Substrata
Archaeological Geophysical Surveyors

An archaeological magnetometer survey

Land either side of Percy Wakley Wood Rockbeare, Devon

Centred on NGRs 303210,095440 and 303750,095500

Report: 1804ROK-R-1

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18 June 2018

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1 Introduction

This report presents the results of an archaeological geophysical survey at the site listed in Section 2 and shown in Figure 1, hereafter referred to as the 'Survey Area'. It was commissioned by AC Archaeology Limited on behalf of clients.

The survey and report were completed in compliance with a Survey Method Statement (Dean, 2018).

2 Survey description

2.1 Survey

Method:	shallow depth magnetometer survey
Instrument:	twin-sensor fluxgate gradiometer
Date:	between 23 May and 8 June 2018
Area:	21.17ha

2.2 Location

Survey Area name:	Land either side of Percy Wakley Wood
Civil parish:	Rockbeare
District:	East Devon
County:	Devon
Nearest Postcode:	Plots 1 to 5: EX5 2EP Plots 6 and 7: EX5 2PL
NGR:	Plots 1 to 5: SY 03210 95440 Plots 6 and 7: SY 03750 95500
NGR (E/N):	Plots 1 to 5: 303210,095440 (point) Plots 6 and 7: 303750,095500 (point)
Historic environment designation:	none

2.3 Client

AC Archaeology Ltd, 4 Halthaies Workshops, Bradninch Nr Exeter, Devon EX5 4QL

3 Summary

A magnetometer survey was selected to provide a relatively fast and cost-effective evaluation of any buried archaeology across the Survey Area (see Section 12). The magnetic anomaly groups pertaining to potential buried archaeology were georeferenced to the Ordnance Survey National Grid, mapped, characterised and assigned with an appropriate degree of certainty in conformance with the survey aims and objectives set out in Section 4.

The differences in magnetic responses across the Survey Area were sufficient to be able to differentiate between anomalies representing possible buried archaeology and background magnetic responses.

Twenty-nine magnetic anomaly groups have been characterised as representing potential buried archaeology. Of these, nine groups coincide with, and likely represent, field boundaries recorded on historic maps. Six groups are likely to represent ground disturbance and stony deposits associated with the filling of former ponds recorded on historic maps. One group is likely to represent the in-filling of a former quarry recorded in the Rockbeare tithe map, aerial photographs and LiDAR. Two groups represent relatively recent ground fill, possibly partly composed of stony material from a field boundary recorded on historic maps. One group may represent a curvilinear archaeological deposit but natural origins cannot be ruled out. The remaining groups have characteristics typical of anomaly groups representing linear deposits such as former field or enclosure boundaries.

4 Aims and objectives

4.1 Aims

Within the framework set out in Chartered Institute for Archaeologists (2014a), complete an archaeological geophysical survey and report which will, as far as possible, establish the

presence or absence, extent and character of any buried archaeology within the survey area.

4.2 Survey objectives

1. Complete a magnetometer survey across the Survey Area.
2. Identify any magnetic anomalies that may be related to buried archaeology.
3. Within the limits of the technique and dataset, archaeologically characterise any such anomalies or patterns of anomalies.
4. Accurately record the location of the identified anomalies.
5. Produce a report based on the survey that is sufficiently detailed to inform any subsequent development on the survey area about the location and possible archaeological character of the recorded anomalies.

5 Standards

The standards used to complete this survey are defined by the Chartered Institute for Archaeologists (2014a) and Historic England (2008). The codes of approved practice that were followed are those of the Chartered Institute for Archaeologists (2014b) and Archaeology Data Service (undated).

6 Methodology

The magnetometer survey was undertaken in accordance with a Survey Method Statement (Dean, 2018) to achieve the aims and objectives set out in Section 4 using the standards and guidance specified in Section 5. The survey method was selected to provide a relatively fast and cost-effective evaluation of any buried archaeology across the Survey Area (see Section 12).

Data processing was undertaken using appropriate software (Table 2), with all anomalies being digitised and geo-referenced. The final report (this document) includes a graphical and textual account of the techniques undertaken, the data obtained and an archaeological interpretation of that data and conclusions about any likely archaeology. The survey and report conform to the Chartered Institute for Archaeologists standard for geophysical survey (CIfA, 2014a).

7 Survey Area

7.1 Location

The Survey Area comprises five fields to the west and two fields to the east of Percy Wakley Wood which lies to the east-north-east of the village of Rockbeare, as shown in Figure 1. The fields were designated Plots 1 to 7 for ease of description as shown in Figure 2.

7.2 Field boundaries

The fields are bounded by Devon banks and Percy Wakley Wood by ditches and some wire fencing. The B3174 lies next to the northern boundary of the Survey Area, Gribble Lane lies to the west and Rewe Lane to the south. Further fields border the east. Percy Wakley Wood separates Plots 1 to 5 from Plots 6 and 7.

7.3 Topography

The survey area slopes gently from just over 60m AOD in the southeast to just over 40mAOD in the northwest.

7.4 Land use

At the time of the survey, the Survey Area was under a crop of young maize.

7.5 Geology

The bedrock across the Survey Area comprises rocks of the Aylesbeare Mudstone Group. Generically they comprise reddish-brown silty mudstone and clayey siltstone; clayey fine-grained sandstone occurs locally as does, less commonly, clean fine- to medium-grained sandstone. The superficial deposits across the Survey Area are not recorded in the source used (British Geological Survey, undated).

7.6 Soils

The topsoil is slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils (Cranfield Soil and Agrifood Institute, undated).

No site-relevant geotechnical reports or borehole logs of near-surface deposits were available at the time of writing.

8 Archaeological background

8.1 Historic Environment Status

None.

The B3174 London Road, which lies on the northern boundary of the Survey Area, follows the route of a Roman Road.

8.2 Historic landscape characterisation

'Barton fields '

These relatively large, regular enclosures seem likely to have been laid out between C15th-C18th. Some curving boundaries may be following earlier divisions in the pre-existing medieval fields (Devon County Council, undated).

8.4 Statement of research

The Devon County Council Historic Environment Record Archive was examined via the Heritage Gateway (Historic England, undated) to gain an appreciation of historic assets pertinent to the geophysical survey data within approximately 500m of the survey area perimeter. Whilst providing a useful context for the data analysis, this source is not comprehensive and publication of the information in commercial reports is not permitted.

8.5 Historic assets within the Survey Area

The site of a former quarry recorded on the Rockbeare tithe map of 1844 but not on later historic maps was cited in the Devon County Council Historic Environment Record MDV112342 as noted in the above source (Section 8.4).

9 Results

9.1 Scope and definitions

This survey was designed to record magnetic anomalies. A magnetic anomaly is a local variation in the Earth's magnetic field. Such variations can result from differences in the magnetism of the underlying solid geology, superficial geology and other near-surface deposits including those altered and created by past human activities. Near-surface artefacts can also create magnetic anomalies.

The dimensions of magnetic anomalies mapped as representing potential buried archaeology do not represent the dimensions of any associated archaeology.

The analysis presented below identifies and characterises anomalies and anomaly groups that may relate to buried archaeology.

9.2 Analysis

Figures 2 to 5 show the interpretation of the survey data and include the anomaly groups identified as possibly relating to archaeological deposits along with their identifying numbers. Table 1 is an extract of the detailed analysis of the survey data sourced from the attribute tables of the GIS project provided in the project archive.

Figures 2 to 5 along with Table 1 comprise the analysis of the survey data.

Figures 6 to 9 are plots of the processed data as specified in Tables 3 and 4. Figure 10 is a plot of minimally processed data as specified in Tables 5 and 6. Figure 11 shows the location of the survey grid and grid data files.

10 Discussion

10.1 General points

Scope

Not all anomalies or anomaly groups identified in Table 1 are necessarily discussed below. All identified anomaly groups are recorded in the GIS project held in the survey archive.

Data collection

Data collection along the survey area edges was restricted as shown in the figures due to the presence of magnetic materials within and adjacent to boundaries. Strong magnetic responses mapped close to the boundaries are likely to relate to these materials except where otherwise indicated in Figures 2 to 5 and Table 1.

Anomaly characterisation

There are a number of anomaly groups that could be interpreted as relating to large postholes or pits although most will have natural origins. Anomalies of this sort are mapped as potential archaeology when they are associated with other significant anomaly groups or otherwise formed recognisable patterns as listed in Table 1.

Anomalies thought to relate to natural features and recent man-made objects such as manholes, water management equipment, drains, cables and other services are only mapped where they comprise significant magnetic responses across the dataset that need clarification.

Numerous dipole magnetic anomalies are present within the dataset. These are likely to represent recent ferrous objects. They are only mapped if they could influence the analysis of anomaly groups thought to have an archaeological origin.

10.2 Data relating to historic maps and other records

Magnetic anomaly groups **1**, **4**, **8**, **12**, **13**, **17**, **23**, **28** and possibly part of group **10** coincide with, and are likely to represent, sections of former field boundaries recorded on historic maps as listed in Table 1.

Groups **2**, **3**, **14**, **18**, **22**, and **29** coincide with the sites of ponds recorded on historic maps as listed in Table 1 and are likely to represent ground disturbance associated with the in-filling of the ponds.

