

Substrata

Archaeological Geophysical Surveyors

An archaeological magnetometer survey
**Land adjacent to the Nobody Inn,
Doddiscombsleigh, Devon**

Centred on NGR (E/N): 285653,086615

Report: 1806DODR-1

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1 Introduction

This report presents the results of an archaeological geophysical survey at the site listed in Section 4 and shown in Figure 1, hereafter referred to as the ‘Survey Area’. It was commissioned by AC Archaeology Ltd on behalf of clients in relation to a forthcoming planning application for a proposed residential development at the site. The commissioning of this report was in keeping with the National Planning Policy Framework, Paragraph 128 (Department for Communities and Local Government, 2012). The survey and report were completed in compliance with a Survey Method Statement (Dean, 2018).

2 Client

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

3 Copyright

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4 Survey type and location

4.1 Survey

Method:	shallow depth magnetometer survey
Instrument:	twin-sensor fluxgate gradiometer
Date:	26 June 2018
Area:	0.5ha

4.2 Location

Site name:	Land adjacent to the Nobody Inn
Address:	Doddiscombsleigh, Devon
Civil Parish:	Doddiscombsleigh
District:	Teignbridge
County:	Devon
Nearest postcode:	EX6 7PS
Survey centre NGR:	SX 85653 86615
Survey centre NGR (E/N):	285653,086615
Historic environment designation:	None

5 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 14). 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 6.

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.

Two groups may represent extant, negative earthworks, possibly remnant ridge-and-furrow, recorded during a walkover survey by AC Archaeology Ltd. A third group represents burnt

deposits from a long term bonfire site in use since at least 2010. A fourth group is likely to represent made ground associated with a field gate.

6 Aims and objectives

6.1 Aims

1. 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.
2. Provide sufficient information on the nature of any archaeological remains to facilitate the assessment of their interest prior to the determination of the planning application.

6.2 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.

7 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).

8 Methodology

The magnetometer survey was undertaken in accordance a Survey Method Statement (Dean, 2018) to achieve the aims and objectives set out in Section 6 using the standards and guidance specified in Section 7. The survey method was selected to provide a relatively fast and cost-effective evaluation of any buried archaeology across the Survey Area (see Section 14).

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).

9 Survey Area

9.1 Location and description

The survey area, hereafter referred to as the ‘Survey Area’ comprises the majority of a field within the small village of Doddiscombsleigh (Figure 1). The field is bounded by Perry Lane to the north, a track leading to the Church of St Michael to the east, and agricultural land to the south and west. The Nobody Inn and associated car park are situated further to the west. The field is bounded by hedges over earth banks with some trees within the banks (AC Archaeology, 2018 p. 2).

The Survey Area is relatively flat, lies between approximately 105m and 107m aOD and was under cut grass at the time of the survey.

9.2 Geology

The bedrock across the Survey Area is interbedded mudstone and sandstone of the Carboniferous Crackington Formation. A geological fault runs close to the southern boundary of the Survey Area with a solid geology of mudstone of the Carboniferous Ashton Mudstone Member to the south of the fault. Generically, the Crackington Formation comprises

rhythmically bedded, dark blue-grey mudstones and subordinate predominantly grey sandstones and siltstones. The Ashton Formation is composed of greyish blue, rusty-weathering mudstones with scattered thin sooty goniatite-bearing mudstones. Scattered siltstones and sandstones (up to 7cm thick) form less than 10% of the Member. The superficial geology is not recorded in the source used (British Geological Survey, undated).

9.3 Soils and near-surface deposits

The topsoil is 'Slowly permeable seasonally wet acid loamy and clayey soils' (LandIS, undated).

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

10 Archaeological background

10.1 Historic landscape characterisation

'Medieval enclosures based on strip fields.'

This area was probably first enclosed with hedge-banks during the later middle ages. The curving form of the hedge-banks suggests that earlier it may have been farmed as open strip-fields (Devon County Council, undated).

10.4 Archaeological summary

As part of a programme of archaeological works to which this report contributes, AC Archaeology Limited produced a Historic Environment Assessment which included a summary of the recorded archaeology within a 1000m radius of the Survey Area (Pink, Passmore and Costen, 2018). The Assessment concludes that there are no heritage assets currently recorded within the site on the Devon Historic Environment Record, although it is situated with an area of 'high' archaeological potential, as suggested by the Conservation Area character appraisal for Doddiscombsleigh.

