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**West Sussex Minerals Plan
Plan 3: Wickham Farm, Oving**

**Agricultural Land Classification
ALC Map and Report**

June 1997

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

WEST SUSSEX MINERALS PLAN PLAN 3: WICKHAM FARM, O Ving

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 49.7 ha of land at Oving. The survey was carried out during June 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 its statutory input to the West Sussex Minerals Plan. The results of this survey supersede any previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey the land on the site was in arable use, for example peas and wheat. The areas mapped as 'Other land' include agricultural buildings and ponds with associated earth banks.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but any enlargement would be misleading.
6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
1	9.4	19.3	18.9
2	11.5	23.6	23.1
3a	8.6	17.6	17.3
3b	19.3	39.5	38.9
Other land	0.9	N/A	1.8
Total surveyed area	48.8	100	-
Total site area	49.7	-	100

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 48 borings and 3 soil pits were described.

8. Agricultural land quality on the site ranges from Grade 1 (excellent quality) land through to Subgrade 3b (moderate quality) land. The land is graded on the basis of soil wetness and also soil droughtiness limitations, which occasionally act together. There is also an area downgraded on the basis of topsoil stone content.

9. Grade 1 (excellent quality) land is found on the slightly higher land in the centre of the site. These soils are deep profiles comprising silty clay loam or silt loam topsoils over similar or heavier subsoils. The profiles are well drained, with evidence of wetness only occurring occasionally at depth. There is sufficient available water for crop growth due to the soil characteristics, despite being located within this locally dry climate. Therefore the land is not limited by soil droughtiness. This land has no or very minor limitations for agricultural or horticultural crops so the land is very versatile and has a high cropping potential.

10. Grade 2 (very good quality) land is found on slightly higher land along the northern boundary of the site and there is also an area along the southern edge. The profiles are similar to those described in paragraph 9 above, but may either be slightly limited by soil droughtiness or soil wetness. Some of these profiles have gravel at depth and others are deep profiles with slightly impeded drainage. As a result slight droughtiness or wetness restrictions apply.

11. Subgrade 3a (good quality) land is found in the western half of the site and links over to the adjacent survey (FRCA Ref: 4203/072/97). This land is classified on the basis of a slight droughtiness limitation and occasionally a slight wetness limitation. The flinty subsoils reduce the amount of available water for crop growth. Also, drainage is impeded in some profiles by a slowly permeable horizon occurring at shallow depth. In these soils the versatility of the land is reduced in terms of yield, choice of crops and timing of cultivations and harvesting.

12. Subgrade 3b (moderate quality) land is found on the lower areas of the site. Across most of this land soil droughtiness is the main limitation, typically due to flinty profiles and gravelly subsoils. A small area is downgraded due to a topsoil stone limitation. In the remaining areas of Subgrade 3b soil wetness caused by shallow clayey horizons limits the drainage of the soil. Both these limitations significantly reduce the versatility of this land for agricultural use.

FACTORS INFLUENCING ALC GRADE

Climate

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

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

Table 2: Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SU 901 034	SU 893 041
Altitude	m, AOD	6	10
Accumulated Temperature	day°C (Jan-June)	1542	1538
Average Annual Rainfall	mm	769	776
Field Capacity Days	days	157	159
Moisture Deficit, Wheat	mm	118	117
Moisture Deficit, Potatoes	mm	114	113
Overall climatic grade	N/A	Grade 1	Grade 1

15. 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.

16. 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.

17. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors, such as exposure and frost risk do not affect land quality at this location. The site is climatically Grade 1. However, climatic factors do interact with soil properties to influence soil wetness and soil droughtiness. At this locality the climate is relatively warm and moist for the south east region, due to the coastal location of the site. The likelihood of soil droughtiness problems may therefore be enhanced.

Site

18. The site is flat and low lying, situated at altitudes in the range of 6-10m AOD. There is no limitation due to gradient, microrelief or flooding.

Geology and soils

19. The published geology maps (BGS, 1881 and 1974) show the whole site to be mapped as valley gravel.

20. The published soils information (SSGB, 1967) maps the site as a variety of soil series. In the centre of the site is found the Hook Series; mainly the shallow phase, but also some of the deep phase. These soils are gleyed and are developed in silty drift. In the west of the site the Park Gate Series is mapped, this comprises the shallow phase over flinty Head. These soils are gleyed and are developed in Brickearth. Running north-south in strips down the site is the Gade complex. This comprises soils which are developed in freshwater alluvium overlying gravel. Soils broadly consistent with these descriptions were observed across the site. Soils are typically fine silty topsoils over similar upper and lower subsoils, with occasionally clayey lower subsoils.

