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TEST VALLEY LOCAL PLAN REVIEW
Land at New Grange, Andover, Hampshire

Agricultural Land Classification
Semi detailed survey
November 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

ADAS Reference 1512/96/96
MAFF Reference EL 15/00292
LUPU Commission 02467

AGRICULTURAL LAND CLASSIFICATION REPORT

TEST VALLEY LOCAL PLAN REVIEW
LAND AT NEW GRANGE ANDOVER
SEMI DETAILED SURVEY

INTRODUCTION

1 This report presents the findings of a semi detailed Agricultural Land Classification (ALC) survey of approximately 84 hectares on the south eastern fringe of Andover in Hampshire The survey was carried out during October 1996

2 The survey was commissioned by the Ministry of Agriculture Fisheries and Food s (MAFF) Land Use Planning Unit Reading in connection with the revision of the Test Valley Local Plan This survey supersedes previous ALC information for this land

3 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group in ADAS 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 land use on the site was all recently prepared arable land The areas mapped as Other include a road and some houses and their associated grounds

SUMMARY

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

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

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	/ Total site area	/ Surveyed Area
3a	56 7	67 8	70 8
3b	23 4	28 0	29 2
Other land	3 5	4 2	
Total surveyed area	80 1	95 8	100
Total site area	83 6	100	

7 The fieldwork was conducted at an average soil observation density of 1 boring per 1 5 hectares A total of 53 borings and 4 soil pits was described

8 The land quality on the site includes Subgrade 3a (good quality agricultural land) and Subgrade 3b (moderate quality) land For the better quality land soil droughtiness is the main limiting factor Here medium and heavy textured soils overlie chalk The limited soil depth restricts the amount of water available for plants this is somewhat offset by the available reserves in the chalk, but roots can only penetrate moderate distances into the chalk Given the local climatic regime these soils experience a significant soil droughtiness limitation Where the soil resource is very shallow the droughtiness limitation is more significant both crop growth and crop yield will be affected by the inadequate supply of soil moisture throughout the growing season, and therefore the land cannot be graded higher than Subgrade 3b Both crop growth and the eventual yield will be affected by the inadequate supply of soil moisture throughout the growing season

9 Parts of the Subgrade 3b land experience a soil wetness limitation Here the soil profiles show some signs f significant wetness related to the presence of poorly structured clay subsoils This degree of wetness will restrict seed germination and growth as well as limit the timing of cultivations

FACTORS INFLUENCING ALC GRADE

Climate

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

10 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) Data from two interpolations are given but many more interpolations were made to help assess the variation in moisture deficits (for both wheat and potatoes) across the site Given the shallow nature of the soils and the chalk geology detailed local climatic information is essential for the accurate grading of land in this area, as soil droughtiness is one of the limiting factors

Table 2 Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SU377453	SU384449
Altitude	m, AOD	120	95
Accumulated Temperature	day C (Jan June)	1406	1435
Average Annual Rainfall	mm	778	762
Field Capacity Days	days	168	165
Moisture Deficit Wheat	mm	100	105
Moisture Deficit, Potatoes	mm	90	97
Overall climatic grade	N/A	Grade 1	Grade 1

11 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

12 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

13 The combination of rainfall and temperature at this site mean that there is no overall climatic limitation There are also no local climatic factors such as exposure or frost risk, affecting the site The site is climatically Grade 1

Site

14 The site contains typical chalkland topography dry valleys gentle slopes and higher plateaux Nowhere on the site are gradient microrelief or flooding significant

Geology and soils

15 The published geological information for the site (BGS 1983) shows the area to be underlain by Upper Chalk (soft white chalk with many flint nodules)

16 The published soils information for the site (SSEW 1983 and 1984) shows two soil associations in this area Soils of the Carstens Association are shown along the northern and eastern boundary These soils are described as fine silty over clayey' and occur where the Chalk is covered by aeolian silty drift over clay with flints and plateau drift Soils of the Andover Association occur over the rest of the site These soils are described as variably flinty and chalky silty loam over chalk

