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Phase 2 (EMG2)

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ENVIRONMENTAL STATEMENT

Volume 2 Technical Appendices

Appendix 15A

Soils and Agricultural Land Quality Report

July 2025

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The East Midlands Gateway Phase 2 and Highway Order 202X and The East Midlands Gateway Rail Freight and Highway (Amendment) Order 202X

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SOIL RESOURCE MANAGEMENT STRATEGY AND AGRICULTURAL QUALITY OF LAND AT DISEWORTH

Report 2098/1

14th February 2025

Land Research ASSOCIATES
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SOIL RESOURCE MANAGEMENT STRATEGY

AND

AGRICULTURAL QUALITY OF LAND AT DISEWORTH

L Thomas, MSc, MISoilSci
M W Palmer, PhD, MISoilSci, CSci

Report 2098/1
Land Research Associates Ltd
Tapton Park Innovation Centre
Brimington Road
Chesterfield
S41 0TZ
www.lra.co.uk

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SUMMARY

A soil resources and agricultural land quality survey has been undertaken of 100.3 ha of land at Diseworth, Leicestershire in December 2022.

The land is underlain by a mixture of coarse loams and fine loams over slowly permeable clay, giving land of grade 1, 2, subgrade 3a and subgrade 3b agricultural quality. The land is predominantly limited by wetness/workability constraints.

Full recommendations for soil restoration and management according to the proposed landscape plan are included in the report.

1.0 Introduction

1.1 This report provides information on the agricultural quality of 100.3 ha of land at Diseworth, Leicestershire. The land is proposed as a logistics park. The report is based on a survey of the land in December 2022.

SITE ENVIRONMENT

1.2 The survey area comprises twenty fields, mainly in arable use with grassland in the west. The site is bordered to the north by the A453, to the east by a service station and the A42, to the west by the settlement of Diseworth, and to the south by adjoining agricultural land site is intersected by Hyam's Lane.

1.3 The land is mainly gently undulating and sloping from 85 m in the north to 65 m in the south with an elevation of approximately 75 m AOD.

PUBLISHED INFORMATION

1.4 British Geology Survey 1:50,000 scale information records the the land as mainly Gunthorpe Member mudstone with bands of siltstone and sandstone. Superficial deposits of sand and gravel are recorded to overlie the basal geology in the north and east of the site, with a band of Oadby Member glacial till in the east. Head deposits are recorded in the far west of the site.

1.5 The National Soil Map (published at 1:250,000 scale) [1] records the land as mainly within the Worcester Association: slowly permeable reddish clayey soils over mudstone, sometimes shallow over mudstone on steeper slopes. In the north Flint Association is mapped: typically reddish fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.

[1] Ragg, 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 soils and agricultural quality survey was carried out in December 2022 in accordance with MAFF (1988) Agricultural Land Classification guidelines[2]. It was based on observations at intersects of a 100 m grid, giving a density of approximately one observation per hectare. During the survey, soils were examined by hand augerings and pits to a maximum depth of 1.2 m. A log of the sampling points, full description of soil profiles and a map (Map 1) showing their location is in an appendix to this report.

2.2 Representative topsoil samples (0-150 mm) were collected on a field-by field basis for laboratory analysis (see Map 2). Representative samples of upper subsoils (350-500 mm) with reuse potential were also collected from two areas (see Map 3).

COARSE LOAMY SOILS

2.3 These soils occur in a small area in the east of the site. They comprise sandy loam topsoil and upper subsoil that often overlies dense slowly permeable sandy clay or clay at depth. The subsoils are *gleyed*[3] indicating the land experiences seasonal waterlogging. The soils are judged moderately-freely to imperfectly draining (Soil Wetness Class II/III).

2.4 An example profile is described from observation point 39 in an appendix to this report.

LOAMY OVER SLOWLY PERMEABLE SOILS

2.5 These soils occur in the west of the site. They comprise mainly medium loamy topsoils over permeable upper subsoils. These overlie dense slowly permeable reddish clay. The subsoils are *gleyed*, indicating they suffer seasonal waterlogging. These soils are moderately freely to imperfectly draining (Soil Wetness Class II/III).

2.6 An example profile is described from observation point 44 in an appendix to this report.

HEAVY SLOWLY PERMEABLE SOILS

2.7 These soils dominate across the site. They typically comprise a heavy clay loam or clay topsoil overlying dense slowly permeable reddish clay. In places mudstone is encountered within 1 m. The subsoils are *gleyed,* evidence the soils suffer seasonal waterlogging. These soils are mainly judged imperfectly to poorly-draining (Soil Wetness Class III to IV).

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

[3] reddish colours with greyish, brownish or ochreous mottles or ferri-manganiferous concentrations and dominantly pale coloured ped faces

2.8 Example profiles are described from observations 20 and 63.

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 Classification[4]. The relevant site data for an average elevation of 75 m at central grid reference SK 459,250 is given below.

• Average annual rainfall:	650 mm
• January-June accumulated temperature >0°C	1377 day°
• Field capacity period (when the soils are fully replete with water)	141 days late Nov-early Apr
• Summer moisture deficits for:	wheat: 103 mm potatoes: 94 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 MAFF[5]. There are no climatic limitations at this locality.

SURVEY RESULTS

3.4 The agricultural quality of the land is primarily determined by wetness/ workability, with minor areas limited by topsoil stone content. Other factors have been assessed but do not affect the land grade. Land of grades 1, 2 and 3 have been identified.

Grade 1

3.5 This land grade comprises the deeper coarse loams with reddish clay at depth (greater than 65 cm) in the east of the site. This land has no significant limitations to agricultural use.

[4]Meteorological Office, (1989).*Climatological Data for Agricultural Land Classification*.
[5]MAFF, (1988).*Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

Grade 2

3.6 This land occurs in the east and west of the site where coarse loamy soils have slowly permeable clay at moderate depth (Soil Wetness Class III) or medium loamy soils are permeable to depth (Soil Wetness Class II). They have slight wetness restrictions which may limit the flexibility of cultivations, particularly in winter.

3.7 Small areas are limited by topsoil stone content (5-10% hard stones >20 mm). The slightly elevated stone content may lead to increased machinery wear and distorted roots crops.

Subgrade 3a

3.8 This land occurs across the centre of the site and comprises medium loams with slowly permeable clay at moderate depth (Soil Wetness Class III). The combination of moderately high topsoil clay content and impeded drainage means that land access will be restricted in winter and early spring most years. However, late spring (and autumn) cropping is possible most years.

3.9 A minor area is limited by topsoil stone content (10-15% hard stones >20 mm). The moderately high stone content can lead to increase machinery wear, reduced quality root crops and restrict the use of precision drilling machinery.

Subgrade 3b

3.10 This subgrade makes up most of the site and comprises the heavy slowly permeable soils. The combination of high topsoil clay content and impeded drainage (Soil Wetness Class III and IV) means that land will be too wet to cultivate in winter and spring. Arable cropping of the land is restricted to autumn-sown combinable crops most years.

