# AGRICULTURAL LAND CLASSIFICATION REPORT

## SWALE BOROUGH LOCAL PLAN

## LAND AT CHILTON MANOR FARM, SITE AA

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### Summary


1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on agricultural land quality at Chilton Manor Farm, Sittingbourne, Site AA. The work was in connection with the Swale Borough Local Plan.

1.2 The site at Chilton Manor Farm comprises 40.9 hectares of land at the southern edge of Sittingbourne and was surveyed in July 1994. The survey was undertaken at a detailed level of approximately one boring per hectare in the agricultural area. A total of 36 borings, 3 soil inspection pits and 10 additional riddle points 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 carried out by members of the Resource Planning Team in the Huntingdon Statutory Group of ADAS.

1.4 At the time of survey the agricultural land was fruit orchards. A chalk quarry has been mapped as Non Agricultural land. Agricultural buildings occur to the northwest.

1.5 Previous ALC field survey work has been carried out on adjacent land at Sites 16 and 17, Swale Borough Local Plan (Ref No 2011/127/92) and at Site A, Swale Local Plan (2011/046/94).

1.6 The distribution of the 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 1:10,000. 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 |
|---|---|---|---|
| 1 | 15.9 | 38.9 | 44.6 |
| 2 | 13.8 | 33.7 | 38.8 |
| 3b | 5.9 | 14.4 | 16.6 |
| Non Agricultural | 4.9 | 12.0 | |
| Agricultural Bldgs | 0.4 | 1.0 | |
| **Total** | **40.9 ha** | **100%** | **100% (35.6 ha)** |

1.7 A general description of the grades, subgrades and land use categories is provided in Appendix 1. 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.

1.8 The land quality on the site has been classified as grades 1, 2 and subgrade 3b. Grade 1 land (excellent quality land) has no or very minor limitations to agricultural use. Land graded 2 (very good quality land) has slight droughtiness and/or topsoil stone restrictions, while land graded 3b (moderate quality land) occurs where the quantity of profile stone significantly reduces the available water for crop growth.

## 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 an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality. The combination of rainfall and temperature at this site means that the site is assessed as climatic grade 1.

**Table 2 : Climatic Interpolation**

| | |
|---|---|
| Grid Reference | TQ 914 624 |
| Altitude (m, AOD) | 36 |
| Accumulated Temperature (° days, Jan-June) | 1459 |
| Average Annual Rainfall (mm) | 656 |
| Field Capacity Days | 131 |
| Moisture Deficit, wheat (mm) | 115 |
| Moisture Deficit, potatoes (mm) | 110 |
| Overall Climatic Grade | 1 |

## 3.0 Relief

3.1 The site is gently undulating and ranges in altitude from of 25-40 m AOD. Neither gradient nor relief impose a limitation on the ALC grade.

## 4.0 Geology and Soils

4.1 The published geology map for the site area, (BGS Sheet 272, Chatham, 1977) shows the site to be underlain by complex geology. Head and Brickearth lie to the west and east, with Thanet Bed Sands traversing an area from the north and through the centre of the site. Chalk lies in the southwest, extending northwards in a narrow band.

4.2 The published soils information for the area (SSEW 1983, Sheet 6, 1:250,000) shows the site to comprise mainly the Hamble 1 association which is described as "deep well drained, often stoneless, fine silty soils". A small area to the southeast has been mapped as the Coombe 1 association which is described as "well drained calcareous fine silty soils".

## 5.0 Agricultural Land Classification

5.1 The ALC classification of the site is shown on the attached ALC map.

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

### Grade 1

5.3 Grade 1 land has been mapped in three areas of the site. Soils typically comprise very slightly stony, silt loam topsoils which are often calcareous over silt loam or medium silty clay loam upper subsoils. Lower subsoils typically consist of medium silty clay loams or heavy silty clay loams. Occasional profiles comprise silt loams throughout. Wetness class has been assessed as I. The high moisture reserves of these silty profiles ensures that available water is more than adequate to meet the demands of a growing crop throughout the year. Consequently, this land has no limitation to agricultural use and has therefore been graded 1.

### Grade 2

5.4 Grade 2 land has been mapped in an area traversing the centre of the site. Soils typically comprise medium silty clay loam topsoils over medium silty clay loam upper subsoils which merge into medium silty clay loam, heavy silty clay loam or silty clay lower subsoils. Wetness class has been assessed as I because there is no evidence of impeded drainage in the profiles.

