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Maidstone Borough Local Plan
Objector Site 215
Bicknor Farm, Otham/Langley, Kent
Agricultural Land Classification
Map & Report
November 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

MAIDSTONE BOROUGH LOCAL PLAN
OBJECTOR SITE 215 BICKNOR FARM, OTHAM/LANGLEY

INTRODUCTION

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 20 hectares of land at Bicknor Farm between Otham and Langley near Maidstone in Kent The survey was carried out during November 1996

2 The survey was commissioned by the Ministry of Agriculture Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading in connection with the Maidstone Borough Local Plan The results of this survey supersede any previous ALC information for this land Information from an adjacent site (ADAS Ref 2007/30/96) was also used in the grading of this site

3 The 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 all of the agricultural land was under permanent pasture including a number of pony paddocks

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 below

Table 1 Area of grades and other land

Grade/Other Land	Area (hectares)	% Total Site Area	% Surveyed Area
1	14 5	71 1	76 7
3a	4 4	21 6	23 3
Other Land	1 5	7 3	
Total Surveyed Area	18 9	92 7	100 0
Total Site Area	20 4	100 0	

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

8 The majority of the agricultural land on this site has been classified as Grade 1 (excellent quality) The remainder of the site has been graded as Subgrade 3a (good quality) due to a moderate soil wetness and/or soil droughtiness limitation This occurs in a small pocket in the north of the site south of Belts Wood and also in a narrow sweep of land in the south west corner of the site

9 Land classified as Grade 1 comprises deep well drained silty clay loams with a very slight to slight stone content Occasional borings were impenetrable to the soil auger at depth, however with information extrapolated from a soil inspection pit it is considered that the soil resource will continue to 120cm with a slight to moderate stone content In this local climatic regime such land will pose little or no restriction to agricultural use It is generally very flexible and capable of growing a wide range of crops with high yields

10 Land classified as Subgrade 3a generally comprises slightly to moderately stony medium and heavy clay loams or silty clay loams over poorly structured clays These clay subsoils impede drainage through the profile resulting in seasonal waterlogging which limits the timing and flexibility of cultivations The majority of the soil profiles become impenetrable over sandstone at moderate depths However information from a soil inspection pit showed that the soil resource continues to depth In this locally dry climatic regime the combination of soil textures structures and stone contents still acts to reduce the amount of profile available water for crops Consequently this land is limited to Subgrade 3a due to soil wetness and/or soil droughtiness restrictions Occasional borings of slightly better quality were also included in this mapping unit as they were too limited in number or extent to be mapped separately

FACTORS INFLUENCING ALC GRADE

Climate

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

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

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

Table 2 Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	TQ 796 523
Altitude	m AOD	105
Accumulated Temperature	day°C (Jan June)	1388
Average Annual Rainfall	mm	711
Field Capacity Days	days	145
Moisture Deficit Wheat	mm	110
Moisture Deficit Potatoes	mm	102

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

15 The combination of rainfall and temperature at this site mean that there is no overall climatic limitation However climatic factors can interact with soil properties to influence soil wetness and droughtiness At this locality the crop adjusted soil moisture deficits are relatively high thus increasing the likelihood of soil droughtiness restrictions

16 Local climatic factors such as frost risk and exposure are unlikely to adversely affect agricultural land use on this site The site is climatically Grade 1

Site

17 The land on this site is relatively flat lying at approximately 105m AOD

18 Gradient microrelief and flooding do not affect land quality in this area

Geology and soils

19 The relevant geological sheet (BGS 1976) maps the majority of the site as head brickearth with a narrow strip of Hythe Beds in the south west corner

20 The most recently published soils information for this area (SSEW 1983) maps the Malling soil association across all of the site These soils are described as Well drained non calcareous fine loamy soils over limestone at various depths Some deep well drained coarse loamy soils and similar fine loamy over clayey soils Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging Occasional shallower calcareous soils over limestone Landslips and associated irregular terrain locally (SSEW 1983)

21 Detailed field examination broadly confirmed the existence of soils similar to those described above as the Malling soil association