Non agricultural

3.11 This comprises a pond, tracks and hedges.

Grade areas

3.12 The land grade is shown on Map 2 and the area occupied is shown below.

Table 1: Areas occupied by the different land grades

Grade/subgrade	*Area (ha)*	*% of the land*
Grade 1	2.0	2
Grade 2	6.4	6
Subgrade 3a	26.8	27
Subgrade 3b	64.2	64
Non agricultural	0.9	1
Total	100.3	100

4.0 Soil laboratory analysis

NUTRIENTS AND ORGANIC MATTER

(See Tables 4.1 and 4.2 for summary)

4.1 The topsoils within the site are mainly of neutral pH with moderate organic matter content and high nutrient concentrations, typical of soils under intensive agricultural management. Fields A, C, D, F and J were found to have low nutrient concentrations (P Index 1 and 0).

4.2 The reusable subsoil resources in the east and west of the site have neutral pH, low organic matter and low nutrient concentrations.

4.3 Full laboratory certificates are appended to this report.

Table 4.1: Topsoil nutrient status

Field ID*	pH	Loss on ignition %	P	K	Mg
			MAFF indices		
A	7.9	5.7	1	3	4
B	6.4	8.6	2	2-	3
C	7.1	4.4	1	2-	3
D	6.6	3.4	1	1	3
E	6.8	4.6	2	2-	4
F	7.6	4.0	0	1	6
G	7.2	5.3	2	4	5
H	6.8	4.9	2	2-	3
I	6.6	4.0	2	1	4
J	7.7	3.9	1	2-	6
K	6.8	3.5	3	2+	3
L	7.1	4.3	2	2+	3
M	7.3	4.3	3	2+	3
N	7.7	4.0	2	2+	5
O	8.0	4.0	2	2+	5
P	8.2	4.4	3	3	6
Q	7.6	8.9	2	2+	7
R	8.1	5.6	2	2+	6
S	8.3	4.5	2	2+	6
T	6.9	4.9	2	2-	4

*See Map 2

Table 4.2: Subsoil nutrient status

Pit ID*	pH	Loss on ignition %	P	K	Mg
			MAFF indices		
A	6.8	1.9	0	1	5
B	6.7	2.0	0	2-	4

*See Map 3

5.0 Available soil resources

5.1. The distribution of topsoil and subsoil resources is shown on Map 4 in the appendix to this report. Two topsoil and three subsoil resources have been identified. The available resources are described below.

TOPSOIL

TS1 This resource comprises the fine loamy topsoils across most of the site. Their relatively high clay content makes them more difficult to handle with machinery. They represent a moderate quality resource for reuse in landscaping. They should be stripped to **300 mm**.

Estimated yield 292,400 m^3 (if all stripped)

TS2 This resource comprises the coarse loamy topsoils in the east of the site. They are relatively easy to handle due to their low clay content, with low stone content. They represent a high quality resource for reuse in landscaping. They should be stripped to **300 mm**.

Estimated yield 6,000 m^3 (if all stripped)

SUBSOIL

SS1 These subsoils occur below TS1 in the west. They comprise medium and heavy clay loams with good structure. They have a moderately high clay content and should be stripped carefully to avoid damage an average thickness of **200 mm** or to an obvious colour change, to avoid inclusion of the poorly structured clay below. They are a moderate quality resource for reuse in landscaping.

SS2 These subsoils occur below the coarse loamy topsoils in the east of the site. They comprise permeable coarse loamy and medium loamy subsoils. They should be stripped to an average thickness of **300 mm** to avoid inclusion of the weakly-structured lower subsoil. They are a high quality resource for reuse in landscaping.

Clay These subsoils comprise the subsurface layer of the slowly permeable soils across most of the site. They are difficult to handle with machinery and naturally poorly structured; they are a low quality resource for reuse in landscaping and best reserved for use in embankments or for lining waterbodies.

6.0 Soil suitability assessment

6.1. The suitability of the identified on-site resources has been evaluated against the proposed landscaping uses. General suitability assessment is summarised in Table 6.1 and described in more detail below.

Table 6.1: soil suitability assessment

After use	Soil resource				
	TS1	TS2	SS1	SS2	Clay
Tree pit planting	✓[1]	✓	✓[1]	✓	✗
Shrubs, hedges and thicket	✓	✓	-	-	-
Ornamental planting	✓	✓	-	-	-
Amenity grassland	✓	✓	-	-	-
Wildflower grassland	✓[2]	✓[2]	✓[3]	-	-
Wetland planting	✗	✗	✓	✓	✓
Embankment (core) formation	✗	✗	✓	✓	✓

✓ well suited ✓ moderately suitable ✗ not suitable

[1] High clay content makes soil handling difficult. Soils used for this purposes must be maintained in good structural condition and carefully replaced without compaction.

[2] Suitable where stripped from low nutrient fields, although likely to contain a significant arable weed seed bank

[3] Used as topsoil

TREE PIT PLANTING

6.2. The topsoils are suitable for use in tree pit planting (emplaced as a 200-300 mm surface layer). Tree pit planting subsoils need to be well structured (friable) and permeable to depth. SS2 would be best suited to this purpose if maintained in good structural condition.

SHRUB, THICKET AND HEDGEROW PLANTING

6.3. A layer of topsoil 300-450 mm in depth may be emplaced over in-situ subsoil which has been thoroughly loosened/ripped to remove compaction before topsoil is emplaced.

AMENITY GRASSLAND

6.4. A layer of topsoil should be emplaced 200-450 mm in thickness (using the greater depth to use surplus material if appropriate) over in-situ subsoil which has been thoroughly loosened/ripped to remove compaction before topsoil is emplaced.

WILDFLOWER GRASSLAND

6.5. Wildflower grassland would be best formed by laying at least 150 mm of SS1 or SS2 over in-situ subsoil which has been thoroughly loosened/ripped.

6.6. Alternatively, soils stripped from the low nutrient areas of TS1 and TS2 (provided nutrient indices have not been increased between the date of sampling and development) can be used, although these soils may contain a relatively high seed bank of arable weeds.

WETLAND

6.7. Topsoil should not be used in the creation of open water wetland, due to the adverse effects of dissolved soil-derived nutrients in aquatic habitats. Topsoil should be stripped from at least the 5 m area surrounding open water to prevent in-flows.

6.8. SS1 and the clay resources are well suited to form an impermeable layer below wetland; compacting/puddling with a digger bucket is likely to be beneficial to reduce permeability. Emergent vegetation such as reeds can be planted directly into subsoil.

EMBANKMENT FORMATION

6.9. Topsoils should be limited to use in the outer 500 mm layer of screening bunds. All of the subsoils are suitable for core formation.

7.0 Soil Handling

STRIPPING & STOCKPILING

7.1. The topsoil resource comprises a mixture of sandy loams and clay loams and clays, the latter of which are susceptible to damage if handled by machinery when wet. Soils should be stripped using the excavator and dumper method as described by Sheet 1 in the Defra Construction Code[6].

7.2. Soil handling will be undertaken when soils are sufficiently dry to be friable and not plastic (this can be judged by whether a 3 mm thick thread can be rolled under current site conditions). All soil handling would be best conducted during dry weather between May and October, and not during or just after heavy rain, when the soils are likely to be in their best handling condition.

7.3. Construction traffic will be restricted to designated roadways to avoid soil compaction.

7.4. If direct placement of stripped soils onto areas being restored is not possible, the resources should be stripped and stored separately in low bunds (no more than 3 m high for topsoil and 5 m for subsoil). The bunds will be constructed either by excavator or bulldozer (Sheets 2 and 14 in the MAFF Good Practice Guide) avoiding over-compaction. Where in use for greater than six months, they will be sown with grass to help maintain biological activity and prevent water erosion. The Construction Code of Practice for Sustainable Use of Soils on Construction Sites (Defra 2009) guidance on good practice in soil handling will be fully adhered to.