5.5 The slightly better bodied nature of the topsoil textures (in particular) impose minor constraints on the availability of water for crop growth. Consequently, a slight droughtiness limitation restricts much of this land to a final ALC grade of 2. In addition, there are a number of profiles within this area which are silt loams throughout but are precluded from grade 1 on the basis of topsoil stoniness. Topsoil stone content has been assessed using riddling methods and was found to be in the range 5-7% (>2 cm in size).

**Subgrade 3b**

5.6 Subgrade 3b land has been mapped to the north of the site. Soils typically comprise slightly stony* silt loam topsoils over very stony medium silty clay loam subsoils. Availability of water and nutrients is considerably reduced by the high stone contents within the soil profile, consequently a significant droughtiness limitation restricts this land to subgrade 3b. Occasionally land is also restricted to subgrade 3b on the basis of significant topsoil stoniness (as assessed by riddling: 30% >2 cm in size).

**Non-Agricultural**

5.7 A chalk quarry occupies the southern part of this site. This has been mapped as Non-Agricultural.

**Agricultural Buildings**

5.7 There are some agricultural buildings in the northwestern part of the site.

ADAS Reference: 0011/130/94
MAFF Reference : EL20/245

Resource Planning Team
Huntingdon Statutory Group
ADAS Cambridge

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* occasionally moderately stony

## REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1977. Sheet 272 Chatham, Drift Edition, 1:50,000.

MAFF 1968. Agricultural Land Classification Map No 172. Provisional 1:63,360 scale.

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

METEOROLOGICAL OFFICE 1989. Published climatic data extracted from the agroclimatic dataset compiled by the Meteorological Office.

SOIL SURVEY OF ENGLAND AND WALES 1983. Soils of South East England, Sheet 6, 1:250,000 scale.

Appendix 1

## DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level of consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls in Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where farmland predominates. The remainder is very poor quality land in Grade 5, which most occurs in the uplands.

### 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 include 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 and horticultural crops can usually be grown but on some land in 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 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. Where 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 levels of yields. It is mainly suited to grass with occasional arable crops (eg. cereals and forage crops) the yield of which are variable. In most 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.

**Descriptions of other land categories used on ALC maps**

**Urban**

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: 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. 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 (e.g. polythene tunnels erected for lambing) may be ignored.

**Open water**

Includes lakes, ponds and rivers as map scale permits.

**Land not surveyed**

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

Appendix 2

## FIELD ASSESSMENT OF SOIL WETNESS CLASS

### Definition of Soil Wetness Classes

| Wetness Class | Duration of Waterlogging[1] |
|---|---|
| I | The soil profile is not wet within 70 cm depth for more than 30 days in most years[2]. |
| II | The soil profile is wet within 70 cm depth for 31-90 days in most years *or*, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years. |
| III | The soil profile is wet within 70 cm depth for 91-180 days in most years *or*, if there is no slowly permeable layer 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 and 90 days in most years. |
| IV | The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years *or*, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years. |
| V | The soil profile is wet within 40 cm depth for 211-335 days in most years. |
| VI | The soil profile is wet within 40 cm depth for more than 335 days in most years. |

[1] The number of days specified is not necessarily a continuous period.

[2] 'In most years' is defined as more than 10 out of 20 years.

Appendix 3

# SOIL BORING AND SOIL PIT DESCRIPTIONS

Contents:

* Soil boring descriptions
* Soil pit descriptions
* Soil Abbreviations : Explanatory Note

