

**AGRICULTURAL QUALITY
OF LAND EAST OF SCRAPTOFT
LEICESTERSHIRE**

Report 2399/1

22nd August 2024

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OF LAND EAST OF SCRAPTOFT, LEICESTERSHIRE**

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Report 2399/1
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SUMMARY

An agricultural land quality survey has been undertaken of 46.6 ha of land east of Scraftoft, Leicestershire during August 2024.

The land has heavy soils with restricted drainage. Agricultural land quality is mainly limited to Subgrade 3b by wetness and in places by steep gradient. An area in the west has better draining soils and is of Subgrade 2 and 3a quality.

1.0 Introduction

- 1.1 This report provides information on the soils and agricultural quality of 46.6 ha of land east of Scraftoft, Leicestershire. The report is based on a survey of the land during August 2024.

SITE ENVIRONMENT

- 1.2 The survey area comprises ten fields to the east of Scraftoft, bounded to the north by Covert Lane, to the west by Station Lane, to the south by housing and to the east by further agricultural land. The land slopes from the north towards a valley feature approximately mid-way within the survey area and rises towards the south-east. Average elevation is approximately 103 m AOD.
- 1.3 At the time of survey the small fields in the west were grassland, the two large fields in the east were a mix of grass and barley with the centre of the survey area being grass and lucerne.

PUBLISHED INFORMATION

- 1.4 British Geological Survey 1:50,000 scale information records the bedrock as Blue Lias Formation mudstone. The bedrock is mainly recorded to be overlain by Thrussington Member glacial till, and in the north-west by mid-Pleistocene and gravel deposits. Alluvial deposits are mapped along the route of the small stream running from the north-east to the south of the site. No superfcials are recorded in the south of the survey area.
- 1.5 The National Soil Map (published at 1:250,000 scale) records the whole of the survey area as Ragdale Association: mainly slowly permeable seasonally waterlogged clays and fine loams over clay formed in chalky glacial till¹.

¹Ragg, J.M., et al., (1984). *Soils and their Use in Midland and Western England*, Soil Survey of England and Wales Bulletin No. 12, Harpenden.

2.0 Soils

- 2.1 A detailed soils and agricultural quality survey was carried out in August 2024 in accordance with MAFF (1988) guidelines². It was based on observations at intersects of a 100 m grid, giving a density of one observation per hectare. During the survey, soils were examined by a combination of pits and augerings to a maximum depth of 1.2 m. A log of the sampling points and a map (Map 1) showing their locations are in an appendix to this report.
- 2.2 The majority of the survey area comprises clay or occasionally heavy clay loam topsoil which overlies slowly permeable clay subsoil, decalcified in the upper layers and chalky at depth. The subsoil shows gleying (greyish colours and ochreous mottles) indicating seasonal waterlogging. These soils are judged to be poorly-draining (Soil Wetness Class IV).
- 2.3 Occasionally slightly better drained soil profiles with a permeable unmottled heavy clay loam upper subsoil were encountered, principally in the west of the survey area. Such profiles were assessed as Wetness Class II. At a single location a soil profile was found with fine and coarse loamy textured subsoil horizons. A small area of disturbed soil was also encountered at a single sample location.
- 2.4 Example profiles of the poorly-drained main soil type from the north and south of the survey area and an example of the better drained soil profile are described in an appendix to this report from pits at observations 6, 32 and 34 respectively (Map 1).

²MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

3.0 Agricultural land quality

3.1 To assist in assessing land quality, the Ministry of Agriculture, Fisheries and Food (MAFF) developed a method for classifying agricultural land by grade according to the extent to which physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF ALC system classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

3.2 The agricultural climate is an important factor in assessing the agricultural quality of land and has been calculated using the Climatological Data for Agricultural Land Classification³. The relevant site data for an average elevation of 103 m AOD is given below.

- Average annual rainfall: 656 mm
- January-June accumulated temperature >0°C 1349 day°
- Field capacity period 144 days
(when the soils are fully replete with water)
- Summer moisture deficits for: wheat: 100 mm
potatoes: 90 mm

3.3 The survey described in the previous section was used in conjunction with the agro-climatic data above to classify the site using the revised guidelines for ALC issued in 1988 by MAFF⁴. There are no climatic limitations at this locality.