Group **6** partially coincides with the site of a former quarry recorded on the Rockbeare tithe map of 1844 but not on later historic maps. It was recorded on aerial photographs as an earthwork pit and on LiDAR as noted in Table 1 (Devon County Council Historic Environment Record MDV112342).

Anomaly group **101** is most likely to represent ploughing disturbance. The western edge of the group coincides with the site of a former field boundary mapped in 1844 and removed before 1889. No trace of the field boundary remains in the survey data.

10.3 Data with no previous archaeological provenance

Magnetic anomaly group **9** and part of group **10** probably reflect relatively recent fill to strengthen the surface in and around a gap in an extant field boundary. Group 10 (Section 10.2), and possibly part of group 9, may also reflect ground disturbance and stony deposits associated with a now removed, historically mapped, field boundary.

Group **15** may represent buried archaeology in the form of a curvilinear deposit but a natural origin for the anomaly group cannot be ruled out.

The other magnetic anomaly groups mapped as representing potential buried archaeology (**5**, **7**, **11**, **16**, 1**9 to 21** and **24 to 27**) have characteristics typical of anomaly groups representing linear deposits such as former field or enclosure boundaries.

11 Conclusions

The differences in magnetic responses across the Survey Area were sufficient to be able to differentiate between anomalies representing possible buried archaeology and background magnetic responses.

Twenty-nine magnetic anomaly groups have been characterised as representing potential buried archaeology. Of these, nine groups (1, 4, 8, 12, 13, 17, 23, 28 and part of group 10) coincide with, and likely represent, field boundaries recorded on historic maps. Six groups (22, 3, 14, 18, 22, and 29) are likely to represent ground disturbance and stony deposits associated with the filling of former ponds recorded on historic maps. One group (6) is likely to represent the in-filling of a former quarry recorded in the Rockbeare tithe map and on aerial photographs and LiDAR. Two groups (9 and part of 10) represent relatively recent ground fill possibly partly composed of stony material from a field boundary recorded on historic maps. One group (15) may represent a curvilinear archaeological deposit but natural origins cannot be ruled out. The remaining groups (5, 7, 11, 16, 19 to 21 and 24 to 27) have characteristics typical of anomaly groups representing linear deposits such as former field or enclosure boundaries.

12 Disclaimer

The description and discussion of the results presented in this report are the authors', based on their interpretation of the survey data. Every effort has been made to provide accurate descriptions and interpretations of the geophysical data set. The nature of archaeological geophysical surveying is such that interpretations based on geophysical data, while informative, can only be provisional. Geophysical surveys are a cost-effective early step in the multi-phase process that is archaeology. The programme of archaeological work of which this survey is part may also be informed by other archaeological work and analysis. It must be presumed that more archaeological features will be found than those specified in this report.

13 Copyright

14 Archive

14.1 Online Access to the Index of archaeological investigationS (OASIS)

OASIS ID: substrat1-320112

The OASIS entry has been completed and the boundary file and report uploaded with six months delay in publication.

14.2 Substrata Limited archive

A full archive of this survey will be held by Substrata Limited on cloud and local hard drive storage as specified in Appendix 3.

14.3 Archaeological Data Service (ADS)

Depending on local authority policy, an archive may be deposited with the ADS as specified in Appendix 3.

14.4 Historic Environment Record (HER)

Subject to any contractual requirements on confidentiality, a PDF or printed copy of the report will be submitted to the appropriate HER within six months of completion.

15 Acknowledgements

Substrata would like to thank John Valentin of AC Archaeology Ltd for commissioning us to complete this survey.

16 Bibliography

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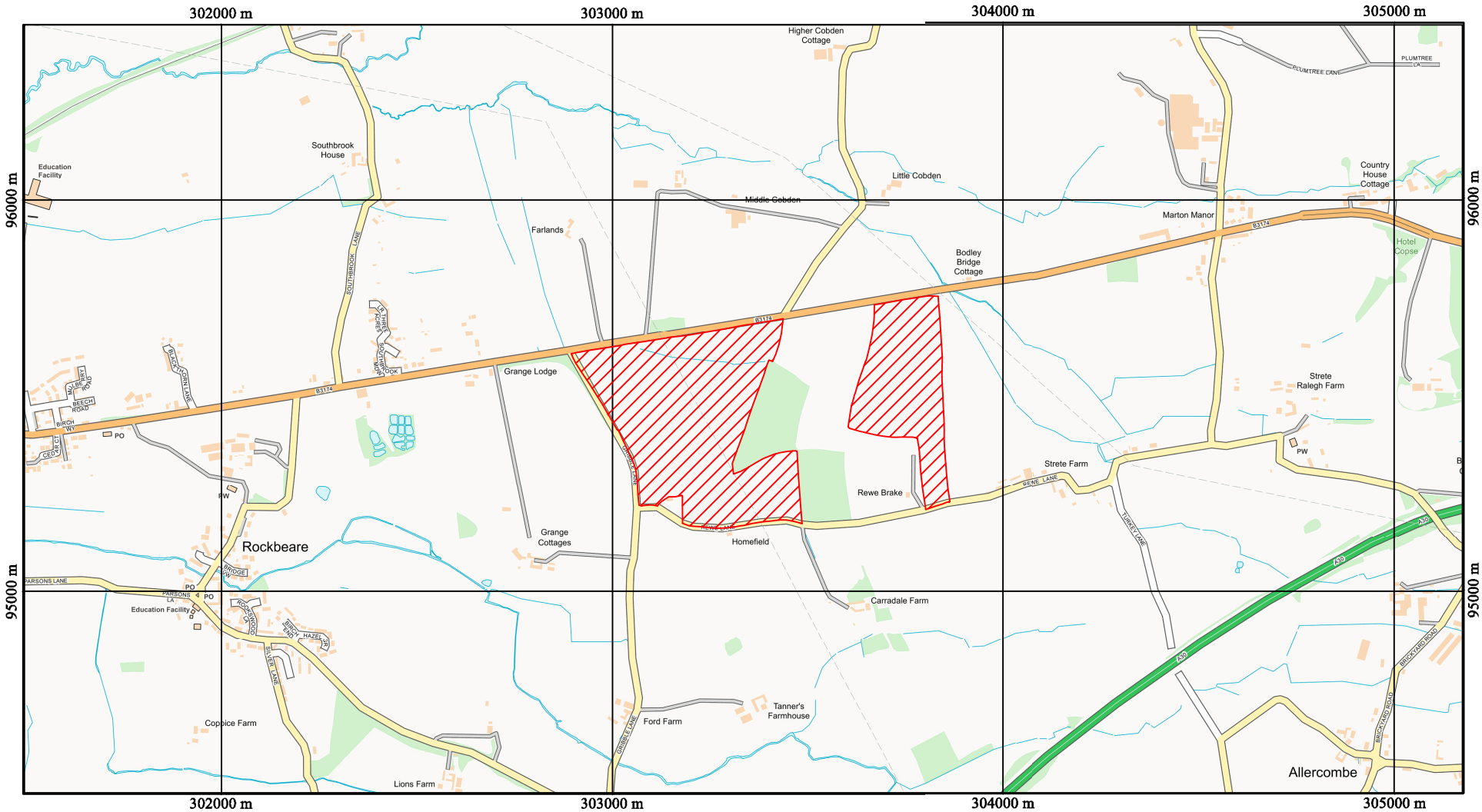
Appendix 1 Figures

General Guidance

The anomalies represented in the survey plots provided in this appendix are magnetic anomalies. The apparent size of such anomalies and anomaly patterns are unlikely to correspond exactly with the dimensions of any associated archaeological features .

A rough rule for interpreting magnetic anomalies is that the width of an anomaly at half its maximum reading is equal to the width of the buried feature, or its depth if this is greater (Clark, 2000: 83). Caution must be applied when using this rule as it depends on the anomalies being clearly identifiable and distinct from adjacent anomalies. In northern latitudes the position of the maximum of a magnetic anomaly will be displaced slightly to the south of any associated physical feature.



