

Substrata

Archaeological Geophysical Surveyors

An archaeological magnetometer survey

Land at Chapel Downs Farm Crediton, Devon

Centred on NGR (E/N): 282060,100890 (point)

Report: 1607CHA-R-1

Ross Dean BSc MSc MA MCifA

8 November 2016

Substrata Ltd
Office 1, 5 Mill Street
Bideford
Devon EX39 2JT
Tel: 01273 273599
Email: geophysics@substrata.co.uk
Web: substrata.co.uk

Client
AC Archaeology Ltd
4 Halthaies Workshops
Bradninch
Nr Exeter
Devon EX5 4QL
Tel: 01392 882410

Substrata Limited
Company number: 10348811

Registered office: Unit 6 Bude Business Centre, Kings Hill Industrial Estate, Bude, Cornwall, England EX23 8QN

Contents

1. Survey description and summary	1
2. Survey aims and objectives	1
3. Standards	2
4. Site description	2
5. Archaeological background.....	2
6. Results, discussion and conclusions	4
7. Disclaimer and copyright	6
8. Acknowledgements	6
9. Bibliography.....	6
Appendix 1 Supporting plots.....	7
Appendix 2 Methodology.....	14
Appendix 3 Data processing.....	15
Appendix 4 Unprocessed and minimally processed data plots.....	16

Figures

Figure 1: location map	8
Figure 2: survey interpretation.....	9
Figure 3: survey interpretation, central area	10
Figure 4: shade plot of processed gradiometer data.....	12
Figure 5: shade plot of processed gradiometer data, central area	13
Figure 6: shade plot of unprocessed data	16

Tables

Table 1: data analysis	11
Table 2: methodology summary	14
Table 3: magnetometer survey - processed data metadata	15

Project archive

Report.....	Adobe PDF format
Copies of report figures.....	Adobe PDF format
Raw and processed grid & composite files	DW Consulting TerraSurveyor 3 formats
Minimal processing data plots and metadata	DW Consulting TerraSurveyor 3 formats
Final data processing data plots and metadata	DW Consulting TerraSurveyor 3 formats
GIS project, shape files and classification schema	
GIS project	Manifold 8 ‘.map’ file
GIS shape files	ESRI standard
GIS classification schema	Adobe PDF format
AutoCAD version of the survey interpretation	AutoCAD DXF

Website: substrata.co.uk

For an overview of Substrata, our archaeological geophysical surveying techniques and the results we obtain.

1 Survey description and summary

1.1 Survey

Type: twin-sensor fluxgate gradiometer
Date: between 24 and 27 October 2016
Area: 8.4ha
Lead surveyor: Mark Edwards BA
Author: Ross Dean BSc MSc MA MifA

1.2 Clients

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

1.3 Location

Site: Land at Chapel Downs Farm
Parish: Crediton
District: Mid Devon
County: Devon
Nearest Postcode: EX17 2EH
NGR: SS 8206 0089 (point)
NGR (E/N): 282060,100890 (point)

1.4 Archive

OASIS number: substrat1-265882
Archive: At the time of writing, the archive of this survey will be held by Substrata. Depending on local authority policy, an archive of the unprocessed data may be deposited with the Archaeological Data Service.

1.5 Introduction

This report presents the results of an archaeological magnetometer survey at the above site, hereafter referred to as the survey area. It has been prepared for AC Archaeology Ltd on behalf of clients. The survey area location is shown in Figure 1.

1.6 Summary

The magnetic responses across the survey area were sufficient to be able to differentiate between anomalies representing possible archaeological features and background magnetic responses.

Thirty-five magnetic anomaly groups were mapped as representing possible archaeological deposits or features. Five of these groups represent former field boundaries recorded on historic maps. One represents a known subcircular enclosure that may be Iron Age or Romano-British. Nine anomaly groups may represent archaeological deposits within this enclosure. Two anomaly groups may represent pits outwith but close to the enclosure. Two adjacent, broad, linear groups are well defined in the data set and may have archaeological significance but cannot be further characterised. The remaining groups have characteristics that are suggestive of multiple phases of archaeological deposits, such as ditches or banks comprising sections of former field and enclosure boundaries, of unknown periods and predating the 1839 Crediton tithe map and possibly a map by John Norden produced in 1598.

2 Survey aims and objectives

2.1 Aims

To establish the presence or absence, extent and character of any archaeological features and deposits within the survey area.

2.2 Survey objectives

1. Complete a magnetometer survey across agreed parts of the survey area.

2. Identify any magnetic anomalies that may be related to archaeological deposits, structures or artefacts.
3. Within the limits of the techniques 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.