A site walkover conducted as part of the Assessment identified three negative earthworks within the site along with a fourth earthwork within the field but to the west, beyond the site boundary. The parallel nature of three of these earthworks indicate that they are contemporary, and their broad character possibly indicates that they are the remains of ploughed out medieval ridge and furrow (ibid p.1, 13, 14, 23).

11 Results

11.1 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 variations 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.

11.2 Analysis

Figure 2 shows the interpretation of the survey data and includes 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.

Figure 2 and Table 1 comprise the analysis of the survey data.

Figures 3 and 4 are plots of the processed data as specified in Table 3. Figure 5 is a plot of

minimally processed data as specified in Table 4. Figure 6 shows the location of the survey grid and grid data files.

12 Discussion

12.1 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 Figure 2 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.

Data trends

One set of linear trends were recorded in the data. It is likely to reflect relatively recent ploughing disturbance (group **101**, Figure 2).

12.2 Data relating to historic maps and other records

None of the magnetic anomaly groups relate to known historic assets.

12.3 Data with no previous archaeological provenance

Referring to Figure 2, magnetic anomaly groups **102** and **103** coincide with negative earthworks recorded by AC Archaeology in their recent Historical Environment Assessment (Pink, Passmore and Costen, 2018 p.1, 13, 14, 23).

Anomaly groups **301**, **302** and **305** are likely to represent relatively recent buried iron or steel objects.

Group **303** coincides with an area of burnt ground used as a bonfire area. Single-use bonfire sites rarely affect the surrounding magnetic response but, in this case, the coincidence of the location of a bonfire cleared of ash while the surveyor was on site along with its visibility on Google Earth since January 2010 (Google Earth Pro, 2018) suggest that the bonfire was responsible for the burnt deposits.

Group **304** is likely to represent made up ground associated with a field gate.

13 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.

Two groups (102 and 103) may represent extant, negative earthworks, possibly remnant ridge-and-furrow, recorded during a walk over by AC Archaeology Ltd (Pink, Passmore and Costen, 2018). A third group (303) represents burnt deposits from a long term bonfire site in use since at least 2010. A fourth group (304) is likely to represent made ground associated with a field gate.

14 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.

15 Archive

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

OASIS ID: substrat1-322810

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

15.2 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.

15.3 Archaeological Data Service (ADS)

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

15.4 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.

16 Acknowledgements

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

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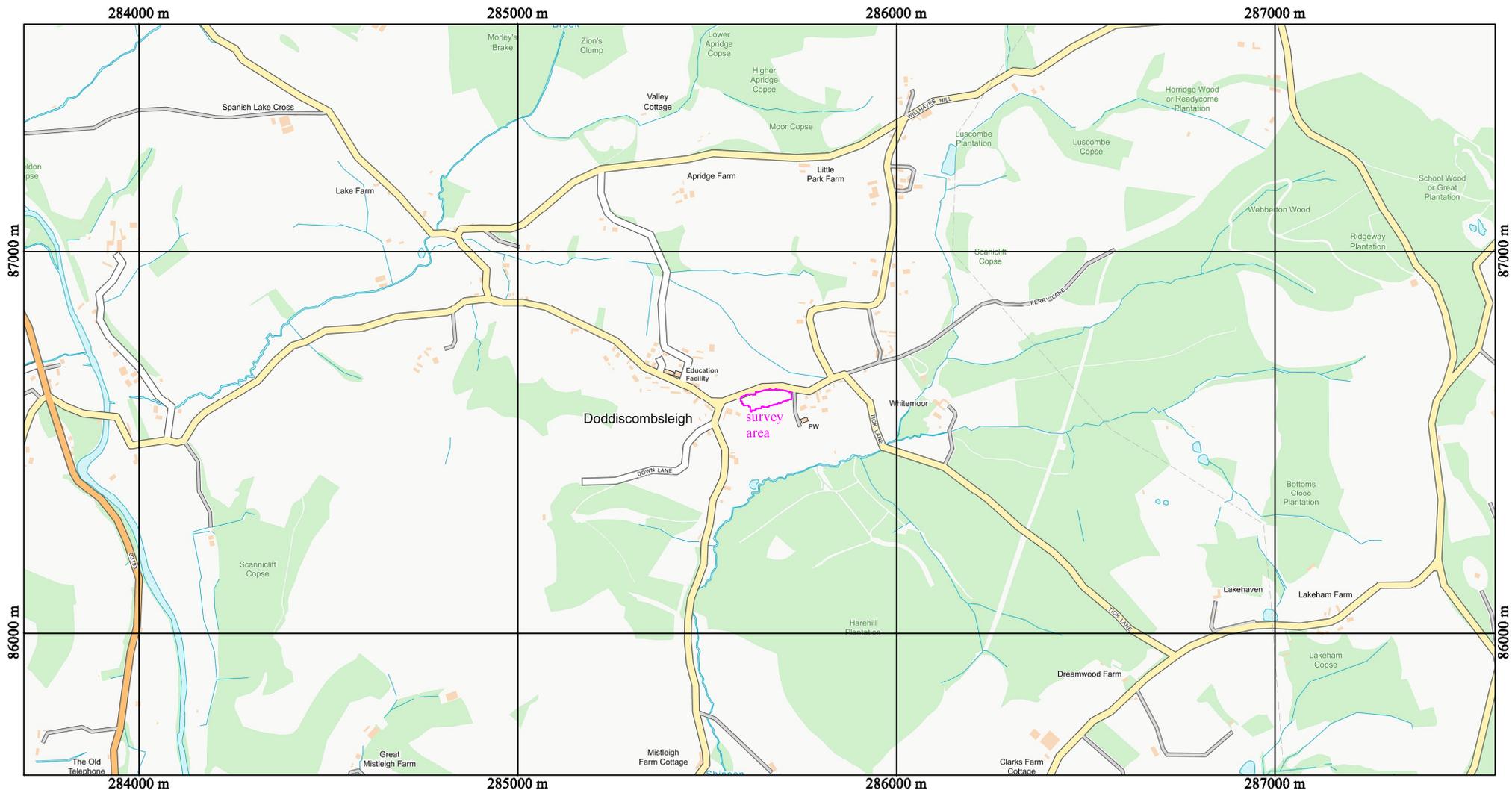
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Appendix 1 Figures

