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Berkshire Minerals Plan,
Omission Site 14B,
Bridge Farm, Arborfield,
ALC Map and Report
August, 1993

AGRICULTURAL LAND CLASSIFICATION REPORT

BERKSHIRE MINERALS LOCAL PLAN
OMISSION SITE 14B, BRIDGE FARM, ARBORFIELD

Introduction

1.1 ADAS was commisioned by MAFF's Land Use Planning Unit to provide information on land quality on a number of omission sites in Berkshire as part of MAFF's input to the preparation of the Berkshire Minerals Local Plan.

1.2 In August, 1993, a detailed Agricultural Land Classification (ALC) was made on approximately 97 hectares on land west of Arborfield on the eastern edge of the River Loddon floodplain. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.3 The classification has been made using MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture.

1.4 The fieldwork was carried out with an observation density of approximately one per hectare. A total of 81 borings and 6 soil pits was examined.

1.5 The ALC information is shown on the attached map at a scale of 1:10,000. It is accurate at this level but any enlargement may be misleading. This map supercedes any previous ALC information for this site. The areas of each grade are given in Table 1 below.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Area
3a	28.9	29.9	31.5
3b	62.8	65.1	68.5
Non Agricultural	3.5	3.6	**100% (107.9 ha)**
Urban	1.4	1.4	
Total	**96.6ha**	**100%**	

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

1.7 The majority of the land is classified as Sub-grade 3b, moderate quality, with three areas of good quality, Sub-grade 3a. The heavy alluvial soils near the River

Loddon experience a significant wetness limitation related to poorly structured clay subsoils but the bulk of the Sub-grade 3b land is downgraded due to a droughtiness limitation related to shallow soils over gravel deposits. The better Sub-grade 3a land still experiences a droughtiness limitation but has sufficient water reserves available in the profile to support a wider range of crops.

Climate

2.1 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.

2.2 The main parameters used in the assessment of the overall climatic limitation are annual average rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5 kilometre gridpoint dataset (Met. Office, 1989). The details are given in Table 2 below and these show that there is no overall climatic limitation affecting the site. However, climatic factors do interact with soil factors to influence soil wetness and soil droughtiness limitations.

2.4 No local climatic factors such as exposure or frost risk affect the site.

Table 2 : Climatic Interpolations

Grid reference	SU746670	SU742665
Altitude (m)	45	43
Accumulated Temperature (^{o}days, Jan - June)	1474	1476
Average Annual Rainfall (mm)	670	672
Field Capacity (days)	138	138
Moisture Deficit, Wheat (mm)	115	115
Moisture Deficit, Potatoes (mm)	109	109
Overall Climatic Grade	1	1

Relief

3.1 The site is flat and lies at a general altitude of 45-50 metres on the eastern margin of the River Loddon floodplain with only a slight variation in topography.

Geology and Soils

4.1 The relevant geological sheet for the site (British Geological Survey, 1946) shows the underlying geology to be Alluvium immediately adjacent to the River Loddon, surrounded by London Clay, with an area of Valley Gravel in the east of the site near Bridge Farm.

4.2 The published soils information for the site (Soil Survey of England and Wales, 1983 and 1984) shows the majority of the site to be affected by argillic gley soils which includes stony, loamy soils in gravels with a high groundwater and clayey alluvial soils affected by high groundwater. In the extreme south there is an area of stagnogley soils described as clayey soils with drainage impedance at moderate depths.

Agricultural Land Classification

5.1 The ALC information is provided on the attached ALC map and the location of the soil observation points is shown on the attached sample point map.

Subgrade 3a

5.2 Three separate 3a units have been identified in the survey area. The soil resource could not be fully described by augering alone due to the presence of high subsoil stone contents. Three soil pits were examined in detail and each of these have in fact been individually classified as Grade 2. Droughtiness is clearly the main limitation and at each of these locations the soil resource extended to depth but with very varying stone contents; Pit 6 has a negligible subsoil stone content whereas Pit 4 has 50 % stone from 80cm.

5.3 Generally, the profiles change into clays at depth and show evidence of clear gleying within the top 40cm. The subsoils are not slowly permeable and the soils can be placed in Wetness Class II and Grade 2 as a result.

5.4 These three map units have not been placed in Grade 2 due to the variation that may exist in detail. Many of the individual borings are impenetrable at shallow depths and may relate to stonier patches, possibly with gravel at moderate depths, and there is therefore insufficient information at this scale of fieldwork to fully substantiate a Grade 2 classification. The land is still believed to fall into the category of 'best and most versatile land' and is conservatively classified as Sub-grade 3a and assessed as better quality than the surrounding stonier, droughtier land. This grading can accomodate some detailed patches of Sub-grade 3b if they exist.

