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**WYCOMBE DISTRICT LOCAL PLAN
Abbey Barn Farm,
High Wycombe, Buckinghamshire**

**Agricultural Land Classification
ALC Map and Report**

February 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

WYCOMBE DISTRICT LOCAL PLAN ABBEY BARN FARM, HIGH WYCOMBE, BUCKINGHAMSHIRE

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on 30 hectares of land at Abbey Barn Farm, between the M40 and Wycombe Marsh, High Wycombe in Buckinghamshire. The survey was carried out during February 1998.
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 Wycombe 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 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 the agricultural land on this site was either under winter cereals, a grass ley or permanent grassland. Those areas shown as 'Other Land' comprise agricultural and residential buildings, woodland and a short trackway.

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)	% surveyed area	% site area
3a	19.6	69.3	65.3
3b	4.5	15.9	15.0
4	4.2	14.8	14.0
Other Land	1.7	-	5.7
Total surveyed area	28.3	100.0	94.3
Total site area	30.0	-	100.0

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

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 22 borings and 2 soil inspection pits was described.

8. On the higher ground, towards the south of the site, the land has been classified as Subgrade 3a (good quality) mainly due to soil wetness and soil droughtiness restrictions. There are two distinct soil types on this site, though these are often mixed together in a complex pattern. The first soil type occurs directly over the chalk bedrock, and comprises shallow, calcareous, fine silty soils with a slight flint content. In these soils the amount of available water for crops is reduced by the presence of chalk and flint, thus limiting the level and consistency of crop yields. The second soil type is derived from the clay-with-flint deposits and comprises fine loamy over clayey soils with a slightly higher flint content. These soils tend to be imperfectly drained, causing seasonal waterlogging which limits the timing and flexibility of mechanised operations and grazing. In places, the high topsoil stone content also limits the land to Subgrade 3a. This limitation may increase production costs, due to tyre and machinery wear, and also adversely affect crop growth, establishment and harvesting.

9. Given the complex nature of the soils in this area, some higher grade land has not been mapped out separately.

10. The land in the north and east of the site is limited by gradient restrictions to Subgrade 3b (moderate quality land) and Grade 4 (poor quality land). This is because steeply sloping land limits the safe and effective use of agricultural machinery and, as a result, the range of crops that can be grown is significantly reduced.

FACTORS INFLUENCING ALC GRADE

CLIMATE

11. Climate affects the grading of the 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 below 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

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. The figures above suggest that overall, the site is comparatively cool (in regional terms) as a result of being located at a relatively high altitude. At this locality, moisture deficit figures are slightly lower than the national average, reflecting the elevated altitude. The likelihood of restrictions associated with soil droughtiness may therefore be reduced.

Table 2: Climatic and altitude data

Factors	Units	Values		
Grid reference	N/A	SU 879 910	SU 885 911	SU 888 913
Altitude	m, AOD	140	125	90
Accumulated Temperature	day°C	1352	1369	1409
Average Annual Rainfall	mm	728	718	706
Field Capacity Days	days	155	153	151
Moisture Deficit, Wheat	mm	93	94	99
Moisture Deficit, Potatoes	mm	81	83	89
Overall Climatic Grade	N/A	Grade 1	Grade 1	Grade 1

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

Site

16. The majority of this site lies at an altitude of 125–140m AOD, and is either flat or gently sloping. In the north and east the land slopes away steeply to Barrowcroft Wood and Spring Lane. The gradients here are in the range 7.5–12°, thus limiting the safe and effective use of agricultural machinery. This land has therefore been classified as Subgrade 3b and Grade 4 according to the severity of the slope.

Geology and soils

17. The published geological information for the site (BGS, 1948) shows all of the site to be underlain by Upper Chalk with a superficial drift deposit, Clay-with-flints, over most of the higher land.

18. The most recently published soil information for the site (SSEW, 1983) maps the Marlow soil association over the clay-with-flint deposits, at the top of the hill, and the Newmarket 2 soil association directly over the Upper Chalk, where it outcrops on the hill sides. The former soils are described as 'well drained fine loamy over clayey soils. Some coarse and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging' (SSEW, 1983). The latter soils are described as 'shallow well drained calcareous coarse loamy and sandy soils over chalk rubble associated with well drained deeper coarse loamy and sandy soils often in an intricate pattern. Slight risk of water erosion' (SSEW, 1983 and 1984).