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
 centre X: 285638.12 m, centre Y: 86611.57 m

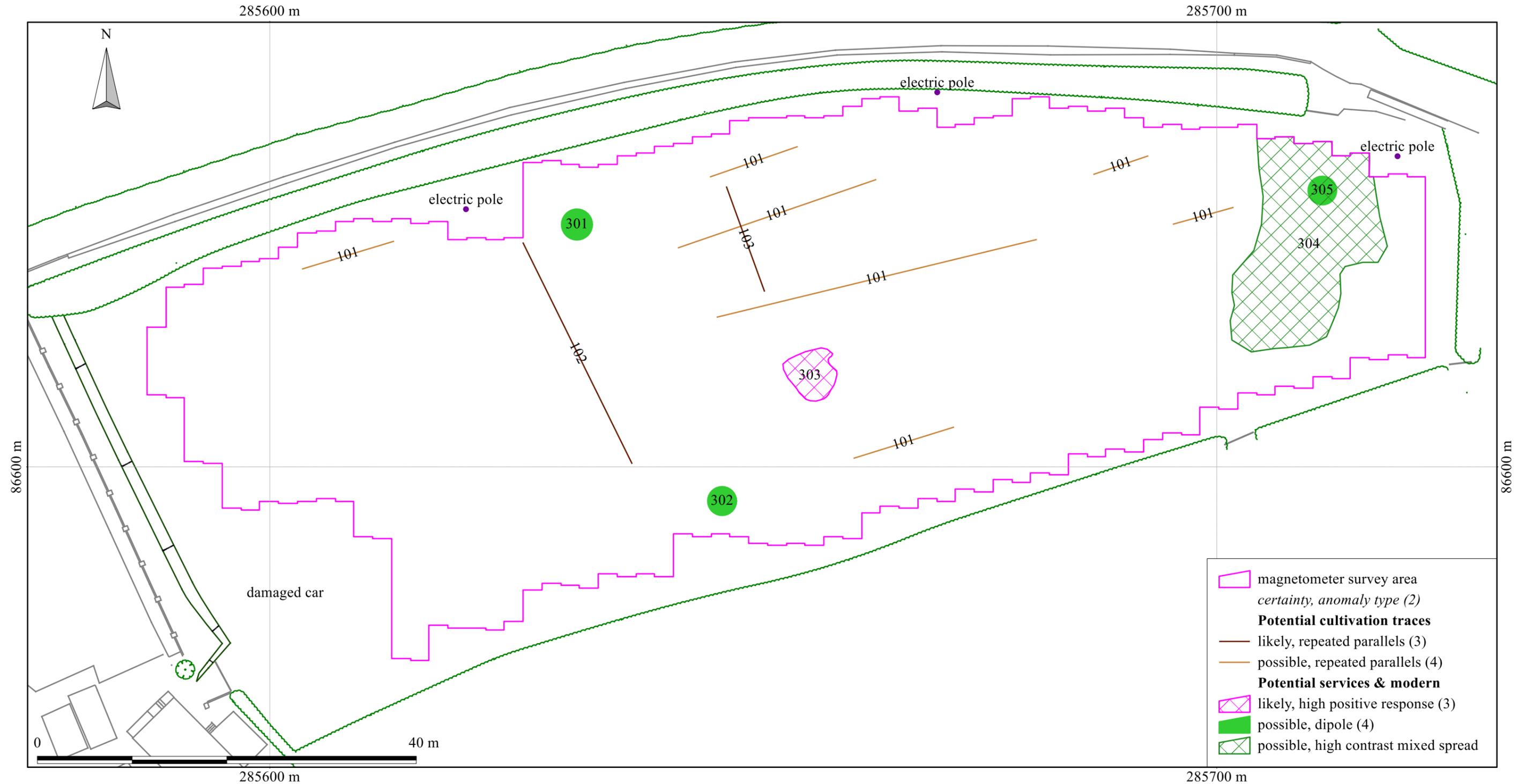
Geophysical survey: Copyright Substrata Limited.
 Base map: Copyright West Country Land Surveyors Ltd

