Gloucestershire Minerals Plan
Forest of Dean Sites

Agricultural Land Classification

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GLOUCESTERSHIRE MINERALS PLAN
FOREST OF DEAN SITES

AGRICULTURAL LAND CLASSIFICATION SURVEY

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INTRODUCTION

1 This report presents the findings of detailed Agricultural Land Classification (ALC) surveys of 199 ha of land at 4 sites in the Forest of Dean Gloucestershire Field survey was based on 186 auger borings and 12 soil profile pits and was completed in August 1997 During the survey 13 samples were analysed for particle size distribution (PSD)

2 The survey was conducted by the Resource Planning Team of FRCA Western Region on behalf of MAFF in its statutory role in the preparation of Gloucestershire Minerals Plan

3 Information on climate geology and soils and from previous ALC surveys was considered and is presented in the relevant section The current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988) and supersedes any previous ALC survey Grade descriptions are summarised in Appendix I

SUMMARY

4 The distribution of ALC grades is shown on the accompanying 1 10 000 scale ALC maps The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas Areas are summarised in the tables below

Table 1 Distribution of ALC grades Hewelsfield

Grade	Area (ha)	% Surveyed Area (81 3 ha)
2	56 7	70
3a	21 6	26
3b	3 0	4
Agricultural land not surveyed	9 2	
Other land	8 4	
Total site area	98 9	

5 This shows that 96% of the area was found to be best and most versatile mainly Grade 2 and Subgrade 3a with minor and occasionally moderate limitations mainly due to restricted workability due to the topsoil textures

Table 2 Distribution of ALC grades Stowe Hill Quarry

Grade	Area (ha)	% Surveyed Area (39 9 ha)
3a	28 1	70
4	11 8	30
Other land	0 4	
Total site area	40 3	

6 This shows that 70% of the surveyed area was found to be best and most versatile This is shown as Subgrade 3a but includes a variety of soil profiles several Grade 2 and some scattered Subgrade 3b The remaining land shown as Grade 4 was found to be consistently heavy and showing evidence of severe wetness

Table 3 Distribution of ALC grades Pingry Farm Coleford

Grade	Area (ha)	% Surveyed Area (40 8 ha)
2	12 2	30
3a	17 8	44
3b	10 8	26
Other land	1 2	
Total site area	42 0	

7 This shows that 74% of the surveyed area was found to be best and most versatile This is shown as Subgrade 3a and Grade 2 with limitations mainly due to restricted workability but also due to wetness in the Subgrade 3a Other land is shown as Subgrade 3b with limitations due to gradient stoniness and soil depth

Table 4 Distribution of ALC grades Drybrook Quarry

Grade	Area (ha)	% Surveyed Area (13 7 ha)
2	10 8	78
3a	0 2	2
3b	2 7	20
Other land	4 0	
Total site area	17 7	

8 This indicates that 80% of the area surveyed was found to be best and most versatile This is mainly Grade 2 with a minor limitation due to topsoil workability Small areas of Subgrade 3b extending from the east are limited by stronger gradients with slopes of 8 11° and another small area of Subgrade 3b is limited by wetness

CLIMATE

9 Estimates of climatic variables for each site were derived from the published agricultural climate dataset Climatological Data for Agricultural Land Classification (Meteorological Office 1989) using standard interpolation procedures Data for key points around the sites are given in the relevant section

10 Since the ALC grade of land is determined by the most limiting factor present overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions Parameters used for assessing overall climate are accumulated temperature a measure of relative warmth and average annual rainfall a measure of overall wetness The results shown at Tables 5 to 8 indicate that there is an overall climatic limitation which limits the land to Grade 2 in all the sites

11 Climatic variables also affect ALC grade through interactions with soil conditions The most important interactive variables are Field Capacity Days (FCD) which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes which are compared with the moisture available in each profile in assessing soil droughtiness limitations These are described in later sections

HEWELSFIELD SITE

12 Apart from the published regional ALC map (MAFF 1977) which shows the site at a reconnaissance scale as Grade 3 the site had not been surveyed previously Also there has been no recent detailed ALC survey on this or any land nearby although a recent survey on similar parent material at Coleford (ADAS 1994) shows mainly Grade 2 with some Subgrade 3a and 3b

Climate

13 The following data is taken to represent the site

Table 5 Climatic Interpolations Hewelsfield Site

Grid Reference		SO 570 016	SO 565 016
Altitude (m)		205	183
Accumulated Temperature (day °C)		1303	1329
Average Annual Rainfall (mm)		1039	1021
Overall Climatic Grade		2	2
Field Capacity Days		218	215
Moisture deficit (mm)	Wheat	68	71
	Potatoes	50	54