3 Standards

The standards used to complete this survey are defined by the Chartered Institute for Archaeologists (2014a) and Historic England (2010). The codes of approved practice that were followed are those of the Chartered Institute for Archaeologists (2014b) and Archaeology Data Service (undated).

4 Site description

4.1 Landscape and land use

The application area (Figure 1) is located on north-western edge of Crediton. Higher Road, which forms the northern limit of the survey area, is the historic parish boundary between Crediton and Sandford. The area is approximately 8.4 hectares of agricultural land comprising one large field. The land slopes gradually down to the south between 131m and 87m AOD.

4.2 Geology

The solid geology is Permian Breccia of the Permian Crediton Breccia Formation. In general, these rocks are reddish brown, poorly to moderately cemented breccia with a silt, sand and clay matrix. The clasts are mostly less than 0.04m and comprise sandstone, siltstone, slate, shale, hornfels, chert, acid lava and tuff, quartz-porphry, vein quartz, and a variety of tourmalinised rocks. The bedding is poorly developed in units mostly over 1m thick. There are thin interbedded or lenses of red mudstone throughout (British Geological Survey, undated).

No superficial deposits were mapped in the source used but series of soil survey trial pits were recorded to the north of the survey area for a proposed bypass in 1987 (ibid). An example is Trial Pit 31 at NGR 282060,101030 along the route of Higher Road and on the northern boundary of the survey area:

- 0.2 to 1.0m: stiff, reddish-brown, slightly gravelly, very fine sandy silt;
- 1.0 to 2.6m: medium dense, reddish-brown, subangular slightly cobbly, silty, sandy, very clayey gravel, very feebly cemented below 2.3m;
- 2.6 to 2.9m: weathered, reddish-purple black, very weak, friable, clayey silty, sandy conglomerate.

5 Archaeological background

5.1 Historic landscape characterisation

Modern enclosures.

Modern fields created out of probable medieval enclosures, themselves based on strip fields. The sinuous medieval boundaries survive in places (Devon County Council, undated).

5.2 Historical and archaeological background

The following is taken from an Historic Environment Assessment completed by AC Archaeology Ltd for the same programme of work as this report (Colsten et al, 2016).

Designated heritage assets within a 1000m study area include the Crediton Conservation Area, one grade II* listed building and a number of Grade II examples, the majority of which relate to the historic core of Crediton town. Two heritage assets are recorded within the application area: a circular cropmark enclosure recorded from aerial photography in 1990, and the survival

of the name of a medieval farmstead 'Kerswell'. It is unlikely that there are any remains of the latter within the application area itself.

The circular cropmark located within the centre of the application area was recorded from an aerial photograph taken in 1990. It is approximately 45m diameter and likely to be late prehistoric in date. A number of linear features are also visible. The circular cropmark could be ring ditch from a large, now ploughed down barrow, or more likely a settlement-type enclosure (Colsten et al, 2016: 1, 10). The enclosure and some of the linear features are recorded in the survey dataset (Section 6).

6 Results, discussion and conclusions

6.1 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 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 terms 'archaeological deposit', 'structure' and 'feature' refer to any material deposits, artefacts or disturbance of natural deposits thought to be the result of human activity, excluding recent land maintenance and farming.

Magnetic anomalies may reflect physical archaeological deposits, structures or features but the dimensions of the anomalies do not represent the dimensions of any associated archaeology.

The analysis presented below identifies and characterises anomalies and anomaly groups that may relate to archaeological deposits, structures and features.

The reader is referred to section 7.

6.2 Results

Figures 2 and 3 show the interpretation of the survey data at different scales. They 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 and 3 and Table 1 comprise the analysis of the survey data.

Figures 4 and 5 are plots of processed data as specified in Table 3. Figure 6 is a plot of the unprocessed gradiometer data.

6.3 Discussion

6.3.1 General points

Discussion 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 the survey archive.

Data collection

Data collection was restricted as shown in the figures due to magnetic materials within and adjacent to the field boundaries and the presence of service poles within the field.

Anomaly characterisation and mapping

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 only mapped as potential archaeology if they are clustered in groups or otherwise form recognisable patterns.

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

Numerous dipole magnetic anomalies are scattered across the data set. 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

There are two distinct north-south and east-north-east to west-south-west trends in the data (Figures 3 and 4). These are likely to represent relatively recent ground disturbance resulting from ploughing.

6.3.2 Data relating to historic maps and other records

Magnetic anomaly groups **1, 5, 9, 10** and **35** coincide with a former field boundaries which is first recorded on the 1839 Crediton tithe map and on later historical Ordnance Survey maps as shown in Table 1. The field boundaries associated with groups 1, 5, 9 and 10 are mapped on a nineteenth century copy of a map produced in 1598. All these anomalies have patterns usually associated with Devon banks which are field boundaries comprising an earthen core with stone revetted sides and a ditch on each side.

