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**Milton Keynes Local Plan
Potential Development Area 5, South**

**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 5, SOUTH

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 50 hectares of land to the east of the River Ouzel and south of the A5, on the south-eastern edge of Milton Keynes in Buckinghamshire. The survey was carried out during June 1997.
2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ 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 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 of the land was in cereal stubble. In the north-west corner of the site, an area of scrub and woodland has been mapped as 'Other Land'.

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
2	16.4	40.7	40.1
3a	10.2	25.3	24.9
3b	13.7	34.0	33.5
Other land	0.6	N/A	1.5
Total surveyed area	40.3	100.0	98.5
Total site area	40.9	-	100.0

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 41 borings and 4 soil pits was described.

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

8. Much of the agricultural land on the site has been mapped as Grade 2 (very good quality). Land in the south of the site has been classified as Subgrade 3a (good quality). The remaining area has been classified as Subgrade 3b (moderate quality).

9. A significant proportion of the land on the site suffers from soil wetness problems to varying degrees. Soil wetness acts to restrict the flexibility of cropping, stocking and cultivations and adversely affects yields. Across much of the site, the topsoils are medium loamy. These profiles overlie similar or heavy loamy upper subsoils and pass into poorly structured clays which act to impede soil drainage. In general, the depth to these poorly structured horizons will determine the final ALC grade. Where these horizons are relatively deep, the land is classified as Grade 2. Elsewhere, where they are shallower within the profile, the land is classified as Subgrade 3a. Profiles similar to the latter, but with heavier topsoils, give rise to land classified as Subgrade 3b. Some profiles on the site are clayey throughout. These profiles, which are poorly drained, also give rise to Subgrade 3b land.

10. Parts of the land classified as Grade 2 are limited by slight soil droughtiness, sometimes in conjunction with soil wetness. Such profiles typically comprise free draining medium loamy upper profiles passing into coarse loamy horizons at depth. Similar profiles, but with a slightly higher stone content, give rise to land with a more pronounced risk of drought stress. This land has been classified as Subgrade 3a. The latter typically occurs on the slightly higher land in the south of the site. Drought stress may result in lower and less consistent crop yields.

FACTORS INFLUENCING ALC GRADE

Climate

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

12. 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 887 331	SP 890 335	SP 891 331
Grid reference	N/A	70	75	77
Altitude	m, AOD	1413	1407	1405
Accumulated Temperature	day°C (Jan-June)	640	637	640
Average Annual Rainfall	mm	135	134	135
Field Capacity Days	days	108	108	108
Moisture Deficit, Wheat	mm	101	101	100
Moisture Deficit, Potatoes	mm			
Overall climatic grade	N/A	Grade 1	Grade 1	Grade 1

13. 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.

14. 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.

15. The combination of rainfall and accumulated temperature at this site mean that there is no overall climatic limitation. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. At this locality, the climate is relatively warm and dry in a regional context. Consequently, the soils will need a moderately high available water capacity to avoid drought stress affecting the crops during part of the growing season. 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, therefore, climatically Grade 1.

Site

16. The highest land, which occurs in the south-east of the site, lies at approximately 79 m AOD. The land gently falls through slopes of 0-4°, through differing aspects, to lie at the lowest point of 69 m AOD. The latter occurs along the western site boundary, which is formed by the River Ouzel. The river is contained by relatively deep embankments and, at the time of survey, flood risk was not considered to adversely affect agricultural land quality. In addition, nowhere on the site do gradient or microrelief limitations impact upon land quality.

Geology and soils

17. The published geology map for the area (BGS, 1992) shows the entire site to be underlain by a solid deposit of Oxford Clay. Drift deposits of first and second terrace river gravels and head are mapped in strips running east-west along the northern and southern site boundaries and, also, across the centre of the site. A thin strip of land, flanking the River Ouzel, is mapped as alluvium.