AGRICULTURAL LAND CLASSIFICATION

21. 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.

22. 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 1

23. Excellent quality agricultural land has been mapped across about one fifth of the agricultural land surveyed. It is found on the slightly higher land in the centre of the site. This land has very minor or no limitations to its agricultural use and is capable of supporting a very wide range of crops, including the most demanding horticultural crops. Yields will be consistently high. Soil profiles typically comprise non-calcareous medium silty clay loam topsoils which may be very slightly stony (1-2% total flints, 0-1% >2cm). These overlie similar or heavier subsoils which may pass to a silty clay subsoil at depth. Profiles tend to be stoneless to very slightly stony (0-2% total flints), occasionally becoming calcareous in the lower subsoil. The profiles are permeable, but may be affected by very slight soil wetness, as indicated by gleying or slight gleying below 40cm caused by a fluctuating groundwater level. In this local climate the soils are assigned to Wetness Class 1 and Wetness Grade 1. Although the climate is relatively warm at this locality and crop adjusted moisture deficits are high, these deep silty soils have good reserves of available water for plant growth. This is sufficient to provide crops with adequate moisture to prevent drought stress in most years. Soil pit 3 (see Appendix II) is representative of these soil types.

Grade 2

24. The Grade 2 (very good quality) land has been classified on the basis of a minor soil droughtiness or minor soil wetness limitation. This land is found on the slightly higher land along the northern boundary of the site and along the southern edge of the site. Soils are typically similar to those described above in paragraph 23. The land is slightly limited by soil droughtiness due to a gravelly horizon at depth which reduces the amount of profile available water for crop growth. This leads to the risk of slight drought stress, especially in drier years, which may affect the level and consistency of yields.

25. These soils may also be affected by a minor wetness limitation caused by fluctuating groundwater levels throughout the year. This produces signs of wetness within the profiles, such as slight gleying, and/or gleying typically below 40cm. In other profiles soil drainage is occasionally impeded by a poorly structured silty clay horizon at depth. Where slowly permeable horizons occur within the soil profile the soils are imperfectly drained and assigned to Wetness Class II. In this local climate and with the above soil characteristics the land is limited to Wetness Grade 2. The number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock are therefore slightly reduced.

Subgrade 3a

26. The Subgrade 3a (good quality) land is classified on the basis of a slight droughtiness and occasionally a slight wetness limitation. The soils are typically similar to those described above. However, they are more severely limited in the amount of profile available water due to a gravelly horizon which occurs at shallower depths in the profile and also stonier profiles. Topsoils typically vary from very slightly stony (2-5% total flints, 0-4% >2cm) to slightly stony (8% total flints, 4% >2cm). In the subsoils stone content generally increases with depth from very slightly stony (5% total flints) to slightly stony (10% total flints). Occasionally chalk stone is found in the lower subsoil (10-20% total chalk). These profiles are described by Pit 1 on the adjacent survey (FRCA Ref: 4203/072/97). In this pit a gravelly horizon was described from 64-85 cm (71% total flints), which reduces the amount of available water to crops. In this locally dry climate, the soil characteristics, especially the gravelly subsoils, lead to a slight limitation in the amount of available water for crop growth. Therefore, yields may be lower and less consistent, especially in drier years.

27. Some land within the Subgrade 3a mapping unit is also slightly limited by soil wetness. Soils may have poorly structured lower subsoils of silty clay, which impede drainage and cause seasonal waterlogging as evidenced by gleying higher up the profile. Such drainage characteristics are consistent with Wetness Class III which in combination with the fine silty topsoils and the local climate results in the land being classified as Subgrade 3a. This slight soil wetness limitation reduces the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock. Excessive soil wetness will also adversely affect crop growth and development.