Agricultural Land Classification

17 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

18 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 III

Subgrade 3a

19 The majority of the site falls into Subgrade 3a, good quality agricultural land with soil droughtiness as the main limiting factor Two soil pits (Pit 1 and Pit 2) show the typical soils in this grade with chalk occurring at or just within 30cm depth The topsoils are medium or heavy silty clay loams with up to 10% chalk stone present The topsoils will either sit directly over the chalk or a thin subsoil may exist containing approximately 25% chalk In both instances roots are unable to penetrate further than 40cm at most into the chalk, as the chalk becomes markedly harder from approximately 65cm depth The calculations of available water therefore do not extend further Given this limited amount of soil resource together with the degree of rooting into the chalk, the impact of soil droughtiness is significant However given the moisture deficits that prevail there is still sufficient available water to classify this land as Subgrade 3a

Subgrade 3b

20 Three units of Subgrade 3b have been mapped on the site defining areas of moderate quality agricultural land Again, two soil pits (Pit 3 and Pit 4) illustrate the type of soils that make up this grade They fall into two camps soils with a wetness limitation and those with an even more significant droughtiness limitation The wet Subgrade 3b land contains heavy profiles typically clays over clays with clear evidence of gleying at shallow depths related to the presence of slowly permeable layers in the upper subsoil These layers possess a moderately developed coarse prismatic structure The droughty Subgrade 3b land relates to the south eastern of the three units and shows an area that either has a very shallow soil resource over the chalk or which may have been disturbed by construction works associated with the A303(T) A shallow topsoil sits over chalk, which then gives way to a thin but very stony horizon of coarse sand before going back into pure chalk This degree of stoniness allied to very limited root penetration, means that there is insufficient available water for this area to be graded higher than Subgrade 3b

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SOURCES OF REFERENCE

British Geological Survey (1983) *Sheet No 283 Andover*
BGS London

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

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

Soil Survey of England and Wales (1983) *Sheet 6 Soils of South East England*
SSEW Harpenden

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

APPENDIX I

DESCRIPTIONS OF THE GRADES AND SUBGRADES

Grade 1 Excellent Quality Agricultural Land

Land with no or very minor limitations to agricultural use A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit soft fruit salad crops and winter harvested vegetables Yields are high and less variable than on land of lower quality

Grade 2 Very Good Quality Agricultural Land

Land with minor limitations which affect crop yield cultivations or harvesting A wide range of agricultural or horticultural crops can usually be grown but on some land of this grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops The level of yield is generally high but may be lower or more variable than Grade 1 land

Grade 3 Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops the timing and type of cultivation, harvesting or the level of yield When more demanding crops are grown, yields are generally lower or more variable than on land in Grades 1 and 2

Subgrade 3a Good Quality Agricultural Land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops especially cereals or moderate yields of a wide range of crops including cereals grass oilseed rape potatoes sugar beet and the less demanding horticultural crops

Subgrade 3b Moderate Quality Agricultural Land

Land capable of producing moderate yields of a narrow range of crops principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year

Grade 4 Poor Quality Agricultural Land

Land with severe limitations which significantly restrict the range of crops and/or the level of yields It is mainly suited to grass with occasional arable crops (e g cereals and forage crops) the yields of which are variable In moist climates yields of grass may be moderate to high but there may be difficulties in utilisation The grade also includes very droughty arable land

Grade 5 Very Poor Quality Agricultural Land

Land with severe limitations which restrict use to permanent pasture or rough grazing except for occasional pioneer forage crops

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

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

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

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land* (MAFF 1988)

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

APPENDIX III

SOIL DATA

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 sandston	**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 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 TEST VALLEY LP NEWGRANGE Pit N mbe 1P

Grid R ference SU37904505 Average Ann al Rainfall 762 mm
Accumul ted Tempe ture 1435 degree days
Field Capacity Level 165 days
Land Use A able
Slope and Aspect 03 degrees E

HORIZON	TEXTURE	COLOUR	STONES 2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 22	HZCL	10YR54 00	2	10	CH					Y
22 30	HZCL	25 Y54 00	0	25	CH				M	Y
30 65	CH	10YR81 00	0	0					M	

Wetness G ade 2 Wetness Cl ss I
Gleying cm
SPL cm

Drought Grade 3A APW 83 mm MBW 18 mm
APP 87 mm MBP 4 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Drought ness

SOIL PIT DESCRIPTION

Site Name TEST VALLEY LP NEWGRANGE Pit N mbe 2P

Grid Reference SU37954495 Ave age A n l Rainfall 762 mm
Accumulated Temperature 1435 degree days
Field Capacity Level 165 days
Land Use A able
Slope and Aspect 01 degrees SE

HORIZON	TEXTURE	COLOUR	STONES 2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 28	MZCL	10YR43 00	1	10	CH					Y
28- 66	CH	10YR81 00	0	0					M	