SOIL EMPLACEMENT

7.5. The soils will be removed from storage (Sheet 3 in the MAFF Good Practice Guide) and replaced by excavator using the loose tipping technique (Sheet 4 in MAFF Good Practice Guide), which avoids traffic on the restored surfaces.

7.6. The subsoils are susceptible to traffic compaction, which can limit rooting depth and affect drainage. Upper subsoils on stripped areas will be loosened before topsoil is replaced. De-compaction would be best performed with a tined ripper pulled by an earth-mover or excavator, undertaken when soils are sufficiently

[6] Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (publishing.service.gov.uk)

dry to be friable and not plastic (this can be judged by whether a 3 mm thick thread can be rolled under current site conditions).

APPENDIX

DETAILS OF OBSERVATIONS

MAPS

LABORATORY ANALYSIS

Land at Diseworth: 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 >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-25	HCL	<5	23-35	HCL(r)	xxx	35-60 60+	C(r) Waterlogged	xxx	1	IV	3b	W
2	Overgrown track (woody scub)												
3	0-28	vslstHCL	<5	28-47	HCL(r)	o	47+	Waterlogged above pan		2	III?	3b	W
4	0-23	slstHCL	<5	23-35	HCL(r)	xxx	35-90+	C(r)	xxx	1	IV	3b	W
5	0-28	HCL	<5	28-58	C(r)	o	58+	Waterlogged		2	IV?	3b	W
6	0-27	C	5-10	27-68	C(r)	x	68+	MST		6	IV	3b	W
7	0-23	HCL/MCL	<5	23-45	HCL	xxx	45-90+	HCL(r)	x	3	II?	3a/2	W
8	0-26	HCL	<5	26-50	HCL	xxx	50+	Waterlogged		1	III/IV	3b	W
9	0-32	vslstMCL/SCL	<5	32-38	SCL(r)	xxx	38-70 70+	C(r) Waterlogged	xxx	2	III/IV	3a/3b	W
10	0-32	vslstHCL	<5	32-41	HCL(r)	xxx	41-90+	C(r)	xxx	2	III	3b	W
11	0-31	vslstMCL	<5	31-42	HCL(r)	xxx	42-60 60+	C(r) Waterlogged	xxx	1	III	3a	W
12	0-28	slstMCL/SCL	<5	28-50	HCL(r)	xx(x)	50+	Waterlogged		1	III/IV	3a/3b	W
13	0-34	vslstMCL	<5	34-70	C(r)	xxx	70+	Waterlogged		3	IV	3b	W
14	0-35	C	<5	35-54	C(r)	xxx	54-80+	MST		2	IV	3b	W
15	0-21	slst/mstSCL	5-10	21-67	slstSCL	o	67-90+	slstSCL	xx	5	I	2	St
16	0-26	slstMCL	10-15	26-43	vstHCL(r)	-	43+	Stopped on stones		4	-	3a	St
17	0-28	vslstMCL/SCL	<5	28-55	SCL	xx	55-70 70-90+	SC(r) MCL(r)	xx x	5	II	2	W
18	0-32	slstSCL	5-10	32-63	SCL	xxx	63-72 72+	C Stopped on stones	xx x	3	III/II	3a/2	W
19	0-26	slstMCL	<5	26-90+	C	xxx				2	IV	3b	W
20	0-24	slstMCL	<5	24-49	C	xxx	49-90+	Cchky	xxx	2	IV	3b	W
21	0-26	slstMCL	5-10	26-64	C	xxx	64+	Stopped on stones		2	IV	3b	W
22	0-27	slstSCL	<5	27-45	slstSCL	xxx	45-64 64-90+	slstC SCL(r)	xxx xxx	2	III	3a	W
23	Not recorded											2/3a	W
24	0-25	slstMCL	5	25-45	C	xxx	45-90+	Cchky	xxx	4	IV	3b	W
25	0-28	vslstSCL	<5	28-34	SCL	xxx	34-60	C Waterlogged	xxx	4	IV	3b	W
26	0-31	slstMCL	5-10	31-60	HCL	xxx	60-90+	C	xxx	4	III	3a	W
27	0-27	slstHCL	<5	27-68	C	xxx	68-90+	C(r)	xxx	4	IV	3b	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
28	0-27	slstSCL	5-10	27-40	SCL	xxx	42-62 62+	C(r) Stopped on stones	xxx	3	III	3a	W
29	0-29	slstMCL	5-10	29-90+	Cchky	xxx				4	IV	3b	W
30	0-28	SCL	<5	28-52	C	xxx	52-100+	SCLr	xxx	2	IV	3b	W
31	0-30	SCL	<5	30-85_	Cr with sand incl	xxx				3	IV	3b	W
32	0-23	vslstSCL	<5	23-90+	vslstSCL	xxx				1	II	2	W
33	0-27	vslstMCL/SCL	<5	27-90+	MCL/SCL	xxx				2	II	2	W
34	0-35	MCL/HCL	<5	35-90+	HCL	xxx				2	III	3a/3b	W
35	0-30	SCL	<5	30-90+	SCL	xxx				1	II	2	W
36	0-28	vslstSCL	<5	28-57	SCL	xx(x)	57-80+	HCL	xxx	1	III/II	3a/2	W
37	0-43	MCL	<5	43-67	HCL	xxx	67-90+	C/HCL	xxx	1	III	3a	W
38	0-26	slstHCL	<5	26-80+	C	xxx	80-90+	Cchky	xxx	1	IV	3b	W
39	0-32	MSL	<5	32-68	MSL/SCL	xxx	68-120+	SC	xxx	3	II	1	-
40	0-28	MSL	<5	28-54	MSL	xxx	54+	Stopped on stone		2	I/II	1	-
41	0-26	H/SCL	<5	26-100+	C	xxx				3	IV	3b	W
42	0-32	MCL	<5	32-36	MCL	xxx	36-65 65+	C(r) Stopped on stones	xxx	2	IV	3b	W
43	0-30	HCL	<5	30-37	HCL(r)	xxx	37-56 56-90+	C(fmn) MST	xxx	3	IV	3b	W
44	0-32	vslstMCL	<5	27-65	SCL	xxx	65-120+	SCL	xxx	3	II	3a/2	W
45	0-33	HCL	<5	33-47	HCL	xxx	47-90+	C	xxx	0	III	3b	W
46	0-30	HCL	<5	30-41	HCL	xxx	41-100+	C	xxx	0	III	3b	W
47	0-28	MCL	<5	28-45	HCL	xxx	45-75 75-90+	C Cchky	xxx xxx	1	III	3a	W
48	0-30	HCL	<5	30-46	HCL	xxx	46-72 72-90+	C C(r)	xxx xxx	2	III	3b	W
49	0-30	SCL	<5	30-50	HCL	xxx	50-100+	Cr	xxx	0	III	3a	W
50	0-30	MSL	<5	30-65	MSL	xxx	65-100+	C	xxx	2	III	2	W
51	0-28	SCL	<5	28-100+	HCLr	xxx				2	II	2	W
52	0-26	MCL	<5	26-70	C(r)	xxx	70+	Waterlogged		3	IV	3b	W
53	0-27	HCL	<5	27-80+	C(r)fmn	xx				1	IV	3b	W
54	0-36	C/HCL	<5	36-60	Cr	xxx	60-90+	HCLr	xxx	0	IV	3b	W
55	0-28	HCL	<5	28-90+	Cr	xxx				0	IV	3b	W
56	0-32	HCL	<5	32-63	SCLr	xxx	63-100	Cr	xxx	0	III	3b	W
57	0-31	HCL	<5	31-100+	C with sand incl.	xxx				1	IV	3b	W
58	0-30	HCL	<5	30-100+	Cr	xxx				1	IV	3b	W
59	0-28	HCL	<5	28-60+	Cr	xxx				0	IV	3b	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
60	Bank/ditch												
61	0-20	HCL	<5	20-90+	Cr	xxx				2	IV	3b	W
62	0-28	HCL	<5	28-100+	HCLr	xxx				2	II	3a	W
63	0-30	HCL	<5	30-100+	C wet	xxx				1	IV	3b	W
64	0-33	HCL/C	<5	33-90+	Cr	xxx				0	IV	3b	W
65	Hedge												
66	0-31	HCL	<5	31-46	Cr	xxx	46-80+	ZC grey	xxx	0	IV	3b	W
67	0-28	HCL	<5	28-90+	Cr wet	xxx				0	IV	3b	W
68	0-30	HCL	<5	30-80+	Cr wet	xxx				0	IV	3b	W
69	0-30	C	<5	30-85+	Cr	xxx				1	IV	3b	W
70	0-30	C	<5	30-90+	Cr	xxx				1	IV	3b	W
71	0-28	C	<5	28-60+	Cr wet	xxx				3	IV	3b	W
72	0-32	HCL/C	<5	32-66	HCL	xxx	66+	Stopped		2	II	3a/3b	W
73	0-30	HCL	<5	Cr	xxx	56-100+	HZCLr	xxx		0	II	3a	W
74	0-29	C/HCL	<5	29-58	Cr	xxx	58-100+	Cr	xxx	1	IV	3b	W
75	0-26	HCL	<5	26-50	Cr	xxx	50+	Stopped		1	IV	3b	W
76	0-28	HCL	<5	28-100+	Cr	xxx				1	II/III	3a/b	W
77	0-29	HCL	<5	29-90+	Cr	xxx				0	IV	3b	W
78	0-26	HCL	<5	26-60	Cr	xxx	60-90+	Cr	xxx	1	IV	3b	W
79	0-30	HCL/C	<5	30-90+	Cr	xxx				0	IV	3b	W
80	Hedge												
81	0-29	HCL	<5	29-100+	Cr	xxx				3	IV	3b	W
82	0-29	C/HCL	<5	29-100+	Cr	xxx				2	IV	3b	W
83	0-30	HCL	<5	30-85+	HCLr	xxx				2	II	3a	W
84	0-33	C/HCL	<5	33-56+	Cr	xxx	56+	Waterlogged		2	IV	3b	W
85	0-33	C	<5	33-71	Cr	xxx	71-100+	HCLr	xxx	1	IV	3b	W
86	0-20	C/HCL	<5	20-50+	Cr wet	xxx				2	IV	3b	W
87	0-28	C/HCL	<5	28-50	Cr	xxx	50+	Waterlogged		2	IV	3b	W
88	0-32	C/HCL	<5	32-100+	Cr	xxx				1	IV	3b	W
89	0-34	C	<5	34-55	Cr	xxx	55-80+	HCL	xxx	0	IV	3b	W
90	0-26	HCL	<5	26-100+	HCL	r	xxx			1	II	3a	W
91	0-33	HCL	<5	33-90+	Cr wet	xxx				1	IV	3b	W
92	0-32	HCL	<5	32-45	Cr	xxx	32-87+	HCLr	xxx	1	II	3a	W
93	0-40	HCL	<5	40-58	HCL	xxx	58-70+	Cr	xxx	2	III	3b	W
94	0-30	HCL/C	<5	30-45	Cr	xxx	45+	Waterlogged		0	IV	3b	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
95	0-30	C	<5	30-100+	Cr	xxx				2	IV	3b	W
96	0-20	HCL	<5	20-66	Cr	xxx	66-100+	HCL	xxx	1	IV	3b	W

