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REIGATE AND BANSTEAD DISTRICT LOCAL PLAN
Land South East of Horley
Semi Detailed Survey

Agricultural Land Classification
ALC Map and Report

November 1997

Resource Planning Team
Eastern Region
FRCA Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

REIGATE AND BANSTEAD DISTRICT LOCAL PLAN
LAND SOUTH EAST OF HORLEY, SURREY
SEMI DETAILED SURVEY

INTRODUCTION

1 This report presents the findings of a semi detailed Agricultural Land Classification (ALC) survey of 101 1 ha on three parcels of land located between the M23 the London Brighton railway line and Smallfield Road to the south east of Horley in Surrey The survey was carried out during November and December 1997

2 The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)[1] on behalf of the Ministry of Agriculture Fisheries and Food (MAFF) in connection with the Reigate and Banstead District Local Plan 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 the 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 most of the agricultural land on the site was in permanent grassland Land to the west of Harrowsley Green Farm located in the northern most block of land had recently been ploughed The areas mapped as Other land include woodland roads and tracks a business unit farm buildings and residential dwellings

SUMMARY

5 The findings of the survey are shown on the enclosed ALC map The map has been drawn at a scale of 1 15 000 It is accurate at this scale but any enlargement would be misleading

6 The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
3b	95 2	100	94 2
Other land	5 9		5 8
Total surveyed area	95 2	100	94 2
Total site area	101 1		100

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

7 The fieldwork was conducted at an average density of approximately 1 boring per 2 hectares of agricultural land In total 65 borings and four soil pits were described

8 All of the agricultural land on this site has been classified as Subgrade 3b (moderate quality) The principal limitation to land quality is soil wetness and workability arising from soils typically derived from Weald Clay Profiles typically comprise medium and occasionally heavy textured topsoils which overlie heavy textured subsoils at shallow depths within the soil profile These subsoils act to impede soil drainage At this locality the interaction between such poor soil drainage and the topsoil textures means that this land is subject to reduced flexibility of cropping stocking and cultivations Subgrade 3b is appropriate

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)

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 (ATO January to June) as a measure of the relative warmth of a locality

Table 2 Climatic and altitude data

	Units	Values	
Grid Reference	N/A	TQ 300 430	TQ 290 420
Altitude	m AOD	57	58
Accumulated Temperature	day°C (Jan June)	1458	1458
Average Annual Rainfall	mm	774	783
Field Capacity Days	days	164	166
Moisture Deficit Wheat	mm	109	107
Moisture Deficit Potatoes	mm	102	100
Overall climatic grade	N/A	Grade 1	Grade 1

13 The combination of rainfall and accumulated temperature at this site mean that there is no overall climatic limitation However climatic factors do interact with soil properties to

influence soil wetness and droughtiness limitations At this locality the soil moisture deficits are tending slightly above average in regional terms As a result the likelihood of soil droughtiness problems may be increased No local climatic factors such as exposure or frost risk are believed to adversely affect the land quality on the site This site is climatically Grade 1

Site

14 The three separate parcels of land that constitute the site are all relatively flat and lie at approximately 57 59 m AOD Nowhere on the site do gradient or microrelief adversely affect agricultural land quality

Geology and soils

15 The most detailed published geological information for the site (BGS 1978) shows the entire site to be underlain by a solid deposit of Weald Clay Drift deposits of low terrace river gravels overlie much of the site These occur across the northern and western half of the most northern block of land across the western half of the land adjacent to the railway line and across all of the remaining south easterly block of land Drift deposits of alluvium are shown to flank the Burstow stream which occurs in the most northern block of land

16 The most recent detailed published soil map for this area (SSEW 1983 and 1984) maps two soil associations across the three areas of land Broadly speaking soils of the Shabbington Association are mapped in conjunction with the river gravel deposits These soils are described as Deep fine loamy and fine loamy over sandy soils variably affected by groundwater Some slowly permeable seasonally waterlogged fine loamy over clayey soils (SSEW 1983) Soils of the Wickham 1 Association are mapped across the area underlain by the Weald Clay These soils are described as Slowly permeable seasonally waterlogged fine silty over clayey fine loamy over clayey and clayey soils (SSEW 1983) Soils similar to the latter rather than the Shabbington Association were found across the site

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 II page 8

Subgrade 3b

19 All of the land on this site has been classified as Subgrade 3b (moderate quality) All of this land is subject to significant soil wetness and workability limitations resulting from soils derived from the underlying Weald Clay