| MPLE . | GRID REF | USE | ASPECT | GRDNT | GLEY | SPL | --WETNESS-- CLASS | GRADE | -WHEAT- AP | MB | -POTS- AP | MB | M.REL DRT | FLOOD | EROSN EXP | FROST DIST | CHEM LIMIT | ALC | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | TQ91706280 | LEY | NE | 02 | 000 | | 1 | 1 | 194 | 79 | 145 | 35 | 1 | | | | | 1 | |
| 2 | TQ91406270 | LEY | NW | | 000 | | 1 | 1 | 078 | -37 | 068 | -42 | 3B | | | | DR | 3B | |
| 3 | TQ91506270 | FRT | SE | 02 | 000 | | 1 | 1 | 173 | 58 | 138 | 28 | 1 | | | | | 1 | |
| 4 | TQ91606270 | FRT | E | 02 | 000 | | 1 | 1 | 178 | 63 | 142 | 32 | 1 | | | | ST | 2 | |
| 5 | TQ91706270 | FRT | NE | 02 | 000 | | 1 | 1 | 180 | 65 | 144 | 34 | 1 | | | | | 1 | |
| 6 | TQ91106260 | FRT | NE | | 000 | | 1 | 1 | 163 | 48 | 137 | 27 | 1 | | | | | 1 | |
| 7 | TQ91206260 | FRT | N | 02 | 000 | | 1 | 1 | 123 | 8 | 116 | 6 | 2 | | | | DR | 2 | |
| 7P | TQ91206260 | FRT | | | 000 | | 1 | 1 | 134 | 19 | 098 | -12 | 3A | | | | ST | 3B | |
| 8 | TQ91306260 | FRT | S | | 000 | | 1 | 1 | 174 | 59 | 137 | 27 | 1 | | | | ST | 2 | |
| 9 | TQ91406260 | FRT | NW | | 000 | | 1 | 1 | 095 | -20 | 078 | -32 | 3B | | | | DR | 3B | |
| 9P | TQ91436263 | FRT | SE | | 000 | | 1 | 1 | 93 | -22 | 83 | -27 | 3B | | | | DR | 3B | |
| 11 | TQ91606260 | FRT | W | 02 | 000 | | 1 | 1 | 168 | 53 | 132 | 22 | 1 | | | | ST | 2 | |
| 12 | TQ91106250 | FRT | W | | 000 | | 1 | 1 | 168 | 53 | 154 | 44 | 1 | | | | | 1 | |
| 13 | TQ91206250 | FRT | E | 02 | 000 | | 1 | 1 | 182 | 67 | 146 | 36 | 1 | | | | | 1 | |
| 14 | TQ91306250 | FRT | NW | 02 | 000 | | 1 | 1 | 095 | -20 | 078 | -32 | 3B | | | | DR | 3B | |
| 15 | TQ91406250 | FRT | NW | 02 | 000 | | 1 | 1 | 141 | 26 | 123 | 13 | 2 | | | | DR | 2 | |
| 16 | TQ91506250 | FRT | S | 02 | 000 | | 1 | 1 | 138 | 23 | 125 | 15 | 2 | | | | DR | 2 | |
| 17 | TQ91606250 | FRT | E | 02 | 000 | | 1 | 1 | 206 | 91 | 152 | 42 | 1 | | | | ST | 2 | 7% TOPSOIL STONE |
