A1
WEST SUSSEX MINERALS PLAN
SITE 37: BALSAM'S FARM
AGRICULTURAL LAND CLASSIFICATION
ALC MAP & REPORT
OCTOBER 1993

**WEST SUSSEX MINERALS PLAN**
**SITE 37: BALSAM'S FARM**
**AGRICULTURAL LAND CLASSIFICATION REPORT**

## 1.0 Summary

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

1.2 Approximately 53 hectares of land relating to Site 37 north-west of Balsam's Farm, Funtington near Chichester was surveyed in October 1993. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 49 soil auger borings and 3 soil inspection pits were assessed in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture.

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

1.4 At the time of the survey the landuse on the site was grass ley which is currently being used for outdoor pig husbandry.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:5,000. It is accurate at this scale, but any enlargement would be misleading. This map supersedes any previous survey information for this site.

Table 1 : Distribution of Grades and Subgrades

| Grade | Area (ha) | % of Site | % of Agricultural Area |
|---|---|---|---|
| 3a | 3.2 | 6.0 | 6.2 |
| 3b | 48.3 | 91.7 | 93.8 |
| Non-agricultural land | 0.4 | 0.7 | 100.0 (51.5 ha.) |
| Urban | 0.4 | 0.7 | |
| Agricultural buildings | 0.5 | 0.9 | |
| Total | 52.8 | 100.0 | |

1.6 Appendix 1 gives a general description of the grades and subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.7 The agricultural land on the site has been classified as Subgrades 3a and 3b with soil droughtiness as the key limitation. The area shown as Subgrade 3a, good quality land, experiences a moderate limitation on the amount of available water in the profile. Soils are typically medium clay loams which become heavier and moderately stony at depth. The area shown as Subgrade 3b, moderate quality land, has similar soil textures which are significantly limited due to the very stony topsoils and subsoils which occur within this mapping unit. The high stone volumes significantly restrict both profile available water for plant growth, and the range of crops that can tolerate such conditions.

## 2.0 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 (degree days Jan-June), as a measure of the relative warmth of a locality.

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

2.4 No local climatic factors such as exposure or frost risk affect the site. However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. At this locality, the climate is relatively wet in regional terms, with field capacity days being high. This will increase the likelihood of soil wetness and workability problems whilst partially offsetting the chances of soil droughtiness risk.

Table 2 : Climatic Interpolations

| | |
|---|---|
| Grid Reference : | SU 795 077 |
| Altitude (m) : | 30 |
| Accumulated Temperature (days) : | 1516 |
| Average Annual Rainfall (mm) : | 827 |
| Field Capacity (days) : | 173 |
| Moisture Deficit, Wheat (mm) : | 111 |
| Moisture Deficit, Potatoes (mm) : | 106 |
| Overall Climatic Grade : | 1 |

## 3.0 Relief

3.1 The site is slightly undulating lying at an altitude in a range between 35 and 40 metres. On no part of the site does relief or gradient pose any limitation to agricultural use.

## 4.0 Geology and Soil

4.1 The relevant geological sheet for the site (BGS Sheet 316: Fareham 1971) shows the underlying geology to be River and Valley Gravels with Coombe Deposits.

4.2 The published soils information for the area (SSEW Sheet 6; Soils of South East England 1983) shows the soils on the site to be of the Charity 1 association. These are described as well drained fine silty and fine silty over clayey soils, locally very flinty, some shallow over flint gravel. Detailed field examination confirms this, particularly the locally shallow and flinty nature of the soils on some parts of the site.

## 5.0 Agricultural Land Classification

5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

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

5.3 Subgrade 3a: Approximately 3 hectares of land on the site has been classified as Subgrade 3a, good quality agricultural land , with soil droughtiness as the main limitation. Soil profiles are typically moderately stony throughout and comprise medium clay loam topsoils which become heavier with depth, with slightly stony subsoils. These soils are well drained, Wetness Class I, but show a moderate restriction on available water within the profile. This arises due to a combination of soil textures, substructural conditions and stone contents, combined with the local climatic regime.