Group **13** coincides with an enclosure recorded as crop marks from a 1990 aerial photograph. Its shape suggests an Iron Age or Romano-British origin. The enclosure is recorded in HER entry MDV51381.

Groups **26** and **30** coincide with linear crop marks from the same aerial photograph but not recorded in the HER. There is a possibility that these represent archaeological linear deposits such as former ditches.

6.3.3 Data with no previous archaeological provenance

Groups **14 to 22** lie within the enclosure discussed in Section 6.3.2 and may represent archaeological deposits and features. Group **18**, and possibly group **21**, may represent archaeological deposits such as a surface or material from former living surfaces such as round house floors or material associated with burial mounds. A natural origin, such as a filled hollow, is also possible but given the context of the enclosure, these groups must be considered as potentially archaeologically significant. The same is true of groups **14 to 17, 19, 20** and **22** which may represent pits.

Further possible pits are represented by groups **12** and **25**.

Groups **2** and **4** are similar in nature to groups 26 and 30 (Section 6.3.2) and may also represent archaeological linear deposits such as former ditches.

Group **31** is relatively enhanced and may represent a linear archaeological deposit although it has the same orientation as modern ploughing disturbance and so may have a recent origin.

Groups **33** and **34** may represent natural deposits but their definition suggests a man-made origin.

The remaining magnetic anomaly groups mapped as representing possible archaeological deposits and features have patterns that are typical of anomalies representing archaeological deposits such as former ditches or banks of unknown period. Their distribution is suggestive of more than one phase of past land management.

6.4 Conclusions

Thirty-five magnetic anomaly groups were mapped as representing possible archaeological deposits or features. Five of these groups represent former field boundaries recorded on historic maps. One represents a known subcircular enclosure that may be Iron Age or Romano-British. Nine anomaly groups may represent archaeological deposits within this enclosure. Two anomaly groups may represent pits outwith but close to the enclosure. Two adjacent, broad, linear groups are well defined in the data set and may have archaeological significance but cannot be further characterised. The remaining groups have characteristics that are suggestive of multiple phases of archaeological deposits, such as ditches or banks comprising sections of former field and enclosure boundaries, of unknown periods and predating the 1839 Crediton tithe map and possibly a map by John Norden produced in 1598.

7 Disclaimer and copyright

The description and discussion of the results presented in this report are the authors, based on his 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 evaluation programme of which this survey is part may also be informed by other archaeological assessment work and analysis. It must be presumed that more archaeological features will be evaluated than those specified in this report.