Wetness G ade 1 Wetness Class I
Gleying cm
SPL cm

Drought Grade 3A APW 84 mm MBW 17 mm
APP 89 mm MBP 3 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Droughtiness

SOIL PIT DESCRIPTION

Site Name TEST VALLEY LP NEWGRANGE Pit Numbe 3P

Grid Reference SU37904470 Average A al Rainfall 762 mm
Accumulated Temperature 1435 degree days
Field Capacity Level 165 days
Land Use A able
Slope and Aspect 01 degrees SE

HORIZON	TEXTURE	COLOUR	STONES 2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 25	ZC	10YR43 00	2	5	HR					
25- 52	C	75YR54 00	0	2	HR	C	MDCPR	FM	P	
52 80	C	75YR54 00	0	5	HR	M	MDCPR	FM	P	

Wetness Grade 3B Wetness Class III
Gleying 025 cm
SPL 025 cm

Drought Grade 3A APW 92 mm MBW 13 mm
APP 97 mm MBP 0 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Wetness

SOIL PIT DESCRIPTION

Site Name TEST VALLEY LP NEWGRANGE P t Numbe 4P

Grid Reference SU38354483 Average Ann al Rainfall 762 mm
Accumulated Tempe ature 1435 degree days
Field Capacity Level 165 d ys
L nd U e A able
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES 2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 25	MZCL	10YR53 00	4	8	HR					Y
25- 37	CH	10YR81 00	0	0					M	Y
37 48	CS	10YR81 00	0	65	HR				M	Y
48- 58	CH	10YR81 00	0	0					M	Y

Wetness Grade 1 Wetness Class I
Gl ying cm
SPL cm

Drought Grade 3B APW 66 mm MBW 39 mm
APP 68 mm MBP 29 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Droughtiness

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	WETNESS CLASS	-WHEAT GRADE	AP	MB	POTS- AP	MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SU38204570	ARA	NE	02			1	2	88	17	93	-4	3A				DR	3A	
1P	SU37904505	ARA	E	03			1	2	83	18	87	-4	3A				DR	3A	
2	SU38004560	ARA	N	04			1	2	88	17	94	3	3A				DR	3A	
2P	SU37954495	ARA	SE	01			1	1	84	17	89	3	3A				DR	3A	PIT 85CM
3	SU38104560	ARA	E	03			1	2	84	18	89	14	3A				DR	3A	
3P	SU37904470	ARA	SE	01	025	025	3	3B	92	13	97	0	3A				WE	3B	PIT IMP 80
4	SU38204560	ARA	N				1	1	86	19	91	6	3A				DR	3A	
4P	SU38354483	ARA					1	1	66	39	68	29	3B				DR	3B	POSSDIST
5	SU37904550	ARA	N	05	003		1	3A	67	38	67	30	3B				DR	3B	IMPX2QWET
9	SU38304550	ARA	E	02			1	1	74	31	74	23	3B				DR	3A	IMP QDR
12	SU37904540	ARA	E				1	3A	46	59	46	51	4				DR	3B	IMPX2QWET
13	SU38004540	ARA	E	04	025		1	3A	63	42	63	34	3B				DR	3A	IMPX2QWET
15	SU38204540	ARA	E		025		2	3B	95	10	92	5	3A				DR	3B	CHECKWET
19	SU37704530	ARA	N	03			1	1	83	22	87	10	3B				DR	3A	
21	SU37904530	ARA	E		028	028	4	3B	79	26	85	12	3B				WE	3B	SPL
23	SU38104530	ARA	E		035	035	4	3B	82	23	88	9	3B				WE	3B	SPL
25	SU38304530	ARA	E				1	1	85	20	90	7	3A				DR	3A	
26	SU38404530	ARA	E	01			1	1	91	14	96	1	3A				DR	3A	ICH40R65
27	SU37804520	ARA					1	2	81	24	86	11	3B				DR	3A	
29	SU38004520	ARA	E	05			1	1	84	21	88	9	3B				DR	3A	
34	SU37504510	ARA	W	01			1	1	88	17	94	3	3A				DR	3A	BDR 3B
35	SU37604510	ARA	S	03			1	1	85	20	90	7	3A				DR	3A	ICH35R60
36	SU37704510	ARA	W	01			1	1	81	24	85	12	3B				DR	3A	ICH 40
37	SU37904510	ARA					1	3A	64	41	64	33	3B				DR	3A	IMP QDR
39	SU38154505	ARA	SW	02			1	1	84	21	89	8	3B				DR	3B	BDR 3A
41	SU38304510	ARA	SE	02			1	1	87	18	92	5	3A				DR	3A	
43	SU38504510	ARA	SW	02			1	1	90	15	96	1	3A				DR	3A	
44	SU37504500	ARA	W	03	000		1	1	83	22	88	9	3B				DR	3A	
45	SU37604500	ARA	WW	02			1	1	74	26	77	13	3B				DR	3B	ICH 32
47	SU37804500	ARA					1	3A	81	24	86	11	3B				DR	3A	
49	SU38054495	ARA	E				1	1	85	20	89	8	3A				DR	3A	
51	SU38204500	ARA	E				1	1	121	16	114	17	2				DR	2	
53	SU38404500	ARA	E				1	1	85	21	90	8	3B				DR	3B	
56	SU37504490	ARA	N	01			1	1	84	21	89	-8	3B				DR	3A	I30
58	SU37704490	PLO	E	02			1	2	100	5	99	2	3A				DR	3A	ICH 55
60	SU37904490	ARA					1	2	83	22	88	9	3B				DR	3A	
62	SU38104490	ARA	E	02			1	1	83	20	87	7	3A				DR	3B	IMPCH 35 BDR 3
64	SU38304490	ARA	E	03			1	1	80	25	83	14	3B				DR	3B	
65	SU38404490	ARA	W		000		1	1	101	4	100	3	3A				DR	3A	
66	SU37404480	ARA	NW	03	000	030	1	2	85	20	90	7	3A				DR	3A	QCHRTS
68	SU37604480	ARA	SE	03			1	2	97	8	104	7	3A				DR	3A	I65QCH
69	SU37704480	ARA	NE		000		1	3A	85	20	91	6	3A				DR	3A	