Soil log key

Gley indicators[1]

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 matrix, often with some ochreous mottles (gleyed horizon)

Texture[2]

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

Limitations:

W - wetness/workability
D - droughtiness
De - depth
F - flooding
St – stoniness
Sl – slope
T – topography/microrelief
C - Climate
S-soil topsoil texture limitation

Suffixes & prefixes:

o - organic

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

Slowly permeable layers[4]

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

Wetness Class[5]

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

(vsl, sl, m, v, x)
(very slightly, slightly,
moderately, very, extremely) calcareous[7]

Other abbreviations

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

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

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

[3] Occasionally recorded in the texture box

[4]Permeability 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)

[5]Soil Wetness Classes are defined in Hodgson (1997)

[6]stoniness classes as defined in Hodgson (1997)

[7]calcareous classes as defined in Hodgson (1997)

Soil pit descriptions

Pit 39

0-37 cm	Dark reddish brown (5YR 3/2) medium sandy loam; slightly stony with 5% medium rounded hard pebbles; weakly developed medium to coarse subangular blocky structure; friable; 2-5% pores; few fine fibrous roots; smooth clear boundary to:
37-68 cm	Reddish brown (5YR 5/4) medium sandy loam with 5% fine faint dark reddish brown (2.5YR 5/2) ferrimanganiferous concentrations and pinkish grey (5YR 6/2) and reddish yellow (5YR 6/6) mottles; moderately developed medium angular blocky structure; friable; very slightly stony; porous; low packing density; smooth diffuse boundary to:
68-120 cm	Reddish grey (5YR 5/2) sandy clay with large yellowish red (5YR 4/5) mottles and pinkish grey (5YR 6/2) ped faces; weakly developed coarse angular blocky structure; firm; very slightly stony; no pores.

Pit 63

0-32 cm	Reddish brown (5YR 4/3) heavy clay loam; slightly stony with 5% small subangular and rounded hard stones; weakly developed very coarse angular blocky structure; very firm; plastic; smooth clear boundary to:
	Perched water above subsoil
32-55 cm	Reddish brown (2.5YR 4/4) clay with pinkish grey (5YR 6/2) ped faces and reddish black (2.5YR 2.5/1) ferrimanganiferous concentrations; weakly developed very coarse prismatic structure to massive (structureless); very firm; stoneless; smooth diffuse boundary to
55-120 cm	Red (2.5YR 4/8) heavy clay loam (mudstone?) with large grey (7.5YR 6/1) siltstone inclusions; weakly developed coarse platy structure; very firm.

Pit 44

0-32 cm	Dark reddish grey (5YR 4/2) sandy clay loam; 1-2% small and medium pebbles; moderately developed medium subangular blocky structure; friable; smooth clear boundary to:
32-65 cm	Reddish brown (5YR 5/3) sandy clay loam with reddish grey (5YR 5/2) ped faces and 2-3% faint fine very dark grey (5YR 3/1) ferri-manganiferous concentrations; very slightly stony; weakly developed coarse subangular blocky structure; friable; uneven diffuse boundary to:
65-120 cm+	Red (2.5YR 4/6) clay with 10% medium and coarse brown (10YR 5/3) mottles and ped faces and 2-3% fine very dark grey (5YR 3/1) ferri-manganiferous concentrations; 2-3% soft greenish siltstone fragments; weakly developed very coarse sub-angular blocky structure; firm; <0.5% macropores.

