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Aylesbury Vale District Local Plan
Land West of Maids Moreton
Buckinghamshire
Agricultural Land Classification
October 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

AYLESBURY VALE LOCAL PLAN: LAND WEST OF MAIDS MORETON

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 29 hectares of land to the west of Maids Moreton in Buckinghamshire. The survey was carried out during September 1996.
2. The work was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading, in connection with MAFF's statutory input to the Aylesbury Vale Local Plan. This survey supersedes any previous ALC information for this land, including a detailed survey undertaken in 1988 (ADAS Ref: 0301/23/88), which was carried out prior to MAFF's revision of its ALC guidelines.
3. The current work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey, the land use in the south of the site was cereal stubble. In the north of the site, the land use comprised both rough grazing and permanent pasture, with some of this area having remnant ridge and furrow features. The areas shown as 'Other Land' consist of houses and gardens, a covered reservoir, allotments, a playing field and an all-weather horse exercise arena. The agricultural land not surveyed comprises land for which details of land ownership and/or tenancy were unavailable at the time of survey; thus, preventing access onto the 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 overleaf.
7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land surveyed. A total of 19 borings and 2 soil pits were described.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area	% Surveyed Area
3a	6.3	22.0	39.9
3b	9.5	33.2	60.1
Other land	7.3	25.5	
Not Surveyed	5.5	19.3	
Total surveyed area	15.8	-	100.0
Total site area	28.6	100.0	-

8. The majority of the land at this site has been classified as Subgrade 3b (moderate quality) on the basis of soil wetness and/or workability limitations, with the remainder being classified as Subgrade 3a (good quality). The soils are developed on chalky boulder clay, and as such comprise calcareous or non-calcareous medium or heavy clay loam topsoils, overlying clay subsoils which typically showed evidence of poor drainage in the form of gleying. Soil drainage is impeded to varying extents across the site by the presence of slowly permeable clay horizons. The depth to these horizons determines the severity of the wetness restriction and therefore, the ALC grade. The resultant waterlogging will restrict seed germination and growth as well as limit the timing of cultivations. Wet soils such as these are susceptible to structural damage through trafficking by agricultural machinery and grazing livestock.

Factors Influencing ALC Grade

Climate

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

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values	Values
Grid reference	N/A	SP 699 355	702 358
Altitude	m, AOD	115	120
Accumulated Temperature	day°C	1365	1359
Average Annual Rainfall	mm	686	688
Field Capacity Days	days	146	147
Moisture Deficit, Wheat	mm	101	101
Moisture Deficit, Potatoes	mm	91	90

11. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Other local climatic factors such as exposure and frost risk are not believed to have a significant adverse effect on the site. The site is climatically Grade 1.

Site

14. The agricultural land at this site lies at an altitude of 110-125m AOD. The majority of the land at the site is very gently sloping with slight undulations. Nowhere does gradient or microrelief affect agricultural land quality.

Geology and soils

15. The published geological information for the site (Geological Survey G.B., 1934, Sheet 46 NW, Solid) shows the site to be underlain by a solid geology of Jurassic Great Oolite clay and limestone overlain by Jurassic Cornbrash towards the central part of the site. A Survey of the Soils of Buckinghamshire (Temple, 1929), indicates that these solid deposits are in turn overlain by superficial deposits of boulder clay and glacial sand and gravels in the general area.

16. The most recently published soil information for the area (SSEW, 1983) shows the Ashley Association mapped across the site. This is described as 'fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging, associated with similar but wetter soils. Some calcareous and non-calcareous slowly permeable clayey soils.' (SSEW, 1983).

17. Detailed field survey broadly confirms the existence of such soils, with clay loam over clay profiles predominating at the site. Interbedded coarser textured material which may be of glacio-fluvial origin was also found at occasional borings, making textural classes somewhat lighter in places.

Agricultural Land Classification

18. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 2.

19. 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 III.

Sub-Grade 3a

20. Land of good quality has been mapped across the survey area. The principal limitations are soil droughtiness and wetness/workability.