Subgrade 3b

5.5 The majority of the site has been placed in this grade, with soil droughtiness as the key limiting factor. Many of the soils could not be fully described by augering as the high subsoil stone contents prevented deep penetration. Three soil pits have been described in this map unit to examine the amount of subsoil stones and the point at which the soil resource changes into gravel (where there is over 70% stone content). The three pits represent a possible range of soil conditions that exist throughout this map unit; in Pit 1, gravel is encountered at 72cm, in Pit 2, it is encountered at 57cm and in Pit 3 the description only goes down to 70cm due to the difficulty in digging deeper into a subsoil that has approximately 50% stone from 40cm.

5.6 Soil detail in the profile also varies throughout this map unit. In general, topsoil textures are mostly medium sandy loams, with some medium clay loams, overlying sandy clay loams, occasionally with sandier horizons. There is regular evidence of groundwater gleying and the profiles have been placed in Wetness Class I or II. At worst, the soils show evidence of gleying within the top 40cm.

5.7 The soil textures and the subsoil stone contents combine to create a significant droughtiness limitation. Even with the possibility of deep root penetration into the gravel there will be insufficient available water to support a wide range of crops.

Non-Agricultural

5.8 Areas of trees and scrub have been placed in this grade.

Urban

5.9 A farm track has been placed in this grade.

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MAFF Reference : EL 20/430

Resource Planning Team
Guildford Statutory Group

APPENDIX I

DESCRIPTION OF THE GRADES AND SUBGRADES

Grade 1 : Excellent Quality Agricultural Land
Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 : Very Good Quality Agricultural Land
Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural or horticultural crops can usually be grown but on some land of this grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1 land.

Grade 3 : Good to Moderate Quality Land
Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When more demanding crops are grown, yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a : Good Quality Agricultural Land
Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b : Moderate Quality Agricultural Land
Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 : Poor Quality Agricultural Land
Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (eg. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 : Very Poor Quality Agricultural Land
Land with severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

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

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

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

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

Open Water
Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed
Agricultural land which has not been surveyed.

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

APPENDIX II

REFERENCES

British Geological Survey (1978), Sheet Number 283, Andover, 1:50,000.

MAFF (1988), Agricultural Land Classification of England and Wales : Revised Guidelines and Criteria for Grading the Quality of Agricultural Land.

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

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

Soil Survey of England and Wales (1984), Soils and their Use in South East England, Bulletin Number 15.

APPENDIX III

DEFINITION OF SOIL WETNESS CLASS

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class 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 180 days, but only wet within 40 cm depth for 31-90 days in most years.

Wetness Class 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.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth fro 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.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

APPENDIX IV

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

Sample Point Map

Soil Abbreviations - explanatory note

Database Printout - soil pit information

Database Printout - boring level information

Database Printout - horizon level information

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

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

Boring Header Information

1. **GRID REF** : national 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 measured by a hand-held optical clinometer.

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

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

6. **MB (WHEAT/POTS)** : Moisture Balance.

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

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

MREL : Microrelief limitation	**FLOOD** : Flood risk	**EROSN** : Soil erosion risk
EXP : Exposure limitation	**FROST** : Frost	**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	**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 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

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

6. **STONE LITH** : One of the following is used.

HR : all hard rocks and stones
CH : chalk
ZR : soft, argillaceous, or silty rocks
MSST : soft, medium grained sandstone
SLST : soft oolitic or dolimitic limestone
FSST : soft, fine grained sandstone
GH : gravel with non-porous (hard) stones
GH : gravel with non-porous (hard) stones
SI : soft weathered igneous/metamorphic rock
Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

7. **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

8. **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

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

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

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

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

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

14. 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 : BERKS MINS.PLAN SITE 14B Pit Number : 1P

Grid Reference: SU745 6723 Average Annual Rainfall : 671 mm
Accumulated Temperature : 1468 degree days
Field Capacity Level : 138 days
Land Use :
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 33	MSL	10YR42 00	11	20		
33- 45	SCL	10YR43 00	0	23		
45- 72	SCL	10YR53 00	0	45	F	
72-120	GH	10YR66 62	0	0	C	

Wetness Grade : 1 Wetness Class : I
Gleying :045 cm
SPL : No SPL

Drought Grade : 3B APW : 081mm MBW : -33 mm
APP : 081mm MBP : -28 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : BERKS MINS.PLAN SITE 148 Pit Number : 2P

