SOILS AND AGRICULTURAL USE & QUALITY OF LAND OFF PRESTON ROAD LONGRIDGE

Report 1031/1

14th October, 2014

Land Research ASSOCIATES

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OF LAND OFF PRESTON ROAD, LONGRIDGE

M W Palmer, MSc, PhD, MISoilSci

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Land Research Associates Ltd
Lockington Hall,
Lockington,
Derby
DE74 2RH

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SUMMARY

A survey has been undertaken of 19.1 ha of land at Longridge, Lancashire.

The agricultural land comprises five fields under grass at the time of survey. The soils are slowly permeable fine loams over clays, giving land of sub-grade 3b quality, limited by soil wetness.

The medium loamy topsoil would form a high to moderate quality resource if the site is developed, but requires careful handling to avoid compaction damage.

1.0 Introduction

1.1 This report provides information on the soils and agricultural quality and use of 19.1 ha of land off Preston Road, Longridge, in Lancashire. The report is based on a soil and agricultural desk study and a survey of the land in October 2014.

SITE ENVIRONMENT

1.2 The site comprises five fields, bordered to the east by Preston Road, to the north by residential development, to the north-west by sports pitches and on other sides by adjoining agricultural land. The site is level at an elevation of approximately 82.5 m AOD.

AGRICULTURAL USE

1.3 At the time of survey the land was under grass and grazed by cattle and sheep.

PUBLISHED INFORMATION

1.4 1:50,000 BGS geological information shows solid geology as mainly Carboniferous sandstones of the Warley Wise Grit and Pendle Grit Formations, with an area of mudstone of the Bowland Shale Formation in the west. Devensian glacial till overlies these rocks over the entire site.

1.5 The national soil map, published at 1:250,000 scale[1] shows the land as in the Salop Association – heavy soils with poor drainage formed in reddish glacial till.

1.6 Agricultural Land Classification (ALC) mapping carried out in the 1970s (before revision of the classification) shows the agricultural land of the study area as grade 3. No later ALC mapping has been published.

[1] Jarvis, R. A. (*et al)* 1984. *Soils and their Use in Northern England.* Soil Survey of England and Wales Bulletin No. 10

2.0 Soils

2.1 The Planning Practice Guidance states that the planning system should protect and enhance valued soils and prevent the adverse effects of unacceptable levels of pollution. This is because soil is an essential finite resource that provides important ecosystem services, for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution.

2.2 A detailed soil resource and agricultural quality survey was carried out in October 2014. It was based on observations at intersects of a 100 m grid, giving a sampling 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 2) showing their location is in an appendix to this report.

2.3 Soils were dominantly found to have medium silty clay loam or clay loam topsoil between 18 and 30 cm in thickness, over similar textured permeable grey-mottled upper subsoil. The lower subsoil is formed from slowly permeable reddish silty clay or clay, mainly occurring at depths of between 40 and 60 cm below the land surface.

2.4 A typical profile is described below from observation 13 (Map 2).

0-24 cm	Very dark greyish brown (10YR 3/2) medium clay loam with rare medium pebbles; moderately developed medium sub-angular blocky structure; friable; gradual smooth boundary to:
24-45 cm	Dark greyish brown (10YR 4/2) heavy clay loam with medium strong brown (7.5YR 4/6) mottles; weakly developed medium sub-angular blocky structure; friable to firm; stoneless; clear smooth boundary to:
45-110+ cm	Yellowish red (5YR 4/6) silty clay with common coarse distinct grey (10YR 6/1) and common medium distinct strong brown (7.5YR 5/8) mottles; weakly developed very coarse prismatic to massive structure; plastic; stoneless.

2.5 These soils are poorly-draining (Soil Wetness Class IV) and have a high capacity to absorb excess rainfall during the growing season, but a low capacity in winter, when they stand wet for long periods and the runoff risk is high.

