

A1

**MILTON KEYNES EXPANSION STUDY**  
**Land West of Willen Road,**  
**Newport Pagnell, Buckinghamshire**

**Agricultural Land Classification**  
**ALC Map and Summary Report**

**January 1999**

**Resource Planning Team**  
**Eastern Region**  
**FRCA Reading**

**RPT Job Number: 0304/008/99**  
**MAFF Reference: EL03/01621**

# AGRICULTURAL LAND CLASSIFICATION REPORT

## MILTON KEYNES EXPANSION STUDY LAND WEST OF WILLEN ROAD, NEWPORT PAGNELL, BUCKINGHAMSHIRE

### INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 27 ha of land to the west of Willen Road (adjacent to the M1 motorway), on the southern fringe of Newport Pagnell in Buckinghamshire. The survey was carried out during January 1999.
2. The fieldwork was undertaken by the Farming and Rural Conservation Agency (FRCA)<sup>1</sup> on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF). It was carried out in connection with MAFF's statutory input to the Milton Keynes Expansion Study. 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 all of the land was in an agricultural use and comprised grassland (both permanent and ley), cereal stubble and land in a Set-aside use.

### 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

Grade/Other land	Area (hectares)	% site area
2	24.0	87.6
3a	3.4	12.4
Total site area	27.4	100.0

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. A total of 27 borings and 2 soil pits was described.

<sup>1</sup> FRCA is an executive agency of MAFF and the Welsh Office

8. The majority of the survey area is classified as Grade 2 agricultural land (very good quality). A limited area of Subgrade 3a land (good quality) is mapped in the north-west of the site (between Tongwell Brook and the A422). The land is mainly restricted by soil droughtiness with soil wetness/workability being equally or more restricting in places.
9. Much of the site is affected by soil droughtiness. The soils are variable but typically comprise fine loamy profiles which are free-draining. The amount of water that is available for crop growth in these soils is restricted due to the variable presence of stones, gravelly horizons and/or sandy textures. Where the profiles are deep and not very stony there is sufficient reserves of water to qualify for Grade 2. Where the stone contents increase and sandy layers occur there is a significant decrease in the amount of water available for crops and this land is placed in Subgrade 3a. Soil droughtiness reduces the flexibility of the land by affecting the level and consistency of yields, particularly in the drier years.
10. In addition to soil droughtiness, parts of the site are equally or solely limited by soil wetness. In these areas, the drainage is slightly impeded and the soils show evidence of slight seasonal waterlogging; in places the soils were wet at moderate to deep depths at the time of survey. In addition, within the Subgrade 3a unit, the heavy topsoil textures give rise to soil workability problems. Wetness limitations such as these will adversely affect crop growth or impose restrictions on cultivations or grazing by livestock by reducing the period in which the soils can be cultivated or grazed without causing damage to the land.

## **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).
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 temperature at this site mean that the area is relatively dry and warm and that there is no overall climatic limitation. Other local climatic factors such as exposure and frost risk are not believed to have a significant effect on the site. The site is climatically Grade 1.

**Table 2: Climatic and altitude data**

Factor	Units	Values	
		SP 876 426	SP 873 423
Grid reference	N/A	SP 876 426	SP 873 423
Altitude	m, AOD	60	60
Accumulated Temperature	day°C (Jan-June)	1421	1421
Average Annual Rainfall	mm	620	621
Field Capacity Days	days	126	127
Moisture Deficit, Wheat	mm	112	112
Moisture Deficit, Potatoes	mm	106	105
Overall climatic grade	N/A	Grade 1	Grade 1

### Site

- The agricultural land at this site lies at an altitude of 55–65m AOD and is generally flat or slightly undulating. Other site limitations, such as flooding or microrelief, do not adversely affect land quality at this location.

### Geology and soils

- The most detailed published geological information (BGS, 1971) shows the majority of the site to lie over 1st level terrace deposits. The exception to this is in the south-east corner of the site where glacial lake deposits and head are mapped.
- The most recently published soil information for the site (SSEW, 1983) shows the entire survey area to be mapped as the Bishampton 2 association. This is 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).
- Upon detailed field examination soils were found to be broadly similar to those described above.

### AGRICULTURAL LAND CLASSIFICATION

- 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.
- 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.
- The agricultural land at this site is classified mainly as Grade 2 (very good quality) with a small area of Subgrade 3a (good quality) land occurring in the north-west of the site (between Tongwell Brook and the A422). The land is mainly restricted by soil droughtiness with soil wetness/workability being equally or more restricting in places.

