

A1

**WEST OXFORDSHIRE DISTRICT LOCAL PLAN
Land East of Witney, Oxfordshire**

**Agricultural Land Classification
ALC Map and Report**

December, 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

**RPT Job Number: 3305/101/98
MAFF Reference:EL 33/01860**

AGRICULTURAL LAND CLASSIFICATION REPORT

WEST OXFORDSHIRE DISTRICT LOCAL PLAN LAND EAST OF WITNEY, OXFORDSHIRE

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of approximately 68 hectares of land east of Witney, in Oxfordshire. The survey was carried out during December 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). The survey was carried out in connection with MAFF's statutory input to the West Oxfordshire District Local Plan. This survey supersedes any previous ALC information for this land, including a 1983 survey (FRCA ref: 3305/42/83) covering part of the area to the north.
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 use on the site included permanent grassland and cereals. The areas mapped as 'Other land' include farm dwellings and associated buildings, two telecommunication towers, and woodland. A small area of agricultural land (1.2 hectares), in the west of the site, was not surveyed as permission for access was not forthcoming

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:15,000. It is accurate at this scale but any enlargement would be misleading.
6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.
7. The fieldwork was conducted at an average density of 1 boring per 1.4 hectares of agricultural land. In total, 46 borings and 4 soil pits were described.
8. The majority of the agricultural land at this site has been classified as Subgrade 3b (moderate quality) with a smaller extent of Subgrade 3a (good quality). The principal limitation to land quality is soil wetness.

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

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
3a	2.8	4.4	4.1
3b	60.2	95.6	88.8
Agricultural land not surveyed	1.2	N/A	1.8
Other land	3.6	N/A	5.3
Total surveyed area	63.0	100	92.9
Total site area	67.8	-	100

9. Land of good quality is quite variable and may be related to an outcrop of gravelly material resting over the Oxford Clay substratum. Soils are typically non-calcareous with fine loamy or fine silty topsoils. These overlie similar or clayey subsoils, or pass through very stony layers to the poor draining clays beneath. It is the depth to these less permeable clays which plays a major part in determining the final ALC grade. Where these occur at moderate depth on this site, the land is better drained and results in a land classification of Subgrade 3a.
10. Moderate quality land covers most of the site and occurs in conjunction with the underlying Oxford Clay. Soils comprise non-calcareous fine loamy or fine silty topsoils. These overlie poor draining clays or pass through a shallow fine loamy layer to the clays beneath. It is the depth to these less permeable horizons, combined with the topsoil texture and the local climate, which determines the overall ALC grade. As these poor draining clays are close to the surface and the topsoils are heavy the land is limited by wetness and Subgrade 3b is appropriate. Wetness causes land utilisation to be restricted and yield potential to be reduced.

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	
		SP 375 098	SP 370 093
Grid reference	N/A	105	90
Altitude	m, AOD	1395	1413
Accumulated Temperature	day°C (Jan-June)	713	705
Average Annual Rainfall	mm	154	153
Field Capacity Days	days	100	102
Moisture Deficit, Wheat	mm	91	93
Moisture Deficit, Potatoes	mm		
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 mean that there is no climatic limitation. Local climatic factors, such as exposure and frost risk do not significantly affect land quality at this location. The site is climatically grade 1. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness. At this locality the climate is average, in regional terms.

Site

16. The site lies at altitudes in the range 85–112 m AOD. The highest land occurs over the central area of the site, with land falling with moderate to gentle gradients away from here. The lowest ground is found in the extreme south of the survey area, close to the A40(T). The site does not suffer from any site restrictions (i.e., gradient, microrelief or flooding).

Geology and soils

17. The most detailed published geological information for the site (BGS, 1982) indicates that it is mostly underlain by Oxford Clay, with a small area of Glacial Sands and Gravels mapped on high ground around Gibbets Close Farm.
18. The most detailed published soils information covering the site (SSEW, Record No. 77, 1982) shows it to mainly comprise the Oak soil series. This is described as 'stony loamy or silty over clayey; drift (till or Head, plateau Drift). A further two soil series constitute the remainder. The most extensive of the two is the Denchworth soil series. This is described as 'clayey-smectitic over Jurassic or Cretaceous clay or clay-shale (Oxford Clay). A small area along the south-west boundary is shown as the Lawford soil series. This is described as 'stony, clayey drift (head) over Jurassic or Cretaceous clay or clay shale (Oxford Clay). Soils fitting these descriptions were observed across the site.