Subgrade 3b

28. The Subgrade 3b (moderate quality) agricultural land is mainly classified on the basis of a significant soil droughtiness limitation. Soils typically comprise medium silty clay loam or silt loam topsoils, which are very slightly to moderately stony (5-31% total flints, 2-17% >2cm). These overlie similar, heavy clay loam or heavy silty clay loam subsoils, which generally increase in stoniness with depth; from 2-57% total flints. Many profiles were found to be impenetrable (to the soil auger). These soils are typified by Pit 1 which also contains 30% chalk stone in the lower subsoil, which is reflected in many of the profiles being calcareous. The combination of soil characteristics, in particular the high stone contents, with the climatic conditions at this locality leads to a significant reduction in the amount of available water to crops. A small area was classified as moderate quality due to the high topsoil stone content (17% >2cm flints), these stones cause a significant mechanical limitation by impeding cultivation, harvesting and crop growth.

29. The remainder of the Subgrade 3b land is classified on the basis of a significant soil wetness limitation. Soils are typically medium silty clay loam or silt loam topsoils, with few to common flints (2-6% total flints, 0-3% >2cm) and 1% chalk stone. They overlie a heavier upper subsoil of heavy silty clay loam, which is very slightly stony (2-5% total flints). This horizon impedes the movement of water through the profile, causing seasonal waterlogging at shallow depth. The shallow depth to this slowly permeable horizon (30-35cm) places these soils in Wetness Class IV, and in this locality Subgrade 3b is appropriate. In Pit 2 which typically describes these soils, the lower subsoil horizons are much stonier (48-58% total

flints with 5-10% total chalk stone) overlying chalk at depth. These horizons are poorly structured and calcareous. This soil wetness limitation significantly reduces the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock, as well as adversely affecting crop growth and development.

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SOURCES OF REFERENCE

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APPENDIX I

DESCRIPTIONS OF THE GRADES AND SUBGRADES

Grade 1: Excellent Quality Agricultural Land

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

Grade 2: Very Good Quality Agricultural Land

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

Grade 3: Good to Moderate Quality Land

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

Subgrade 3a: Good Quality Agricultural Land

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

Subgrade 3b: Moderate Quality Agricultural Land

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

Grade 4: Poor Quality Agricultural Land

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

Grade 5: Very Poor Quality Agricultural Land

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

APPENDIX II

SOIL DATA

Contents:

Sample location map

Soil abbreviations - explanatory note

Soil pit 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. **GLEYS/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. **GLEYS:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.
7. **STONE LITH:** Stone Lithology - one of the following is used:

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

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

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

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

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

L: loose	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 : PLAN 3 WICKHAM FM OVING Pit Number : 1P

Grid Reference: SU90100360 Average Annual Rainfall : 769 mm
 Accumulated Temperature : 1542 degree days
 Field Capacity Level : 159 days
 Land Use : Wheat
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 31	MZCL	10YR42 00	2	31	HR					Y
31- 55	MZCL	25 Y72 74	0	42	HR				P	Y
55- 63	MZCL	25 Y73 74	0	57	HR				P	Y

Wetness Grade : 1 Wetness Class : I
 Gleying : cm
 SPL : No SPL

Drought Grade : 3B APW : 069mm MBW : -49 mm
 APP : 074mm MBP : -40 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : PLAN 3 WICKHAM FM OVING Pit Number : 2P

Grid Reference: SU89900410 Average Annual Rainfall : 769 mm
 Accumulated Temperature : 1542 degree days
 Field Capacity Level : 159 days
 Land Use : Peas
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 34	MZCL	10YR43 00	1	4	HR		WVCSAB	FR		
34- 58	HZCL	25 Y53 00	0	5	HR	M	MDVCAB	FR	M	
58- 69	MZCL	10YR53 00	0	48	HR	F			P	Y
69- 93	MZCL	05 Y62 72	0	58	HR				P	Y
93-120	CH	25 Y81 00	0	15	HR	M			P	Y

Wetness Grade : 3B Wetness Class : IV
 Gleying : 034 cm
 SPL : 034 cm

Drought Grade : 3A APW : 100mm MBW : -18 mm
 APP : 109mm MBP : -5 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : PLAN 3 WICKHAM FM OVING Pit Number : 3P

Grid Reference: SU89700410 Average Annual Rainfall : 769 mm
 Accumulated Temperature : 1542 degree days
 Field Capacity Level : 159 days
 Land Use : Peas
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 32	MZCL	10YR43 00	1	2	HR		WVCSAB	FR		
32- 52	MZCL	10YR44 54	0	0			MDCSAB	FR	M	
52-110	HZCL	10YR53 00	0	0		M	MDCSAB	FR	M	
110-120	MZCL	10YR53 00	0	0		M	MDVCSB	FR	M	