British Grid
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Scale: 1:10000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological magnetometer survey
Land either side of Percy Wakley Wood, Rockbeare, Devon
Centred on NGR: 303210,095440 and 303750,095500
Report: 1804ROK-R-1

Figure 1: location map

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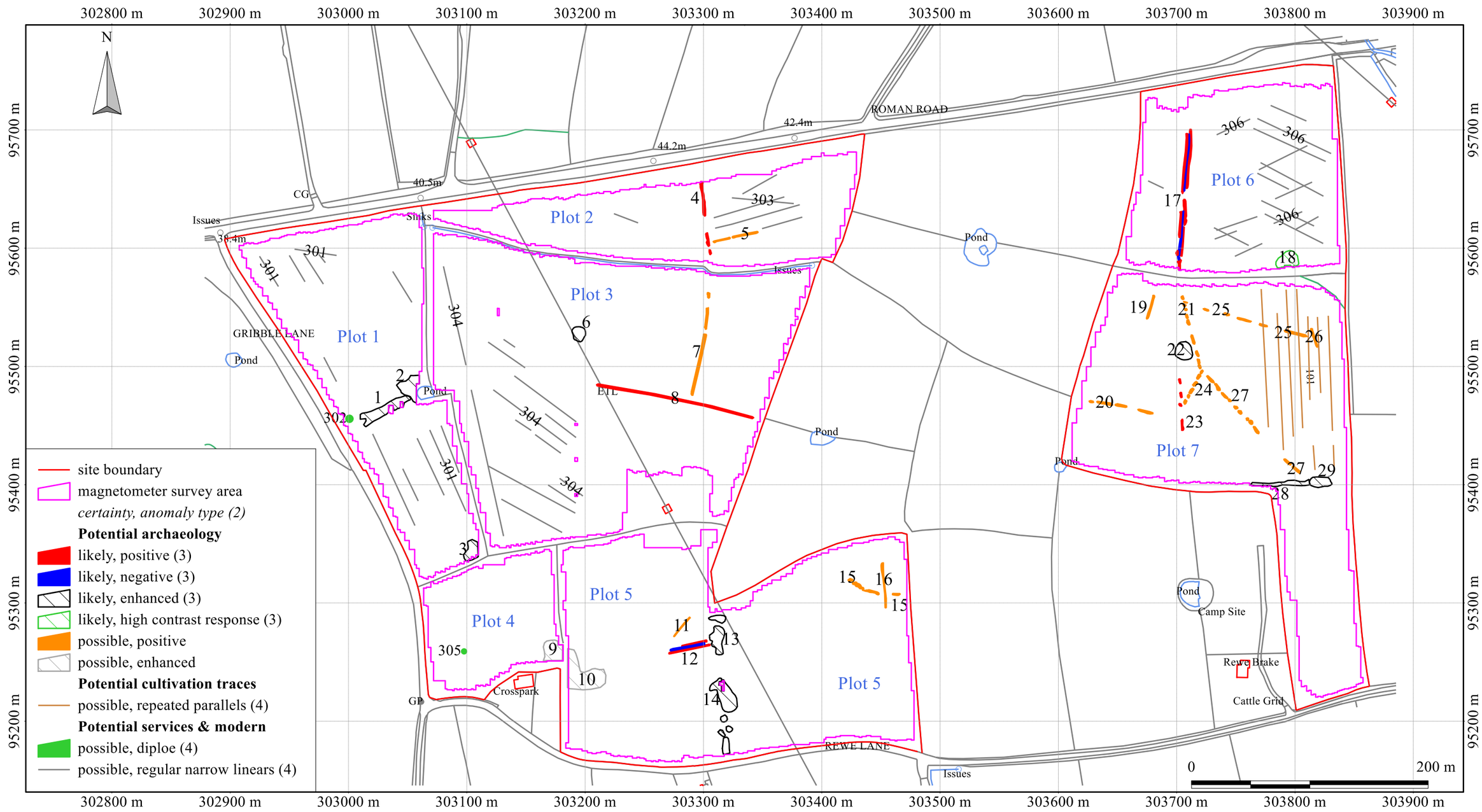

British Grid
centre X: 303334.82 m, centre Y: 95464.45 m

Scale: 1:3300 @ A3. Spatial Units: Meter. Do not scale off this drawing

Notes:
1. All interpretations are provisional and represent potential archaeological deposits.
2. 'Anomaly type' is a description of the magnetic anomaly. See the report text or GIS for an archaeological characterisation.
3. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.
4. Not all instances are mapped.
5. Anomalies likely to represent recent deposits or ground disturbance, or geological and other natural deposits are not mapped unless relevant to potential buried archaeology.

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Figure 2: survey interpretation, all plots

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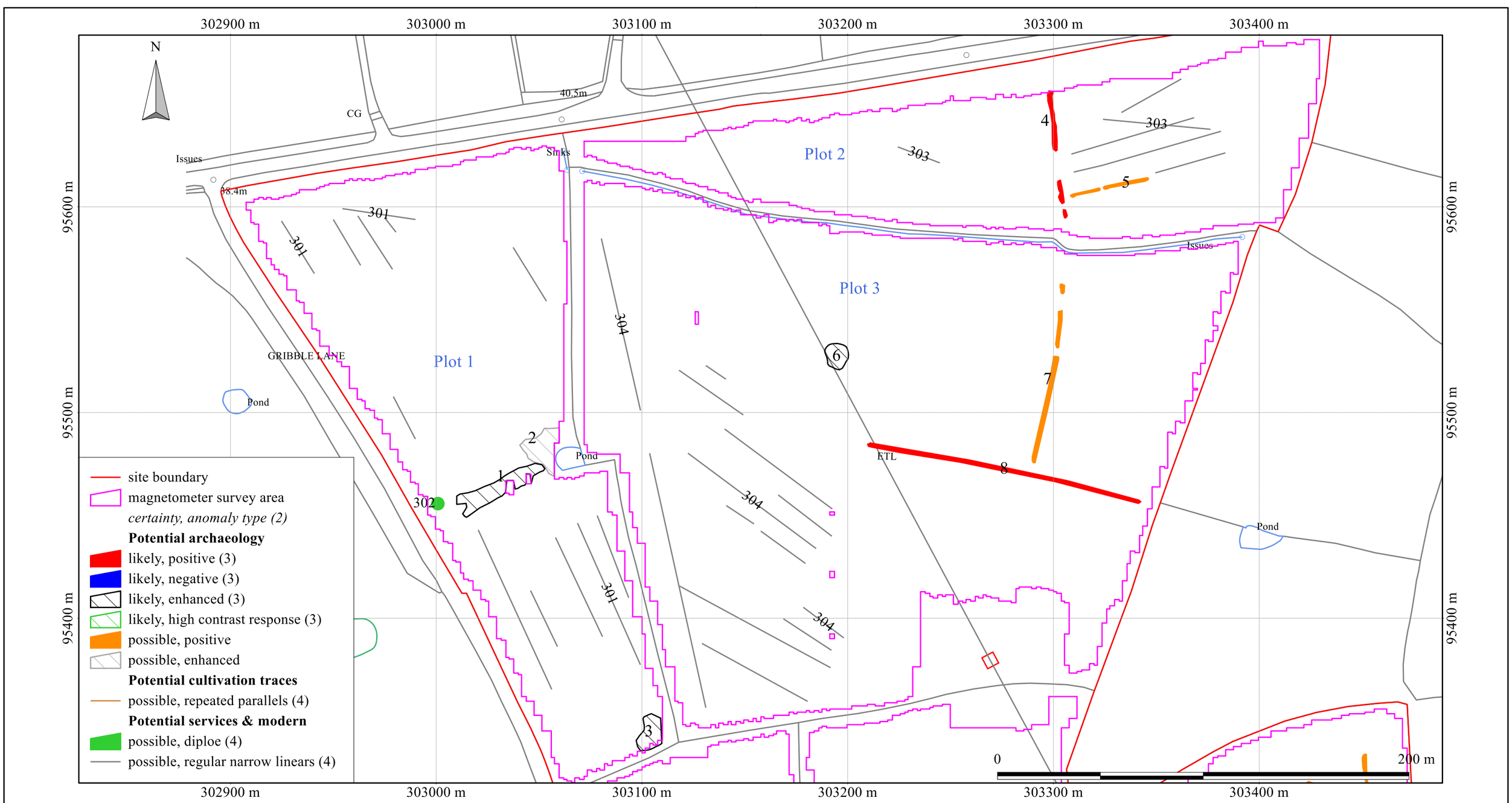

British Grid
centre X: 303157.69 m, centre Y: 95501.70 m

Scale: 1:1800 @ A3. Spatial Units: Meter. Do not scale off this drawing

Notes:
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Figure 3: survey interpretation, Plots 1, 2 and 3

