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Winchester District Local Plan
Land at Denmead, Hampshire.
Agricultural Land Classification
ALC Map and Report
April 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

WINCHESTER DISTRICT LOCAL PLAN.
LAND AT DENMEAD.

1. Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the Winchester District of Hampshire. The work forms part of MAFF's statutory input to the preparation of the Winchester District Local Plan.

1.2 The site comprises approximately 45 hectares of land to the north of Denmead, near Waterlooville in Hampshire. An Agricultural Land Classification (ALC) survey was carried out in April 1995. The survey was undertaken at a detailed level of approximately one boring per hectare of agricultural land surveyed. A total of 46 borings and three soil inspection pits were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land, (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose a long term limitation on its use for agriculture.

1.3 The survey work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of the survey the agricultural land on the site comprised permanent grassland, grassland ley and cereals. Areas of urban marked on the map comprises private dwellings and roads.

1.5 The distribution of grades and subgrades is shown on the attached ALC map, and the areas and extent are given in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
3a	24.6	54.1	55.9
3b	15.2	33.4	34.5
4	4.2	9.2	9.6
Urban	1.5	3.3	100% (44.0 ha.)
Total area of site	45.5	100%	

1.6 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.7 The agricultural land on the site has been classified as Subgrades 3a and 3b with an area of Grade 4 at the western end. The main limitation associated with this site is wetness due to the slowly permeable clayey subsoils that predominate over the site. The wetness limitation is most severe at the western end of the site where the land has been classified as Grade 4. In the central part of the site an area of very stony soils has been identified, giving rise to land of Subgrade 3b due to a moderately severe droughtiness restriction.

2. Climate

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

2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (degree days Jan-June), as a measure of the relative warmth of a locality.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site.

2.4 However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. The climate at this location is relatively warm and moist in a regional context, therefore the likelihood of a soil wetness limitation may be increased.

2.5 No local climatic factors such as exposure or frost risk are believed to affect the site.

Table 2 : Climatic Interpolation

Grid Reference	SU 669 122
Altitude (m)	50
Accumulated Temperature (day degrees, Jan-June)	1494
Average Annual Rainfall (mm)	839
Field Capacity (days)	182
Moisture Deficit, Wheat (mm)	105
Moisture Deficit, Potatoes (mm)	98
Overall Climatic Grade	1

3. Relief

3.1 The site is gently undulating, lying at an altitude of approximately 45-50m AOD. Gradients of between 0-4° have been measured on the site with the steeper slopes occurring toward the western end of the site. Such gradients however are not considered to be limiting to agricultural operations.

4. Geology and Soils

4.1 The published geological map (BGS, 1971) shows the majority of the site to be underlain by Upper Chalk from the east, with the western part mapped as Reading Beds.

4.2 The published Soil Survey map (SSEW, 1983) shows the soils on the site to comprise those of the Carstens association. These are described as 'well drained fine silty over clayey, clayey and fine silty soils, often very flinty' (SSEW 1983).

4.3 Detailed field examination found the soils towards the east of the site to be fine silty over clayey, variably flinty and generally showing signs of a minor wetness imperfection. In the central part of the site, better drained very stony variants were identified.

4.4 On the slightly higher land to the west of the site, poorly drained fine silty over clayey soils with slowly permeable subsoils were mapped.

5. Agricultural Land Classification

5.1 The location of the soil observation points are shown on the attached sample point map.

Subgrade 3a

5.2 Two areas of Subgrade 3a have been mapped, with the land restricted to this subgrade principally due to a wetness limitation. The soils in these areas typically have a medium silty clay loam topsoil over a heavy silty clay loam upper subsoil overlying a mottled stony clay. The soil profile pit within this unit (pit 3) indicates that the mottled clay subsoil is poorly structured and slowly permeable and the soils have therefore been assessed as wetness class II or III depending on the depth to the clay. The soils are also variably stony, and moisture balance calculations indicate that the stonier profiles will also suffer a droughtiness restriction limiting them to this subgrade. Included within this unit are some better drained profiles, which have been assessed as wetness class I and as such are Grade 2 quality. However, these profiles do not occur in a sufficiently large area to warrant separate delineation at this scale of mapping.

