

**AGRICULTURAL QUALITY
OF LAND AT M1 JUNCTION 22,
MARKFIELD, LEICESTERSHIRE**

Report 2679/1

11th August 2025

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**AGRICULTURAL QUALITY
OF LAND AT M1 JUNCTION 22, MARKFIELD, LEICESTERSHIRE**

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Report 2679/1
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SUMMARY

An agricultural land quality survey has been undertaken of 28.1 ha of land to the east of the M1 Motorway at Junction 22, Markfield, Leicestershire in August 2025.

The land has sandy clay loams over reddish slowly permeable clay that are imperfectly to poorly-draining. The land is limited by wetness to Subgrade 3a and 3b agricultural quality.

1.0 Introduction

- 1.1 This report provides information on the soils and agricultural quality of 28.1 ha of land east of the M1 Motorway at Junction 22, Markfield, Leicestershire. The report is based on a survey of the land during August 2025.

SITE ENVIRONMENT

- 1.2 The survey area comprises fifteen fields bounded to the west by the M1 Motorway, to the south by the A50, to the east by Whitwick Road and further agricultural land and to the north by further agricultural field.
- 1.3 At the time of survey the agricultural land was all grassland.

PUBLISHED INFORMATION

- 1.4 British Geological Survey 1:50,000 scale information records the bedrock geology of the whole of the survey area as Gunthorpe Member mudstone formed. Superficial deposits of Oadby till are recorded for the majority of the survey with a small area in the south recorded as Head (clay, silt, sand and gravel).
- 1.5 The National Soil Map (published at 1:250,000 scale) records the whole of the survey area as Cleverley Association soils. Cleverley Association soils are described as slowly permeable seasonally waterlogged reddish coarse and fine loamy soils. Associated with shallow stony well drained soils on brows and steep slopes where bare rock is common¹.

¹Ragg, *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 2025 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 maps (Map 1) showing their locations are in an appendix to this report.
- 2.2 The land typically comprises sandy clay loam topsoil and permeable upper subsoil over dense reddish clay that is slowly permeable. In places, the upper subsoil is absent and the topsoil directly overlies the reddish clay. The subsoils are gleyed, indicating the land suffers seasonal waterlogging. The soils are slightly to moderately stony with small to large stones. The land is judged imperfectly to poorly-draining dependent on the depth to the slowly permeable layer (Soil Wetness Class III/IV).
- 2.3 Soil pits were dug in representative profiles and the results are presented in an appendix to this report.

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 the survey area at Grid Reference SK 482 115 at an average elevation of 205 m AOD is given below.

- Average annual rainfall: 729 mm
- January-June accumulated temperature >0°C 1234 day°
- Field capacity period 167 days
(when the soils are fully replete with water)
- Summer moisture deficits for: wheat: 82 mm
potatoes: 66 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 is a slight climatic limitation to the land within the survey area restricting all of the land to Grade 2 quality.

SURVEY RESULTS

3.4 The agricultural quality of the land is determined by a wetness limitation. Land of Grade 3 has been identified. Other factors have been assessed but do not affect the grading of the land.

Subgrade 3a

3.5 Land in the north and south of the survey area is of Subgrade 3a quality (Map 2). This land has moderately high topsoil clay content and imperfect drainage (Soil Wetness

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*.

Class III). This combination means that land access with machinery is restricted in winter and early spring. Although late spring and autumn croppings are possible most years.

Subgrade 3b

- 3.6 This land grade occurs across most of the site. The land has moderately high topsoil clay content and poor-drainage (Soil Wetness Class IV). This combination means land will be too wet to access with machinery in winter and spring. Arable cropping of the land is limited to autumn in most years.

Non agricultural Land

- 3.7 The buildings, hard standing and a menage of Cliffe Hill Farm, a strip of woodland in the centre of the site and a wooded track and woodland corner in the south of the survey area have been mapped as non agricultural land (Map 2).

Grade areas

- 3.8 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>
Subgrade 3a	9.2	33
Subgrade 3b	17.7	63
Non agricultural land	1.2	4
Total	28.1	100