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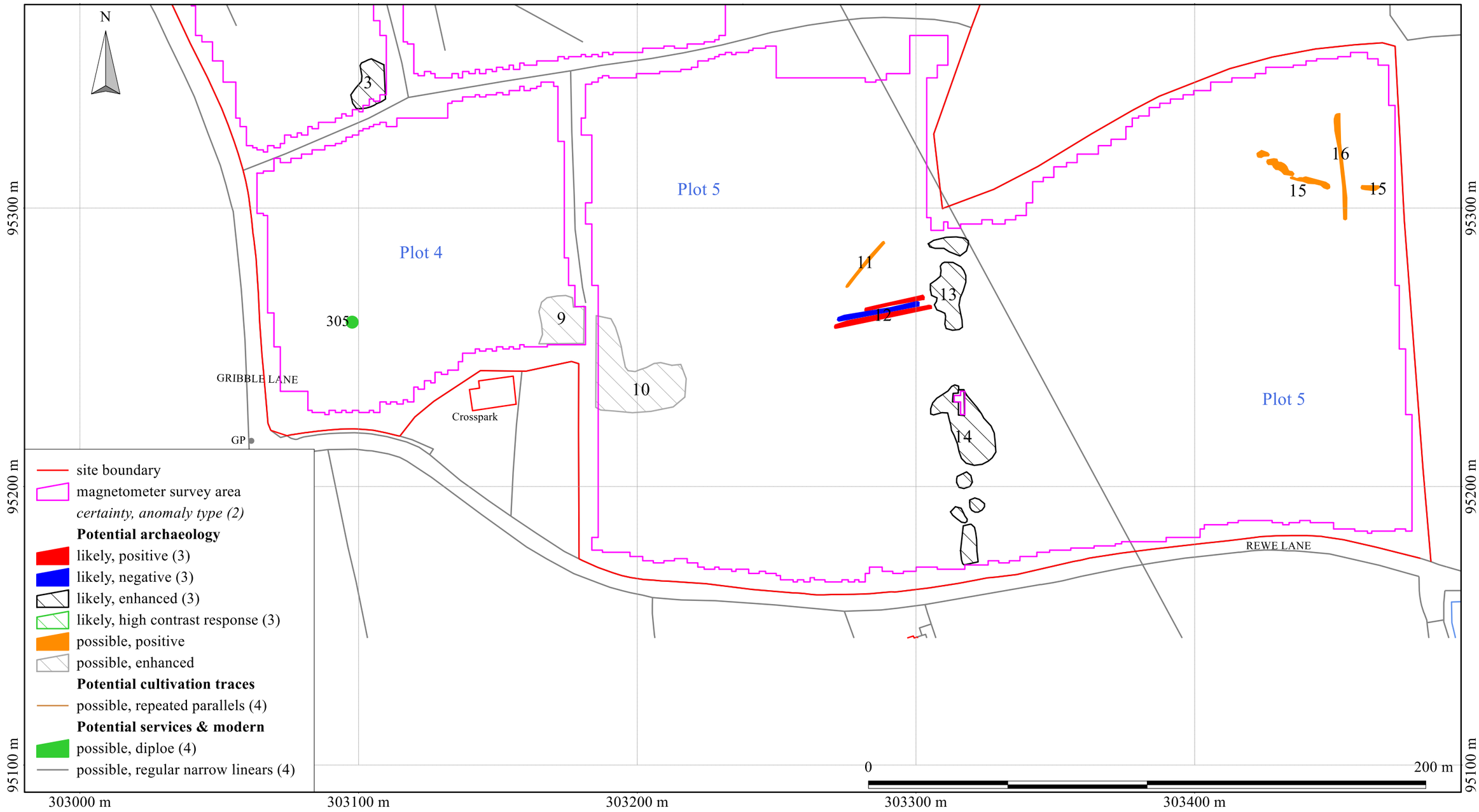

British Grid
centre X: 303237.86 m, centre Y: 95231.64 m

Scale: 1:1400 @ A3. Spatial Units: Meter. Do not scale off this drawing

Notes:
1. All interpretations are provisional and represent potential archaeological deposits.
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Figure 4: survey interpretation, Plots 4 and 5

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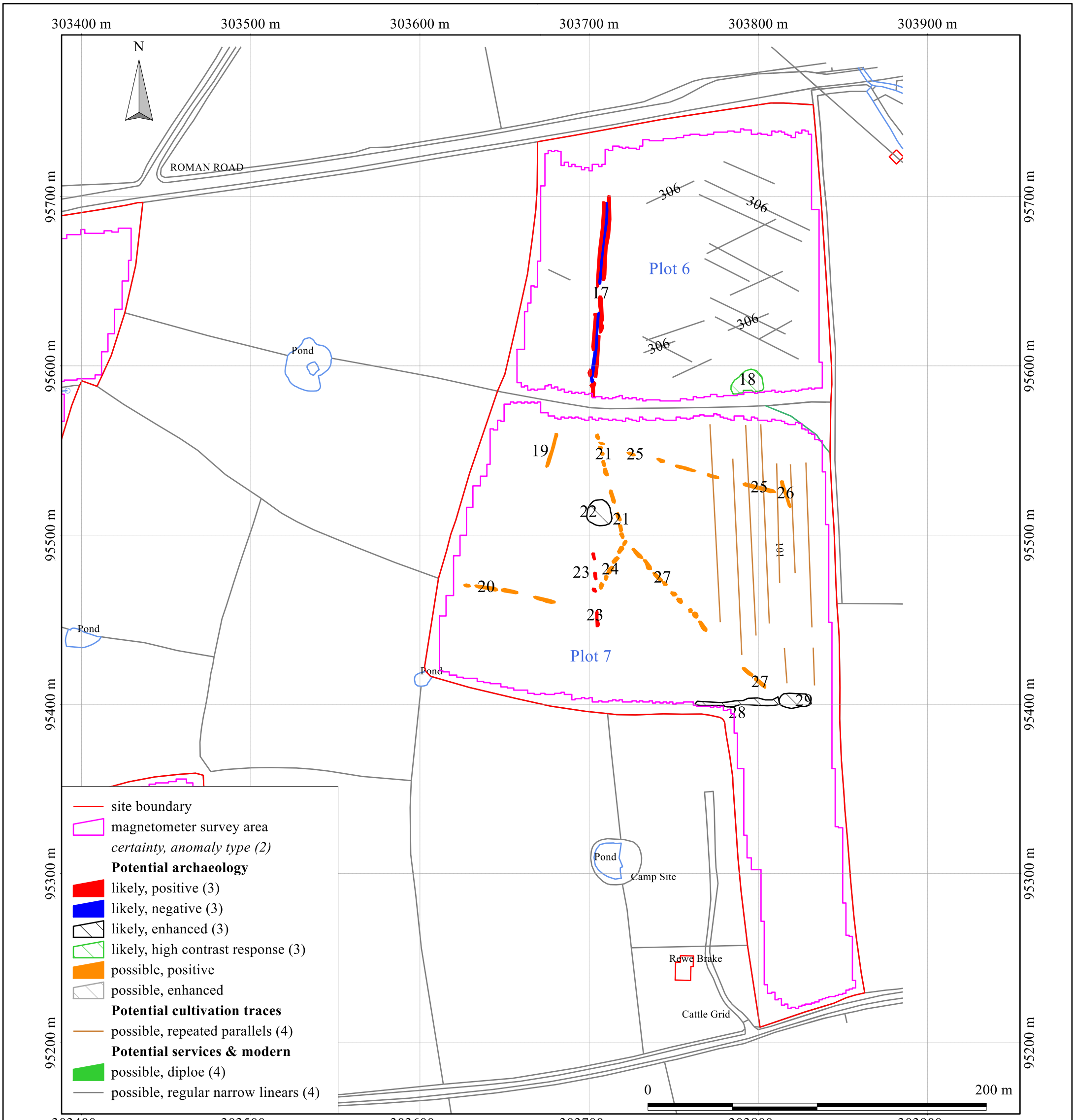

British Grid
centre X: 303671.43 m, centre Y: 95476.75 m

Scale: 1:2200 @ A3. Spatial Units: Meter. Do not scale off this drawing

Notes:
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Figure 5: survey interpretation, Plots 6 and 7

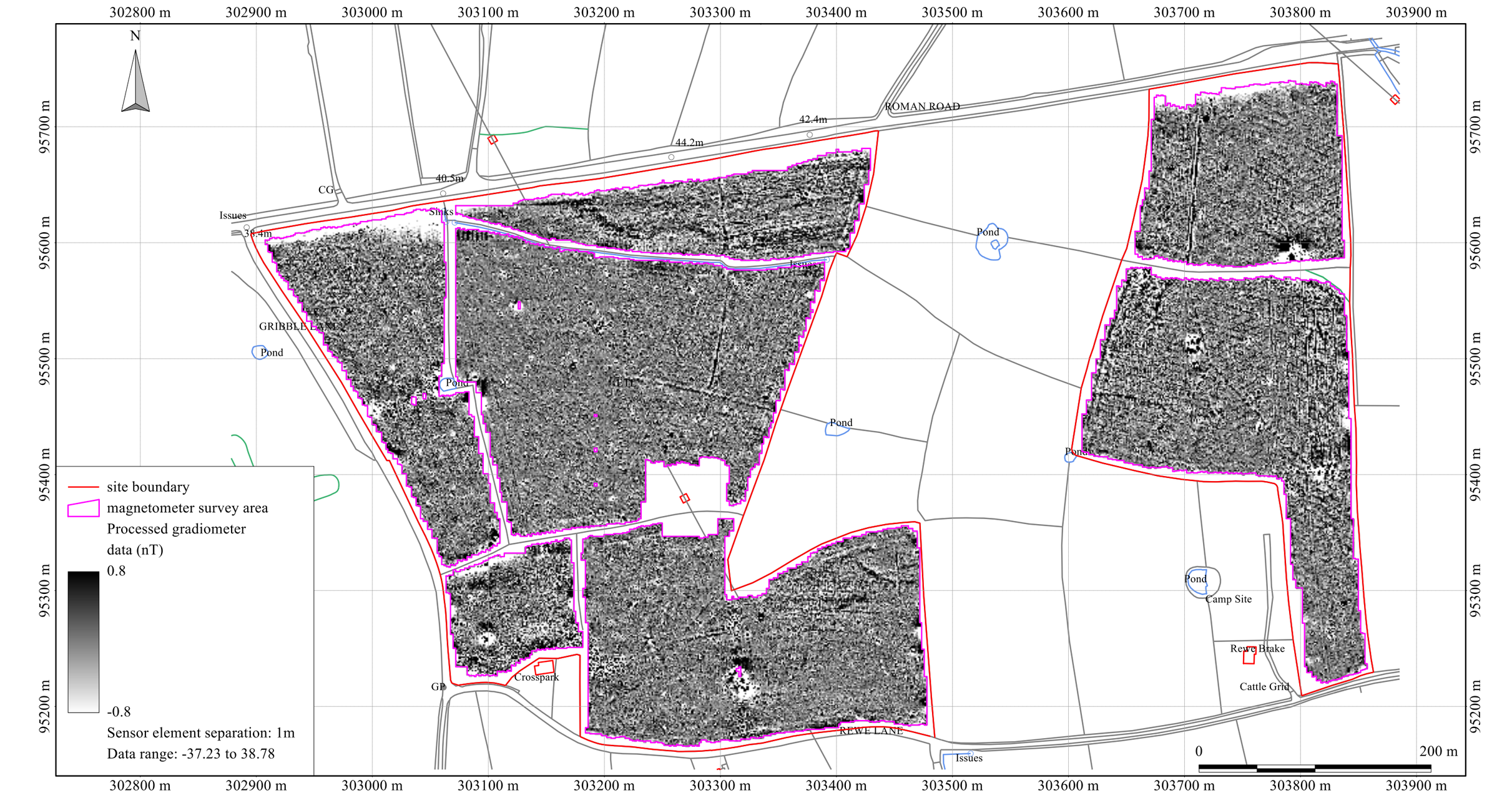

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Figure 6: shade plot of processed data, all plots