Pit 20

0-24 cm	Dark greyish brown (10YR 4/2) medium clay loam; 5% small and medium mixed hard pebbles (<5% >20 mm); weakly developed very coarse sub-angular blocky structure; friable to plastic (saturated); non-calcareous; smooth sharp boundary to:
24-49 cm	Greyish brown (10YR 5/2) clay with 40% diffuse medium and coarse strong brown (7.5YR 5/6) mottles; slightly stony; weakly developed very coarse angular blocky structure; very firm; <0.5% macropores; non-calcareous; smooth diffuse boundary to:

49-120 cm	Greyish brown and grey (10YR 5/2 & 5/1) clay with 20% strong brown (7.5YR 5/8) and reddish brown (5YR 5/4) mottles; slightly stony; weakly developed very coarse angular blocky structure to structureless (massive); very firm; no macropores; calcareous.

KEY

- Auger observation
- Soil/land grade description pit
- Survey area

Site:

Land at Diseworth

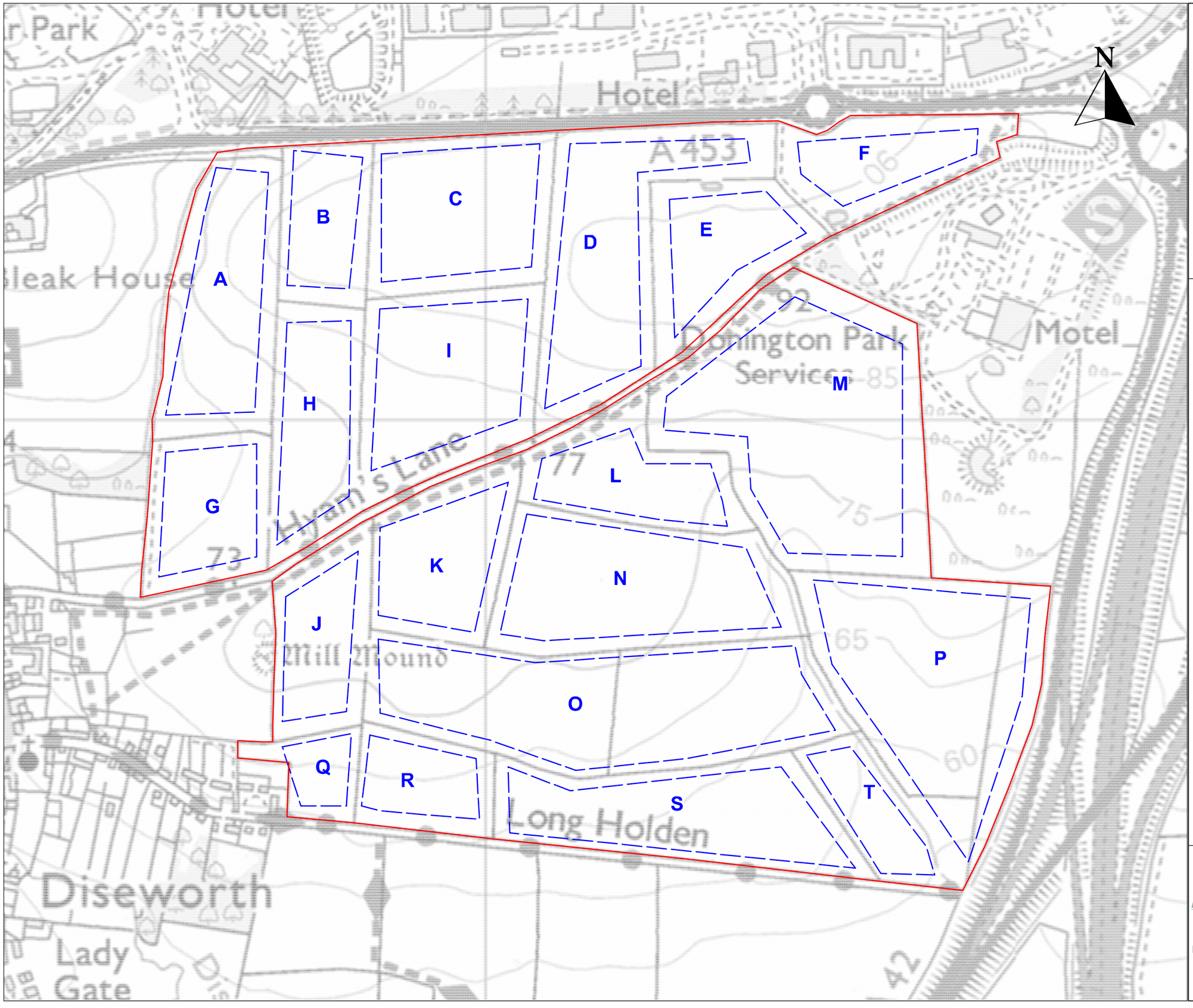
Map title:

Map 1
Survey observations

Land Research Associates
Lockington Hall
Lockington
Derby DE74 2RH
01509 670570

Scale: 1:5,000

Date: 24/01/2023



KEY

Sample area

Survey area

Site:

Land at Diseworth

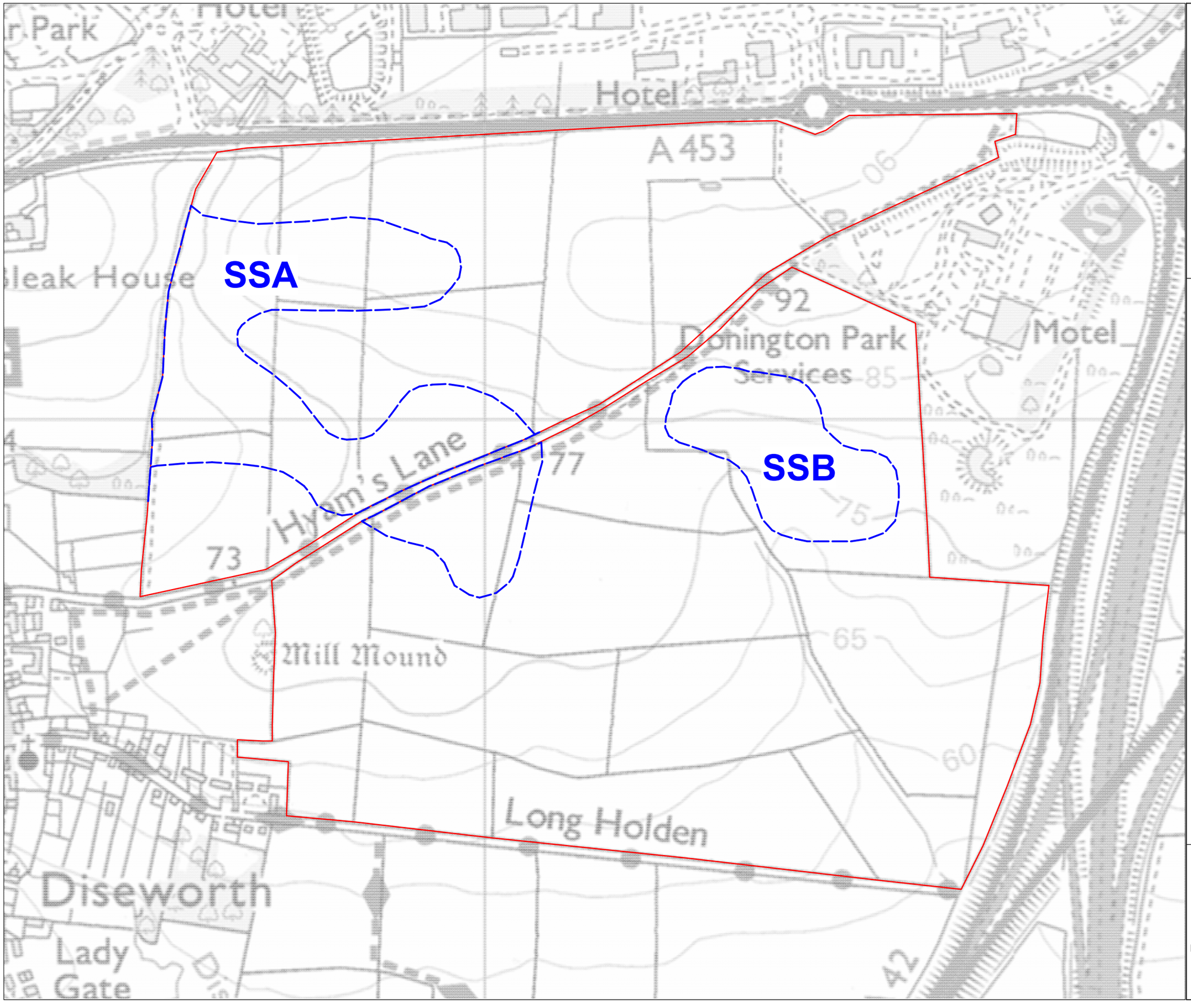
Map title:

Map 2
Topsoil sample areas

Land Research Associates
Lockington Hall
Lockington
Derby DE74 2RH
01509 670570

Scale: 1:5,000

Date: 24/01/2023



KEY

Subsoil sample area

Survey area

Site:

Land at Diseworth

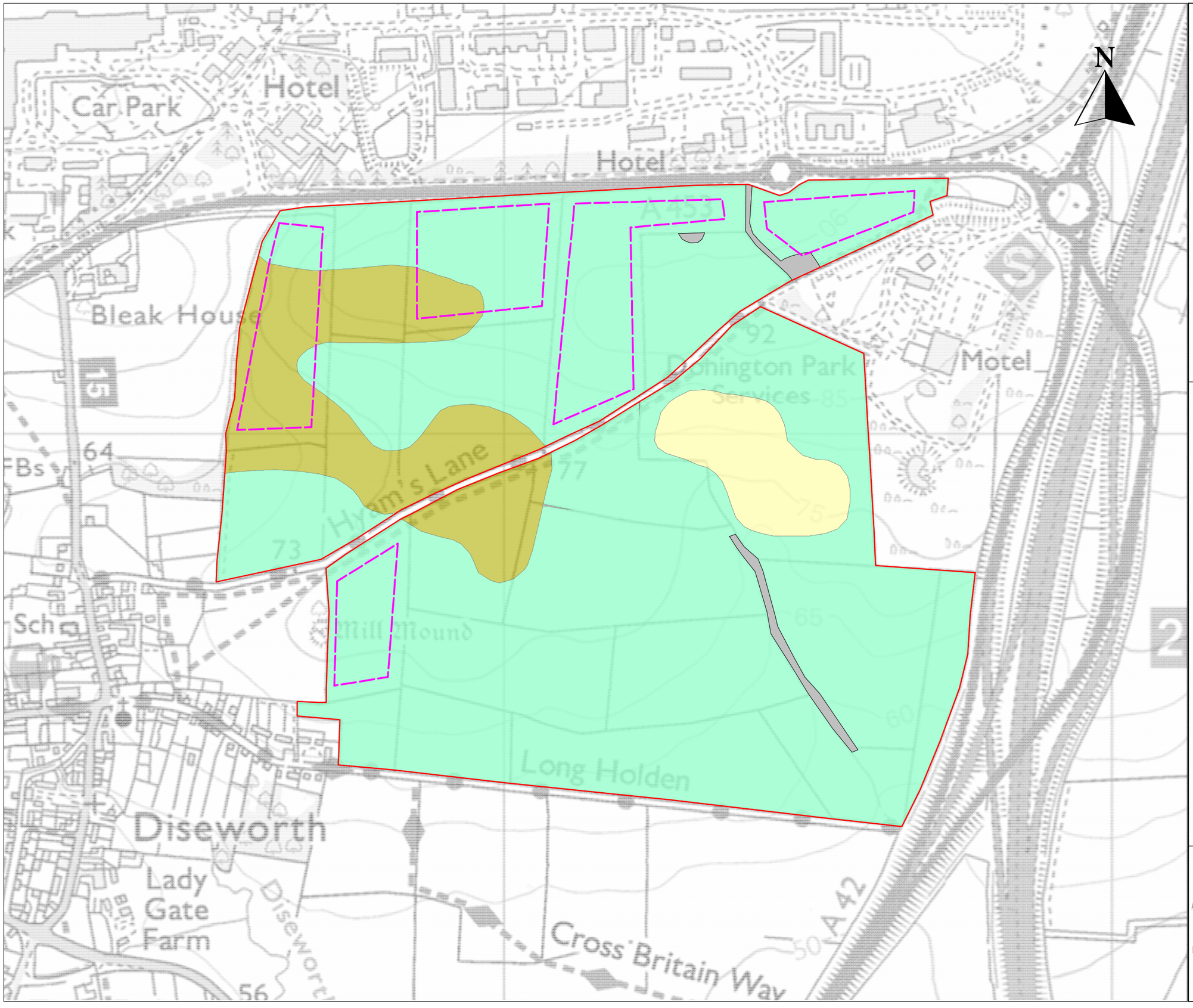
Map title:

Map 3
Subsoil sample areas

Land Research Associates
Lockington Hall
Lockington
Derby DE74 2RH
01509 670570

Scale: 1:5,000

Date: 24/01/2023



KEY

- Coarse loamy soil
  TS2 / SS2
- Loamy over slowly permeable soil
  TS1 / SS1
- Heavy slowly permeable soil
  TS1
- Fields with low nutrient soils
- No soil resources
- Survey area

Site:

