SPRING FARM, CHELLASTON, DERBY

Verification report on agricultural land quality and soil resources of the proposed development.

1. BACKGROUND

The site of approximately 47 ha in extent at Spring Farm, Chellaston lies immediately to the south of the City of Derby (Grid Ref. SK386290). The planning proposal is to provide for and dispose of bulk fill materials in connection with the proposed Derby southern by-pass.

Reports have been submitted to accompany the application relating to the agricultural land quality, soil resources and restoration works by Land Research Associates (LRA) and RPS Clouston.

A slight difference occurs in the extent of the survey area in the north of the site between the LRA survey and the present survey. Hence the survey area is stated as 49.7 ha by LRA but was found to only extend to 46.7 ha in the present survey, the boundary being derived from the planning application.

In January 1995 ADAS Statutory Resource Planning Team conducted a semi-detailed survey to verify the findings contained within the reports submitted with the application. Information was collected from auger borings made at an approximate density of one per two hectares. These borings were supplemented by three soil inspection pits to provide more detailed information on the structural development within the soil profile. Additionally shallow pits were dug at a number of locations to verify the structure of the subsoil lying immediately below the topsoil.

2. AGRICULTURAL LAND QUALITY

The report on agricultural land quality produced by LRA identifies land of grade 2 and subgrades 3a and 3b within the site.

LRA state that the soils within areas of grade 2 land consist of 28-30 cm of sandy clay loam topsoil overlying an upper subsoil of sandy clay loam or medium sandy loam texture. Between 50-90 cm a change to a slowly permeable clay or sandy clay occurs.

Soils within subgrade 3a land are similar to those within the area of grade 2 but the upper subsoils were thinner.

Soils within subgrade 3b land are described as heavy and wet with heavy clay loam topsoil immediately overlying a clay subsoil.

The present survey also found land of grade 2 and subgrades 3a and 3b quality. The soil profiles examined within each of the grades were similar to those described by LRA. Occasionally the topsoil within areas of grades 2 and 3a land were described as the slightly heavier textured medium clay loam compared with the sandy clay loam texture described overall by LRA.

LRA state that a few random inclusions of grade 3a soils fall into the area mapped as 3b. However, three adjacent auger borings at LRA sample points 34, 35 and 44 are all grades as 3a but mapped as 3b. Two of these sample points were confirmed as grade 3a by the present survey. Hence a sufficiently large area of grade 3a land is likely to occur within the area mapped as 3b by LRA to be mapped separately.

The extent of the land mapped as grade 2 in the north east of the site was found to be less in the present survey than mapped by LRA with much of the area being found to be subgrade 3a. This difference occurs between the two surveys because in the LRA survey the upper subsoil in this area was not found

to be gleyed and hence profiles were assigned to wetness class II. However, in the present survey sufficient evidence of gleying was found to place the profiles into wetness class III and hence grade 3a.

3. SOIL PHYSICAL CHARACTERISTICS AND SOIL RESOURCES

A single soil type with three variants were identified in the LRA report with the variants corresponding to the subsequent land grades of 2, 3a and 3b. In areas of grades 2 and 3a the topsoil was identified as sandy clay loam overlying a sandy clay loam or locally sandy loam upper subsoil. The thickness of the upper subsoil varying between the grade 2 and 3a land. This upper subsoil in turn overlies a dense clay or sandy clay lower subsoil. In areas of 3b land the topsoil was generally heavier ranging from sandy clay loam to heavy clay loam which directly overlies the dense clay or sandy clay which also underlies the grade 2 and 3a land.

Similar variants of a single soil type were found in the present survey with the three variants being similarly associated with the subsequent grade of the land. These soils may be described as:

Grade 2 areas: A brown medium sandy clay loam topsoil approximately 30 cm thick overlies a light olive brown medium sandy clay loam. At a depth of approximately 75 cm the upper subsoil changes to a lower subsoil of a light yellowish brown sandy clay. All horizons contain only a few small to medium sized flint and quartzite stones.