| 18 | TQ91006240 | FRT | NE | | 000 | | 1 | 1 | 174 | 59 | 138 | 28 | 1 | | | | | 1 | |
| 19 | TQ91106240 | FRT | NE | 01 | 000 | | 1 | 1 | 155 | 40 | 120 | 10 | 2 | | | | DR | 2 | |
| 20 | TQ91206240 | FRT | NW | 02 | 000 | | 1 | 1 | 111 | -4 | 104 | -6 | 3A | | | | DR | 3A | |
| 21 | TQ91306240 | FRT | W | | 085 | 085 | 1 | 1 | 138 | 23 | 123 | 13 | 2 | | | | DR | 2 | |
| 22 | TQ91406240 | FRT | SE | | 000 | | 1 | 1 | 168 | 53 | 132 | 22 | 1 | | | | | 1 | |
| 23 | TQ91506240 | FRT | SE | 02 | 000 | | 1 | 1 | 168 | 53 | 132 | 22 | 1 | | | | ST | 2 | |
| 24 | TQ91606240 | FRT | NE | | 000 | | 1 | 1 | 182 | 67 | 152 | 42 | 1 | | | | DR | 1 | |
| 25 | TQ91006230 | FRT | SE | | 000 | | 1 | 1 | 170 | 55 | 134 | 24 | 1 | | | | | 1 | |
| 25P | TQ91006230 | FRT | | | 000 | | 1 | 1 | 167 | 52 | 132 | 22 | 1 | | | | | 1 | |
| 26 | TQ91106230 | FRT | SE | 01 | 000 | | 1 | 1 | 152 | 37 | 117 | 7 | 2 | | | | DR | 2 | |
| 27 | TQ91206230 | FRT | SE | | 000 | | 1 | 1 | 161 | 46 | 125 | 15 | 1 | | | | | 1 | |
| 28 | TQ91306230 | FRT | W | | 000 | | 1 | 1 | 156 | 41 | 121 | 11 | 1 | | | | | 1 | |
| 29 | TQ91406230 | FRT | SE | 02 | 000 | | 1 | 2 | 157 | 42 | 121 | 11 | 1 | | | | W | 2 | |
| 30 | TQ91506230 | FRT | SE | | 000 | | 1 | 1 | 206 | 91 | 152 | 42 | 1 | | | | ST | 2 | |
| 31 | TQ91006220 | FRT | SE | | 000 | | 1 | 1 | 156 | 41 | 121 | 11 | 1 | | | | | 1 | |
| 32 | TQ91106220 | FRT | SE | | 000 | | 1 | 2 | 156 | 41 | 120 | 10 | 2 | | | | DR | 2 | |
| 33 | TQ91206220 | FRT | SE | 01 | 000 | | 1 | 1 | 157 | 42 | 121 | 11 | 1 | | | | | 1 | |
| 34 | TQ91306220 | FRT | SE | 03 | 000 | 075 | 1 | 1 | 147 | 32 | 119 | 9 | 2 | | | | DR | 2 | |
| 35 | TQ91406220 | FRT | SE | 04 | 000 | | 1 | 1 | 157 | 42 | 121 | 11 | 1 | | | | | 1 | |
| 38 | TQ91306210 | FRT | SE | 03 | 000 | | 1 | 1 | 156 | 41 | 120 | 10 | 2 | | | | DR | 2 | |
| 39 | TQ91406210 | FRT | SE | | 000 | | 1 | 1 | 163 | 48 | 129 | 19 | 1 | | | | | 1 | |