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Figure 7: shade plot of processed data, Plots 1, 2 and 3

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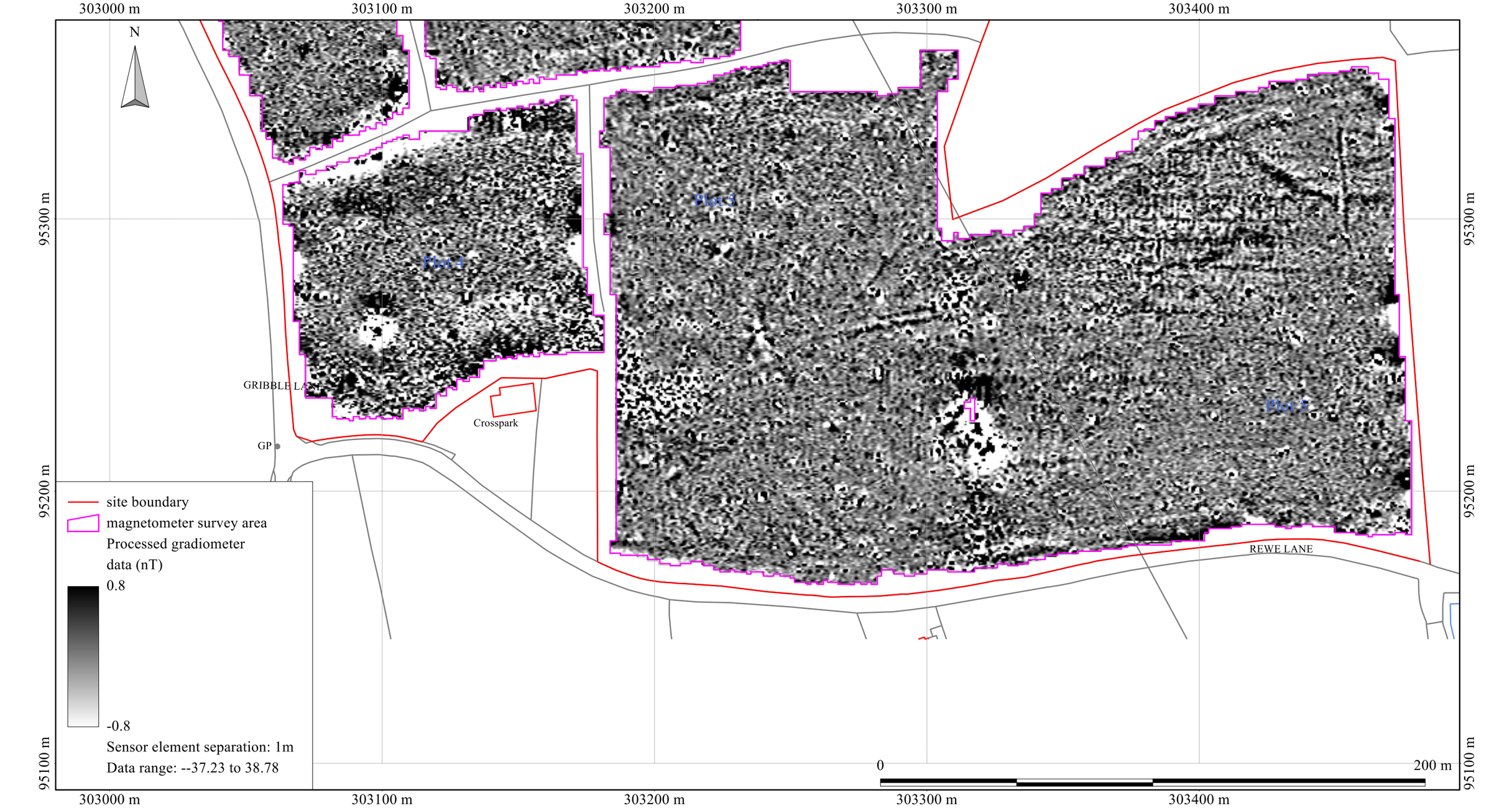

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Figure 8: shade plot of processed data, Plots 4 and 5

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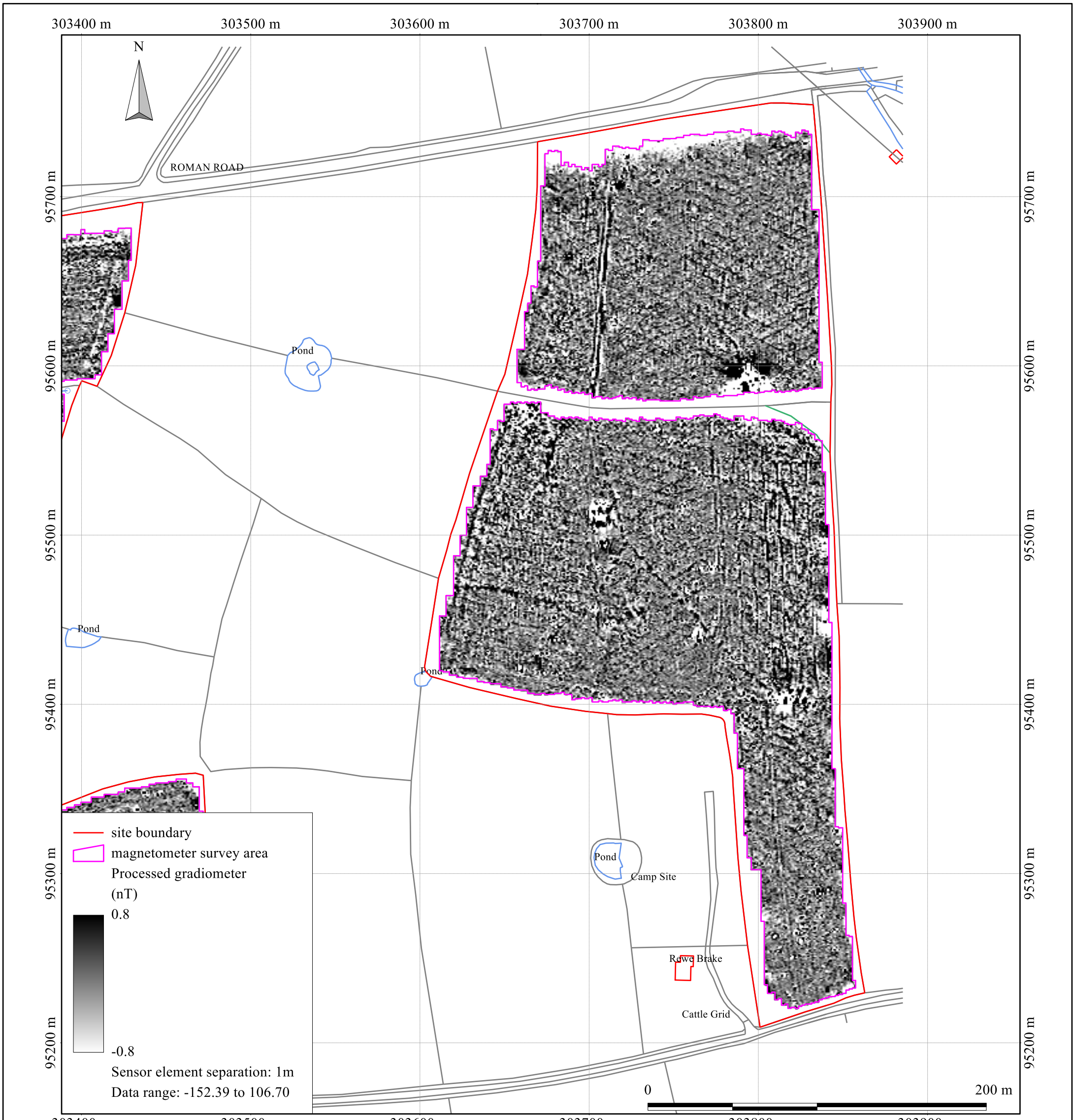