Agricultural 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 Agricultural Land Classification (ALC) system classifies land into five grades numbered 1 to 5, with grade 3 divided into two sub-grades (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[2]. The relevant site data for an average elevation of 82.5 m is given below.

• Average annual rainfall:	1053 mm
• January-June accumulated temperature >0°C	1339 day°
• Field capacity period (when the soils are fully replete with water)	243 days early Sept-mid May
• Summer moisture deficits for:	wheat: 60 mm potatoes: 40 mm

3.3 The survey described in the previous section was used in conjunction with the agroclimatic data above to classify the site using the revised guidelines for agricultural land classification issued in 1988 by the Ministry of Agriculture, Fisheries and Food[3]. The slightly cool, moist climate limits land quality to a maximum of grade 2 in this locality.

SURVEY RESULTS

3.4 The agricultural quality of the land is determined by soil wetness. Land of grade 3 has been identified.

Sub-grade 3b

3.5 This sub-grade accounts for all of the agricultural land at the site. The impeded subsoil drainage means these soils will stand wet to shallow depth in late autumn and spring in an average year, and given the relatively high clay

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

content of the topsoil, safe machinery access is restricted. This particularly affects spring sowings and consequently arable cropping is mainly limited to winter cereals and oilseeds.

Non-agricultural

3.6 This comprises a stable block and associated hard standings in the north of the site, a drainage ditch passing through the centre and four small ponds in the north-east.

Grade areas

3.7 The boundaries between the different grades of land are shown on Map 1 and the areas occupied by each are shown below.

Table 1. Areas occupied by the different land grades

Grade/sub-grade	*Area (ha)*	*% of the agricultural land*
Sub-grade 3b	18.4	100
Non-agricultural	0.7	-
Total	19.1	100

3.0 Soil resources and their use

4.1 An objective of the Defra Soil Strategy was to ensure that the construction industry and planning authorities take sufficient account of the need to protect soil resources, and ensure soils are able to fulfil as many as possible of their functions. An Environment Agency strategy *Soil a Precious Resource: Our strategy for protecting*, *managing and restoring soil* (Environment Agency, 2007) has complementary aims.

Topsoil

4.2 The topsoils are mainly 200-250 mm in thickness. Were the site to be developed, the topsoils represent a high to moderate quality resource for use in landscaping, being relatively easy to handle with machinery, but susceptible to compaction when wet, particularly likely during long periods between October and May. The suitability of soil conditions should be checked before stripping during this period and during wet periods at other times of year.

Subsoil

4.3 The upper subsoils of the site are naturally permeable, but are very susceptible to smearing and sealing during construction activities which could result in restricted rooting depth, increased droughtiness and risk of localised flooding. If compacted during construction they should be loosened before any topsoil is spread on them.

Soil Handling

4.4 Areas not being built over (e.g. environmental buffers and landscape areas) should not be trafficked by construction vehicles as this will render the soils impermeable, preventing percolation of rainfall beyond the base of the topsoil, which will quickly become saturated.

4.5 Stripped topsoil should be stored in separate resource bunds no more than 3 m high, and kept grassed and free from construction traffic until required for re-use. The *Construction Code of Practice for Sustainable Use of Soils on Construction Sites* (Defra 2009) provides guidance on good practice in soil handling.