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	WETNESS- CLASS	WHEAT GRADE	WHEAT AP	WHEAT MB	POTS- AP	POTS- MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
70	SU37804480	ARA					1	3A	73	32	76	21	3B				DR	3B	
72	SU38004480	BEA	SE	01			1	2	89	16	95	2	3A				DR	3A	
74	SU38204480	ARA	E	02			1	1	81	24	85	12	3B				DR	3B	IMPCH 35
76	SU37504470	ARA	SE	02	045	045	3	3B	104	1	106	9	3A				WE	3B	I85STNS
78	SU37704470	ARA	SE	03	030	030	4	3B	104	1	97	0	3A				WE	3B	QSP3AI70
80	SU37904470	ARA			025		2	3B	60	-45	60	37	3B				WE	3B	IMPX2QWE
82	SU37604460	ARA	NE	04	055	055	3	3B	105	0	111	14	3A				WE	3B	I STN 80

				-MOTTLES-			PED		STONES				STRUCT/	SUBS			
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL	GLEY	2	6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
1	0 28	hzcl	10YR43 00						1	0	HR	4						
	28-32	hzcl	10YR53 00						0	0	CH	10		M				
	32 67	ch	10YR81 00						0	0		0		M				
1P	0 22	hzcl	10YR54 00						2	0	CH	10						Y
	22 30	hzcl	25 Y54 00						0	0	CH	25		M				Y
	30 65	ch	10YR81 00						0	0		0		M				
2	0 20	hzcl	10YR54 00						2	0	HR	5						Y
	20 35	c	10YR53 00						0	0	CH	10		M				Y
	35-70	ch	10YR81 00						0	0		0		M				Y
2P	0 28	mzcl	10YR43 00						1	0	CH	10						Y
	28 66	ch	10YR81 00						0	0		0		M				
3	0 25	h cl	10YR54 00						2	0	HR	4						Y
	25 30	hzcl	10YR54 00						0	0	CH	10		M				Y
	30 65	ch	10YR81 00						0	0		0		M				
3P	0 25	c	10YR43 00						2	0	HR	5						
	25 52	c	75YR54 00	00MN00	00	C	75YR53 00	S	0	0	HR	2	MDCPR	FM	P	Y	Y	
	52 80	c	75YR54 00	00MN00	00	M	75YR53 00	S	0	0	HR	5	MDCPR	FM	P	Y	Y	
4	0 22	mzcl	10YR43 00						2	0	HR	5						
	22 32	h cl	10YR43 00						0	0	CH	10		M				Y
	32 67	ch	10YR81 00						0	0		0		M				
4P	0 25	mzcl	10YR53 00						4	0	HR	8						Y
	25-37	ch	10YR81 00						0	0		0		M				Y
	37 48	cs	10YR81 00						0	0	HR	65		M				Y
	48 58	ch	10YR81 00						0	0		0		M				Y
5	0 30	c	10YR53 00						2	0	HR	5						Y
	30 42	c	10YR54 00	000C00	00	C	00MN00	00 S	0	0	HR	5		M				Y
9	0 25	mz l	10YR53 00						2	0	HR	4						Y
	25-42	hzcl	10YR54 00						0	0	HR	2		M				Y
12	0 30	c	10YR53 00						5	0	HR	10						Y
13	0 25	c	10YR53 00						5	2	HR	10						Y
	25 45	c	75YR54 00	000C00	00	C	00MN00	00 S	0	0	HR	5		P	Y			
15	0 25	c	10YR53 00						2	0	HR	4						Y
	25 48	c	10YR53 00	000C00	00	C	00MN00	00 Y	0	0	HR	2		P	Y			Y
	48 83	ch	10YR81 00					Y	0	0		0		M				
19	0 25	mzcl	10YR43 00						4	0	HR	8						Y
	25-30	mzcl	10YR53 00						0	0	CH	10		M				Y
	30 65	ch	10YR81 00						0	0		0		M				