21. The soil profiles in the Sub-grade 3a area comprise medium clay loam topsoils overlying very slightly stony or slightly stony heavy clay loam, clay or occasionally sandy clay loam subsoils. They tend to be non-calcareous and are typically gleyed below 45cm and therefore assessed as Wetness Class I, (2p Appendix IV) since lower subsoils are permeable. The soils are in places impenetrable to the auger at variable depths but the pit indicates that this was caused by dry soil conditions and fragments of flint. Due to the combination of soil characteristics and the local climate regime, these soils have restricted amounts of water, such that the land suffers a slight droughtiness limitation. Occasional borings of better quality occur within this mapping unit. They were not mapped separately due to their limited number and extent.

22. The second main soil type comprises heavy clay loam topsoils overlying clay subsoils with chalk fragments. The soils are calcareous throughout. The soils are slowly permeable at depth (40-50cm) and are therefore assigned to wetness class II or III. Drainage is slightly impeded causing slight seasonal waterlogging in the soil profile. This land is therefore limited to Sub-grade 3a by soil wetness.

Sub-Grade 3b

23. Land of moderate quality is most extensive across the survey area. Soil wetness is the most limiting factor.

24. Soils in this unit also comprise heavy clay loam topsoils over clay subsoils which are calcareous throughout. The soils are very slightly or slightly stony (containing both flint and chalk fragments). The soils are poorly drained with a slowly permeable layer occurring at relatively shallower depths than land assigned to Sub-grade 3a above (re.35-40cm) meaning that the soils are assigned to wetness class III or IV due to the impeded drainage.

25. As a result of soil wetness, crop germination and growth may be adversely affected. The heavier topsoil textures can also restrict the timing of grazing or cultivations as trafficking by agricultural machinery or grazing by livestock may lead to structural damage.

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SOURCES OF REFERENCE

Geological Survey of Great Britain (1934) Sheet 46 NW (Solid).

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.

M. S. Temple, (1929) *A Survey of the Soils of Buckinghamshire.* University of Reading.

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 (eg. 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 WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Wetness Class	Duration of waterlogging ¹
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years. ²
II	The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

¹ The number of days is not necessarily a continuous period.

² 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

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 Pasture	LEY: Ley Grass	RGR: Rough Grazing
SCR: Scrub	CFW: Coniferous Woodland	DCW: Deciduous Wood
HTH: Heathland	BOG: Bog or Marsh	FLW: Fallow
PLO: Ploughed	SAS: Set aside	OTH: Other
HRT: Horticultural Crops		

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	EX: Exposure
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
ST: Topsoil Stoniness		

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

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 **VC**: very 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 : AYLESBURY LP W MAIDS MON Pit Number : 1P

Grid Reference: SP Average Annual Rainfall : 686 mm
 Accumulated Temperature : 1365 degree days
 Field Capacity Level : 146 days
 Land Use :
 Slope and Aspect : 02 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 33	HCL	10YR42 00	0	2	HR					Y
33- 47	C	25 Y54 00	0	2	HR		WKCSAB	FM	M	Y
47- 75	C	25 Y53 00	0	2	HR	C	STCOAB	VM	P	Y

Wetness Grade : 3A Wetness Class : III
 Gleying : 047 cm
 SPL : 047 cm

Drought Grade : APW : 000mm MBW : 0 mm
 APP : 000mm MBP : 0 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : AYLESBURY LP W MAIDS MON Pit Number : 2P

Grid Reference: SP Average Annual Rainfall : 686 mm
 Accumulated Temperature : 1365 degree days
 Field Capacity Level : 146 days
 Land Use : Permanent Grass
 Slope and Aspect : degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT. STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MCL	10YR43 00	4	8	HR					
30- 47	HCL	10YR54 00	7	10	HR	C	WKCSAB	FR	M	
47-120	C	10YR54 5B	0	8	HR	C	WKCSAB	FM	P	

