A1

Isle of Wight Unitary Development Plan
Hale Manor Farm, Arreton (Minerals)

Agricultural Land Classification
ALC Map and Report

May 1997

Resource Planning Team
Eastern Region
FRCA Reading

RPT Job Number: 1600/078/97
FRCA Reference: EL 16/01251

AGRICULTURAL LAND CLASSIFICATION REPORT

ISLE OF WIGHT UNITARY DEVELOPMENT PLAN (UDP)
HALE MANOR FARM, ARRETON (MINERALS).

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 50 hectares of land around Hale Manor Farm, Arreton. The survey was carried out during May 1997.

2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA) on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with the Isle of Wight Unitary Development Plan. This survey supersedes any previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Eastern Region of the 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 was in arable cultivation.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% site area
2	25.1	49.5
3a	25.6	50.5
Total site area	50.7	100

7. The fieldwork was conducted at an average density of 1 boring every hectare. A total of 49 borings and 3 soil pits were described.

8. The area under agricultural use has been classified as Grade 2 (very good quality) and Subgrade 3a (good quality). The land is predominantly limited by soil droughtiness and soil wetness/workability and occasionally stoniness, to a lesser extent.

9. Much of the site is affected by soil droughtiness restrictions. The soils are variable but typically comprise fine and coarse loamy profiles, which are on the whole freely draining. Profile available water is restricted due to the presence of stones, gravelly horizons and/or sandy textures to varying extents. The degree of restriction determines the ALC grade; the deeper and less stony profiles are assigned to Grade 2, whilst shallower, more gravelly soils fall into Subgrade 3a. Soil droughtiness may result in the yield potential being lower.

10. Parts of the site are equally or solely limited by soil wetness, where soil drainage is impeded. Additionally, the moist climatic regime at this locality gives rise to minor soil workability problems. Occasionally, land quality is also limited by topsoil stoniness. In these areas up to 15% flints > 2cm were measured, the volume of stones determining the severity of the limitation. The presence of large stones in the topsoil has the effect of increasing production costs caused by extra wear and tear to equipment and reducing crop quality and establishment.

FACTORS INFLUENCING ALC GRADE

Climate

11. Climate affects the grading of the land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

12. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factors	Units	Values	Values
Grid reference	N/A	SZ 540 844	SZ 546 842
Altitude	m,AOD	20	25
Accumulated Temperature	day°C	1543	1537
Average Annual Rainfall	mm	896	899
Field Capacity Days	days	187	187
Moisture Deficit, Wheat	mm	107	106
Moisture Deficit, Potatoes	mm	101	99
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 overall climatic limitation. The site is climatically Grade 1. The site is believed not to be at risk from exposure. However, it does lie in an area which is indicated as being 'Rather Frost Prone' (Met. Office, 1968). Detailed field examination indicates that frost is not likely to be a significant limitation in the grading of this site.

Site

16. The agricultural land at this site lies at an altitude of 15-30m AOD. The majority of the land at the site is flat or very gently sloping with slight undulations. Nowhere does gradient or microrelief affect agricultural land quality.

Geology and soils

17. The published geological information fo the site (BGS, 1976) shows the majority of it to be underlain with Lower Greensand which is almost all overlain by drift deposits of gravel terraces (except for the extreme south-west corner of the site).

18. The most recently published soil information (SSEW, 1983) shows the survey area to be entirely mapped as the Hucklesbrook Association. These soils are described as 'Well drained coarse loamy and sandy soils, commonly over gravel. Some similar permeable soils affected by groundwater. Usually on flat land.' (SSEW, 1983). Field examination of the soils on the site found them to be broadly consistent with this description.

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.

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.

Grade 2

21. Just over half of the area is mapped as very good quality agricultural land (Grade 2). This land is affected mainly by soil droughtiness with soil wetness/workability being equally or solely restricting in places. The soils within this unit comprise intermixed sands and clays and as such are very variable depending on the amount of sand in the profile. On the whole, the profiles comprise very slightly to slightly stony (0-10% total flints, 0-2% > 2cm diameter) medium clay loam, sandy clay loam or medium sandy loam topsoils. Where topsoil textures are heavier, these interact with the moist climatic regime at this locality to give rise to minor soil workability problems. The topsoils overlie similar upper subsoils which are again very slightly to slightly stony (0-15% total flints). Lower subsoils vary considerably in composition from loamy medium sand to clay textures (the latter being slowly permeable). These subsoils are generally well drained although occasionally they are gleyed or slightly gleyed at depths between 43-90cm, suggesting seasonal waterlogging. A wetness class of I, or occasionally II has been assigned to these soils depending on the degree of waterlogging. The soils may contain up to 15% total flints. Many of the profiles are impenetrable to the auger at depths between 68-