AGRICULTURAL LAND CLASSIFICATION

19. 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.
20. 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

21. Land of good quality covers a small area, either side of Gibbets Close Farm and the B4022. It occurs in conjunction with two soil types.
22. All of the land classified as Subgrade 3a is affected by a soil wetness limitation, often in combination with a less severe soil droughtiness limitation. The first soil type comprises non-calcareous heavy silty clay loam or heavy clay loam topsoils, which may contain up to 2% total flints by volume. Subsoils may be gleyed from below the topsoil but have no slowly permeable clays within auger depth or are not gleyed within 40 cm but have slowly permeable layers from 65 cm. Soil pit 1P (see Appendix II), is similar to these soils although in the 3a mapping unit the depth to the slowly permeable clay is greater. Soil structure of the heavy clay loam was assessed as moderate and poor for the clay. It is the depth to gleying and the depth to a slowly permeable layer, which determines the final ALC grade. The depth to these, results in soils which are assigned to Wetness Class II. This combination of imperfect drainage, topsoil texture and the prevailing field capacity level (154 days) results in land classified as Subgrade 3a. Soil wetness can affect the range of crops which can be grown and the level of yield. In addition, soil wetness is a major factor in determining the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock.
23. Where the influence of the glacial sand and gravel is more evident, soils comprise non-calcareous heavy or medium clay loam topsoils, which may contain up to 2% total flints by volume. These overlie slightly stony sandy clay loam (SCL) subsoils or pass through a thin horizon of heavy clay loam to the SCL beneath. These stony layers distinguish the soils described above. These were impenetrable to the auger from 65 and 90 cm. Soil pit 3P (see Appendix II), is typical of these soils and proved the existence of these stony subsoils, which were measured from the pit as 29%, increasing to 47% total flints by volume. Due to the high stone contents, soil structure could not be determined. Consequently, a moderate assessment of structural conditions has been assumed. At 75 cm, the SCL passed to a slowly permeable clay. This results in these soils being again assigned to Wetness Class II and individual borings classified as Grade 2 (good quality) or Subgrade 3a. Moisture balance calculations indicate that these soils experience a slight to moderate soil droughtiness limitation and that Grade 2 is appropriate. However, the limited extent of this and the scale of mapping is such that this better (Grade 2) land could not be distinguished separately and is therefore appropriately included in the Subgrade 3a mapping unit.

Subgrade 3b

24. Land of moderate quality has been mapped over most of the site. It is coincident with the underlying Oxford Clay.
25. All of the land classified as Subgrade 3b suffers from a significant soil wetness limitation. Soils comprise non-calcareous heavy clay loam or heavy silty clay or clay topsoils, which may contain up to 5% total flints by volume. These overlie slowly permeable clay or pass through a thin horizon of permeable heavy clay loam to the clay beneath. Soil pits 1P, 2P and 3P (see Appendix II), confirm the existence of these shallow poorly structured clayey subsoils. It is the depth to these slowly permeable layers (between 17–39 cm), which will determine the overall ALC grade and in this locality assigned to Wetness Class IV or III.

This combination of poor drainage, topsoil texture and the prevailing field capacity level (154 days) gives rise to a land classification of Subgrade 3b. Excessive soil wetness adversely affects seed germination and survival, partly by a reduction in soil temperature and partly because of anaerobism. It also inhibits the development of a good root system, all of which can affect the range of crops that can be grown and the level of yield. Soil wetness also influences the sensitivity of the soil to structural damage and is, therefore, a major factor in determining the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock.