20 The topsoils on the site tend to be medium textured typically medium (silty) clay loams though heavy textured topsoils heavy (silty) clay loams also prevail These pass into heavy textured subsoils heavy (silty) clay loams and (silty) clays immediately below the

topsoil These profiles tend to be stoneless or very slightly stony throughout with topsoils and subsoils containing 0 2% total flints by volume Occasionally lower subsoils are slightly to moderately stony containing 10 20% total flints These profiles are typified by Pits 2 3 and 4 Around Haroldslea Poultry Farm in the northern block of land the profiles tend to be silty in texture here subsoils contain 5 25% total siltstone by volume The latter are typified by Pit 1 All of the pits on the site show the (silty) clay subsoils to be poorly structured the heavy (silty) clay loam subsoils are either moderately or poorly structured (depending upon the constituent soil ped consistency) All of these subsoils are slowly permeable and act to significantly impede soil drainage as indicated by gleying either from the surface or directly below the topsoil Given the prevailing climate these profiles are assessed as poorly drained (Wetness Class IV)

21 The interaction between the medium and heavy textured topsoils poor soil drainage and prevailing local climate means that this land is limited by soil wetness and workability Soil wetness can adversely affect seed germination and survival and can inhibit the development of a good root system It also influences the sensitivity of soil to structural damage and is therefore a major factor in determining the number of days when cultivation trafficking or grazing can take place

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SOURCES OF REFERENCE

British Geological Survey (1978) *Sheet No 286 Reigate 1 50 000 (drift edition)*
BGS London

Ministry of Agriculture Fisheries and Food (1988) *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land*
MAFF London

Met Office (1989) *Climatological Data for Agricultural Land Classification*
Met Office Bracknell

Soil Survey of England and Wales (1983) *Sheet 6 1 250 000 scale Soils of South East England and accompanying legend*
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

SOIL PROFILE DESCRIPTIONS EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database This uses notations and abbreviations as set out below

Boring Header Information

1 **GRID REF** national 100 km grid square and 8 figure grid reference

2 **USE** Land use at the time of survey The following abbreviations are used

ARA	Arable	**WHT**	Wheat	**BAR**	Barley
CER	Cereals	**OAT**	Oats	**MZE**	Maize
OSR	Oilseed rape	**BEN**	Field beans	**BRA**	Brassicae
POT	Potatoes	**SBT**	Sugar beet	**FCD**	Fodder crops
LIN	Linseed	**FRT**	Soft and top fruit	**FLW**	Fallow
PGR	Permanent pasture	**LEY**	Ley grass	**RGR**	Rough grazing
SCR	Scrub	**CFW**	Coniferous woodland	**OTH**	Other
DCW	Deciduous woodland	**BOG**	Bog or marsh	**SAS**	Set Aside
HTH	Heathland	**HRT**	Horticultural crops	**PLO**	Ploughed

3 **GRDNT** Gradient as estimated or measured by a hand held optical clinometer

4 **GLEY/SPL** Depth in centimetres (cm) to gleying and/or slowly permeable layers

5 **AP (WHEAT/POTS)** Crop adjusted available water capacity

6 **MB (WHEAT/POTS)** Moisture Balance (Crop adjusted AP crop adjusted MD)

7 **DRT** Best grade according to soil droughtiness

8 If any of the following factors are considered significant Y will be entered in the relevant column

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

9 **LIMIT** The main limitation to land quality The following abbreviations are used

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

Soil Pits and Auger Borings

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

S	Sand	**LS**	Loamy Sand	**SL**	Sandy Loam
SZL	Sandy Silt Loam	**CL**	Clay Loam	**ZCL**	Silty Clay Loam
ZL	Silt Loam	**SCL**	Sandy Clay Loam	**C**	Clay
SC	Sandy Clay	**ZC**	Silty Clay	**OL**	Organic Loam
P	Peat	**SP**	Sandy Peat	**LP**	Loamy Peat
PL	Peaty Loam	**PS**	Peaty Sand	**MZ**	Marine Light Silts

For the sand loamy sand sandy loam and sandy silt loam classes the predominant size of sand fraction will be indicated by the use of the following prefixes

F Fine (more than 66% of the sand less than 0 2mm)
M Medium (less than 66% fine sand and less than 33% coarse sand)
C Coarse (more than 33% of the sand larger than 0 6mm)

The clay loam and silty clay loam classes will be sub divided according to the clay content
M Medium (<27% clay) **H** Heavy (27 35% clay)

2 **MOTTLE COL** Mottle colour using Munsell notation

3 **MOTTLE ABUN** Mottle abundance expressed as a percentage of the matrix or surface described

F few <2% **C** common 2 20% **M** many 20 40% **VM** very many 40% +

4 **MOTTLE CONT** Mottle contrast

F faint indistinct mottles evident only on close inspection
D distinct mottles are readily seen
P prominent mottling is conspicuous and one of the outstanding features of the horizon

5 **PED COL** Ped face colour using Munsell notation

6 **GLEY** If the soil horizon is gleyed a Y will appear in this column If slightly gleyed an S will appear

7 **STONE LITH** Stone Lithology one of the following is used

HR	all hard rocks and stones	**FSST**	soft fine grained sandstone
ZR	soft argillaceous or silty rocks	**CH**	chalk
MSST	soft medium grained sandstone	**GS**	gravel with porous (soft) stones
SI	soft weathered igneous/metamorphic rock	**GH**	gravel with non porous (hard) stones