5.4 Subgrade 3b: The remainder of the agricultural land on the site (48.3 ha) has been classified as Subgrade 3b, moderate quality land, with soil droughtiness as the main limitation. The majority of soil auger inspections within this mapping unit proved to be impenetrable below the topsoil, particularly in the south of the site. Therefore, three soil inspection pits were dug to assess the nature of the subsoil. Pits 1, 2 and 3 demonstrate the variation in subsoil stoniness which occurs throughout the site, Pit 2 the stoniest and Pit 1 the least stoniest. Pit 1 proved impenetrable to digging at 95cm. The soil profile consists of a medium clay loam topsoil containing 39% total flints. The upper subsoil is also a medium clay loam containing 34% total flints. The lower subsoil is a clay which contains 30% total flints down to 80cm, becoming stonier after this depth with 60% total flints. Although this is the least stony of all the pits in this mapping unit, it still has a resultant classification of Subgrade 3b. Pit 2 was dug in one of the more stony areas of the site, and proved impenetrable to digging at 70cm. From this pit it is evident that the topsoil is a medium silty clay loam and contains 45% total flints overlying a medium clay loam upper subsoil containing 59% total flints. The lower subsoil consists of a heavy clay loam containing 63% total flints. Pit 3 in the north-west of the site showed the soils comprised of a deep and very stony topsoil consisting of a medium clay loam containing a total of 53% flints. the upper subsoil is less stony, comprising a heavy clay loam with 31% total flints. Below this is a very stony clay containing 46% total flints which proved impenetrable to digging at 80cm. In all of the pits, the stony nature of the subsoils contribute to a restriction on the amount of profile available water, which in turn affects the final grade.

The impenetrable nature of the subsoils on this site means that a number of assumptions regarding stone contents and rooting depths below the level at which the pit became impenetrable to digging. The nature of the underlying geology for the site has made it possible to assume that profiles will not become any less stony below these depths. Furthermore, it has been assumed that there is a further 20cm of rooting depth below the depth to which it was dug. This information is incorporated into the calculation of the profile available water for the soils on the site. Evidence gained from the soil inspection pits suggests that the soils over the majority of the site have a significant droughtiness limitation on profile available water arising as a result of the soil textures, structures and relatively high stone contents alongside the local climatic regime. This leads to a consequent restriction on yields, and the range of crops that can tolerate such conditions.

5.6 The area marked as urban includes a road in the east of the site. There is some non-agricultural land in the south-east of the site, and some agricultural buildings around Balsam's Farm.

APPENDIX I

DESCRIPTION OF THE GRADES AND SUB-GRADES

**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 on the 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.

**Grade 3 : Good To Moderate Quality Agricultural Land**

Land with moderate limitations which affect the choice of crops, 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.

**Sub-grade 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.

**Sub-grade 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 very 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 : housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

**Non-agricultural**

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

**Woodland**

Includes commercial and non-commercial 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 (1957), Sheet No.317, Chichester, 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 (1982), Sheet No.6, Soils of South East England, 1:250,000, and accompanying legend.

## APPENDIX III

## DEFINITION OF SOIL WETNESS CLASSES

### Wetness Class I

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

### Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

### Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

### Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

### Wetness Class V

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

### Wetness Class VI

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

(The number of days is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.)

# APPENDIX IV

## SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

* Soil Abbreviations : Explanatory Note
* Soil Pit Descriptions
* 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 HRT : Horticultural Crops PGR : Permanent Pasture LEY : Ley Grass RGR : Rough Grazing
SCR : Scrub CFW : Coniferous Woodland DCW : Deciduous Woodland HTH : Heathland BOG : Bog or Marsh
FLW : Fallow PLO : Ploughed SAS : Set aside OTH : Other

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 : Soil Erosion Risk WD : Combined 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 MSST : soft, medium or coarse grained sandstone
SI : soft weathered igneous or metamorphic SLST : soft oolitic or dolimitic limestone
FSST : soft, fine grained sandstone ZR : soft, argillaceous, or silty rocks CH : chalk
GH : gravel with non-porous (hard) stones GS :gravel with porous (soft) stones