Subgrade 3b

5.3 Two areas of Subgrade 3b have been identified. The area in the central part of the site correlates with very stony soils where the major limitation is soil droughtiness. These soils typically have a moderately stony medium silty clay loam topsoil over a very stony heavy silty clay loam or clay subsoil. Measurements made in a soil profile pit in this area (pit 2) indicate subsoil stone contents in the region of 50% by volume. Moisture balance calculations indicate a moderately severe droughtiness limitation due to the volume of stones in the soil, restricting the land to this subgrade.

5.4 The second area of Subgrade 3b has been mapped toward the western end of the site, with the land being restricted to this subgrade due to a moderately severe wetness limitation. The soils in this area typically have a medium silty clay loam topsoil overlying a clay subsoil. The subsoils are typically strongly mottled and gleyed having a coarse angular

blocky structure (see pit 1). The presence of gleying and the relatively shallow depth to the slowly permeable layers means that these soils are assigned to Wetness Class IV with a resultant classification of Subgrade 3b, given the prevailing climatic conditions. Further evidence of the wet soil conditions that prevail in this area is provided by the degree of poaching of the grass sward that had been caused by grazing animals.

Grade 4

5.5 The extreme western end of the site has been classified as Grade 4 due to a severe wetness limitation. The soils in this area typically have a 15cm thick medium silty clay loam topsoil over a strongly mottled clay subsoil. The soils are strongly gleyed to the surface and the clays are slowly permeable. As with the adjacent Subgrade 3b soils, this land is placed into Wetness Class IV but is assessed as poorer quality because of the heavier nature of the top 25cm (this has been assessed as a heavy clay loam). The severity of gleying associated with the shallow depth to the underlying clay results in a major limitation to the agricultural use of this area with the land being restricted to permanent grassland.

ADAS Ref: 1513/59/95
MAFF Ref: EL 15/594

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1975), Sheet No. 299, Winchester, 1:50,000 Series (drift edition).

MAFF (1988), Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

Meteorological Office (1989), Climatological Data for Agricultural Land Classification.

Soil Survey of England and Wales (1983), Sheet 6, Soils of South East England, 1:250,000 and accompanying legend.

APPENDIX I

DESCRIPTION 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 (eg. 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.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural Buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

Open Water

Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years.[2]
II	The soil profile is wet within 70 cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

[1]The number of days specified is not necessarily a continuous period.
[2]'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF** : national 100 km grid square and 8 figure grid reference.

2. **USE** : Land use at the time of survey. The following abbreviations are used.

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

3. **GRDNT** : Gradient as estimated or measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in centimetres (cm) to gleying and/or slowly permeable layers.

5. **AP (WHEAT/POTS)** : Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)** : Moisture Balance. (Crop adjusted AP - crop adjusted MD)

7. **DRT** : Best grade according to soil droughtiness.

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

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

9. **LIMIT** : The main limitation to land quality. The following abbreviations are used.

OC : Overall Climate	**AE** : Aspect	**EX** : Exposure
FR : Frost Risk	**GR** : Gradient	**MR** : Microrelief
FL : Flood Risk	**TX** : Topsoil Texture	**DP** : Soil Depth
CH : Chemical	**WE** : Wetness	**WK** : Workability
DR : Drought	**ER** : Erosion Risk	**WD** : Soil Wetness/Droughtiness
ST : Topsoil Stoniness		

Soil Pits and Auger Borings

1. **TEXTURE** : soil texture classes are denoted by the following abbreviations.

S :	Sand	**LS** :	Loamy Sand	**SL** :	Sandy Loam
SZL :	Sandy Silt Loam	**CL** :	Clay Loam	**ZCL** :	Silty Clay Loam
ZL :	Silt Loam	**SCL** :	Sandy Clay Loam	**C** :	Clay
SC :	Sandy Clay	**ZC** :	Silty Clay	**OL** :	Organic Loam
P :	Peat	**SP** :	Sandy Peat	**LP** :	Loamy Peat
PL :	Peaty Loam	**PS** :	Peaty Sand	**MZ** :	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

F : Fine (more than 66% of the sand less than 0.2mm)
M : Medium (less than 66% fine sand and less than 33% coarse sand)
C : Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M** : Medium (<27% clay) **H** : Heavy (27-35% clay)

2. **MOTTLE COL** : Mottle colour using Munsell notation.

3. **MOTTLE ABUN** : Mottle abundance, expressed as a percentage of the matrix or surface described.