Wetness Grade : 1 Wetness Class : I
 Gleying : 052 cm
 SPL : No SPL

Drought Grade : 1 APW : 160mm MBW : 42 mm
 APP : 124mm MBP : 10 mm

FINAL ALC GRADE : 1
 MAIN LIMITATION :

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB				
1	SU89100440	OTH			1	1	091	-27	095	-19	3B		DR 3A	See 1P JN7297
1P	SU90100360	WHT			1	1	069	-49	074	-40	3B		DR 3B	Roots to 63
2	SU89100430	OTH			1	1	079	-39	079	-35	3B		DR 3A	See 1P JN7297
2P	SU89900410	PEA	034	034	4	3B	100	-18	109	-5	3A		WE 3B	Roots to 69
3	SU89200430	OTH	S55		1	1	110	-8	124	10	3A		DR 3A	Prob 2
3P	SU89700410	PEA	052		1	1	160	42	124	10	1			1
4	SU89300430	OTH	S55	068	2	2	164	46	135	21	1		WE 2	
5	SU89400430	OTH	S27		1	1	138	20	122	8	2		DR 2	See 3P
6	SU89500430	PEA			1	1	057	-61	057	-57	4		DR 3B	Imp See 1P
6A	SU89500440	PEA	030		2	2	062	-56	062	-52	4		DR 3B	See 1P
7	SU89600430	PEA	S50		1	1	160	42	124	10	1		DR 2	See 3P
8	SU89700430	PEA	S57		1	1	159	41	123	9	2		DR 2	See 3P
9	SU89800430	PEA	S45	068	2	2	138	20	136	22	2		WD 2	Like 3P
11	SU90000430	PEA	050		1	1	108	-10	116	2	3A		DR 3A	Imp 75
12	SU89200420	OTH			1	1	057	-61	057	-57	4		ST 3B	Imp 35 See 1P
13	SU89300420	OTH	S26	048	3	3A	122	4	121	7	3A		WD 3A	
14	SU89400420	OTH	040	040	3	3A	100	-18	109	-5	3A		WD 3A	
15	SU89500420	OTH			1	1	051	-67	051	-63	4		DR 3B	I35See1PJN7297
16	SU89600420	OTH			1	1	074	-44	074	-40	3B		DR 3B	Q3aDR
17	SU89700420	PEA	S55		1	1	152	34	122	8	2		DR 2	See 3P
18	SU89800420	PEA	100		1	1	160	42	125	11	1			1 See 3P
19	SU89900420	PEA	030		2	2	061	-57	061	-53	4		DR 3B	See 2P
20	SU90000420	PEA			1	1	063	-55	063	-51	4		DR 3B	See 1P
21	SU89200410	OTH			1	1	074	-44	074	-40	3B		DR 3B	3a ST See 1P
22	SU89300410	OTH	035	035	4	3B	117	-1	127	13	3A		WE 3B	Imp Gravelly65
23	SU89400410	OTH	029		1	1	101	-17	107	-7	3A		DR 3A	See 2P
24	SU89500410	OTH	030		2	2	095	-23	102	-12	3B		DR 3B	
25	SU89600410	OTH	035		2	2	088	-30	088	-26	3B		DR 3A	
26	SU89700410	PEA	S50		1	1	155	37	124	10	2			1 See 3P
27	SU89800410	PEA	S55		1	1	157	39	124	10	2			1 See 3P
28	SU89900410	PEA	031		2	2	109	-9	121	7	3A		WE 3B	Imp 72 See 2P
29	SU90000410	PEA			1	1	052	-66	052	-62	4		DR 3B	Imp 32 See 1P
30	SU89700400	PEA	S58		1	1	151	33	125	11	1			1 See 3P
31	SU89800400	PEA	S55		1	1	159	41	124	10	2			1 See 3P
32	SU89900400	PEA	S50		1	1	130	12	124	10	2		DR 2	
33	SU90000400	PEA			1	1	051	-67	051	-63	4		DR 3B	Imp 30 See 1P
34	SU89700390	PEA	S60		1	1	154	36	118	4	2		DR 2	See 3P
35	SU89800390	PEA	S42		1	1	152	34	116	2	2		DR 2	See 3P
36	SU89900390	PEA	042	075	2	2	140	22	124	10	2		WD 2	See 3P
36A	SU03808990	PEA	030	060	3	3A	126	8	118	4	3A		WE 3A	
37	SU90000390	PEA			1	1	052	-66	052	-62	4		DR 3B	Imp 30 See 1P
38	SU90100390	PEA	030	030	4	3B	099	-19	105	-9	3A		WE 3B	Imp 60 See 2P