18. The published reconnaissance soil survey map (SSEW, 1983) maps three soil types across the site. Most of the site is shown to comprise soils of the Bishampton 2 Association. These soils are described as 'Deep fine loamy and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging associated with similar slowly permeable seasonally waterlogged soils.' (SSEW, 1983). The central eastern part of the site is shown to comprise soils of the Oxpasture Association. These soils are described as 'Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some slowly permeable seasonally waterlogged clayey soils.' (SSEW, 1983). Finally, soils of the Fladbury 1 Association are mapped along the River Ouzel, in conjunction with the alluvial deposits. These soils are described as 'Stoneless clayey soils, in places calcareous, variably affected by groundwater. Flat land. Risk of flooding.' (SSEW, 1983).

AGRICULTURAL LAND CLASSIFICATION

19. 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 Tables 1, page 1.

20. 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, page 10.

Grade 2

21. Grade 2, very good quality, land occurs adjacent to the northern site boundary and also in the centre of the site. Most of this land is limited by soil droughtiness; parts of the land are also equally limited by soil wetness. This land is associated with deep, coarse loamy soils.

22. Where soil droughtiness is the key limitation, topsoils comprise calcareous and non-calcareous medium clay loams. The topsoils are slightly stony, containing 0-4% flints larger than 2 cm and 2-8% total flints by volume. These overlie similarly textured and, to a lesser extent, heavy clay loam subsoils. The subsoils in this area are slightly to moderately stony, typically containing 5-20% total flints by volume, and are moderately structured. Due to the relatively dry subsoil conditions at the time of survey, most of the auger borings within this area proved impenetrable to a soil auger between 40 and 90 cm depth. A soil inspection pit (Pit 4) was used to describe this mapping unit. From Pit 4, it could be seen that the lower subsoils comprise medium clay loams which are moderately stony (about 35% total flints by volume) and moderately structured. The profiles within this area are well drained (Wetness Class I). The interaction between the soil characteristics and the prevailing climate means that the profile available water is not quite sufficient to fully meet crop needs. Consequently, there is a minor risk of drought stress which will result in a slightly lower yield potential and less consistent crop yields.

23. Discrete areas of this mapping unit are limited by soil wetness and, in parts, also by soil droughtiness. Here, some profiles are similar to those described in paragraph 22, but have heavier (heavy clay loam) topsoils, which may impose minor restrictions on cultivations or grazing by livestock. Of the remaining profiles, some have medium textured topsoils but overlie poorly structured clay at approximately 50-60 cm depth. This clay is slowly permeable, resulting in moderately well drained profiles (Wetness Class II). In other profiles, lighter textured lower subsoils (medium sandy loams, loamy medium sands) are subject to fluctuating groundwater levels, as indicated by gleying within 40 cm depth. These profiles, which are typified by Pit 1, are also assessed as moderately well drained. The interaction between these soil drainage characteristics, the medium textured topsoils and the local climate results in a slight soil wetness limitation. Consequently, this land may be subject to minor restrictions on the flexibility of cropping, stocking and cultivations.

Subgrade 3a

24. Subgrade 3a, good quality, land occurs as two blocks in the south of the site. This land is limited either by soil droughtiness or soil wetness/workability, which sometimes act in conjunction.

25. Where soil droughtiness is limiting, topsoils comprise non-calcareous medium clay loams which tend to be slightly stony, containing 1-8% flints larger than 2 cm, 0-2% flints larger than 6 cm and 3-15% total flints by volume. Upper subsoils comprise heavy clay loams and sandy clay loams which are moderately stony (15-35% total flints by volume). However, the dry subsoil conditions at the time of survey, together with underlying gravelly deposits, meant that most of the profiles within this unit proved impenetrable to a soil auger at shallow depths (40-60 cm) within the soil profile.