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

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 Report 1806DOD-R-1

Figure 1 location map

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British Grid
 centre X: 285652.00 m, centre Y: 86607.62 m

Geophysical survey: Copyright Substrata Limited.
 Base map: Copyright West Country Land Surveyors Ltd

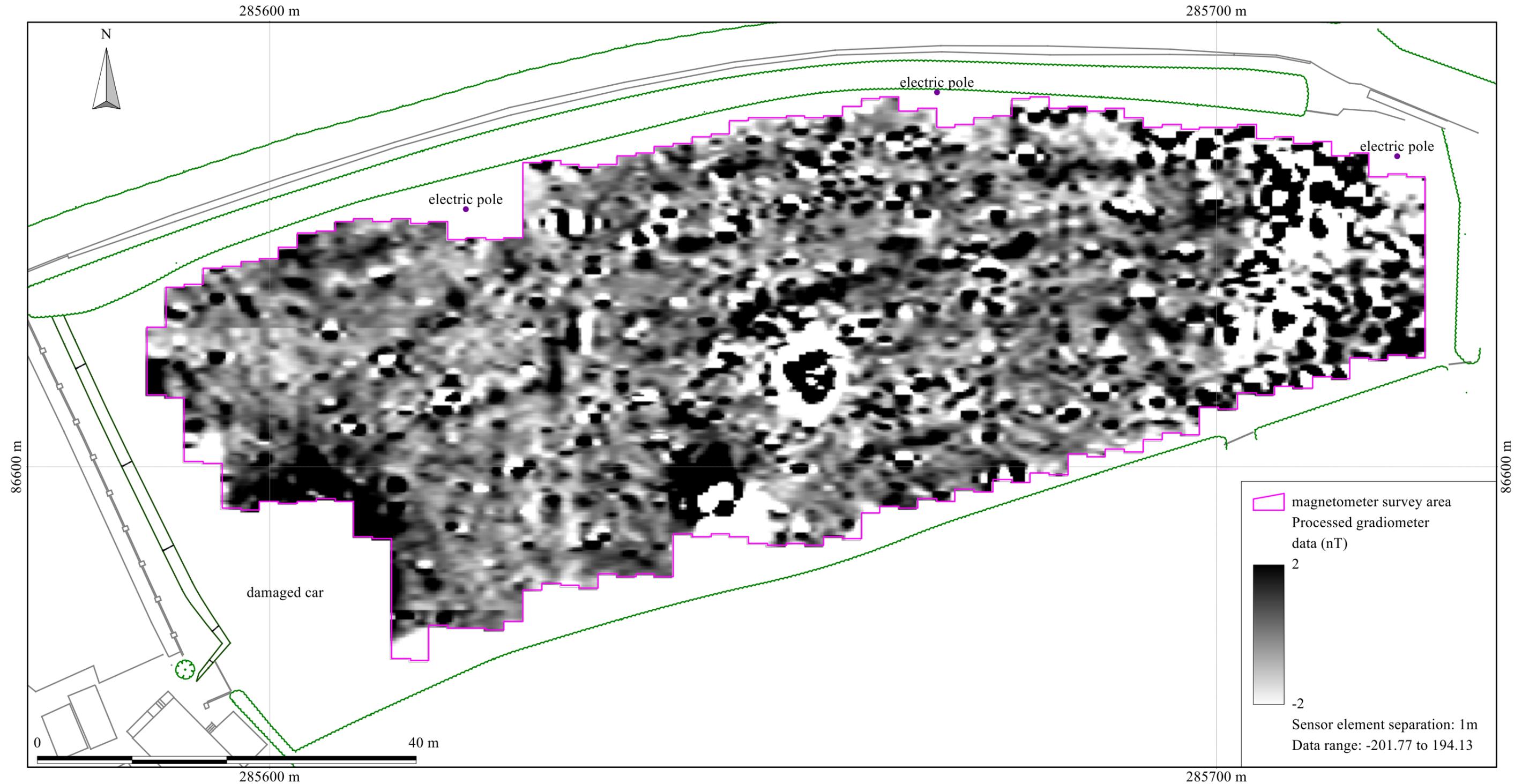
Notes: Scale: 1:400 @ A3. Spatial Units: Meter. Do not scale off this drawing

