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Arun District Local Plan
Site 37 : Land north of Barnham
Agricultural Land Classification
ALC Map and Report
April 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

ARUN DISTRICT LOCAL PLAN SITE 37 : LAND NORTH OF BARNHAM

1. Summary

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the Arun District of West Sussex. The work forms part of MAFF's statutory input to the preparation of the Arun District Local Plan.
- 1.2 Site 37 comprises 12.9 hectares of land west of Barnham Lane, north of Barnham, West Sussex. An Agricultural Land Classification, (ALC), survey was carried out during April 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 16 borings and two soil inspection pits were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land, (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose a long term limitation on its use for agriculture.
- 1.3 At the time of the survey the predominant land use was a rye grass ley. The field abutting Barnham Lane was in permanent pasture.
- 1.4 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent are given in the table below. The map has been drawn at a scale of 1:5,000. It is accurate at this scale, but any enlargement would be misleading.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Agricultural Land
1	3.5	27.1
2	6.6	51.2
3a	1.9	14.7
3b	<u>0.9</u>	<u>7.0</u>
Total area of site	12.9	100.0

- 1.5 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.
- 1.6 The agricultural land surveyed has been classified as a mixture of Grades 1 and 2 and Subgrades 3a and 3b. Grade 1 (excellent quality) land has no or very minor limitations to agricultural use, and generally comprises silt loam topsoils overlying silty clay loams. Grade 2 (very good quality) land is limited by minor soil droughtiness, caused by a slightly higher clay content within soil profiles, and/or

soil wetness restrictions. Where these limitations are slightly more severe land has been classed as Subgrade 3a (good quality). Land classed as Subgrade 3b (moderate quality), has been so graded because of significant soil wetness and workability limitations resulting from poor drainage.

2. Climate

- 2.1 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.
- 2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (degree days Jan-June), as a measure of the relative warmth of a locality.
- 2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. At this locality the crop adjusted moisture deficits are relatively high in a regional context. High crop adjusted moisture deficits increase the likelihood of soil droughtiness limitations.
- 2.4 No local climatic factors such as exposure or frost risk are believed to affect the site.

Table 2 : Climatic Interpolation

Grid Reference	SU958052
Altitude (m)	9
Accumulated Temperature (degree days, Jan-June)	1538
Average Annual Rainfall (mm)	776
Field Capacity (days)	159
Moisture Deficit, Wheat (mm)	117
Moisture Deficit, Potatoes (mm)	114
Overall Climatic Grade	1

3. Relief

- 3.1 Along the northern boundary of the site the land is slightly higher and lies at approximately 10m AOD. The remainder of the site lies at approximately 8m AOD. The field adjacent to Barnham Lane is slightly lower lying than elsewhere on the site, and lies at an altitude of 7m AOD. Neither gradient nor relief impose any limitation to agricultural land quality.

4. Geology and Soil

- 4.1 British Geological Survey (1972), Sheet 317, Chichester shows most of the site to be underlain by valley gravel, with a small area of London Clay mapped to the east of the stream in the most easterly field.
- 4.2 The published Soil Survey map, (SSGB, 1967, 1:25,000) maps six soil series at this site. The predominant soil series mapped is the Hook series (deep phase and shallow phase over flinty head), described as 'brown earths with gleying' (SSGB, 1967). The Binsted series is mapped along most of the southern boundary of the site, described as 'non-calcareous gley soils developed in flinty silty head' (SSGB, 1967). In the most easterly field, the Gade complex plus a small area of the Park Gate series are mapped, described as 'soils developed in freshwater alluvium overlying gravel at no great depth' and a 'range of gley soils developed in brickearth' (SSGB, 1967) respectively. A very small area west of the Gade complex, along the southern boundary, is mapped as the Calcetto series and the Titchfield Complex. These soils are respectively described as a 'range of loamy non-calcareous gley soils developed in the loamy pebbly marine drift of the Pleistocene beaches' and a 'range of poorly and imperfectly drained surface-water gley soils developed in Eocene clay' (SSGB, 1967).
- 4.3 Detailed field examination found three broad soil types : deep, well drained and moderately well drained soils, soils overlying chalky drift and poorly drained soils.

5. Agricultural Land Classification

- 5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.
- 5.2 The location of the soil observation points are shown on the attached sample point map.

Grade 1

- 5.3 Excellent quality land generally occurs where the Hook series (deep phase) is mapped. This land has no or very minor limitations to agricultural use. Profiles typically comprise deep non-calcareous silt loam topsoils overlying medium and heavy silty clay loam subsoils. Profiles are stoneless to slightly stony, typically containing a total of c. 0-10% flints v/v, and are well drained (Wetness Class I). The silty textured soils within these profiles are capable of holding adequate reserves of profile available water, so despite the relatively high crop adjusted moisture deficits at this locality land is not droughty. Consequently, this land is capable of producing consistent and high yields from a very wide range of agricultural and horticultural crops.