AGRICULTURAL LAND CLASSIFICATION

22 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

23 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 1

24 The majority of the agricultural land on this site has been classified as Grade 1 as it poses little or no limitation to agricultural use The soil profiles are typically deep and well drained comprising very slightly stony (0 5% sandstone by v/v) medium silty clay loam topsoils and upper subsoils over similar or slightly heavier (heavy silty clay loam) lower subsoils Occasionally the lower subsoils become slightly more stony (10-15% sandstone) or even impenetrable to the soil auger from 70-95cm depth However soil inspection Pit 1 shows that the soil resource continues to at least 120cm and despite the locally dry climatic regime these profiles contain enough reserves of available water for a wide range of crops

Subgrade 3a

25 To the south and east of the site the agricultural land has been classified as Subgrade 3a due to a slight soil wetness and/or and soil droughtiness limitation These profiles comprise very slightly stony (1-5% sandstone by v/v) medium silty clay loam topsoils over moderately well structured slightly stony (5-15% sandstone by v/v) medium or heavy silty clay loam upper subsoils At between 35 65cm depth the clay lower subsoils become markedly less stony (0-5% sandstone by v/v) and more poorly structured Soil inspection Pit 2 showed these subsoils to be slowly permeable and therefore responsible for a slight drainage impedance As a result these soils become seasonally waterlogged (as demonstrated by the presence of common ochreous mottles from the upper subsoil) and this land is therefore limited to Wetness Class III (Appendix III) and Subgrade 3a Wet soils such as these will slightly inhibit seed germination and growth and in combination with the medium textured topsoils may experience structural damage from over-trafficking by agricultural machinery and grazing livestock As a result the timing and flexibility of cultivations is slightly restricted

26 Some of the Subgrade 3a profiles became impenetrable to the soil auger between 40 90cm depth due to sandstone fragments However soil inspection Pit 2 shows that the soil resource continues to depth with essentially similar horizons to those above In this locally dry climatic regime this combination of soil textures structures and stone contents reduces the amount of profile available water for crops thus restricting the level and consistency of crop yields These profiles are therefore equally limited by soil droughtiness and soil wetness restrictions

27 Occasional borings of either slightly higher or lower quality were also included in this mapping unit as they were too limited in number and extent to map separately

Helen Goode
Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet *No 288 Maidstone* 1 50 000 Series Solid & Drift 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

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

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 **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	**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 **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	**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 appropiate 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 MAIDSTONE BLP SITE 215 Pit Number 1P

Grid Reference TQ79725230 Average Annual Rainfall 711 mm
Accumulated Temperature 1388 degree days
Field Capacity Level 145 days
Land Use Permanent Grass
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MZCL	10YR53 00	0	1	HR					
25- 55	MZCL	10YR54 00	0	1	HR		MDCSAB	FR	M	
55- 75	MZCL	10YR54 00	0	0		C	MDCSAB	FR	M	
75-120	HZCL	75YR54 00	0	0		C	MDCSAB	FR	M	

Wetness Grade 1 Wetness Class I
Gleying S55 cm
SPL No SPL

Drought Grade 1 APW 159mm MBW 49 mm
APP 123mm MBP 21 mm

FINAL ALC GRADE 1
MAIN LIMITATION

SOIL PIT DESCRIPTION

Site Name MAIDSTONE BLP SITE 215 Pit Number 2P

Grid Reference TQ79505020 Average Annual Rainfall 711 mm
Accumulated Temperature 1388 degree days
Field Capacity Level 145 days
Land Use Permanent Grass
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 21	MZCL	10YR42 43	0	2	HR					
21- 59	HCL	10YR54 00	0	12	HR	F	MDCSAB	FR	M	
59- 70	C	75YR54 53	0	0		C	MDCSAB	FM	M	
70-120	C	75YR63 00	0	0		M	WKCAB	FM	P	