100cm over flints or sometimes gravel.. On the whole, the combination of soil texture and hard stone restricts the water available to crops such that there is a very slight risk of drought stress to the plants in most years. This, in combination with soil wetness and/or workability (which affects the timing of cultivations and trafficking) restricts the land to Grade 2.

Subgrade 3a

22. The remaining parts of the site have been mapped as good quality agricultural land (Subgrade 3a). Similar to the Grade 2 unit, the principal limitation is soil droughtiness with wetness/workability and topsoil stoniness being equally or more limiting on occasion.

23. The areas affected by soil droughtiness are those where soil texture and moderate stone contents within the profile restrict water availability to plants. Typically, these profiles consist of medium clay loam, sandy clay loam and medium sandy loam topsoils which are very slightly to moderately stony (0-23% total flints, 0-7% >2cm diameter). These pass to similar upper subsoils which have a maximum stone content of 25% total flints. The lower subsoils are again very variable ranging from medium sand textures to sandy clay loam (depending on the amount of sand content). These lower horizons are often gleyed but become more gravelly with depth and impenetrable to the auger between 30-100cm. Despite this, the soils are generally well drained and a Wetness class of I or II has been assigned. The combination of soil characteristics and climate means that water availability to crops is restricted such that there is a slight risk of drought stress to plants in most years. the extent of this soil droughtiness restriction is more severe than for land classified as Grade 2.

24. A few profiles within the Subgrade 3a unit are affected by soil wetness/workability and suffer from impeded drainage which gives rise to gleying at depths between 29 and 35cm. Soils are assigned to wetness class II. The heavier topsoil textures (medium clay loam and sandy clay loam) and imperfect drainage combine with the moist climatic regime to result in a slight wetness/workability limitation which leads to restricted utilisation of the land by reducing the number of days when cultivations and/or grazing may occur without causing structural damage to the soil.Crop growth and development will also be affected by seasonal waterlogging of the soil.

25. Occasionally, a stone content of between 11% and 14% > 2cm diameter in the topsoil is sufficient to limit the classification to Subgrade 3a on the basis of topsoil stones alone. The presence of large stones in the topsoil has the effect of increasing production costs caused by extra wear and tear to equipment and reducing crop quality and establishment.

Sharron Cauldwell
Resource Planning Team,
FRCA Reading.

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet No. 269, Isle of Wight 1:50,000 scale (Drift Edition). BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

Met. Office (1968) *Unpublished Climatological Data.* Map Sheet 180. Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South East England.* 1:250,000 scale. SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England.* Bulletin 15. SSEW: Harpenden.

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 descriptions

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

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

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

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

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

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

15. Other notations:

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

SOIL PIT DESCRIPTION

Site Name : I OF WIGHT UDP ARRETON Pit Number : 1P

Grid Reference: SZ54308430 Average Annual Rainfall : 896 mm
Accumulated Temperature : 1543 degree days
Field Capacity Level : 187 days
Land Use : Cereals
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 35	MCL	10YR42 43	1	5	HR					
35- 54	MCL	10YR56 66	0	3	HR	C	MDVCAB	FR	M	
54- 74	LMS	10YR64 00	0	25	HR	C	MDCSAB	FR	M	
74- 95	LMS	05Y 53 54	0	5	HR	M	WKCSAB	FR	M	
95-120	GH	10YR53 00	0	0					P	

Wetness Grade : 2 Wetness Class : I
Gleying :054 cm
SPL : cm

Drought Grade : 3A APW : 105mm MBW : -2 mm
APP : 099mm MBP : -2 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : I OF WIGHT UDP ARRETON Pit Number : 2P

Grid Reference: SZ54508410
Average Annual Rainfall : 896 mm
Accumulated Temperature : 1543 degree days
Field Capacity Level : 187 days
Land Use : Cereals
Slope and Aspect : 01 degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 32	MCL	10YR42 00	1	5	HR					
32- 50	MCL	10YR43 64	0	3	HR	F	MDCSAB	FR	M	
50- 72	SCL	25Y 63 64	0	6	HR	M	MDCSAB	FR	M	
72-120	LMS	25Y 64 00	0	10	HR	C	WKCSAB	VF	M	