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 : W.SSX - BALSAMS FARM, 37  Pit Number : 1P

Grid Reference: SU79450799
Average Annual Rainfall : 822 mm
Accumulated Temperature : 1522 degree days
Field Capacity Level : 173 days
Land Use : Ley
Slope and Aspect : degrees

| HORIZON | TEXTURE | COLOUR | STONES >2 | TOT.STONE | MOTTLES | STRUCTURE |
|---|---|---|---|---|---|---|
| 0- 30 | MCL | 10YR42 00 | 8 | 39 | | WCSAB |
| 30- 45 | MCL | 10YR54 00 | 0 | 34 | | |
| 45- 80 | C | 75YR46 00 | 0 | 30 | F | |
| 80-115 | C | 75YR44 00 | 0 | 60 | F | |

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

Drought Grade : 3B
APW : 87 mm MBW : -24 mm
APP : 79 mm MBP : -28 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : W.SSX - BALSAMS FARM, 37  Pit Number : 2P

Grid Reference: SU79480767  Average Annual Rainfall : 822 mm
Accumulated Temperature : 1522 degree days
Field Capacity Level : 173 days
Land Use : Ley
Slope and Aspect : degrees E

| HORIZON | TEXTURE | COLOUR | STONES >2 | TOT.STONE | MOTTLES | STRUCTURE |
|---|---|---|---|---|---|---|
| 0- 32 | MZCL | 10YR42 00 | 12 | 45 | | WCSAB |
| 32- 53 | MCL | 10YR54 56 | 0 | 59 | | |
| 53- 90 | HCL | 10YR58 00 | 0 | 63 | | |

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

Drought Grade : 3B  APW : 64 mm  MBW : -47 mm
APP : 61 mm  MBP : -46 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : W.SSX - BALSAMS FARM, 37  Pit Number : 3P

Grid Reference: SU79200799  Average Annual Rainfall : 822 mm
Accumulated Temperature : 1522 degree days
Field Capacity Level : 173 days
Land Use : Ley
Slope and Aspect : degrees E

| HORIZON | TEXTURE | COLOUR | STONES >2 | TOT.STONE | MOTTLES | STRUCTURE |
|---|---|---|---|---|---|---|
| 0- 36 | MCL | 10YR42 00 | 8 | 54 | | WCSAB |
| 36- 56 | HCL | 10YR43 00 | 0 | 31 | | |
| 56-100 | C | 75YR46 00 | 0 | 46 | F | |

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

Drought Grade : 3B  APW : 72 mm  MBW : -39 mm
APP : 67 mm  MBP : -40 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