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
39	SU90000380	PEA			1	1	052	-66	052	-62	4			DR	3B Imp 30 See 1P
40	SU90100380	PEA	035	060	3	3A	129	11	114	0	2			WE	3A
41	SU90000370	WHT	028		2	2	080	-38	080	-34	38			DR	3B See1P
42	SU90100370	WHT			1	1	068	-50	068	-46	4			DR	3B Imp 40 See 1P
43	SU90000360	WHT	032		2	2	077	-41	077	-37	38			DR	3B Imp 45 See 1P
44	SU90100360	WHT			1	1	050	-68	050	-64	4			DR	3B 130ChGrv1See1P
45	SU90100350	WHT	030		2	2	052	-66	052	-62	4			DR	3B Imp 35 See 1P
46	SU90100340	WHT			1	1	054	-64	054	-60	4			DR	3B Imp 30 See 1P
47	SU90100330	WHT			1	1	053	-65	053	-61	4			DR	3B Imp 30 See 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES-----			STRUCT/ CONSIST	SUBS		SPL	CALC	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR			POR
1	0-27	mzc1	10YR43 00						2	0	HR	4					
	27-55	mzc1	10YR54 56	00MN00	00	F			0	0	HR	5	M			IMP STONY	
1P	0-31	mzc1	10YR42 00						2	1	HR	31	WKCSAB	FR		Y +5% CH STONE	
	31-55	mzc1	25 Y72 74				05 Y61		0	0	HR	42		P		Y	
	55-63	mzc1	25 Y73 74						0	0	HR	57		P		Y +30% CH STONE	
2	0-30	z1	10YR42 00						4	0	HR	8					
	30-40	mzc1	10YR56 00	10YR58	00	F			0	0	HR	10	M			IMP STONY	
2P	0-34	mzc1	10YR43 00						1	0	HR	4	WVCSAB	FR		+1% CH STONE	
	34-58	hzc1	25 Y53 00	10YR56	00	M		Y	0	0	HR	5	MDVCAB	FR	M	Y	Y SPL
	58-69	mzc1	10YR53 00	10YR56	00	F			0	0	HR	48		P		Y +5% CH STONE	
	69-93	mzc1	05 Y62 72						0	0	HR	58		P		Y +10% CH STONE	
	93-120	ch	25 Y81 00	25 Y66	00	M			0	0	HR	15		P		Y	
3	0-30	mzc1	10YR43 00						0	0	HR	1					
	30-55	mzc1	10YR54 00						0	0	HR	1	M				
	55-70	hzc1	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	0	M			IMP GRAVELLY	
3P	0-32	mzc1	10YR43 00						1	0	HR	2	WVCSAB	FR			
	32-52	mzc1	10YR44 54						0	0		0	MDCSAB	FR	M		
	52-110	hzc1	10YR53 00	10YR56	00	M	00MN00	00	Y	0	0	0	MDCSAB	FR	M		
	110-120	mzc1	10YR53 00	10YR56	00	M	00MN00	00	Y	0	0	0	MDVCSB	FR	M		
4	0-30	mzc1	10YR43 00						0	0	HR	1					
	30-55	mzc1	10YR54 00	00MN00	00	F			0	0	HR	1	M				
	55-68	hzc1	10YR54 00	75YR58	00	C	00MN00	00	S	0	0	0	M			FRIABLE	
	68-95	zc	10YR64 00	10YR58	00	C	10YR62	72	Y	0	0	0	P		Y	QSPL	
	95-120	hzc1	10YR63 00	10YR58	00	M	10YR71	00	Y	0	0	0	M			MN CONCS	
5	0-27	mzc1	10YR43 00						0	0	HR	1					
	27-45	mzc1	10YR54 66	10YR58	00	C	00MN00	00	S	0	0	HR	3	M			
	45-100	hzc1	10YR64 66	10YR58	00	C	00MN00	00	Y	0	0	HR	2	M		IMP GRAVELLY	
6	0-30	mzc1	10YR42 00						9	0	HR	18				Y IMP STONY	
6A	0-30	mzc1	10YR42 43						7	0	HR	15				Y	
	30-32	mzc1	10YR63 00	10YR58	00	C			Y	0	0	HR	25	M		Y IMP FLINTS	