APPENDIX
DETAILS OF OBSERVATIONS
MAPS

Land at M1 Junction 22, Markfield, 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	0-30	SCL	7	<u>30</u> -120	r C fmn	xxx				2	IV	3b	W
2	0-25	SCL	7	25-40	SCL	xxx	<u>40</u> -120	r C fmn	xxx	1	IV	3b	W
3	0-27	SCL	10	27-48	SCL	xxx	<u>48</u> -120	r C fmn	xxx	1	III	3a	W
4	0-26	SCL	10	26-44	SCL	xxx	<u>44</u> -120	r C fmn	xxx	0	IV	3b	W
5	0-24	SCL	15	24-55	SCL mst	xxx	55+	Stopped on stones		2	III	3a	W
6	0-26	SCL	10	26-44	SCL	xxx	<u>44</u> -75 75+	r C fmn Stopped on stones	xxx	2	IV	3b	W
7	0-30	SCL	10	30-48	SCL	o	48-52 <u>52</u> -75 75+	SCL r C fmn Stopped on stones	xxx xxx	1	III	3a	W
8	0-31	SCL	10	31-49	SCL mst	xxx	<u>49</u> -120	r C fmn	xxx	0	III	3a	W
9	0-27	SCL	10	27-40	SCL	xxx	<u>40</u> -75 75+	r C fmn Stopped on stones	xxx	1	IV	3b	W
10	0-28	SCL	7	28-43	SCL	xxx	<u>43</u> -85 85+	r C fmn Stopped on stones	xxx	0	IV	3b	W
11	0-25	SCL	7	<u>25</u> -50	r C fmn	xxx	<u>50</u> -80 80+	r C fmn Stopped on stones	xxx	3	IV	3b	W
12	0-34	SCL	10	<u>34</u> -80	r C fmn	xxx	80+	Stopped on stones		0	IV	3b	W
13	0-30	SCL	10	30-37	SCL	xxx	<u>37</u> -75 75+	r C fmn Stopped on stones	xxx	0	IV	3b	W
14	0-28	SCL	7	28-42	SCL	xxx	<u>42</u> -120	r C fmn	xxx	1	IV	3b	W
15	0-19	SCL	15	<u>19</u> -47	r C fmn mst	xxx	<u>47</u> -80 80+	r C fmn Stopped on stones	xxx	4	IV	3b	W
16	0-25	SCL	10	<u>25</u> -50	r C fmn	xxx	<u>50</u> -120	r C fmn	xxx	2	IV	3b	W
17	0-17	SCL	20 16% > 2 cm	17-50	SCL vst	xxx	50+	Stopped on stones		1	III	3b	St
18	0-30	SCL	10	30-45	SCL mst	xxx	<u>45</u> -90 90+	r C fmn Stopped on stones	xxx	0	III/IV	3a/3b	W
19	0-20	SCL	10	<u>20</u> -60	r C fmn	xxx	60+	Stopped on stones		2	IV	3b	W
20	0-30	SCL	7	30-65	SCL mst	xxx	<u>65</u> -85 85+	r C fmn Stopped on stones	xxx	2	III	3a	W
21	0-25	SCL	10	25-49	SCL	xxx	<u>49</u> -80 80+	r C fmn Stopped on stones	xxx	1	III	3a	W
22	0-29	SCL	7	29-63	SCL	xxx	<u>63</u> -85 85+	r C fmn Stopped on stones	xxx	2	III	3a	W
23	Non agricultural												
24	0-25	SCL	8	25-38	SCL mst	xxx	<u>38</u> -120	r C fmn	xxx	1	IV	3b	W
25	0-27	SCL	15	27-55	SCL mst	xxx	<u>55</u> -75 75+	r C fmn Stopped on stones	xxx	0	III	3a	W
26	0-30	SCL	7	30-36	SCL	xxx	<u>36</u> -120	r C fmn	xxx	0	IV	3b	W

[illegible]

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 mottles or f-m concentrations (gleyed horizon)
xxxx	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

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)

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

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)

⁶stoniness classes as 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

Land at M1 Junction 22, Markfield, Leicestershire

Soil Pit Data

Pit 1 (AB8): Slope – Level

Land use – Grass

Depth (cm)	Texture	Colour	Mottles	Stone Content	Structure	Pores	Consistence	Structural Condition	Roots	Calcium Carbonate	Ferri-manganese	Horizon Boundary
0 – 31	Sandy clay loam	10YR4/3 (Brown)	None	10% small to large sub-angular mudstone and few rounded quartzite pebbles	Moderately developed fine sub- angular blocky	-	-	-	Abundant very fine to fine	Non-calcareous	-	Abrupt, smooth
31 – 49	Sandy clay loam	10YR6/3 (Pale brown)	Many prominent ochreous mottles (10YR5/6)	25% small to large sub-angular mudstone and few rounded quartzite pebbles	Weakly developed medium sub-angular blocky	>0.5% biopores	Firm	Moderate	Many very fine to fine	Non-calcareous	-	Abrupt, smooth
49 – 100+	Clay	5YR4/6 (Yellowish red)	Many prominent grey mottles (5YR5/1)	7% small to large sub-angular mudstone	Moderately developed coarse to very coarse prismatic	<0.5% biopores	Firm	Poor	Few very fine to fine	Non-calcareous	Few	