26. A soil inspection pit (Pit 3) was used in association with pit information from an adjacent survey to the south of the site (FRCA Ref: 0301\147\97; Pit 3) to describe this mapping unit. From the two pits, it could be seen that these 'impenetrable' horizons comprise variably textured soils, typically sandy clay loam, clay and sandy clay. These subsoils are very stony with stone contents in the range of 35-50% total flints by volume. On this site, the sandy clay loam lower subsoils tend to give rise to well drained profiles (Wetness Class I). However, the clay and sandy clay lower subsoils act to impede drainage, resulting in imperfectly drained profiles (Wetness Class III). For all of these profiles, the gravelly subsoils restrict the moisture content of the profiles, and moisture balance calculations indicate that the amount of water available to a growing crop may not be sufficient to meet its needs throughout the growing season. The resulting drought stress may cause the level and consistency of crop yields to be depressed. Subgrade 3a is appropriate.

27. Land where soil wetness is limiting is associated with imperfectly drained soil profiles. Non-calcareous medium clay loam topsoils overlie similarly textured and heavy clay loam upper subsoils. These upper subsoils are moderately structured and permeable. At approximately 45 cm depth, these pass into poorly structured clay lower subsoils. These clay subsoils range in stone content, from very stony (45% total flints - see Pit 3, FRCA Ref: 0301/147/97) to slightly stony (6-10% total flints). All of these clay subsoils have been assessed as slowly permeable which, at this locality, results in imperfect soil drainage (Wetness Class III). The combination of imperfect soil drainage, medium textured topsoils and climatic factors means that this land is limited by soil wetness and workability. This land will be subject to seasonal restrictions on the flexibility of cropping, stocking and cultivations.

Subgrade 3b

28. Land of Subgrade 3b, moderate quality, is mapped on the lower land adjacent to the River Ouzel and in the extreme south-east of the site. Land of this quality also occurs in the south and centre of the site. All of this land is subject to significant soil wetness and workability limitations.

29. The profiles are derived from Oxford Clay. Topsoils comprise non-calcareous medium clay loam, heavy clay loam and clay textures. All of the medium clay loam topsoils, and about half of the heavier textured topsoils, directly overlie poorly structured clay in the subsoil. These subsoils are slowly permeable and act to significantly impede soil drainage. This is indicated by gleying either from the surface or directly below the topsoil. Given the prevailing climate, these profiles are assessed as poorly drained (Wetness Class IV). The

interaction between the medium and heavy textured topsoils, the poor soil drainage and prevailing local climate means that this land is limited by soil wetness and workability.

30. Elsewhere, the heavier textured topsoils overlie permeable, similarly textured upper subsoils before passing into the poorly structured clay at about 40-42 cm depth. These profiles are imperfectly drained (Wetness Class III), as indicated by gleying from 40-42 cm depth. Despite being slightly better drained, the heavier topsoils mean that at this locality the land is also limited to Subgrade 3b because of soil wetness restrictions. Soil wetness can adversely affect seed germination and survival and can inhibit the development of a good root system. It also influences the sensitivity of soil to structural damage and is, therefore, a major factor in determining the number of days when cultivation, trafficking or grazing can take place.

Gillian Iles
Resource Planning Team
Eastern Region
FRCA Reading

SOURCES OF REFERENCE

British Geological Survey (1992), *Sheet 220, Leighton Buzzard, 1:50,000 (solid and drift edition)*.

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 and accompanying legend*.

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. **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
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	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 |