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8 Acknowledgements

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

9 Bibliography

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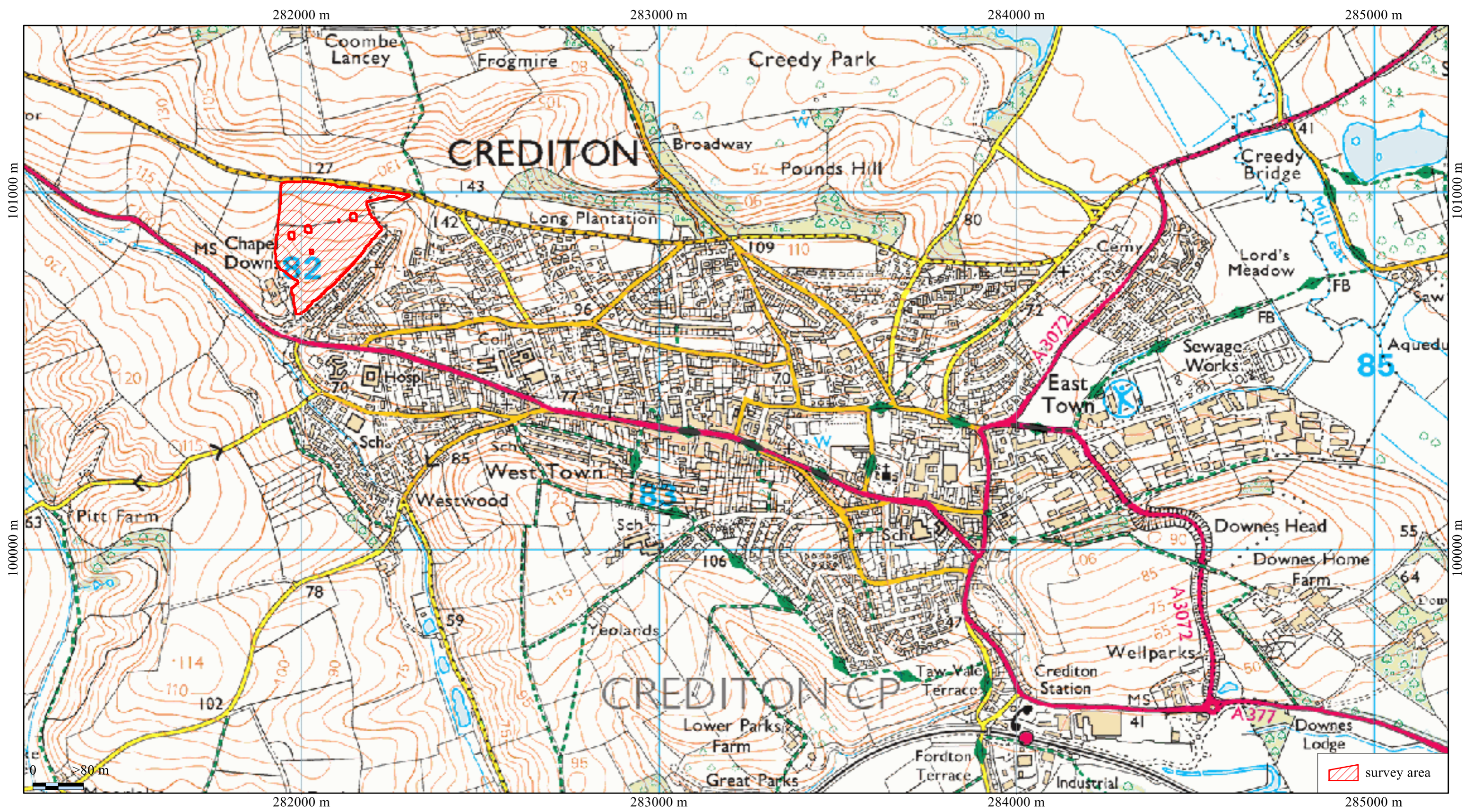
Costen, D., Jones, A. and Valentin, J. (2016) *Land at Chapel Downs Farm, Crediton, Devon (Centred on SS 8206 0089) Historic Environment Assessment*, AC Archaeology Ltd unpublished report ACD1410/1/0