Slowly Permeable Layer 49 cm

Wetness Class: III

Wetness Grade: 3a

ALC Grade: 3a

Main limiting factor: Wetness and workability

Pit 2 (AB16): Slope – Top of hill, 2° south west and north east

Land use – Grass

Depth (cm)	Texture	Colour	Mottles	Stone Content	Structure	Pores	Consistence	Structural Condition	Roots	Calcium Carbonate	Ferri-manganese	Horizon Boundary
0 – 25	Sandy clay loam	7.5YR4/3 (Brown)	None	10% small to large sub-angular mudstone and few rounded quartzite pebbles	Moderately developed fine to medium sub-angular blocky	-	-	-	Abundant very fine to fine	Non-calcareous	-	Abrupt, smooth
25 – 50	Clay	2.5YR3/6 (Dark red)	Many distinct ochreous mottles (10YR4/6)	5% small to large sub-angular mudstone	Weakly developed very coarse angular blocky	<0.5% biopores	Firm	Poor	Common very fine to fine	Non-calcareous	Few	Clear, smooth
50 – 80+	Clay	5YR4/6 (Yellowish red)	Many prominent grey mottles (5YR5/1)	5% small to large sub-angular mudstone	Weakly developed very coarse prismatic	<0.5% biopores	Firm	Poor	Few very fine to fine	Non-calcareous	Few	

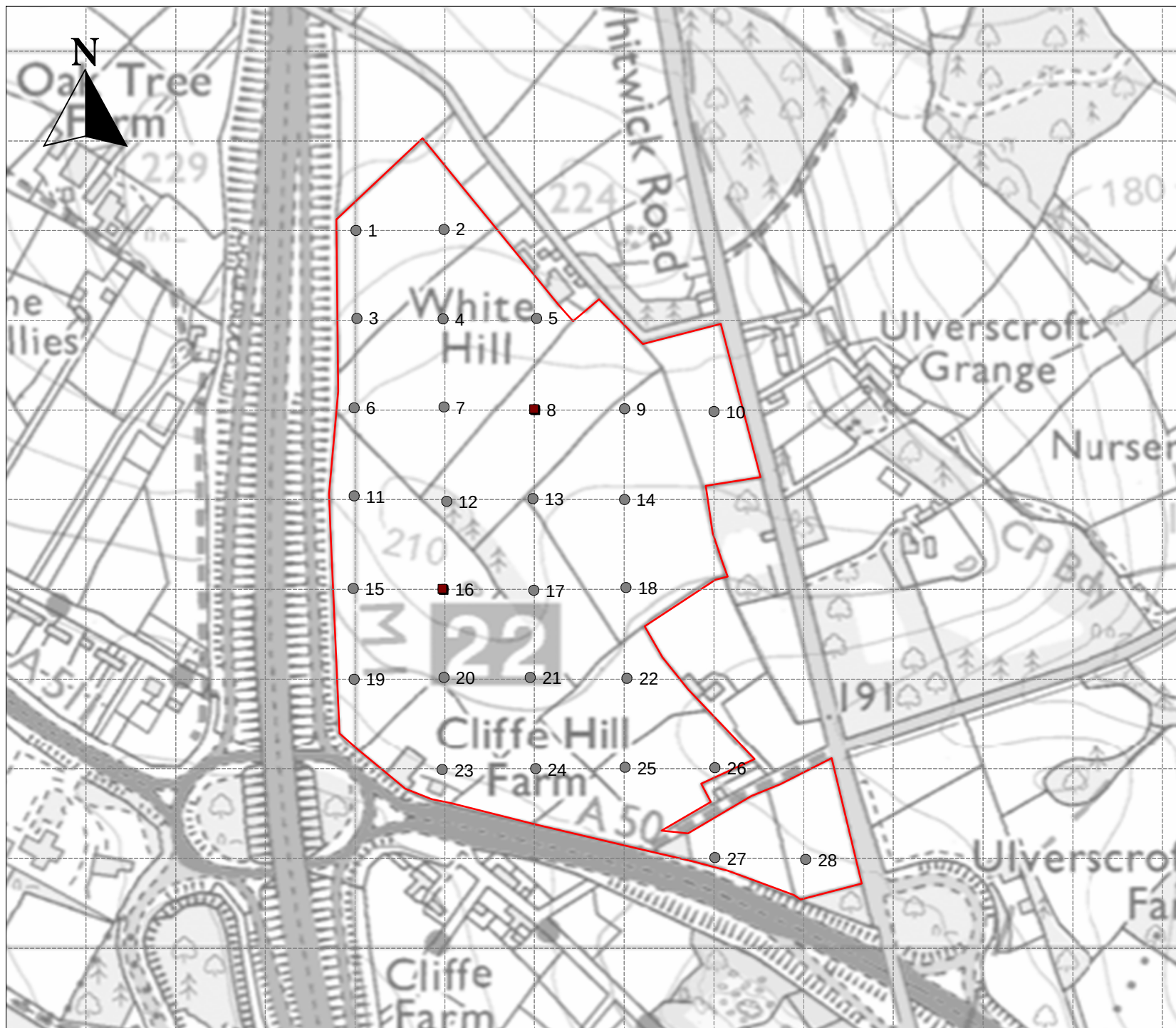
Slowly Permeable Layer 25 cm

Wetness Class: IV

Wetness Grade: 3b

ALC Grade: 3b

Main limiting factor: Wetness and workability



KEY

● Auger observation

■ Soil/land grade
description pit

□ Survey area

Site:

M1 Junction 22, Markfield

Map title:

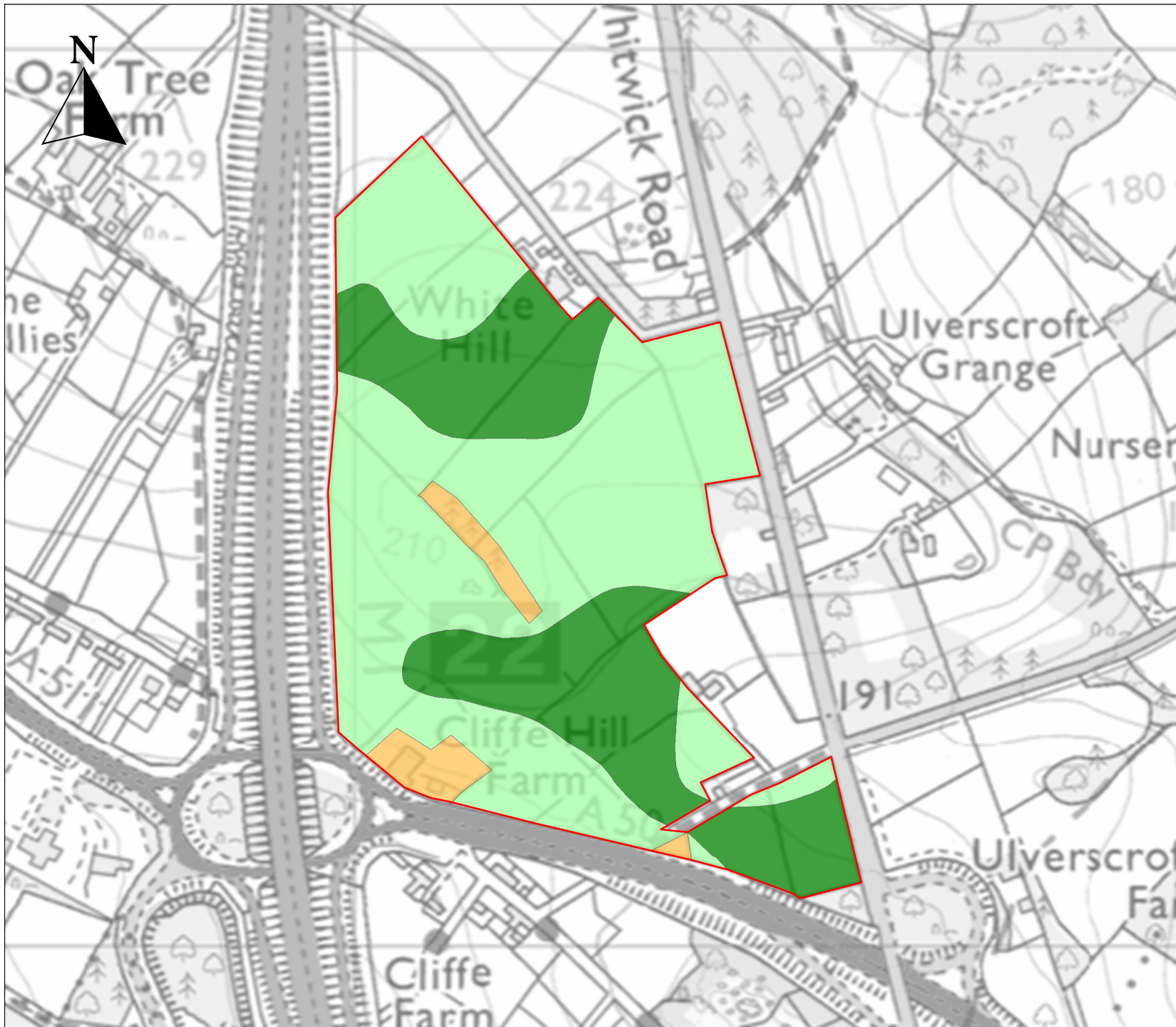
**Map 1
Survey observations**

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Scale: 1:6,000

Date: 11/08/2025



KEY

-  Subgrade 3a
-  Subgrade 3b
-  Non agricultural
-  Survey area

Site:

M1 Junction 22, Markfield

Map title:

**Map 2
Agricultural Land Classification**

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