F : few <2% **C** : common 2-20% **M** : many 20-40% **VM** : very many 40% +

4. **MOTTLE CONT** : Mottle contrast

F : faint - indistinct mottles, evident only on close inspection
D : distinct - mottles are readily seen
P : prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL** : Ped face colour using Munsell notation.

6. **GLEY** : If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH** : Stone Lithology - One of the following is used.

HR :	all hard rocks and stones	**SLST** :	soft oolitic or dolimitic limestone
CH :	chalk	**FSST** :	soft, fine grained sandstone
ZR :	soft, argillaceous, or silty rocks	**GH** :	gravel with non-porous (hard) stones
MSST :	soft, medium grained sandstone	**GS** :	gravel with porous (soft) stones
SI :	soft weathered igneous/metamorphic rock		

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

8. **STRUCT** : the degree of development, size and shape of soil peds are described using the following notation:

degree of development	**WK** : *weakly developed*	**MD** : *moderately developed*
	ST : strongly developed	
ped size	**F** : fine	**M** : medium
	C : coarse	**VC** : very coarse
ped shape	**S** : single grain	**M** : massive
	GR : granular	**AB** : angular blocky
	SAB : sub-angular blocky	**PR** : prismatic
	PL : platy	

9. **CONSIST** : Soil consistence is described using the following notation:

L : loose **VF** : very friable **FR** : friable **FM** : firm **VM** : very firm
EM : extremely firm **EH** : extremely hard

10. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness : **G** : good **M** : moderate **P** : poor

11. **POR** : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP** : If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropiate horizon.

13. **SPL** : Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC** : If the soil horizon is calcareous, a 'Y' will appear in this column.

15. Other notations
APW : available water capacity (in mm) adjusted for wheat
APP : available water capacity (in mm) adjusted for potatoes
MBW : moisture balance, wheat
MBP : moisture balance, potatoes

SOIL PIT DESCRIPTION

Site Name : WINCH LP DENMEAD Pit Number : 1P

Grid Reference: SU66101210 Average Annual Rainfall : 839 mm
Accumulated Temperature : 1494 degree days
Field Capacity Level : 182 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MZCL	10YR52 00	2	3	HR	C				
28- 55	ZC	10YR64 00	0	2	HR	C	WKCSAB	FM	P	
55- 80	C	10YR64 00	0	0		M	MDVCAB	VM	P	

Wetness Grade : 3B Wetness Class : IV
Gleying : 0 cm
SPL :028 cm

Drought Grade : 3A APW : 106mm MBW : 1 mm
APP : 111mm MBP : 13 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : WINCH LP DENMEAD Pit Number : 2P

Grid Reference: SU66501210 Average Annual Rainfall : 839 mm
Accumulated Temperature : 1494 degree days
Field Capacity Level : 182 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 26	MZCL	10YR43 00	15	18	HR					
26- 55	MCL	10YR54 00	0	50	HR		WKCSAB	FR	M	
55-100	C	75YR54 00	0	55	HR				M	

Wetness Grade : 2 Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 3B APW : 081mm MBW : -24 mm
APP : 077mm MBP : -21 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : WINCH LP DENMEAD Pit Number : 3P

Grid Reference: SU66601200
Average Annual Rainfall : 839 mm
Accumulated Temperature : 1494 degree days
Field Capacity Level : 182 days
Land Use : Cereals
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MZCL	10YR43 00	4	8	HR					
28- 60	HZCL	10YR54 00	0	20	HR		MDCSAB	FM	M	
60- 80	C	10YR63 00	0	20	HR	C	WKVCSA	VM	P	

Wetness Grade : 3A
Wetness Class : III
Gleying :060 cm
SPL :060 cm

Drought Grade : 3A
APW : 099mm MBW : -6 mm
APP : 104mm MBP : 6 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SAMPLE NO.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT		ALC	COMMENTS
42	SU67001200	CER	E	02			1	2	116	11	115	17	2				WK	2	I85	FLINTS
43	SU66601190	CER			025	025	4	3B	000	0	000	0					WE	3B		
44	SU66701190	CER			S40	050	3	3A	105	0	109	11	3A				WE	3A		
45	SU66801190	CER	E	02	S30	050	3	3B	118	13	108	10	2				WE	3B		
46	SU66901190	CER	E	02	S60	060	2	3A	111	6	113	15	2				WE	3A	I85	FLINTS
47	SU66901185	CER					1	2	086	-19	092	-6	3A				DR	3A	I60	FLINTS
48	SU66001201	PGR			012	040	4	4	087	-18	090	-8	3A				WE	4		