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 analysis

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British Grid
 centre X: 285652.00 m, centre Y: 86607.62 m

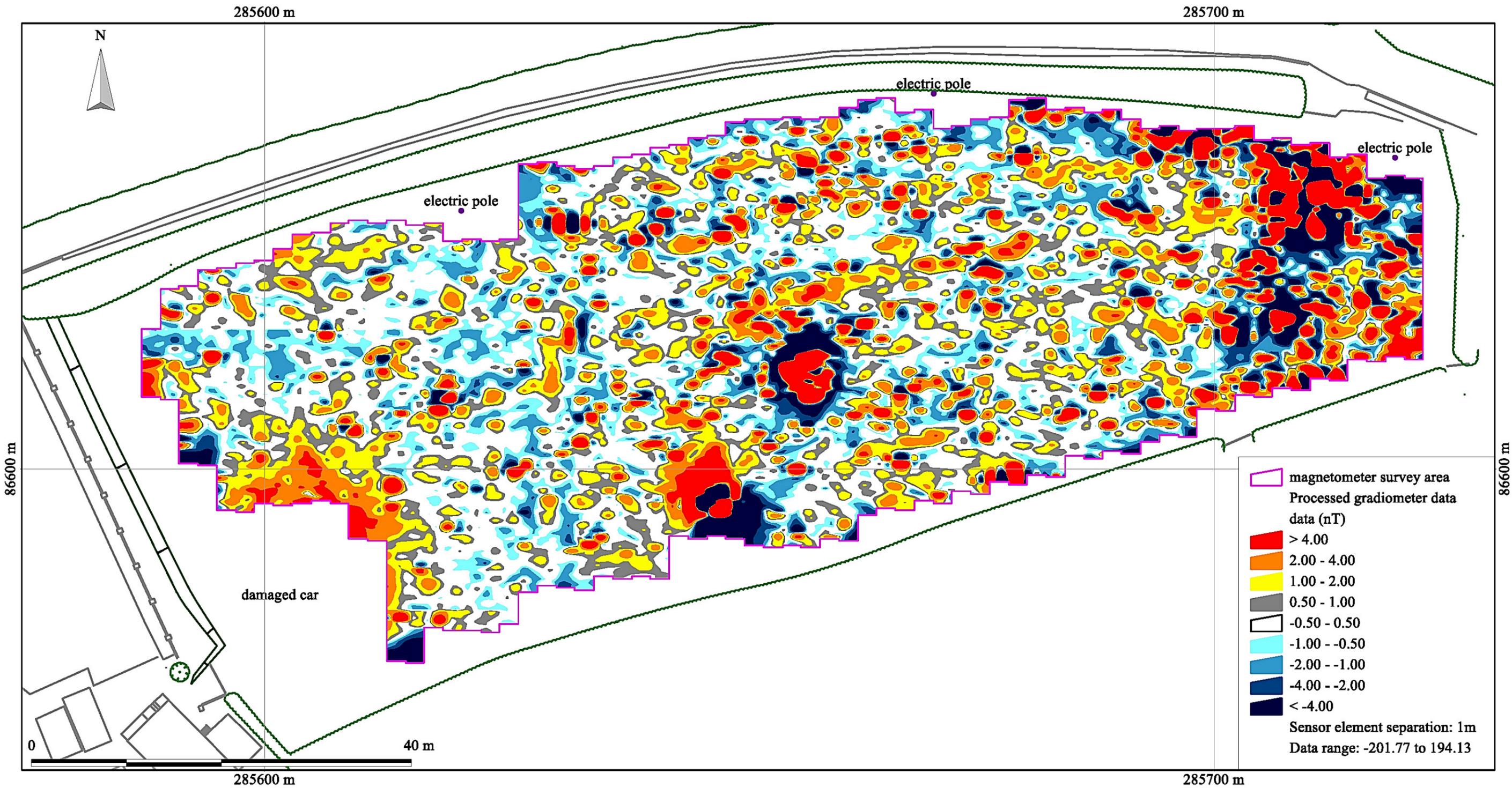
Geophysical survey: Copyright Substrata Limited.
 Base map: Copyright West Country Land Surveyors Ltd