| 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 | 0-30 | zl | 10YR43 00 | | | | | | 5 | 0 | HR | 5 | | | | | | |
| | 30-120 | zl | 10YR54 00 | | | | | | 0 | 0 | HR | 10 | | M | | | | |
| 2 | 0-25 | mzcl | 10YR43 00 | | | | | | 14 | 5 | HR | 20 | | | | | | Y |
| | 25-120 | mzcl | 10YR43 00 | | | | | | 0 | 0 | HR | 50 | | P | | | | Y |
| 3 | 0-30 | zl | 10YR43 00 | | | | | | 11 | 1 | HR | 11 | | | | | | |
| | 30-50 | zl | 10YR54 00 | | | | | | 0 | 0 | HR | 2 | | M | | | | |
| | 50-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 3 | | M | | | | Y |
| 4 | 0-30 | zl | 10YR43 00 | | | | | | 7 | 1 | HR | 7 | | | | | | Y |
| | 30-50 | zl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| | 50-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| 5 | 0-30 | zl | 10YR43 00 | | | | | | 4 | 1 | HR | 4 | | | | | | Y |
| | 30-50 | zl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | Y |
| | 50-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | Y |
| 6 | 0-40 | zl | 10YR54 00 | | | | | | 6 | 0 | HR | 6 | | | | | | |
| | 40-70 | hzcl | 10YR56 00 | | | | | | 0 | 0 | HR | 2 | | M | | | | |
| | 70-120 | zc | 10YR56 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| 7 | 0-25 | zl | 10YR43 00 | | | | | | 5 | 1 | HR | 5 | | | | | | |
| | 25-55 | mzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| | 55-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 50 | | P | | | | |
| 7P | 0-32 | zl | 10YR42 00 | | | | | | 30 | 0 | HR | 35 | | | | | | |
| | 32-50 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 35 | | P | | | | |
| | 50-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | MCPA | FR | M | | | |
| 8 | 0-30 | zl | 10YR43 00 | | | | | | 9 | 1 | HR | 9 | | | | | | |
| | 30-50 | zl | 10YR44 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 50-80 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 80-120 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 0 | | M | | | | |
| 9 | 0-30 | mszl | 10YR42 00 | | | | | | 14 | 0 | HR | 20 | | | | | | |
| | 30-120 | mszl | 10YR42 00 | | | | | | 0 | 0 | HR | 50 | | P | | | | |
| 9P | 0-30 | zl | 10YR42 00 | | | | | | 14 | 3 | HR | 18 | | | | | | |
| | 30-120 | mzcl | 10YR43 00 | | | | | | 0 | 0 | HR | 50 | | P | | | | |
| 11 | 0-30 | zl | 10YR32 00 | | | | | | 7 | 1 | HR | 7 | | | | | | |
| | 30-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| 12 | 0-30 | zl | 10YR43 00 | | | | | | 1 | 0 | HR | 1 | | | | | | |
| | 30-70 | zl | 10YR54 00 | | | | | | 0 | 0 | HR | 3 | M | | FR | M | | |
| | 70-100 | mzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | M | | FR | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | 0-30 | zl | 10YR43 00 | | | | | | 5 | 1 | HR | 5 | | | | | | |
| | 30-55 | zl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| | 55-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| 14 | 0-30 | mszl | 10YR43 00 | | | | | | 14 | 0 | HR | 20 | | | | | | |
| | 30-120 | mszl | 10YR43 00 | | | | | | 0 | 0 | HR | 50 | | P | | | | |
| 15 | 0-27 | zl | 10YR43 00 | | | | | | 5 | 0 | HR | 5 | | | | | | |
| | 27-50 | zl | 10YR54 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 50-120 | zl | 10YR54 00 | | | | | | 0 | 0 | HR | 50 | | P | | | | |
| 16 | 0-25 | zl | 10YR43 00 | | | | | | 8 | 0 | HR | 9 | | | | | | Y |
| | 25-85 | mzcl | 10YR43 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | Y |
| | 85-120 | mzcl | 10YR43 00 | | | | | | 0 | 0 | HR | 50 | | P | | | | Y |
| 17 | 0-30 | zl | 10YR43 00 | | | | | | 6 | 0 | HR | 6 | | | | | | |
| | 30-120 | zl | 10YR54 00 | | | | | | 0 | 0 | HR | 1 | | M | | | | Y |
| 18 | 0-35 | zl | 10YR43 00 | | | | | | 3 | 0 | HR | 3 | | | | | | Y |
| | 35-45 | hzcl | 75YR44 00 | | | | | | 0 | 0 | HR | 1 | | M | | | | |
| | 45-120 | hzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| 19 | 0-30 | mzcl | 10YR43 00 | | | | | | 4 | 0 | HR | 4 | | | | | | |
| | 30-80 | mzcl | 10YR43 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 80-120 | mzcl | 10YR54 00 | 10YR58 00 | F | | 10YR54 00 | | 0 | 0 | HR | 2 | | M | | | | |
| 20 | 0-35 | mzcl | 10YR43 00 | | | | | | 9 | 0 | HR | 11 | | | | | | |
| | 35-60 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 12 | | M | | | | |
| | 60-120 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 50 | | P | | | | |
| 21 | 0-30 | mzcl | 10YR43 00 | | | | | | 1 | 0 | HR | 1 | | | | | | |
| | 30-70 | mzcl | 10YR44 00 | | | | | | 0 | 0 | HR | 3 | M | M | | | | |
| | 70-85 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 4 | M | M | | | | |
| | 85-100 | hzcl | 10YR53 00 | 10YR68 00 | C | | | Y | 0 | 0 | HR | 1 | M | M | Y | | Y | |
| 22 | 0-30 | zl | 10YR43 00 | | | | | | 4 | 0 | HR | 4 | | | | | | |
| | 30-55 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 55-80 | hzcl | 10YR56 00 | | | | | | 0 | 0 | HR | 2 | | M | | | | |
| | 80-120 | scl | 10YR56 00 | | | | | | 0 | 0 | HR | 1 | | M | | | | |
| 23 | 0-30 | zl | 10YR43 00 | | | | | | 7 | 1 | HR | 8 | | | | | | |
| | 30-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| 24 | 0-25 | zl | 10YR43 00 | | | | | | 8 | 0 | HR | 9 | | | | | | Y |
| | 25-95 | zl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | Y |
| | 95-120 | zl | 10YR54 00 | | | | | | 0 | 0 | HR | 50 | | P | | | | Y |
| 25 | 0-30 | zl | 10YR43 00 | | | | | | 3 | 0 | HR | 3 | | | | | | Y |
| | 30-65 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 1 | | M | | | | Y |
| | 65-120 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 1 | | M | | | | Y |