7	0-29	mzc1	10YR43 00						0	0	HR	1					
	29-50	mzc1	10YR54 00						0	0		0	M				
	50-90	hzc1	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	0	M				
	90-120	hzc1	10YR53 00	10YR58	00	C	10YR61	00	Y	0	0	0	M			FRIABLE	
8	0-29	mzc1	10YR43 00						0	0	HR	1					
	29-57	mzc1	10YR54 00	00MN00	00	F			0	0	HR	2	M				
	57-90	hzc1	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	HR	1	M			
	90-120	mzc1	10YR63 00	75YR58	00	C	25 Y71	00	Y	0	0	0	M		Y		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----			STRUCT/ CONSIST	SUBS		SPL	CALC
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR		
9	0-32	mzc1	10YR43 00						0	0	HR	1				
	32-45	mzc1	10YR44 54	00MN00	00	F			0	0	HR	1	M			
	45-52	mzc1	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	0	M			
	52-68	hzc1	10YR62 54	10YR58	00	C	00MN00	00	Y	0	0	0	M			
	68-85	zc	10YR62 00	10YR58	00	C	00MN00	00	Y	0	0	0	P		Y	
	85-90	hzc1	10YR62 00	10YR58	00	C	00MN00	00	Y	0	0	0	M			IMP STONE
11	0-30	mzc1	10YR42 00						3	0	HR	5				
	30-50	mzc1	10YR43 00						0	0	HR	10	M		Y	
	50-75	mzc1	25 Y72 00	10YR56	00	C			Y	0	0	HR	10	M		Y +10% CH STONES
12	0-35	z1	10YR31 00						17	5	HR	30				IMP GRAVELLY
13	0-26	mzc1	10YR42 00						0	0	HR	2				
	26-48	hzc1	10YR54 00	10YR56	00	C			S	0	0	HR	2	M		NOT SPL
	48-85	zc	25Y 62 63	10YR58	00	M	00MN00	00	Y	0	0	HR	2	P	Y	IMP GRAVELLY QSPL
14	0-30	mzc1	10YR42 00						2	0	HR	5				
	30-40	mzc1	10YR31 32						0	0	HR	2	M			
	40-50	hzc1	10YR51 52	10YR58	00	C			Y	0	0	HR	5	P	Y	SPL
	50-70	zc	10YR52 00	10YR58	00	C			Y	0	0	HR	10	P	Y	IMP GRAVELLY
15	0-35	mzc1	10YR32 00						13	5	HR	25				IMP FLINTS
16	0-35	z1	10YR42 00						7	2	HR	15			Y	
	35-40	mzc1	10YR43 00						0	0	HR	40	M		Y	IMP STONY
17	0-32	mzc1	10YR43 00						0	0	HR	2				
	32-40	mzc1	10YR54 00	00MN00	00	F			0	0	HR	2	M			
	40-55	hzc1	10YR54 00	00MN00	00	F			0	0	HR	2	M			
	55-65	hzc1	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	HR	2	M		
	65-100	zc	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	HR	1	M		FRIABLE
	100-120	hzc1	10YR54 00	10YR58	00	C	10YR62	00	S	0	0	HR	1	M		QSPL
18	0-35	mzc1	10YR43 00						0	0	HR	1				
	35-100	mzc1	10YR44 00						0	0	HR	1	M			
	100-120	mzc1	10YR53 00	10YR58	00	C			Y	0	0	HR	1	M		
19	0-30	mzc1	10YR42 00						3	1	HR	8				
	30-35	hzc1	10YR51 52	10YR58	00	M	00MN00	00	Y	0	0	HR	2	M		IMP FLINTS QSPL
20	0-35	mzc1	10YR42 00						2	0	HR	5				IMP FLINTS
21	0-40	mzc1	10YR31 00						13	4	HR	20				IMP GRAVELLY
22	0-35	z1	10YR42 00						2	0	HR	4				
	35-65	hzc1	25Y 51 52	10YR58	00	C			Y	0	0	HR	3	P	Y	SPL IMP GRAVELLY