Scale: 1:400 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 3: shade plot of processed data

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British Grid
centre X: 285652.00 m, centre Y: 86607.62 m

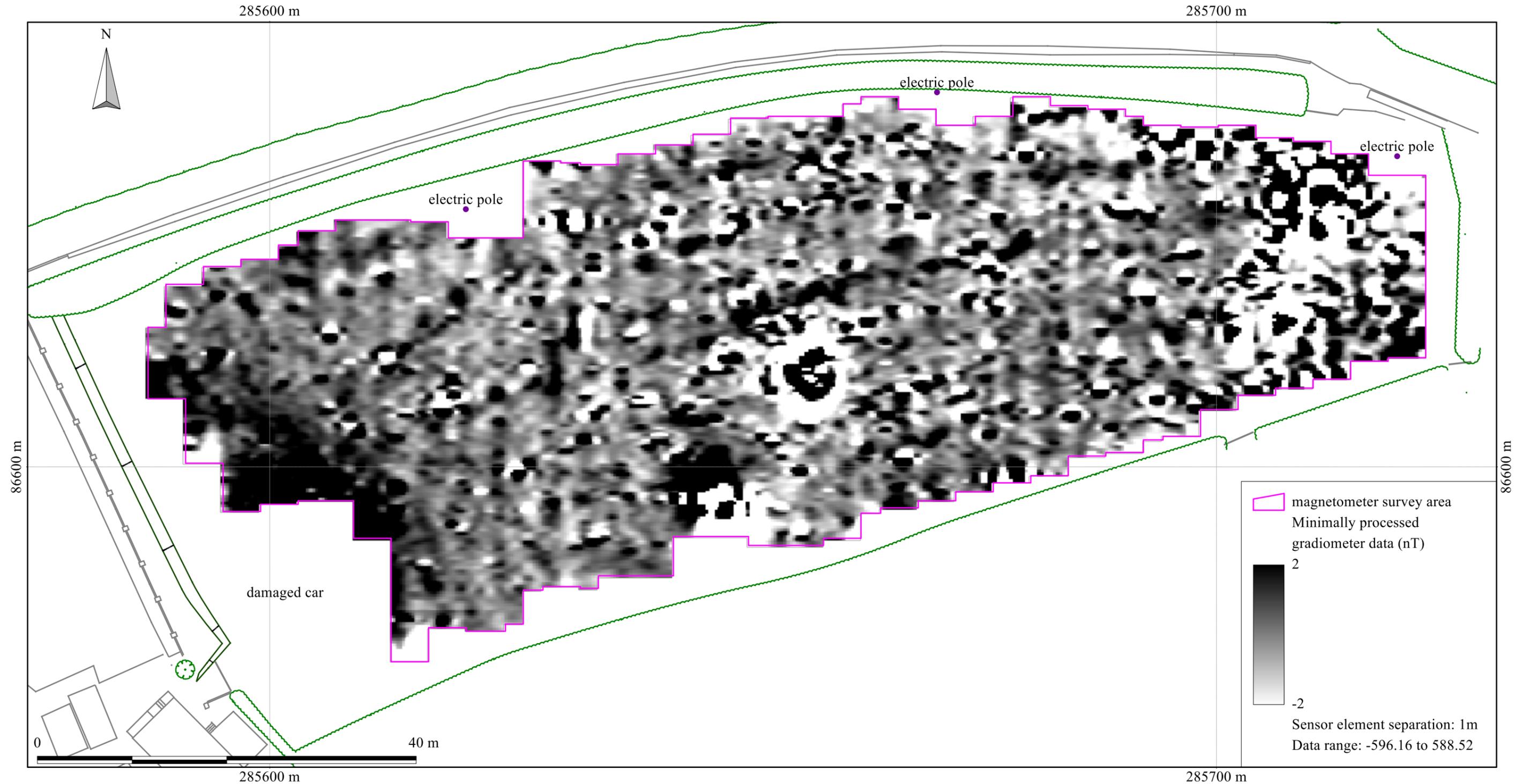
Geophysical survey: Copyright Substrata Limited.
Base map: Copyright West Country Land Surveyors Ltd