SURVEY RESULTS

3.4 This report describes the main limitations affecting ALC grades at this site. Other factors were assessed but did not affect the overall grading of the site. The agricultural quality of the land is determined by wetness and gradient limitations, with land of Grades 2 and 3 being identified.

Grade 2

3.5 A small area in the north-west has loamy topsoils and slight drainage impedance (Soil Wetness Class II). Some wetness restrictions to winter operations is likely, but there are few restriction at other times of year.

³Meteorological Office, (1989). *Climatological Data for Agricultural Land Classification*.

⁴MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

Subgrade 3a

- 3.6 This land has heavy topsoils and slight drainage impedance (Soil Wetness Class II). This combination is likely to result in wetness restrictions to machinery operations in winter and early spring. Late spring (as well as autumn) sowings are usually possible however.

Subgrade 3b

- 3.7 The majority of the land has high topsoil clay content (heavy loam or clay) and poor drainage (Soil Wetness Class IV). Under the local climate this means that the land is usually too wet for spring machinery land access, and arable cropping is therefore largely limited to autumn sowings.
- 3.8 Additionally, areas in the centre and south-east have gradients in excess of 7°. Such gradients are restrictive for the use of farm machinery and could result in soil erosion problems.

Other land (non-agricultural)

- 3.9 This comprises an area of rough grassland associated with a very steep slope a small copse in the north and trees alongside a small stream.

Grade areas

- 3.10 The land grades are shown on Map 2 and the areas occupied shown below.

Table 1: Areas occupied by the different land grades

<i>Grade/subgrade</i>	<i>Area (ha)</i>	<i>% of the land</i>
Grade 2	1.0	2
Subgrade 3a	4.2	9
Subgrade 3b	39.6	85
Non-agricultural land	1.8	4
Total	46.6	100

**APPENDIX
DETAILS OF OBSERVATIONS
MAPS**

Land at Scraftoft, Leicestershire: Soils and ALC survey – Details of observations at each sampling point