Grade 2

- 5.4 Very good quality land is limited by minor soil droughtiness or wetness, and occasionally both. Land limited by slight soil droughtiness generally comprises

non-calcareous silt loam and medium silty clay loam topsoils over medium silty clay loam upper subsoils and heavy silty clay loam lower subsoils. Profiles are well drained (Wetness Class I). Topsoils and upper subsoils are slightly stony, containing 0-2% flints >2 cm v/v and 4-11% total flints v/v. These pass into subsoils containing chalk or chalky drift (c. 15-25% total chalk v/v) at c. 55-80 cm. The interaction between these soil textures and profile stone contents, in comparison to land graded 1, imparts a slight reduction in profile available water. This mapping unit, typified by Pit 2, may have slightly reduced yield potential as a result. Land limited by slight soil wetness generally comprises non-calcareous medium silty clay loam and silt loam topsoils over medium and heavy silty clay loam subsoils. Profiles are generally gleyed at c. 45-65 cm and slowly permeable at c. 60-75 cm. Occasionally, profiles are gleyed within 40 cm but are not slowly permeable. These profiles are moderately well drained (Wetness Class II) and are typified by Pit 1. The interaction between these drainage characteristics and topsoil textures at this site means that this land has restricted flexibility of cropping, stocking and cultivation, and so cannot be graded higher than 2.

Subgrade 3a

- 5.5 Land classed as good quality is limited by soil droughtiness and/or soil wetness and workability. Profiles typically comprise medium silty clay loam topsoils and upper subsoils and heavy silty clay loam lower subsoils. Profiles are generally gleyed and slowly permeable from c. 45 cm (Wetness Class III), though profile drainage characteristics equating to Wetness Classes II and IV also occur within short distances of each other, resulting in a variable mapping unit. This soil wetness results in land with restricted flexibility of cropping, stocking and cultivations. Some profiles become very stony, containing a total of c. 40% v/v flints, at c. 55 cm depth. Crop roots are able to extract less moisture from flints, in comparison with chalky drift or chalk, and consequently these soils have a moderate reduction in profile available water in comparison to land graded 2. Consequently, such profiles are also limited by soil droughtiness. The restricted available water for crops in such profiles will tend to reduce the level and consistency of crop yields, meaning this land can be graded no higher than 3a.

Subgrade 3b

- 5.6 Land classed as moderate quality is restricted by soil wetness and workability. Non-calcareous medium silty clay loam topsoils overlie poorly structured clay subsoils. The clay severely impedes drainage, as evidenced by gleying within the topsoil, and such profiles are thus assigned to Wetness Class IV. The interaction between these drainage characteristics and topsoil textures at this site means that this land can be graded no higher than Subgrade 3b. This land is subject to significantly reduced flexibility of cultivations, cropping and stocking.

SOURCES OF REFERENCE

British Geological Survey (1972), Sheet No. 317, Chichester, 1:63,360 (drift edition).

MAFF (1988), Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

Meteorological Office (1989), Climatological Data for Agricultural Land Classification.

Soil Survey of Great Britain (1967), Bulletin No. 3, Soils of the West Sussex Coastal Plain and accompanying maps.

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 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 (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 which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural Buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

Open Water

Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

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.

Definition of Soil Wetness Classes

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.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

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

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

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

Soil Abbreviations - Explanatory Note

Soil Pit Descriptions

Database Printout - Boring Level Information

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 : ARUN LP SITE 37, BARNHAM Pit Number : 1P

Grid Reference: SU95700520 Average Annual Rainfall : 774 mm
 Accumulated Temperature : 1539 degree days
 Field Capacity Level : 159 days
 Land Use : Ley
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	ZL	10YR42 00	2	4		
28- 42	MZCL	10YR44 54	0	5		MDCSAB
42- 52	HZCL	10YR56 00	0	5		WKCSAB
52- 76	HZCL	10YR53 00	0	11	C	MDCSAB
76-120	CH	10YR82 00	0	25		

Wetness Grade : 1 Wetness Class : I
 Gleying : 052 cm
 SPL : No SPL

Drought Grade : 2 APW : 145mm MBW : 28 mm
 APP : 128mm MBP : 14 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : ARUN LP SITE 37, BARNHAM Pit Number : 2P

