FOUR WAYS QUARRY, OAKMERE

Agricultural Land Classification and Statement of Physical Characteristics

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Resource Planning Team
Northern Region
FRCA Wolverhampton

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AGRICULTURAL LAND CLASSIFICATION & STATEMENT OF SITE PHYSICAL CHARACTERISTICS FOUR WAYS QUARRY, OAKMERE

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 23.7ha of land immediately to the east of Four Ways Quarry, Oakmere. The survey was carried out during March 1999.

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). The survey was carried out in connection with MAFF's statutory input to the proposed extension to the Four Ways Quarry. This survey supersedes any previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Northern 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 partly under cereals, with the remainder of the site fallow or recently ploughed. The areas mapped as 'Other land' include storage bunds of soil and ponds.

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.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
1	-	-	-
2	-	-	-
3a	18.0	85	76
3b	3.2	15	13
4	-	-	-
5	-	-	-
Agricultural land not surveyed	-	N/A	-
Other land	2.5	N/A	11
Total surveyed area	21.2	100	-
Total site area	23.7	-	100

[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 of agricultural land. A total of 25 borings and 2 soil pits was described.

8. The agricultural land on this site has been classified as Subgrade 3a (good quality) and Subgrade 3b (moderate quality). The key limitations to the agricultural use of this land are topsoil texture and soil droughtiness.

9. The good quality land is located over the majority of the site. The soils have a loamy medium sand topsoil texture which overlies a medium sand to depth, with few to common stones within the soil profile. Occasionally there are lenses of fine and coarse textured sand in the subsoil.

10. The area of moderate quality land is mapped towards the west of the site. The soils in this area have a medium sand topsoil texture overlying medium and coarse sand to depth, with common to many stones.

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).

Table 2: Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SJ 576 694	SJ 575 692
Altitude	m, AOD	75	80
Accumulated Temperature	day°C (Jan-June)	1378	1372
Average Annual Rainfall	mm	814	813
Field Capacity Days	days	188	188
Moisture Deficit, Wheat	mm	84	83
Moisture Deficit, Potatoes	mm	70	69
Overall climatic grade	N/A	Grade 1	Grade 1

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 (AT0, January to June), as a measure of the relative warmth of a locality.

15. The combination of rainfall and temperature at this site means that there is no overall climatic limitation. The site is climatically Grade 1.

Site

16. The site is gently undulating ranging in altitude between 75 and 80 metres AOD.

17. The three site factors of gradient, microrelief and flooding are considered when classifying the land.

18. These factors do not impose any limitations on the agricultural use of this land.

Geology and soils

19. The solid geology of the area is comprised of Mercia Lower Mudstone. This is overlain with deposits of glacial sands and gravel - British Geological Survey (1986 & 1990).

20. The soils that have developed on this geology are generally of a loamy sand topsoil texture over a subsoil of sand, typical of the Crannymoor Soil Association (SSEW 1984). Occasionally there are areas of sand topsoils.

21. Upon detailed field examination, soils broadly consistent with the above descriptions were found across the site

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.

Subgrade 3a

23. Land of good quality occupies 18.0 hectares (76%) of the site area and is found across the majority of the site.

24. The main limitation to the agricultural use of this land is soil droughtiness.

25. The soils have a loamy medium sand topsoil texture which overlies a medium sand subsoil to depth, with few to common stones within the soil profile. Occasionally there are lenses of fine and coarse textured sand in the subsoil. The moisture balance places these soils in Subgrade 3a.

Subgrade 3b

26. Land of moderate quality occupies 3.2 hectares (13%) of the site area and is mapped towards the west of the site.

27. The main limitations to the agricultural use of this land include topsoil texture and soil droughtiness.

28. The soils in this area have a medium sand topsoil texture overlying medium and coarse sand to depth, with common to many stones within the soil profile. The moisture balance places these soils in Subgrade 3b. The topsoil texture limits these soils to Subgrade 3b. Occasionally there are topsoils of loamy sand in this unit.

SOIL RESOURCES

29. This section describes the soil resources identified on the site. It should be emphasised that this is not intended as a prescription for soil stripping, but merely as an illustration of the soil resources available for restoration on the site. Due to the natural variability of soils, the depths of topsoil and subsoil given should be treated with caution. Soils were sampled to a maximum depth of 120cm, where possible, during survey work. In some cases soil resources will extend below this depth. Textures described relate predominantly to hand texturing, incorporating the results of laboratory analysis (particle size distribution) from 2 pits and three auger borings.