Grid Reference: SU74656703

Average Annual Rainfall : 671 mm
Accumulated Temperature : 1468 degree days
Field Capacity Level : 138 days
Land Use : Wheat
Slope and Aspect : 01 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 29	MCL	10YR42 00	3	10		
29- 48	SCL	25Y 41 00	0	20	M	MDCSAB
48- 57	LMS	25Y 62 00	0	50	M	WKCSAB
57-120	GH	25Y 62 00	0	0		

Wetness Grade : 2

Wetness Class : II
Gleying :029 cm
SPL : No SPL

Drought Grade : 3B

APW : 079mm MBW : -35 mm
APP : 077mm MBP : -32 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : BERKS MINS.PLAN SITE 148 Pit Number : 3P

Grid Reference: SU73936705 Average Annual Rainfall : 671 mm
Accumulated Temperature : 1468 degree days
Field Capacity Level : 138 days
Land Use : Cereals
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MSL	10YR43 00	4	12		
30- 40	MSL	25Y 64 00	0	15		MDCSAB
40- 70	SCL	05YR58 00	0	50		

Wetness Grade : 1 Wetness Class : I
Gleying :000 cm
SPL : No SPL

Drought Grade : 3B APW : 077mm MBW : -37 mm
APP : 082mm MBP : -27 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : BERKS MINS.PLAN SITE 14B Pit Number : 4P

Grid Reference: SU738 6687 Average Annual Rainfall : 671 mm
Accumulated Temperature : 1468 degree days
Field Capacity Level : 138 days
Land Use : Cereals
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MSL	10YR43 00	0	3		
30- 70	MSL	10YR53 44	0	3		MDCSAB
70- 80	MSL	10YR53 44	0	15		MDCSAB
80-100	SCL	05YR58 00	0	50		

Wetness Grade : 1 Wetness Class : I
Gleying :000 cm
SPL : No SPL

Drought Grade : 2 APW : 120mm MBW : 6 mm
APP : 108mm MBP : -1 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : BERKS MINS.PLAN SITE 14B Pit Number : 5P

Grid Reference: SU742 6653
Average Annual Rainfall : 671 mm
Accumulated Temperature : 1468 degree days
Field Capacity Level : 138 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MCL	10YR32 00	1	3		
30- 55	MCL	10YR53 00	0	25	C	
55-120	C	25Y 51 00	0	1	M	MCSAB

Wetness Grade : 2
Wetness Class : II
Gleying :030 cm
SPL : No SPL

Drought Grade : 2
APW : 132mm MBW : 18 mm
APP : 107mm MBP : -2 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : BERKS MINS.PLAN SITE 14B Pit Number : 6P

Grid Reference: SU74456685 Average Annual Rainfall : 671 mm
Accumulated Temperature : 1468 degree days
Field Capacity Level : 138 days
Land Use : Barley
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 22	MCL	10YR32 00	0	2	F	
22- 55	C	10YR53 52	0	1	M	MCSAB
55-120	C	10YR53 00	0	1	M	MCSAB

