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Aylesbury Vale District Local Plan
Land at Ellen Road, Aylesbury
Agricultural Land Classification
June 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

AYLESBURY VALE DISTRICT LOCAL PLAN LAND AT ELLEN ROAD, AYLESBURY

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 22 ha of land to the west of Ellen Road, Aylesbury. The survey was carried out in June 1996.
2. The survey was commissioned by Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit (Reading) in connection with the Aylesbury Vale District Local Plan. This survey supersedes previous ALC surveys on this land including a reconnaissance survey which covers the site (ADAS Ref: 0301/01/80). This reconnaissance survey was undertaken in 1980 at a comparatively low sampling density. Since the 1980 survey, MAFF has updated the ALC system (MAFF, 1988) and consequently a new and more detailed survey covering the whole site was undertaken using the revised 1988 guidelines. This 1996 survey therefore supersedes the previous ALC survey on this land.
3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group in 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 on the site was in permanent pasture, set aside and cereals.

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)	% Total site area	% Surveyed Area
2	15.0	67.3	67.3
3b	7.3	32.7	32.7
Total surveyed area	22.3		100
Total site area	22.3	100	-

7. The fieldwork was conducted at an average density of just over one boring per hectare. A total of 27 borings and 2 soil pits were described.

8. The majority of land on the site comprises Grade 2 (very good quality) land, with the principal limitations being of soil wetness and workability. Soil droughtiness is also a potential limitation at some locations. Topsoils typically comprise calcareous medium or heavy clay loams overlying similar or heavier (clay) calcareous upper subsoils. These shallow upper subsoils rest above permeable, highly calcareous clay loams, sandy clay loams and sandy loams which may contain gravelly layers. Where the upper clay subsoils are sufficiently deep to be slowly permeable, or where the underlying highly calcareous permeable drift is absent, the soil profile is slowly permeable at shallow depths. This significantly increases the wetness limitation and the land is appropriately graded Subgrade 3b (moderate quality land) due to the potential restrictions in the crop yield and flexibility of use.

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
Grid reference	N/A	SP 808124
Altitude	m, AOD	78
Accumulated Temperature	day°C (Jan-June)	1415
Average Annual Rainfall	mm	639
Field Capacity Days	days	137
Moisture Deficit, Wheat	mm	111
Moisture Deficit, Potatoes	mm	103

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 in terms of agricultural land quality and the site is climatically grade 1. No local climatic factors are believed to have a significant adverse effect on the site.

Site

14. The survey area lies at altitudes between 75 - 80m AOD. The land is generally flat or very gently sloping, but does rise more noticeably to a small dome in the south east corner. Nowhere on the site do steep gradients adversely affect agricultural land quality.

Geology and soils

15. The published 1:63360 scale (solid) geological map sheet covering the survey area (Geol. Surv. G.B., 1865) shows the site to be underlain by Kimmeridge Clay to the north with valley gravels over the majority of the remainder. Towards the southern boundary Portland Stone and Sand Beds are indicated. However since the published map sheet concentrates on the solid geology some drift deposit of significance in the area may not be shown.

16. The most detailed published soil map for the area is the 1:250,000 scale Soil Map of South East England (SSEW, 1983). The northern part of the area is shown as the Denchworth Association, whilst to the south the Aberford Association is indicated. The former soil type is described in the accompanying legend to the map as 'Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils. Some fine loamy over clayey soils with only slight seasonal waterlogging and some slowly permeable calcareous clayey soils'. Similarly, the Aberford Association is described as 'Shallow, locally brashy, well drained calcareous fine loamy soils over limestone. Some deeper calcareous soils in colluvium'. The published soil map is broadly in accord with survey findings, and although no hard limestone deposits were encountered to the south, highly calcareous fine and coarse loamy materials were present.

Agricultural Land Classification

17. 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 1.

18. 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.