Grade 3a areas: A relatively uniform thickness of 30 cm of dark greyish brown medium sandy clay loam/medium clay loam topsoil covered this area. The topsoil immediately overlies a light olive brown/brown weakly developed fine to medium angular blocky structured, predominantly mottled, clay or occasionally sandy clay textured subsoil. Occasionally this subsoil was calcareous at depth.

Both topsoil and subsoil contained only a few small and medium sized flint and quartzite stones.

Grade 3b areas: A uniform thickness of 30 cm of dark greyish brown medium clay loam/heavy clay loam topsoil covered this area. The topsoil immediately overlies a light olive brown/brown weakly developed fine to medium angular blocky structured prominently mottled clay or occasionally sandy clay textured subsoil. Occasionally this subsoil was calcareous at depth. Both topsoil and subsoil contained only a few small and medium sized flint and quartzite stones.

The proposals in the LRA report to strip the topsoil from the grade 2 and 3a land as a single unit (T1) with a second topsoil stripping unit of the heavier soil from areas of grade 3b land (T2) is reasonable. Additionally the two subsoil stripping units identified as the upper subsoil in areas of grade 2 and 3a land (S1) and the underlying clay subsoil from all areas (S2) would also be recommended. However, care will be required in areas with a variable upper subsoil thickness to avoid contamination of the upper subsoil with the heavier clay textured lower subsoil.

4. RESTORATION WORKS - FROM REPORT BY RPS CLOUSTON

The recommendation that all soil movements should be when the soils are dry is good practice but no indication is given as to how the moisture content of the soils is to be determined and at what point the soils become dry enough for soil movements to take place.

The stripping of topsoil from the whole site at a thickness of 300 mm but keeping the topsoil from areas of grade 2 and 3a land separate from those soils stripped from land of 3b quality is as recommended by LRA and is reasonable. Similarly the stripping of the upper subsoil from areas of grade 2 and 3a land above the clay lower subsoil is recommended. However, the RPS Clouston report states in paragraph 3.3 "In the areas of grade 2 and 3a the upper subsoil will be stripped down to the dense clay, an average depth of 500 mm ....". It is

unclear from this statement if a total of 300 mm of topsoil and 200 mm of upper subsoil will be stripped to give an over depth of 500 mm or if a 500 mm thickness of upper subsoil is to be stripped. Similarly RPS Clouston state in paragraph 3.3 "In areas of grade 3b the subsoil will be stripped to an average depth of 500 mm, or until very heavy waterlogged clays .... are reached". It is again unclear if 200 mm or 500 mm of subsoil are to be stripped. If a 500 mm thickness of subsoil is to be stripped then this will still result in only an 800 mm thickness of soil being stripped which is likely to result in a shortfall of material for restoration. However, the report also states that stripping could continue until waterlogged clays are reached. No waterlogged clays were noted within the survey by LRA or the present survey. Therefore a significantly greater quantity of subsoil may require stripping than envisaged with an average thickness of 500 mm. This may reduce any shortfall of soil for restoration but will increase the provision necessary for soil storage.

The proposals in paragraph 2.1 state that the whole site will be restored to arable agricultural usage. Paragraph 3.7 of the report states that 28 ha of land will be restored with profiles similar to those of the existing grade 2 and 3a land. However, no mention is made of the restoration soil profiles of the substantial areas of land currently of grade 3b.

Further information is therefore required on soil movements and soil resources to ensure the proposals for the restoration of the site are feasible and practical.

5. CONCLUSIONS

1. The site was found to be predominantly as graded by LRA.

2. The soil stripping units proposed by LRA are reasonable.

3. Information on restoration profiles and soil volumes are inadequate, with some ambiguity in the thickness of some stripping units.

4. More information is required on soil movements, soil resources and restoration profiles to evaluate fully the restoration proposals.

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