Wetness Grade : 2 Wetness Class : II
Gleying :022 cm
SPL : No SPL

Drought Grade : 2 APW : 139mm MBW : 25 mm
APP : 115mm MBP : 6 mm

FINAL ALC GRADE : 2
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
1P	SU745 6723	POT			045		1	1	081	-33	081	-28	3B				DR	3B	GH72PT85
2	SU742 675	PGR			010	010	4	3B	083	-31	087	-22	3B				WE	3B	WE-DR
2P	SU74656703	WHT	W	01	029		2	2	079	-35	077	-32	3B				DR	3B	PIT 60
3	SU745 675	POT			035	060	3	3A	115	1	106	-3	3A				DR	3A	IMPGH 90
3P	SU73936705	CER			000		1	1	077	-37	082	-27	3B				DR	3B	PIT 70
4P	SU738 6687	CER			000		1	1	120	6	108	-1	2				DR	2	BDR 23A
5P	SU742 6653	PGR			030		2	2	132	18	107	-2	2				DR	2	WK ALSO
6P	SU74456685	BAR			022		2	2	139	25	115	6	2				DR	2	ALSO WK
8	SU741 674	PGR			020	020	4	3B	113	-1	117	8	3A				WE	3B	STNS-80
9	SU742 674	PGR			000		2	3A	100	-14	105	-4	3A				WE	3A	WE-DR
10	SU744 674	POT	W	01	000		1	1	035	-79	035	-74	4				DR	4	IMPST 25
11	SU745 674	POT			000		1	1	053	-61	053	-56	4				DR	4	IMPST 35
14	SU748 674	PGR			000		1	1	024	-90	024	-85	4				DR	4	STNS-20
15	SU749 674	PGR			035		2	2	111	-3	125	16	3A				DR	3A	GH-70
16	SU739 673	PGR			000	000	4	3B	000	0	000	0					WE	3B	GH-75
17	SU740 673	PGR			010		2	2	089	-25	091	-18	3B				DR	3B	GH-55
18	SU741 673	PGR			000	040	4	3B	132	18	122	13	2				WE	3B	CHECKSPL
19	SU742 673	PGR			000	000	4	3B	100	-14	114	5	3A				WE	3B	GH-70
20	SU744 673	POT	W	01	000		1	1	043	-71	043	-66	4				DR	4	IMPST 30
21	SU745 673	POT			000		1	1	047	-67	047	-62	4				DR	4	IMPST 32
22	SU746 673	ARB			000		1	1	031	-83	031	-78	4				DR	4	STNS-20
23	SU747 673	ARB			000		1	1	050	-64	050	-59	4				DR	4	STNS-30
24	SU748 673	ARB			030	060	3	3A	122	8	090	-19	3A				WE	3A	WE-DR
25	SU749 673	ARB			030		2	2	081	-33	081	-28	3B				DR	3B	STNS45
26	SU750 673	ARB			000		1	1	050	-64	050	-59	4				DR	4	STNS-30
27	SU738 672	PGR			000	020	4	3B	000	0	000	0					WE	3B	GH-85
28	SU739 672	PGR			000		2	2	056	-58	056	-53	4				DR	4	STNS-30
29	SU740 672	PGR			035		2	1	093	-21	092	-17	3B				DR	3B	GH-55
30	SU741 672	PGR			000	025	4	3B	113	-1	120	11	3A				WE	3B	GH-75
31	SU745 672	POT			000		1	1	039	-75	039	-70	4				DR	4	IMPST 25
32	SU746 672	ARB			000		1	1	031	-83	031	-78	4				DR	4	STNS-20
33	SU747 672	BAR			000		1	1	052	-62	052	-57	4				DR	3B	PICK-35
35	SU749 672	BAR			000		1	1	066	-48	066	-43	3B				DR	3B	PICK 38
36	SU750 672	BAR			035		1	2	085	-29	085	-24	3B				DR	3A	IMPEN 50
38	SU738 671	PGR			010	010	4	3B	000	0	000	0					WE	3B	
39	SU739 671	PGR			000		2	2	091	-23	093	-16	3B				DR	3B	GH -55
40	SU740 671	CER			000		1	1	048	-66	048	-61	4				DR	4	IMP Q3B
41	SU741 671	CER			027		2	2	070	-44	070	-39	3B				DR	3B	IMP 42
42	SU745 671	WHT	SW	01	000		1	1	041	-73	041	-68	4				DR	3B	SEE 1P
43	SU746 671	WHT	SW	01	000		1	1	044	-70	044	-65	4				DR	3B	SEE 1P
44	SU747 671	ARB		01	000		1	1	049	-65	049	-60	4				DR	4	STNS30
45	SU748 671	ARB		01	000		1	1	031	-83	031	-78	4				DR	4	STNS-30