Grade 2

19. Grade 2 (very good) quality land is mapped over the majority of the site. Topsoils typically comprise calcareous medium or heavy clay loams overlying similar textured or heavier (clay) upper subsoils which are gleyed. The lower subsoil horizons (from about 40-50cm) are pale coloured and highly calcareous (marly) and comprise various textures from medium clay loam, heavy clay loam, to sandy clay loam and sandy loam. Pit evidence (pit 2p) shows that these are porous and not slowly permeable. However they are subject to seasonal ground water fluctuations which can be controlled by normal field drainage techniques. Soil pits (1p and 2p) indicates that, where they occur, clay subsoil horizons have the structural characteristics of a slowly permeable layer. Where thin clay horizons are encountered

immediately beneath the topsoil there are insufficiently thick to cause the layer to be described as slowly permeable. Since soils can be loosened to 35cm, a clay horizon which terminates within 50cm (and is underlain by permeable layers) is less than 15cm thick and therefore does not meet the definition of a slowly permeable layer. Due to a residual wetness limitation, the majority of land in this mapping unit is appropriately placed in wetness class II (see Appendix II). Given the fine loamy calcareous topsoils such land is graded 2. The main agricultural limitations of this land are, therefore, of soil wetness and workability, the latter being most significant where the heavier topsoils are found. A subsidiary minor droughtiness limitation may also occur in some profiles, particularly where flinty lower subsoil horizons are found.

Subgrade 3b

20. Moderate quality (Subgrade 3b) land is found mainly to the north and east of the site. This is associated with areas where the upper clay subsoil is sufficiently deep to be slowly permeable (i.e. extends to depths in excess of 50cm from the surface), or where the underlying highly calcareous permeable drift is absent. These soils are slowly permeable at shallow depths and this significantly increases the wetness limitation. Such land is typically assessed as wetness class IV and given the heavy clay loam topsoil textures, the land is appropriately graded Subgrade 3b due to the potential restrictions in the crop yield and flexibility of use.

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SOURCES OF REFERENCE

Geological Survey of Great Britain (1865) *Sheet No. (Old Series) 46 S.W, (Woburn)*.
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 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

- 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.

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		
- 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.

MREL: Microrelief limitation	FLOOD: Flood risk	EROSN: Soil erosion risk
EXP: Exposure limitation	FROST: Frost prone	DIST: Disturbed land
CHEM: Chemical limitation		

- 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:

<u>degree of development</u>	WK: weakly developed ST: strongly developed	MD: moderately developed
<u>ped size</u>	F: fine C: coarse	M: medium VC: very coarse
<u>ped shape</u>	S : single grain GR: granular SAB: sub-angular blocky PL: platy	M: massive AB: angular blocky PR: prismatic

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, ELLEN ROAD Pit Number : 1P

Grid Reference: SP80801240 Average Annual Rainfall : 639 mm
 Accumulated Temperature : 1415 degree days
 Field Capacity Level : 137 days
 Land Use : Set-aside
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	HCL	10YR32 00	1	5	HR					Y
25- 55	C	25Y 52 00	0	10	HR	C	STVCAB	FM	P	Y
55- 80	MCL	10YR71 72	0	15	HR	C	MDCSAB	FR	M	Y
80-120	MSL	10YR71 72	0	20	HR	M	WKCSAB	FR	G	Y

Wetness Grade : 3B Wetness Class : IV
 Gleying : 025 cm
 SPL : 025 cm

Drought Grade : 2 APW : 139mm MBW : 28 mm
 APP : 099mm MBP : -4 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : AYLESBURY LP, ELLEN ROAD Pit Number : 2P

Grid Reference: SP80701210 Average Annual Rainfall : 639 mm
 Accumulated Temperature : 1415 degree days
 Field Capacity Level : 137 days
 Land Use : Ley
 Slope and Aspect : degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	HCL	10YR32 00	0	0						Y
27- 38	HCL	10YR62 00	0	0		C	MDVSAB	VF	M	Y
38- 75	FSL	10YR71 00	0	0		C	MDCSAB	FR	M	Y
75- 85	MZCL	10YR81 00	0	0		C	WKCSAB	FM	P	Y
85-120	MCL	10YR62 61	0	0		C	WKVCPL	FR	P	Y

Wetness Grade : 2 Wetness Class : II
 Gleying : 027 cm
 SPL : No SPL

Drought Grade : 1 APW : 151mm MBW : 40 mm
 APP : 124mm MBP : 21 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Wetness