| SAMPLE NO. | GRID REF | USE | ASPECT | GRDNT | GLEY | SPL | --WETNESS-- CLASS | GRADE | -WHEAT- AP | MB | -POTS- AP | MB | DRT | M.REL FLOOD | EROSN EXP | FROST DIST | CHEM LIMIT | ALC | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SU79100810 | LEY | | | | | 1 | 2 | 73 | -38 | 80 | -27 | 3B | | | | DR | 3B | I60-Q DR |
| 1P | SU79450799 | LEY | | | | | 1 | 2 | 87 | -24 | 79 | -28 | 3B | | | | DR | 3B | PIT 95 |
| 2 | SU79200810 | LEY | | | 035 | | 2 | 3A | 52 | -59 | 52 | -55 | 4 | | | | DR | 4 | I40-Q DR |
| 2P | SU79480767 | LEY | E | | | | 1 | 1 | 64 | -47 | 61 | -46 | 3B | | | | DR | 3B | PIT 70 |
| 3 | SU79300810 | LEY | | | | | 1 | 2 | 47 | -64 | 47 | -60 | 4 | | | | DR | 4 | I40-Q DR |
| 3P | SU79200799 | LEY | E | | | | 1 | 2 | 72 | -39 | 67 | -40 | 3B | | | | DR | 3B | PIT 80 |
| 4 | SU79400810 | LEY | | | | | 1 | 2 | 51 | -60 | 51 | -56 | 4 | | | | DR | 4 | I43-Q DR |
| 5 | SU79500810 | LEY | | | | | 1 | 2 | 77 | -34 | 87 | -20 | 3B | | | | DR | 3B | I65-Q DR |
| 6 | SU79600810 | LEY | Y | | | | 1 | 2 | 48 | -63 | 48 | -59 | 4 | | | | DR | 4 | I40-Q DR |
| 7 | SU79700810 | LEY | Y | | | | 1 | 2 | 82 | -29 | 87 | -20 | 3B | | | | DR | 3B | I60-Q DR |
| 8 | SU79100800 | LEY | | | | | 1 | 1 | 70 | -41 | 70 | -37 | 3B | | | | DR | 3B | IMP45Q3A |
| 9 | SU79200800 | LEY | | | | | 1 | 1 | 66 | -45 | 66 | -41 | 3B | | | | DR | 3B | IMP40Q3A |
| 10 | SU79300800 | LEY | | | | | 1 | 1 | 88 | -23 | 93 | -14 | 3B | | | | DR | 3B | IMP Q3A |
| 11 | SU79400800 | LEY | | | | | 1 | 1 | 100 | -11 | 107 | 0 | 3A | | | | DR | 3A | IMP 80 |
| 12 | SU79500800 | LEY | | | | | 1 | 1 | 102 | -9 | 109 | 2 | 3A | | | | DR | 3A | IMP 75 |
| 13 | SU79600800 | LEY | | | | | 1 | 1 | 93 | -18 | 99 | -8 | 3A | | | | DR | 3A | IMPQZ |
| 14 | SU79700800 | LEY | | | | | 1 | 1 | 87 | -24 | 92 | -15 | 3B | | | | DR | 3B | IMP60 |
| 15 | SU79800800 | LEY | | | 58 | 58 | 3 | 3A | 98 | -13 | 93 | -14 | 3A | | | | WE | 3A | QDRST |
| 16 | SU79100790 | LEY | | | | | 1 | 1 | 94 | -17 | 104 | -3 | 3A | | | | DR | 3A | IMPEN 75 |
| 17 | SU79200790 | LEY | | | | | 1 | 1 | 72 | -39 | 72 | -35 | 3B | | | | DR | 3B | IMPEN 35 |
| 18 | SU79300790 | LEY | | | | | 1 | 1 | 82 | -29 | 89 | -18 | 3B | | | | DR | 3B | IMPEN 60 |
| 19 | SU79400790 | LEY | | | | | 1 | 1 | 84 | -27 | 87 | -20 | 3B | | | | DR | 3B | IMPEN 55 |
| 21 | SU79600790 | LEY | | | | | 1 | 2 | 81 | -30 | 88 | -19 | 3B | | | | DR | 3B | I60-Q DR |
| 22 | SU79700790 | LEY | | | | | 1 | 2 | 80 | -31 | 81 | -26 | 3B | | | | DR | 3B | I52-Q DR |
| 23 | SU79800790 | LEY | | | | | 1 | 2 | 81 | -30 | 81 | -26 | 3B | | | | DR | 3B | I50-Q DR |
