
	25-30	hc1	10YR54 00											M					Y
24	0-27	hc1	10YR42 00																Y
	27-32	hc1	10YR54 00											M					Y

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED	----STONES----			STRUCT/	SUBS	IMP	SPL	CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT			
25	0-29	hc1	10YR43 00					0	0	0					
	29-45	hc1	10YR44 00					0	0	0		M			
	45-50	hc1	10YR44 00					0	0	HR	10	M			
	50-60	c	10YR44 00	75YR58 00 C			00M00 00 S	0	0	HR	10	P		Y	
	60-80	c	10YR54 00	10YR68 00 C			00M00 00 S	0	0		0	P		Y	
	80-120	c	10YR54 00	10YR68 00 C			00M00 00 S	0	0		0	P		Y	Y
26	0-25	hc1	10YR43 00					0	0	0					
	25-45	hc1	10YR44 54					0	0	HR	2	M			
	45-57	c	10YR44 46					0	0	HR	2	M			
	57-70	c	10YR44 00	10YR58 00 C			00M00 00 S	0	0	HR	5	P		Y	Imp Stone
27	0-25	mc1	10YR42 00	75YR46 00 C				0	0	0				Y	Root mottles
	25-30	mc1	10YR54 00					0	0	SLST	25	M		Y	Imp Lst
28	0-25	hc1	10YR33 00					0	0	0					
	25-50	c	25 Y54 00					0	0	HR	2	M		Y	Imp Lst
29	0-25	hc1	10YR43 00					0	0	0					
	25-35	hc1	10YR54 44					0	0	0		M			
	35-45	hc1	10YR54 44					0	0	HR	10	M			Imp Lst
30	0-25	hc1	10YR42 00					0	0	HR	2				
	25-35	hc1	10YR54 00					0	0	HR	2	M			
	35-45	c	10YR54 00					0	0	0		M			
	45-120	c	25 Y53 00	10YR56 00 C			10YR51 00 Y	0	0	0		P		Y	Y
31	0-35	hc1	10YR33 00					0	0	0					
	35-45	hc1	10YR44 00					0	0	HR	1	M			
	45-68	c	10YR54 00					0	0	0		M			
	68-120	c	25 Y53 52	10YR58 00 C			00M00 00 Y	0	0	SLST	1	P		Y	

SAMPLE NO.	GRID REF	ASPECT USE	GRDNT	--WETNESS--			-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
				GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1	SP83604240	PGR N	01			1	2	087	-22	088	-13	3B			DR	3A	SEE 3P
1P	SP84104210	PGR S	01	038	038	3	3B	127	18	104	3	2			WE	3B	
2	SP83804240	PGR N	01			1	2	083	-26	083	-18	3B			DR	3A	SEE 3P
2P	SP83804220	PGR W	01	066	066	2	3A	120	11	101	0	2		Y	WE	3A	DISTURBED
3	SP84004240	PGR N	01			1	1	112	3	114	13	3A			DR	3A	POSS 2 DR
3P	SP83804200	PGR W	01	040	040	3	3B	105	-4	096	-5	3A			WE	3B	ROOTS TO 120
4	SP84104240	PGR N	01			1	1	063	-46	063	-38	3B			DR	3B	IMP 35 LST
5	SP84204240	PGR NE	01			1	2	047	-62	047	-54	4			DR	3B	IMP 32 LST
6	SP84404240	PGR E	01			1	2	061	-48	061	-40	3B			DR	3B	IMP 40 LST
7	SP83704230	PGR S	01	045	045	3	3B	102	-7	111	10	3A			WE	3B	IMP LST
8	SP83904230	PGR S	01			1	2	070	-39	070	-31	3B			DR	3A	SEE 3P
9	SP84104230	PGR S	01			1	1	084	-25	084	-17	3B			DR	3A	SEE 3P
10	SP84204230	PGR N	01			1	2	100	-9	109	8	3A			DR	3A	IMP 65
11	SP84304230	LEY E	01	040	040	3	3B	000	0	000	0				WE	3B	IMP LST
12	SP84404230	LEY E	01	045	045	3	3B	000	0	000	0				WE	3B	IMP LST
13	SP83704220	PGR W	03			1	1	063	-46	063	-38	3B			DR	3A	SEE 3P
14	SP83804220	PGR W	01			1	2	083	-26	083	-18	3B			WD	2	SEE 2P
15	SP84004220	PGR N	01			1	2	076	-33	076	-25	3B			DR	3A	SEE 3P
16	SP84204220	PGR		040	040	3	3B	096	-13	108	7	3A			WE	3B	IMP 70
17	SP84304220	LEY		045	045	3	3B	133	24	110	9	2			WE	3B	
18	SP83704210	PGR W	01	025	025	4	3B	077	-32	078	-23	3B			WE	3B	IMP 52
19	SP83804210	PGR W	01	025		2	3A	063	-46	063	-38	3B			WD	3A	IMP 42 SEE 3P
20	SP83904210	PGR W	01	040	040	3	3B	115	6	106	5	2			WE	3B	
21	SP84004210	PGR S	01	047	047	2	3A	119	10	110	9	2			WE	3A	
22	SP84104210	PGR S	01	045	045	2	3A	104	-5	111	10	3A			WE	3B	SEE 1P
23	SP83804200	PGR W	02			1	2	052	-57	052	-49	4			WE	3B	SEE 3P
24	SP83904200	PGR S	01			1	2	053	-56	053	-48	4			DR	3A	IMP 32 SEE 3P
25	SP84004200	PGR SE	01	S50	050	2	3A	133	24	110	9	2			WE	3A	
26	SP84204200	PGR SE	01	057	057	2	3A	098	-11	111	10	3A			WE	3A	
27	SP83804190	PGR W	02			1	1	052	-57	052	-49	4			DR	3B	IMP 30 LST
28	SP83904190	PGR S	01			1	2	084	-25	084	-17	3B			DR	3A	SEE 3P
29	SP84104190	PGR SE	01			1	2	076	-33	076	-25	3B			DR	3A	SEE 3P
30	SP83804180	PGR S	01	045	045	3	3B	131	22	108	7	2			WE	3B	
31	SP84004180	PGR		068	068	2	3A	137	28	118	17	2			WE	3A	