SAMPLE NO.	GRID REF	ASPECT USE	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
46	SU749 671	BAR		000		1	1	056	-58	056	-53	4				DR	3B	PICK 32
47	SU750 671	BAR		030		2	2	080	-34	080	-29	3B				DR	3A	IMP48-DR
49	SU738 670	PGR		000		2	2	056	-58	056	-53	4				DR	4	GH YZ
50	SU739 670	CER		000		1	1	052	-62	052	-57	4				DR	4	IMP Q3B
51	SU740 670	CER		037	055	3	3A	108	-6	113	4	3A				WE	3A	IMP 80
52	SU741 670	CER		025	025	4	3B	048	-66	048	-61	4				WE	3B	IMP30
53	SU742 670	CER		035	040	3	3B	075	-39	075	-34	3B				WE	3B	IMP 45
54	SU743 670	CER		000		1	1	033	-81	033	-76	4				DR	4	IMP Q3B
55	SU744 670	BAR		000		1	1	056	-58	056	-53	4				DR	3B	IMPEN 35
56	SU745 670	WHT		032	100	2	2	147	33	113	4	2				WD	2	DEEP DRY
57	SU746 670	WHT SW	01	026		2	2	063	-51	063	-46	4				DR	3B	IMPST 40
58	SU747 670	WHT SE	01	000		1	1	046	-68	046	-63	4				DR	3B	IMPST 30
59	SU748 670	ARB	01	000		1	1	046	-68	046	-63	4				DR	4	STNS-30
60	SU749 670	BAR		000		1	1	061	-53	061	-48	4				DR	3B	IMPEN 35
61	SU750 670	BAR		030		2	2	108	-6	115	6	3A				DR	2	IMP80-DR
62	SU738 669	CER		068		1	1	103	-11	110	1	3A				DR	3A	IMP 72
63	SU739 669	CER		000		1	1	052	-62	052	-57	4				DR	4	IMP Q3B
64	SU740 669	CER		030		2	2	088	-26	091	-18	3B				DR	3B	IMP 55
65	SU741 669	CER		025		2	2	051	-63	051	-58	4				DR	4	IMP 30
66	SU74306690	WHT		025		2	3A	088	-26	088	-21	3B				WE	3A	IMPEN 50
67	SU74406690	BAR		045		2	2	000	0	000	0					DR	3A	IMP45-DR
68	SU74506690	BAR		025		2	2	075	-39	075	-34	3B				DR	3A	IMP45-DR
70	SU74706690	ARB	02	035		2	1	064	-50	064	-45	4				DR	4	STNS-40
71	SU73806680	CER		055		1	1	139	25	108	-1	2				DR	2	
72	SU73906680	CER		000		1	1	078	-36	078	-31	3B				DR	3B	IMP 50
73	SU74006680	CER		035		2	2	085	-29	088	-21	3B				DR	3B	POSS3AWE
74	SU74406680	WHT		025		2	3A	096	-18	104	-5	3A				WE	3A	IMPEN 60
75	SU74506680	BAR		025		2	2	076	-38	076	-33	3B				DR	3A	IMP45-DR
76	SU74706680	BAR		030		2	2	064	-50	064	-45	4				DR	3A	IMP38-DR
77	SU73906670	CER		028		2	2	106	-8	108	-1	3A				DR	3A	IMP 80
78	SU74206670	WHT		030		2	2	078	-36	078	-31	3B				WE	2	IMPEN 45
79	SU74306670	WHT		000		1	2	054	-60	054	-55	4				DR	3B	IMPEN 30
80	SU74406670	CER		000		1	1	033	-81	033	-76	4				DR	3B	IMPEN 20
81	SU74506670	BAR		000		1	1	062	-52	062	-47	4				DR	3B	PICK 35
82	SU74306660	CER		000		1	1	063	-51	063	-46	4				DR	3B	IMPEN 35
83	SU74406660	CER		000		1	1	045	-69	045	-64	4				DR	3B	IMPEN 25
84	SU74506660	CER		000		1	1	043	-71	043	-66	4				DR	3B	IMPEN 25
85	SU74106650	PGR		000		1	1	036	-78	036	-73	4				DR	3B	IMPEN 20
86	SU74206650	PGR		000		2	2	053	-61	053	-56	4				DR	3B	IMPEN 30
87	SU74306650	CER		000		1	1	060	-54	060	-49	4				DR	3B	IMPEN 35
88	SU74406650	CER		000		1	1	049	-65	049	-60	4				DR	3B	IMPEN 30
89	SU74506650	CER		000		1	1	033	-81	033	-76	4				DR	3B	IMPEN 20

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
90	SU74206640	PGR		000			1	1	053	-61	053	-56	4				DR	3B		IMPEN 30
91	SU74306640	PGR		000			1	1	072	-42	072	-37	3B				DR	3B		IMPEN 40
92	SU74406640	CER		000			1	1	054	-60	054	-55	4				DR	3B		IMPEN 30