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					DRT
1	SP88803370	STB		048 048	2	2	145	37 108	7	2			WD	2	
1P	SP89203320	STB		024	2	2	153	45 113	12	1			WE	2	
2	SP88803360	STB		060	1	1	112	4 114	13	3A			DR	2	Imp80dry/stony
2P	SP88903340	STB	S	02 042 042	3	3B	125	17 103	2	2			WE	3B	
3	SP88903360	STB			1	1	76	-32 76	-25	3B			DR	2	Imp45 see 4P
3P	SP89103310	STB	W	02		1	1	85	-23 85	-16	3B		DR	3A	Pit to 80 dry
4	SP89003360	STB			1	1	88	-20 91	-10	3A			DR	2	Imp55 see 4P
4P	SP89003360	STB			1	1	97	-11 99	-2	3A			DR	2	Pit to 80 dry
5	SP88903350	STB			1	1	81	-27 84	-17	3B			DR	2	Imp55 see 4P
6	SP89003350	STB			1	1	83	-25 83	-18	3B			DR	2	Imp60 see 4P
7	SP89103350	STB			1	1	148	40 113	12	1				1	Augered to 100
8	SP88703340	STB		030 030	4	3B		0	0				WE	3B	
9	SP88803340	STB			1	1	68	-40 68	-33	3B			DR	2	Imp40 see 4P
10	SP88903340	STB	S	02 040 040	3	3B		0	0				WE	3B	Q clay topsoil
11	SP89003340	STB		028 028	4	3B		0	0				WE	3B	Slightly sandy
12	SP89103340	STB		050 050	2	2	98	-10 109	8	3A			DR	2	Imp70dry see 4
13	SP89203340	STB			1	1	117	9 112	11	2			DR	2	Imp90 dry
14	SP88603330	STB		040 040	3	3B		0	0				WE	3B	
15	SP88703330	STB		028 028	4	3B		0	0				WE	3B	
16	SP88803330	STB	N	01		1	1	81	-27 83	-18	3B		DR	2	Imp55 see 4P
17	SP88903330	STB			1	1	93	-15 99	-2	3A			DR	2	Imp60 see 4P
18	SP89003330	STB		025 025	4	3B		0	0				WE	3B	
19	SP88903330	STB		025 025	4	3B		0	0				WE	3B	
20	SP89203330	STB	W	02		1	1	68	-40 68	-33	3B		DR	2	Imp40 see 4P
21	SP88503320	STB		055 055	2	3B	112	4 111	10	3A			WE	3B	
22	SP88603320	STB			1	1	93	-15 99	-2	3A			DR	2	Imp60see 4P&1P
23	SP88703320	STB		050	1	1	112	4 109	8	3A			DR	2	Imp80see 4P&1P
24	SP88803320	STB	W	01 045 045	3	3B		0	0				WE	3B	
25	SP88903320	STB		030 080	2	2	119	11 105	4	2			WE	2	
26	SP89003320	STB	N	02 045 045	3	3A	124	16 100	-1	2			WE	3A	
27	SP89103320	STB		030 030	4	3B		0	0	3A			WE	3B	
28	SP89203320	STB		028	2	2	122	14 116	15	2			WD	2	Imp85 Q DR
29	SP88603310	STB			1	2	82	-26 82	-19	3B			WD	3A	3P 0301/147/97
30	SP88703310	STB		040	1	2	104	-4 104	3	3A			WD	3A	3P 0301/147/97
31	SP88803310	STB	W	01 060 060	2	2	119	11 109	8	2			WD	2	
32	SP88903310	STB	W	02 025 025	4	3B		0	0				WE	3B	
33	SP89003310	STB		045 045	3	3A	110	16 101	0	2			WE	3A	
34	SP89103310	STB			1	1	61	-47 61	-40	3B			DR	3A	Imp45 see 3P
35	SP89203310	STB	N	02 030 030	4	3B		0	0				WE	3B	
36	SP88803300	STB	W	01 025 025	4	3B		0	0				WE	3B	
37	SP88903300	STB	E	03 060	1	1	126	18 110	9	2			WD	2	Imp100 Q DR
38	SP89003300	STB		030	2	3A	99	-9 106	5	3A			WE	3A	Imp70 prob 2DR