APPENDIX

MAPS AND DETAILS OF OBSERVATIONS

Land at Longridge: ALC and soil resources 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	0-44	HZCL (dist)	0	44-82	HZCL	xxx	82-100+	ZC(r)	xxx	0	IV	4	W
2	0-27	M/HZCL	0	27-35	HZCL	xxx	35-110+	ZC(r)	xxx	0	IV	3b/4	W
3	0-23	M/HZCL	0	23-47	HZCL	xxx	47-100+	ZC(r)	xxx	0	IV	3b/4	W
4	0-19	MCL	0	19-39	MCL	xxx	39-100+	ZC(r)	xxx	0	IV	3b	W
5	0-25	MZCL	0	25-39	HZCL	xxx	39-67 67-90+	HZCL C(r)	xxx xx	0	IV	3b	W
6	0-18	MZCL	0	18-41	MZCL	xxx	41-58 58-100+	HZCL ZC(r)	xxx xxx	0	IV	3b	W
7	0-24	MZCL	0	24-59	HZCL	xxx	59-79 79-100+	HZCL ZC(r)	xxx xx	0	IV	3b	W
8	0-21	MZCL	0	21-42	MZCL	xxx	42-100+	ZC(r)	xxx	0	IV	3b	W
9	0-20	MCL	0	20-54	HZCL	xxx	54-81 81-90+	HZCL ZC(r)	xx xxx	0	IV	3b	W
10	0-23	MCL	0	23-49	M/ZCL	xxx	49-100+	C(r)	xx	0	IV	3b	W
11	0-30	MCL	0	30-50	HZCL	xxx	50-110+	C(r)	xx	0	IV	3b	W
12	0-22	MZCL	0	22-58	HZCL	xxx	58-80+	ZC (r)	xxxx	0	IV	4	W
13	0-24	MCL	<5	24-45	HCL	xxx	45-110+	ZC (r)	xxx	0	IV	3b	W
14	0-26	MZCL	0	26-50	HZCL	xxx	50-110+	ZC (r)	xxx	0	IV	3b	W
15	0-20	HCL	0	20-51	HCL	xxx	51-110+	C/ZC (r)	xxx	0	IV	4	W
16	0-26	HCL	0	26-48	HCL	xxx	48-110+	C (r)	xxx	0	IV	4	W
17	0-22	MZCL	0	22-48 48-58	HZCL MZCL	xxx x(x)	58-75 75-110+	SCL ZC (r)	xx xxx	0	III	3b	W
18	0-24	MCL	0	24-45	HCL	xxx	45-110+	ZC(r)	xxx	0	IV	3b	W
19	0-20	MCL	0	20-38	HCL	xxx	38-110+	ZC(r)	xxx	0	IV	3b	W
20	0-22	MCL	0	22-58	HCL	xxx	58-75 75-110+	SCL/SC ZC	xxx xxx	0	III	3b	W

Key to table

Mottle intensity:
- o unmottled
- x few to common rusty root mottles (topsoils) or a few ochreous mottles (subsoils)
- xx common to many ochreous mottles (slightly gleyed horizon)
- xxx greyish colours and common to many ochreous mottles (gleyed horizon)
- xxxx dominantly grey, often with some ochreous mottles (gleyed horizon)