Soil Units : considerations for restoration

30. Two soil units have been identified across the site, the extent and distribution of which are illustrated on the accompanying soil resources map. The land shown as other land was deposited with screening material and soil storage bunds. This land has not been appraised in terms of soil units.

Soil Unit One

31. This unit covers an area of 3.2 hectares and coincides with the Subgrade 3b land. Generally this unit comprises of a medium sand topsoil texture to a depth of about 29cm (range 28 to 34cm) overlying medium and coarse sand to a depth of at least 120cm, with common to many stones within the soil profile. This unit is typified by Pit Two which is described below.

Representative soil profile for Soil Unit One

Horizon	Average Depth (cm)	Description
Topsoil	0–29	Medium sand, very dark grey (7.5YR3/1); 12% total stone (hard rock); moderately developed medium subangular blocky structure; friable consistence; few roots.
Upper Subsoil	29–68	Medium sand, strong brown (7.5YR4/6); 3% total stone (hard rock); weakly developed coarse angular blocky structure; friable consistence; few roots.
Lower Subsoil	68 –120	Medium sand, strong brown (7.5YR5/6); 1% total stone (hard rock); weakly developed medium subangular blocky structure; very friable consistence; no roots observed.

Soil Unit Two

32. This unit covers an area of 18.0 hectares and coincides with the Subgrade 3a land. Generally the unit comprises of a loamy medium sand topsoil texture to a depth of about 31cm (range 25 to 39cm) which overlies a medium sand subsoil to at least 120cm depth, with few to common stones within the soil profile. This unit is typified by Pit One which is described below.

Representative soil profile for Soil Unit Two

Horizon	Average Depth (cm)	Description
Topsoil	0–31	Loamy medium sand, very dark brown (7.5YR2.5/2); 2% total stone (hard rock); moderately developed medium subangular blocky structure; friable consistence; common roots.
Upper Subsoil	31–58	Medium sand, brown (7.5YR4/4); 1% total stone (hard rock); moderately developed coarse angular blocky structure; friable consistence; common roots.
Lower Subsoil	58 –120	Medium sand, strong brown & reddish yellow (7.5YR5/6& 6/6); 1% total stone (hard rock); moderately developed coarse platy structure; very friable consistence; few roots.

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SOURCES OF REFERENCE

British Geological Survey (1986) *Sheet No. 109, Chester Solid Edition, Scale 1: 50 000.* BGS: London.

British Geological Survey (1990) *Sheet No. 109, Chester Drift Edition, Scale 1: 50 000.* 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 (1984) *Sheet 3, Map of Midland and Western England.* SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in Midland and Western 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:

Sample location map

Soil abbreviations - explanatory note

Soil pit and soil boring descriptions (boring and horizon levels)