Scale: 1:400 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 4: contour plot of processed data

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Email: enquiries@substrata.co.uk
Web: substrata.co.uk



British Grid
 centre X: 285652.00 m, centre Y: 86607.62 m

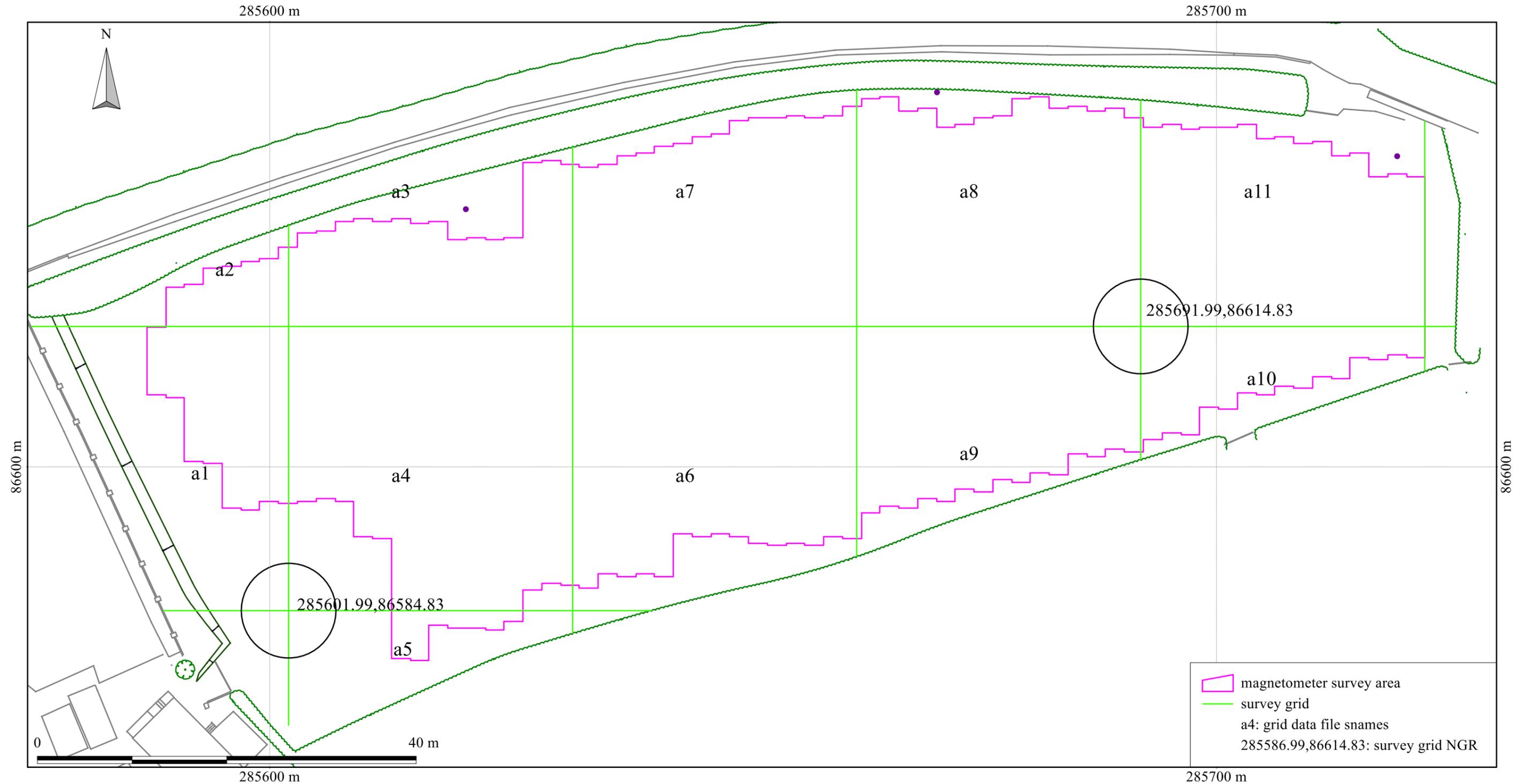
Geophysical survey: Copyright Substrata Limited.
 Base map: Copyright West Country Land Surveyors Ltd