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
1P	0-33	msl	10YR42 00						11	0	HR	20						
	33-45	scl	10YR43 00						0	0	HR	23		M				
	45-72	scl	10YR53 00	10YR56 00	F			Y	0	0	HR	45		M				
	72-120	gh	10YR66 62	10YR66 00	C			Y	0	0		0		P				
2	0-10	mzcl	10YR32 00						0	0		0						
	10-55	zc	10YR51 00	75YR58 00	C			Y	0	0		0		M			Y	
2P	0-29	mcl	10YR42 00						3	0	HR	10						
	29-48	scl	25Y 41 00	75YR46 00	M			Y	0	0	HR	20	MDCSAB	FR M				
	48-57	lms	25Y 62 00	75YR58 00	M			Y	0	0	HR	50	WKCSAB	VF M				
	57-120	gh	25Y 62 00					Y	0	0		0		P				
3	0-24	scl	10YR42 00						0	0	HR	3						
	24-35	scl	10YR43 00	40YR46 00	F				0	0		0		M				
	35-60	scl	10YR53 00	10YR56 00	C			Y	0	0		0		M				
	60-90	sc	05Y 62 00	75YR56 00	M			Y	0	0	HR	5		P			Y	
	90-120	gh	00ZZ00 00					Y	0	0		0		P			Y	
3P	0-30	msl	10YR43 00						4	0	HR	12						
	30-40	msl	25Y 64 00						0	0	HR	15	MDCSAB	FR M				
	40-70	scl	05YR58 00						0	0	HR	50		M				
4P	0-30	msl	10YR43 00						0	0	HR	3						
	30-70	msl	10YR53 44						0	0	HR	3	MDCSAB	FR M				
	70-80	msl	10YR53 44						0	0	HR	15	MDCSAB	FR M				
	80-100	scl	05YR58 00						0	0	HR	50		M				
5P	0-30	mcl	10YR32 00						1	0	HR	3						
	30-55	mcl	10YR53 00	10YR56 00	C			Y	0	0	HR	25		M				
	55-120	c	25Y 51 00	10YR46 56	M		00MN00 00	Y	0	0	HR	1	MCSAB	FR M				
6P	0-22	mcl	10YR32 00	000C00 00	F				0	0	HR	2						
	22-55	c	10YR53 52	10YR56 00	M		10YR51 00	Y	0	0	HR	1	MCSAB	FM M	Y			
	55-120	c	10YR53 00	10YR58 00	M			Y	0	0	HR	1	MCSAB	FM M	Y			
8	0-20	hzcl	10YR32 00						0	0		0						
	20-50	hzcl	10YR51 00	75YR58 00	C			Y	0	0	HR	2		M			Y	
	50-70	msl	10YR62 00	10YR68 00	C			Y	0	0	HR	2		M			Y	
	70-80	ms	10YR62 00	10YR68 00	C			Y	0	0	GH	10		M			Y	
9	0-40	hzcl	10YR41 00	75YR58 00	C			Y	0	0	HR	1						
	40-60	scl	10YR62 00	10YR68 00	C			Y	0	0	HR	1		M				
10	0-25	scl	10YR42 00						0	0	HR	20						
11	0-25	scl	10YR42 00						0	0	HR	5						
	25-35	scl	10YR43 44						0	0	HR	20		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	STONES GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
14	0-20	lms	10YR33 00						0	0	HR	10						
15	0-35	mzcl	10YR33 00						0	0	HR	1						
	35-60	mzcl	10YR51 00	75YR58 00	C			Y	0	0		0		M				
	60-70	hzcl	10YR62 00	75YR58 00	C			Y	0	0		0		M				
16	0-40	hzcl	10YR51 00	75YR58 00	C			Y	0	0		0					Y	
	40-75	zc	10YR51 00	75YR58 00	C			Y	0	0	HR	2					Y	
17	0-10	mzcl	10YR32 00						0	0		0						
	10-35	hzcl	10YR51 00	75YR58 00	C			Y	0	0		0		M				
	35-45	scl	10YR61 00	75YR58 00	C			Y	0	0	HR	1		M				
	45-55	msl	10YR62 00	10YR58 00	C			Y	0	0	HR	2		M				
18	0-40	hzcl	10YR41 00	75YR58 00	C			Y	0	0		0						
