DH

LAND CLASSIFICATION NOTES FOR LAND AT PYFORD BROOK, ALREWAS

This 25.3 ha site lies 2 km west of Alrewas and 3 km east of Kings Bromley and is south of the A5130. The site adjoins the Pyford Brook to the south and a minor road in the west and is surrounded on all sides by open countryside. The site is level and lies at an altitude of 58 m OB. There are no site limitations to the agricultural use of the land.

The area receives an average annual rainfall of 675 mm of which almost half falls between April and September. The accumulated temperature above 0°C for the period January-June is 1408 which indicates that the site is climatically Grade 1. The interaction of summer temperatures and rainfall produce moisture deficits of 103 mm for wheat and 94 mm for potatoes. The median number of field capacity days is 151.

The whole area is underlain by fluvio-glacial gravels of the Trent First Terrace, which has given rise to predominantly sandy soils of variable stone content belonging to the Wigton Moor, Quorndon and Arrow soil series. These soils are classified as groundwater gley soils and the lowermost soil layers are waterlogged as a result of a high water table. Around the periphery of the site the soils have a slightly heavier sandy clay loam topsoil but generally pass into loamy sand or sand subsoils by about 50 cm. In the centre of the site the topsoils are lighter in texture (sandy loam) and loamy sand or sand subsoils occur slightly nearer the surface, typically between 35 and 45 cm. The main limitation to the agricultural use of the land is drought risk, though in a few places topsoil stone content is also limiting.

The land is under regular arable cultivation with cereals, potatoes and sugar beet grown in rotation. The latter two crops being irrigated from the Pyford Brook.

The site was visited during the summer of 1990 when 28 soil observations were made on a 100 x 100 m grid using a 120 cm Dutch auger.

Agricultural Land Classification

Grade 2 land occupies 3.25 ha and accounts for 12.8% of the site. The Grade 2 land is in 3 small areas across the site. The soils have a very slightly stony sandy loam or sandy clay loam topsoil overlying sandier and stonier subsoils. Although many of the soil profiles exhibit gleying the permeable nature of the soils indicates the gleying to be relict. No slowly permeable layers were observed and soil wetness is not a current limitation to the agricultural use of this land. The sandy soils are, however, drought-prone and qualify for Grade 2 using the MAFF drought assessment. One or two of the borings are marginal Grade 2/3a but the presence of the high water table which produces damp subsoils even in the middle of a very dry summer, indicates that additional water is available to plant roots. In addition there is a water abstraction licence to take water for irrigation from the Pyford Brook which will easily make up the marginal moisture balance on those soils.

Grade 3a land occupies 22.4 ha and accounts for 87.2% of the site. Most of the site is Grade 3a land and the soils are very similar to those graded 2. The main differences being either:

1) The volume of subsoil or topsoil stones;

2) The proximity of loamy sand or sand subsoils to the surface, and

3) A combination of both of these.

Scattered within the Grade 3a land are isolated profiles of Grade 2 land which are too small to map and also some profiles which are borderline 3a/b. In common with the Grade 2/3a land some of the borderline 3a/b profiles exhibited wet subsoils below about 70 cm (eg boring 19) which will provide additional water reserves for crops. Irrigation will also provide additional water which will ensure the borderline soils are more appropriately graded 3a.

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SOILS REPORT FOR PROPOSED SAND AND GRAVEL QUARRY, PYFORD BROOK, ALREWAS

Two soil units have been identified for the site and they are described below.

Soil Unit I covers 11.8 ha and accounts for 46.5% of the site. These are the lighter soils found and occupy the central and eastern parts of the site. The soils typically have a deep sandy loam topsoil (35-40 cm) with lighter textured subsoils and loamy sand or sand is generally encountered within 35-45 cm of the surface. The soils are generally slightly stony with generally less than 5% topsoil stones, with the exception of borings 12 and 19 which have 10% and 15% total topsoil stones respectively. The subsoils are generally stonier than the topsoils though rarely exceed 10%. Profile 19 being the exception having a moderately stony (35%) layer from 36-68 cm.

Because the soils were very dry at the time of survey many soilpits were dug but only two representative pits are described.

Pit Profile 1

0-28 cm 7.5 YR 3/3 sandy loam with 3% medium rounded quartzite pebbles. No mottles observed, many fibrous roots.

28-58 cm 7.5 YR 6/4 sandy loam (sandy loam tending towards sandy clay loam). 10% small and medium rounded quartzite pebbles. Many ochreous (7.5 YR 5/6 and 5/8) mottles. Moderately well developed medium sub-angular blocky structures. Very firm consistence with some slight evidence of soil compaction.