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR	IMP	SPL	CALC
23	0-29	mzc1	10YR43 00						0	0	HR	2						
	29-45	hzc1	25 Y61 62 10YR58 00 C					Y	0	0	HR	5	M				QSPL	
	45-60	mzc1	25 Y62 00 10YR58 00 C					Y	0	0	CH	20	M		Y		IMP GRAVELLY	
24	0-30	mzc1	10YR42 00						14	0	HR	22						
	30-35	mzc1	25 Y63 00 10YR58 00 C				25 Y61 62 Y	0	0	HR	20	M						
	35-45	hzc1	25 Y63 00 10YR58 00 C				25 Y61 62 Y	0	0	HR	5	M		Y				
	45-60	mzc1	25 Y71 00 10YR58 00 C					Y	0	0	HR	5	M		Y		IMP GRAVELLY	
25	0-35	mzc1	10YR42 00						2	0	HR	4						
	35-50	mzc1	10YR51 52 10YR58 00 C					Y	0	0	CH	10	M		Y		IMP STONES	
26	0-33	mzc1	10YR43 00						0	0	HR	2						
	33-50	mzc1	10YR44 54						0	0	HR	2	M					
	50-70	hzc1	10YR54 00 10YR58 00 C				00MN00 00 S	0	0	HR	1	M					FRIABLE	
	70-90	zc	10YR54 00 10YR58 00 C				00MN00 00 S	0	0	HR	1	M					QSPL	
	90-120	hzc1	10YR54 00 10YR58 00 C				00MN00 00 S	0	0	HR	1	M						
27	0-33	mzc1	10YR43 00						0	0	HR	1						
	33-55	mzc1	10YR54 00						0	0	HR	2	M					
	55-70	hzc1	10YR54 00 75YR58 00 C				00MN00 00 S	0	0	HR	1	M						
	70-85	zc	10YR54 00 75YR58 00 C				00MN00 00 S	0	0	HR	1	M					FRIABLE	
	85-120	hzc1	10YR54 00 75YR58 00 C				00MN00 00 S	0	0	HR	1	M					QSPL	
28	0-31	mzc1	10YR42 00						3	0	HR	6						
	31-72	hzc1	25Y 51 52 10YR58 00 M				00MN00 00 Y	0	0	HR	2	M					IMP GRAVELLY	
29	0-32	mzc1	10YR32 00						7	2	HR	15			Y		IMP GRAVELLY	
30	0-35	mzc1	10YR43 00						0	0	HR	1						
	35-58	mzc1	10YR54 00 00MN00 00 F						0	0	HR	1	M					
	58-75	mzc1	10YR54 00 10YR58 00 C				00MN00 00 S	0	0	HR	2	M					FRIABLE	
	75-90	hzc1	10YR54 00 10YR58 00 C				10YR62 00 S	0	0	HR	1	M					QSPL	
	90-120	zc	10YR54 00 10YR58 00 C				10YR62 00 S	0	0	HR	2	M						
31	0-30	mzc1	10YR43 00						0	0	HR	1						
	30-55	mzc1	10YR54 00 00MN00 00 F						0	0	HR	1	M					
	55-90	hzc1	10YR54 00 10YR58 00 C				00MN00 00 S	0	0	HR	1	M					QSPL	
	90-120	mzc1	10YR54 00 10YR58 00 C				00MN00 00 S	0	0	HR	1	M		Y				
32	0-32	mzc1	10YR43 00						0	0	HR	1						
	32-50	mzc1	10YR54 00						0	0	HR	1	M					
	50-80	hzc1	10YR54 00 10YR58 00 C				00MN00 00 S	0	0	HR	1	M					QSPL	
	80-90	mzc1	10YR54 00 10YR58 00 C				00MN00 00 S	0	0	HR	2	M		Y			IMP FLINT	
33	0-30	mzc1	10YR32 00						6	2	HR	12			Y		IMP STONY	
34	0-30	mzc1	10YR43 00						0	0	HR	2						
	30-50	mzc1	10YR54 00 00MN00 00 F						0	0	HR	1	M					
	50-60	hzc1	10YR54 00 00MN00 00 C						0	0	HR	1	M					
	60-80	zc	10YR54 00 10YR58 00 C				00MN00 00 S	0	0		0	M					QSPL	
	80-120	hzc1	10YR54 00 10YR58 00 C				10YR62 00 S	0	0		0	M					QSPL FRIABLE	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----			STRUCT/ CONSIST	SUBS				