| 24 | SU79400780 | LEY | | | | | 1 | 1 | 49 | -62 | 49 | -58 | 4 | | | | DR | 4 | IMPEN 30 |
| 25 | SU79500780 | LEY | | | | | 1 | 1 | 35 | -76 | 35 | -72 | 4 | | | | DR | 4 | IMPEN 20 |
| 26 | SU79600780 | LEY | N | 01 | | | 1 | 1 | 34 | -77 | 34 | -73 | 4 | | | | ST | 3B | IMPST 30 |
| 27 | SU79700780 | LEY | SW | 01 | | | 1 | 1 | 58 | -53 | 58 | -49 | 4 | | | | DR | 4 | IMPST 45 |
| 28 | SU79800780 | LEY | SW | 01 | | | 1 | 1 | 54 | -57 | 54 | -53 | 4 | | | | DR | 4 | IMPST 40 |
| 29 | SU79900780 | LEY | SW | | | | 1 | 1 | 66 | -45 | 66 | -41 | 3B | | | | DR | 3B | IMPST 50 |
| 30 | SU79400770 | LEY | | | | | 1 | 1 | 135 | 24 | 113 | 6 | 2 | | | | DR | 2 | |
| 31 | SU79500770 | LEY | | | | | 1 | 1 | 34 | -77 | 34 | -73 | 4 | | | | DR | 4 | IMPEN 20 |
| 32 | SU79600770 | LEY | E | 02 | | | 1 | 1 | 49 | -62 | 49 | -58 | 4 | | | | DR | 4 | IMPST 40 |
| 33 | SU79700770 | LEY | S | 01 | | | 1 | 1 | 39 | -72 | 39 | -68 | 4 | | | | DR | 4 | IMPST 30 |
| 34 | SU79800770 | LEY | W | 01 | | | 1 | 1 | 88 | -23 | 95 | -12 | 3B | | | | DR | 3B | IMPST 80 |
| 35 | SU79900770 | LEY | SW | | | | 1 | 1 | 128 | 17 | 107 | 0 | 2 | | | | DR | 2 | |
| 36 | SU79400760 | LEY | | | | | 1 | 1 | 59 | -52 | 59 | -48 | 4 | | | | DR | 4 | IMPEN 35 |
| 37 | SU79500760 | LEY | | | | | 1 | 1 | 58 | -53 | 58 | -49 | 4 | | | | DR | 4 | IMPEN 35 |
| 38 | SU79600760 | LEY | S | | | | 1 | 1 | 64 | -47 | 64 | -43 | 3B | | | | DR | 3B | IMPST 50 |
| 39 | SU79700760 | LEY | E | 02 | | | 1 | 1 | 68 | -43 | 70 | -37 | 3B | | | | DR | 3B | IMPST 55 |
| 40 | SU79800760 | LEY | S | 01 | | | 1 | 2 | 69 | -42 | 72 | -35 | 3B | | | | DR | 3B | IMPST 60 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | SU79900760 | LEY | SW | | 35 | | 2 | 2 | 103 | -8 | 109 | 2 | 3A | | | | DR | 3A | IMPST 80 |
| 42 | SU79400750 | LEY | | | | | 1 | 1 | 33 | -78 | 33 | -74 | 4 | | | | DR | 4 | IMPEN 20 |
| 43 | SU79500750 | LEY | | | | | 1 | 1 | 52 | -59 | 52 | -55 | 4 | | | | DR | 4 | IMPEN 30 |
| 44 | SU79600750 | LEY | E | 01 | | | 1 | 1 | 66 | -45 | 68 | -39 | 3B | | | | DR | 3B | IMPST 55 |
| 45 | SU79700750 | CER | E | 01 | | | 1 | 1 | 62 | -49 | 62 | -45 | 3B | | | | DR | 3B | IMPST 50 |
| 46 | SU79800750 | CER | E | 03 | | | 1 | 1 | 54 | -57 | 54 | -53 | 4 | | | | DR | 4 | IMPST 45 |
| 47 | SU79900750 | CER | W | 01 | | | 1 | 1 | 52 | -59 | 52 | -55 | 4 | | | | DR | 4 | IMPST 40 |
| 48 | SU79400740 | LEY | | | | | 1 | 1 | 43 | -68 | 43 | -64 | 4 | | | | DR | 4 | IMPEN 25 |
| 49 | SU79500740 | LEY | | | | | 1 | 1 | 57 | -54 | 57 | -50 | 4 | | | | DR | 4 | IMPEN 35 |
| 50 | SU79600740 | CER | S | 03 | 35 | 45 | 4 | 3B | 124 | 13 | 102 | -5 | 2 | | | | WE | 3B | SPL 45 |