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-28	C	5	<u>28</u> -120	Cca fmn	xxx				2	IV	3b	W
2	0-32	C	4	<u>32</u> -55	C fmn	xxx	<u>55</u> -120	Cca fmn	xxx	2	IV	3b	W
3	0-30	C	4	<u>30</u> -46	C fmn	xxx	<u>46</u> -120	Cca fmn	xxx	2	IV	3b	W
4	0-30	C	6	<u>30</u> -60	Cca	xxx	60+	Stopped on stones		1	IV	3b	W
5	0-28	C	5	<u>28</u> -55	C fmn	xxx	<u>55</u> -120	Cca fmn	xxx	3	IV	3b	W
6	0-26	C	3	<u>26</u> -55	C fmn	xxx	<u>55</u> -120	C fmn	xxx	3	IV	3b	W
7	0-34	C	4	<u>34</u> -80	C fmn	xxx	<u>80</u> -120	Cca fmn	xxx	3	IV	3b	W
8	0-30	Cca	10	<u>30</u> -55	C fmn	xxx	<u>55</u> -120	Cca fmn	xxx	1	IV	3b	W
9	0-37	C	5	<u>37</u> -62	C fmn	xxx	<u>62</u> -80 <u>80</u> -120	C fmn Cca fmn	xxx xxx	2	IV	3b	W
10	0-38	HCL	4	<u>38</u> -58	C fmn	xxx	<u>58</u> -70 70+	C fmn Stopped on stones	xxx	4	IV	3b	W
11	0-30	C	5	<u>30</u> -65	C fmn	xxx	65+	Stopped on stones		2	IV	3b	W
12	0-35	C	5	<u>35</u> -65	C fmn	xxx	65+	Stopped on stones		2	IV	3b	W
13	0-35	C	5	<u>35</u> -68	C (sandy)	xxx	<u>68</u> -120	C (sandy) fmn	xxx	2	IV	3b	W
14	0-28	C	5	<u>28</u> -50	C fmn	xxx	<u>50</u> -120	C fmn	xxx	1	IV	3b	W
15	0-28	MCL	1	28-55	SCLca	o	<u>55</u> -90 <u>90</u> -120	SCLca MSLca	xxx o	4	II	2	W
16	0-36	HCL	4	<u>36</u> -60	Cca fmn	xxx	<u>60</u> -120	Cca fmn	xxx	2	IV	3b	W
17	0-30	HCL	5	<u>30</u> -53	Cca	o	<u>53</u> -120	Cca fmn	xxx	2	II	3a	W
18	0-33	C	5	<u>33</u> -100	C dist (red brick debris to 90 cm)	xxx	100+	Stopped on stones		5	IV	3b	W
19	0-30	MCL	4	<u>30</u> -120	Cca fmn	xxx				6	IV	3b	W
20	0-33	HCL	5	<u>33</u> -60	C fmn	xxx	60+	Stopped on stones		6	IV	3b	W
21	0-40	C	4	<u>40</u> -120	C fmn	xxx				4	IV	3b	W
22	0-36	HCL	4	<u>36</u> -60	HCL	o	<u>60</u> -95 95+	C fmn Stopped on stones	xxx	2	II	3a	W
23	0-30	C	4	<u>30</u> -70	C fmn	xxx	<u>70</u> -120	C fmn	xxx	3	IV	3b	W
24	0-30	C	5	<u>30</u> -48	C fmn	xxx	<u>48</u> -120	C v calc fmn	xxx	1	IV	3b	W
25	0-25	MCL	1	25-35	HCL	xxx	<u>35</u> -120	C	xxx	2	IV	3b	W
26	0-35	Cca	5	<u>35</u> -60	C v calc	xxx	<u>60</u> -80 80-120	Cca (sandy lenses) MS (C lenses) r	xxx xxx	4	IV	3b	W
27	0-38	HCL	5	<u>38</u> -82	HCLca	o	<u>82</u> -120	Cca fmn	xxx	10	I	3b	G
28	0-33	C	5	<u>33</u> -70	Cca fmn	xxx	<u>70</u> -120	Cca fmn	xxx	10	IV	3b	W/G
29	0-28	C	3	<u>28</u> -69	Cca	xxx	<u>69</u> -120	Cca	xxx	9	IV	3b	W/G
30	0-35	HCL	4	<u>35</u> -90	C (sandy)	xxx	<u>90</u> -120	C (sandy) fmn	xxx	6	IV	3b	W

Soil log key

Gley indicators¹

o	unmottled
x	1-2% ochreous mottles and brownish matrix (or a few to common root mottles (topsoils)) ³
xx	>2% ochreous mottles and brownish matrix and/or dull structure faces (slightly gleyed horizon)
xxx	>2% ochreous mottles and greyish or pale matrix (gleyed horizon) or reddish matrix and >2% greyish, brownish or ochreous mottles and pale ped faces
xxxx	mottles or f-m concentrations (gleyed horizon) dominantly blueish/greenish matrix, often with some reddish mottles (gleyed horizon)

Slowly permeable layers⁴

a depth underlined (e.g. 50) indicates the top of a slowly permeable layer

A wavy underline (e.g. 50) indicates the top of a layer borderline to slowly permeable

¹Gley indicators in accordance with Hodgson, J.M., 1997. Soil Survey Field Handbook (third edition). Soil survey technical monograph No. 5

²Texture in accordance with particle size classes in Hodgson (1997)

³ Occasionally recorded in the texture box

⁴Permeability is estimated for auger borings and must be confirmed by full pit observations in accordance with the definitions in: Revised Guidelines for grading the quality of Agricultural Land (Maff 1988)

⁵Soil Wetness Classes are defined in Hodgson (1997)

⁷calcareous classes as defined in Hodgson (1997)

Grades shown as intergrade e.g. **3a/3b** are close to the grade boundary. The estimate of which side of the boundary the grading falls is the shown first (in bold here) grades in brackets eg. (3a) raised by one grade due to calcareous topsoil