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	0-30	mzcl	10YR43 00						5	0	HR	7							
	30-60	c	10YR54 00						0	0	HR	18		M					I60 FLINTS
1P	0-28	mzcl	10YR52 00	75YR46 00	C			Y	2	0	HR	3							
	28-55	zc	10YR64 00	10YR66 00	C		00MN00 00	Y	0	0	HR	2	WKCSAB FM	P	Y		Y		
	55-80	c	10YR64 00	05YR66 00	M		25Y 72 00	Y	0	0		0	MDVCAB VM	P	Y		Y		
2	0-30	hcl	10YR43 00						4	0	HR	5							
	30-55	c	10YR54 00						0	0	HR	15		M					
	55-90	c	10YR64 00	10YR66 00	C			Y	0	0	HR	10		P			Y		I90 FLINTS
2P	0-26	mzcl	10YR43 00						15	0	HR	18							
	26-55	mcl	10YR54 00						0	0	HR	50	WKCSAB FR	M					
	55-100	c	75YR54 00						0	0	HR	55		M					
3	0-20	hzcl	10YR53 00						3	0	HR	4							
	20-55	c	10YR55 00	10YR66 00	F				0	0	HR	15		M					
	55-80	c	10YR64 00	75YR56 00	C			Y	0	0	HR	5		P			Y		
	80-100	c	25Y 64 00	10YR66 00	M			Y	0	0	HR	5		P			Y		
3P	0-28	mzcl	10YR43 00						4	3	HR	8							
	28-60	hzcl	10YR54 00						0	0	HR	20	MDCSAB FM	M					
	60-80	c	10YR63 00	10YR66 00	C			Y	0	0	HR	20	WKVCSA VM	P	Y		Y		
4	0-30	mzcl	75YR43 00						6	0	HR	10							
	30-90	c	75YR44 00	00MN00 00	F				0	0	HR	15		M					
	90-110	zc	25Y 73 00	10YR66 00	C			Y	0	0	CH	25		M					
5	0-28	mzcl	10YR43 00						6	0	HR	8							
	28-60	c	10YR54 00	00MN00 00	C			S	0	0	HR	15		M					
	60-100	c	25Y 64 00	10YR66 00	C		00MN00 00	Y	0	0	HR	8		P			Y		
6	0-30	mzcl	10YR53 00						10	0	HR	12							
	30-40	mzcl	75YR43 00						0	0	HR	25		M					I40 FLINTS
7	0-30	mzcl	10YR43 53						6	0	HR	10							
	30-40	mzcl	10YR43 00						0	0	HR	25		M					I40 FLINTS
8	0-27	mzcl	10YR53 00						5	0	HR	8							
	27-45	mzcl	10YR44 00						0	0	HR	5		M					
	45-120	c	10YR64 54	00MN00 00	F				0	0		0		M					
9	0-26	mzcl	10YR53 00						5	0	HR	8							
	26-40	hzcl	10YR54 00						0	0	HR	8		M					
	40-60	c	75YR46 00	75YR58 00	C		00MN00 00	S	0	0	HR	5		P			Y		
10	0-15	mzcl	10YR42 00	10YR56 00	M			Y	0	0	HR	2							
	15-40	c	25Y 63 00	10YR68 00	M		25Y 72 00	Y	0	0	HR	1		M					OVERALL
	40-100	c	25Y 63 00	10YR68 00	M		25Y 71 00	Y	0	0	HR	6		P			Y		HEAVY TOPSOIL