Wetness Grade : 2
Wetness Class : I
Gleying :050 cm
SPL : cm

Drought Grade : 2
APW : 125mm MBW : 18 mm
APP : 111mm MBP : 10 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Soil Wetness/Droughtiness

SOIL PIT DESCRIPTION

Site Name : I OF WIGHT UDP ARRETON Pit Number : 3P

Grid Reference: SZ53908425
Average Annual Rainfall : 896 mm
Accumulated Temperature : 1543 degree days
Field Capacity Level : 187 days
Land Use : Cereals
Slope and Aspect : 01 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MSL	10YR42 00	6	12	HR					
30- 45	MSL	10YR44 00	0	25	HR				M	
45- 80	LMS	10YR46 00	0	25	HR				M	
80-120	MS	10YR53 54	0	2	HR	F	WKMSAB	VF	M	

Wetness Grade : 1
Wetness Class : I
Gleying : cm
SPL : cm

Drought Grade : 3A
APW : 092mm MBW : -15 mm
APP : 076mm MBP : -25 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Droughtiness

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
1	SZ54108480	CER	W	05			1	1	074	-33	075	-26	3B				DR	3A	Imp52 see 3p
1P	SZ54308430	CER			054		1	2	105	-2	099	-2	3A				DR	3A	Assume to 120
2	SZ54208480	CER	N	01			1	1	060	-47	060	-41	3B				DR	3A	Imp40 see 3p
2P	SZ54508410	CER	E	01	050		1	2	125	18	111	10	2				WD	2	Also WK
3	SZ54108470	CER	W	05	035		2	2	110	3	096	-5	3A				TS	3A	DR see 3p
3P	SZ53908425	CER	W	01			1	1	092	-15	076	-25	3A				DR	3A	
4	SZ54208470	CER			043		1	1	101	-6	108	7	3A				DR	2	See 2p
5	SZ54108460	CER	NW	01			1	2	040	-67	040	-61	4				DR	3A	Also ST
6	SZ54208460	CER	W	01			1	2	107	0	113	12	3A				WD	2	Imp 72
7	SZ54008450	CER	W	02			1	2	062	-45	062	-39	3B				DR	3A	Imp40 see 3p
8	SZ54108450	CER	W	01			1	2	101	-6	109	8	3A				DR	3A	Poss 2
9	SZ54208450	CER	N	01			1	1	088	-19	092	-9	3A				DR	3A	Imp60 see 1p
10	SZ54308450	CER			055		1	1	151	44	111	10	2				DR	2	
11	SZ54408450	CER			035		2	3A	077	-30	077	-24	3B				WD	3A	see 1p
12	SZ54508450	CER			030		2	2	055	-52	055	-46	4				DR	3A	Also ST
13	SZ54708450	CER					1	1	086	-21	090	-11	3B				DR	3A	Imp60 see 3p
14	SZ54008440	CER	W	01			1	1	123	16	105	4	2				DR	2	Imp 100
15	SZ54108440	CER					1	2	090	-17	093	-8	3A				DR	3A	Imp65 see 1p
16	SZ54208440	CER	N	01			1	2	106	-1	101	0	3A				WD	2	
17	SZ54308440	CER			055		1	2	094	-13	097	-4	3A				DR	3A	Imp60 see 1p
18	SZ54408440	CER			045		1	2	094	-13	098	-3	3A				DR	3A	Imp60 see 1p
19	SZ54508440	CER					1	2	049	-58	049	-52	4				DR	3A	Imp30 see 3p
20	SZ54608440	CER	W	02	080		1	2	156	49	118	17	1				WK	2	
21	SZ54708440	CER					1	2	105	-2	108	.7	3A				DR	3A	Imp75 poss 2
22	SZ54808440	CER					1	2	093	-14	099	-2	3A				DR	3A	See 1p
23	SZ53908430	CER	W	01			1	1	053	-54	053	-48	4				DR	3A	See 3p
24	SZ54008430	CER	W	01			1	2	119	12	113	12	2				WD	2	
25	SZ54108430	CER					1	2	051	-56	051	-50	4				DR	3A	Imp30 see 3p
26	SZ54208430	CER			090		1	2	153	46	115	14	1				WK	2	
27	SZ54308430	CER					1	1	063	-44	063	-38	3B				DR	3A	Imp40 see 3p
28	SZ54408430	CER					1	2	095	-12	100	-1	3A				DR	3A	Imp60 see 1p
29	SZ54508430	CER			030		1	1	098	-9	106	5	3A				DR	3A	Imp 70
30	SZ54608430	CER	W	01	060	070	2	2	135	28	109	8	2				WD	2	Imp 110
31	SZ54708430	CER	W	02			1	2	110	3	105	4	3A				WD	2	Also WK
32	SZ54808430	CER	W	01			1	2	086	-21	088	-13	3B				DR	3A	Imp55 see 1p
33	SZ53908420	CER	SW	01			1	1	037	-70	037	-64	4				DR	3A	Imp25 see 3p
34	SZ54008420	CER	W	01			1	2	103	-4	109	8	3A				WD	2	
35	SZ54108420	CER	W	01			1	2	150	43	110	9	2				WD	2	
36	SZ54208420	CER					1	1	049	-58	049	-52	4				DR	3A	Imp 30
37	SZ54308420	CER	E	01			1	2	113	6	115	14	2				DR	2	Also WK
38	SZ54408420	CER	W	01			1	2	105	-2	117	16	3A				DR	2	Also WK
39	SZ54508420	CER	E	01	050		1	2	136	29	118	17	2				DR	2	Also WK