Appendix 1 Supporting plots

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 (see Section 6.1).

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: 283215.55 m, centre Y: 100388.87 m

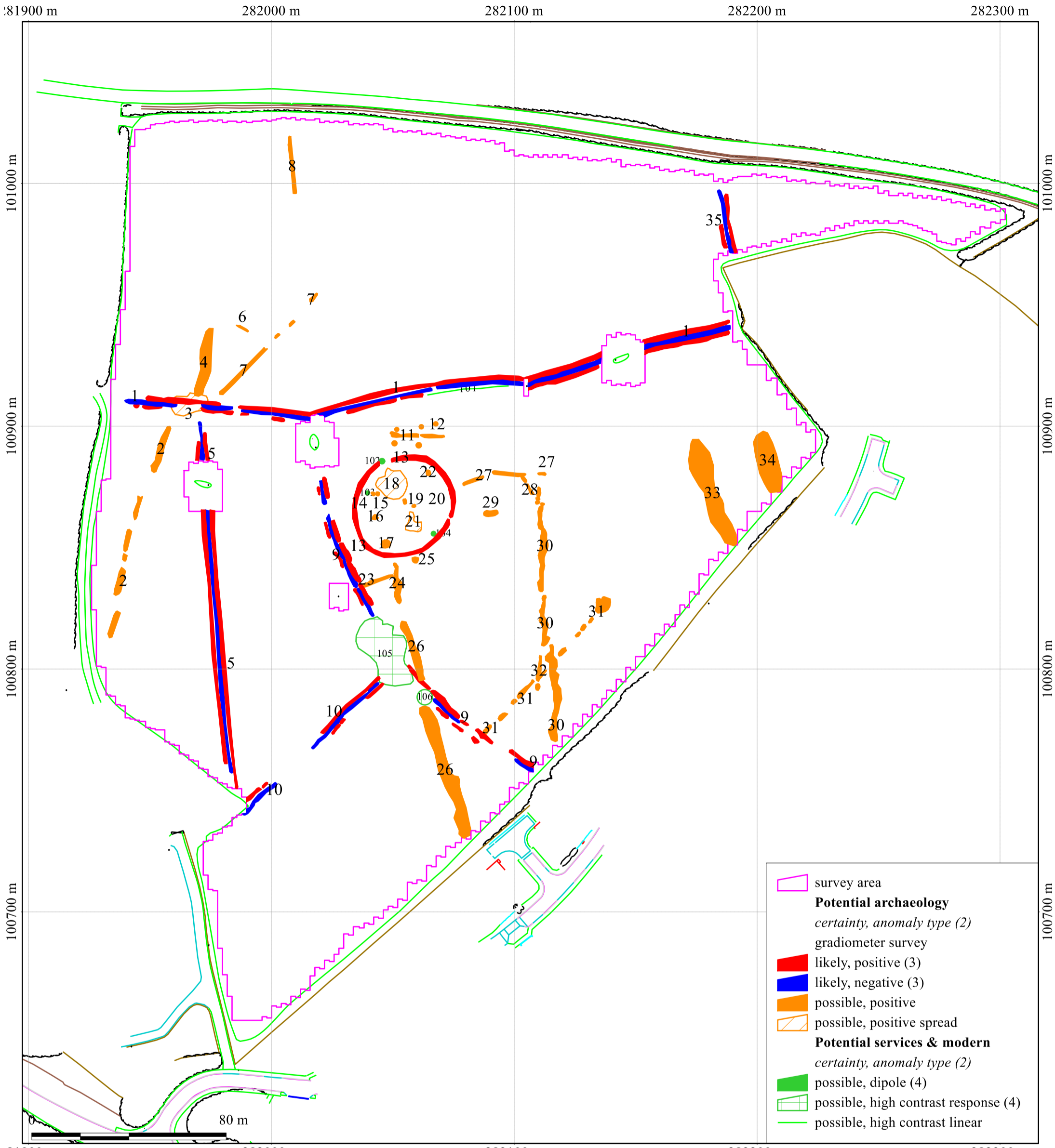
Geophysical survey: Copyright Substrata.
 Base map: Crown Copyright. Ordnance Survey
 All rights reserved