Grid Reference: SU95800510 Average Annual Rainfall : 774 mm
 Accumulated Temperature : 1539 degree days
 Field Capacity Level : 159 days
 Land Use : Ley
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 29	ZL	10YR54 56	0	1		
29- 65	MZCL	10YR54 53	0	1	F	MDCSAB
65-100	HZCL	10YR53 00	0	0	M	MDMPR

Wetness Grade : 2 Wetness Class : II
 Gleying : 065 cm
 SPL : 065 cm

Drought Grade : 1 APW : 151mm MBW : 34 mm
 APP : 135mm 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						DRT
1	SU95600530	LEY	0	040	4	3B	95	-22	101	-13	3B			WE	3B	IMP60 - 3A DR
1P	SU95700520	LEY		052	1	1	145	28	128	14	2			DR	2	PIT DUG TO 80
2	SU95700530	LEY SW	01	045 060	2	2	160	43	124	10	1			WE	2	
2P	SU95800510	LEY		065 065	2	2	151	34	135	21	1			WE	2	W/TABLE 100
3	SU95600520	LEY			1	1	111	-6	120	6	3A			DR	3A	PROB 2 RE 2P
4	SU95700520	LEY			1	1	123	6	129	15	2			DR	2	IMPEN 78
5	SU95800520	LEY			1	1	149	32	131	17	1				1	IMPEN 105
6	SU95900520	LEY			1	1	165	48	131	17	1				1	
7	SU96000520	LEY		045 075	2	2	146	29	124	10	2			WD	2	
8	SU95700510	LEY			1	1	62	-55	62	-52	4			DR	3B	IMPEN 35 X3
9	SU95800510	LEY		060	2	2	185	68	150	36	1			WE	2	SL GLEYED 60+
10	SU95900510	LEY			1	1	174	57	139	25	1				1	
11	SU96000510	LEY		030	2	2	167	50	132	18	1			WE	2	
12	SU96000500	LEY			1	1	154	37	136	22	1				1	
13	SU96100500	PGR		0 025	4	3B		0		0				WE	3B	IMPEN 55
14	SU95570537	LEY		045 045	3	3A	124	7	120	6	2			WE	3A	IMPEN 90
15	SU95590530	LEY		030	2	2	154	37	122	8	2			WD	2	1 m FROM AB 1
16	SU95690513	LEY		060 060	2	2	167	50	131	17	1			WE	2	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES----			STRUCT/ CONSIST	SUBS			SPL	CALC	
				COL	ABUN	CONT	COL.	GLEYS	>2	>6	LITH		TOT	STR	POR			IMP
1	0-25	mzc1	10YR42 00	10YR46 00	C			Y	0	0	HR	2						
	25-40	mzc1	10YR43 52	10YR46 00	C			Y	0	0	HR	3		M				
	40-55	hzc1	10YR53 00	10YR56 00	M		00MN00	00	Y	0	0	HR	5		M		Y	
	55-60	hzc1	10YR53 00	10YR58 00	M				Y	0	0	HR	40		M			
1P	0-28	z1	10YR42 00						2	0	HR	4						
	28-42	mzc1	10YR44 54						0	0	HR	5	MDCSAB	FR	M			
	42-52	hzc1	10YR56 00						0	0	HR	5	WKCSAB	FR	M		Y	
	52-76	hzc1	10YR53 00	10YR56 00	C		00MN00	00	Y	0	0	HR	11	MDCSAB	FM	M		Y
	76-120	ch	10YR82 00						Y	0	0	HR	25		M			Y
2	0-30	mzc1	10YR44 54						0	0	HR	2						
	30-45	mzc1	10YR54 00						0	0		0		M				
	45-60	mzc1	10YR53 00	10YR56 00	C			Y	0	0		0		M				
	60-120	hzc1	10YR53 52	10YR58 00	M		00MN00	00	Y	0	0		0		M			Y
2P	0-29	z1	10YR54 56						0	0	HR	1						
	29-65	mzc1	10YR54 53	10YR56 00	F				0	0	HR	1	MDCSAB	FR	M			
	65-100	hzc1	10YR53 00	10YR56 00	M		00MN00	00	Y	0	0		0	MDMPR	FR	M		Y
3	0-28	z1	10YR42 00						1	0	HR	4						
	28-55	mzc1	10YR54 00						0	0	HR	6		M				
	55-65	hzc1	25Y 63 00						0	0	CH	25		M			IMPEN 65	
4	0-30	z1	10YR42 00						1	0	HR	5						
	30-40	mzc1	10YR43 00						0	0	HR	8		M				
	40-55	mzc1	10YR54 00						0	0	HR	8		M				