				-MOTTLES			PED		STONES-				STRUCT/	SUBS				
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL	GLEY	2	6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
21	0 28	c	10YR43 00						4	2	HR	8						Y
	28-60	c	75YR53 00	000C00	00	C	00MN00	00 Y	0	0	HR	1		P	Y		Y	
23	0 20	c	10YR44 00						2	0	HR	4						Y
	20 35	c	10YR43 00						0	0	HR	4		M				Y
	35-60	c	10YR53 00	000C00	00	C	00MN00	00 Y	0	0		0		P	Y		Y	Y
25	0 30	mzcl	10YR54 00						2	0	HR	4						Y
	30 65	ch	10YR81 00						0	0		0		M				
26	0 28	mzcl	10YR43 53						1	0	HR	3						Y
	28 35	mzcl	10YR44 54						0	0	CH	30		M				Y
	35-70	ch	10YR81 00						0	0	HR	2		P				Y
27	0 20	hz l	10YR53 00						4	2	HR	8						Y
	20 30	hzcl	10YR53 00						0	0	CH	20		M				Y
	30 65	ch	10YR81 00						0	0		0		M				
29	0 25	mzcl	10YR54 00						2	0	HR	5						Y
	25 30	hzcl	10YR53 00						0	0	CH	10		M				Y
	30 65	ch	10YR81 00						0	0		0		M				
34	0 25	mzcl	10YR53 00						2	0	HR	6						Y
	25 35	mzcl	10YR53 63						0	0	CH	30		M				Y
	35 70	ch	10YR81 00						0	0	HR	2		P				Y
35	0 30	mzcl	10YR43 53						1	0	HR	3						Y
	30 65	h	10YR81 00						0	0	HR	2		P				Y
36	0 28	mzcl	10YR43 53						2	0	HR	6						Y
	28-63	ch	10YR81 00						0	0	HR	2		P				Y
37	0 25	c	10YR53 00						4	2	HR	8						Y
	25-30	c	10YR44 00						0	0	CH	5		M				Y
	30 42	c	10YR54 00						0	0	CH	30		M				Y
39	0 25	mzcl	10YR53 00						2	0	HR	4						Y
	25 30	mzcl	10YR54 00						0	0	CH	20		M				Y
	30 65	ch	10YR81 00						0	0		0		M				
41	0 28	mzcl	10YR43 00						0	0	HR	5						Y
	28 32	mzcl	10YR43 00						0	0	CH	25		M				Y
	32 67	ch	10YR81 00						0	0		0		M				Y
43	0 28	mzcl	10YR43 00						0	0	HR	5						Y
	28 35	mz l	10YR43 00						0	0	CH	25		M				Y
	35 70	ch	10YR81 00						0	0		0		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	-MOTTLES- COL	ABUN	CONT	PED COL	GLEY	STONES 2	6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
44	0 22	mzcl	10YR43 00						2	0	HR	10						Y
	22 32	mzcl	10YR43 00						0	0	CH	25		M				Y
	32 67	ch	10YR81 00						0	0		0		M				Y
45	0 25	mzcl	10YR43 53						2	0	CH	20						Y
	25-60	ch	10YR81 00						0	0	HR	2		P				Y
47	0 28	c	10YR43 00						0	0	HR	5						Y
	28-32	c	10YR54 00						0	0	CH	25		M				Y
	32 67	ch	10YR81 00						0	0		0		M				
49	0 30	mzcl	10YR53 00						0	0	CH	10						Y
	30 65	ch	10YR81 00						0	0		0		M				
51	0 28	mzcl	10YR43 00						2	0	HR	4						Y