Wetness Grade 2 Wetness Class II
Gleying 059 cm
SPL 070 cm

Drought Grade 2 APW 132mm MBW 22 mm
APP 111mm MBP 9 mm

FINAL ALC GRADE 2
MAIN LIMITATION Soil Wetness/Droughtiness

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	DRT	M REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ79405250	PGR					1	1	114	4	118	16	3A					1	I80 Hythe Beds
1P	TQ79725230	PGR			S55		1	1	159	49	123	21	1					1	At Boring 15
2	TQ79505250	PGR			035	045	3	3A	112	2	120	18	3A				WE	3A	
2P	TQ79505020	PGR			059	070	2	2	132	22	111	9	2				WD	2	At Boring 17
3	TQ79605250	PGR			038	065	3	3A	132	22	111	9	2				WE	3A	Border 2
4	TQ79705250	PGR	N	01	060		1	1	128	18	118	16	2					1	I95 Hythe Beds
5	TQ79805250	PGR	N	01	S75		1	1	143	33	124	22	1					1	I105 Hythe Bed
6	TQ79905250	PGR					1	1	157	47	122	20	1					1	
7	TQ79405240	PGR			045	065	2	2	123	13	123	21	2				WE	2	
8	TQ79505240	PGR			080		1	1	159	49	123	21	1					1	
9	TQ79605240	PGR					1	1	136	26	122	20	2					1	I100 Hythe Bed
10	TQ79705240	PGR					1	1	160	50	124	22	1					1	
11	TQ79805240	PGR					1	1	160	50	125	23	1					1	
12	TQ79905240	PGR					1	1	160	50	125	23	1					1	
13	TQ79525230	PGR					1	1	139	29	123	21	2					1	I100 Hythe Bed
14	TQ79605230	PGR			070		1	1	159	49	123	21	1					1	
15	TQ79725230	PGR			S55		1	1	160	50	124	22	1					1	See 1P
16	TQ79805230	PGR			S45		1	1	160	50	124	22	1					1	S1 Gley 45
17	TQ79505220	PGR			S45	060	2	2	101	-9	109	7	3A				WD	2	I75 See 2P
18	TQ79605220	PGR			045		1	1	161	51	125	23	1					1	
19	TQ79705220	PGR			060		1	1	121	11	125	23	2					1	I80 Hythe Beds
20	TQ79825218	PGR			060		1	1	149	39	123	21	1					1	
21	TQ79705210	PGR					1	1	69	-41	69	-33	3B				DR	3A	I40 Hythe Beds
22	TQ79805210	PGR			043		1	1	129	19	122	20	2					1	I90 Hythe Beds
23	TQ79455237	PGR					1	1	160	50	124	22	1					1	S1 Gley 100
24	TQ79605215	PGR					1	1	74	-36	74	-28	3B				DR	3A	I45 Hythe Beds
25	TQ79455248	PGR			045		1	1	159	49	123	21	1					1	
26	TQ79405233	PGR			S20	035	3	3A	101	-9	99	-3	3A				WE	3A	I90 Hythe Beds
27	TQ79355227	RGR			S38		3	3A	65	-45	65	-37	3B				WD	3A	I42 Hythe Beds