## Grade 2

23. Very good quality agricultural land (Grade 2) has been mapped over most of the site (totalling 87.6% of the area). The land is mainly affected by soil droughtiness limitations with soil wetness being equally or more restricting in places. The majority of profiles within this mapping unit comprise very slightly to slightly stony (2-10% total flints), non-calcareous, medium clay loam topsoils. These overlie similar or slightly heavier upper subsoils which are usually gleyed (suggesting seasonal waterlogging) and contain between 0-20% total flints. The lower subsoils vary in texture from clays to sandy clay loams or heavy clay loams. They are usually gleyed but are permeable and are variably stony (containing between 0-50% stones). Just less than half of the profiles were impenetrable to the soil auger at depths between 67-89cm over gravelly material. The majority of these impenetrable soils occur in the northern half of the survey area. A wetness class of I or II has been assigned to these soils depending on the depth to gleying. Soil Pit I (see Appendix II) is representative of these soils. On the whole, the combination of soil texture and hard stone restricts the water available to crops such that there is a slight risk of drought stress to the plants in most years. This, sometimes in combination with soil wetness (caused by fluctuating groundwater which affects crop growth and development and opportunities for landwork and/or grazing), restricts the land to Grade 2.

## Subgrade 3a

24. A relatively small proportion (12.4%) of the survey area is of good quality (Subgrade 3a agricultural land). The principal limitation is soil wetness/workability.
25. The profiles within the Subgrade 3a unit are similar to those described in paragraph 23, but tend to have heavier (non-calcareous heavy clay loam) topsoils, which may impose greater restrictions on cultivations or grazing by livestock by reducing the number of days that these activities can occur without causing structural damage to the soils. In addition, the majority of the profiles show evidence of fluctuating groundwater levels in the subsoils (as indicated by gleying within 40cm depth and saturated soils at depths between 53cm and 65cm at the time of survey - January 1999). As a result, Wetness Class II is considered appropriate. These profiles are typified by Pit 2 (see Appendix II). The interaction between these drainage characteristics, the topsoils textures, and the local climate results in a soil wetness/workability limitation such that Subgrade 3a is considered appropriate.

Sharron Cauldwell  
Resource Planning Team  
Eastern Region  
FRCA

## SOURCES OF REFERENCE

British Geological Survey (1971) *SP 83 and parts of SP73, 74, 84, 93 and 94 (Solid) 1:25,000 scale*.  
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*.  
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

- 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.

<b>ARA:</b> Arable	<b>WHT:</b> Wheat	<b>BAR:</b> Barley
<b>CER:</b> Cereals	<b>OAT:</b> Oats	<b>MZE:</b> Maize
<b>OSR:</b> Oilseed rape	<b>BEN:</b> Field Beans	<b>BRA:</b> Brassicae
<b>POT:</b> Potatoes	<b>SBT:</b> Sugar Beet	<b>FCD:</b> Fodder Crops
<b>LIN:</b> Linseed	<b>FRT:</b> Soft and Top Fruit	<b>FLW:</b> Fallow
<b>PGR:</b> Permanent Pasture	<b>LEY:</b> Ley Grass	<b>RGR:</b> Rough Grazing
<b>SCR:</b> Scrub	<b>CFW:</b> Coniferous Woodland	<b>DCW:</b> Deciduous Wood
<b>HTH:</b> Heathland	<b>BOG:</b> Bog or Marsh	<b>FLW:</b> Fallow
<b>PLO:</b> Ploughed	<b>SAS:</b> Set aside	<b>OTH:</b> Other
<b>HRT:</b> Horticultural Crops		
- 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.

<b>MREL:</b> Microrelief limitation	<b>FLOOD:</b> Flood risk	<b>EROSN:</b> Soil erosion risk
<b>EXP:</b> Exposure limitation	<b>FROST:</b> Frost prone	<b>DIST:</b> Disturbed land
<b>CHEM:</b> Chemical limitation		
- LIMIT:** The main limitation to land quality. The following abbreviations are used.

<b>OC:</b> Overall Climate	<b>AE:</b> Aspect	<b>EX:</b> Exposure
<b>FR:</b> Frost Risk	<b>GR:</b> Gradient	<b>MR:</b> Microrelief
<b>FL:</b> Flood Risk	<b>TX:</b> Topsoil Texture	<b>DP:</b> Soil Depth
<b>CH:</b> Chemical	<b>WE:</b> Wetness	<b>WK:</b> Workability
<b>DR:</b> Drought	<b>ER:</b> Erosion Risk	<b>WD:</b> Soil Wetness/Droughtiness
<b>ST:</b> Topsoil Stoniness		

## Soil Pits and Auger Borings

1. **TEXTURE:** soil texture classes are denoted by the following abbreviations.