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
40	SZ54608420	CER			035		2	3A	153	46	115	14	1				WE	3A	
41	SZ54708420	CER	W	01	045		1	2	094	-13	100	-1	3A				DR	3A	Imp60 see 1P
42	SZ54808420	CER					1	1	107	0	092	-9	3A				DR	3A	Imp100
43	SZ54108410	CER	W	01			1	2	090	-17	096	-5	3A				WD	2	See 2p
44	SZ54208410	CER	W	01			1	2	134	27	115	14	2				WD	2	Imp 100
45	SZ54308410	CER	W	01			1	2	000	0	000	0					DR	3A	Imp 35
46	SZ54408410	CER			085	085	1	2	143	36	113	12	1				WK	2	
47	SZ54508410	CER	E	01			1	2	102	-5	113	12	3A				DR	3A	See 2p
48	SZ54608410	CER			050	068	2	3A	116	9	112	11	2				WE	3A	Imp 90
49	SZ54778413	WHT	W	01	055		1	2	098	-9	105	4	3A				DR	3A	Imp 68

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-30	msl	10YR43 00						7	0	HR	9							
	30-52	msl	10YR44 00						0	0	HR	15		M					IMP, FLINTS
1P	0-35	mcl	10YR42 43						1	3	HR	5							
	35-54	mcl	10YR56 66	10YR58 00	C		00MN00 00	S	0	0	HR	3	MDVCAB	FR M					
	54-74	lms	10YR64 00	75YR58 00	C			Y	0	0	HR	25	MDCSAB	FR M					
	74-95	lms	05Y 53 54	75YR58 00	M			Y	0	0	HR	5	WKCSAB	FR M					
	95-120	gh	10YR53 00						0	0		0		P					ASSUME ROOTS
2	0-30	msl	10YR43 00						6	0	HR	8							
	30-40	msl	10YR44 00						0	0	HR	15		M					IMP, FLINTS
2P	0-32	mcl	10YR42 00						1	0	HR	5							
	32-50	mcl	10YR43 64	10YR58 00	F				0	0	HR	3	MDCSAB	FR M					
	50-72	scl	25Y 63 64	75YR58 00	M			Y	0	0	HR	6	MDCSAB	FR M					POROUS
	72-120	lms	25Y 64 00	10YR56 00	C			Y	0	0	HR	10	WKCSAB	VF M					FRIABLE
3	0-35	msl	10YR43 00						11	0	HR	15							
	35-45	mcl	10YR64 00	75YR58 00	C			Y	0	0	HR	5		M					
	45-60	msl	10YR64 00	05YR58 00	C			Y	0	0	HR	2		M					
	60-80	lms	25Y 64 00	10YR66 68	C			Y	0	0		0		M					
	80-120	ms	05Y 64 00	10YR66 00	C			Y	0	0		0		M					
3P	0-30	msl	10YR42 00						6	0	HR	12							
	30-45	msl	10YR44 00						0	0	HR	25		M					HARD, STONY
	45-80	lms	10YR46 00						0	0	HR	25		M					HARD, STONY
	80-120	ms	10YR53 54	10YR58 00	F				0	0	HR	2	WKMSAB	VF M					
4	0-30	msl	10YR43 00						2	0	HR	5							
	30-43	msl	10YR44 00						0	0	HR	8		M					
	43-59	hcl	10YR64 00	10YR66 68	C			Y	0	0	HR	5		M					
	59-75	hcl	25Y 64 00	10YR68 00	M			Y	0	0	HR	5		M					IMP, FLINTS
5	0-30	scl	10YR43 00						12	0	HR	23							IMP, FLINTS
6	0-35	mcl	10YR43 00						0	0	HR	2							
	35-45	scl	10YR56 00						0	0	HR	2		M					
	45-60	msl	10YR56 66						0	0	HR	2		M					
	60-72	msl	10YR66 00	75YR58 00	C			S	0	0	HR	5		M					IMP, FLINTS
7	0-35	scl	10YR43 00						4	0	HR	8							
	35-40	msl	10YR56 00						0	0	HR	10		M					IMP,FLINTS