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS	
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP		DIST
39	SP89103300	STB S	01	025		2	2	109	1	100	-1	3A			WE 2	Imp90 prob 2DR
40	SP89203300	STB S	04	060 060		2	1	111	3	104	3	3A			DR 2	Imp90 prob 2DR
41	SP89203290	STB		020 020		4	3B		0		0				WE 3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES-----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR		IMP
1	0-30	mc1	10YR32 00						0	0	HR	2					
	30-48	hc1	10YR32 00						0	0	HR	8		M			
	48-65	c	25Y 52 32 75YR56 00 C					Y	0	0	HR	5		P		Y	
	65-120	mc1	10YR33 00 10YR58 00 F						0	0	HR	5		M			
1P	0-24	mc1	10YR32 00						0	0	HR	2					
	24-50	mc1	10YR53 00 75YR58 00 C					Y	0	0	HR	2	MDCSAB	FR	M		St. sandy
	50-84	ms1	25Y 53 00 75YR58 00 C					Y	0	0	HR	2	MDCSAB	FR	M		
	84-100	ms1	10YR52 00 75YR46 56 M					Y	0	0	HR	10	MDCSAB	FR	M		
	100-120	sc1	10YR61 00 75YR46 56 M					Y	0	0	HR	15			M		
2	0-30	mc1	10YR32 00						0	0	HR	2					Few brick frags
	30-60	mc1	10YR31 00						0	0	HR	5		M		Y	Few brick frags
	60-70	mc1	10YR42 44 10YR58 00 C					Y	0	0	HR	5		M		Y	Few brick frags
	70-80	mc1	10YR43 00						0	0	HR	8		M		Y	Imp80,dry/stony
2P	0-28	c	10YR42 00						0	0	HR	2					
	28-42	c	10YR41 00 10YR56 00 F						0	0	HR	5	MDCSAB	FM	M		Y
	42-120	c	25Y 53 52 75YR68 00 M				00MN00 00	Y	0	0	HR	5	MDCSAB	FM	P	Y	Y
3	0-30	mc1	10YR31 00						0	0	HR	2				Y	Few brick frags
	30-45	mc1	10YR32 00						0	0	HR	5		M		Y	Imp45,dry/stony
3P	0-27	mc1	10YR43 00						8	2	HR	15					
	27-80	sc1	10YR56 00						0	0	HR	35	MDCSAB	FM	M		Pit to 80 v dry
4	0-30	mc1	10YR31 00						0	0	HR	2				Y	Few brick frags
	30-55	mc1	10YR32 53						0	0	HR	5		M		Y	Imp55,dry/stony
4P	0-30	mc1	10YR31 00						4	0	HR	8				Y	
	30-55	mc1	10YR31 00						0	0	HR	20	MDCSAB	FR	M	Y	
	55-80	mc1	75YR46 00 00FE00 00 C						0	0	HR	35		FR	M	Y	Pit to 80 v dry
5	0-30	hc1	10YR32 00						0	0	HR	2				Y	Few brick frags
	30-55	c	10YR33 00 10YR58 00 F						0	0	HR	5		P		Y	Imp55,dry/stony
6	0-30	hc1	10YR32 00						0	0	HR	2				Y	Few brick frags
	30-50	hc1	10YR43 00						0	0	HR	5		M		Y	Imp50,dry/stony
7	0-30	mc1	10YR43 00						0	0	HR	2					
	30-50	mc1	10YR32 00						0	0	HR	5		M			
	50-120	hc1	10YR32 00						0	0	HR	8		M			
8	0-30	c	10YR42 00						0	0		0					
	30-60	c	10YR52 00 75YR58 00 C					Y	0	0		0		P		Y	Aug'd 60
9	0-30	mc1	10YR43 00						0	0	HR	2					
	30-40	mc1	10YR44 00						0	0	HR	5		M			Imp40,dry/stony