19. Detailed field examination revealed soils of a similar nature to those described above.

AGRICULTURAL LAND CLASSIFICATION

20. 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.

21. 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.

Subgrade 3a

22. Good quality agricultural land is mapped across the majority of the site. The land is limited by soil wetness, soil droughtiness and/or topsoil stoniness. Two main variants occur within this unit.

23. At the top of the slope, towards the centre of the site, medium silty clay loam topsoils overlie the chalk bedrock at shallow depths (28–32cm). The topsoils contain 5–12% total flints and approximately 20% chalk fragments, while the chalk itself contains a further 5% large flints. Soil inspection Pit 1 shows that the top 40cm of the chalk is weathered, thus allowing crop roots to penetrate the bedrock. After this point, however, the chalk becomes much harder, preventing roots from reaching and extracting additional water. These soils therefore suffer from a soil droughtiness limitation as there may be insufficient reserves of available water for crops in some years. As a result the level and consistency of crop yields will be reduced.

24. Closer to the M40, the Subgrade 3a land is affected by soil wetness. These soils are derived from the clay-with-flints and as such comprise, non-calcareous, medium or heavy clay loam topsoils with 10–18% total flint (including 5–12% flint which is >2 and >6cm in diameter). These sometimes overlie slightly stony (5–10% total flint), non-calcareous, heavy clay loam upper subsoils before the slightly gleyed, reddish brown clay subsoil is reached. Often these profiles became impenetrable to the soil auger at shallow to moderate depths, due to the high flint content. However, a small pit was dug at auger sample point 12, which proved that the clay subsoils continue to at least 60cm depth. A pit from an adjacent survey to the south (Pit 3, 0305/150/97) was also used to show that the heavy clay loam upper subsoils are porous and moderately well structured. The clay subsoils, on the other hand, are poorly structured and slowly permeable from 25–45cm depth. As a result, these profiles impede drainage, causing waterlogging during the wetter months. In this local climatic regime this land has therefore been assigned to Wetness Class II or III (depending on the depth to the slowly permeable layer) which, given the topsoil textures, gives rise to Subgrade 3a quality land. Soil wetness may adversely affect plant growth or impose restrictions on cultivations or grazing by livestock.

25. In addition to the soil wetness or soil droughtiness limitations described above, the amount of topsoil stone larger than 2cm in diameter is equally restricting in some profiles. This is because large flints can impede cultivation, harvesting and crop growth, and increase the cost of cropping in terms of machinery wear and tear, and yield reduction.

26. In places, a complex mixture of the two soil types occurs. These profiles tend to comprise slightly flinty (5–12% total flint) medium silty clay loam or clay loam topsoils over increasingly stony (5–18% chalk and 5–30% flints), medium and heavy silty clay loam, clay loam or clay upper subsoils. These subsoils are occasionally mottled but tend to become impenetrable over flints at shallow depths. Soil inspection Pit 2 shows that they are generally well drained; overlying the chalk at moderate depths. The depth of rooting in these profiles tends to be about 30cm, thus restricting the amount of available water for crops. Where the chalk does not appear until slightly deeper within the profile (65–75cm), soil droughtiness is

less severe and land quality is, therefore, slightly higher. However, these profiles are too limited in number and extent to map separately. This land has therefore been classified as Subgrade 3a due to the soil droughtiness limitation.

Subgrade 3b

27. The majority of the land in the north and east of the site has been classified as Subgrade 3b due to gradient restrictions. The land here measures 7.5° – 11° and so restricts the safe and effective use of some agricultural machinery. This therefore limits the range of crops that can be grown.

Grade 4

28. Towards the bottom of the hill, in the north east corner of the site, the gradient is even steeper; measuring 11.5 – 12° . Agricultural activities are therefore further restricted and this land has been classified as Grade 4.