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

An archaeological magnetometer survey
 Land at Chapel Downs Farm, Crediton, Devon
 Centred on NGR (E/N): 282060,100890 (point)
 Report: 1607CHA-R-1

Figure 1: location map

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 Bideford, Devon EX39 2JT
 Tel: 01273 273599
 Email: geophysics@substrata.co.uk
 Web: substrata.co.uk



	survey area
Potential archaeology	
<i>certainty, anomaly type (2)</i>	
gradiometer survey	
	likely, positive (3)
	likely, negative (3)
	possible, positive
	possible, positive spread
Potential services & modern	
<i>certainty, anomaly type (2)</i>	
	possible, dipole (4)
	possible, high contrast response (4)
	possible, high contrast linear

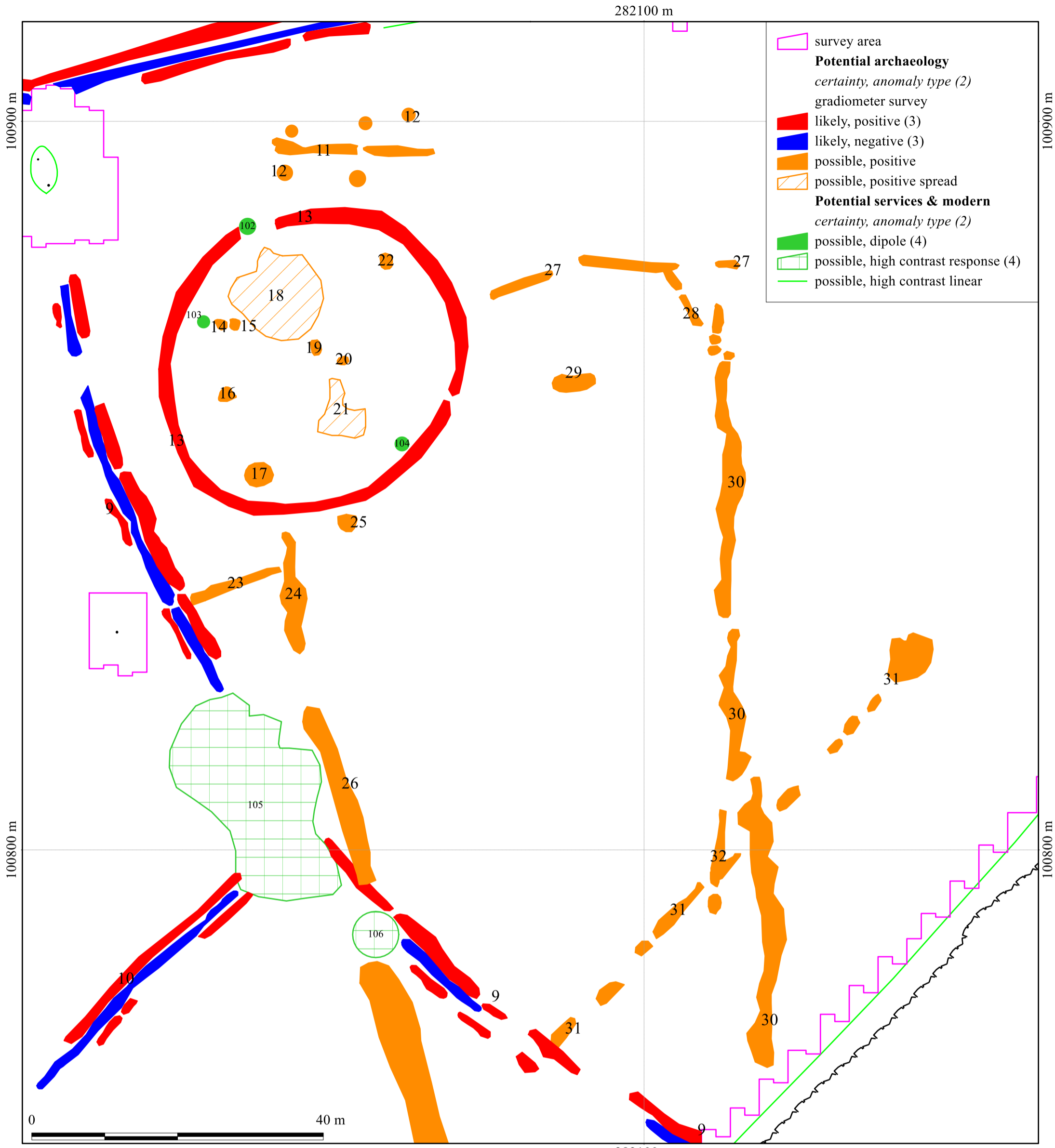
British Grid
 centre X: 282106.65 m, centre Y: 100835.60 m