| SAMPLE | DEPTH | TEXTURE | COLOUR | MOTTLES COL | MOTTLES ABUN | MOTTLES CONT | PED COL. | GLEY | STONES >2 | STONES >6 | STONES LITH | STONES TOT | STRUCT/ CONSIST | SUBS STR | SUBS POR | SUBS IMP | SUBS SPL | SUBS CALC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0-29 | mcl | 10YR32 00 | | | | | | 14 | 0 | HR | 34 | | | | | | |
| | 29-40 | hcl | 10YR56 00 | | | | | | 0 | 0 | HR | 12 | | M | | | | |
| | 40-60 | c | 10YR58 00 | | | | | | 0 | 0 | HR | 10 | | M | | | | |
| 1P | 0-30 | mcl | 10YR42 00 | | | | | | 8 | 0 | HR | 39 | WCSAB | FR | | | | |
| | 30-45 | mcl | 10YR54 00 | | | | | | 0 | 0 | HR | 34 | | FR | M | | Y | |
| | 45-80 | c | 75YR46 00 | 00MN00 | 00 | F | | | 0 | 0 | HR | 30 | | FM | M | | Y | |
| | 80-115 | c | 75YR44 00 | 00MN00 | 00 | F | | | 0 | 0 | HR | 60 | | FM | M | | Y | |
| 2 | 0-35 | mcl | 10YR32 00 | | | | | | 10 | 0 | HR | 30 | | | | | | |
| | 35-40 | c | 10YR42 00 | 10YR56 | 00 | C | | Y | 0 | 0 | HR | 10 | | M | | | | |
| 2P | 0-32 | mzcl | 10YR42 00 | | | | | | 12 | 0 | HR | 45 | WCSAB | FR | | | | |
| | 32-53 | mcl | 10YR54 56 | | | | | | 0 | 0 | HR | 59 | | FR | M | | | |
| | 53-90 | hcl | 10YR58 00 | | | | | | 0 | 0 | HR | 63 | | FM | M | | | |
| 3 | 0-30 | mcl | 10YR32 00 | | | | | | 14 | 0 | HR | 35 | | | | | | |
| | 30-40 | mcl | 10YR54 00 | | | | | | 0 | 0 | HR | 35 | | M | | | | |
| 3P | 0-36 | mcl | 10YR42 00 | | | | | | 8 | 0 | HR | 54 | WCSAB | FR | | | | |
| | 36-56 | hcl | 10YR43 00 | | | | | | 0 | 0 | HR | 31 | | FR | M | | | |
| | 56-100 | c | 75YR46 00 | 00MN00 | 00 | F | | | 0 | 0 | HR | 46 | | FM | M | | Y | |
| 4 | 0-26 | mcl | 10YR42 00 | | | | | | 14 | 0 | HR | 35 | | | | | | |
| | 26-43 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 30 | | M | | | | |
| 5 | 0-28 | mcl | 10YR42 00 | | | | | | 10 | 0 | HR | 30 | | | | | | |
| | 28-47 | hcl | 10YR56 00 | | | | | | 0 | 0 | HR | 15 | | M | | | | |
| | 47-65 | c | 10YR58 00 | 00MN00 | 00 | F | | | 0 | 0 | HR | 15 | | M | | | Y | |
| 6 | 0-30 | mcl | 10YR42 00 | | | | | | 14 | 0 | HR | 35 | | | | | | |
| | 30-40 | hcl | 10YR43 00 | | | | | | 0 | 0 | HR | 25 | | M | | | | |
| 7 | 0-30 | mcl | 10YR42 00 | | | | | | 4 | 0 | HR | 10 | | | | | | |
| | 30-45 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 20 | | M | | | | |
| | 45-60 | mcl | 10YR44 00 | | | | | | 0 | 0 | HR | 25 | | M | | | | |
| 8 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 10 | | | | | | |
| | 35-45 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 20 | | M | | | | |
| 9 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 6 | | | | | | |
| | 35-40 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 20 | | M | | | | |
| 10 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 7 | | | | | | |
| | 35-50 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 12 | | M | | | | |
| | 50-60 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 20 | | M | | | | |
| 11 | 0-35 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 10 | | | | | | |
| | 35-80 | c | 10YR56 00 | | | | | | 0 | 0 | HR | 12 | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 0-35 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 7 | | | | | | |
