SUNNICA ENERGY FARM

EN010106

Peer Review of SNTS ALC Report

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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1.0 Introduction

1.1 Land Research Associates Limited (LRA) have been instructed by AECOM Limited to provide information on the agricultural quality of land around Chippenham, Cambridgeshire. LRA have specialized in soil and agricultural land studies for over thirty years.

1.2 The review has been conducted by Mike Palmer, Director of LRA, a professional member of the British Society of Soil Science (MISoilSci) and chartered soil scientist (CSci). Mike has over fifteen years experience in agricultural land assessment.

BACKGROUND

1.3 A survey of approximately 80 ha of land was conducted by Patrick Stevenson Limited and subject to a report in October 2022. The findings have been extrapolated to neighbouring land proposed as Sunnica Energy Farm, concluding those results are contested (see section 7.0).

1.4 This review has been conducted independently to determine whether the conclusions of the Patrick Stevenson Limited report regarding the grading of the Sunnica Energy land are justified.

1.5 The Sunnica site grading is subject to review by Natural England (the statutory consultees on agricultural land quality matters) and no evaluation of this grading is included in this review.

2.0 Methodology

2.1 The survey by Patrick Stevenson Limited has been conducted of land neighbouring Sunnica Energy Farm, rather than the land itself. The Patrick Stevenson survey provides sampling point logs at 81 referenced grid points. It is possible to verify from the grid points that the samples do relate to the fields mapped in the appendix to the report. A map of the sample points is not provided, but grid coordinate points have been provided (in degrees longitude and latitude). In the absence of a map it is very difficult to verify the nature of the sampling pattern, but the samples appear, from the coordinates provided, to be on a somewhat ad-hoc basis rather than a randomised grid pattern (possibly due to a standing crop at the time of survey). However, the density of sampling (1 observation per hectare) appears appropriate for a detailed survey.

2.2 Nine soil pit descriptions are provided. A map indicating ten pits along the western and southern margins of the Sunnica site is provided. Given the difficulties in verifying from the grid coordinates no attempt has been made to verify exactly which is which, although numbering of pit photographs does provide the location of some of the pits.

2.3 Ten laboratory testing results for topsoil particle size analysis are provided; it is assumed that these relate to the ten pits shown on the map, although it is not fully clear which is which. The results comprise only tabulated results, rather than laboratory certificates, so it is not possible to verify that they have been analysed appropriately.

2.4 A limited amount of field data has been provided in the auger logs from the detailed auger survey, limited to horizon depths, texture and stone types. Omitted information relevant to Agricultural Land Classification and required to make a full assessment for this site includes:

- Soil stone content %
- Subsoil structure and depth
- Effective rooting depth (as evidenced by lower depths for subsoil layers and hardness and fracture status of the bedrock)

2.5 It is normal when undertaking Agricultural Land Classification assessments to use data from soil pits to determine the properties above, although it would also be normal to show the depth to bedrock where this occurs within normal auger sample depth (120 cm).

2.6 The soil pits information does include subsoil depths and generally indicates that the soils are very slightly stony or stoneless, suggesting that the effect of stones on droughtiness may be very limited across the whole site. However soil structure description and information on effective rooting depth is also omitted for the pit records.

3.0 Survey findings

3.1 The initial auger survey suggested that soils comprise sandy loam topsoil over **loamy sand or sand** subsoil. The later soil pit data generally records sandy loam topsoil over **sandy loam** subsoil, over chalk at variable depth. Both sandy and coarse loamy soils are common in this area, but it is not clear why the pit survey subsoil textures differ from those of the initial survey auger logs (for example for Field T25). This discrepancy is important for the grading of this land (according to droughtiness).

3.2 The pit photographs provided in the report appendix appear to indicate that the soils are often shallow, either over chalk bedrock or over chalk rubble. The difference between chalky subsoil and chalk parent material are often difficult to determine (particularly when the underlying chalk is soft), but is important in particular to investigate and record the difference between the two with regard to effective rooting depth. The photograph of Pit 2 (Gargetts Field) for example appears shallower soil than the pit log suggests. The records of subsoil stone content also do not always appear accurate: for example the pits in CCC land are recorded as <1% stones, when the 'subsoil' material appears to consist mainly of chalk fragments on photographs.

4.0 Land grading

4.1 Most of the land is recorded to be limited by droughtiness (crop moisture shortages resulting from low soil storage and limiting rooting depth), with shallow soil depth a limiting factor in some places. In order to undertake moisture balance calculations for drought limitations the following information is required:

- Climatic moisture deficits (derived from published data interpolated for the site)
- Topsoil/subsoil thicknesses and depth to bedrock
- Topsoil and subsoil stone concentration (%) and stone type
- Subsoil structure (to provide good, moderate or poor structural conditions for calculations)
- The effective rooting depth (dependent on the nature of the bedrock)

4.2 Stone content estimates, soil textures and depth to bedrock are available for the ten soil pits. It is normal practice to extrapolate calculations from pit investigations to surrounding auger logs, although as noted previously the pits undertaken do not to match the sandy subsoils which were widely reported in the initial survey auger logs. Structural conditions and effective rooting depth information is absent from the pit records. Without this data it is not possible to fully verify the findings for droughtiness limitations. To give specific examples:

- **Field T1** is graded as mainly subgrade 3a with an area of subgrade 3b in the south-west. The majority of the auger records show the topsoil as sandy loam over sand or loamy sand subsoil. The detailed subsoil investigations do not show the depth to bedrock (assuming that bedrock occurs within 120 cm). There are no investigation pits recorded in this field. It is therefore difficult to understand how these gradings were obtained.
- **Field Isleham** is graded as grade 2 with subgrade 3a in the east. One investigation pit is recorded in the field, showing sandy loamy topsoil over sandy loam/chalk subsoil and 'compacted' chalk at 50 cm. Subsoil structure and effective rooting depth information is not recorded. Detailed logs from the field often show sandier subsoil and do not show the depth to chalk bedrock. Assuming the description of the chalk as 'compacted' means it to be hard, it would be expected that rooting depth would be restricted by this layer to some degree (although no information is provided). It is not clear how the soils with sandy subsoil have been assessed, but

these are very likely to be limited to subgrade 3b at best by droughtiness if over impenetrable chalk at relatively shallow depth.

- **Field Gargetts** is graded as subgrade 3a, and subgrade 3b in the north and south. Detailed logs show soils with a mixture of loamy sand, sandy loam and sandy silt loam topsoils, typically with sand, loamy sand or silt loam subsoil. The records do not show depth to bedrock. One pit has been recorded in the field, which shows 50 cm of topsoil over sandy loam subsoil, with chalk bedrock at 75 cm. Subsoil structure and effective rooting depth are not provided. The pit does not appear representative of any the recorded detailed auger sample logs. It is therefore not clear how the gradings were derived.

5.0 Conclusions

5.1. While a detailed investigation appears to have been undertaken of the land included in the survey, there are significant data omissions in the report, the absence of which makes grading according to droughtiness difficult. In particular, the absence of general information on soil depths in the auger sample logs (and to a lesser extent in the pit logs) means that it is hard to see how the land could be graded accurately from the data available.

5.2. There are inconsistencies between soil pit descriptions and the earlier detailed auger sampling logs, which make extrapolation of the pit data to other sample points problematic.

5.3. In the absence of examples of the droughtiness calculations undertaken, it is not possible to determine how the data omissions/inconsistencies have been overcome to reach the grading conclusions.