Geophysical survey: Copyright Substrata.
 Base map: Copyright Hydrock Ltd
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- 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. Representative; not all instances are mapped.
 5. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

Scale: 1:1500 @ A3. Spatial Units: Meter. Do not scale off this drawing

<p>An archaeological magnetometer survey Land at Chapel Downs Farm, Crediton, Devon Centred on NGR (E/N): 282060,100890 (point) Report: 1607CHA-R-1</p>	<p>Figure 2: survey interpretation</p>	<p>Substrata Limited Office 1, 5 Mill Street Bideford, Devon EX39 2JT Tel: 01273 273599 Email: geophysics@substrata.co.uk Web: substrata.co.uk</p>
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British Grid
 centre X: 282084.40 m, centre Y: 100836.69 m

Geophysical survey: Copyright Substrata.
 Base map: Copyright Hydrock Ltd
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Notes: Scale: 1:500 @ 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. Representative; not all instances are mapped.
5. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

An archaeological magnetometer survey
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Figure 3: survey interpretation, central region

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 Office 1, 5 Mill Street
 Bideford, Devon EX39 2JT
 Tel: 01273 273599
 Email: geophysics@substrata.co.uk
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Site: An archaeological magnetometer survey
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anomaly group	associated anomalies	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
1		likely, positive/negative/positive	disrupted linear	field boundary - possible Devon bank	anomaly group coincides with a field boundary recorded on historic maps	19th century copy of 1598 map by John Norden, 1839 Crediton tithe map, OS maps 1889-90 1:2500 to after 1990-2 1:10000
2		possible, positive	disrupted linear			
3		possible, positive spread	irregular	archaeological material	anomaly group may represent a disrupted discrete archaeological deposit or a spread of material at the intersection of three potential archaeological linears	
4		possible, positive				
5		likely, positive/negative/positive	disrupted linear	field boundary - Devon bank	anomaly group coincides with a field boundary recorded on historic maps	19th century copy of 1598 map by John Norden, 1839 Crediton tithe map, OS maps 1889-90 1:2500 to 1972-3 1:10000
6		possible, positive				
7		possible, positive	disrupted linear	archaeological deposit or service trench		
8		possible, positive	linear			
9		likely, positive/negative/positive	disrupted curvilinear	field boundary - possible Devon bank	anomaly group coincides with a field boundary recorded on historic maps	19th century copy of 1598 map by John Norden, 1839 Crediton tithe map, OS maps 1889-90 1:2500 to 1972-3 1:10000
10		likely, positive/negative/positive	disrupted curvilinear	field boundary - possible Devon bank	anomaly group coincides with a field boundary recorded on historic maps	19th century copy of 1598 map by John Norden, 1839 Crediton tithe map, OS maps 1889-90 1:2500 to 1972-3 1:10000
11		possible, positive	disrupted linear			
12		possible, positive	ovals	group of pits or natural hollows		
13	13 to 22	likely, positive	disrupted subcircular	Iron Age or Romano-British enclosure	anomaly group coincides with a circular cropmark of approximately 45m diameter recorded from an aerial photograph dating to 1990	HER entry MDV51381
14	13 to 22	possible, positive	oval	pit	anomaly group has a relatively large positive response and is within a prehistoric enclosure and so is mapped as potential archaeology	
15	13 to 22	possible, positive	oval	pit	anomaly group has a relatively large positive response and is within a prehistoric enclosure and so is mapped as potential archaeology	
16	13 to 22	possible, positive	oval	pit	anomaly group has a relatively large positive response and is within a prehistoric enclosure and so is mapped as potential archaeology	
17	13 to 22	possible, positive	oval	pit	anomaly group has a relatively large positive response and is within a prehistoric enclosure and so is mapped as potential archaeology	
18	13 to 22	possible, positive spread	subcircular	filled hollow, surface or spread of potential archaeological material		
19	13 to 22	possible, positive	oval	pit	anomaly group has a relatively large positive response and is within a prehistoric enclosure and so is mapped as potential archaeology	
20	13 to 22	possible, positive	oval	pit	anomaly group has a relatively large positive response and is within a prehistoric enclosure and so is mapped as potential archaeology	
21	13 to 22	possible, positive spread	irregular with possible linear element	filled hollow, surface or spread of potential archaeological material		
22	13 to 22	possible, positive	oval	pit	anomaly group has a relatively large positive response and is within a prehistoric enclosure and so is mapped as potential archaeology	
23		possible, positive	linear			
24		possible, positive	disrupted linear			
25		possible, positive	oval	pit or natural hollow		
26		possible, positive	disrupted linear		anomaly group coincides with a linear recorded as a cropmark on an aerial photograph but not recorded in the HER	DCC HER DAP/qu 5,6 (24/5/1990)
27		possible, positive	disrupted curvilinear			
28		possible, positive	disrupted linear			
29		possible, positive	broad linear	archaeological deposit disrupted by ploughing		
30		possible, positive	disrupted linear		anomaly group coincides with a linear recorded as a cropmark on an aerial photograph but not recorded in the HER	DCC HER DAP/qu 5,6 (24/5/1990)
31		possible, positive	disrupted linear		anomaly groups represents an archaeological deposit or spread of magnetically enhanced material (possibly archaeological) by recent ploughing	
32		possible, positive	disrupted linear			
33		possible, positive	broad linears	archaeological or natural features		
34		possible, positive	broad linears	archaeological or natural features		
35		likely, positive/negative/positive	disrupted linear	field boundary - possible Devon bank	anomaly group coincides with a field boundary recorded on historic maps	1839 Crediton tithe map, OS maps 1889-90 1:2500 to 1966-70 1:2500
101		possible, high contrast linear		ferrous-rich service	iron or steel wire, cable or pipe	
102		possible, dipole		ferrous material	recent iron or steel material affecting magnetic responses associated with potential archaeological deposits	
103		possible, dipole		ferrous material	recent iron or steel material affecting magnetic responses associated with potential archaeological deposits	
104		possible, dipole		ferrous material	recent iron or steel material affecting magnetic responses associated with potential archaeological deposits	
105		possible, high contrast response		ferrous material		
106		possible, high contrast response		ferrous material		

Table 1: data analysis



British Grid
 centre X: 282106.65 m, centre Y: 100835.60 m

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<p>An archaeological magnetometer survey Land at Chapel Downs Farm, Crediton, Devon Centred on NGR (E/N): 282060,100890 (point) Report: 1607CHA-R-1</p>	<p>Figure 4: shade plot of processed data</p>	<p>Substrata Limited Office 1, 5 Mill Street Bideford, Devon EX39 2JT Tel: 01273 273599 Email: geophysics@substrata.co.uk Web: substrata.co.uk</p>
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British Grid
 centre X: 282084.40 m, centre Y: 100836.69 m