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	SP80601280	PGR		025 025	4	3B	000	0 000	0				WE	3B	IMP-70
1P	SP80801240	SAS		025 025	4	3B	139	28 099	-4	2			WE	3B	At Boring 8
2	SP80601270	PGR		028 028	4	3B	000	0 000	0				WE	3B	
2P	SP80701210	LEY	S	027	2	2	151	40 124	21	1			WE	2	At Boring 15
3	SP80701270	PGR		035 050	3	2	147	36 109	6	2			WD	2	
4	SP80601260	PGR		030 030	4	3B	000	0 000	0				WE	3B	
5	SP80701260	SAS		028	2	2	151	40 113	10	2			WD	2	
6	SP80701250	SAS	W	01 000	3		000	0 000	0				WE	3A	SEE BOR7
7	SP80701240	SAS		025 025	4	3B	000	0 000	0				WE	3B	
8	SP80801240	SAS		025 025	4	3B	000	0 000	0				WE	3B	See 1P0
9	SP80701230	BAR		020	2	2	082	-29 083	-20	3B			DR	3A	Q AP
10	SP80801230	BAR		025	2	2	092	-19 098	-5	3A			DR	3A	Q AP
11	SP80901230	BAR		025 025	4	3B	000	0 000	0				WE	3B	QSPL 60
12	SP80701220	BAR		023	2	2	000	0 000	0				WE	2	
13	SP80801220	BAR		000	2	2	000	0 000	0				WE	2	
14	SP80901220	SAS	W	027	2	2	000	0 000	0				WE	2	IMP90(2-3B)
15	SP80701210	SAS	W	01 027	2	2	150	39 111	8	2			WD	2	See 2P
16	SP80801210	SAS	W	01 030	2	2	155	44 117	14	1			WE	2	
17	SP80901210	SAS	W	02 050	1	1	123	12 118	15	2			DR	2	
18	SP81001210	SAS	W	030	2	2	134	23 116	13	2			WD	2	ORGANIC
19	SP80701200	GRA	W	027	2	2	118	7 109	6	2			WE	2	IMP90SPQ
20	SP80801200	GRA	S	02 060	1	1	156	45 118	15	1				1	
21	SP80901200	GRA	E	01 000	1	1	180	69 123	20	1				1	
22	SP81001200	GRA	E	023 023	4	3B	000	0 000	0				WE	3B	IMP
23	SP80701190	GRA		020 020	4	3B	115	4 103	0	3A			WE	3B	IMP100
24	SP80801190	GRA		028	2	2	124	13 113	10	2			WD	2	IMP95
25	SP80631244	SAS		030	2	1	131	20 124	21	2			DR	2	
26	SP80631254	SAS		025	2	1	133	22 123	20	2			DR	2	
27	SP80701230	BAR		025 060	3	3A	000	0 000	0				WE	3A	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES-----			STRUCT/ CONSIST	SUBS			SPL	CALC		
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR			POR	IMP
1	0-25	hc1	10YR41 42					0	0	CH	5					Y		
	25-50	c	10YR42 52 75YR58 00 C					Y	0	0	CH	6	P			Y	Y	
	50-70	c	10YR51 52 10YR58 00 C					Y	0	0	CH	3	P			Y	Y	
1P	0-25	hc1	10YR32 00						1	0	HR	5					Y	
	25-55	c	25Y 52 00 10YR58 00 C					Y	0	0	HR	10	STVCAB FM P	Y		Y	Y	
	55-80	mc1	10YR71 72 10YR58 00 C					Y	0	0	HR	15	MDCSAB FR M				Y	
	80-120	ms1	10YR71 72 75YR58 00 M					Y	0	0	HR	20	WKCSAB FR G				Y	
2	0-28	mc1	10YR32 00						0	0	CH	2					Y	
	28-50	c	10YR51 00 10YR58 00 M					Y	0	0	CH	2	P			Y	Y	
	50-120	c	10YR51 52 10YR58 00 M					Y	0	0	CH	3	P			Y	Y	
2P	0-27	hc1	10YR32 00						0	0		0					Y	
	27-38	hc1	10YR62 00 10YR58 00 C				00MN00	00	Y	0	0	0	MDVSAB VF M				Y	
	38-75	fs1	10YR71 00 10YR68 00 C						Y	0	0	0	MDCSAB FR M				Y	POROUS
	75-85	mzc1	10YR81 00 10YR68 00 C						Y	0	0	0	WKCSAB FM P				Y	POROUS
	85-120	mc1	10YR62 61 10YR58 00 C				00MN00	00	Y	0	0	0	WKVCPL FR P				Y	POROUS
3	0-23	mc1	10YR42 00						0	0	CH	2					Y	
	23-35	hc1	10YR52 53						0	0	CH	3	M				Y	
	35-50	hc1	10YR42 52 10YR58 00 F						Y	0	0	HR	2	M			Y	
	50-70	c	25Y 42 52 10YR58 00 M						Y	0	0	CH	2	P			Y	Y
	70-120	hc1	10YR62 72 10YR58 00 M						Y	0	0	CH	2	M			Y	Y
4	0-30	hc1	10YR32 00						0	0	CH	2					Y	
	30-58	c	25Y 52 53 10YR58 00 M						Y	0	0	CH	2	P			Y	Y
	58-120	hc1	10YR62 72 10YR58 00 M						Y	0	0	CH	2	M			Y	Y
5	0-28	hc1	10YR32 33						0	0	HR	2					Y	
	28-38	c	25Y 52 53 10YR58 00 C						Y	0	0	HR	1	P			Y	
	38-70	hc1	10YR62 72 10YR58 00 M						Y	0	0	HR	2	M			Y	
	70-120	sc1	10YR62 00 10YR58 00 M				10YR72	00	Y	0	0	CH	1	M			Y	
6	0-30	hc1	10YR32 33						0	0	HR	2						IMP 30CM
7	0-25	hc1	10YR32 00						0	0		0					Y	
	25-65	c	10YR51 00 10YR56 00 C						Y	0	0	0	P			Y	Y	
	65-100	hc1	25Y 72 64 10YR56 00 C						Y	0	0	0	P			Y	Y	
8	0-25	hc1	10YR32 00						0	0		0					Y	
	25-50	c	10YR56 00 10YR56 00 C						Y	0	0	CH	2	P			Y	Y
	50-90	sc1	25Y 72 74 25Y 66 00 C						Y	0	0	CH	20	M			Y	
9	0-20	hc1	10YR32 00						0	0		0					Y	
	20-30	c	10YR51 00 10YR56 00 C						Y	0	0	HR	2	P			Y	Y
	30-47	hc1	25Y 72 00 25Y 66 00 C						Y	0	0	HR	10	M			Y	POROUS
	47-55	ms1	10YR56 71 10YR71 00 M						Y	0	0	HR	20	M			Y	IMP 55CM