Land at Diseworth

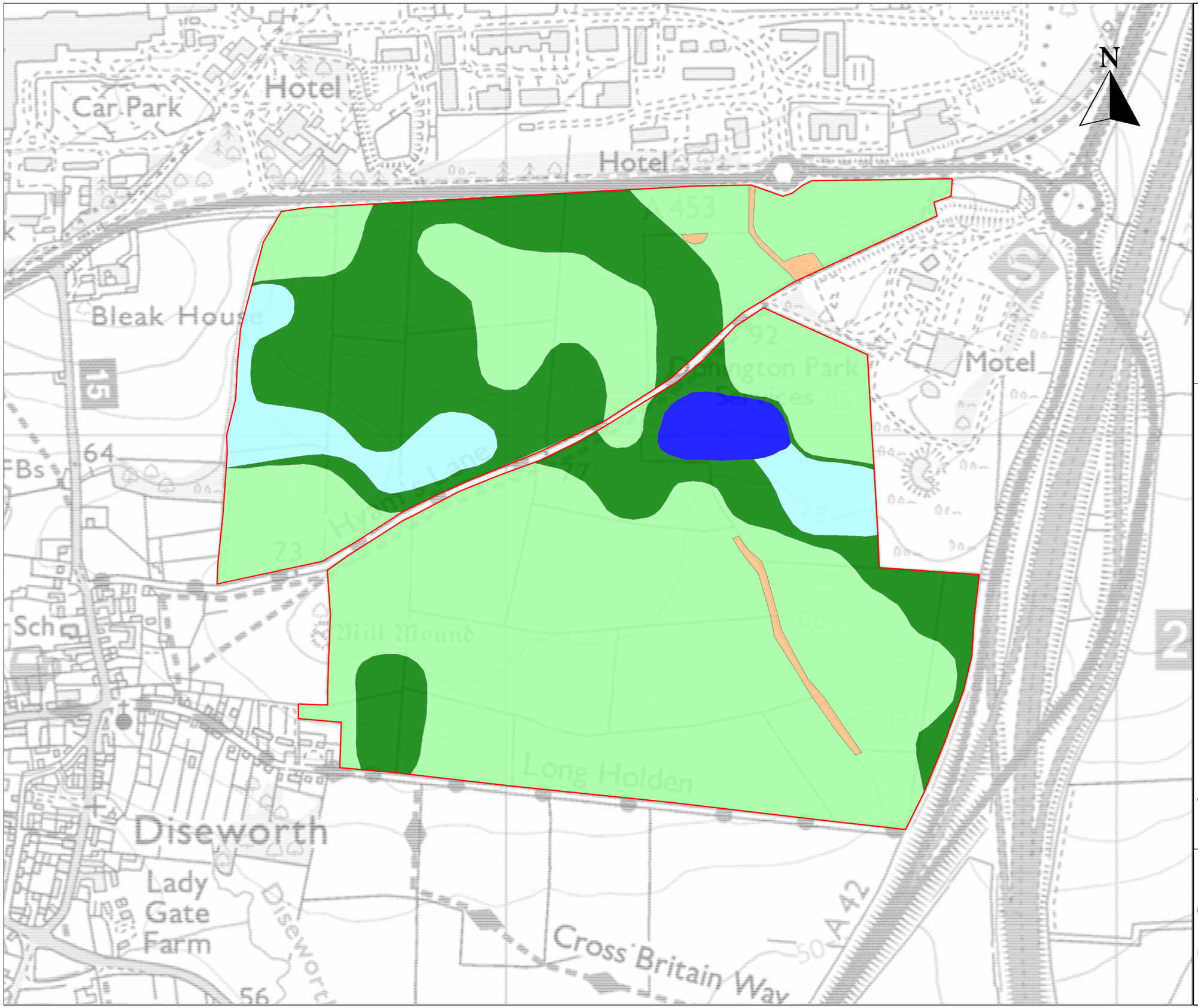
Map title:

Map 4
Soil resources

Land Research Associates
Lockington Hall
Lockington
Derby DE74 2RH
01509 670570

Scale: 1:5,000

Date: 24/01/2023



KEY

- Grade 1
- Grade 2
- Subgrade 3a
- Subgrade 3b
- Non agricultural
- Survey area

Site:

Land at Diseworth

Map title:

Map 5
Agricultural Land Classification

Land Research Associates
Lockington Hall
Lockington
Derby DE74 2RH
01509 670570

Scale: 1:5,000

Date: 24/01/2023

ANALYSIS REPORT

Contact : MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel. : 01509 670570

H579

Please quote the above code for all enquiries

Client : EMG 2

Local Rep : LAURA THOMAS

Telephone : 07545 584568

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 63876/23

Date Received 24-Jan-23
Date Reported 31-Jan-23

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
346814/23	1	**TSA** *No cropping details given*	7.9	1	3	4	14.6	278	191
346815/23	2	**TSB** *No cropping details given*	6.4	2	2-	3	16.8	173	162
346816/23	3	**TSC** *No cropping details given*	7.1	1	2-	5	12.8	123	265
346817/23	4	**TSD** *No cropping details given*	6.6	1	1	3	14.8	118	109
346818/23	5	**TSE** *No cropping details given*	6.8	2	2-	4	18.4	141	219
346819/23	6	**TSF** *No cropping details given*	7.6	0	1	6	9.4	120	395

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by *Sandy Cameron* On behalf of NRM Date *31/01/23*

ANALYSIS REPORT

Contact : MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel. : 01509 670570

H579

Please quote the above code for all enquiries

Client : EMG 2

Local Rep : LAURA THOMAS

Telephone : 07545 584568

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 63876/23

Date Received 24-Jan-23
Date Reported 31-Jan-23

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
346820/23	7	**TSG** *No cropping details given*	7.2	2	4	5	22.8	415	266
346821/23	8	**TSH** *No cropping details given*	6.8	2	2-	3	18.0	132	162
346822/23	9	**TSI** *No cropping details given*	6.6	2	1	4	18.2	77	176
346823/23	10	**TSJ** *No cropping details given*	7.7	1	2-	6	14.6	128	423

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Sandy Cameron On behalf of NRM Date 31/01/23

ANALYSIS REPORT

DATE **31st January 2023**

SAMPLES FROM **EMG 2**

Report Reference: 63876/23

MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel: 01509 670570
Fax: 01509 670676

Lab Ref.	Field Details		Soil Organic Matter [LOI%] Result
	No.	Field Name or Reference	
346814	1	TSA	5.7
346815	2	TSB	8.6
346816	3	TSC	4.4
346817	4	TSD	3.4
346818	5	TSE	4.6
346819	6	TSF	4.0
346820	7	TSG	5.3
346821	8	TSH	4.9
346822	9	TSI	4.0
346823	10	TSJ	3.9

Your Organic Matter Results Interpretation

Land use	Rainfall	Soil type	Very Low	Low	Target	High
Arable	Low <650mm	Light	<=1.0	1.1-2.1	2.2-3.2	>=3.3
		Medium	<=1.7	1.8-3.3	3.4-5.0	>=5.1
		Heavy	<=2.2	2.3-4.4	4.5-6.5	>=6.6
	Moderate 650-800mm	Light	<=1.0	1.1-3.0	3.1-4.5	>=4.6
		Medium	<=1.9	2.0-4.0	4.1-6.0	>=6.1
		Heavy	<= 2.7	2.8-5.2	5.3-7.6	>=7.7
	High 800-1100mm	Light	<=1.3	1.4-3.7	3.8-6.1	>=6.2
		Medium	<=2.5	2.6-5.0	5.1-7.5	>=7.6
		Heavy	<=3.6	3.7-6.2	6.3-8.8	>=8.9
Grassland (Lowland)	All	Light	<=2.1	2.2-4.9	5.0-7.9	8.0-14.9
		Medium	<=3.4	3.5-6.4	6.5-9.3	9.3-19.9
		Heavy	<=4.6	4.7-7.6	7.7-10.5	10.6-19.9

ANALYSIS REPORT

Contact : MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel. : 01509 670570