Wetness Grade : 1 Wetness Class : I
 Gleying : 030 cm
 SPL : cm

Drought Grade : 2 APW : 124mm MBW : 23 mm
 APP : 102mm MBP : 11 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : 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	SP70203580	PGR		0 038	4	3B	000	0 000	0				WE	3B	
1P	SP	STB W	02	047 047	3	3A	000	0 000	0				WE	3A	
2	SP70103570	PGR			1	1	000	0 000	0				DR	2	SLIGHTLY AT 30
2P	SP	PGR			1	1	124	23 102	11 2				DR	2	SLIGHTLY AT 30
3	SP70203570	RGR		0 035	4	3B	000	0 000	0				WE	3B	
4	SP69803560	STB		030 030	4	3B	000	0 000	0				WE	3B	
5	SP69903560	STB SW	01	030 030	4	3B	000	0 000	0				WE	3B	
6	SP70003560	STB SW	01	030 030	3	3B	000	0 000	0				WE	3B	
7	SP70103560	PGR		0 038	4	3B	000	0 000	0				WE	3B	
8	SP70203560	PGR		050 050	3	3A	112	11 110	19 2				WE	3A	
9	SP70303560	RGR		070	1	1	124	23 117	26 2				DR	2	IMP 90 POSS 1
10	SP69803550	STB N	02	030 030	4	3B	000	0 000	0				WE	3B	
11	SP69903550	STB W	02	045 045	3	3A	000	0 000	0				WE	3A	
12	SP70003550	STB W	01	032	2	3A	000	0 000	0				WE	3A	IMP55
13	SP70103550	RGR		040 040	3	3B	133	32 110	19 1				WE	3B	POSS 3A
14	SP70203550	RGR			1	1	088	-13 092	1 3A				DR	3A	SLIGHTLY AT 45
16	SP69803540	STB N	02	030 030	4	3B	000	0 000	0				WE	3B	
17	SP69903540	STB		045 045	3	3A	000	0 000	0				WE	3A	
18	SP70003540	STB		045 045	3	3A	000	0 000	0				WE	3A	IMP65
19	SP70103540	STB		025 035	4	3B	000	0 000	0				WE	3B	
20	SP70203540	RGR		0 040	3	3B	000	0 000	0				WE	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES-----			STRUCT/		SUBS				
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
1	0-38	mc1	10YR42 00	10YR58	00	C			Y	0	0	0						
	38-70	c	10YR53 00	10YR58	00	M	25Y 62	00	Y	0	0	HR	3		P	Y	Y	
1P	0-33	hc1	10YR42 00							0	0	HR	2				Y	
	33-47	c	25 Y54 00							0	0	HR	2	WKCSAB	FM	M	Y	Y
	47-75	c	25 Y53 00	10YR58	00	C	25 Y62	00	Y	0	0	HR	2	STCOAB	VM	P	Y	Y
2	0-30	mc1	10YR43 00							0	0	HR	3					
	30-45	hc1	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	HR	4			M		
	45-65	c	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	HR	6			P		
2P	0-30	mc1	10YR43 00							4	0	HR	8					
	30-47	hc1	10YR54 00	10YR58	00	C	00MN00	00	S	7	0	HR	10	WKCSAB	FR	M		
	47-120	c	10YR54 58	75YR58	00	C	00MN00	00	S	0	0	HR	8	WKCSAB	FM	P		
3	0-35	mc1	10YR42 43	10YR58	00	C	00MN00	00	Y	0	0	HR	2					
	35-80	c	10YR53 00	10YR58	00	C	10YR62	00	Y	0	0	HR	3		P		Y	Y
4	0-30	hc1	25 Y42 00							0	0	HR	1					