	28 58	mzcl	10YR54 00						0	0	CH	2		M				Y
	58 93	ch	10YR81 00						0	0		0		M				
53	0 30	mzcl	10YR54 00						2	0	HR	4						Y
	30 65	h	10YR81 00						0	0		0		M				
56	0 30	mzcl	10YR43 00						1	0	HR	5						Y
	30 65	ch	10YR81 00						0	0	HR	2		P				Y
58	0 30	hzcl	10YR44 00						1	0	HR	5						
	30 45	hzcl	10YR66 81						0	0	CH	50		M				Y
	45 80	ch	10YR81 74						0	0	HR	2		P				Y
60	0 25	hzcl	10YR43 00						0	0	HR	5						Y
	25 30	h cl	10YR53 00						0	0	CH	25		M				Y
	30 65	ch	10YR81 00						0	0		0		M				
62	0 28	mzcl	10YR43 53						0	0	HR	2						Y
	28 63	ch	10YR81 00						0	0	HR	2		P				Y
64	0 20	mzcl	10YR53 00						0	0	CH	10						Y
	20 28	mzcl	10YR53 00						0	0	CH	25		M				Y
	28 63	ch	10YR81 00						0	0		0		M				
65	0 25	mzcl	10YR43 00						1	0	HR	5						Y
	25 44	mzcl	10YR54 00						0	0	CH	25		M				Y
	44 80	h	10YR81 00						0	0		0		M				
66	0 30	hzcl	10YR43 00						0	0	HR	3						Y
	30 65	ch	10YR81 00						0	0	HR	2		P			Y	Y
68	0 30	hzcl	10YR43 00						1	0	HR	5						Y
	30 55	hzcl	10YR54 00						0	0	CH	20		M				Y
	55 65	mzcl	10YR66 81						0	0	CH	50		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
69	0 25	c	10YR43 00						1	0	HR	5						Y
	25-35	c	10YR54 00						0	0	HR	5		M				Y
	35-70	ch	10YR81 00						0	0		0		M				
70	0 25	c	10YR43 00						0	0	HR	5						Y
	25-60	ch	10YR81 00						0	0		0		M				
72	0 25	hzcl	10YR43 00						0	0	HR	5						Y
	25-30	hzcl	10YR54 00						0	0	CH	25		M				Y
	30 35	hzcl	10YR54 00						0	0	CH	50		M				Y
	35-70	ch	10YR81 00						0	0		0		M				
74	0 28	mzcl	10YR43 53						1	0	HR	5						Y
	28 63	h	10YR81 00						0	0	HR	2		P				Y
76	0 30	hzcl	10YR43 00						1	0	HR	5						
	30 45	c	10YR54 00	10YR56 00	F		00MN00 00		0	0	HR	8		M				
	45 75	c	10YR54 53	10YR66 68	C		00MN00 00	Y	0	0	HR	10		P			Y	
	75 85	c	10YR53 00	75YR56 00	M		00MN00 00	Y	0	0	HR	20		P			Y	
78	0 30	hcl	10YR43 00						1	0	HR	5						Y
	30 45	c	10YR54 53	10YR68 00	M		00MN00 00	Y	0	0	HR	5		P			Y	Y
	45-55	c	10YR54 53	10YR68 00	M			Y	0	0	HR	5		P			Y	Y
	55 90	ch	10YR81 00					Y	0	0	HR	2		P			Y	Y
80	0 25	c	10YR53 00						0	0	HR	5						Y
	25-40	c	75YR54 00	000C00 00	C		00MN00 00	S	0	0	HR	2		P	Y			Y
82	0 30	h cl	10YR43 00						1	0	HR	5						
	30 40	hcl	10YR44 00						0	0	HR	5		M				
	40 55	c	75YR46 00	00MN00 00	C				0	0	HR	5		M				
	55-80	c	10YR62 00	10YR68 00	C		00MN00 00	Y	0	0	HR	5		P			Y	