<b>S:</b> Sand	<b>LS:</b> Loamy Sand	<b>SL:</b> Sandy Loam
<b>SZL:</b> Sandy Silt Loam	<b>CL:</b> Clay Loam	<b>ZCL:</b> Silty Clay Loam
<b>ZL:</b> Silt Loam	<b>SCL:</b> Sandy Clay Loam	<b>C:</b> Clay
<b>SC:</b> -Sandy Clay	<b>ZC:</b> Silty Clay	<b>OL:</b> Organic Loam
<b>P:</b> Peat	<b>SP:</b> Sandy Peat	<b>LP:</b> Loamy Peat
<b>PL:</b> Peaty Loam	<b>PS:</b> Peaty Sand	<b>MZ:</b> 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:

<b>F:</b> Fine (more than 66% of the sand less than 0.2mm)
<b>M:</b> Medium (less than 66% fine sand and less than 33% coarse sand)
<b>C:</b> 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.

<b>HR:</b> all hard rocks and stones	<b>SLST:</b> soft oolitic or dolimitic limestone
<b>CH:</b> chalk	<b>FSST:</b> soft, fine grained sandstone
<b>ZR:</b> soft, argillaceous, or silty rocks	<b>GH:</b> gravel with non-porous (hard) stones
<b>MSST:</b> soft, medium grained sandstone	<b>GS:</b> gravel with porous (soft) stones
<b>SI:</b> soft weathered igneous/metamorphic rock	

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



SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--			-WHEAT-		-POTS-		M.REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC COMMENTS
			GRDNT	GLEY	SPL CLASS	GRADE	AP	MB	AP	MB	DRT				
1	SP87604290	SAS	20		2	2	128	16	106	1	2			WD 2	WET 100CM+
2	SP87604280	SAS	22		2	2	121	9	103	-2	2			WD 2	WET 60CM+
3	SP87604270	SAS	35		2	2	133	21	117	12	2			WD 2	
4	SP87404260	STB	26		2	3A	124	12	102	-3	2			WE 3A	WET 55+ SEE 2P
5	SP87504260	STU	26		2	2	109	-3	107	2	3A			DR 2	
6	SP87604260	STB	35		2	2	97	-15	105	0	3A			DR 2	I70, SEE 1P
7	SP87354253	STU	27		2	2	87	-25	92	-13	3B			DR 3A	IMP 60
8	SP87504250	PGR	44		1	1	97	-15	102	-3	3A			DR 2	I77, SEE 1P
9	SP87604250	PGR	30		2	2	92	-20	99	-6	3A			WD 2	I67, SEE 1P
10	SP87704250	PGR	27		2	2	104	-8	101	-4	3A			WD 2	I89, SEE 1P
11	SP87204240	PGR	25		2	3A	119	7	101	-4	2			WK 3A	WET 55CM+
12	SP87404240	PGR	48		1	1	102	-10	111	6	3A			DR 2	I78, SEE 1P
13	SP87504240	PGR	47		1	1	96	-16	102	-3	3A			DR 2	I75, SEE 1P
14	SP87604240	PGR	28		2	2	77	-35	79	-26	3B			DR 3A	I55, Q GR 2
15	SP87704240	PGR	46		1	1	133	21	109	4	2			DR 2	
16	SP87304230	PGR	47		1	1	130	18	106	1	2			DR 2	
17	SP87404230	PGR	30		2	2	102	-10	112	7	3A			WD 2	I75, SEE 1P
18	SP87504230	PGR	50		1	1	136	24	108	3	2			DR 2	
19	SP87604230	PGR	50		1	1	147	35	114	9	2			DR 2	
20	SP87704230	PGR	26		2	2	106	-6	101	-4	3A			WD 2	I90, SEE 1P
21	SP87504220	PGR	38		2	2	152	40	116	11	1			WE 2	IMP 110
22	SP87604220	PGR	34		2	2	105	-7	112	7	3A			WD 2	I78, SEE 1P
23	SP87704220	PGR	55		1	1	141	29	115	10	2			DR 2	
24	SP87604210	PGR	43		1	1	138	26	115	10	2			WD 2	
25	SP87704210	PGR	67		1	1	131	19	114	9	2			DR 2	I100, SEE 1P
26	SP87704200	PGR	65		1	1	144	32	116	11	1				1
27	SP87274240	STU	27		2	3A	116	4	105	0	3A			WK 3A	HCL T/S
1P	SP87404230	PGR	30		2	2	121	9	103	-2	2			WD 2	
2P	SP87404260	STB	23		2	3A	91	-21	97	-8	3B			WK 3A	PIT67 WET53+