H579

Please quote the above code for all enquiries

Client : EMG 2

Local Rep : LAURA THOMAS

Telephone : 07545 584568

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 63874/23

Date Received 24-Jan-23
Date Reported 31-Jan-23

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
346803/23	1	**TSK** *No cropping details given*	6.8	3	2+	3	30.8	196	147
346804/23	2	**TSL** *No cropping details given*	7.1	2	2+	3	25.4	188	161
346805/23	3	**TSM** *No cropping details given*	7.3	3	2+	3	26.0	227	144
346806/23	4	**TSN** *No cropping details given*	7.7	2	2+	5	19.4	227	299
346807/23	5	**TSO** *No cropping details given*	8.0	2	2+	5	23.2	205	327
346808/23	6	**TSP** *No cropping details given*	8.2	3	3	6	25.6	260	493

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
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The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Sandy Cameron On behalf of NRM Date 31/01/23

ANALYSIS REPORT

Contact : MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel. : 01509 670570

H579

Please quote the above code for all enquiries

Client : EMG 2

Local Rep : LAURA THOMAS

Telephone : 07545 584568

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 63874/23

Date Received	24-Jan-23
Date Reported	31-Jan-23

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
346809/23	7	**TSR** *No cropping details given*	8.1	2	2+	6	19.8	232	520
346810/23	8	**TSS** *No cropping details given*	8.3	2	2+	6	22.4	232	495
346811/23	9	**TST** *No cropping details given*	6.9	2	2-	4	19.8	180	242
346812/23	10	**SSA** *No cropping details given*	6.8	0	1	5	5.6	89	263

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Sandy Cameron On behalf of NRM Date 31/01/23

ANALYSIS REPORT

DATE **31st January 2023**

SAMPLES FROM **EMG 2**

Report Reference: 63874/23

MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel: 01509 670570
Fax: 01509 670676

Lab Ref.	Field Details		Soil Organic Matter [LOI%] Result
	No.	Field Name or Reference	
346803	1	TSK	3.5
346804	2	TSL	4.3
346805	3	TSM	4.3
346806	4	TSN	4.0
346807	5	TSO	4.0
346808	6	TSP	4.4
346809	7	TSR	5.6
346810	8	TSS	4.5
346811	9	TST	4.9
346812	10	SSA	1.9

Your Organic Matter Results Interpretation

Land use	Rainfall	Soil type	Very Low	Low	Target	High
Arable	Low <650mm	Light	<=1.0	1.1-2.1	2.2-3.2	>=3.3
		Medium	<=1.7	1.8-3.3	3.4-5.0	>=5.1
		Heavy	<=2.2	2.3-4.4	4.5-6.5	>=6.6
	Moderate 650-800mm	Light	<=1.0	1.1-3.0	3.1-4.5	>=4.6
		Medium	<=1.9	2.0-4.0	4.1-6.0	>=6.1
		Heavy	<= 2.7	2.8-5.2	5.3-7.6	>=7.7
	High 800-1100mm	Light	<=1.3	1.4-3.7	3.8-6.1	>=6.2
		Medium	<=2.5	2.6-5.0	5.1-7.5	>=7.6
		Heavy	<=3.6	3.7-6.2	6.3-8.8	>=8.9
Grassland (Lowland)	All	Light	<=2.1	2.2-4.9	5.0-7.9	8.0-14.9
		Medium	<=3.4	3.5-6.4	6.5-9.3	9.3-19.9
		Heavy	<=4.6	4.7-7.6	7.7-10.5	10.6-19.9

ANALYSIS REPORT

Contact : MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel. : 01509 670570

H579

Please quote the above code for all enquiries

Client : EMG 2

Local Rep : LAURA THOMAS

Telephone :

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 63978/23

Date Received 26-Jan-23
Date Reported 01-Feb-23

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details		Soil pH	Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details		P	K	Mg	P	K	Mg
347278/23	1	**TS Q** *No cropping details given*	**7.6**	**2**	**2+**	**7**	**22.4**	**225**	**662**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Sandy Cameron On behalf of NRM Date 01/02/23

ANALYSIS REPORT

DATE **1st February 2023**

SAMPLES FROM **EMG 2**

Report Reference: 63978/23

MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel: 01509 670570
Fax: 01509 670676

Lab Ref.	Field Details		Soil Organic Matter [LOI%] Result
	No.	Field Name or Reference	
347278	1	TS Q	8.9

Your Organic Matter Results Interpretation

Land use	Rainfall	Soil type	Very Low	Low	Target	High
Arable	Low <650mm	Light	<=1.0	1.1-2.1	2.2-3.2	>=3.3
		Medium	<=1.7	1.8-3.3	3.4-5.0	>=5.1
		Heavy	<=2.2	2.3-4.4	4.5-6.5	>=6.6
	Moderate 650-800mm	Light	<=1.0	1.1-3.0	3.1-4.5	>=4.6
		Medium	<=1.9	2.0-4.0	4.1-6.0	>=6.1
		Heavy	<= 2.7	2.8-5.2	5.3-7.6	>=7.7
	High 800-1100mm	Light	<=1.3	1.4-3.7	3.8-6.1	>=6.2
		Medium	<=2.5	2.6-5.0	5.1-7.5	>=7.6
		Heavy	<=3.6	3.7-6.2	6.3-8.8	>=8.9
Grassland (Lowland)	All	Light	<=2.1	2.2-4.9	5.0-7.9	8.0-14.9
		Medium	<=3.4	3.5-6.4	6.5-9.3	9.3-19.9
		Heavy	<=4.6	4.7-7.6	7.7-10.5	10.6-19.9

ANALYSIS REPORT

Contact : MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel. : 01509 670570

H579

Please quote the above code for all enquiries

Client : EMG 2

Local Rep : LAURA THOMAS

Telephone : 07545 584568

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 63875/23

Date Received	24-Jan-23
Date Reported	31-Jan-23

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
346813/23	1	**SSB** *No cropping details given*	**6.7**	**0**	**2-**	**4**	**5.0**	**155**	**220**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Sandy Cameron On behalf of NRM Date 31/01/23

ANALYSIS REPORT

DATE **31st January 2023**

SAMPLES FROM **EMG 2**

Report Reference: 63875/23

MR MIKE PALMER
LAND RESEARCH ASSOCIATES
LOCKINGTON HALL
LOCKINGTON
DERBY
DE74 2RH
Tel: 01509 670570
Fax: 01509 670676

Lab Ref.	Field Details		Soil Organic Matter [LOI%] Result
	No.	Field Name or Reference	
346813	1	SSB	2.0

Your Organic Matter Results Interpretation

Land use	Rainfall	Soil type	Very Low	Low	Target	High
Arable	Low <650mm	Light	<=1.0	1.1-2.1	2.2-3.2	>=3.3
		Medium	<=1.7	1.8-3.3	3.4-5.0	>=5.1
		Heavy	<=2.2	2.3-4.4	4.5-6.5	>=6.6
	Moderate 650-800mm	Light	<=1.0	1.1-3.0	3.1-4.5	>=4.6
		Medium	<=1.9	2.0-4.0	4.1-6.0	>=6.1
		Heavy	<= 2.7	2.8-5.2	5.3-7.6	>=7.7
	High 800-1100mm	Light	<=1.3	1.4-3.7	3.8-6.1	>=6.2
		Medium	<=2.5	2.6-5.0	5.1-7.5	>=7.6
		Heavy	<=3.6	3.7-6.2	6.3-8.8	>=8.9
Grassland (Lowland)	All	Light	<=2.1	2.2-4.9	5.0-7.9	8.0-14.9
		Medium	<=3.4	3.5-6.4	6.5-9.3	9.3-19.9
		Heavy	<=4.6	4.7-7.6	7.7-10.5	10.6-19.9