Colin Pritchard
Resource Planning Team
Eastern Region
FRCA Reading

SOURCES OF REFERENCE

British Geological Survey (1982) *Sheet No. 216, Witney*, 1:50,000, Solid and 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 England and Wales (1982) *Soil Survey Record No. 77, Soils in Oxfordshire, Sheet SP30, Witney South*.
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. **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	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	--WETNESS--						-HEAT-		-POTS-		M.REL		EROSN	FROST		CHEM	ALC	COMMENTS
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT				
1	SP37301030	PGR N	1	0	20	4	3B	89	-11	101	10	3A						WE	3B	SPLSEE2P
2	SP37401030	PGR N	2	0	20	4	3B	82	-18	88	-3	3A						WE	3B	SPLSEE2P
4	SP37401020	PGR NW	2	0	18	4	3B	81	-19	87	-4	3A						WE	3B	PIT2
7	SP37301010	PGR N	5	34	34	4	3B	86	-14	92	1	3A						WE	3B	SPLSEE2P
8	SP37401010	PGR N	2	0	17	4	3B	88	-12	100	9	3A						WE	3B	SPLSEE2P
9	SP37501010	PGR N	1	0	30	4	3B	94	-6	106	15	3A						WE	3B	SPLSEE2P
10	SP37201000	PGR W	1	0	38	4	3B	87	-13	93	2	3A						WE	3B	SPLSEE2P
12	SP37401000	PGR NE	1	0	18	4	3B	79	-21	84	-7	3B						WE	3B	SPLSEE2P
14	SP36940990	PGR S	6	24	24	4	3B	105	5	103	12	2						WE	3B	SPLSEE1P
15	SP37000990	PGR W	6	65		1	2	117	17	111	20	2						WD	2	+WKSEE3P
16	SP37100990	PGR		65	65	2	3A	137	37	117	26	1						WE	3A	SPLSEE1P
17	SP37200990	PGR E	1	45	45	3	3B	117	17	112	21	2						WE	3B	DISTURBED
18	SP37300990	PGR E	1	20	20	4	3B	93	-7	98	7	3A						WE	3B	SPLSEE1P
19	SP37400990	PGR E	1	0	35	4	3B	90	-10	102	11	3A						WE	3B	SPLSEE1P
20	SP37500990	PGR NW	4	0	35	4	3B	91	-9	103	12	3A						WE	3B	SPLSEE2P
21	SP37020980	PGR W	3	26		2	3A	155	55	117	26	1						WE	3A	SPLSEE1P
22	SP37100980	PGR		28	45	4	3B	112	12	110	19	2						WE	3B	PIT1
23	SP37200980	PGR E	2	0	40	4	3B	99	-1	104	13	3A						WE	3B	SPLSEE1P
24	SP37300980	PGR E	2	28	40	4	3B	102	2	107	16	3A						WE	3B	SPLSEE1P
25	SP37400980	PGR		28	28	4	3B	105	5	103	12	1						WE	3B	SPLSEE1P
27	SP37600980	PGR S	1	22	22	4	3B	100	0	98	7	3A						WE	3B	SPLSEE2P
28	SP36800970	PGR NW	4	27	27	4	3B	86	-14	92	1	3A						WE	3B	SEE3PHOR4
29	SP36900970	PGR NW	2	27		2	2	91	-9	99	8	3A						WD	2	PROBGR2
30	SP37000970	CER NW	1	27	37	4	3B	85	-15	91	0	3A						WE	3B	SPLSEE1P
31	SP37100970	CER N	1	37	37	4	3B	93	-7	105	14	3A						WE	3B	SPLSEE1P
33	SP37300970	PGR E	2	28	28	4	3B	100	0	105	14	3A						WE	3B	SEE3PHOR4
35	SP37500970	PGR SW	2	25	25	4	3B	97	-3	102	11	3A						WE	3B	SPLSEE1P
36	SP37650975	LEY SE	1	35	35	4	3B	90	-10	102	11	3A						WE	3B	SPLSEE1P
38	SP36800960	PGR W	2	26	26	4	3B	85	-15	91	0	3A						WE	3B	SPLSEE3P
39	SP36900960	PGR SW	3	29	29	4	3B	94	-6	106	15	3A						WE	3B	RIDGE/FURROW
40	SP37000960	CER SW	1	35	55	3	3B	123	23	116	25	2						WE	3B	SPLSEE4P
42	SP37200960	PGR E	3	25	25	4	3B	103	3	101	10	3A						WE	3B	SPLSEE1P
45	SP36900950	CER W	3	0	27	4	3B	82	-18	88	-3	3A						WE	3B	SPLSEE4P
47	SP37100950	CER S	1	0	26	4	3B	81	-19	87	-4	3A						WE	3B	SPLSEE4P
49	SP37300950	PGR NE	1	20	20	4	3B	81	-19	87	-4	3A						WE	3B	SPLSEE4P
50	SP37350945	PGR		25	25	4	3B	106	6	104	13	2						WE	3B	SPLSEE4P
51	SP36800940	PGR SW	3	23	23	4	3B	86	-14	92	1							WE	3B	SEE4P
53	SP37000940	PGR S	2	0	18	4	3B	90	-10	102	11	3A						WE	3B	SPLSEE4P
55	SP37200940	CER SW	2	25	25	4	3B		0		0							WE	3B	PIT4
58	SP36900930	PER S	1	0	18	4	3B	82	-18	88	-3	3A						WE	3B	SPLSEE4P
60	SP37100930	CER SW	3	25	25	4	3B	87	-13	93	2	3A						WE	3B	SPLSEE4P
61	SP37200930	CER SW	4	28	28	4	3B		0		0							WE	3B	SPLSEE4P