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES-----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR		IMP
10	0-25	hc1	10YR42 00						0	0	HR	2					
	25-40	c	10YR41 00	10YR56 00	F				0	0	HR	5	M			Y	
	40-60	c	25Y 61 63	75YR58 00	C				Y	0	0	SLST	2	P		Y	Y
11	0-28	hc1	10YR33 00						0	0		0					
	28-45	c	25Y 52 00	10YR58 00	M			Y	0	0		0	P		Y		
	45-50	c	25Y 51 00	10YR58 00	M			Y	0	0		0	P		Y		
	50-65	c	25Y 52 00	10YR58 00	M			Y	0	0		0	P		Y		Aug'd 65
12	0-30	mc1	10YR32 00						0	0	HR	2					
	30-50	hc1	10YR42 00						0	0	HR	2	M				
	50-70	c	25Y 41 00	75YR58 68	M		00MN00 00	Y	0	0	HR	5	P		Y		Imp70,dry/stony
13	0-30	mc1	10YR32 00						0	0		0					
	30-40	ms1	10YR33 00						0	0	HR	2	M				
	40-60	ms1	10YR33 00						0	0	HR	5	M				
	60-75	ms1	10YR44 00	10YR58 00	C			S	0	0		0	M				S1. gleyed
	75-90	lms	10YR44 00	10YR58 00	C			S	0	0	HR	5	M				Imp90,dry/stony
14	0-30	c	10YR33 00						0	0		0					
	30-40	c	10YR54 00						0	0		0	M				
	40-70	c	10YR53 00	75YR58 00	C			Y	0	0		0	P		Y		Aug'd 70
15	0-28	hc1	10YR43 00						0	0	HR	1					
	28-60	c	10YR42 53	75YR56 00	M		00MN00 00	Y	0	0	HR	2	P		Y		
	60-70	c	10YR42 53	75YR56 00	M		00MN00 00	Y	0	0	HR	8	P		Y		Aug'd 70
16	0-30	mc1	10YR43 00						3	0	HR	6					
	30-55	hc1	10YR54 00						0	0	HR	20	M				Imp55,dry/stony
17	0-30	mc1	10YR43 00						0	0	HR	2					
	30-60	hc1	10YR43 00	10YR58 00	F				0	0	HR	5	M				Imp60,dry/stony
18	0-25	hc1	10YR43 00						0	0	HR	2					
	25-60	c	25Y 53 52	75YR58 00	C			Y	0	0	HR	5	P		Y		Aug'd 60
19	0-25	mc1	10YR43 00						0	0		0					
	25-70	c	25Y 52 00	75YR58 00	M			Y	0	0		0	P		Y		Aug'd 70
20	0-30	mc1	10YR43 00						0	0	HR	2					
	30-40	hc1	10YR43 00	00FE00 00	C				0	0	HR	5	M				Imp40,dry/stony
21	0-35	c	10YR42 00						0	0		0					
	35-55	c	10YR54 00						0	0		0	M				
	55-90	c	10YR53 00	75YR46 00	C			Y	0	0		0	P		Y		Aug'd 90
22	0-28	mc1	10YR43 00						0	0	HR	2					
	28-45	mc1	10YR44 00						0	0	HR	2	M				
	45-60	mc1	10YR46 00	00MN00 00	C				0	0	HR	5	M				Imp60,dry/stony