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

8 **STRUCT** the degree of development size and shape of soil peds are described using the following notation

Degree of development	**WK**	weakly developed	**MD**	moderately developed
	ST	strongly developed		
Ped size	**F**	fine	**M**	medium
	C	coarse		
Ped shape	**S**	single grain	**M**	massive
	GR	granular	**AB**	angular blocky
	SAB	sub angular blocky	**PR**	prismatic
	PL	platy		

9 **CONSIST** Soil consistence is described using the following notation

L loose	**FM** firm	**EH** extremely hard
VF very friable	**VM** very firm	
FR friable	**EM** extremely firm	

10 **SUBS STR** Subsoil structural condition recorded for the purpose of calculating profile droughtiness **G** good **M** moderate **P** poor

11 **POR** Soil porosity If a soil horizon has less than 0 5% biopores >0 5 mm a 'Y will appear in this column

12 **IMP** If the profile is impenetrable to rooting a Y will appear in this column at the appropriate horizon

13 **SPL** Slowly permeable layer If the soil horizon is slowly permeable a Y will appear in this column

14 **CALC** If the soil horizon is calcareous a Y will appear in this column

15 Other notations

APW	available water capacity (in mm) adjusted for wheat
APP	available water capacity (in mm) adjusted for potatoes
MBW	moisture balance wheat
MBP	moisture balance potatoes

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ30204330	PGR		0	25	4	3B		0		0						WE	3B	Water table 15
2	TQ30404330	PGR		0	29	4	3B		0		0						WE	3B	Ridge & furrow
3	TQ29404320	PLO		35	35	4	3B		0		0						WE	3B	
4	TQ29504320	PLO		25	25	4	3B		91	-18	97	-5	3A				WE	3B	Imp 60 Mn & HR
5	TQ29704320	PLO		25	25	4	3B		0		0						WE	3B	Fe 70 Water 65
6	TQ29904320	PLO		28	28	4	3B		0		0						WE	3B	
7	TQ30104320	PGR		0	28	4	3B		0		0						WE	3B	Very wet
8	TQ30304320	PGR		0	29	4	3B		0		0						WE	3B	Ridge & furrow
9	TQ29404310	PLO		25	25	4	3B		0		0						WE	3B	
10	TQ29604310	PLO		25	25	4	3B		0		0						WE	3B	Wet 30 Imp 80
11	TQ29804310	PLO		25	25	4	3B		0		0						WE	3B	Fe concs 65+
12	TQ30204310	PGR		0	30	4	3B		0		0						WE	3B	Water table 10
13	TQ30404310	PGR		0	30	4	3B		0		0						WE	3B	Ridge & furrow
14	TQ29404300	RGR		0	30	4	3B		0		0						WE	3B	
15	TQ29504300	PLO		25	25	4	3B		0		0						WE	3B	Wet25 Imp/Fe65
16	TQ29704300	PLO		25	25	4	3B		0		0						WE	3B	Wet 25
17	TQ29904300	PGR		0	23	4	3B		0		0						WE	3B	
18	TQ30104300	PGR		30	30	4	3B		0		0						WE	3B	
19	TQ30304300	PGR		0	35	4	3B		0		0						WE	3B	Sl drier
20	TQ29434294	PGR		0	35	4	3B		0		0						WE	3B	
21	TQ29664290	PLO		25	25	4	3B		0		0						WE	3B	
22	TQ29804290	PLO		25	25	4	3B		0		0						WE	3B	
23	TQ30004290	PGR		0	20	4	3B		0		0						WE	3B	
24	TQ30204290	PGR		0	28	4	3B		0		0						WE	3B	
25	TQ30404290	PGR		0	30	4	3B		0		0						WE	3B	Standing water
26	TQ29504280	PGR		0	30	4	3B		0		0						WE	3B	
27	TQ29944280	PGR		0	25	4	3B		0		0						WE	3B	
28	TQ30104280	PGR		0	28	4	3B		0		0						WE	3B	
29	TQ30304280	PGR		0	35	4	3B		0		0						WE	3B	
30	TQ29404270	PGR		0	25	4	3B		0		0						WE	3B	
31	TQ29604270	PGR		0	30	4	3B		0		0						WE	3B	
32	TQ29724270	PGR		30	30	4	3B		0		0						WE	3B	Sl drier
33	TQ30034272	PGR		0	30	4	3B		0		0						WE	3B	
34	TQ30204270	PGR		0	35	4	3B		0		0						WE	3B	
35	TQ28744242	PGR		28	48	3	3A		120	11	114	12	2				WE	3A	Med upr s/soil
36	TQ28804230	PGR		0	25	4	3B		0		0						WE	3B	
37	TQ29034227	PGR		35	35	4	3B		0		0						WE	3B	
38	TQ28724220	PGR		0	28	4	3B		0		0						WE	3B	
39	TQ28804220	PGR		0	30	4	3B		0		0						WE	3B	
40	TQ28904220	PGR		30	30	4	3B		0		0						WE	3B	
41	TQ28824210	PGR		0	35	4	3B		0		0						WE	3B	
42	TQ28904210	PGR		30	30	4	3B		0		0						WE	3B	