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR		POR
10	0-25	hc1	10YR32 00					0	0	0					Y	
	25-33	c	25Y 52 53 10YR56 00 C					Y	0	0		P			Y	
	33-60	hc1	25Y 72 00 10YR58 00 C					Y	0	0	CH	5	M		Y	
															IMP FLINTS	
11	0-25	hc1	10YR32 00					0	0	0					Y	
	25-60	c	25Y 52 53 10YR56 00 C					Y	0	0			P		Y	
	60-100	hc1	25Y 62 71 10YR56 00 C					Y	0	0			M		Y	
12	0-23	hc1	10YR32 00					2	0	HR	2				Y	
	23-35	c	10YR61 00 10YR56 00 C					Y	0	0	CH	5	P		Y	
	35-60	mc1	25Y 72 00 10YR56 00 C					Y	0	0			M		Y	
	60-100	hc1	05Y 61 71 10YR56 00 C					Y	0	0			P		Y	
13	0-25	mzc1	10YR42-00					0	0	0						
	25-48	mzc1	25Y 54-00					0	0	0			M			
	48-100	ms1	10YR72-56 10YR58- C					Y	0	0			M		VCALC MARL	
14	0-27	hc1	10YR32 00					0	0	HR	1				Y	
	27-48	c	25Y 52 53 10YR58 00 M					Y	0	0	CH	2	P		Y	
	48-80	sc1	25Y 52 53 10YR58 00 M					00M00 00	Y	0	0	CH	3	M		Y
	80-90	sc1	25Y 52 53 10YR58 00 C					00M00 00	Y	0	0	CH	10	M		Y
15	0-27	hc1	10YR32 00					0	0	CH	2				Y	
	27-40	c	25Y 52 53 10YR58 00 M					00M00 00	Y	0	0	CH	3	P		Y
	40-60	hc1	10YR62 72 10YR58 00 C					Y	0	0	CH	4	M		Y	
	60-90	sc1	10YR62 72 10YR58 00 C					Y	0	0	CH	4	M		Y	
	90-120	hc1	05Y 62 51 10YR58 00 C					25Y 62 00	Y	0	0	CH	2	M		Y
16	0-30	hc1	10YR32 42					0	0	CH	2				Y	
	30-45	hc1	25Y 52 53 10YR58 00 C					Y	0	0	CH	3	M		Y	
	45-90	hc1	10YR62 72 10YR58 00 C					Y	0	0	CH	1	M		Y	
	90-120	hc1	05Y 62 51 10YR58 00 C					Y	0	0	CH	1	M		Y	
17	0-25	mc1	10YR43 00					0	0	HR	1				Y	
	25-50	hc1	25Y 54 56					0	0	HR	2		M		Y	
	50-70	mzc1	25Y 72 54 10YR46 00 C					Y	0	0	HR	1	M		Y	
	70-90	sc1	25Y 54 72 10YR46 00 C					Y	0	0	HR	1	M		Y	
18	0-30	mc1	10YR42 43					0	0	HR	2				Y	
	30-60	hc1	10YR42 00 10YR36 00 C					Y	0	0	CH	2	M		Y	
	60-90	hc1	10YR32 00 10YR36 00 M					Y	0	0	CH	5	M		Y	
	90-100	hc1	10YR32 00 10YR36 00 C					Y	0	0	CH	15	M		Y	
19	0-27	hc1	10YR32 00					0	0	CH	2				Y	
	27-45	c	25Y 52 53 10YR58 00 C					Y	0	0	CH	4	P		Y	
	45-55	hc1	25Y 52 53 10YR58 00 M					Y	0	0	CH	8	M		Y	
	55-90	sc1	10YR62 72 10YR58 00 C					Y	0	0	CH	10	M		Y	