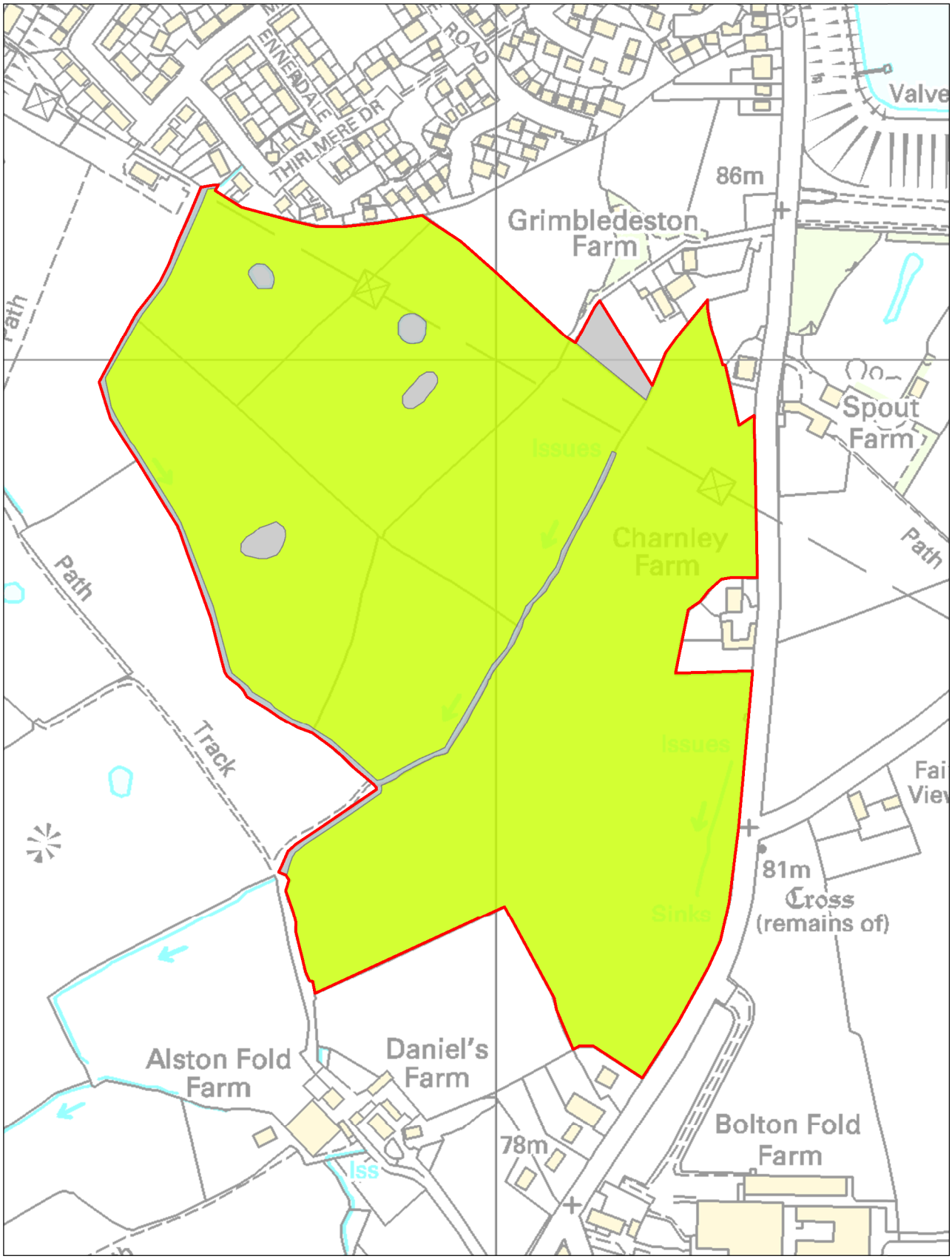
a depth underlined (e.g. 50) indicates the top of a slowly permeable layer
(a wavy underline indicates the top of a layer borderline to slowly permeable)

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

Limitations:
- W - wetness/workability
- D - droughtiness
- De - depth
- St – stoniness
- Sl – slope
- F - flooding
- T – topography/microrelief

Texture suffixes & prefixes:
- ca – calcareous: x-extremely, v-very, sl-slightly
- (ca) – marginally calcareous
- mn - ferrimanganiferous concentrations