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
43	TQ29004210	PLO			28	28	4	3B	100	-9	97	-5	3A				WE	3B	Imp 85 stony
44	TQ29804210	PGR			25	25	4	3B		0		0					WE	3B	V many Mn 38
45	TQ28734200	PGR			0	25	4	3B		0		0					WE	3B	
46	TQ28804200	PGR			0	25	4	3B		0		0					WE	3B	
47	TQ28904202	PGR			0	75	3	3A		0		0					WE	3A	Wet 50
48	TQ29004200	PGR			0	28	4	3B		0		0					WE	3B	Very wet 50
49	TQ29104200	PGR			0	28	4	3B	113	4	99	-3	3A				WE	3B	Imp 105 stony
50	TQ29704200	PGR			25	25	4	3B		0		0					WE	3B	
51	TQ29904200	PGR			20	20	4	3B		0		0					WE	3B	
52	TQ28804190	PGR			0	20	4	3B		0		0					WE	3B	Standing water
53	TQ29004190	PGR			0	25	4	3B		0		0					WE	3B	Very wet 60
54	TQ29804190	PGR			0	25	4	3B		0		0					WE	3B	
55	TQ30004190	PGR			0	22	4	3B		0		0					WE	3B	
56	TQ28804180	PGR			28		2	2	126	17	96	-6	2				WD	2	Mod stony 45
57	TQ28904180	PGR			20	40	4	3B		0		0					WE	3B	Med upr s/soil
58	TQ29104180	PGR			28	28	4	3B		0		0					WE	3B	
59	TQ29304176	PGR			28	28	4	3B		0		0					WE	3B	Standing water
60	TQ29754180	PGR			10	10	4	3B		0		0					WE	3B	
61	TQ29904180	PGR			0	20	4	3B		0		0					WE	3B	
62	TQ30104180	PGR			0	35	4	3B		0		0					WE	3B	
63	TQ28804170	PGR			25	35	4	3B		0		0					WE	3B	
64	TQ29004170	PGR			25	25	4	3B	79	-30	81	-21	3B				WE	3B	Impen 55
65	TQ29204170	PGR			28	28	4	3B	97	-12	96	-6	3A				WE	3B	Imp85 stony/Mn
1P	TQ30104280	PGR			0	24	4	3B	121	12	99	-3	2				WE	3B	Includes ZR
2P	TQ29004210	PGR			0	28	4	3B	85	-24	88	-14	3B				WE	3B	Many Mn at 55
3P	TQ29804210	PGR			20	20	4	3B	98	-11	110	11	3A				WE	3B	
4P	TQ29404287	PGR			0	29	4	3B	93	-16	103	0	3A				WE	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	GLEY	STONES 2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
1	0-25	MZCL	10YR53	10YR58	C			Y	0	0		0							
	25-60	ZC	25Y 61 71	10YR68	M			Y	0	0		0			P		Y		
2	0-29	MZCL	10YR53	10YR58	C			Y	0	0		0							
	29-60	ZC	25Y 71 72	75YR68	M			Y	0	0		0			P		Y		
3	0-35	MCL	10YR42						0	0	HR	2							
	35-70	C	25Y 73	10YR68	M	D		Y	0	0	HR	2			P		Y		
	70-85	HCL	25Y 72	75YR58	M	D		Y	0	0	HR	5			M		Y		
4	0-25	MCL	10YR42						0	0	HR	2							
	25-40	HCL	25Y 63 52	10YR58	C	D		Y	0	0	HR	2			M		Y		
	40-60	HCL	25Y 53 62	75YR58	M	D		Y	0	0	HR	10			M		Y		Imp60 stony/Mn
5	0-25	MCL	25Y 42						0	0	HR	2							
	25-70	C	25Y 62	10YR5868	M	D		Y	0	0		0			P		Y		
	70-90	HCL	25Y 63	75YR58	M	D		Y	0	0	HR	2			P		Y		
6	0-28	MCL	25Y 42 52						0	0	HR	2							
	28-75	C	25Y 62 63	10YR58	M	D		Y	0	0		0			P		Y		
	75-120	C	N 71 41	10YR58	M	D		Y	0	0		0			P		Y		Very blue matrix
7	0-28	MCL	25Y 62	75YR56	M			Y	0	0		0							
	28-60	ZC	25Y 61 62	10YR68	M			Y	0	0		0			P		Y		
8	0-29	MZCL	10YR53	10YR56	C			Y	0	0		0							
	29-42	MZCL	10YR53	10YR58	M			Y	0	0		0			P		Y		
	42-50	C	25Y 51	75YR68	M			Y	0	0		0			P		Y		
	50 70	ZC	25Y 51 61	75YR68	M			Y	0	0		0			P		Y		
9	0 25	MCL	10YR42 43						0	0	HR	2							
	25 55	HCL	25Y 53 71	10YR5868	M	D		Y	0	0	HR	2			P		Y		
	55 85	HCL	25Y 72 62	75YR58	M	D		Y	0	0	HR	10			M		Y		
	85-100	HCL	25Y 62 72	75YR58	M	D		Y	0	0	HR	30			M				Stonier- Q spl
10	0-25	MCL	25Y 42						0	0	HR	2							
	25-70	C	25Y 51 61	10YR58	M	D		Y	0	0		0			P		Y		
	70-80	C	25Y 71	75YR58	M	D		Y	0	0	HR	5			P				
11	0-25	HCL	25Y 42 52						0	0	HR	2							
	25-65	C	25Y 61 63	10YR58	M	D		Y	0	0		0			P		Y		
	65-90	C	25Y 72 82	75YR58	M	D		Y	0	0		0			P		Y		Fe concretions
12	0 30	MZCL	10YR53	10YR58	C			Y	0	0		0							
	30 60	ZC	25Y 51 61	75YR68	M			Y	0	0		0			P		Y		
13	0-30	MZCL	25Y 52	10YR58				Y	0	0		0							
	30-60	C	25Y 52 62	10YR68	M			Y	0	0		0			P		Y		