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	ASPECT USE		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	SJ57606950	WHT	E	01	000		1	1	077	-7	060	-10	3A				DR	3A	PSD LMS TOP
1P	SJ58106930	PLO			000		1	1	078	-6	061	-9	3A				DR	3A	PSD LMS TOP
2	SJ57506940	FAL	SE	05	000		1	1	076	-8	064	-6	3A				DR	3A	
2A	SJ57426933	PLO		02	000		1	1	082	-2	070	0	3A				DR	3A	STILL 3A TO 120
2P	SJ57626938	FAL			000		1	1	073	-11	056	-14	3A				TX	3B	PSD MS TOP
3A	SJ57626938	FAL	NE		000		1	1	053	-31	056	-14	3B				TX	3B	DTA, GRAVEL, MS TOP
4	SJ57706940	WHT	W	01	000		1	1	071	-13	059	-11	3A				DR	3A	
5	SJ57806940	CER			000		1	1	077	-7	060	-10	3A				DR	3A	
6	SJ58106940	PLO			000		1	1	059	-25	061	-9	3B				DR	3B	USE PIT ONE
7	SJ58206940	PLO		01	000		1	1	080	-4	067	-3	3A				DR	3A	
8	SJ58306940	SET			000		1	1	083	-1	067	-3	3A				DR	3A	
9	SJ57506930	PLO	SE	03	000		1	1	071	-13	058	-12	3A				DR	3A	STN AT70
10	SJ57606930	STU	N	05	000		1	1	061	-23	050	-20	3B				TX	3B	PSD MS TOP
11	SJ57706930	FAL	NE	07	000		1	1	081	-3	068	-2	3A				TX	3B	PSD MS TOP
12	SJ57806930	CER	NW	02	000		1	1	069	-15	058	-12	3A				DR	3A	
13	SJ57906930	CER		01	000		1	1	137	53	093	23	1				TX	2	WETBASE
14	SJ58006930	PLO		01	000		1	1	072	-12	060	-10	3A				DR	3A	10YR46MS
15	SJ58106930	PLO			000		1	1	076	-8	063	-7	3A				DR	3A	SEE PIT ONE
16	SJ58206930	PLO			000		1	1	074	-10	061	-9	3A				DR	3A	
17	SJ57606920	PLO			000		1	1	073	-11	060	-10	3A				DR	3A	
18	SJ57736923	FCD			000		1	1	076	-8	060	-10	3A				DR	3A	
19	SJ57836917	FCD	W	01	000		1	1	113	29	083	13	2				TX	2	SUPP BOR LS/CS = 3A
20	SJ57906920	CER	NW	01	000		1	1	077	-7	065	-5	3A				DR	3A	
21	SJ58006920	PLO	E	01	000		1	1	089	5	067	-3	3A				DR	3A	
22	SJ58106920	SA	SW	02	000		1	1	106	22	069	-1	2				TX	2	
23	SJ57906910	FCR	W	05	066	083	1	1	116	32	077	7	2				TX	2	SUPP BOR LS/CS = 3A
24	SJ58006910	SA	NE	01	000		1	1	119	35	107	37	1					1	CK OSOIL

NB/this has to be resaved as keyboard broke

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	0-29	lms	75YR25 02						0	0	HR	1						
	29-45	ms	75YR32 00						0	0	HR	1		M				
	45-65	ms	75YR46 00						0	0	HR	1		M				
	65-120	ms	75YR66 00						0	0	HR	1		M				
1P	0-31	lms	75YR25 01						1	0	HR	2	MDMSAB	FR				
	31-58	ms	75YR44 00						0	0	HR	1	MDCAB	FR	G			
	58-120	ms	75YR66 56						0	0	HR	1	MDCPL	VF	M			
2	0-35	lms	75YR25 01						1	0	HR	3						
	35-55	ms	75YR25 01						0	0	HR	1		M				
	55-110	ms	75YR44 46						0	0	HR	1		M				
2A	0-45	lms	75YR32 31						2	0	HR	5						
	45-110	ms	75YR46 44						0	0	HR	1		M				
2P	0-29	ms	75YR31 00						7	0	HR	12	MDMSAB	FR				
	29-68	ms	75YR46 00						0	0	HR	3	WKCAB	FR	M			
	68-120	ms	75YR56 00						0	0	HR	1	WKMSAB	VF	M			
3A	0-36	ms	75YR25 01						14	0	HR	20						
	36-70	ms	75YR44 00						0	0	HR	8		M				
4	0-29	lms	75YR25 02						0	0	HR	5						
	29-34	ms	75YR25 03						0	0	HR	1		M				
	34-82	ms	75YR56 00						0	0	HR	1		M				
	82-120	cs	75YR66 00						0	0	HR	15		M				
5	0-30	lms	75YR32 56						0	0	HR	3						
	30-85	ms	75YR56 00						0	0	HR	1		M				
	85-120	ms	75YR66 00						0	0	HR	1		M				
6	0-35	lms	75YR25 01						0	0	HR	1						
	35-67	ms	75YR44 00						0	0	HR	10		M				
	67-100	ms	75YR46 00						0	0	HR	5		M				