- r – reddish; (v)st – (very) stony
- dist - disturbed soil layer



Client: JWPC CHARTERED TOWN PLANNERS

Project: Longridge

Map title: Map 1
Land Quality

KEY

Sub-grade 3b

Non-agricultural

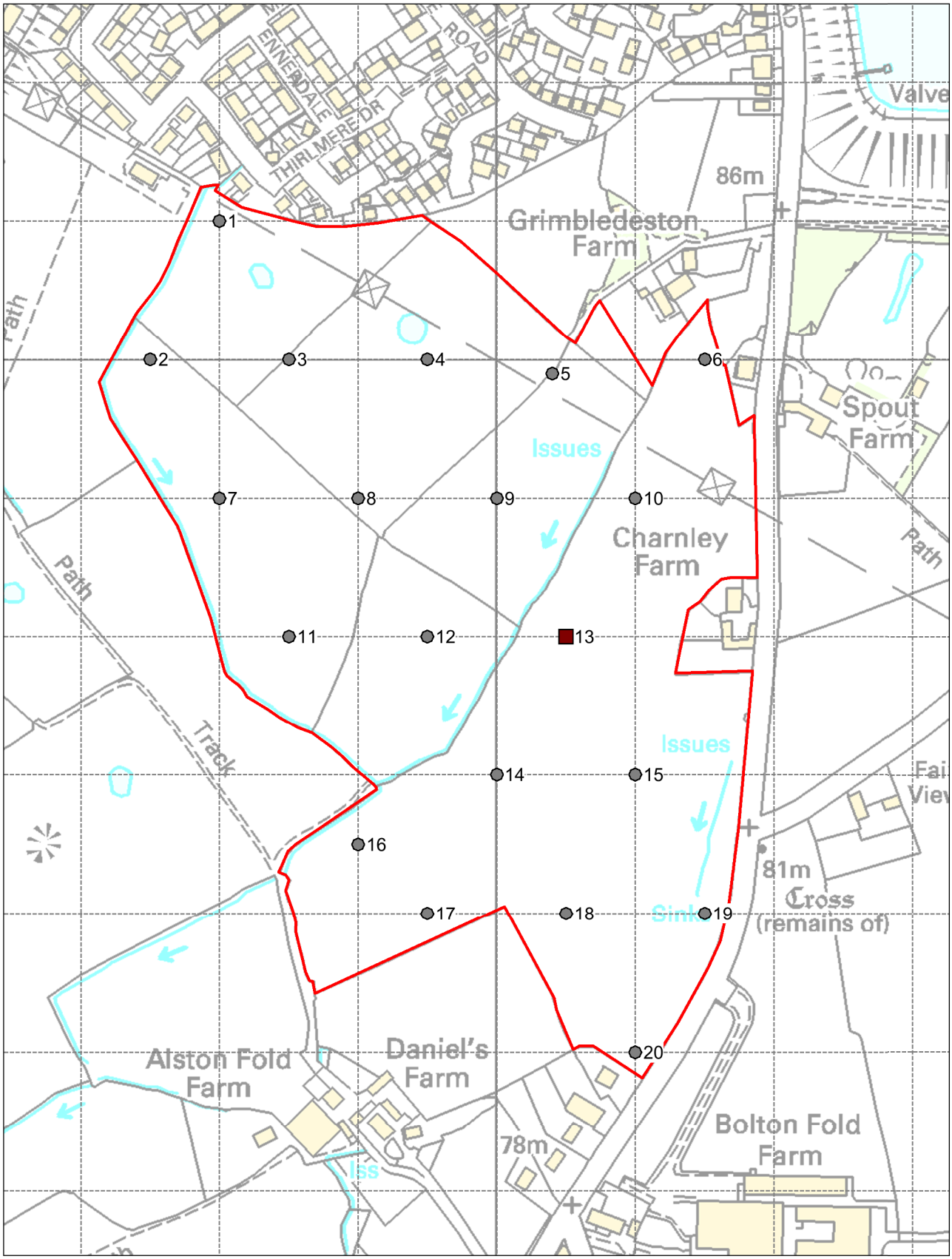
Survey area

1031/1

Scale: 1:4,000 at A4

Date: 14/10/2014

Land Research ASSOCIATES
Lockington Hall
Lockington
Derby DE74 2RH
Tel: 01509 670570



Client: JWPC CHARTERED TOWN PLANNERS

Project: Longridge

Map title: Map 2
Survey Observations

KEY

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

1031/2

Scale: 1:4,000 at A4

Date: 14/10/2014

Land Research ASSOCIATES
Lockington Hall
Lockington
Derby DE74 2RH
Tel: 01509 670570