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
14	0-30	MCL	25Y 42	10YR46	C	D		Y	0	0	HR	2							
	30 65	HCL	25Y 53 71	10YR5868	M	D		Y	0	0	HR	5		M		Y			
	65-120	C	05Y 71	10YR68	M	D		Y	0	0		0		P		Y			
15	0-25	MCL	25Y 42						0	0	HR	2							
	25-55	C	25Y 52	10YR58	M	D		Y	0	0		0		P		Y			
	55-65	HCL	25Y 71	75YR58	M	D		Y	0	0	HR	5		M		Y		Imp 65	stony/Fe
16	0-25	HZCL	25Y 42						0	0	HR	2							
	25-80	C	25Y 72	10YR68	M	D		Y	0	0		0		P		Y			
17	0-27	MZCL	25Y 52	75YR46	C	F		Y	0	0		0							
	27-35	HZCL	25Y 63	75YR56	C	D		Y	0	0		0		M		Y			
	35-65	ZC	25Y 73 71	75YR58	M	D		Y	0	0		0		P		Y			
	65-100	ZC	05Y 81	05YR58	M	D		Y	0	0		0		P		Y			
18	0-30	MZCL	10YR53						0	0		0							
	30-44	HZCL	25Y 63	75YR56	C			Y	0	0		0		M		Y			
	44-70	ZC	25Y 71 63	75YR68	M			Y	0	0		0		P		Y			
19	0-35	MZCL	10YR53	10YR56	C			Y	0	0		0							
	35-60	ZC	25Y 71 63	75YR68	M			Y	0	0		0		P		Y			
20	0-35	MZCL	25Y 52	75YR56	C	D		Y	0	0	HR	2							
	35 45	HZCL	25Y 62 72	75YR56	C	D		Y	0	0	HR	2		P		Y			
	45 80	C	25Y 73 71	75YR68	M			Y	0	0	HR	2		P		Y			
21	0-25	HCL	25Y 42						0	0	HR	2							
	25 60	C	25Y 62 72	10YR68	M	D		Y	0	0		0		P		Y			
	60-80	ZC	25Y 72	75YR68	M	D		Y	0	0		0		P		Y			
22	0-25	HCL	25Y 42						0	0	HR	2							
	25-70	ZC	25Y 71	75YR68	M	D		Y	0	0		0		P		Y			
23	0-20	MZCL	25Y 52	75YR56	C	D		Y	0	0		0							
	20 40	HZCL	25Y 62	75YR56	C	D		Y	0	0		0		M		Y			
	40 52	ZC	25Y 62	75YR56	C	D		Y	0	0		0		P		Y			
	52 80	ZC	25Y 71 73	75YR68	M	D		Y	0	0		0		P		Y			
24	0-28	HZCL	25Y 63 72	05YR58	C	D		Y	0	0		0							
	28-50	ZC	25Y 71	75YR68	M	D		Y	0	0		0		P		Y			
	50-75	ZC	05Y 71	75YR58	M	D		Y	0	0		0		P		Y			
25	0-30	HZCL	25Y 62 52	75YR68	C			Y	0	0		0							
	30 60	ZC	25Y 71 63	75YR68	M			Y	0	0		0		P		Y			
26	0-30	MZCL	25Y 62	75YR56	C			Y	0	0		0							
	30-60	C	25Y 72	75YR56	C			Y	0	0		0		P		Y			