| | 35-60 | mcl | 10YR44 00 | | | | | | 0 | 0 | HR | 10 | | M | | | | |
| | 60-75 | mcl | 10YR54 00 | | | | | | 0 | 0 | HR | 15 | | M | | | | |
| 13 | 0-35 | mcl | 10YR43 00 | | | | | | 9 | 0 | HR | 16 | | | | | | |
| | 35-50 | mcl | 10YR44 00 | | | | | | 0 | 0 | HR | 20 | | M | | | | |
| | 50-70 | mcl | 10YR56 00 | | | | | | 0 | 0 | HR | 20 | | M | | | | |
| | 70-75 | c | 10YR53 00 | | | | | | 0 | 0 | HR | 8 | | M | | | | |
| 14 | 0-36 | mcl | 10YR43 00 | | | | | | 7 | 0 | HR | 14 | | | | | | |
| | 36-60 | mcl | 10YR54 00 | | | | | | 0 | 0 | HR | 6 | | M | | | | |
| 15 | 0-30 | mcl | 10YR42 00 | | | | | | 12 | 0 | HR | 20 | | | | | | |
| | 30-58 | hcl | 10YR56 00 | | | | | | 0 | 0 | HR | 25 | | M | | | | |
| | 58-95 | c | 25Y 62 00 | 10YR56 00 | M | | | Y | 0 | 0 | HR | 8 | | P | Y | | Y | |
| 16 | 0-25 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 12 | | | | | | |
| | 25-45 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 12 | | M | | | | |
| | 45-75 | c | 75YR56 00 | | | | | | 0 | 0 | HR | 15 | | M | | | | |
| 17 | 0-30 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 10 | | | | | | |
| | 30-45 | mzcl | 10YR42 00 | | | | | | 0 | 0 | HR | 10 | | M | | | | |
| 18 | 0-30 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 12 | | | | | | |
| | 30-35 | hcl | 10YR54 00 | | | | | | 0 | 0 | HR | 12 | | M | | | | |
| | 35-60 | c | 75YR58 00 | | | | | | 0 | 0 | HR | 15 | | M | | | | |
| 19 | 0-30 | mzcl | 10YR42 00 | | | | | | 0 | 0 | HR | 10 | | | | | | |
| | 30-55 | hcl | 10YR54 00 | | | | | | 0 | 0 | HR | 12 | | M | | | | |
| 21 | 0-30 | mcl | 10YR32 00 | | | | | | 5 | 0 | HR | 20 | | | | | | |
| | 30-60 | c | 10YR56 00 | | | | | | 0 | 0 | HR | 8 | | M | Y | | | |
| 22 | 0-30 | mcl | 10YR32 00 | | | | | | 4 | 0 | HR | 10 | | | | | | |
| | 30-48 | mcl | 10YR44 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 48-52 | hcl | 10YR44 00 | | | | | | 0 | 0 | HR | 25 | | M | | | | |
| 23 | 0-26 | mzcl | 10YR43 00 | | | | | | 4 | 0 | HR | 10 | | | | | | |
| | 26-50 | mcl | 10YR44 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| 24 | 0-30 | mzcl | 10YR42 00 | | | | | | 8 | 0 | HR | 15 | | | | | | |
| 25 | 0-20 | mzcl | 10YR43 00 | | | | | | 5 | 0 | HR | 8 | | | | | | |
| 26 | 0-30 | mcl | 10YR42 00 | | | | | | 20 | 0 | HR | 40 | | | | | | |
| 27 | 0-33 | mcl | 10YR42 43 | | | | | | 10 | 0 | HR | 20 | | | | | | |
| | 33-45 | mcl | 10YR56 00 | | | | | | 0 | 0 | HR | 50 | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28 | 0-30 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 20 | | | | | | |
| | 30-40 | mcl | 10YR46 56 | | | | | | 0 | 0 | HR | 40 | | M | | | | |
| 29 | 0-37 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 20 | | | | | | |
| | 37-50 | mzcl | 10YR56 00 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 30 | 0-30 | mzcl | 10YR43 00 | | | | | | 6 | 0 | HR | 12 | | | | | | |
| | 30-45 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 3 | | M | | | | |
| | 45-85 | hcl | 10YR56 00 | | | | | | 0 | 0 | HR | 7 | | M | | | | |
| | 85-110 | c | 75YR58 00 | | | | | | 0 | 0 | HR | 3 | | M | | | | |
| 31 | 0-20 | mzcl | 10YR43 00 | | | | | | 6 | 0 | HR | 12 | | | | | | |