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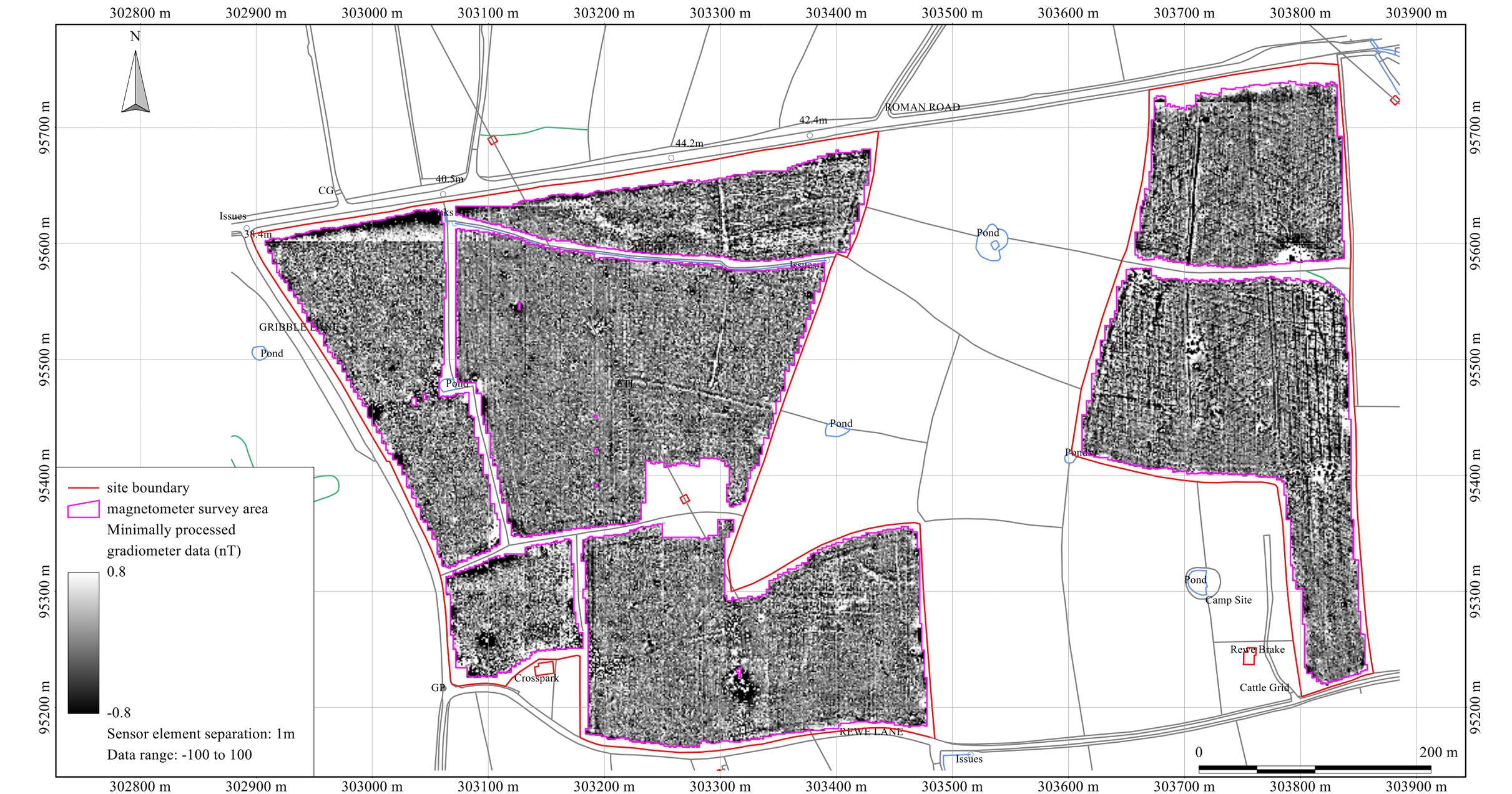
Figure 9: shade plot of processed data, Plots 6 and 7



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An archaeological magnetometer survey
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Figure 10: shade plot of minimally processed data, all plots

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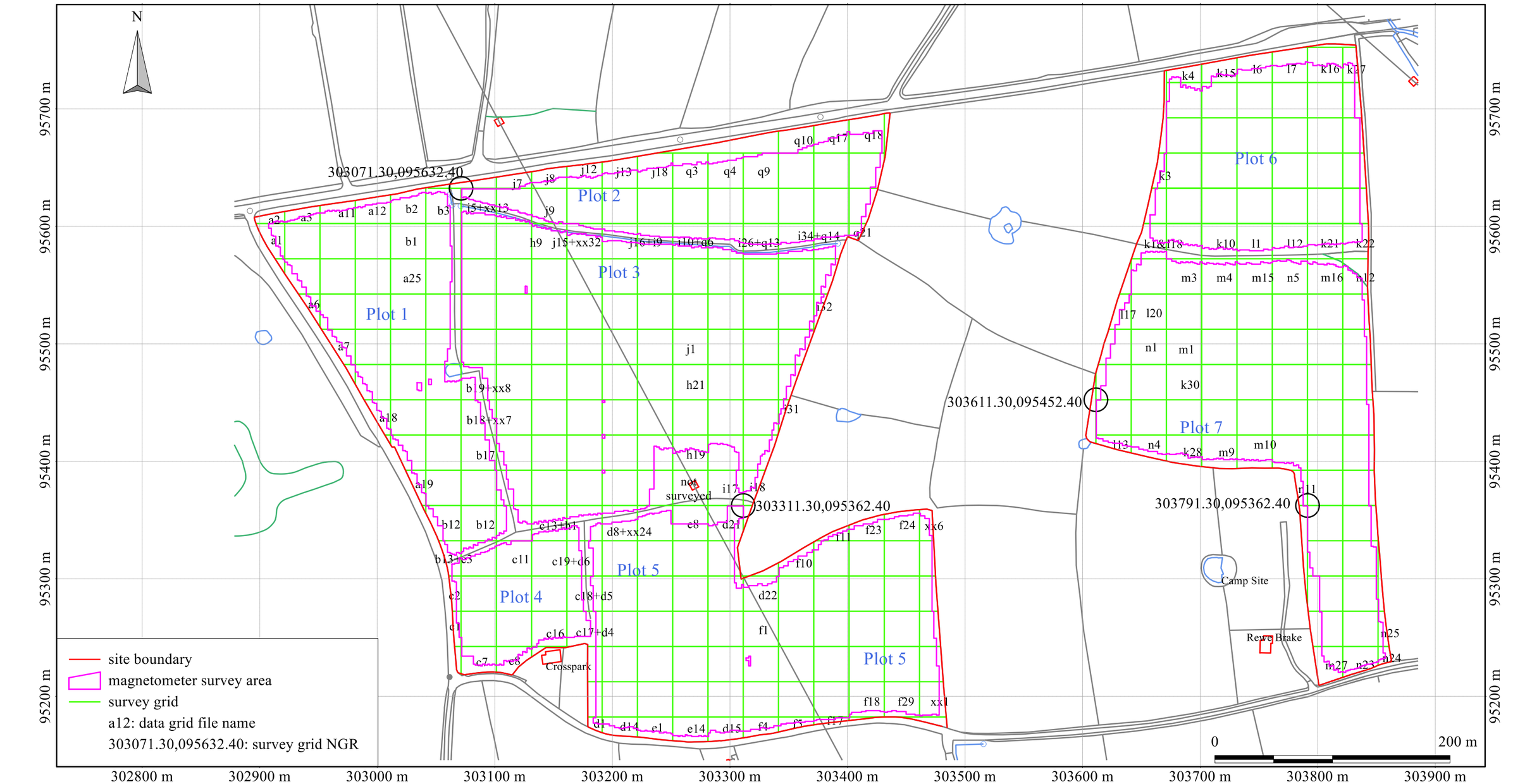

British Grid
centre X: 303334.82 m, centre Y: 95464.45 m

Scale: 1:3300 @ A3. Spatial Units: Meter. Do not scale off this drawing

Notes:
1. The survey grid data file names run south to north/north to south in sequence.
2. Only the start and end data grid file names of each sequence are shown.