| SAMPLE | DEPTH | TEXTURE | COLOUR | MOTTLES COL | MOTTLES ABUN | MOTTLES CONT | PED COL. | PED GLEY | STONES >2 | STONES >6 | STONES LITH | STONES TOT | STRUCT/ CONSIST | SUBS STR | SUBS POR | SUBS IMP | SUBS SPL | SUBS CALC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25P | 0-25 | zl | 10YR43 00 | | | | | | 3 | 0 | HR | 3 | | | | | | |
| | 25-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 1 | MCAB | FR M | | | | Y |
| 26 | 0-25 | mzcl | 10YR43 00 | | | | | | 4 | 0 | HR | 4 | | | | | | Y |
| | 25-65 | hzcl | 10YR44 00 | | | | | | 0 | 0 | HR | 8 | | M | | | | Y |
| | 65-120 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 3 | | M | | | | Y |
| 27 | 0-30 | zl | 10YR43 00 | | | | | | 10 | 0 | HR | 10 | | | | | | |
| | 30-45 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 18 | | M | | | | |
| | 45-120 | hzcl | 10YR56 00 | | | | | | 0 | 0 | HR | 2 | | M | | | | |
| 28 | 0-30 | mzcl | 10YR43 00 | | | | | | 3 | 0 | HR | 3 | | | | | | |
| | 30-55 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 55-120 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 2 | | M | | | | |
| 29 | 0-25 | hzcl | 10YR43 00 | | | | | | 3 | 0 | HR | 3 | | | | | | |
| | 25-120 | hzcl | 10YR56 00 | | | | | | 0 | 0 | HR | 2 | | M | | | | |
| 30 | 0-30 | zl | 10YR43 00 | | | | | | 7 | 1 | HR | 7 | | | | | | |
| | 30-120 | zl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| 31 | 0-35 | mzcl | 10YR43 00 | | | | | | 6 | 0 | HR | 6 | | | | | | Y |
| | 35-70 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 3 | | M | | | | Y |
| | 70-120 | hzcl | 10YR56 00 | | | | | | 0 | 0 | HR | 1 | | M | | | | Y |
| 32 | 0-35 | hzcl | 10YR43 00 | | | | | | 8 | 0 | HR | 8 | | | | | | |
| | 35-55 | hzcl | 10YR56 00 | | | | | | 0 | 0 | HR | 4 | | M | | | | |
| | 55-80 | mzcl | 10YR54 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| | 80-120 | hzcl | 10YR54 00 | 10YR68 00 | C | | 10YR54 00 | | 0 | 0 | | 0 | | M | | | | |
| 33 | 0-30 | mzcl | 10YR43 00 | | | | | | 4 | 0 | HR | 4 | | | | | | |
| | 30-70 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 3 | | M | | | | |
| | 70-120 | hzcl | 10YR53 00 | 10YR68 00 | C | | 10YR53 00 | Y | 0 | 0 | HR | 1 | | M | | | | |
| 34 | 0-35 | mzcl | 10YR43 00 | | | | | | 5 | 0 | HR | 5 | | | | | | Y |
| | 35-65 | hzcl | 10YR44 00 | | | | | | 0 | 0 | HR | 7 | | M | | | | Y |
| | 65-75 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 3 | | M | | | | Y |
| | 75-120 | zc | 10YR54 00 | 10YR68 00 | C | | 10YR54 00 | | 0 | 0 | | 0 | | M | Y | | Y | Y |
| 35 | 0-30 | mzcl | 10YR43 00 | | | | | | 3 | 0 | HR | 3 | | | | | | |
| | 30-60 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | |
| | 60-120 | hzcl | 10YR56 00 | | | | | | 0 | 0 | HR | 1 | | M | | | | |
| 38 | 0-30 | mzcl | 10YR43 00 | | | | | | 3 | 0 | HR | 3 | | | | | | |
| | 30-70 | hzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 6 | | M | | | | |
| | 70-120 | hzcl | 10YR56 00 | | | | | | 0 | 0 | | 0 | | M | | | | |
| 39 | 0-25 | zl | 10YR54 00 | | | | | | 3 | 0 | HR | 3 | | | | | | Y |
| | 25-120 | mzcl | 10YR54 00 | | | | | | 0 | 0 | HR | 5 | | M | | | | Y |