	40-50	hcl	10YR52 00	10YR58 00	C			Y	0	0		0		M			Y	
	50-90	scl	10YR62 00	10YR56 00	C			Y	0	0		0		M			Y	
19	0-25	hzcl	10YR41 00	75YR58 00	C			Y	0	0		0					Y	
	25-70	zc	10YR51 00	75YR58 00	C			Y	0	0	GH	2		M			Y	
20	0-30	msl	10YR42 00						0	0	HR	20						
	30-31	msl	00ZZ00 00						0	0		0		M				
21	0-25	msl	10YR42 00						0	0	HR	10						
	25-32	scl	10YR43 00						0	0	HR	20		M				
22	0-20	msl	10YR32 00						0	0	HR	10						
23	0-30	msl	10YR33 00						0	0	HR	2						
24	0-30	mcl	10YR32 00						0	0	HR	2						
	30-60	lms	10YR62 00	75YR58 00	C			Y	0	0	HR	1		M				
	60-110	hcl	10YR51 00	75YR58 00	C			Y	0	0		0		M			Y	
25	0-30	mzcl	10YR33 00						0	0	HR	2						
	30-45	mzcl	10YR62 00	75YR58 00	C			Y	0	0	HR	2		M				
26	0-30	msl	10YR32 00						0	0	HR	2						
27	0-20	hzcl	10YR51 00	75YR58 00	C			Y	0	0		0						
	20-85	zc	10YR62 00	10YR68 00	C			Y	0	0		0					Y	
28	0-30	hzcl	10YR51 00	75YR58 00	C			Y	0	0	HR	2						
29	0-35	msl	10YR46 00						0	0	HR	1						
	35-55	msl	10YR62 00	10YR68 00	C			Y	0	0	HR	1		M				
	55-120	gh	10YR66 00					Y	0	0		0		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
30	0-25	hzcl	10YR51 00	75YR58 00	C			Y	0	0		0						
	25-75	hcl	10YR51 00	10YR68 00	C			Y	0	0		0		M			Y	
31	0-25	scl	10YR42 00						0	0	HR	10						
32	0-20	msl	10YR32 00						0	0	HR	10						
33	0-30	mcl	10YR42 00						0	0	HR	3						
35	0-38	mcl	10YR32 00						0	0	HR	3						
36	0-35	mcl	10YR31 00						0	0	HR	2						
	35-50	c	10YR31 00	10YR56 00	C			Y	0	0	HR	2		M				
38	0-10	hzcl	10YR32 00						0	0		0						
	10-55	hzcl	10YR51 00	75YR58 00	C			Y	0	0		0					Y	
	55-120	zc	10YR62 00	10YR58 00	C			Y	0	0		0					Y	
39	0-20	mzcl	10YR51 00	75YR58 00	C			Y	0	0		0						
	20-55	hcl	10YR62 00	10YR58 00	C			Y	0	0	HR	1		M				
40	0-25	mcl	10YR42 00						0	0	HR	10						
	25-30	scl	10YR42 00						0	0	HR	10		M				
41	0-27	mcl	10YR43 00						0	0	HR	3						
	27-40	mcl	10YR63 64	10YR56 00	C			Y	0	0	HR	5		M				
	40-42	mcl	10YR63 64	10YR56 00	M			Y	0	0	HR	20		M				
42	0-28	msl	10YR42 00						0	0	HR	20						
	28-30	scl	10YR43 00						0	0	HR	25		M				
43	0-30	scl	10YR42 00						0	0	HR	15						
44	0-30	msl	10YR32 00						0	0	HR	5						
45	0-20	msl	10YR33 00						0	0	HR	10						
46	0-32	mcl	10YR32 00						0	0	HR	3						
47	0-30	mcl	10YR31 00						0	0	HR	2						
	30-48	mcl	10YR32 00	10YR56 00	C			Y	0	0	HR	5		M				
49	0-30	hzcl	10YR51 00	75YR58 00	C			Y	0	0	HR	2						
50	0-30	mcl	10YR43 00						0	0	HR	3						
51	0-37	mcl	10YR42 00						0	0	HR	2						
	37-48	mcl	25Y 63 64	75YR58 00	C			Y	0	0		0		M				
	48-55	scl	25Y 63 64	75YR58 00	C			Y	0	0		0		M				
	55-80	c	25Y 63 00	75YR56 00	M			Y	0	0		0		P			Y	