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					
62	SP36800920	CER S	2	25	25	4	3B		0	0			WE	3B	SPLSEE4P
64	SP37000920	CER W	1	0	22	4	3B	92	-8	104	13	3A	WE	3B	SPLSEE4P
66	SP36900910	CER NW	1	29	29	4	3B	96	-4	108	17	3A	WE	3B	SPLSEE4P
68	SP36900900	CER NW	2	24	24	4	3B	93	-7	105	14	3A	WE	3B	SPLSEE4P
1P	SP37100980	PGR W	3	23	39	4	3B	86	-14	92	1	3A	WE	3B	PIT60 ASP22
2P	SP37401020	PGR N	2	17	17	4	3B	80	-20	83	-8	3A	WE	3B	PIT55 ASP4
3P	SP36900970	PGR NW	2	25	75	2	2	93	-7	92	1	3A	DR	3A	PIT90 ASP29
4P	SP36900930	PGR SW	2	19	19	4	3B		0	0			WE	3B	PIT60 ASP58

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----			PED		-----STONES-----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT	COL.	GLEYS	>2	>6	LITH		TOT	STR	POR		IMP
1	0-20	HCL	25Y52	10YR46	M	D		Y	0	0	0						
	20-48	C	25Y63	10YR46	M	D		Y	0	0	0		P		Y	FIRM	
	48-70	C	05Y62	10YR68	M	D		Y	0	0	0		P		Y	PLASTIC	
2	0-20	HCL	25Y52	10YR46	C	D		Y	0	0	0						
	20-39	C	25Y53	10YR4656	M	D		Y	0	0	0		P		Y	FIRM	
	39-60	C	05Y62	10YR68	M	D		Y	0	0	0		P		Y	PLASTIC	
4	0-18	HCL	25Y52	10YR46	C	F		Y	0	0	0						
	18-37	C	25Y53	10YR56	M	D		Y	0	0	0		P		Y	FIRM	
	37-60	C	05Y62	10YR68	M	D		Y	0	0	0		P		Y	PLASTIC	
7	0-34	C	25Y52	10YR46	F	D			0	0	0						
	34-60	C	05Y62	10YR68	M	D		Y	0	0	0		P		Y	PLASTIC	
8	0-17	HCL	25Y52	10YR46	C	D		Y	0	0	0						
	17-50	C	25Y62	10YR46	M	D		Y	0	0	0		P		Y	FIRM	
	50-70	C	05Y62	10YR68	M	D		Y	0	0	0		P		Y	PLASTIC	
9	0-30	HCL	25Y52	10YR46	M	D		Y	0	0	0						
	30-50	C	25Y63	10YR56	M	D		Y	0	0	0		P		Y	FIRM	
	50-70	C	05Y62	10YR68	M	D		Y	0	0	0		P		Y	PLASTIC	
10	0-20	HCL	25Y52	10YR46	C	D		Y	0	0	0						
	20-38	HCL	25Y63	10YR56	C	D		Y	0	0	0		M			FRIABLE	
	38-60	C	05Y62	10YR68	M	D		Y	0	0	0		P		Y	PLASTIC	
12	0-18	HCL	25Y52	10YR46	C	D		Y	0	0	0						
	18-60	C	25Y62	10YR68	M	D		Y	0	0	HR 5		P		Y	PLASTIC	
14	0-24	HCL	10YR42	10YR46	F	D		Y	0	0	0						
	24-45	C	25Y 53	10YR58	C	D		Y	0	0	0		P		Y	FIRM	
	45-90	C	25Y 63	10YR58	M	D		Y	0	0	0		P		Y	PLASTIC	
15	0-20	HCL	10YR42						0	0	HR 2						
	20-65	HCL	10YR44	10YR56	F	F			0	0	HR 5		M				
	65-85	SCL	25Y 53	10YR58	M	D		Y	0	0	HR 10		M				
	85-90	HCL	25Y 53	10YR58	M	D		Y	0	0	HR 30		M				IMP GRAVELY
16	0-23	HZCL	10YR42						0	0	HR 2						
	23-65	C	10YR4454	10YR56	C	F		S	0	0	0		M				FRIABLEHCL?