Helen Goode
Resource Planning Team
Eastern Region
FRCA Reading

SOURCES OF REFERENCE

Geological Survey of England and Wales (1948) *Sheet No. 255, Beaconsfield 1:63,360 scale* (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, Soils of South East England 1:250,000 scale.*

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.

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. **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	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. **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	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 **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

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M. REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS	
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP						MB
1	SU88409130	CER NE	4			1	1	90	-4	94	11	3A		DR	3A	See 1P
2	SU88509130	CER NE	4			1	1	84	-10	90	7	3A		DR	3A	See 1P
3	SU88109120	PGR N	6			1	1	57	-37	57	-26	3B		WE	3A	I35 Q CHF
4	SU88209120	PGR N	4	S25	25	3	3A	79	-15	82	-1	3A		WE	3A	I55 CHF
5	SU88309120	PGR NE	2	S35		2	3A	68	-26	68	-15	3B		DR	3A	I45 See AB6
6	SU88409120	PGR SE	2			1	1	95	1	94	11	3A		DR	3A	
7	SU88509120	CER E	3			1	1	80	-14	85	2	3B		DR	3A	
8	SU87829108	PGR		S28	35	3	3A	83	-11	87	4	3A		WE	3A	I58 CHF
9	SU87909110	PGR		S30		1	1	65	-29	65	-18	3B		WE	3A	I40 See AB12
10	SU88109110	CER		S30		1	1	71	-23	71	-12	3B		DR	2	I45 See 2P
11	SU88209110	PGR				1	1	70	-24	70	-13	3B		DR	2	See 2P
12	SU88309110	LEY		S28	28	3	3A	80	-14	85	2	3A		WE	3A	I35 Small Pit
13	SU88409110	LEY E	3			1	2	52	-42	52	-31	3B		DR	3A	I32 See AB12
14	SU88509110	LEY SE	6			1	2	53	-41	53	-30	3B		DR	3A	I35 See AB12
15	SU87809100	PGR		40		2	2	92	-2	100	17	3A		DR	3A	Q Disturbed
16	SU87909100	PGR		S45	45	3	3A	93	-1	97	14	3A		TS	3A	3A WD Also
17	SU87959098	PGR		S25	25	3	3A	75	-19	80	-3	3A		WD	3A	
18	SU88109100	CER				1	1	91	-3	98	15	3A		WE	3A	I60 Q CHF
19	SU88209100	CER		45	45	3	3A	104	10	109	26	3A		WE	3A	S1. Gley 30
20	SU88309100	LEY				1	1	89	-5	93	10	3A		DR	3A	
21	SU88409100	LEY				1	1	118	24	113	30	2		DR	2	
22	SU88509100	LEY E	5	S20		1	2	124	30	102	19	1		WK	2	
1P	SU88409130	CER N	3			1	1	79	-15	84	1	3A		DR	3A	Near AB1
2P	SU88209110	PGR				1	1	112	18	98	15	2		DR	2	At AB11