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
52	0-25	mcl	10YR42 00						0	0	HR	7						
	25-30	c	25Y 52 00 75YR58 00 C					Y	0	0	HR	5		P			Y	
53	0-35	hcl	10YR42 00						0	0	HR	3						
	35-40	c	10YR53 00 75YR58 00 C					Y	0	0	HR	3		M				
	40-45	c	10YR53 00 75YR58 00 M					Y	0	0	HR	3		P			Y	
54	0-20	mcl	10YR42 00 10YR56 00 F						0	0	HR	10						
55	0-30	mcl	10YR32 00						7	0	HR	10						
	30-35	mcl	10YR33 00						0	0	HR	10		M				
56	0-32	mcl	10YR42 00						0	0	HR	3						
	32-55	scl	10YR53 00 10YR56 00 C					Y	0	0	HR	5		M				
	55-70	mcl	10YR52 62 75YR56 00 C					Y	0	0		0		M				
	70-100	scl	10YR53 63 10YR66 00 C					Y	0	0		0		M				
	100-120	sc	25Y 63 00 75YR58 00 M					Y	0	0	HR	5		P			Y	
57	0-26	mcl	10YR42 00						0	0	HR	5						
	26-40	scl	10YR53 00 10YR66 00 C					Y	0	0	HR	15		M				
58	0-30	scl	10YR41 42						0	0	HR	10						
59	0-30	msl	10YR32 00						0	0	HR	10						
60	0-30	mcl	10YR32 00						0	0	HR	2						
	30-35	mcl	10YR42 00						0	0	HR	5		M				
61	0-30	mcl	10YR32 00						0	0	HR	2						
	30-40	mcl	10YR42 00 10YR56 00 C					Y	0	0	HR	5		M				
	40-65	c	10YR42 00 10YR58 00 M					Y	0	0	HR	2		M				
	65-80	c	10YR42 00 10YR68 00 M					Y	0	0		0		M				
62	0-28	msl	10YR43 00						0	0	HR	2						
	28-68	msl	10YR53 44						0	0		0		M				
	68-72	scl	10YR53 00 10YR56 00 C					Y	0	0	HR	2		M				
63	0-30	mcl	10YR42 00						0	0	HR	4						
64	0-30	mcl	10YR42 00						0	0	HR	2						
	30-45	mcl	10YR53 54 75YR58 00 C					Y	0	0	HR	5		M				
	45-55	hcl	25Y 63 00 75YR58 00 C					Y	0	0	HR	5		M				
65	0-25	mcl	10YR42 00						0	0	HR	4						
	25-30	mcl	10YR53 00 75YR58 00 C					Y	0	0	HR	6		M				
66	0-25	hzcl	10YR53 00						0	0		0						
	25-50	hcl	25Y 63 00 10YR58 61 C				00MN00 00	Y	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
67	0-25	mcl	10YR32 00						0	0	HR	2						
	25-45	mcl	10YR53 00	10YR56 00	C			Y	0	0	HR	5		M				
68	0-25	mcl	10YR32 00						0	0	HR	2						
	25-45	mcl	10YR53 00	10YR56 00	C			Y	0	0	HR	5		M				
70	0-35	msl	10YR33 00						0	0	HR	5						
	35-40	scl	10YR62 00	10YR68 00	C			Y	0	0	HR	5		M				
71	0-26	msl	10YR43 00						0	0	HR	3						
	26-55	msl	10YR54 44						0	0	HR	2		M				
	55-90	scl	25Y 63 00	75YR56 00	M			Y	0	0	HR	2		M				
	90-120	c	25Y 52 00	75YR56 58	M			Y	0	0		0		P				
72	0-30	msl	10YR42 00						0	0	HR	3						
	30-50	msl	10YR54 00						0	0	HR	5		M				
73	0-35	mcl	10YR42 00						0	0	HR	3						
	35-45	hcl	25Y 63 00	75YR56 00	C			Y	0	0	HR	5		M				
	45-55	c	25Y 63 00	75YR56 00	M			Y	0	0	HR	15		P				
74	0-25	hzcl	10YR43 00						0	0		0						
	25-60	c	10YR53 00	10YR58 61	C		00MN00 00	Y	0	0		0		M				
75	0-25	mcl	10YR32 00						0	0	HR	2						
	25-45	mcl	10YR53 00	10YR56 00	C			Y	0	0	HR	2		M				
76	0-30	mcl	10YR32 00						0	0	HR	5						
	30-38	hcl	10YR53 00	75YR46 00	M		00MN00 00	Y	0	0	HR	5		M				
77	0-28	msl	10YR43 00						0	0	HR	2						
	28-50	msl	10YR64 44	10YR56 00	C			Y	0	0	HR	3		M				
	50-75	scl	25Y 63 00	75YR56 00	C			Y	0	0	HR	2		M				
	75-80	c	25Y 63 00	75YR56 00	M			Y	0	0	HR	20		P				
78	0-30	mcl	10YR44 00						0	0		0						
	30-45	c	10YR52 00	10YR58 61	M			Y	0	0		0		M				
79	0-30	mcl	10YR52 00						0	0		0						
80	0-20	mcl	10YR42 00						0	0	HR	8						
81	0-35	mcl	10YR42 00						0	0	HR	2						
82	0-35	mcl	10YR53 00						0	0		0						
83	0-25	mcl	10YR43 00						0	0		0						

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
84	0-25	mcl	10YR42 00						0	0	HR	5						
85	0-20	mcl	10YR52 00						0	0		0						
86	0-30	mszl	10YR63 00						0	0	HR	8						
87	0-35	mcl	10YR43 00						0	0	HR	5						
88	0-30	mcl	10YR53 00						0	0	HR	10						
89	0-20	mcl	10YR43 00						0	0	HR	8						
90	0-30	mszl	25Y 63 00						0	0	HR	8						
91	0-40	mszl	25Y 53 00						0	0	HR	5						
92	0-30	mcl	10YR53 00						0	0		0						