Relief

14 Altitude ranges from 183 metres at the north of the site to 207 metres at above Poolfield Court Farm with mainly gentle and moderate slopes which are not limiting

Geology and Soils

15 The underlying geology of the site is shown on the published geology map (IGS 1974 1978) as Carboniferous Limestone mainly Lower Dolomite but with Lower Limestone Shale to the north of the site and Crease Limestone to the south of the site This distribution was largely borne out by the recent survey

16 Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1 250 000 (SSEW 1983) as mainly Crwbin Association which is described as comprising shallow well drained loamy soils over limestone This was also borne out by the recent survey

Agricultural Land Classification

17 The distribution of ALC grades found by the current survey is shown on the accompanying 1 10 000 scale map and areas are summarised in Table 1 The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas

Grade 2

18 The area shown as Grade 2 comprises the main mapping unit of the site Typical topsoil texture was medium silty clay loam although medium clay loam and silt loam were also found and confirmed by PSD analysis At Wetness Class I (See Appendix II) this implies only a minor limitation due to restricted workability This is defined in the ALC guidelines as a relation between topsoil texture and the climatic characteristics of the site expressed as Field Capacity Days in this case around 215 FC Days This mapping unit is illustrated by Pits 1 3 and 4

19 Within the area scattered borings show slight evidence of wetness in the lower subsoil as common manganese deposits and occasionally as slightly gleyed ped faces The occasional appearance of red clay in the lower subsoil suggests the possibility of a slowly permeable layer (SPL) and this was investigated at Pit 5 However in this case an SPL was shown not to exist and the profile was assessed as borderline between Wetness Class I and II borderline also between Grade 2 and Subgrade 3a This was taken to illustrate the half dozen or so borings through this mapping unit with similar minor wetness characteristics

Subgrade 3a

20 Rather more convincing wetness characteristics can be seen in a narrow strip at the south of the site and along the ridge around Poolfield Court Farm and these have been identified more positively as Subgrade 3a with a moderate limitation due to wetness These are mainly medium silty clay loam topsoils at Wetness Class II or III with occasional borings found to be heavy silty clay loam at Wetness Class I

21 The ridge to the west of Woodland Farms was found more consistently to show heavy silty clay loam topsoil textures at Wetness Class I indicating a moderate limitation due to restricted workability Although many of the borings across this ridge were found to be shallow and impenetrable to the auger a typical profile at ASP 13 was investigated as Pit 2 and despite a stone content of 70% below 41 cm was found to be droughtiness Grade 2 even when the available water in the profile was calculated only to 60 cm This is taken to be representative of this mapping unit

Subgrade 3b

22 Small areas of short slopes in the west of the site were found to be Subgrade 3b with gradients of 8 or 9° and a small area to the west of Poolfield Court Farm was found to be Subgrade 3b with restricted soil depth on shallow soils over rock outcropping almost to the surface

Agricultural Land Not Surveyed

23 The area of 9 2 ha at Cows Hill Farm was not surveyed because the owners refused permission for access

Other Land

24 A small area shown as other land includes roads and tracks agricultural buildings residential land and two small areas of woodland

STOWE HILL QUARRY SITE

25 Apart from the published regional ALC map (MAFF 1977) which shows the site at a reconnaissance scale as Grade 3 the site had not been surveyed previously An adjacent site had been previously surveyed as a potential more limited extension to Stowe Hill Quarry (ADAS 1994) This survey found soils similar to the current survey and shows Grade 2 and Subgrade 3a and 3b The area shown as Subgrade 3b includes Wetness Class IV profiles similar to those found in the current survey and shown in this case as Grade 4 This apparent inconsistency is due to the observed balance of topsoil textures in the wet area whereas the 1994 survey found mainly lighter textures those found in the current survey were mainly heavy silty clay loam or clay

Climate

26 The following data is taken to represent the site

Table 6 Climatic Interpolations Stowe Hill Quarry Site

Grid Reference		SO 573 069	SO 566 066
Altitude (m)		183	182
Accumulated Temperature (day °C)		1326	1328
Average Annual Rainfall (mm)		1016	1026
Overall Climatic Grade		2	2
Field Capacity Days		216	218
Moisture deficit (mm)	Wheat	72	71
	Potatoes	55	54

Relief

27 Altitude varies little across the site being around 183 metres with mainly gentle and moderate slopes which are not limiting

Geology and Soils

28 The underlying geology of the site is shown on the published geology map (IGS 1974) as Carboniferous Lower Limestone and Limestone Shale The area in the south east of the site shown as Limestone Shale was found to coincide with the clay soils giving rise to ALC Grade 4