An archaeological magnetometer survey
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Figure 11: survey grid plan and location

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Appendix 2 Tables

Site: An archaeological magnetometer survey
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Centred on NGR: 303210,095440 and 303750,095500
Report: 1804ROK-R-1

plot	anomaly group	associated anomalies	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
1	1		likely, enhanced	linear	field boundary - stony deposits and disturbed ground	anomaly group coincides with and likely represents a field boundary recorded on historic maps and removed before 1969	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500 to 1969 1:2500
	2		likely, enhanced	irregular	pond - stony deposits and disturbed ground	anomaly group coincides with and likely represents a pond recorded on historic maps 1889 onwards and removed after 1972	Ordnance Survey 1889 1:250 to 1972 1:1000
	3		likely, enhanced	irregular	pond - stony deposits and disturbed ground	anomaly group coincides with a pond recorded on historic maps 1844 onwards and removed after 1972	1844 Rockbeare tithe map, Ordnance Survey 1889 1:250 to 1972 1:1000
	301		possible, regular narrow linears		field drains		
	302		possible, diploe		ferrous material		
2	4		likely, positive	disrupted linear	field boundary	anomaly group coincides with and likely represents a field boundary recorded on historic maps and removed before 1969	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500 to 1969 1:2500
	5	303	possible, positive	disrupted linear	buried archaeology, cultivation traces or field drains		
	303	5	possible, regular narrow linears		field drains or cultivation traces		
3	6		likely, enhanced	ovoid	quarry - stony deposits and disturbed ground	anomaly group partially coincides with a possible former quarry of medieval to post-medieval date was recorded on the 1844 Rockbeare tithe map, visible as an earthwork pit on aerial photographs of the 1940s onwards and digital images derived from lidar data captured in 2005	MDV112342, 1844 Rockbeare tithe map
	7		possible, positive	disrupted linear	field boundary		
	8		likely, positive	linear	field boundary	anomaly group coincides with and likely represents a field boundary recorded on the 1844 Rockbeare tithe map & removed before 1889	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500
	304		possible, regular narrow linears		field drains		
4	9		possible, enhanced		stony deposits and disturbed ground	anomaly group may reflect buried archaeology or recent disturbance such as ground strengthening with rubble	
	305		possible, diploe		ferrous material		
5	10	12?	possible, enhanced		stony deposits and disturbed ground	anomaly group may reflect buried archaeology or recent disturbance such as ground strengthening with rubble, possibly part of the anomaly may represent material from a demolished field boundary	
	11		possible, positive	linear			
	12	10?	likely, positive/negative/positive		field boundary - possible Devon bank	anomaly group coincides with and likely represents part of a field boundary recorded on historic maps and removed after 1972	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500 to 1972 1:10000
	13		likely, enhanced	disrupted linear	field boundary - stony deposits and disturbed ground	anomaly group coincides with and likely represents part of a field boundary recorded on historic maps and removed after 1972	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500 to 1972 1:10000
	14		likely, enhanced		pond - stony deposits and disturbed ground	anomaly group coincides with and likely represents a pond recorded on historic maps and removed after 1972	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500 to 1972 1:10000
	15		possible, positive	disrupted curvilinear	buried archaeology or natural deposits		
	16		possible, positive	linear			
6	17		likely, positive/negative/positive	disrupted linear	field boundary	anomaly group coincides with and likely represents a field boundary recorded on the Rockbeare tithe map and removed before 1889	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500
	18		likely, high contrast response		ferrous material - possibly associated with a former pond	anomaly group coincides with a pond recorded on historic maps 1844 onwards and removed after 1972	1844 Rockbeare tithe map, Ordnance Survey 1889 1:250 to 1972 1:1000
	306		possible, regular narrow linears		field drains		
7	19		possible, positive	linear			
	20		possible, positive	disrupted linear			
	21		possible, positive	disrupted linear			
	22		likely, enhanced		pond - stony deposits and disturbed ground	anomaly group coincides with and likely represents a pond mapped on the Rockbeare tithe map and removed after 1972	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500 to 1972 1:10000
	23		likely, positive	disrupted linear	field boundary	anomaly group coincides with and likely represents a field boundary recorded on the Rockbeare tithe map and removed after 1972	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500 to 1972 1:10000
	24		possible, positive	disrupted linear			
	25		possible, positive	disrupted linear			
	26		possible, positive	linear			
	27		possible, positive	disrupted linear			
	28		likely, enhanced	linear	field boundary - stony deposits and disturbed ground	anomaly group coincides with and likely represents part of a field boundary recorded on historic maps and removed after 1972	1844 Rockbeare tithe map, Ordnance Survey 1889 1:250 to 1972 1:1000
	29		likely, enhanced		pond - stony deposits and disturbed ground	anomaly group coincides with and likely represents a pond recorded on historic maps 1889 onwards and removed after 1972	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500 to 1972 1:10000
	101		possible, repeated parallels		cultivation traces	anomaly group represents cultivation traces confined to the west by a former field boundary mapped in 1844 and removed before 1889	1844 Rockbeare tithe map, Ordnance Survey 1889 1:2500

Table 1: data analysis

Grid *Method of Fixing:* DGPS set-out using pre-planned survey grids and Ordnance Survey coordinates. *Composition:* 30m by 30m grids *Recording:* Geo-referenced and recorded using digital map tiles. *DGPS used:* Spectra Precision PM5V2 GPS with external antenna and survey pole and DigiTerra Explorer 7 as the survey control program.	
Equipment *Instrument:* Bartington Instruments grad601-2 *Firmware:* version 6.1	**Data Capture** *Sample Interval:* 0.25m *Traverse Interval:* 1 metre *Traverse Method:* zigzag *Traverse Orientation:* GN
Data Processing, Analysis and Presentation Software IntelliCAD 8.4 DW Consulting TerraSurveyor3 Manifold System 8 GIS Microsoft Corp. Office 365: Excel, Publisher, Word Adobe Systems Inc Adobe Acrobat 9 Pro Extended	

Table 2: methodology information

Instrument

Type: Bartington Grad-601 gradiometer
Units: nT
Direction of 1st Traverse: see below
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing, each with 1m separation
Dummy Value: 32702

Program

Name: TerraSurveyor
Version: 3.0.33.6

Statistics

Max:	38.78
Min:	-37.23
Std Dev:	2.22
Mean:	0.00
Median:	0.00

Processing

Processes: 17

1 Base Layer
2 Search & Replace From: -3000 To: 3000 With: Dummy (Area: Top 358, Left 780, Bottom 395, Right 828)
3 Search & Replace From: -3000 To: 3000 With: Dummy (Area: Top 361, Left 818, Bottom 377, Right 836)
4 Clip at 1.00 SD
5 DeStripe Median Traverse: Grids: d1.xgd d14.xgd e1.xgd e14.xgd d15.xgd f4.xgd f5.xgd f17.xgd d2.xgd d13.xgd e2.xgd e13.xgd d16.xgd f3.xgd f6.xgd f16.xgd f18.xgd f29.xgd xx1.xgd c7.xgd c8.xgd d3.xgd d12.xgd e3.xgd e12.xgd d17.xgd f2.xgd f7.xgd f15.xgd f19.xgd f28.xgd xx2.xgd c1.xgd c6.xgd c9.xgd c16.xgd c17+d4.xgd d11.xgd e4.xgd e11.xgd d18.xgd f1.xgd f8.xgd f14.xgd f20.xgd f27.xgd xx3.xgd c2.xgd c5.xgd c10.xgd c15.xgd c18+d5.xgd d10.xgd e5.xgd e10.xgd d19.xgd d22.xgd f9.xgd f13.xgd f21.xgd f26.xgd xx4.xgd b13+c3.xgd c4+b14.xgd c11.xgd c14.xgd c19+d6.xgd d9.xgd e6.xgd e9.xgd d20.xgd f10.xgd f12.xgd f22.xgd f25.xgd xx5.xgd b12.xgd b15.xgd b21+xx23.xgd c13+h1.xgd d7+c20+h18.xgd d8+xx24.xgd i1+e7.xgd e8.xgd d21.xgd f11.xgd f23.xgd f24.xgd xx6.xgd a19.xgd b11.xgd b16.xgd xx22+b20.xgd h2.xgd h17.xgd xx25.xgd i2.xgd i17.xgd i18.xgd a20.xgd b10.xgd b17.xgd xx21.xgd h3.xgd h16.xgd xx26.xgd i3.xgd h19.xgd i16.xgd i19.xgd a18.xgd a21.xgd b9.xgd b18+xx7.xgd xx20.xgd h4.xgd h15.xgd xx27.xgd i4.xgd h20.xgd i15.xgd i20.xgd i31.xgd a17.xgd a22.xgd b8.xgd xx8+b19.xgd xx19.xgd h5.xgd h14.xgd xx28.xgd i5.xgd h21.xgd i14.xgd i21.xgd i30.xgd a7.xgd a16.xgd a23.xgd b7.xgd xx9.xgd xx18.xgd h6.xgd h13.xgd xx29.xgd i6.xgd j1.xgd i13.xgd i22.xgd i29.xgd a6.xgd a8.xgd a15.xgd a24.xgd b6.xgd xx10.xgd xx17.xgd h7.xgd h12.xgd xx30.xgd i7.xgd j2.xgd i12.xgd i23.xgd i28.xgd i32.xgd a5.xgd a9.xgd a14.xgd a25.xgd b5.xgd xx11.xgd xx16.xgd h8.xgd h11.xgd xx31.xgd i8.xgd j3.xgd i11.xgd i24.xgd i27.xgd i33.xgd a1.xgd a4.xgd a10.xgd a13.xgd b1.xgd b4.xgd xx12.xgd xx15.xgd h9.xgd h10+j10.xgd xx32+j15.xgd j16+i9.xgd q1+j4.xgd i10+q6.xgd i25+q7.xgd i26+q13.xgd i34+q14.xgd q21.xgd
6 DeStripe Median Traverse: Grids: xx13+j5.xgd xx14+j6.xgd j9.xgd j11.xgd j14.xgd j17.xgd q2.xgd q5.xgd q8.xgd q12.xgd q15.xgd q20.xgd j7.xgd j8.xgd j12.xgd j13.xgd j18.xgd q3.xgd q4.xgd q9.xgd q11.xgd q16.xgd q19.xgd q10.xgd q17.xgd q18.xgd
7 De Stagger: Grids: c1.xgd c2.xgd b13+c3.xgd b12.xgd a19.xgd b11.xgd a20.xgd b10.xgd a18.xgd a21.xgd b9.xgd a17.xgd a22.xgd b8.xgd a7.xgd a16.xgd a23.xgd b7.xgd a6.xgd a8.xgd a15.xgd a24.xgd b6.xgd a5.xgd a9.xgd a14.xgd a25.xgd b5.xgd a1.xgd a4.xgd a10.xgd a13.xgd b1.xgd b4.xgd a2.xgd a3.xgd a11.xgd a12.xgd b2.xgd b3.xgd By: 0 intervals, 50.00cm
8 De Stagger: Grids: c7.xgd c8.xgd c6.xgd c9.xgd c16.xgd c5.xgd c10.xgd c15.xgd c4+b14.xgd c11.xgd c14.xgd b15.xgd b21+xx23.xgd c13+h1.xgd By: 0 intervals, 50.00cm
9 De Stagger: Grids: e1.xgd e14.xgd e2.xgd e13.xgd e3.xgd e12.xgd e4.xgd e11.xgd e5.xgd e10.xgd e6.xgd e9.xgd i1+e7.xgd e8.xgd By: 0 intervals, 50.00cm
10 De Stagger: Grids: c13+h1.xgd d7+c20+h18.xgd h2.xgd h17.xgd h3.xgd h16.xgd h4.xgd h15.xgd h5.xgd h14.xgd h6.xgd h13.xgd h7.xgd h12.xgd h8.xgd h11.xgd h9.xgd h10+j10.xgd By: 0 intervals, 50.00cm
11 De Stagger: Grids: xx13+j5.xgd xx14+j6.xgd j9.xgd j11.xgd j14.xgd j17.xgd j7.xgd j8.xgd j12.xgd j13.xgd j18.xgd By: 0 intervals, 50.00cm
12 De Stagger: Grids: j1.xgd j2.xgd j3.xgd q1+j4.xgd By: 0 intervals, 50.00cm
13 De Stagger: Grids: i2.xgd i17.xgd i18.xgd i3.xgd h19.xgd i16.xgd i19.xgd i4.xgd h20.xgd i15.xgd i20.xgd i31.xgd i5.xgd h21.xgd i14.xgd i21.xgd i30.xgd i6.xgd j1.xgd i13.xgd i22.xgd i29.xgd i7.xgd j2.xgd i12.xgd i23.xgd i28.xgd i32.xgd i8.xgd j3.xgd i11.xgd i24.xgd i27.xgd i33.xgd By: 0 intervals, 50.00cm
14 De Stagger: Grids: d18.xgd By: 0 intervals, -50.00cm
15 DeStripe Median Traverse: Grids: b2.xgd b3.xgd
16 Edge Match (Area: Top 120, Left 1800, Bottom 149, Right 1919) to Left edge
17 Edge Match (Area: Top 150, Left 1800, Bottom 179, Right 1919) to Left edge