	65-75	C	25Y 53	10YR68	C	D		Y	0	0	0		P		Y	PLASTIC	
	75-120	C	25Y 63	10YR58	M	D		Y	0	0	0		P		Y	PLASTIC	
17	0-35	HZCL	10YR42						0	0	HR 2						
	35-45	HCL	10YR53	10YR66	F	D		N	0	0	0		M				
	45-75	SCL	25Y 63	10YR58	M	D		Y	0	0	HR 5		P		Y	FIRM	
	75-90	C	25Y 61	10YR58	M	D		Y	0	0	HR 5		P		Y	PLASTIC	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----		PED	----STONES----			STRUCT/ CONSIST	SUBS			CALC			
				COL	ABUN		CONT	COOL.	GLE		>2	>6	LITH		TOT	STR	POR
18	0-20	MZCL	10YR42	75YR46	F	D			0	0	0						
	20-40	HCL	10YR61	75YR56	M	D		Y	0	0	HR	5		P		Y	FIRM C?
	40-80	C	25Y 63	10YR58	M	D		Y	0	0	HR	5		P		Y	PLASTIC
19	0-35	C	10YR52	75YR46	C	D		Y	0	0	HR	2					
	35-70	C	26Y 62	10YR58	M	D		Y	0	0	HR	5		P		Y	PLASTIC
20	0-35	C	10YR52	75YR46	C	D		Y	0	0		0					
	35-70	C	25Y 61	10YR58	M	D		Y	0	0	HR	5		P		Y	PLASTIC
21	0-26	HCL	10YR43						0	0		0					
	26-55	HCL	10YR5354	10YR56	C	F		Y	0	0		0		M			FRIABLE
	55-120	HCL	25Y 62	10YR68	M	D		Y	0	0		0		M			FRIABLE
22	0-28	HCL	10YR43						0	0		0					
	28-45	C	25Y 53	10YR58	C	D		Y	0	0		0		M			FRIABLEHCL?
	45-90	C	25Y 6163	10YR58	M	D		Y	0	0		0		P		Y	PLASTIC
23	0-22	HCL	10YR41	10YR46	C	D		Y	0	0	HR	2					
	22-40	C	25Y 52	10YR58	C	D		Y	0	0	HR	10		M			FRIABLEHCL?
	40-80	C	25Y 6162	10YR58	M	D		Y	0	0		0		P		Y	FRIABLE
24	0-28	HCL	10YR42	10YR46	C	D		Y	0	0		0					
	28-40	C	25Y 52	10YR56	C	D		Y	0	0	HR	5		M		Y	FRIABLE
	40-80	C	25Y 6162	10YR68	M	D		Y	0	0		0		P		Y	PLASTIC
25	0-28	HCL	10YR42	10YR46	F	D			0	0	HR	2					
	28-60	C	25Y 6364	10YR58	C	D		Y	0	0	HR	3		P		Y	
	60-90	C	25Y 62	10YR58	M	D		Y	0	0		0		P		Y	PLASTIC
27	0-22	HCL	10YR42	10YR46	F	D			0	0	HR	5					
	22-60	C	25Z 63	10YR58	M	D		Y	0	0	HR	5		P		Y	
	60-90	C	05Y 61	10YR68	M	D		Y	0	0		0		P		Y	PLASTIC
28	0-27	HCL	10YR43	10YR46	C	F		S	0	0		0					
	27-37	C	25Y 53	10YR58	C	D		Y	0	0		0		P		Y	FIRM
	37-60	C	05Y 62	10YR68	M	D		Y	0	0		0		P		Y	PLASTIC
29	0-27	MCL	75YR44	75YR46	F	F			0	0	HR	5					+M. SAND
	27-68	SCL	75YR42	75YR46	C	D		Y	0	0	HR	15		M			FRIABLE
30	0-27	MCL	10YR42						1	0	HR	5					+M. SAND
	27-37	HCL	75YR42	75YR46	C	D		Y	0	0	HR	10		M			+M. SAND
	37-60	C	25Y62	10YR68	M	D		Y	0	0		0		P		Y	PLASTIC
31	0-37	HCL	10YR42						1	0	HR	5					
	37-50	C	25Y53	10YR56	M	D		Y	0	0	HR	10		P		Y	FIRM
	50-70	C	25Y62	10YR68	M	D		Y	0	0		0		P		Y	PLASTIC