29 Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1 250 000 (SSEW 1983) as the Ston Easton Association These are described as well drained fine silty over clayey soils on limestone some being shallow over rock This was borne out in part by the current survey although the published description does not seem to predict the wet clay soils shown as Grade 4 in the current ALC survey

Agricultural Land Classification

30 The distribution of ALC grades found by the current survey is shown on the accompanying 1 10 000 scale map and areas are summarised in Table 2 The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas

Subgrade 3a

31 The area shown as Subgrade 3a includes several Grade 2 borings at the northeast end of the site as well as several others which are borderline to Grade 2 These have mainly medium and heavy silty clay loam topsoils at Wetness Class I indicating a minor limitation due to restricted workability These are illustrated by Pit 1 which is sited at an impenetrable boring in order to investigate also the extent of a stony but rootable subsoil In this case it was found to extend from 42 to below 80 cm with around 70% stone but with common very fine roots and was assumed to extend to at least 100 cm for the calculation of available water Topsoil texture at Pit 1 was confirmed by PSD analysis to be heavy silty clay loam but borderline to medium silty clay loam

32 The area shown as Subgrade 3a also includes borings which show evidence of wetness with manganese or gleying in the lower subsoil These were assessed as Wetness Class II Some borings which were found to be more shallow than that described at Pit 1 were assessed as droughtiness Subgrade 3a Pit 2 represents perhaps the shallow end of the spectrum but with only 25 cm of topsoil over fissured rock is graded as Subgrade 3b because of restricted soil depth Taking account of approximately 15% soil matrix in horizon 2 in the calculation of profile available water shows this to be Subgrade 3a on droughtiness Other shallow profiles were found on a narrow ridge around ASP 18 and 26

33 Two profiles at ASP 25 and 29 were found to show a possible slowly permeable layer in the lower subsoil similar to Pit 2 in the previous survey (ADAS 1994) These were assessed as Wetness Class IV Subgrade 3b but being few and scattered have been included in the Subgrade 3a mapping unit along with any shallow profiles such as at Pit 2 of the current survey

Grade 4

34 The area shown as Grade 4 was found to be deep clay slowly permeable from below the topsoil and therefore Wetness Class IV with either heavy silty clay loam or clay topsoil this was assessed as Grade 4 with a severe limitation due to wetness and is illustrated by Pit 3

PINGRY FARM COLEFORD

35 Apart from the published regional ALC map (MAFF 1977) which shows the site at a reconnaissance scale as Grade 3 the site had not been surveyed previously In 1994 a survey was carried out for the Forest of Dean Local Plan (ADAS 1994) on land adjacent to the Pingry Farm site This showed mainly Grade 2 adjacent to the current site with some Subgrade 3b on valley sides further to the north

Climate

36 The following data is taken to represent the site

Table 7 Climatic Interpolations Pingry Farm

Grid Reference		*SO 576 094*	*SO 570 095*
Altitude (m)		183	213
Accumulated Temperature (day °C)		*1325*	*1291*
Average Annual Rainfall (mm)		995	1003
Overall Climatic Grade		2	2
Field Capacity Days		212	213
Moisture deficit (mm)	Wheat	74	72
	Potatoes	58	54

Relief

37 Altitude ranges from 183 m at Pingry Farm to 213 m near Breckness Court Slopes over 7° between Breckness Court Highfield Barn and in the north of the site limit the land to Subgrade 3b at Pingry Farm

Geology and Soils

38 The underlying geology of the site is shown on the published geology map (IGS 1974) as largely Carboniferous limestone This was borne out by the recent ALC survey which found parent materials to be fractured limestone

39 Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1 250 000 (SSEW 1983) as mainly Crwbin Association which is described as having shallow well drained loamy soils over limestone

40 This was largely borne out by the recent ALC survey which found soils to have largely clay loam topsoils over heavier slightly stony subsoils with some sandier and very stony soils around the north edge of the site Slowly permeable subsoils were found at several borings at the top of the site and confirmed at Pit 1

Agricultural Land Classification

41 The distribution of ALC grades found by the current survey is shown on the accompanying 1 10 000 scale map and areas are summarised in Table 3 The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas

Grade 2

42 The Grade 2 mapping unit covers a large part of the south and east of the site These soils were identified as having clay loam topsoils which overlay heavy clay loam or silty clay loam subsoils and clay to depth Pit 2 confirmed that although slightly stony the soils were not droughty and that the clay subsoil was not slowly permeable and therefore there was no wetness limitation The profile was assessed as Wetness Class I which with 212 Field Capacity days implies a workability limitation due to the medium clay loam topsoil texture