68-90 cm+ 7.5 YR 6/4 loamy sand. 10% medium and small rounded quartzite pebbles. Many ochreous (7.5 YR 5/8) mottles. Weakly developed medium sub-angular blocky structures readily breaking down to a medium crumb structure.

Quorndon soil series.

Pit Profile 2

0-36 cm 10 YR 3/3 sandy loam. 15% small and medium rounded quartzite pebbles. Many fine roots. No mottles observed.

36-68 cm 10 YR 6/2 sand (tending towards loamy sand). 35% small and medium rounded quartzite pebbles. Common ochreous (10 YR 5/6) mottles. More than 0.5% of biopores larger than .5 mm. Weakly developed coarse and medium sub-angular blocky structures. Friable consistence (good subsoil structural conditions). Common fine roots.

68-90 cm+ 10 YR 6/2 sand. 5% small and medium rounded quartzite pebbles. Common ochreous (10 YR 5/6) mottles. Too stony to accurately assess structure but probably weakly developed coarse and medium sub-angular blocky breaking down to fine and medium crumb structure. Friable consistence.

Soil damp below 75 cm due to high ground water table.

Blackwood soil series.

Soil Unit II occupies 13.5 ha and accounts for 53.5% of the site. The soils occur as a broad band around the north, south and western edges of the site, being slightly less well developed in the south. The soils are distinguished from those in the the Soil Unit I by the presence of a sandy clay loam or more rarely clay loam topsoil of at least 35 cm depth. There are one or two inclusions of sandy loam topsoils which approach sandy clay loam in texture (eg borings 26 and 27). Apart from the presence of a slightly heavier sandy clay loam topsoil the other main distinguishing features of this soil unit are:-

1. Presence of stony subsoils which in some places exceed 50% but are more typically 15-35% for all or part of the subsoil;

2. The presence of loamy sand or sand subsoils below about 50 cm though in some places they are not encountered within 100 cm of the surface (eg. boring 4).

There is a slight tendency for the sandy subsoils to be nearer the surface in the south of the site. Two representative soilpits are described.

Pit Profile 3

0-41 cm 10 YR 3/3 sandy clay loam. 17% medium and small rounded quartzite pebbles. Moderately developed coarse sub-angular blocky structures. Many roots observed. No mottles seen.

41-50 cm 10 YR 6/3 and 6/4 loamy sand. 37% small and medium rounded quartzite pebbles. Weakly developed coarse and medium sub-angular blocky structures. Very friable consistence. Porosity greater than 0.5% biopores larger than 0.5 mm. Common ochreous (10 YR 5/3 and 5/6) mottles.

50-68 cm 10 YR 6/3 sand. 5% small and medium rounded quartzite pebbles. Weakly developed coarse and medium sub-angular blocky structures readily breaking down into single grain and crumb structures. Very friable consistence. Common ochreous (10 YR 5/6) mottles.

68-100 cm+ 7.5 YR 5/6 sand (medium sand verging on fine sand). 5% small and medium rounded quartzite pebbles. Weakly developed coarse and medium sub-angular blocky structures readily breaking down to single grain and crumb structure. Very friable/loose consistence. Many ochreous (10 YR 5/6 and 5/8) mottles.

Soil is wet below 68 cm due to high ground water table. Arrow/Quorndon soil series.

Pit Profile 4

0-30 cm 10 YR 4/3 clay loam/sandy loam. 18% medium and small rounded quartzite pebbles. A few ochreous mottles below 28 cm.

30-45 cm 10 YR 4/2 and 6/3 sandy loam. 35% small and medium rounded quartzite pebbles. Moderately well developed medium sub-angular blocky structures. Friable/very friable consistence. Common ochreous mottles in very dry subsoils.

45-60 cm 10 YR 4/2 loamy sand. 52% small and medium rounded quartzite pebbles. Weakly developed coarse sub-angular blocky structure. Friable consistence.

No further penetration possible due to stony dry subsoil.

Wigton Moor/Quorndon soil series.

Both soil units are relatively pure with few admixtures of a typical soil texture. From the soil handling point of view the topsoils from Soil Unit I should be stripped and stores separately from the topsoil in Unit II. The topsoils are particularly deep on this site and topsoil could be stripped to 35 cm over the whole site.

The subsoil can be stripped as one. The subsoils are fairly variable but with the exception of the northwest and northern corners where sandy clay loam or clay loam persist to at least 45 cm depth in borings 1, 3, 4 and 9, the subsoil (below 35 cm) is generally sandy loam, loamy sand or sand of variable stone content.