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	STONES GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
27	0-25	HZCL	25Y 62	75YR56	C	D		Y	0	0		0							
	25-65	ZC	25Y 63	75YR68	M	D		Y	0	0		0			P			Y	
	65-80	ZC	25Y 71 73	05YR58	C	D		Y	0	0		0			P			Y	
28	0-28	MZCL	25Y 62	75YR56	C	D		Y	0	0		0							
	28-50	ZC	25Y 73 72	75YR66	C	D		Y	0	0		0			P			Y	
	50-95	ZC	05Y 71	75YR58	M	D		Y	0	0		0			P			Y	
29	0-35	MZCL	25Y 62	75YR46	C	D		Y	0	0		0							
	35-42	HZCL	25Y 72	75YR68	C	D		Y	0	0		0			M			Y	
	42-100	ZC	05Y 71	75YR68	M	D		Y	0	0		0			P			Y	
30	0-25	MZCL	25Y 52	75YR56	C	D		Y	0	0		0							
	25-50	HZCL	25Y 62	75YR5658	C			Y	0	0		0			P			Y	
	50-80	C	25Y 72	75YR58	M			Y	0	0		0			P			Y	
31	0-30	HCL	25Y 42	10YR46	C	D		Y	0	0	HR	2							
	30-60	C	05Y 62	10YR5868	M	D		Y	0	0		0			P			Y	
32	0-30	HCL	10YR53						0	0	HR	2							
	30-55	C	25Y 62	10YR58	M	D		Y	0	0		0			M			Y	
	55-120	C	25Y 62 72	75YR5868	M	D		Y	0	0		0			P			Y	
33	0 30	HZCL	25Y 52	75YR56	C	D		Y	0	0		0							
	30-80	C	25Y 62	75YR58	M	D		Y	0	0		0			P			Y	
34	0-35	MZCL	25Y 52	75YR46	C	D		Y	0	0		0							
	35-45	HZCL	25Y 62	75YR66	C	D		Y	0	0		0			M			Y	
	45-80	ZC	25Y 63 71	75YR66	M	D		Y	0	0		0			P			Y	
35	0-28	MZCL	10YR42	75YR46	F	F			0	0		0							
	28-48	MZCL	25Y 53	75YR56	C	F		Y	0	0		0			M				
	48 55	HZCL	25Y 63	75YR66	C	D		Y	0	0		0			P			Y	
	55-85	ZC	25Y 72	75YR68	M	D		Y	0	0		0			P			Y	
	85-95	HCL	25Y 73	10YR58	M	D		Y	0	0	HR	10			P			Y	
36	0-25	MCL	25Y 62	75YR46	C	D		Y	0	0	HR	2							
	25-65	HCL	25Y 81	75YR58	M	D		Y	0	0	HR	2			P			Y	
	65-80	C	25Y 71	75YR68	M			Y	0	0	HR	2			P			Y	
37	0-35	MZCL	10YR42	10YR46	F	D			0	0		0							
	35-60	HCL	25Y 63	10YR68	C	D		Y	0	0	HR	10			P			Y	
	60 120	MCL	05Y 71	75YR68	M	D		Y	0	0	HR	15			P			Y	V pale- prob spl
38	0 28	MZCL	25Y 62	75YR46	C	D		Y	0	0	HR	2							
	28-42	HCL	25Y 63	75YR56	C	D		Y	0	0	HR	5			P			Y	
	42-60	C	25Y 71	75YR68	M	D		Y	0	0	HR	2			P			Y	
	60-80	HCL	25Y 71	10YR58	M	D		Y	0	0	HR	10			P			Y	