8	0-32	mcl	10YR43 00						2	0	HR	5							
	32-60	scl	10YR44 00						0	0	HR	5		M					
	60-70	msl	10YR66 00	75YR58 00	C			S	0	0	HR	5		M					IMP, FLINTS
9	0-30	msl	10YR43 44						1	0	HR	2							
	30-42	mcl	10YR56 00	75YR58 00	F				0	0	HR	2		M					
	42-55	msl	10YR56 00	75YR58 00	C			S	0	0	HR	2		M					
	55-60	lms	10YR56 00	75YR58 00	C			S	0	0	HR	2		M					IMP, FLINTS

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	STRUCT/ TOT	CONSIST	SUBS STR	POR	IMP	SPL	CALC	
10	0-25	msl	10YR43 00						1	0	HR	2							
	25-55	msl	10YR56 00						0	0	HR	2		M					
	55-120	scl	25Y 63 00	75YR58 00	C			Y	0	0	HR	1		M					
11	0-35	mcl	10YR43 00						0	0	HR	1							
	35-45	mcl	10YR64 00	10YR68 00	C			Y	0	0	HR	10		M					IMP, FLINTS
12	0-30	msl	10YR32 00						14	9	HR	20							
	30-40	c	05Y 51 52	75YR58 00	M			Y	0	0	HR	15		M					IMP, GRAVELLY
13	0-35	msl	10YR43 00						4	1	HR	10							
	35-50	msl	10YR53 56				00MN00 00		0	0	HR	5		M					
	50-60	msl	10YR56 00	75YR58 00	F				0	0	HR	5		M					IMP, FLINTS
14	0-33	msl	10YR43 44						2	0	HR	3							
	33-50	mcl	10YR44 00						0	0	HR	10		M					
	50-65	scl	10YR46 56						0	0	HR	1		M					
	65-80	lms	10YR56 00						0	0	HR	1		M					
	80-100	msl	10YR56 00	75YR58 00	C			S	0	0	HR	1		M					IMP, FLINTS
15	0-35	mcl	10YR43 00						0	0	HR	4							
	35-50	scl	10YR56 00						0	0	HR	2		M					
	50-65	lms	10YR56 00						0	0	HR	2		M					IMP, FLINTS
16	0-33	mcl	10YR43 00						1	0	HR	2							
	33-45	mcl	10YR46 00						0	0	HR	5		M					
	45-50	msl	10YR66 00	75YR58 00	C		00MN00 00	S	0	0	HR	5		M					
	50-65	lms	10YR66 00	75YR58 00	C		00MN00 00	S	0	0	HR	5		M					
	65-80	msl	10YR66 00	75YR58 00	C		00MN00 00	S	0	0	HR	5		M					IMP, FLINTS
17	0-32	mcl	10YR43 00						1	0	HR	2							
	32-55	msl	10YR54 00	10YR58 00	C			S	0	0	HR	1		M					
	55-60	msl	10YR64 00	10YR58 00	C			Y	0	0	HR	10		M					IMP, FLINTS
18	0-30	mcl	10YR42 00						0	0	HR	3							
	30-45	mcl	10YR43 00						0	0	HR	2		M					
	45-60	msl	25Y 53 64	75YR58 00	C		00MN00 00	Y	0	0	HR	2		M					IMP, FLINTS
19	0-30	mcl	10YR42 00						2	3	HR	10							IMP, FLINTS
20	0-30	mcl	10YR42 00						0	0	HR	3							
	30-40	fszl	10YR42 00						0	0		0		M					
	40-60	scl	10YR53 68						0	0		0		M					
	60-80	scl	25Y 64 00	10YR58 00	F		00MN00 00		0	0	HR	2		M					FRIABLE
	80-120	scl	25Y 63 00	75YR58 46	M		00MN00 00	Y	0	0	HR	5		M					LOOSE
21	0-20	mcl	10YR42 43						0	0	HR	4							
	20-30	mcl	10YR43 00						0	0		0		M					
	30-75	msl	10YR53 56						0	0	HR	5		M					IMP, FLINTS