Appendix 3 (Cont)

## *SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE*

Soil profile and pit information obtained during ALC surveys is held on a database. This has commonly used notations and abbreviations as set out below.

### BORING HEADERS

1. GRID REF : *National grid square followed by 8 figure grid reference.*

2. USE : Land-use at the time of survey.
   The following abbreviations are used

| | |
|---|---|
| ARA - arable | PAS/PGR - permanent pasture |
| WHT - wheat | RGR - rough grazing |
| BAR - barley | LEY - ley grassland |
| CER - cereals | CFW - coniferous woodland |
| OAT - oats | DCW - deciduous woodland |
| MZE - maize | SCR - scrub |
| OSR - oilseed rape | HTH - heathland |
| BEN - field beans | BOG - bog or marsh |
| BRA - brassicae | FLW - fallow |
| POT - potatoes | PLO - ploughed |
| SBT - sugar beet | SAS - set-aside |
| FDC - fodder crops | OTH - other |
| FRT - soft and top fruit | LIN - linseed |
| HOR/HRT - horticultural crops | |

3. GRDNT : Gradient as measured by optical reading clinometer.

4. GLEY/SPL : Depth in centimetres (cm) to gleyed and/or slowly permeable horizons.

5. AP (WHEAT/POTS) : Crop-adjusted available water capacity. The amount of soil water (in millimetres) held in the soil profile that is available to a growing crop (wheat and potatoes are used as reference crops).

6. MB (WHEAT/POTS) : The moisture balance for wheat and potatoes obtained by subtracting the soil moisture deficit from the crop-adjusted available water capacity.

7. DRT : Grade according to soil droughtiness assessed against soil moisture balances.

8.

| | | |
|---|---|---|
| M REL | : Micro-relief | ) |
| FLOOD | : Flood risk | ) If any of these factors are |
| EROSN | : Soil erosion | ) considered significant in terms of |
| EXP | : Exposure | ) the assessment of agricultural land |
| FROST | : Frost prone | ) quality a 'y' will be entered in the |
| DIST | : Disturbed land | ) relevant column. |
| CHEM | : Chemical limitation | ) |

9. LIMIT :Principal limitation to agricultural land quality.
The following abbreviations are used:

| | |
|---|---|
| OC - overall climate | CH - chemical limitations |
| AE - aspect | WE - wetness |
| EX - exposure | WK - workability |
| FR - frost | DR - drought |
| GR - gradient | ER - erosion |
| MR - micro-relief | WD - combined soil wetness/soil droughtiness |
| TX - soil texture | ST - topsoil stoniness |
| DP - soil depth | |

## PROFILES AND PITS

1. TEXTURE : Soil texture classes are denoted by the following abbreviations:

| | |
|---|---|
| S | - sand |
| LS | - loamy sand |
| SL | - sandy loam |
| SZL | - sandy silt loam |
| ZL | - silt loam |
| MZCL | - medium silty clay loam |
| MCL | - medium clay loam |
| SCL | - sandy clay loam |
| HZCL | - heavy silty clay loam |
| HCL | - heavy clay loam |
| SC | - sandy clay |
| ZC | - silty clay |
| C | - clay |

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction may be indicated by the use of prefixes.

F - fine (more than ⅔ of the sand less than 0.2 mm)
C - coarse (more than ⅓ of sand greater than 0.6 mm)
M - medium (less than ⅔ fine sand and less than ⅓ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:

M - medium (less than 27% clay)
H - heavy (27-35% clay)

Other possible texture classes include:

OL - organic loam
P - peat
SP - sandy peat
LP - loamy peat
PL - peaty loam
PS - peaty sand
MZ - marine light silts

2. MOTTLE COL : Mottle colour

3. MOTTLE ABUN : Mottle abundance

F - few - less than 2% of matrix or surface described
C - common - 2-20% of the matrix
M - many - 20-40% of the matrix
VM - very many - 40% + of the matrix

4. MOTTLE CONT : Mottle continuity

F - faint - indistinct mottles, evident only on close examination
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 : Stone lithology. One of the following is used.

HR - all hard rocks or stones
MSST - soft, medium or coarse grained sandstone
SI - soft weathered igneous or metamorphic
SLST - soft oolitic or dolomitic 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 (>2 cm, >6 cm 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 well developed

- ped size
  - F - fine
  - M - medium
  - C - coarse
  - VC - very coarse

- ped shape
  - S - single grain
  - M - massive
  - GR - granular
  - SB/SAB - sub-angular blocky
  - AB - 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 in impenetrable a 'y' will appear in this column at the appropriate 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

Appendix 3 (Cont)