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
1	0-20	mzcl	10YR43 00						0	0	HR	2							
	20-40	mzcl	10YR54 00						0	0	HR	5		M					
	40-80	mzcl	10YR53 00	10YR58 00	F		00MN00 00		0	0	HR	5		M					Imp sandstone
1P	0-25	mzcl	10YR53 00						0	0	HR	1							
	25-55	mzcl	10YR54 00						0	0	HR	1	MDCSAB	FR M					Few MN concs
	55-75	mzcl	10YR54 00	10YR58 00	C		00MN00 00	S	0	0		0	MDCSAB	FR M					
	75-120	hzcl	75YR54 00	10YR58 00	C		00MN00 00	S	0	0		0	MDCSAB	FR M					
2	0-35	mzcl	10YR43 33						0	0	HR	3							
	35-45	hzcl	10YR42 43	10YR58 00	C			Y	0	0	HR	5		M					
	45-80	c	10YR52 53	10YR56 58	C			Y	0	0	HR	2		M			Y		Imp gravelly
2P	0-21	mzcl	10YR42 43						0	0	HR	2							
	21-59	hcl	10YR54 00	75YR56 00	F		00MN00 00		0	0	HR	12	MDCSAB	FR M					
	59-70	c	75YR54 53	75YR58 00	C		00MN00 00	Y	0	0		0	MDCSAB	FM M					
	70-120	c	75YR63 00	05YR58 00	M		00MN00 00	Y	0	0		0	WKCAB	FM P	Y		Y		
3	0-28	mzcl	10YR42 43	10YR46 00	F				0	0	HR	5							
	28-38	mzcl	10YR54 00	75YR56 00	C		00MN00 00	S	0	0	HR	15		M					
	38-55	mzcl	10YR53 00	75YR56 00	C		00MN00 00	Y	0	0	HR	15		M					
	55-65	hzcl	10YR53 00	75YR56 00	C		00MN00 00	Y	0	0	HR	15		M					
	65-120	c	25Y 52 00	05YR56 00	C			Y	0	0	HR	5		P			Y		
4	0-30	mzcl	10YR42 00						0	0	HR	1							
	30-60	mcl	10YR54 00	10YR56 00	C			S	0	0	HR	5		M					
	60-80	hzcl	10YR54 53	75YR56 00	C		00MN00 00	Y	0	0	HR	5		M					
	80-95	scl	10YR54 00	75YR58 00	C		00MN00 00	Y	0	0	HR	15		M					Imp sandstone
5	0-30	mzcl	10YR42 00	00MN00 00	F				0	0		0							
	30-60	mzcl	10YR54 00	10YR56 00	F		00MN00 00		0	0		0		M					
	60-75	hzcl	75YR54 00	75YR58 00	F		00MN00 00		0	0	HR	5		M					
	75-95	hzcl	75YR54 00	75YR56 58	C		00MN00 00	S	0	0	HR	5		M					
	95-105	hcl	75YR54 00	75YR58 00	C		00MN00 00	S	0	0	HR	15		M					Imp sandstone
6	0-30	mzcl	10YR42 00						0	0	HR	2							
	30-75	mzcl	10YR54 00	10YR58 00	F		00MN00 00		0	0	HR	3		M					
	75-120	hzcl	75YR54 00	10YR58 00	F		00MN00 00		0	0	HR	3		M					
7	0-32	mzcl	10YR33 00						0	0	HR	1							
	32-45	mzcl	10YR53 00	10YR58 00	F				0	0		0		M					
	45-58	mzcl	10YR53 00	10YR58 00	C			Y	0	0		0		M					
	58-65	hzcl	10YR53 00	10YR58 00	C		00MN00 00	Y	0	0		0		M					
	65-90	c	10YR52 53	10YR56 58	M			Y	0	0		0		P			Y		
8	0-28	mzcl	10YR43 33						0	0	HR	1							
	28-65	mzcl	10YR54 00						0	0	HR	2		M					
	65-80	hzcl	10YR53 00	10YR58 00	F				0	0		0		M					
	80-120	hzcl	10YR53 52	10YR58 00	C		00MN00 00	Y	0	0		0		M					

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
9	0-28	mzcl	10YR42 00						0	0	HR	2							
	28-70	mzcl	10YR54 00	10					0	0	HR	2		M					
	70-100	mzcl	10YR54 64	10YR56 00	F				0	0	HR	10		M					Imp Flinty
10	0-25	mzcl	10YR42 00						0	0		0							
	25-60	mzcl	10YR54 00	00MN00 00	F				0	0		0		M					
	60-120	hzcl	10YR54 00	75YR56 00	F		00MN00 00		0	0		0		M					
11	0-30	mzcl	10YR42 43						0	0		0							
	30-75	mzcl	10YR44 54	00MN00 00	F				0	0		0		M					
	75-120	hzcl	75YR54 00	75YR56 00	F		00MN00 00		0	0	HR	2		M					
12	0-30	mzcl	10YR42 43						0	0		0							
	30-70	mzcl	10YR44 54						0	0		0		M					
	70-120	hzcl	75YR54 00	75YR56 00	F		00MN00 00		0	0	HR	3		M					
13	0-24	mzcl	10YR33 43						0	0	HR	1							
	24-65	mzcl	10YR54 00	10YR58 00	F				0	0		0		M					
	65-100	hzcl	10YR53 00	10YR58 00	F			N	0	0		0		M					
14	0-28	mzcl	10YR42 00						0	0	HR	2							
	28-55	mzcl	10YR54 00						0	0	HR	2		M				Y	+ 1% Chalk
	55-70	hzcl	10YR54 64	10YR58 00	F				0	0		0		M					
	70-120	hzcl	10YR62 00	10YR58 00	C		00MN00 00	Y	0	0		0		M					
15	0-25	mzcl	10YR52 00	75YR46 00	F				0	0	HR	1							Q Root Mottles
	25-55	mzcl	10YR54 00						0	0		0		M					
	55-80	mzcl	10YR54 00	75YR58 00	C		00MN00 00	S	0	0		0		M					
	80-120	hzcl	10YR58 00	10YR54 64	C		00MN00 00	S	0	0		0		M					Friable
16	0-30	mzcl	10YR52 53						0	0	HR	1							
	30-45	mzcl	10YR54 00						0	0	HR	1		M					
	45-75	mzcl	10YR54 00	10YR58 00	C		00MN00 00	S	0	0		0		M					
	75-120	hzcl	10YR54 64	10YR58 00	C		00MN00 00	S	0	0		0		M					Friable
17	0-27	mcl	10YR43 00						0	0	HR	2							
	27-45	mcl	10YR54 00	75YR58 00	F		00MN00 00		0	0	HR	5		M					
	45-60	hcl	10YR54 00	75YR58 00	C		00MN00 00	S	0	0	HR	10		M					Border MCL
	60-75	c	10YR54 53	75YR58 00	C		00MN00 00	S	0	0	HR	5		P		Y			Imp sandstone
18	0-28	mzcl	10YR42 00						0	0		0							
	28-45	mzcl	10YR54 64						0	0		0		M					
	45-120	hzcl	10YR63 64	10YR58 00	C		00MN00 00	Y	0	0		0		M					Dry/Friable
19	0-35	mzcl	10YR43 00						0	0	HR	1							
	35-60	mzcl	10YR53 00						0	0	HR	1		M					
	60-80	hzcl	10YR52 53	10YR58 00	C			Y	0	0		0		M					

