8FC54050

31/90

# Old Camp Farm, Compton Bassett, Wiltshire

## Proposed Quarry Extension

## SITE PHYSICAL CHARACTERISTICS REPORT

### 1. Introduction

In October 1990, a statement of site physical characteristics was drawn up for a 30 hectare site near Compton Bassett, east of Calne in Wiltshire. The survey was requested as part of MAFF's statutory response to an application to extract clay on a site adjacent to an existing area of mineral extraction.

Survey work was conducted by members of the Resource Planning Group (SW Region). An Agricultural Land Classification (ALC) survey was carried out with an auger sampling density of one boring per hectare; a total of 28 borings and one soil pit were described. Information obtained in this way facilitates MAFF in commenting on land quality and provides a baseline statement on the physical characteristics of the soils in their pre-working condition (ie topsoil textures and depths, subsoil textures and depths, soil structure and soil volumes).

Details of the land quality are contained in Table 2 below and illustrated on the ALC map; the location of the auger sample points and the soil pit are shown on the ASP map. A soil resource map illustrates the textures, depths and volumes of both topsoil and subsoil.

Fieldwork has shown that the site is underlain by a single typical soil type. One ALC map unit has therefore been identified together with a single topsoil and subsoil unit.

### 2. Agricultural Land Classification

2.1 Climate: A detailed assessment of the prevailing climate was obtained by interpolation from a MET Office/MAFF 5 km grid dataset for a representative location (see Table 1 below). The two parameters used to assess the agricultural effects of overall climate are average annual rainfall (a measure of overall wetness) and accumulated temperature (a measure of the relative warmth of a locality). The interpolation shows that there is no overall climatic limitation affecting the site; no minor climatic factors, such as exposure or frost, affect the site significantly.

**Table 1: Climatic Interpolation**

| | |
|---|---|
| Grid reference | : SU 023 710 |
| Altitude (m) | : 90 |
| Average Annual Rainfall (mm) | : 774 |
| Accumulated Temperature (° days) | : 1437 |
| Field Capacity (days) | : 172 |
| Moisture Deficit, Wheat (mm) | : 102 |
| Moisture Deficit, Potatoes (mm) | : 92 |
| Climatic Grade | : 1 |

**Table 2: Distribution of ALC Grades and Sub-grades**

| Grade | Area (ha) | % of Survey Area |
|---|---|---|
| 3B | 26.5 | 83.3 |
| Non Agric | 0.6 | 2.0 |
| Urban | 1.2 | 4.0 |
| Agric Bldgs | 1.7 | 5.7 |
| | 30.0 ha | 100% |

2.2 **Sub-grade 3B:** Soil wetness is the single most limiting factor across the site and, as a result, the soils cannot be graded higher than sub-grade 3B. Topsoil textures are typically Heavy Clay Loams or Heavy Silty Clay Loams and overlie heavy clay subsoils. The topsoils show some evidence of previous disturbance, with high stone contents (although the size of the store is typically < 2 cm and, as such, has little detrimental effect on either machinery or crop establishment). The heavy subsoils show clear evidence of shallow waterlogging for considerable periods throughout the year, caused by the presence of slowly permeable layers within the top 40 cm. As a result, the soils have been placed in Wetness Class IV (ie the soil is wet within 40 cm for up to 7 months in most years); this wetness class restricts the range of crops that can tolerate such conditions and limits the number of days during which cultivations can be carried out without risk of structural damage.

## 3. Soil Resources

3.1 **Topsoil:** "Topsoil" includes the organic-rich surface horizons of Heavy Clay Loam or Heavy Silty Clay Loam (and, occasionally, Medium Clay Loam) which typically extend to an average depth of 22 cm.
There is, thus, a **Total Topsoil Resource of 58,300 $m^3$**.

**Subsoil**: "Subsoil" comprises the non-organic rich lower horizons of Clay and Heavy Clay Loam which typically extend to at least 120 cm.

This gives a **Total Subsoil Resource of 259,700 $m^3$**.

## SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

### (i) TEXTURE:-

Soil texture classes are denoted by the following abbreviations (all Upper case*):

| | |
|---|---|
| **S** | Sand |
| **LS** | Loamy Sand |
| **SL** | Sandy Loam |
| **SZL** | Sand 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, thus:

| | |
|---|---|
| **F** | fine (more than $\frac{2}{3}$ of sand less than 0.2 mm) |
| **C** | coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm) |
| **M** | medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ 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:

| | |
|---|---|
| **P** | Peat |
| **SP** | Sandy Peat |
| **LP** | Loamy Peat |
| **PL** | Peaty Loam |
| **PS** | Peaty Sand |
| **MZ** | Marine Light Silts |

* There are two exceptions to the Upper Case rule:-

- The prefix "**Calc**" is used to identify naturally calcareous soils containing more than 1% Calcium Carbonate
- For organic mineral soils, the texture of the mineral fraction is prefixed by "**Org**".