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---		PED COL.	---STONES---			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN		CONT	GLE	>2		>6	LITH	TOT		STR
1	0-20	MCL	10YR31							5					
	20-55	HCL	10YR53	10YR56	C	F		Y	0	0	HR	5		M	
	55-75	HCL	10YR53	10YR56	C	F		Y	0	0	HR	25		M	
	75-120	SCL	10YR64	10YR68	C	D		Y	0	0	HR	40		M	WET 100CM
2	0-22	MCL	10YR42							5					
	22-50	HCL	10YR64	10YR68	C	F		Y	0	0	HR	5		M	
	50-60	HCL	10YR64	10YR66	C	F		Y	0	0	HR	10		M	
	60-120	SCL	10YR66							50				M	WET 60CM
3	0-35	MCL	10YR42							3					
	35-70	HCL	10YR52	10YR56	C	F		Y	0	0		0		M	
	70-110	C	10YR52	10YR56	C	D		Y	0	0		0		M	NOT SPL, SEE 2P
4	0-26	HCL	10YR42							3					
	26-55	C	25Y 52	10YR56	C	F		Y	0	0	HR	5		M	
	55-70	HCL	25Y 52	10YR56	M	D		Y	0	0	HR	50		M	
	70-100	HCL	25Y 62	10Y56	M	F		Y	0	0	HR	50		M	
	100-120	C	05Y 62	10YR58	M	D		Y	0	0	HR	10		M	
5	0-26	MCL	10YR42							5					
	26-60	HCL	10YR52	10YR56	C	F		Y	0	0	HR	10		M	
	60-90	C	05Y 63	10YR56	C	D		Y	0	0	HR	3		M	
6	0-35	MCL	10YR42							5					
	35-55	HCL	10YR5354	10YR56	C	D		Y	0	0	HR	5		M	
	55-70	SCL	10YR53	10YR68	C	D		Y	0	0	HR	40		M	IMP GRAVELLY
7	0-27	MCL	10YR42							5					
	27-60	HCL	10YR53	10YR56	C	D		Y	0	0	HR	15		M	IMP GRAVELLY
8	0-26	MCL	10YR43							10					
	26-44	HCL	10YR53	10YR56	F	D				5				M	
	44-60	C	10YR53	10YR56	C	D		Y	0	0	HR	5		M	Y
	60-77	SC	10YR53	10YR56	M	D		Y	0	0	HR	5		M	Y
9	0-30	MCL	10YR43							10					
	30-50	C	10YR53	10YR56	C	D		Y	0	0	HR	10		M	
	50-67	SC	10YR53	10YR56	M	D		Y	0	0	HR	20		M	IMP GRAVELLY
10	0-27	MCL	10YR43							10					
	27-49	HCL	25Y53	10YR56	C	D		Y	0	0	HR	5		M	
	49-60	HCL	25Y53	10YR56	C	F		Y	0	0	HR	25		M	
	60-89	HCL	25Y53							40				M	IMP GRAVELLY
11	0-25	HCL	10YR42							5					
	25-55	C	25Y 52	10YR58	C	D		Y	0	0	HR	5		M	
	55-120	SCL	10YR66							50				M	WET 55CM