Subgrade 3a

43 An area in the centre of the site was identified as land of good quality Subgrade 3a In this mapping unit the soils generally have clay loam or silty clay loam topsoils which pass onto heavier subsoils Pit 1 confirmed the presence of a slowly permeable layer in the lower subsoil and the profile was assessed as Wetness Class II although below the SPL shattered limestone was found Along the northern edge of this block of Subgrade 3a land the soils were more stony but were also mapped as Subgrade 3a They were considered to be so due to soil droughtiness

Subgrade 3b

44 An area of land along the northern western and southern boundaries of the site has been identified as land of moderate quality Subgrade 3b In the south and north gradients in excess of 7° downgrade these areas to Subgrade 3b

45 Along the western boundary and in the north immediately bordering the Subgrade 3a land shallow and very stony profiles were found These are illustrated by Pit 3 where the main limitation was assessed as topsoil stone content

Other Land

46 Other land includes a strip of woodland in the south west near to Breckness Court and a number of farm buildings

DRYBROOK QUARRY SITE

47 Apart from the published regional ALC map (MAFF 1977) which shows the site at a reconnaissance scale as Grade 3 the site had not been surveyed previously A recent survey at Manning s Farm Drybrook (ADAS 1994) found mainly Subgrades 3a and 3b but was of soils developed on different parent material

Climate

48 The following data is taken to represent the site

Table 8 Climatic Interpolations Drybrook Quarry Site

Grid Reference		SO 635176	SO 634 179
Altitude (m)		230	255
Accumulated Temperature (day °C)		1266	1238
Average Annual Rainfall (mm)		857	863
Overall Climatic Grade		2	2
Field Capacity Days		187	188
Moisture deficit (mm)	Wheat	75	72
	Potatoes	57	53

Relief

49 Altitude ranges from 230 m at the farm buildings to 255 m on the ridge with mainly gentle and moderate slopes which are not limiting but with stronger slopes adjacent to the woodland at the east of the site where gradients of 8 11° limit this area to Subgrade 3b

Geology and Soils

50 The underlying geology of the site is shown on the published geology map (IGS 1974) as mainly Lower Dolomite (Carboniferous Limestone) with a small area of Crease limestone at the south of the site This was largely borne out by the current survey particularly on the sloping land whereas in the valley the soil parent material was found to be deeper alluvium

51 Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1 250 000 (SSEW 1983) as mainly Crwbin Association which is described as comprising shallow well drained loamy soils over limestone Dunkeswick Association soils are shown nearby These comprise slowly permeable seasonally waterlogged fine loamy over clayey soils developed on till derived from sandstone and shale The current survey found soils matching this description in the valley bottom

Agricultural Land Classification

52 The distribution of ALC grades found by the current survey is shown on the accompanying 1 10 000 scale map and areas are summarised in Table 4 The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas

Grade 2

53 Much of the area shown as Grade 2 was found to be medium clay loam topsoil at Wetness Class I implying a minor limitation due to restricted workability Auger borings in the area were frequently found to be impenetrable at around 50 cm and this was investigated at Pit 1 This found the stony subsoil to extend from 50 to below 84 cm with a few very fine roots evident Calculation of available water for the profile to 90 cm shows this to be at least droughtiness Grade 2 and was taken to be representative of similar profiles on the sloping land with bright orange or reddish brown soils over limestone rock

54 Soils on the same mapping unit on the valley floor were found to be more variable frequently with sandy loam or sandy silt loam topsoil as well as medium clay loam

Subgrade 3a

55 A small area adjacent to the road and buildings was found to show evidence of wetness in one case with gleying within 40 cm (Wetness Class III) and in another with a distinct slowly permeable layer in the lower subsoil also Wetness Class III

Subgrade 3b

56 One small area of Subgrade 3b was found to have slopes of 8 11° as described previously but with a soil profile as described as Pit 1 which would be capable of contributing soil resources to any future restoration programme

57 Another small area at the top of the site was found to have heavy clay loam topsoils but with a slowly permeable layer starting at around 60 cm This was assessed as Wetness Class III Subgrade 3b limited by wetness

Other Land

58 Other land in the survey area includes farm buildings and a bungalow and also a large area of young woodland presumably planted to screen the quarry workings to the east

59 The owner reports that a main gas pipeline runs through the site just to the east of ASPS 10 13 and 14 This should not affect land quality for agriculture but it may be relevant to possible quarry operations

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24 September 1997

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APPENDIX I

DESCRIPTION OF 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 include 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 and horticultural crops can usually be grown but on some land in the 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