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
39	0-30	MCL	25Y 62	75YR46	C	D		Y	0	0		0							
	30-40	HCL	25Y 53	75YR56	C	D		Y	0	0	HR	2			P		Y		
	40-75	HCL	25Y 71	75YR58	M	D		Y	0	0	HR	2			P		Y		
	75-120	HCL	05Y 81	10YR558	M	D		Y	0	0	HR	5			P		Y		
40	0-30	MCL	10YR42						0	0	HR	2							
	30-65	HCL	25Y 63 62	10YR58	C	D		Y	0	0		0			P		Y		
	65-80	SCL	25Y 72	75YR58	M	D		Y	0	0	HR	10			P		Y		
	80-120	ZC	05Y 71	10YR68	M	D		Y	0	0		0			P		Y		
41	0-35	MZCL	25Y 62	75YR46	C	D		Y	0	0	HR	2							
	35-48	ZC	25Y 62	75YR56	M	D		Y	0	0	HR	2			P		Y		
	48-60	C	25Y 72	75YR5666	M	D		Y	0	0	HR	2			P		Y		
	60-80	ZC	05Y 81	05YR58	M	D		Y	0	0		0			P		Y		
42	0-30	MCL	10YR42						0	0	HR	2							
	30-70	HCL	25Y 53 62	10YR5868	M	D		Y	0	0		0			P		Y		
	70-120	ZC	05Y 71 72	75TR58	M	D		Y	0	0		0			P		Y		
43	0-28	MCL	10YR43 32						0	0	HR	2							
	28-55	HCL	25Y 53 62	10YR68	M			Y	0	0	HR	5			P		Y		
	55 75	HCL	25Y 53 61	10YR58	M			Y	0	0	HR	10			P		Y		
	75-85	MSL	10YR42 43	10YR58	C			Y	0	0	HR	20			M				Imp 85 stony/Mn
44	0-25	MCL	10YR42	10YR58	F				0	0	HR	2							
	25-38	C	25Y 62 61	75YR68	M			Y	0	0		0			P		Y		
	38-70	C	10YR62	75YR58	M			Y	0	0		0			P		Y		
45	0-25	MZCL	25Y 52	75YR46		C		Y	0	0	HR	2							
	25-40	HZCL	25Y 63	75YR58	C	D		Y	0	0	HR	2			P		Y		
	40-80	ZC	05Y 81	75YR68	M	D		Y	0	0		0			P		Y		
46	0-25	MZCL	25Y 62	75YR46	C	D		Y	0	0	HR	2							
	25 58	HZCL	25Y 72	10YR58	M	D		Y	0	0	HR	10			P		Y		
	58-80	ZC	05Y 71	75YR68	M	D		Y	0	0		0			P		Y		
47	0 28	MZCL	25Y 52	75YR46	C	D		Y	0	0	HR	2							
	28-50	HCL	25Y 64 74	75YR68	M	D		Y	0	0	HR	25			M				Stonier- Q spl
	50-75	HCL	25Y 72	75YR58	M	D		Y	0	0	HR	45			M				Stonier- Q spl
	75-120	ZC	05Y 81	10YR58	M	D		Y	0	0		0			P		Y		
48	0-28	MCL	10YR52	10YR58	C			Y	0	0		0							
	28 40	HCL	25Y 51 52	75YR68	M			Y	0	0		0			P		Y		
	40 50	C	25Y 51 52	75YR68	M			Y	0	0	HR	2			P		Y		
	50 120	HCL	10YR53 52	10YR58	C			Y	0	0	HR	50			M		Y		
49	0-28	MCL	10YR42 52	10YR58	C			Y	0	0	HR	2							
	28-95	HCL	25Y 53 62	10YR68	M			Y	0	0	HR	2			P		Y		
	95-105	HCL	10YR53	10YR56	C			Y	0	0		0			P		Y		Imp 105 stony