Texture²

C	clay
ZC	silty clay
SC	sandy clay
CL	clay loam (H-heavy, M-medium)
ZCL	silty clay loam (H-heavy, M-medium)
SZL	sandy silt loam (F-fine, M-medium, C-coarse)
LS	loamy sand (F-fine, M-medium, C-coarse)
SL	sandy loam (F-fine, M-medium, C-coarse)
S	sand (F-fine, M-medium, C-coarse)
SCL	sandy clay loam
P	peat (H-humified, SF-semi-fibrous, F-fibrous)
LP	loamy peat; PL - peaty loam

Wetness Class⁵

I (freely drained) to VI (very poorly drained)

⁶stoniness classes as defined in Hodgson (1997)

Limitations:

W	wetness/workability
D	droughtiness
De	depth
F	flooding
St	stoniness
G	gradient
T	topography/microrelief
C	Climate

Suffixes & prefixes:

o - organic

(vsl, sl, m, v, x)**st** – (very slightly, slightly, moderately, very, extremely) **stony**⁶

(vsl, sl, m, v, x)**ca**
(very slightly, slightly, moderately, very, extremely) **calcareous**⁷

Other abbreviations

fmn	ferri-manganiferous concentrations
dist	disturbed soil layer; chky - chalky
R	bedrock (CH – chalk, SST – sandstone)
LST	limestone, MST – Mudstone)
r	reddish, gn – greenish

SOIL PIT DESCRIPTIONS

Observation 6

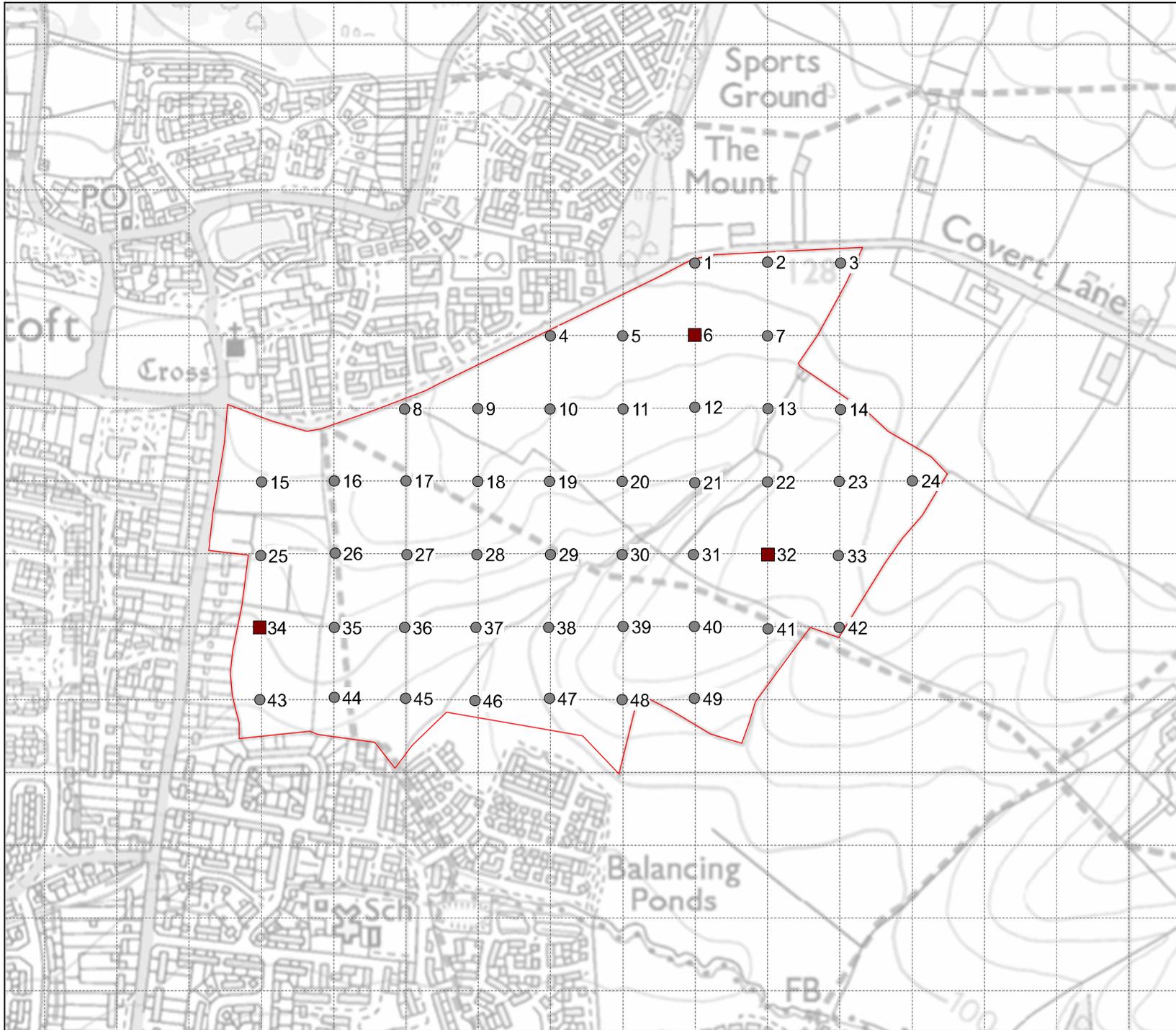
- 0-26 cm Brown (10YR 4/3) clay; non-calcareous, 3% small to medium rounded and sub-angular quartzite and flints with few sandstone fragments; weakly developed medium sub-angular blocky structure; friable; many fine roots; smooth abrupt boundary to:
- 26-55 cm Brown (10YR 5/3) clay; non-calcareous; 2% small to medium rounded and sub-angular quartzite and flint with few sandstone fragments; weakly developed coarse angular blocky structure; firm; common fine fibrous roots; <0.5% biopores; many prominent ochreous and grey mottles (10YR 5/6, 5/2); few ferri-manganiferous concentrations; smooth clear boundary to:
- 55-100 cm+ Light olive brown and yellowish brown (2.5Y 5/3, 10YR 5/6) clay; non-calcareous; 2% small sub-angular flint; weakly developed very coarse prismatic structure; firm; few fine fibrous roots; <0.5% bio-pores; very many prominent ochreous mottles (10YR5/6); few ferri-manganiferous concentrations.