Grade 3 good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops timing and type of cultivation harvesting or the level of yield Where 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 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 most 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 very severe limitations which restrict use to permanent pasture or rough grazing except for occasional pioneer forage crops

Source MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for Grading the Quality of Agricultural Land MAFF Publications Alnwick

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years

Wetness Class 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 not wet within 40 cm depth for more than 30 days in most years

Wetness Class 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 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 and 90 days in most years

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or if there is no slowly permeable layer within 80 cm depth it is wet within 40 cm depth for 91 210 days in most years

Wetness Class V

The soil profile is wet within 40 cm depth for 211 335 days in most years

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years

Notes The number of days specified is not necessarily a continuous period

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

Source Hodgson J M (In preparation) Soil Survey Field Handbook Revised Edition

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report Terms used and abbreviations are set out below These conform to definitions contained in the Soil Survey Field Handbook (Hodgson 1974)

1 Terms used on computer database in order of occurrence

GRID REF National 100 km grid square and 8 figure grid reference

LAND USE At the time of survey

WHT	Wheat	**SBT**	Sugar Beet	**HTH**	Heathland
BAR	Barley	**BRA**	Brassicas	**BOG**	Bog or Marsh
OAT	Oats	**FCD**	Fodder Crops	**DCW**	Deciduous Wood
CER	Cereals	**FRT**	Soft and Top Fruit	**CFW**	Coniferous Woodland
MZE	Maize	**HRT**	Horticultural Crops	**PLO**	Ploughed
OSR	Oilseed Rape	**LEY**	Ley Grass	**FLW**	Fallow (inc Set aside)
POT	Potatoes	**PGR**	Permanent Pasture	**SAS**	Set Aside (where known)
LIN	Linseed	**RGR**	Rough Grazing	**OTH**	Other
BEN	Field Beans	**SCR**	Scrub		

GRDNT Gradient as estimated or measured by hand held optical clinometer

GLEY, SPL Depth in centimetres to gleying or slowly permeable layer

AP (WHEAT/POTS) Crop adjusted available water capacity

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

DRT Best grade according to soil droughtiness

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

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

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

OC	Overall Climate	**AE**	Aspect	**EX**	Exposure
FR	Frost Risk	**GR**	Gradient	**MR**	Microrelief

FL	Flood Risk	**TX**	Topsoil Texture	**DP**	Soil Depth
CH	Chemical	**WE**	Wetness	**WK**	Workability
DR	Drought	**ER**	Erosion Risk	**WD**	Soil Wetness/Droughtiness
ST	Topsoil Stoniness				

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)

MOTTLE COL Mottle colour using Munsell notation

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%+

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

PED COL Ped face colour using Munsell notation

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

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 or metamorphic rock		

Stone contents are given in % by volume for sizes >2cm >6cm and total stone >2mm

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

Degree of development	**WA**	Weakly developed Adherent	**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		

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		

SUBS STR Subsoil structural condition recorded for the purpose of calculating profile droughtiness **G** Good **M** Moderate **P** Poor

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

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

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

CALC If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a Y will appear this column

2 Additional terms and abbreviations used mainly in soil pit descriptions

STONE ASSESSMENT

VIS	Visual	**S**	Sieve	**D**	Displacement

MOTTLE SIZE

EF	Extremely fine <1mm	**M**	Medium 5 15mm
VF	Very fine 1 2mm>	**C**	Coarse >15mm
F	Fine 2 5mm		

MOTTLE COLOUR May be described by Munsell notation or as ochreous (OM) or grey (GM)

ROOT CHANNELS In topsoil the presence of rusty root channels should also be noted

MANGANESE CONCRETIONS Assessed by volume

N	None		**M**	Many	20 40%
F	Few	<2%	**VM**	Very Many	>40%
C	Common	2 20%			

POROSITY

P	Poor	less than 0 5% biopores at least 0 5mm in diameter
G	Good	more than 0 5% biopores at least 0 5mm in diameter

ROOT ABUNDANCE

The number of roots per $100cm^2$		Very Fine and Fine	Medium and Coarse
F	Few	1 10	1 or 2
C	Common	10 25	2 5
M	Many	25 200	>5
A	Abundant	>200	

ROOT SIZE

VF	Very fine	<1mm	**M**	Medium	2 5mm
F	Fine	1 2mm	**C**	Coarse	>5mm

HORIZON BOUNDARY DISTINCTNESS

Sharp	<0 5cm	**Gradual**	6 13cm
Abrupt	0 5 2 5cm	**Diffuse**	>13cm
Clear	2 5 6cm		

HORIZON BOUNDARY FORM Smooth wavy irregular or broken *
* See Soil Survey Field Handbook (Hodgson 1974) for details