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			SPL	CALC
				COL	ABUN	CONT		GLEY	>2	>6		LITH	TOT	STR		
1	0-32	MZCL	10YR43					4	0	HR	5					
	32-72	CH	10YR81					0	0	HR	5		P			
2	0-30	MZCL	10YR42					8	0	CH	20					
	30-70	CH	10YR81					0	0	HR	5		P			
3	0-25	MCL	10YR43					4	0	HR	6					
	25-35	HCL	75YR44					0	0	HR	10		M			Imp Flints
4	0-25	MCL	10YR43					2	0	HR	4					
	25-55	C	75YR54	75YR56	C	D		S	0	0	HR	2	P		Y	Imp Flints
5	0-25	HCL	10YR42					2	0	HR	5					
	25-35	C	75YR54					0	0	HR	2		P			
	35-45	C	75YR54	75YR56	C	D		S	0	0	CH	15	P			Imp Ch/Flts
6	0-22	MCL	10YR42					4	0	HR	5					
	22-35	C	75YR54					0	0	HR	5		M			
	35-50	C	10YR54					0	0	CH	25		M			
	50-80	CH	10YR81					0	0	HR	5		P			
7	0-28	MCL	10YR43					5	0	HR	8					
	28-68	CH	10YR81					0	0	HR	5		P			
8	0-28	MZCL	10YR43					2	0	HR	5					
	28-35	HCL	10YR54	75YR56	C			S	0	0	HR	2	M			
	35-58	C	75YR54	75YR56	M			S	0	0	HR	15	P		Y	Imp Flints
9	0-30	MZCL	10YR43					4	0	HR	10					
	30-40	HCL	10YR54	75YR56	C			S	0	0	HR	15	M			Imp Flints
10	0-30	MZCL	10YR43					2	0	HR	5					
	30-45	C	75YR54	75YR56	C			S	0	0	HR	15	P			Imp Ch/Flts
11	0-28	MZCL	10YR43					6	1	HR	12					
	28-45	HZCL	10YR54					0	0	HR	15		M		Y	+ 15% Chalk
12	0-28	HCL	10YR42					5	0	HR	10					
	28-60	C	75YR54	10YR56	C	D		S	0	0	HR	5	P		Y	I35 Dug to 60
13	0-32	HCL	10YR42					5	0	HR	10					Imp Flints
14	0-25	HCL	10YR42					5	0	HR	10					
	25-35	C	10YR54					0	0	HR	10		M			Imp Flints
15	0-40	MCL	10YR42	75YR56	C	D		Y	6	0	HR	10				
	40-65	MCL	10YR52	75YR56	M	D		Y	0	0	HR	15	M			V. Compacted

SAMPLE	DEPTH	TEXTURE	COLOUR	---MOTTLES---			PED		---STONES---			STRUCT/		SUBS		CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR	
16	0-25	MCL	10YR43						12	3	HR	18				
	25-45	HCL	10YR54						0	0	HR	5		M		
	45-80	C	75YR54	75YR56	M			S	0	0	HR	10		P		Y
17	0-25	MCL	10YR42						6	0	HR	10				
	25-60	C	75YR54	75YR56	M			S	0	0	HR	15		P		Y
18	0-25	MZCL	10YR43						3	0	HR	8				V. Poor Crop
	25-35	MZCL	10YR53						0	0	HR	10		M		
	35-60	HZCL	75YR54						0	0	HR	10		M		Imp Flints
19	0-30	MZCL	10YR43						2	0	HR	5				
	30-45	MZCL	10YR56	10YR56	C	F		S	0	0	HR	10		M		
	45-55	C	25Y 72	10YR66	C	D		Y	0	0	HR	5		P		Y
	55-80	C	10YR73	10YR68	M	D		Y	0	0	HR	2		P		Y
20	0-20	MZCL	10YR42						7	2	HR	15				Almost ZL
	20-43	HZCL	10YR56						0	0	CH	30		M		Y + 5% Chalk
	43-73	CH	10YR81						0	0	HR	5		P		Y + 5% Flints
21	0-20	MZCL	10YR43						4	0	HR	10				
	20-38	MZCL	10YR44						0	0	HR	10		M		
	38-65	MZCL	10YR54						0	0	HR	5		M		Y
	65-95	CH	10YR81						0	0	HR	5		P		Y
22	0-20	HCL	10YR42						0	0	HR	2				Y + 10% Chalk
	20-40	C	10YR54	75YR56	C	D		S	0	0	HR	2		P		Y + 5% Flints
	40-60	C	10YR54						0	0	CH	33		M		Y
	60-80	C	10YR54						0	0	CH	50		M		Y
	80-120	CH	10YR81						0	0		0		P		
1P	0-28	MZCL	10YR43						12	0	HR	10				Y + 10% Chalk
	28-68	CH	10YR81						0	0	HR	5		P		Y + 5% Flints
2P	0-25	MZCL	10YR43						6	0	HR	12				
	25-48	MZCL	10YR54						0	0	HR	17		M		Y + 18% Chalk
	48-75	MZCL	10YR64						0	0	HR	30		M		Y + 5% Chalk
	75-105	CH	10YR81						0	0	HR	5		P		Y + 5% Flints