Observation 32

- 0-33 cm Dark yellowish brown (10YR 4/4) clay; non-calcareous, 4% small to medium rounded and sub-angular quartzite and flints with few sandstone fragments; weakly developed medium sub-angular blocky structure; friable; many fine roots; smooth abrupt boundary to:
- 33-100 cm+ Brown, yellowish brown (10YR 5/3, 5/6) clay; non-calcareous; 3% small to medium rounded and sub-angular quartzite and flints with few sandstone fragments; weakly developed coarse prismatic structure; firm; common fine fibrous roots; <0.5% biopores; many prominent ochreous and grey mottles (10YR 5/6, 5/2); few ferri-manganiferous concentrations from 80 cm.

Observation 34

- 0-30 cm Dark yellowish brown (10YR 4/4) heavy clay loam; non-calcareous, 2% small to medium rounded and sub-angular quartzite and flints with few sandstone fragments; moderately developed fine to medium sub-angular blocky structure; friable; many fine roots; smooth clear boundary to:
- 30-57 cm Brown (10YR 5/3) heavy clay loam; non-calcareous; 5% small to medium rounded and sub-angular quartzite and flints with few sandstone fragments; moderately developed medium angular blocky structure; firm; common fine fibrous roots; >0.5% biopores; no mottles; smooth clear boundary to:
- 57-100 cm+ Brown, yellowish brown (10YR 5/3, 5/6) clay; non-calcareous; 5% small sub-angular flint; weakly developed very coarse prismatic structure; firm; few fine fibrous roots; <0.5% bio-pores; many prominent ochreous mottles (10YR 5/6).