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH		TOT	STR	POR	IMP	SPL
35	0-32	mzc1	10YR43 00						0	0	HR	2					
	32-42	mzc1	10YR54 00	00MN00	00	F			0	0	HR	2	M				
	42-55	hzc1	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	HR	2	M			
	55-75	zc	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	HR	2	M			QSPL
	75-85	hzc1	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	HR	2	M			QSPL FRIABLE
	85-120	mzc1	10YR54 00	10YR58	00	C	00MN00	00	S	0	0	HR	2	M			
36	0-30	mzc1	10YR43 00						0	0	HR	1					
	30-42	mzc1	10YR54 00				00MN00	00		0	0	HR	1	M			
	42-65	mzc1	25 Y64 00	10YR58	00	C	00MN00	00	Y	0	0		0	M			
	65-75	hzc1	10YR72 00	10YR58	00	M	00MN00	00	Y	0	0		0	M			QSPL
	75-110	zc	10YR72 00	10YR58	00	M	00MN00	00	Y	0	0		0	P	Y		IMP GRAVELLY
36A	0-30	mzc1	10YR43 00						0	0	HR	2					
	30-43	mzc1	10YR53 54	10YR58	00	C	10YR62	00	Y	0	0	HR	3	M			
	43-60	hzc1	10YR53 00	10YR68	00	C	10YR61	00	Y	0	0	HR	2	M			QSPL
	60-65	zc	10YR53 00	10YR68	00	M	10YR61	00	Y	0	0	HR	2	P	Y		QSPL
	65-100	zc	10YR71 00	10YR58	00	C			Y	0	0	HR	2	P	Y		IMP STONES
37	0-30	mzc1	10YR42 00						6	1	HR	10				Y	IMP GRAVELLY
38	0-30	mzc1	10YR42 00						0	0	HR	2					
	30-55	hzc1	25Y 51 52	10YR58	00	M	00MN00	00	Y	0	0	HR	2	M		Y	QSPL
	55-60	hzc1	10YR52 00	10YR58	00	M	00MN00	00	Y	0	0	HR	10	M		Y	+5%CH IMPGRAVELLY
39	0-30	mzc1	10YR32 00						6	2	HR	10				Y	IMP GRAVELLY
40	0-35	mzc1	10YR32 00						4	1	HR	8					
	35-60	hzc1	10YR51 00	10YR46	58	M	00MN00	00	Y	0	0	HR	4	M			
	60-80	zc	25Y 61 62	10YR58	00	M	00MN00	00	Y	0	0	HR	1	P		Y	SPL
	80-100	mzc1	25Y 61 00	10YR56	00	F			Y	0	0	CH	1	M		Y	IMP GRAVELLY
41	0-28	mzc1	10YR43 00						2	0	HR	10				Y	
	28-35	hzc1	25 Y64 62	10YR56	00	C	00MN00	00	Y	0	0	CH	5	M		Y	
	35-45	z1	25 Y63 62	10YR56	00	C			Y	0	0	CH	15	M		Y	+5% FLINTS IMPFLINT
42	0-35	mzc1	10YR42 00						2	0	HR	10				Y	
	35-40	mzc1	10YR43 00						0	0	HR	10	M		Y		+5%CHALK IMPFLINT
43	0-32	mzc1	10YR43 00						2	0	HR	8				Y	
	32-45	hzc1	25 Y64 00	10YR68	00	C			Y	0	0	CH	15	M		Y	+5% FLINTS IMPFLINT
44	0-28	mzc1	10YR43 00						2	0	HR	12				Y	+1% CH STONE
	28-30	hc1	25 Y64 00						0	0	HR	15	M		Y		IMP GRAVELLY
45	0-30	mzc1	10YR43 00						2	1	HR	7				Y	+1% CH STONE
	30-35	hzc1	25 Y64 62	10YR56	00	C	00MN00	00	Y	0	0	HR	10	M		Y	+1%CH IMP STONES

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES-----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH		TOT	STR	POR	IMP	SPL	CALC
46	0-30	mzc1	10YR42 00						2	0	HR	6					Y	IMPFLINT +1%CHSTONE
47	0-30	mzc1	10YR42 00						3	1	HR	8					Y	IMPFLINT +1%CHSTONE