Scale: 1:400 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 5: shade plot of minimally processed data

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British Grid
 centre X: 285652.00 m, centre Y: 86607.62 m

Geophysical survey: Copyright Substrata Limited.
 Base map: Copyright West Country Land Surveyors Ltd

Scale: 1:400 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 6: survey grid plan and location

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Appendix 2 Tables

Site: Land adjacent to the Nobody Inn, Doddiscombsleigh
Devon, Centred on NGR 285653,086615

anomaly group	associated groups	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
101		possible, repeated parallels		cultivation traces - possibly recent ploughing		
102	103	possible, repeated parallels		cultivation traces - possibly ridge-and-furrow	anomaly group is vague but coincides with a negative earthwork recorded by AC Archaeology; the Survey Area has a HLC designation 'Medieval enclosures based on strip fields'	Report ACD1796/1/0
103	102	possible, repeated parallels		cultivation traces - possibly ridge-and-furrow	anomaly group is vague but coincides with a negative earthwork recorded by AC Archaeology; the Survey Area has a HLC designation 'Medieval enclosures based on strip fields'	Report ACD1796/1/0
301		possible, dipole		ferrous material		
302		possible, dipole		ferrous material		
303		likely, high positive response	sub-circular	burnt deposits	anomaly group is indicative of burnt material coinciding with a long-term bonfire site at the location making it likely that the burnt deposits are recent	surveyor observation Google Earth Pro (2018)
304		possible, high contrast mixed spread		made ground with ferrous material present	anomaly group is likely to represent made ground associated with a field access gate	
305		possible, dipole		ferrous material		

Table 1: data analysis

<p>Grid <i>Method of Fixing:</i> DGPS set-out using pre-planned survey grids and Ordnance Survey coordinates. <i>Composition:</i> 30m by 30m grids <i>Recording:</i> Geo-referenced and recorded using digital map tiles. <i>DGPS used:</i> Spectra Precision PM5V2 GPS with external antenna and survey pole and DigiTerra Explorer 7 as the survey control program.</p>	
<p>Equipment <i>Instrument:</i> Bartington Instruments grad601-2 <i>Firmware:</i> version 6.1</p>	<p>Data Capture <i>Sample Interval:</i> 0.25m <i>Traverse Interval:</i> 1 metre <i>Traverse Method:</i> zigzag <i>Traverse Orientation:</i> GN</p>
<p>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</p>	

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
<u>Statistics</u>	<u>Processing</u>
Max:	194.13
Min:	-201.77
Std Dev:	15.68
Mean:	-0.08
Median:	0.00
	1 Base Layer
	2 Clip at 1.00 SD
	3 DeStripe Median Sensors: Grids: All
	4 De Stagger: Grids: All By: 0 intervals, 25.00cm
	Interpolate match x & y double is imposed on export to the GIS

Table 3: processed data metadata

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
<u>Statistics</u>	<u>Processing</u>
Max:	588.52
Min:	-596.16
Std Dev:	41.58
Mean:	-0.57
Median:	0.00
	1 Base Layer
	2 Clip at 3.00 SD
	Interpolate match x & y double is imposed on export to the GIS

Table 4: minimally processed data metadata

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 (.pdf), Microsoft Publisher (.pub)
Raw grid data files:	DW Consulting TerraSurveyor 3 (.xgd) and XYZ (.dat)
Minimally processed data composite files:	DW Consulting TerraSurveyor 3 (.xgd) and ESRI ASCII (.asc)
Final data processing composite files:	DW Consulting TerraSurveyor 3 (.xgd) and ESRI ASCII (.asc)
GIS project:	GIS project Manifold 8 (.map)
Survey interpretation:	ESRI shape files
AutoCAD version of the survey interpretation: (if generated)	AutoCAD (.dwg)
All project working files:	IntelliCAD 8.4 Microsoft Corp. Office 365: Excel, Publisher, Word Adobe Systems Inc Adobe Acrobat 9 Pro Extended

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

Metadata:	online form
Georeferenced survey boundary file:	ESRI shape file
Report:	Adobe PDF (.pdf)

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.