	55-78	hzc1	10YR54 00	10YR58 00	F		00MN00	00		0	0	HR	8		M			IMPEN 78
5	0-25	z1	10YR43 00	10YR58 00	F				0	0	HR	2						
	25-50	mzc1	10YR54 00						0	0	HR	2		M				
	50-70	hzc1	10YR56 00						0	0	HR	5		M				
	70-105	hzc1	10YR56 00						0	0	HR	10		M			IMPEN 105	
6	0-22	z1	10YR42 00	10YR46 00	F				0	0		0						
	22-35	mzc1	10YR54 53						0	0		0		M				
	35-80	mzc1	10YR54 53						0	0	HR	3		M				
	80-120	mzc1	10YR54 53						0	0	HR	4		M				
7	0-30	mzc1	10YR43 53	10YR46 00	F				0	0	HR	2						
	30-45	mzc1	10YR54 00	10YR56 00	F				0	0		0		M				
	45-75	mzc1	10YR53 00	10YR56 00	C		00MN00	00	Y	0	0		0		M			
	75-85	hzc1	10YR53 00	10YR56 00	M		00MN00	00	Y	0	0		0		M		Y	
	85-105	zc	10YR53 00	10YR58 00	M		00MN00	00	Y	0	0	HR	10		P		Y	
	105-120	c	25Y 53 00	10YR58 00	M				Y	0	0	HR	25		P		Y	
8	0-24	z1	10YR42 00						6	0	HR	15						
	24-35	mzc1	10YR52 00						0	0	HR	25		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----			STRUCT/ CONSIST	SUBS			SPL	CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR		
9	0-29	z1	10YR54 56						0	0	HR	1					
	29-60	z1	10YR54 64	10YR56	00	F			0	0	HR	1		M			
	60-120	hzc1	10YR54 00	10YR56	63	M	00MN00	00	S	0	0	HR	1		M		Y
10	0-30	z1	10YR53 00	10YR58	00	C			0	0	HR	1					OCH ROOT MOTTLES
	30-40	z1	10YR54 00	10YR56	00	F			0	0	HR	1		M			
	40-50	mzc1	10YR54 00						0	0	HR	1		M			
	50-78	hzc1	10YR56 00	00MN00	00	F			0	0	HR	5		M			
	78-120	hc1	25Y 54 00	10YR56	00	F			0	0	CH	15		M			
11	0-30	z1	10YR52 00						0	0		0					
	30-55	hzc1	10YR53 00	10YR58	00	C			Y	0	0	0		M			Q SPL
	55-85	hzc1	75YR53 00	10YR58	00	C			Y	0	0	HR	20	M			
	85-120	hzc1	10YR73 00	10YR58	00	C			Y	0	0	CH	5	M			Q SPL
12	0-31	z1	75YR53 00	10YR58	00	C			0	0		0					OCH ROOT MOTTLES
	31-40	mzc1	10YR52 00	10YR58	00	F			0	0		0		M			
	40-50	hzc1	10YR54 00						0	0	HR	2		M			
	50-65	hzc1	10YR56 00						0	0		0		M			
	65-80	ms1	10YR58 00						0	0		0		M			
	80-120	lms	10YR58 00						0	0		0		M			
13	0-25	mzc1	10YR42 00	10YR58	00	C			Y	0	0	0					
	25-45	c	10YR52 00	10YR68	72	M			Y	0	0	HR	5		P		Y
	45-55	c	10YR52 00	10YR68	72	M			Y	0	0	HR	15		P		Y
14	0-25	mzc1	10YR42 52						0	0	HR	3					
	25-35	mzc1	10YR42 00						0	0	HR	5		M			
	35-45	mzc1	10YR43 53						0	0	HR	3		M			
	45-75	hzc1	10YR53 00	10YR58	00	M	00MN00	00	Y	0	0	HR	3		M		Y
	75-85	hzc1	10YR53 00	10YR58	00	M	00MN00	00	Y	0	0	HR	15		M		Y
	85-90	hzc1	10YR72 81						Y	0	0	CH	35		M		Y
15	0-30	mzc1	10YR42 00						0	0	HR	2					
	30-55	mzc1	10YR42 52	10YR56	00	C			Y	0	0	HR	3		M		
	55-75	mzc1	10YR53 00	10YR58	00	C			Y	0	0	HR	5		M		Y
	75-110	mzc1	25Y 53 63	10YR66	00	M			Y	0	0	CH	25		M		Y
	110-120	mzc1	25Y 63 72	10YR68	00	C			Y	0	0	CH	40		M		Y
16	0-25	z1	10YR42 00	10YR56	00	F			0	0	HR	4					
	25-60	mzc1	10YR54 00	10YR56	00	F			0	0	HR	2		M			
	60-120	hzc1	10YR64 00	10YR58	61	M	00MN00	00	Y	0	0	0		M		Y	