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
7	0-39	lms	75YR25 01						0	0	HR	1						
	39-67	ms	75YR44 00						0	0	HR	1		M				
	67-110	ms	75YR56 00						0	0	HR	1		M				
8	0-38	lms	75YR25 01						0	0	HR	1						
	38-65	ms	75YR44 00						0	0	HR	1		M				
	65-120	ms	75YR46 00						0	0	HR	1		M				
9	0-28	lms	75YR25 01						2	0	HR	4						
	28-50	ms	75YR44 00						0	0	HR	1		M				
	50-110	ms	75YR46 00						0	0	HR	1		M				
10	0-34	ms	75YR32 33						13	0	HR	20						
	34-110	cs	75YR56 00						0	0	HR	5		M				
11	0-45	ms	75YR25 01						6	0	HR	8						
	45-70	ms	75YR32 52						0	0	HR	1		M				
	70-110	ms	75YR44 46						0	0	HR	1		M				
12	0-28	lms	75YR32 00						3	0	HR	6						
	28-70	ms	75YR58 00						0	0	HR	1		M				
	70-110	ms	75YR58 00						0	0	HR	10		M				
13	0-28	lms	75YR25 01						3	0	HR	5						
	28-50	fs	75YR44 00						0	0	HR	1		M				
	50-110	fs	05YR46 00						0	0	HR	1		M				
14	0-30	lms	75YR25 01						2	0	HR	4						
	30-36	ms	75YR31 00						0	0		0		M				
	36-60	ms	75YR33 44						0	0	HR	1		M				
	60-110	ms	75YR44 00						0	0	HR	1		M				
15	0-36	lms	75YR25 01						4	0	HR	6						
	36-55	ms	75YR44 00						0	0	HR	1		M				
	55-110	ms	75YR46 56						0	0	HR	1		M				

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
16	0-33	lms	75YR25 01						4	0	HR	6						
	33-48	ms	75YR32 33						0	0	HR	1		M				
	48-110	ms	75YR46 56						0	0	HR	1		M				
17	0-29	lms	75YR25 02						0	0	HR	1						
	29-85	ms	75YR56 00						0	0	HR	1		M				
	85-110	ms	75YR66 00						0	0	HR	1		M				
18	0-29	lms	75YR25 01						0	0	HR	1						
	29-45	ms	75YR34 00						0	0	HR	1		M				
	45-75	ms	75YR44 00						0	0	HR	5		M				
	75-120	ms	75YR66 00						0	0	HR	1		M				
19	0-29	lms	75YR25 01						0	0	HR	1						
	29-45	ms	75YR44 00						0	0	HR	1		M				
	45-65	lfs	75YR64 00						0	0	HR	1		M				
	65-85	lfs	75YR64 00	05YR56 00	C				0	0	HR	1		M				
	85-120	ms	05YR66 00						0	0	HR	1		M				
20	0-38	lms	75YR32 31						3	0	HR	5						
	38-50	ms	75YR44 00						0	0	HR	1		M				
	50-110	ms	05YR56 00						0	0	HR	5		M				
21	0-38	lms	75YR25 01						0	0	HR	1						
	38-45	ms	75YR44 00	05YR44 00	C				0	0	HR	1		M				
	45-77	ms	75YR54 00						0	0	HR	1		M				
	77-83	lfs	75YR53 00						0	0	HR	1		M				
	83-120	ms	75YR56 00						0	0	HR	1		M				
22	0-29	lms	75YR25 01						0	0	HR	1						
	29-45	lms	75YR25 03						0	0	HR	1		M				
	45-65	ms	75YR33 00	75YR46 32	C				0	0	HR	1		M				
	65-75	fsl	75YR54 00						0	0	HR	1		M				
	75-95	fsl	05YR54 00						0	0	HR	1		M				
	95-120	ms	75YR54 00						0	0	HR	1		M				

				----MOTTLES-----			PED		----STONES----			STRUCT/	SUBS			
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
23	0-25	lms	75YR25 02						0	0	HR	1						
	25-47	ms	75YR44 00						0	0	HR	15		M				
	47-66	lfs	75YR64 00						0	0	HR	1		M				
	66-83	lfs	75YR64 00	05YR56 00		C		Y	0	0	HR	1		M				
	83-120	c	05YR44 00					Y	0	0	HR	1		P			Y	
24	0-39	lms	75YR25 01						0	0	HR	1						
	39-47	ms	75YR25 01						0	0	HR	1		M				
	47-65	olms	75YR25 01						0	0	HR	1		M				
	65-75	olms	75YR31 41						0	0	HR	1		M				
	75-120	ms	75YR44 00						0	0	HR	1		M				