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES-----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT		GLEYS	>2	>6		LITH	TOT	STR	POR	IMP	SPL
12	0-30	MCL	10YR43						0	0	HR	5					
	30-48	HCL	10YR53						0	0	HR	5		M			
	48-78	C	10YR53	10YR46	C	D		Y	0	0	HR	10		M			IMP GRAVELLY
13	0-28	MCL	10YR43						0	0	HR	10					
	28-47	HCL	10YR53	10YR56	F	D			0	0	HR	10		M			
	47-75	SC	75YR53	10YR56	M	D		Y	0	0	HR	5		M			IMP GRAVELLY
14	0-28	MCL	10YR43						0	0	HR	10					
	28-55	SCL	25Y64	10YR56	C	D		Y	0	0	HR	20		M			IMP GRAVELLY
15	0-29	MCL	10YR43						0	0		0					
	29-46	HCL	10YR53						0	0	HR	10		M			
	46-75	SCL	25Y53	10YR56	C	D		Y	0	0	HR	10		M			
	75-120	HCL	25Y64	10YR56	C	D		Y	0	0	HR	10		M			Y
16	0-30	MCL	10YR42						0	0	HR	2					
	30-47	HCL	10YR53						0	0	HR	3		M			
	47-82	HCL	10YR53	10YR5856	M	D		Y	0	0	HR	5		M			
	82-120	C	25Y 5253	10YR58	M	D		Y	0	0	HR	5		M			
17	0-30	MCL	10YR42						0	0	HR	10					
	30-50	MCL	10YR53	10YR46	C	D		Y	0	0	HR	15		M			
	50-75	C	10YR53	10YR5658	M	D		Y	0	0	HR	15		M			IMP GRAVELLY
18	0-28	MCL	10YR42						0	0	HR	5					
	28-50	HCL	10YR53	10YR56	F	D			0	0	HR	5		M			
	50-65	HCL	10YR53	10YR56	C	D		Y	0	0	HR	15		M			
	65-120	SCL	10YR64	10YR68	C	D		Y	0	0	HR	25		M			
19	0-24	MCL	10YR43						0	0	HR	3					
	24-50	HCL	10YR5354	10YR56	F	F			0	0	HR	3		M			
	50-75	HCL	10YR5253	10YR58	C	F		Y	0	0	HR	3		M			
	75-120	HCL	10YR63	10YR68	M	D		Y	0	0	HR	10		M			
20	0-26	MCL	10YR42	10YR46	C	D		Y	0	0	HR	5					
	26-46	HCL	25Y52	25Y68	M	D		Y	0	0	HR	5		M			
	46-60	SCL	25Y53	10YR58	C	D		Y	0	0	HR	25		M			
	60-90	SCL	25Y 53	10YR58	C	D		Y	0	0	HR	40		M			
21	0-38	MCL	10YR42						0	0	HR	2					
	38-75	MCL	10YR4142	10YR4644	C	D		Y	0	0	HR	5		M			
	75-120	MCL	10YR52	10YR5658	C	D		Y	0	0	HR	5		M			
22	0-34	MCL	10YR42						0	0	HR	2					
	34-55	HCL	10YR4152	10YR46	C	D		Y	0	0	HR	2		M			
	55-78	C	10YR5253	10YR58	M	D		Y	0	0	HR	5		M			IMP GRAVELLY

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR		POR
23	0-32	MCL	10YR42						0	0	HR	2				
	32-55	MCL	10YR43						0	0	HR	2		M		
	55-80	HCL	10YR53	10YR46	M	D		Y	0	0	HR	5		M		SATURATED 58CM
	80-120	C	10YR5253	10YR5658	M	D		Y	0	0	HR	2		M		
24	0-32	MCL	10YR42						0	0	HR	2				
	32-43	MCL	10YR43						0	0	HR	2		M		
	43-58	MCL	10YR53	10YR4656	C	D		Y	0	0	HR	5		M		
	58-68	MCL	10YR53	10YR4656	M	D		Y	0	0	HR	2		M		
	68-120	C	10YR53	10YR58	M	D		Y	0	0	HR	2		M		
25	0-31	MCL	10YR42						0	0	HR	2				
	31-67	MCL	10YR43						0	0	HR	5		M		
	67-90	MCL	10YR53	10YR4656	C	D		Y	0	0	HR	5		M		
	90-100	MCL	10YR53	10YR4656	C	D		Y	0	0	HR	10		M		IMP GRAVELLY
26	0-30	MCL	10YR42						0	0	HR	2				
	30-65	MCL	10YR43						0	0	HR	2		M		
	65-90	MCL	10YR53	10YR4656	C	D		Y	0	0	HR	2		M		
	90-120	C	25Y 5363	10YR58	M	D		Y	0	0	HR	2		M		
27	0-27	HCL	10YR42						0	0	HR	5				
	27-75	HCL	10YR53	10YR56	C	D		Y	0	0	HR	15		M		
	75-100	C	05Y 63	10YR56	M	D		Y	0	0	HR	3		M		
1P	0-30	MCL	10YR42						2	0	HR	9				
	30-58	MCL	10YR5153	10YR46	C	D		Y	4	0	HR	16	MDCSAB	FR	M	
	58-80	C	10YR5253	10YR58	M	D		Y	0	0	HR	19	MDCSAB	FR	M	Y WET SIEVED
	80-120	SCL	10YR5253	10YR5658	M	D		Y	0	0	HR	45		FR	M	Y WET SIEVED
2P	0-23	HCL	10YR42						0	0	HR	3				
	23-51	C	10YR6162	10YR56	C	D		Y	0	0	HR	5	MDCSAB	FR	M	
	51-67	HCL	25Y 52	10YR56	M	D		Y	0	0	HR	50		FR	M	WET 67CM