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
22	0-32	mcl	10YR43 00						2	0	HR	3							
	32-60	mcl	10YR44 00						0	0	HR	5		M					IMP, FLINTS
23	0-27	msl	10YR43 00						3	0	HR	8							
	27-35	msl	10YR46 00						0	0	HR	15		M					IMP, FLINTS
24	0-32	mcl	10YR43 00						3	0	HR	6							
	32-40	mcl	10YR46 00						0	0	HR	10		M					
	40-70	mcl	10YR56 00	75YR58 00	F		00MN00 00		0	0	HR	2		M					
	70-77	msl	25 Y66 00	75YR58 00	C			S	0	0	HR	5		M					
	77-100	lms	25 Y66 00	75YR58 00	C			S	0	0	HR	5		M					IMP, FLINTS
25	0-30	mcl	10YR43 00						3	0	HR	5							IMP, FLINTS
26	0-35	mcl	10YR43 00						0	0	HR	5							
	35-55	mcl	10YR44 00						0	0	HR	2		M					
	55-90	mcl	10YR56 66	75YR58 00	F		00MN00 00		0	0		0		M					
	90-120	mcl	25Y 64 00	75YR58 00	C			Y	0	0		0		M					
27	0-30	msl	10YR44 46						1	0	HR	3							
	30-40	mcl	10YR44 00						0	0	HR	15		M					IMP, FLINTS
28	0-35	mcl	10YR42 43						0	0	HR	3							
	35-60	mcl	10YR44 00	10YR46 00	F		00MN00 00		0	0	HR	2		M					IMP, FLINTS
29	0-30	msl	10YR42 00						0	0	HR	5							
	30-70	msl	10YR64 00	75YR58 00	C		00MN00 00	Y	0	0	HR	5		M					IMP, FLINTS
30	0-30	msl	10YR42 00						2	0	HR	3							
	30-40	msl	10YR43 00						0	0	HR	3		M					
	40-60	msl	10YR66 00	10YR58 00	C		25 Y76 00	S	0	0	HR	2		M					
	60-70	scl	25 Y64 00	75YR58 00	M			Y	0	0		0		M					
	70-85	c	10YR63 00	75YR58 00	M			Y	0	0		0		P		Y			
	85-110	sc	25 Y52 53	75YR58 00	M			Y	0	0		0		M		Y			IMP, FLINTS
31	0-30	mcl	10YR44 00						4	0	HR	10							
	30-55	mcl	10YR44 54						0	0	HR	10		M					
	55-75	msl	10YR56 00						0	0	HR	15		M					
	75-85	mcl	10YR56 00	10YR58 00	C			S	0	0	HR	10		M					IMP, FLINTS
32	0-32	mcl	10YR43 00						3	0	HR	5							
	32-45	mcl	10YR44 00						0	0	HR	5		M					
	45-55	msl	10YR56 00						0	0	HR	15		M					IMP, FLINTS
33	0-25	msl	10YR43 00						6	0	HR	15							IMP, FLINTS
34	0-32	mcl	10YR43 00						3	0	HR	8							
	32-60	mcl	10YR44 00						0	0	HR	10		M					
	60-75	mcl	10YR46 00	00MN00 00	F				0	0	HR	5		M					IMP, FLINTS