**SOIL PIT DESCRIPTION**

SITE : AA CHILTON MANOR FARM PIT 1 (AB 9P)

| | | | | |
|---|---|---|---|---|
| G.R. | TQ 91006230 | AAR | : | 656 mm |
| | | ATO | : | 1459° days |
| | | FCD | : | 131 |
| | | Land Use | : | Orchard |
| | | Slope & Aspect | : | 0.5° South west |

| Horizon | Texture | Colour | Stones >2 | Tot Stone | Mottles | Structure |
|---|---|---|---|---|---|---|
| 0-30 | ZL | 10YR42 | 14 | 18 | - | - |
| 30-120 | MZCL | 10YR43 | - | 50 | - | too stony to assess |

| | | | |
|---|---|---|---|
| Wetness Grade : 1 | Wetness class | : | I |
| | Gleying | : | No gleying |
| | SPL | : | No SPL |

| | | |
|---|---|---|
| Drought Grade : 3b | APW = 93 mm | MBW = -22 mm |
| | APP = 83 mm | MBP = -27 mm |

Topsoil Stoniness Grade : 3a

| | | |
|---|---|---|
| Final ALC grade | : | 3b |
| Limitations | : | Droughtiness |

## SOIL PIT DESCRIPTION

SITE : AA CHILTON MANOR FARM PIT 2A (AB 7P)*

G.R. TQ 91006230

| | | |
|---|---|---|
| AAR | : | 656 mm |
| ATO | : | 1459° days |
| FCD | : | 131 |
| Land Use | : | Orchard |
| Slope & Aspect | : | 1° west |

| Horizon | Texture | Colour | Stones >2 | Tot Stone | Mottles | Structure |
|---|---|---|---|---|---|---|
| 0-32 | ZL | 10YR42 | 30 | 35 | - | - |
| 32-50 | MZCL | 10YR54 | - | 35 | - | too stony to assess |
| 50-120 | MZCL | 10YR54 | - | - | - | MDCP |

Wetness Grade : 1

| | | |
|---|---|---|
| Wetness class | : | I |
| Gleying | : | No gleying |
| SPL | : | No SPL |

Drought Grade : 3a

| | |
|---|---|
| APW = 134 mm | MBW = 19 mm |
| APP = 98 mm | MBP = -12 mm |

Topsoil Stoniness Grade : 3b

Final ALC grade : 3b
Limitations : Topsoil stoniness

N.B. The two halves of this pit exhibit marked differences in profile stone content. Hence they have been described separately. Please see the following page for a description of the other half of the same pit.

**SOIL PIT DESCRIPTION**

SITE : AA CHILTON MANOR FARM PIT 2B (AB 7P)*

G.R. TQ 91006230

| | | |
|---|---|---|
| AAR | : | 656 mm |
| ATO | : | 1459° days |
| FCD | : | 131 |
| Land Use | : | Orchard |
| Slope & Aspect | : | 1° west |

| Horizon | Texture | Colour | Stones >2 | Tot Stone | Mottles | Structure |
|---|---|---|---|---|---|---|
| 0-32 | ZL | 10YR42 | 6 | 9 | - | - |
| 32-120 | MZCL | 10YR54 | 0 | 0 | - | MDCP |

Wetness Grade : 1

| | | |
|---|---|---|
| Wetness class | : | I |
| Gleying | : | No gleying |
| SPL | : | No SPL |

Drought Grade : 1

| | |
|---|---|
| APW = 170 mm | MBW = 55 mm |
| APP = 134 mm | MBP = 24 mm |

Final ALC grade : 2

Limitations : Topsoil stoniness

N.B. The two halves of this pit exhibit marked differences in profile stone content. Hence they have been described separately. Please see the preceeding page for a description of the other half of the same pit.

**SOIL PIT DESCRIPTION**

SITE : AA CHILTON MANOR FARM PIT 3 (AB 25P)

| | | | | |
|---|---|---|---|---|
| G.R. | TQ 91006230 | AAR | : | 656 mm |
| | | ATO | : | 1459° days |
| | | FCD | : | 131 |
| | | Land Use | : | Orchard |
| | | Slope & Aspect | : | 0.5° south west |

| Horizon | Texture | Colour | Stones >2 | Tot Stone | Mottles | Structure |
|---|---|---|---|---|---|---|
| 0-25 | ZL | 10YR43 | 2 | 3 | - | - |
| 25-120 | MZCL | 10YR54 | 1 | 1 | - | MDCAB |

Wetness Grade : 1 Wetness class : I
Gleying : No gleying
SPL : No SPL

Drought Grade : 1 APW = 167 mm MBW = 52 mm
APP = 132 mm MBP = 22 mm

Final ALC grade : 1
Limitations : None