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES-----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR	POR	IMP	SPL
33	0-28	HCL	10YR4252	10YR46	F	D		0	0	0							
	28-45	C	25Y 53	10YR56	C	D		Y	0	0	0		P		Y		FIRM
	45-80	C	05Y 61	10YR68	M	D		Y	0	0	0		P		Y		PLASTIC
35	0-25	HCL	10YR41	10YR66	F	D			0	0	0						
	25-50	C	25Y 63	10YR58	C	D		Y	0	0	HR	5		P		Y	FIRM
	50-80	C	25Y 61	10YR58	M	D		Y	0	0	0		P		Y		PLASTIC
36	0-22	HCL	10YR42						0	0	HR	5					
	22-35	C	10YR54	10YR56	F	F			0	0	HR	10		M			FRIABLEHLC?
	35-70	C	25Y 6364	10YR68	M	D		Y	0	0	0		P		Y		PLASTIC
38	0-26	HCL	10YR43	75YR46	C	F		S	0	0	0						
	26-36	C	25Y 63	75YR46	C	D		Y	0	0	HR	2		P		Y	FIRM
	36-60	C	05Y 61	10YR68	M	D		Y	0	0	0		P		Y		PLASTIC
39	0-29	HZCL	75YR42						0	0	HR	2					
	29-47	C	25Y51	10YR58	M	D		Y	0	0	HR	5		P		Y	FIRM
	47-70	C	05Y51	10YR58	M	D		Y	0	0	0		P		Y		PLASTIC
40	0-35	HZCL	10YR41						1	0	HR	3					
	35-55	HCL	10YR52	75YR46	C	D		Y	0	0	0		M				FRIABLE
	55-75	C	25Y 63	10YR68	M	D		Y	0	0	0		P		Y		FIRM
	75-100	C	25Y 61	10YR58	M	D		Y	0	0	HR	10		P		Y	PLASTIC
42	0-25	HCL	10YR43	10YR66	C	F		S	0	0	0						
	25-45	C	25Y 63	10YR58	C	D		Y	0	0	HR	5		P		Y	FIRM
	45-90	C	05Y 63	10YR68	M	D		Y	0	0	HR	5		P		Y	PLASTIC
45	0-27	C	25Y53	25Y66	C	D		Y	0	0	HR	2					
	27-60	C	25Y52	10YR58	M	D		Y	0	0	0		P		Y	Y	V. STICKY PLASTIC
47	0-26	C	25Y52	25Y66	C	D		Y	0	0	HR	3					
	26-60	C	05Y62	10YR68	M	D		Y	0	0	0		P		Y		V. STICKY PLASTIC
49	0-20	HCL	10YR43						0	0	0						
	20-30	C	25Y 63	10YR66	C	F		Y	0	0	HR	5		P		Y	FIRM
	30-60	C	05Y 61	10YR58	M	D		Y	0	0	0		P		Y		PLASTIC
50	0-25	HCL	10YR43	10YR66	C	F		S	0	0	0						
	25-65	C	25Y 63	10YR68	C	D		Y	0	0	0		P		Y		FIRM
	65-90	C	05Y 61	10YR58	M	D		Y	0	0	0		P		Y		PLASTIC
51	0-23	HZCL	10YR42						0	0	0						
	23-60	C	25Y61	10YR58	C	D		Y	0	0	0		P		Y		PLASTIC
53	0-18	HZCL	10YR42	10YR56	C	F		Y	0	0	0						
	18-35	C	10YR61	10YR58	C	D		Y	0	0	0		P		Y		
	35-70	C	05Y61	10YR58	M	D		Y	0	0	0		P		Y		PLASTIC