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
35	0-30	mcl	10YR43 00						3	0	HR	10							
	30-40	mcl	10YR44 46						0	0	HR	15		M					
	40-75	mcl	10YR46 00						0	0	HR	2		M					
	75-120	msl	10YR46 56						0	0	HR	5		M					
36	0-30	msl	10YR43 00						1	0	HR	5							IMP, FLINTS
37	0-30	mcl	10YR43 00						2	0	HR	3							
	30-80	mcl	10YR44 00						0	0	HR	2		M					IMP, FLINTS
38	0-35	mcl	10YR43 00						1	0	HR	2							
	35-40	mcl	10YR44 00						0	0	HR	2		M					
	40-70	mcl	10YR46 56						0	0	HR	2		M					IMP, FLINTS
39	0-38	mcl	10YR42 00						0	0	HR	1							
	38-50	mcl	10YR56 00	10YR58 00	F				0	0		0		M					
	50-100	hcl	25 Y54 00	75YR58 00	C			Y	0	0	HR	2		M					IMP, FLINTS
40	0-35	mcl	10YR53 00	10YR68 00	F				1	0	HR	3							
	35-50	mcl	10YR63 72	10YR58 00	C			Y	0	0	HR	8		M					
	50-70	hcl	25Y 64 74	10YR58 00	M			Y	0	0	HR	1		M					
	70-98	mcl	10YR66 68	75YR68 00	C		00MN00 00	Y	0	0	HR	1		M					
	98-120	scl	25Y 62 00	75YR58 00	C		00MN00 00	Y	0	0	HR	1		M					
41	0-32	mcl	10YR43 00						1	0	HR	3							
	32-45	mszl	10YR43 00						0	0	HR	2		M					
	45-60	mcl	10YR64 00	10YR68 58	C			Y	0	0	HR	8		M					IMP, FLINTS
42	0-32	msl	10YR44 00						1	0	HR	3							
	32-40	msl	10YR46 56						0	0	HR	3		M					
	40-80	lms	10YR56 66						0	0	HR	5		M					
	80-100	lms	10YR56 66						0	0	HR	15		M					IMP, GRAVELLY
43	0-30	scl	10YR43 00						4	0	HR	7							
	30-45	scl	10YR46 56						0	0	HR	10		M					
	45-60	msl	10YR56 00						0	0	HR	5		M					
	60-70	lms	10YR56 66						0	0	HR	15		M					IMP, FLINTS
44	0-30	mcl	10YR43 00						0	0	HR	1							
	30-60	mcl	10YR44 46						0	0	HR	2		M					
	60-100	scl	10YR46 56	75YR58 00	F				0	0	HR	2		M					IMP, FLINTS
45	0-35	mcl	10YR43 00						3	0	HR	5							IMP, FLINTS
46	0-35	mcl	10YR43 00						2	0	HR	3					Y		
	35-45	mcl	10YR56 00						0	0	HR	5		M					
	45-65	scl	10YR56 00	75YR58 00	F				0	0	HR	2		M					
	65-85	scl	10YR56 00	75YR58 00	C			S	0	0	HR	2		M					
	85-120	c	25 Y63 00	75YR58 00	M			Y	0	0		0		P		Y			

				----MOTTLES-----			PED		----STONES----				STRUCT/	SUBS				
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC	
47	0-32	mcl	10YR42 00						2	0	HR	3							
	32-45	mcl	10YR43 00						0	0	HR	5		M					
	45-60	mcl	10YR56 00	75YR58 00	F		00MN00 00		0	0	HR	5		M					
	60-70	scl	10YR56 00	75YR58 00	C			S	0	0	HR	5		M					IMP, FLINTS
48	0-29	scl	10YR43 00						0	0		0							
	29-50	hcl	25 Y66 00	10YR58 00	C			S	0	0		0		M					
	50-68	scl	25 Y63 00	75YR58 00	M			Y	0	0		0		M					
	68-90	c	10YR62 00	75YR58 00	M			Y	0	0	HR	2		P			Y		IMP, GRAVELLY
49	0-30	mcl	10YR43 00						1	0	HR	3							
	30-41	mcl	10YR44 46	10YR58 00	C		00MN00 00	S	0	0	HR	5		M					
	41-55	scl	10YR64 00						0	0	HR	8		M					
	55-68	scl	10YR64 54	75YR58 00	C			Y	0	0	HR	15		M					IMP, GRAVELLY