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
11	0-15	mzcl	25Y 42 00	10YR56 00	M			Y	0	0	HR	1							
	15-45	zc	25Y 53 00	10YR56 00	M			Y	0	0	HR	5		M					
	45-85	c	25Y 63 00	10YR66 00	M		25Y 71 00	Y	0	0	HR	6		P		Y		OVERALL	
	85-100	c	25Y 62 00	10YR68 00	M			Y	0	0		0		P		Y		HEAVY TOPSOIL	
12	0-25	mzcl	10YR42 00	10YR56 00	M			Y	0	0		0							
	25-45	c	25Y 54 00	10YR56 00	C			S	0	0	HR	5		M					
	45-100	c	25Y 63 00	10YR66 00	M		25Y 72 00	Y	0	0		0		P		Y			
13	0-17	mzcl	10YR43 00						0	0		0							
	17-50	c	10YR64 00	10YR66 00	C			Y	0	0	HR	8		M					
	50-80	c	10YR64 00	10YR64 00	M		10YR72 00	Y	0	0	HR	1		P		Y			
	80-100	c	25Y 73 00	10YR68 00	M			Y	0	0		0		P		Y			
14	0-25	zl	75YR43 00						4	0	HR	5							
	25-45	hzcl	10YR54 00						0	0	HR	5		M					
	45-75	c	10YR54 00	75YR56 00	C		00MN00 00	S	0	0	HR	5		P		Y			
16	0-30	mzcl	10YR43 00						10	0	HR	12							
	30-35	mzcl	10YR53 00						0	0	HR	25		M				I35 FLINTS	
17	0-27	mzcl	10YR53 00						4	0	HR	6							
	27-40	mzcl	10YR44 00						0	0	HR	25		M				I40 FLINTS	
18	0-25	mzcl	10YR53 43						5	0	HR	8							
	25-35	hzcl	10YR54 00						0	0	HR	10		M					
	35-70	c	10YR66 00	75YR54 00	C		00MN00 00	S	0	0	HR	10		P		Y			
19	0-25	mzcl	10YR43 00						8	0	HR	10							
	25-65	c	10YR64 00	75YR54 00	C		00MN00 00	Y	0	0	HR	15		P		Y			
20	0-26	mzcl	10YR53 00						8	0	HR	10							
	26-35	mzcl	10YR44 00						0	0	HR	25		M				I35 FLINTS	
21	0-25	mzcl	10YR53 00						8	0	HR	10							
	25-70	c	10YR66 00	75YR54 00	C		00MN00 00	S	0	0	HR	10		P		Y			
22	0-16	mzcl	10YR42 00	10YR56 00	M			Y	0	0	HR	2							
	16-35	c	25Y 52 00	10YR68 00	M			Y	0	0	HR	1		M				OVERALL	
	35-80	c	25Y 63 00	10YR68 00	M		25Y 72 00	Y	0	0	HR	8		P		Y		HEAVY TOPSOIL	
23	0-25	mzcl	10YR43 00	10YR56 00	C			Y	0	0		0							
	25-60	c	10YR64 00	10YR66 00	C		10YR62 00	Y	0	0	HR	5		P		Y			
	60-100	c	10YR64 00	10YR62 00	M		25YR46 00	Y	0	0		0		P		Y			
24	0-10	zl	75YR42 00	75YR46 00	C			Y	0	0		0							
	10-25	hzcl	10YR53 00	10YR56 00	C			Y	0	0	HR	2		M					
	25-65	zc	25Y 53 00	10YR56 00	C		10YR62 00	Y	0	0	HR	5		P		Y			
	65-110	zc	25Y 63 00	10YR56 00	M		25Y 71 00	Y	0	0		0		P		Y			