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			CALC			
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR		POR	IMP	SPL
55	0-25	HZCL	10YR42							0	0	0						
	25-60	C	25Y61	10YR58	C	D		Y	0	0	0		P		Y		PLASTIC	
58	0-18	MZCL	10YR51	10YR56	C	D		Y	0	0	0							
	18-29	C	25Y61	10YR58	M	D		Y	0	0	0		P		Y		FIRM	
	29-60	C	25Y72	10YR58	M	D		Y	0	0	0		P		Y		PLASTIC	
60	0-25	MZCL	10YR52							0	0	HR	1					
	25-60	C	10YR61	10YR58	M	D		Y	0	0	0		P		Y		PLASTIC	
61	0-28	HZCL	10YR42							2	1	HR	3					
	28-60	C	25Y61	10YR58	M	D		Y	0	0	0				Y		PLASTIC	
62	0-25	HZCL	10YR42							0	0	HR	1					
	25-60	C	10YR53	10YR58	M	D		Y	0	0	0				Y		PLASTIC	
64	0-22	HZCL	10YR42	10YR58	C	D		Y	0	0	0							
	22-70	C	25Y6162	10YR56	M	D		Y	0	0	0		P		Y		PLASTIC	
66	0-29	MZCL	10YR42							0	0	0						
	29-70	C	10YR52	10YR58	M	D		Y	0	0	0		P		Y		PLASTIC	
68	0-24	HZCL	10YR42							0	0	HR	1					
	24-70	C	25Y61	10YR58	M	D		Y	0	0	0		P		Y		PLASTIC	
1P	0-23	HZCL	10YR42	10YR46	C	D		Y	0	0	HR	5						
	23-39	HCL	25Y 5363	10YR58	C	D		Y	0	0	HR	10	MDCSAB	FR	M			FRIABLE
	39-60	C	25Y 63	10YR58	M	D		Y	0	0	0		MDCAB	FM	P	Y	Y	PLASTIC
2P	0-17	HCL	10YR42	10YR46	F	D				0	0	HR	3					
	17-36	C	25Y 52	10YR58	M	D	25Y 53	Y	0	0	HR	5	MDCAB	FR	M	Y	Y	FIRM
	36-55	C	05Y 61	10YR68	M	D		Y	0	0	0		MDCAB	FM	P	Y	Y	PLASTIC
3P	0-25	MCL	75YR43							1	0	HR	7					
	25-60	SCL	10YR53	75YR46	C	D		Y	0	0	HR	29	LOOSE	FR	M			PSD=SCL
	60-75	SCL	10YR53	75YR58	M	D		Y	0	0	HR	47			M			SL. CEMENTED
	75-90	C	05Y 61	10YR68	M	D		Y	0	0	HR	0	MASSVE	VF	P	Y	Y	V. PLASTIC
4P	0-19	HZCL	10YR52							0	0	HR	1					
	19-38	C	25Y62	75YR58	C	D		Y	0	0	HR	1	MDCP	FM		Y	Y	FIRM
	38-60	C	25Y72	10YR58	C	D		Y	0	0	HR	1	MCAB	FM		Y	Y	PLASTIC