KEY

- Auger observations
- Pits
- Site boundary

Site:

Scraftoft East

Map title:

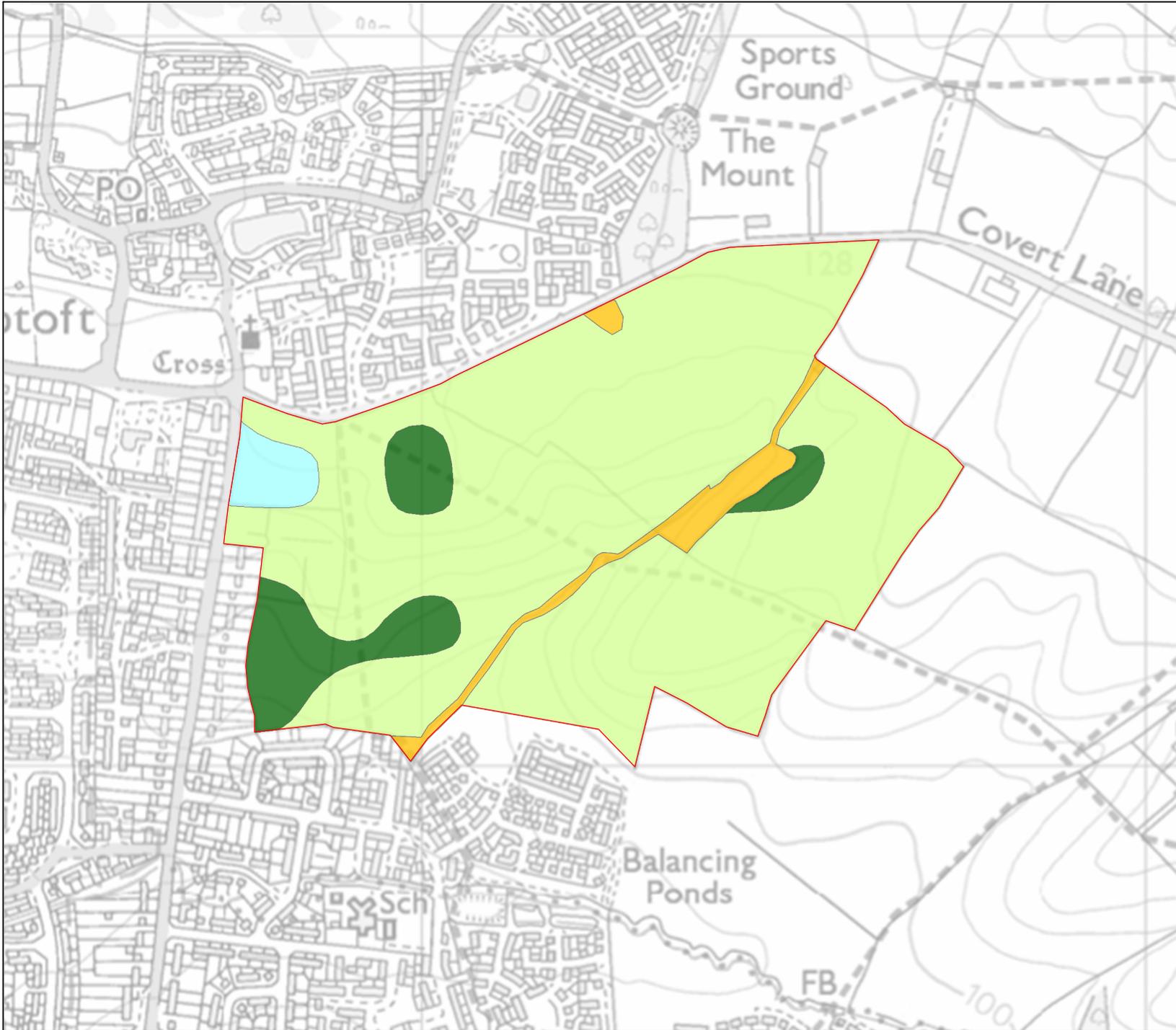
MAP 1
Observations

**Land
Research**
ASSOCIATES

Tapton Innovation Centre
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www.lra.co.uk

Date: 22/08/2024

Scale: 1:7,500



KEY

- Grade 2
- Subgrade 3a
- Subgrade 3b
- Other land
- Site boundary

Site:

Scraptoft East

Map title:

MAP 2
Agricultural Land
Classification

Land
Research
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Tapton Innovation Centre
Brimington Road
Chesterfield
S41 0TZ
www.lra.co.uk

Date: 22/08/2024

Scale: 1:7,500