Interpolate match x & y double is imposed on export to the GIS

Table 3: processed data metadata, Plots 1 to 5

Instrument

Type: Bartington Grad-601 gradiometer
Units: nT
Direction of 1st Traverse: see below
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing, each with 1m separation
Dummy Value: 32702

Program

Name: TerraSurveyor
Version: 3.0.33.6

Statistics	
Max:	106.70
Min:	-152.39
Std Dev:	4.58
Mean:	-0.02
Median:	0.00

Processing

1 Base Layer
2 Clip from -100.00 to 100.00 nT
3 DeStripe Median Traverse: Grids: m27.xgd n23.xgd n24.xgd m26.xgd n22.xgd n25.xgd m25.xgd n21.xgd m24.xgd n20.xgd m23.xgd n19.xgd n11.xgd m22.xgd n18.xgd l13.xgd n04.xgd k28.xgd m09.xgd m10.xgd n10.xgd m21.xgd n17.xgd l14.xgd n03.xgd k29.xgd m08.xgd m11.xgd n09.xgd m20.xgd n16.xgd l15.xgd n02.xgd k30.xgd m07.xgd m12.xgd n08.xgd m19.xgd n15.xgd l16.xgd n01.xgd m01.xgd m06.xgd m13.xgd n07.xgd m18.xgd n14.xgd l17.xgd l20.xgd m02.xgd m05.xgd m14.xgd n06.xgd m17.xgd n13.xgd l19.xgd m03.xgd m04.xgd m15.xgd n05.xgd m16.xgd n12.xgd k1+l18.xgd k9.xgd k10.xgd l1.xgd l12.xgd k21.xgd k22.xgd k2.xgd k8.xgd k11.xgd l2.xgd l11.xgd k20.xgd k23.xgd k3.xgd k7.xgd k12.xgd l3.xgd l10.xgd k19.xgd k24.xgd k6.xgd k13.xgd l4.xgd l9.xgd k18.xgd k25.xgd k5.xgd k14.xgd l5.xgd l8.xgd k17.xgd k26.xgd
4 DeStripe Median Traverse: Grids: l7.xgd
5 Edge Match (Area: Top 150, Left 2040, Bottom 179, Right 2159) to Left edge
6 DeStripe Median Traverse: Grids: l6.xgd
7 Edge Match (Area: Top 120, Left 2040, Bottom 149, Right 2159) to Left edge
8 DeStripe Median Traverse: Grids: k16.xgd
9 DeStripe Median Traverse: Grids: k27.xgd
10 De Stagger: Grids: l13.xgd l14.xgd l15.xgd l16.xgd l17.xgd By: 0 intervals, 50.00cm
11 De Stagger: Grids: n04.xgd n03.xgd n02.xgd n01.xgd By: 0 intervals, 50.00cm
12 De Stagger: Grids: l1.xgd l12.xgd l2.xgd l11.xgd l3.xgd l10.xgd l4.xgd l9.xgd l5.xgd l8.xgd l6.xgd l7.xgd By: 0 intervals, 50.00cm
13 De Stagger: Grids: n02.xgd By: 0 intervals, -50.00cm
14 De Stagger: Grids: All By: 0 intervals, -50.00cm

Interpolate match x & y double is imposed on export to the GIS

Table 4: processed data metadata, Plots 6 and 7

Instrument	
Type:	Bartington Grad-601 gradiometer
Units:	nT
Direction of 1st Traverse:	see below
Collection Method:	ZigZag
Sensors:	2 @ 1.00 m spacing, each with 1m separation
Dummy Value:	32702
Program	
Name:	TerraSurveyor
Version:	3.0.33.6

Statistics		**Processing**
Max:	100.00	1 Base Layer
Min:	-100.00	2 Search & Replace From: -3000 To: 3000 With: Dummy (Area: Top 358, Left 780, Bottom 395, Right 828)
Std Dev:	3.23	3 Search & Replace From: -3000 To: 3000 With: Dummy (Area: Top 361, Left 818, Bottom 377, Right 836)
Mean:	0.01	4 DeStripe Median Sensors: Grids: All
Median:	0.00	5 Clip from -100.00 to 100.00 nT
		l
		Interpolate match x & y double is imposed on export to the GIS

Table 5: minimally processed data metadata, Plots 1 to 5

Instrument	
Type:	Bartington Grad-601 gradiometer
Units:	nT
Direction of 1st Traverse:	see below
Collection Method:	ZigZag
Sensors:	2 @ 1.00 m spacing, each with 1m separation
Dummy Value:	32702
Program	
Name:	TerraSurveyor
Version:	3.0.33.6

Statistics		**Processing**
Max:	100.00	1 Base Layer
Min:	-100.00	2 DeStripe Median Sensors: Grids: All
Std Dev:	4.62	3 Clip from -100.00 to 100.00 nT
Mean:	-0.02	
Median:	0.00	Interpolate match x & y double is imposed on export to the GIS

Table 6: minimally processed data metadata, Plots 6 and 7

Appendix 3 Project archive contents

A3.1 Substrata Limited archive

A full archive of this survey will be held by Substrata Limited on cloud and local hard drive storage as follows:

Report:	Adobe PDF format
Raw grid & composite files:	DW Consulting TerraSurveyor 3 format xyz files
Final data processing composite files: (excluding interpolation processes)	DW Consulting TerraSurveyor 3 format xyz files
GIS project:	GIS project Manifold 8 .map format ESRI shape files
AutoCAD version of the survey interpretation: (if generated)	AutoCAD DXF
All project working files:	various (Table 2)

A3.2 Online Access to the Index of archaeological investigationS (OASIS)

Metadata:	online form
Georeferenced survey boundary file:	ESRI shape file
Report:	Adobe PDF format

A3.3 Archaeological Data Service

Depending on local authority policy, an archive may be deposited with the ADS as follows:

Raw data composite file:	xyz file
Processed data plot:	rendered images in TIFF format
Survey grid plot:	image in TIFF format
Details of data processing:	image in TIFF format
Interpretation plot:	rendered images in TIFF format
Metadata:	Microsoft Excel format

A3.4 Historic Environment Record (HER)

Subject to any contractual requirements on confidentiality, a PDF copy of the report will be submitted to the appropriate HER within 6 months of the completion of this report via the OASIS process or by other means, depending on the relevant HER process.