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS		
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR
23	0-30	mc1	10YR42 00					3	0	HR	6			
	30-50	mc1	10YR54 00					0	0	HR	8	M		
	50-80	ms1	10YR74 00 75YR58 00 C				Y	0	0	HR	4	M		Imp80,dry/stony
24	0-25	hc1	25 Y43 00					2	0	HR	5			
	25-45	c	25 Y53 00 10YR68 00 F					0	0	HR	5	M		
	45-80	c	25 Y53 00 10YR58 00 C				Y	0	0		0	P	Y	Aug'd 80
25	0-30	mc1	25 Y43 00					3	0	HR	6			
	30-80	sc1	25 Y53 00 10YR58 00 M				Y	0	0	HR	10	M		
	80-100	c	05 Y61 00 10YR68 00 C				Y	0	0		0	P	Y	Aug'd 100
26	0-25	mc1	25 Y43 00					4	2	HR	10			
	25-45	hc1	25 Y53 00 10YR68 00 F					0	0	HR	10	M		
	45-65	c	10YR51 00 10YR58 00 C				Y	0	0	HR	10	P	Y	
	65-120	c	75YR51 00 10YR68 00 C				Y	0	0		0	P	Y	Aug'd 85
27	0-30	mc1	10YR33 00					3	0	HR	6			
	30-70	c	25 Y51 00 10YR58 00 C				Y	0	0		0	P	Y	Aug'd 70
28	0-28	mc1	10YR33 00					0	0		0			
	28-50	hc1	10YR53 00 10YR58 00 C				Y	0	0	HR	2	M		Tending mc1
	50-60	mc1	10YR53 00 10YR58 00 C				Y	0	0	HR	2	M		Tending sc1
	60-80	ms1	10YR53 00 10YR58 00 M				Y	0	0		0	M		
	80-85	ms1	10YR53 00 10YR58 00 M				Y	0	0	HR	8	M		Imp85,dry/stony
29	0-40	hc1	10YR33 00					2	0	HR	5			
	40-50	hc1	10YR44 00					0	0	HR	20	M		Imp50,dry/stony
30	0-30	hc1	10YR43 00					3	0	HR	7			
	30-40	c	25 Y43 00 10YR58 00 F					0	0	HR	7	M		
	40-80	sc1	10YR53 00 10YR58 00 M				Y	0	0	HR	15	M		Imp80,dry/stony
31	0-30	mc1	25 Y43 00					3	0	HR	6			
	30-40	hc1	25 Y44 00					0	0	HR	6	M		
	40-60	hc1	25 Y54 00 10YR58 00 F					0	0	HR	6	M		
	60-100	c	25 Y61 00 10YR68 00 C				Y	0	0		0	P	Y	Aug'd 100
32	0-25	hc1	25 Y42 00					0	0	HR	6			
	25-60	c	25 Y63 00 10YR68 00 C				Y	0	0	SLST	6	P	Y	Aug'd 60
33	0-30	mc1	25 Y43 00					6	0	HR	12			
	30-45	c	25 Y44 00					0	0	HR	8	M		
	45-120	c	10YR61 00 10YR68 00 C				Y	0	0	SLST	6	P	Y	Aug'd 90
34	0-30	ms1	10YR43 00					4	0	HR	10			
	30-45	ms1	10YR54 00					0	0	HR	35	M		Imp45,dry/stony

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR		POR
35	0-30	mc1	10YR33 00						0	0	HR	5				
	30-80	c	10YR52 00	10YR58 00	M			Y	0	0	HR	5	P		Y	Aug'd 80
36	0-25	c	25 Y43 00						0	0	SLST	2				
	25-60	c	25 Y52 00	10YR58 00	M			Y	0	0	SLST	2	P		Y	Aug'd 60
37	0-30	mc1	25 Y43 00						3	0	HR	6				
	30-60	hc1	25 Y53 00	75YR68 00	F				0	0	HR	6	M			
	60-100	sc1	10YR53 00	75YR58 00	C			Y	0	0	HR	12	M			Imp100,dry/stony
38	0-30	hc1	25 Y43 00						2	0	HR	5				
	30-70	ms1	25 Y63 00	10YR68 00	M			Y	0	0	HR	10	M			Imp70,dry/stony
39	0-25	mc1	10YR33 00						4	0	HR	10				
	25-45	hc1	10YR52 00	10YR66 00	C			Y	0	0	HR	14	M			
	45-90	sc1	10YR63 00	75YR58 00	M			Y	0	0	HR	16	M			Imp90,dry/stony
40	0-25	ms1	10YR33 00						4	0	HR	10				
	25-60	hc1	10YR53 00						0	0	HR	10	M			
	60-90	hc1	10YR53 00	75YR58 00	M			Y	0	0	HR	10	M		Y	Imp90,dry/stony
41	0-20	c	10YR44 00						0	0		0				
	20-60	c	10YR53 00	10YR58 00	M			Y	0	0		0	P		Y	Aug'd 60