STATEMENT OF SOIL PHYSICAL CHARACTERISTCS
INCORPORATING AGRICULTURAL LAND CLASSIFICATION

SOMERSHAM (WEST); CAMBRIDGESHIRE

1.0 INTRODUCTION

1.1 This 62 hectare site was inspected during early June 1989, in connection with proposals to extract sand and gravel. The site lies adjacent to an existing mineral extraction area, and would form an extension to those workings. A total of 50 soil inspections were made on site, supplemented by 2 soil profile pits. In order to avoid unnecessary crop trampling, soil sampling was undertaken on a loose 100-150 metre grid orientated parallel to field boundaries and crop wheelings. At the time of survey the agricultural land was in arable cultivation, typical crops including cereals, sugar beet, and, previously, potatoes. One field immediately north of Aredale House had been site "set-aside" and was supporting volunteer cereal crops and weeds.

2.0 AGRICULTURAL LAND CLASSIFICATION

2.1 The site is graded 3a and 3b. A breakdown of ALC grades in ha and % terms is provided below:

ALC	Ha	%
3a	35.9	58.3
3b	15.3	24.8
Non Agricultural	0.3	0.5
Restored Agricultural	4.7	7.6
Lake	3.0	4.9
Dismatled Railway	2.4	3.9
Total	61.6	100

2.2 Towards the south of the site soils have developed in superficial deposits of fine loamy drift overlying gravel. Land of this type is graded 3a and 3b and is limited by droughtiness imperfections. Although these droughtiness imperfections may be partly offset by the presence of groundwater at depth, this in itself will contribute to a wetness/workability imperfection during winter months which effectively

constitutes a further limitation to agricultural use. Although individual profiles of grade 2 were noted randomly within this mapping unit, they occurred to inextensively to delineate at the scale of mapping shown.

2.3 To the north and immediate south of the poultry houses soils have developed in deep (ie greater than one metre) of clayey drift. Land in this area is graded 3b and is limited by moderate wetness and workability imperfections, which derive from the slowly permeable nature of the subsoil.

A full description of site/soil physical factors is provided below:

3.0 SITE PHYSICAL FACTORS

Climate

3.1 Site specific climate data how been obtained by interpolating information contained in the 5k grid agroclimatic data set prepared by the Meteorological Office (Met. Office 1989).

3.2 This shows that average annual rainfall is 550mm (22 inches) which is low by national standards. Soils are likely to be at field capacity for a relatively short period of approximately 90 days.

3.3 The accumulated temperature for this area is approximately 1457 degrees celsius. This parameter indicates the cumulative build up of warmth available for crop growth, and has an influence on the development of soil moisture deficits (SMD)* and susceptibility to drought. The soil moisture deficits for potatoes and wheat are 116mm and 120mm respectively. These figures are slightly higher than average for lowland England.

* SMD respresents the balance between rainfall and potential evapotranspiration occurring during the growing season.

Relief

The site occupies gently sloping and undulating land between approximately 3 metres and 9 metres above ordnance datum. From a high point of 9 metres in the south west corner of the site, the land falls very gently to the north and west. Neither altitude nor relief constitute limiting factors to agricultural land quality.

4.0 SOIL PHYSICAL FACTORS

Geology

4.1 The geology of this area is described in Mineral Assessment Report 124, The Sand and Gravel Resources of Chatteris. (Inst Geol Sci., 1982). This shows the site to comprise of undifferential river terrace deposits, overlying upper Jurassic Clays. The application area is located towards the western edge of the gravel sheet, where some thinning of the terrace deposits over the underlying clay may occur. This factor may help explain local variations in soil type.

Soils

4.2 Two soil mapping unit have been identified on site based on similarities in texture, depth, and handling characteristics.

SOIL MAPPING UNIT I

Topsoil Texture : clay loam, may be sandy clay loam, especially in the central and south eastern parts of the site.

$CaCO_3$: variable, typically non calcareous, may be very slightly or slightly calcareous.

depth : in the range 30 to 40cm

stone : in the range 2% to 15%, typically 5%-10%, comprising medium, few small subangular flints and subrounded pebbles.

structure : cultivation zone, not applicable. (plough pan 20cm+).

boundary : clear wavey lower boundary.

roots : Common fine and very fine roots.

Subsoil Texture : clay loam or sandy clay loam.

$CaCO_3$: variable, typically very slightly calcareous or slightly calcareous; (in the range non calcareous to calcareous).

depth : in the range 40cm to 90cm, typically 55cm to 65cm.

stone : variable, in the range 2-20%, typically 5-10%. Size composition as above. Often becoming stonier with depth.

structure : weakly developed coarse subangular blocky, friable consistence.

porosity : in excess of .5% biopores.

boundary : clear wavey lower boundary.

roots : common fine and very fine, becoming fewer with depth.

Gravel Deposit : variable, typically the matrix comprises of loose sand or loamy sand with upwards of 25% fine gravel, comprising flints, quartz and limestone fragments. Occasionally the matrix comprises sandy loam or sandy clay loam. The deposit is typically strongly calcareous, slightly moist and may become bleached at depth.

Soil Variations : Towards the south and south east corner of the mapping unit, soil profiles may contain a thin (15-25cm) horizon of clay or sandy clay below 55-65cm, overlying the gravel below depths of 70-90cm.

Profiles of soil mapping unit II, occur randomly.

Further Information :

gleyed horizon : typically occurs 35-40cm+

slowly permeable layer : none identified at the soil profile pit. However the land is believed to be subject to fluctuating groundwater levels and is assessed as wetness class II.

SOIL MAPPING UNIT II

Topsoil

Texture : clay loam, occasionally clay

$CaCO_3$: variable, typically non clacareous may be very slightly or slightly calcareous.

depth : in the range 30-40cm

stone : less than 5%, comprising medium and small subangular flints and subrounded pebbles

structure : cultivation zone, not applicable, (plough pan 20cm+)

boundary : sharp, wavey boundary

roots : common stunted fine and very fine roots.

Upper Subsoil

Texture : clay, occasionally clay laom or sandy clay, may contain sand pockets

$CaCO_3$: typically very slightly or slightly calcareous, becoming increasingly calcareous with depth. Calcareous or strongly calcareous in the sand pockets.

depth : typically 55-65cm

stone : less than 5%, size composition as above

structure : strongly developed very coarse prismatic, breaking into coarse prismatic, firm to very firm consistence.

porosity : variable, typically less than .5% biopores, but may exceed .5% biopores within sand pockets.

boundary : clear wavey lower boundary.

roots : few fine and very fine roots.

Lower Subsoil

Texture : clay; may contain strongly calcareous horizons of marly clay below 65-70cm depth

$CaCO_3$: calcareous

depth : one metre plus

stone : typically stoneless

structure : moderately developed coarse angular bocky tending towards coarse prismatic, firm consistence

porosity : typically less than .5%

roots : few fine roots to 75cm

Further Information :

gleyed horizon : typically occurs below 30-40cm

slowly permeable layer : typically occurs below 30-40cm.

Sources of Reference:

MET OFFICE (1989) Climatological Data for Agricultural Land Classification.

MAFF (1988) Revised guidelines and criteria for assessing the quality of agricultural land.

INST GEOL SCI (1982) Mineral Assessment Report 124 Sheet TL38, Chatteris.