**(ii) STRUCTURE:-**

*Nature and size of structural units are denoted by the following abbreviations:*

| | |
|---|---|
| **SAB** | Subangular Blocky |
| **AB** | Angular Blocky |
| **P** | Prismatic |

(single grain, granular and platy are not abbreviated)

| | |
|---|---|
| **F** | Fine |
| **M** | Medium |
| **C** | Coarse |
| **VC** | Very Coarse |

eg Weak **MSAB** = Weakly developed medium subangular blocky

**(iii) OTHER**

| | | | |
|---|---|---|---|
| **f** | = few | = | less than 2% of the matrix or surface described |
| **c** | = commom | = | 2-20% of the matrix or surface described |
| **m** | = many | = | 20-40% of the matrix or surface described |
| **vm** | = very many | = | +40% of the matrix or surface described |
| **f** | = faint | = | indistinct mottles, evident only on close examination |
| **d** | = disinct | = | although not striking, the mottles are readily seen |
| **p** | = prominent | = | the mottles are conspicuous, and the mottling is one of the outstanding features of the horizon |
| **gm** | = grey mottling | | |
| **om** | = ochreous mottling | | |

eg **cdom** = common distinct ochreous mottles

| | |
|---|---|
| **ppf** = | pale ped faces |
| **mn** = | manganese |
| **st** = | stones 6 cm |
| **sst** = | stones 2-6 cm |
| **vsst=** | stones 2 cm |
| **WC** = | Wetness Class (use Roman numerals, eg WC IV) |
| **SPL** = | Slowly Permeable Layer |
| **WT** = | Water Table |
| **I** = | Impenetrable if used in Depth Column |
| **IMP** = | Impenetrable if used in soil profile notes |

(**IMP 2 x 40 cm** = 2 additional borings, both impenetrable at 40 cm)

**ASP** = Auger Sample Point

| SITE NAME | PROFILE NUMBER | SLOPE AND ASPECT | LAND USE | | PARENT MATERIAL |
|---|---|---|---|---|---|
| Old Camp Farm<br>Compton Bassett<br>Wilts<br>8FCS 4050 | 1<br>DATE<br>8/10/90 | 1° SW<br>GRID REFERENCE<br>SU 023 713 | Grass | Av Rainfall :- 774<br>ATO :- 1437<br>FC Days :- 172<br>Climatic grade:- 1 | Gault Clay |

| Horizon Number | Lowest Av Depth | Matrix and Ped Face Colours | Texture | Stoniness: Size, Shape, Type, and Field Method | Mottling Abundance, Contrast Size and Colour | Structure: Development Size and Shape | Pores and Fissures | Structural Condition | Consistence | Roots Abundance Size and Nature | Calcium Carbonate Content | Mangan Concs etc | Horizon Boundary: Distinctness and Form |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Topsoil | 0-18 | 10YR31 | HCL | 2% > 2 cm<br>17% < 2 cm<br>sieve | Not mottled | Moderate<br>Medium granular | > 0.5% | Good<br>Not<br>compacted | Friable | Many | | | Clear Smooth |
| Subsoil 1 | 18-27 | 10YR42 | C | 2% > 2 cm<br>17% < 2 cm<br>sieve | cdom | | | | | Common | | | |
| Subsoil 2 | 27-60+ | 2.5Y52 | C | 2-5% < 2 cm<br>visual | cdom | Moderate CAB | < 0.5% | Poor | Firm | Few | | | |

Pit dug to 60 cm; augering below revealed continuation of Subsoil 2 to 120 cm, with a change of colour (2.5Y62) at 100 cm

Depth to Slowly Permeable Horizon :- Gleyed < 40cm SPL +35cm

Wetness Class :- IV

Wetness Grade :- 3B

Available Water Wheat :- Not limiting

Potatoes :-

Moisture Deficit Wheat :-

Potatoes :-

Moisture Balance Wheat :-

Potatoes :-

Droughtiness Grade :-

Final ALC Grade :- 3B

Main Limiting Factor(s) :- Wetness

Remarks :- Slightly disturbed topsoil; stone content composed of some brick, ash and concrete fragments.

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