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
50	0-25	MZCL	25Y 42						0	0	HR	2							
	25-70	ZC	05Y 71	10YR68	M	D		Y	0	0		0			P		Y		
51	0-20	MCL	10YR42	10YR46	F	D			0	0	HR	2							
	20-70	ZC	05Y 71	10YR68	M	D		Y	0	0		0			P		Y		
52	0-20	MZCL	10YR53	10YR58	C			Y	0	0		0							
	20-70	C	10YR52	10YR56	M			Y	0	0	HR	4			P		Y		
53	0-25	MCL	10YR43						0	0	HR	2							
	25-35	HCL	10YR53	10YR56	C			Y	0	0	HR	2			M		Y		
	35-50	HCL	10YR72 63	10YR68	C			Y	0	0		0			M		Y		
	50-60	HCL	25Y 71 72	10YR68	C			Y	0	0		0			M		Y		
	60-120	C	25Y 71 72	10YR68	C			Y	0	0		0			P		Y		
54	0-25	MZCL	25Y 52	75YR46	C	D		Y	0	0		0							
	25-40	HZCL	25Y 72	75YR68	M	D		Y	0	0		0			P		Y		
	40-80	ZC	25Y 71	75YR58	M	D		Y	0	0		0			P		Y		
55	0-22	MZCL	25Y 52	75YR46	C	D		Y	0	0		0							
	22-35	HZCL	25Y 71	75YR68	C	D		Y	0	0		0			P		Y		
	35-60	HZCL	25Y 71	75YR68	M	D		Y	0	0	HR	2			P		Y		
56	0-28	MCL	10YR42	00MN00	F				0	0	HR	2							
	28-45	HCL	25Y 53 62	10YR58	C			Y	0	0		0			P				
	45-55	SCL	25Y 42	10YR58	C			Y	0	0	HR	25			M				{ Lighter
	55-90	SCL	25Y 62 71	75YR5868	C			Y	0	0	HR	35			M				{ and
	90-120	MCL	25Y 71 72	75YR68	M			Y	0	0	HR	20			M				{ stonier
57	0-20	MCL	10YR43						0	0		0							
	20-40	MCL	10YR53	75YR56	C			Y	0	0		0			M				
	40-75	HCL	25Y 51 52	75YR56	M			Y	0	0		0			M		Y		
58	0-28	MCL	10YR42						0	0	HR	2							
	28-45	HCL	25Y 53 62	10YR68	M	D		Y	0	0		0			P		Y		
	45-55	SCL	25Y 42	10YR58	C	D		Y	0	0	HR	25			P		Y		
	55-90	SCL	25Y 62 74	75YR5868	M	D		Y	0	0	HR	30			P		Y		
	90-120	MCL	25Y 71 72	75YR68	C	D		Y	0	0	HR	20			M				
59	0-28	MCL	10YR42						0	0	HR	2							
	28-60	HCL	25Y 63 62	75YR58	M			Y	0	0		0			P		Y		
	60-120	ZC	05Y 71	75YR68	M			Y	0	0		0			P		Y		
60	0-10	MZCL	25Y 52	75YR46	C	D		Y	0	0		0							
	10-62	HZCL	25Y 72	75YR68	M	D		Y	0	0	HR	2			P		Y		
	62 80	HCL	25Y 71	10YR58	M	D		Y	0	0	HR	20			M				Prob spl- see 4P
61	0 20	MZCL	25Y 52	75YR46	C	D		Y	0	0		0							
	20-80	HCL	25Y 72	75YR58	M	D		Y	0	0	HR	2			P		Y		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST STR	POR	IMP	SPL	CALC	
62	0-20	ZC	25Y 72	75YR58	M	D		Y	0	0		0						
	20-35	MZCL	25Y 52	75YR58	C	D		Y	0	0		0	M					
	35-60	HCL	25Y 73 72	10YR58	M	D		Y	0	0	HR	5	P			Y		
	60-75	SCL	25Y 71	75YR58	M	D		Y	0	0	HR	40	M					
63	0-25	MCL	25Y 42						0	0	HR	2						
	25-35	MCL	25Y 42 52	10YR58	C	D		Y	0	0	HR	5	M					
	35-60	HCL	25Y 53 62	10YR58	C	D		Y	0	0	HR	5	P			Y		
	60-80	HCL	10YR53	10YR5868	C	D		Y	0	0	HR	20	P			Y		
	80-120	HCL	05GY41	10YR68	C	D		Y	0	0	HR	15	P			Y		
64	0-25	MCL	10YR52						0	0		0						
	25-50	C	10YR52	10YR58	C			Y	0	0	HR	5	P			Y		
	50-55	HCL	10YR52	10YR58	C			Y	0	0	HR	35	M					Imp55 stonier
65	0 28	MCL	10YR42						0	0	HR	2						
	28 60	HCL	25Y 53 62	10YR5868	M	D		Y	0	0	HR	5	P			Y		
	60-75	HCL	25Y 53 61	10YR5868	C	D		Y	0	0	HR	20	P			Y		Prob spl- see 4P
	75-85	SCL	10YR43 53	10YR68	C	D		Y	0	0	HR	30	M					Imp 85 stony/Mn

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1P	0-24	MZCL	25Y 62	75YR46 68	C	D		Y	0	0	ZR	2						
	24-56	HZCL	25Y 63 71	75YR68	M	D		Y	0	0	ZR	5	MDMPR	FM	P	Y		Y
	56-70	ZC	05Y 81	75YR56	M	D		Y	0	0	ZR	10	WKVCAB	FM	P	Y		Y
	70-120	ZC	05Y 71	05YR58	M	D		Y	0	0	ZR	25	STVCPL	FM	P	Y		Y
2P	0-29	MZCL	25Y 52	75YR56	C	F		Y	0	0	HR	2						
	29-42	HZCL	25Y 52 62	75YR68	C	D		Y	0	0	HR	2	WKCAB	FM	P	Y		Y
	42-50	C	25Y 71	75YR68	M	D		Y	0	0	HR	2	WKCAB	FM	P	Y		Y
	50-70	HCL	25Y 62	75YR68	M	D		Y	0	0	HR	20		FM	P			
3P	0-20	MZCL	10YR42	10YR56	F	D			0	0	HR	2						
	20-43	C	25Y 62 61	75YR58	M	D		Y	0	0		0	MDCAB	FM	P	Y		Y
	43-53	HZCL	05Y 71	75YR56	M	D		Y	0	0		0	MDCAB	FR	M	Y		Y
	53-70	HCL	05Y 71	75YR58	M	D		Y	0	0	HR	5	MDCAB	FR	M	Y		Y
4P	0-28	MCL	10YR42	10YR58	C			Y	0	0	HR	2						
	28-40	HCL	25Y 53 63	75YR68	M			Y	0	0	HR	2	MDCAB	FR	M	Y		Y
	40-55	C	25Y 63 62	75YR6866	M			Y	0	0		0	WKCAB	FM	P	Y		Y