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
20	0-25	mzcl	10YR43 00						0	0	HR	2							
	25-43	mzcl	10YR54 00						0	0	HR	1		M					
	43-60	mzcl	10YR53 00	10YR56 00	F				0	0		0		M					
	60-70	mzcl	10YR53 00	10YR58 00	C		00MN00 00	Y	0	0		0		M					
	70-110	hzcl	10YR52 53	10YR56 00	C			Y	0	0		0		M					Imp sandstone
21	0-25	mzcl	10YR43 00						0	0	HR	2							
	25-40	mzcl	10YR54 00						0	0	HR	15		M					Imp sandstone
22	0-25	mzcl	10YR43 00						0	0	HR	2							
	25-43	mzcl	10YR53 00						0	0	HR	1		M					
	43-65	mzcl	10YR53 00	10YR58 00	C		00MN00 00	Y	0	0	HR	1		M					
	65-90	hzcl	10YR52 53	10YR58 56	C			Y	0	0		0		M					Imp sandstone
23	0-28	mzcl	10YR43 00						0	0	HR	1							
	28-65	mzcl	10YR54 00	10YR58 00	F		00MN00 00		0	0		0		M					
	65-100	mzcl	10YR54 64	10YR58 00	F		00MN00 00		0	0		0		M					
	100-120	hcl	10YR54 00	10YR58 00	C		00MN00 00	S	0	0		0		M					Friable
24	0-25	mcl	10YR43 00						0	0	HR	5							
	25-40	mzcl	10YR54 00	10YR66 00	F		00MN00 00		0	0	HR	5		M					
	40-45	mcl	10YR64 00	75YR58 00	F		00MN00 00		0	0	HR	20		M					Imp Sandstone
25	0-25	mzcl	10YR43 00	10YR54 00	F				0	0	HR	1							Q Root Mottles
	25-45	mzcl	10YR54 00	10YR58 00	F				0	0	HR	1		M					
	45-70	mzcl	10YR53 00	10YR58 00	C		00MN00 00	Y	0	0	HR	1		M					
	70-100	hzcl	10YR53 00	10YR58 56	C		00MN00 00	Y	0	0	HR	1		M					
	100-120	hzcl	10YR53 00	10YR58 56	C		00MN00 00	Y	0	0		0		M					
26	0-20	mcl	10YR43 00						0	0	HR	5							
	20-35	hcl	10YR54 00	75YR58 00	C		00MN00 00	S	0	0	HR	10		M					Dry/Friable
	35-90	c	10YR56 00	05YR58 00	M		00MN00 00	S	0	0	HR	5		P		Y			Firm/Imp Sst
27	0-20	mcl	10YR43 00						0	0	HR	5							
	20-38	hcl	10YR54 00	75YR58 00	F				0	0	HR	10		M					
	38-42	c	10YR56 00	05YR58 00	M		00MN00 00	Y	0	0	HR	10		P					Imp Sandstone