| 32 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 30 | | | | | | |
| | 35-40 | mcl | 10YR54 00 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 33 | 0-30 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 30 | | | | | | |
| 34 | 0-38 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 20 | | | | | | |
| | 38-50 | mcl | 10YR54 00 | | | | | | 0 | 0 | HR | 30 | | M | | | | |
| | 50-75 | c | 10YR58 00 | | | | | | 0 | 0 | HR | 20 | | M | | | | |
| | 75-80 | c | 10YR58 00 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 35 | 0-37 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 15 | | | | | | |
| | 37-45 | hcl | 10YR56 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 45-95 | c | 75YR46 56 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 95-120 | c | 75YR46 56 | | | | | | 0 | 0 | HR | 15 | | M | | | | |
| 36 | 0-35 | mzcl | 10YR43 00 | | | | | | 8 | 0 | HR | 12 | | | | | | |
| 37 | 0-25 | mzcl | 10YR43 00 | | | | | | 6 | 0 | HR | 10 | | | | | | |
| | 25-35 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 15 | | M | | | | |
| 38 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 25 | | | | | | |
| | 35-45 | mcl | 10YR54 00 | | | | | | 0 | 0 | HR | 30 | | M | | | | |
| | 45-50 | mcl | 10YR54 00 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 39 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 25 | | | | | | |
| | 35-50 | hcl | 10YR56 00 | | | | | | 0 | 0 | HR | 30 | | M | | | | |
| | 50-55 | hcl | 10YR56 00 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 40 | 0-40 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 25 | | | | | | |
| | 40-60 | mcl | 10YR53 63 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 41 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 15 | | | | | | |
| | 35-70 | mcl | 10YR53 52 | 10YR56 00 | C | | 00MN00 00 | Y | 0 | 0 | HR | 3 | | M | | | | |
| | 70-80 | c | 75YR56 00 | | | | | Y | 0 | 0 | HR | 20 | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42 | 0-20 | mzcl | 10YR42 00 | | | | | | 12 | 0 | HR | 15 | | | | | | |
| 43 | 0-30 | mzcl | 10YR44 00 | | | | | | 6 | 0 | HR | 10 | | | | | | |
| 44 | 0-40 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 25 | | | | | | |
| | 40-55 | mcl | 10YR53 63 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 45 | 0-37 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 25 | | | | | | |
| | 37-50 | mcl | 10YR43 53 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 46 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 30 | | | | | | |
| | 35-45 | mcl | 10YR43 00 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 47 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 25 | | | | | | |
| | 35-40 | mcl | 10YR54 00 | | | | | | 0 | 0 | HR | 50 | | M | | | | |
| 48 | 0-25 | mzcl | 10YR43 00 | | | | | | 8 | 0 | HR | 10 | | | | | | |
| 49 | 0-35 | mzcl | 10YR43 00 | | | | | | 8 | 0 | HR | 15 | | | | | | |
| 50 | 0-35 | mcl | 10YR42 00 | | | | | | 0 | 0 | HR | 15 | | | | | | |
| | 35-45 | hcl | 10YR64 00 | 10YR66 00 | C | | | Y | 0 | 0 | HR | 2 | | M | | | | |
| | 45-120 | c | 10YR58 00 | 10YR61 00 | M | | | Y | 0 | 0 | HR | 2 | | P | | | Y | |