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
25	0-25	hzcl	10YR43 00	75YR46 00	F				2	0	HR	4							
	25-55	c	10YR53 00	10YR58 00	C			Y	0	0	HR	7		P			Y		
	55-100	c	10YR53 00	75YR56 00	C			Y	0	0	HR	5		P			Y		
26	0-28	mzcl	10YR42 00						8	0	HR	12							
	28-45	hcl	10YR54 00						0	0	HR	20		M					I45 FLINTS
28	0-26	mzcl	10YR53 00						8	0	HR	10							
	26-40	mzcl	10YR53 00						0	0	HR	25		M					I40 FLINTS
29	0-25	mzcl	10YR53 00						5	0	HR	8							
	25-40	mzcl	10YR44 00						0	0	HR	10		M					
	40-60	hzcl	10YR54 00	75YR56 00	C		00MN00 00	S	0	0	HR	30		M					I60 FLINTS
30	0-30	mzcl	10YR53 00						5	0	HR	8							
	30-43	mzcl	10YR54 00						0	0	HR	10		M					
	43-70	c	10YR66 00	75YR54 00	C		00MN00 00	S	0	0	HR	15		P			Y		I70 FLINTS
31	0-25	mzcl	10YR53 00						5	0	HR	8							
	25-60	c	10YR66 00	75YR54 00	C		00MN00 00	S	0	0	HR	15		P			Y		I60 FLINTS
32	0-30	mzcl	10YR53 00						5	0	HR	8							
	30-40	c	10YR54 00	75YR56 00	C			S	0	0	HR	25		M					
	40-60	c	10YR66 00	75YR54 00	C		00MN00 00	S	0	0	HR	10		P			Y		I60 FLINTS
33	0-20	mzcl	25Y 52 00	10YR56 00	M			Y	0	0	HR	1							
	20-45	hzcl	25Y 62 00	75YR56 00	C			Y	0	0	HR	12		M					
	45-70	c	10YR63 00	10YR68 00	M		25Y 72 00	Y	0	0	HR	15		P			Y		I70 FLINTS
34	0-22	mzcl	10YR43 00	10YR56 00	C			S	2	0	HR	3							
	22-45	c	25Y 63 00	10YR56 00	C			Y	0	0	HR	15		M					
	45-70	c	25Y 64 00	10YR68 00	M		25Y 71 00	Y	0	0	HR	1		P			Y		
35	0-28	zl	10YR53 00	10YR56 00	F				12	0	HR	15							
	28-50	mzcl	25Y 62 00						0	0	HR	25		M					I50 FLINTS
36	0-30	mcl	10YR43 00						10	0	HR	15							
	30-70	hzcl	10YR54 00						0	0	HR	15		M					I70 FLINTS
37	0-30	mcl	10YR43 00						10	0	HR	15							
	30-65	c	75YR44 00						0	0	HR	20		M					I65 FLINTS
38	0-30	mzcl	10YR43 00						4	0	HR	5							
	30-50	hzcl	10YR54 00						0	0	HR	5		M					I60 FLINTS
	50-60	c	75YR55 00	75YR56 00	C			S	0	0	HR	15		M					
39	0-30	mzcl	10YR43 00						4	0	HR	5							
	30-55	hzcl	75YR55 00						0	0	HR	12		M					
	55-100	c	10YR54 00	10YR56 00	F		00MN00 00		0	0	HR	5		M					

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
40	0-30	mzcl	10YR43 00						3	0	HR	5							
	30-50	hzcl	10YR54 00						0	0	HR	12		M					
	50-80	c	10YR54 00	00MN00	00	F			0	0	HR	15		M					I80 FLINTS
41	0-32	mzcl	10YR43 00						2	0	HR	6							
	32-85	c	10YR54 00	10YR56	00	C	00MN00	00 S	0	0	HR	15		P		Y			I85 FLINTS
42	0-32	mzcl	10YR43 00						4	2	HR	8							
	32-85	hzcl	10YR54 00						0	0	HR	9		M					I85 FLINTS
43	0-25	mzcl	10YR52 53						4	0	HR	8							
	25-55	c	10YR62 00	10YR68	71	M		Y	0	0		0		P		Y			
	55-80	c	05Y 74 00	10YR68	00	M		Y	0	0	HR	5		P		Y			
44	0-30	mzcl	10YR53 00						4	0	HR	8							
	30-40	mzcl	10YR53 00						0	0	HR	8		M					
	40-50	hzcl	10YR56 00	10YR58	00	C		S	0	0	HR	5		M					
	50-80	c	10YR64 00	10YR68	00	C		Y	0	0	HR	5		P		Y			
45	0-30	hzcl	10YR43 00						4	0	HR	5							
	30-50	hzcl	10YR54 00	00MN00	00	C		S	0	0	HR	15		M					
	50-65	c	10YR54 00	10YR56	00	C		S	0	0	HR	10		P		Y			
	65-100	c	10YR63 00	10YR66	00	M	00MN00	00 Y	0	0		0		P		Y			
46	0-32	hzcl	10YR43 00						4	0	HR	5							
	32-60	hzcl	10YR54 00						0	0	HR	12		M					
	60-85	c	10YR54 00	10YR66	00	C	00MN00	00 S	0	0	HR	5		P		Y			I85 FLINTS
47	0-30	mzcl	10YR53 00						6	0	HR	10							
	30-35	mzcl	10YR53 00						0	0	HR	10		M					
	35-60	hzcl	10YR54 00						0	0	HR	25		M					I60 FLINTS
48	0-12	zl	75YR42 00						0	0		0							
	12-40	c	10YR52 00	75YR58	00	M		Y	0	0	HR	1		M					OVERALL
	40-55	c	25Y 63 00	10YR68	00	M		Y	0	0	HR	10		P		Y			HEAVY TOPSOIL