	30-70	c	25 Y53 00	10YR58	00	C			Y	0	0	HR	1		P		Y	
5	0-30	hc1	25 Y43 00							0	0	HR	1				Y	
	30-60	c	25 Y64 00	25 Y68	00	C	25 Y62	00	Y	0	0	HR	1		P		Y	Y
6	0-30	hc1	10YR42 00							0	0	HR	1				Y	
	30-42	c	25 Y53 00	10YR56	00	C			Y	0	0	HR	1		P		Y	Y
	42-70	c	25 Y63 00	75YR58	00	C	25 Y62	00	Y	0	0	HR	1		P		Y	Y
7	0-30	hc1	10YR52 00	10YR58	00	C			Y	0	0	HR	3					
	30-38	hc1	10YR53 54	10YR58	00	M	00MN00	00	S	0	0	HR	5			M		
	38-90	c	25Y 62 00	10YR58	00	M	00MN00	00	Y	0	0		0		P		Y	
8	0-30	mc1	10YR42 00							0	0	HR	2					
	30-50	hc1	10YR54 00	75YR58	00	F	00MN00	00		0	0	HR	2			M		
	50-90	c	25Y 62 00	10YR58	00	C	10YR53	00	Y	0	0	HR	1		P		Y	
9	0-30	mc1	10YR42 00							0	0		0					
	30-70	hc1	10YR43 00							0	0	HR	2			M		
	70-90	sc1	10YR52 53	10YR58	00	C	00MN00	00	Y	0	0	HR	5			M		
10	0-30	hc1	10YR43 00							0	0	HR	2				Y	
	30-65	c	25 Y64 00	25 Y56	00	C	25 Y62	00	Y	0	0	HR	2		P		Y	Y
11	0-32	hc1	10YR32 00							0	0	HR	1				Y	
	32-45	c	25 Y54 00	10YR58	00	F				0	0	HR	1			M	Y	
	45-70	c	25 Y63 00	10YR58	00	C	25 Y62	00	Y	0	0	HR	1		P		Y	Y
12	0-32	hc1	10YR43 00							0	0	HR	2					
	32-45	c	10YR53 00	10YR58	00	C			Y	0	0	HR	5			M		
	45-55	c	10YR53 00	10YR58	00	C			Y	0	0	HR	10			M		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR	IMP	SPL	CALC
13	0-30	hc1	10YR43 00						0	0	HR	2						
	30-40	c	10YR54 56				00MN00 00		0	0	HR	3	M					
	40-50	c	10YR54 00	10YR58 00 C			00MN00 00 S		0	0	HR	2	M			N		
	50-120	c	25Y 62 00	10YR58 00 M			00MN00 00 Y		0	0		0	P				Y	
14	0-30	mc1	10YR42 43						0	0	HR	2						
	30-45	hc1	10YR44 00				00MN00 00		0	0	HR	4	M					
	45-55	c	10YR53 54	10YR58 00 C			00MN00 00 S		0	0	HR	2	M					
16	0-30	hc1	25 Y42 00						0	0	HR	2					Y	
	30-65	c	25 Y53 00	10YR58 00 C				Y	0	0	HR	2	P			Y	Y	
17	0-30	hc1	10YR42 00						0	0	HR	1					Y	
	30-45	c	25 Y44 00						0	0	HR	1	M				Y	
	45-75	c	25 Y54 00	25 Y66 00 C			25 Y62 00 Y		0	0	HR	1	P			Y	Y	
18	0-30	hc1	10YR32 00						0	0	HR	1					Y	
	30-45	c	10YR58 00	25 Y54 00 F					0	0	HR	1	M				Y	
	45-65	c	25 Y53 00	25 Y62 00 C			10YR58 00 Y		0	0	HR	2	P			Y	Y	
19	0-25	hc1	10YR33 00						0	0	HR	1					Y	
	25-35	c	25 Y53 00	10YR58 00 C				Y	0	0	HR	5	M				Y	
	35-45	c	25 Y53 00	10YR56 00 C				Y	0	0	HR	5	P			Y	Y	
	45-75	c	25 Y53 00	10YR56 00 C				Y	0	0	HR	2	P			Y	Y	
20	0-20	hc1	10YR42 00	10YR56 00 C					Y	0		0						
	20-40	c	10YR51 52	10YR58 00 C			00MN00 00 Y		0	0	HR	2	M					
	40-120	c	25Y 62 00	10YR56 00 M			00MN00 00 Y		0	0	CH	3	P	Y		Y	Y	