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----		PED		-----STONES-----			STRUCT/ CONSIST	SUBS			SPL	CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6		LITH	TOT	STR		
20	0-25	mzc1	10YR42 00					0	0	HR	1					Y
	25-60	mc1	10YR53 63 10YR58 00 F			10YR72 00		0	0	CH	3		M			Y
	60-100	mc1	10YR53 63 10YR58 00 C			10YR72 00 Y		0	0	CH	2		M			Y
	100-120	sc1	10YR53 63 10YR58 00 C			10YR72 00 Y		0	0	CH	2		M			Y
21	0-30	mc1	10YR42 00					0	0		0					
	30-40	mc1	10YR42 00					0	0		0		M			
	40-60	mc1	10YR43 00					0	0		0		M			Y
	60-90	fsz1	25Y 54 00					0	0		0		M			Y
	90-120	fs1	25Y 56 00					0	0		0		M			Y
22	0-23	hc1	10YR32 00					0	0		0					Y
	23-60	c	10YR51 00 10YR56 00 C					Y	0	0	0		P		Y	Y
	60-70	sc1	25Y 61 00 10YR56 00 C					Y	0	0	CH	5	M			Y
23	0-20	hc1	10YR42 00					2	0	HR	4					Y
	20-60	c	25YR62 00 10YR58 00 M					Y	0	0	CH	4	P	Y	Y	Y
	60-95	mzc1	25YR62 00 75YR46 00 C					Y	0	0	CH	5	M			Y
	95-100	mc1	10YR62 00 75YR46 00 C					Y	0	0	HR	15	M			Y
24	0-28	hc1	10YR32 42					0	0	CH	2					Y
	28-45	c	25Y 52 53 10YR58 00 C			00M00 00 Y		0	0	CH	4		P			Y
	45-65	mzc1	10YR62 72 10YR58 00 C			00M00 00 Y		0	0	CH	5		M			Y
	65-95	hc1	10YR62 72 10YR58 00 M			10YR41 00 Y		0	0	CH	10		M			Y
25	0-30	mzc1	10YR42 00					0	0		0					Y
	30-60	mzc1	25Y 62 72 75YR58 00 M			00M00 00 Y		0	0		0		M			Y
	60-80	mzc1	10YR62 81 10YR58 00 C					Y	0	0	SLST	10	M			Y
	80-95	ms1	25Y 62 00 10YR58 00 C					Y	0	0	HR	30	M			Y
26	0-25	mzc1	10YR42 00					0	0		0					Y
	25-60	mzc1	10YR81 00 10YR58 00 C			00M00 00 Y		0	0		0		M			Y
	60-75	mc1	05Y 51 00 10YR58 00 C			00M00 00 Y		0	0	HR	2		M			Y
	75-90	mc1	25Y 72 00 75YR58 00 M			00M00 00 Y		0	0	HR	2		M			Y
	90-95	ms1	10YR54 00 10YR56 00 M			00M00 00 Y		0	0	HR	30		M			Y
27	0-25	hc1	10YR32 00					0	0	HR	2					Y
	25-45	c	10YR51 00 10YR56 00 C					Y	0	0	HR	2	P			Y
	45-60	hzc1	25Y 82 00 25Y 66 00 C					Y	0	0		0	M			Y
	60-90	c	25Y 72 76 25Y 66 00 C					Y	0	0		0	P		Y	Y
	90-120	sc1	10YR72 56 10YR58 00 C					Y	0	0	HR	5	M		Y	Y