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 Report: 1607CHA-R-1

Figure 5: shade plot of processed data, central region

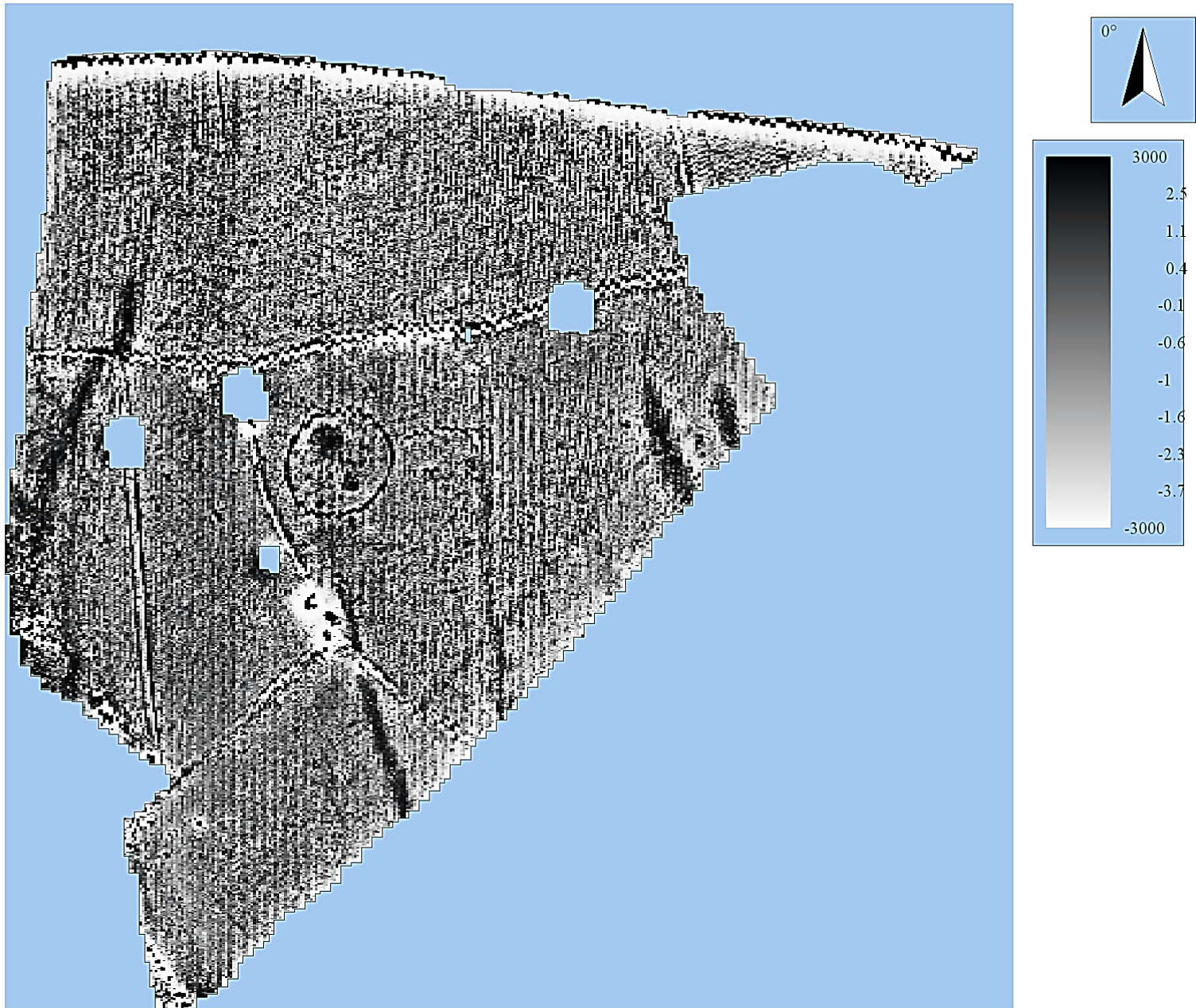
Substrata Limited
 Office 1, 5 Mill Street
 Bideford, Devon EX39 2JT
 Tel: 01273 273599
 Email: geophysics@substrata.co.uk
 Web: substrata.co.uk

Appendix 2 Methodology Summary

Table 2: methodology summary	
<p>Documents Survey methodology statement: Dean (2016)</p>	
<p>Methodology</p> <ol style="list-style-type: none"> 1. The work was undertaken in accordance with the survey methodology statement. The geophysical (magnetometer) survey was undertaken with reference to standard guidance provided by the Chartered Institute for Archaeologists (2014) and Archaeology Data Service (undated). 2. The survey grid location information and grid plan was recorded as part of the project in a suitable GIS system. 3. Data processing was undertaken using appropriate software, with all anomalies being digitised and geo-referenced. The final report included 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. 	
<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> Trimble R10 with TSC3 handset.</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 Technology Consortium IntelliCAD 8.0 DW Consulting TerraSurveyor3 Manifold System 8 GIS Microsoft Corp. Office Excel 2016 Microsoft Corp. Office Publisher 2016 Adobe Systems Inc Adobe Acrobat 9 Pro Extended</p>	

Table 3: magnetometer survey - processed data metadata	
<p>SITE Instrument Type: Bartington Grad-601 gradiometer Units: nT Direction of 1st Traverse: see below Collection Method: ZigZag Sensors: 2 @ 1.00 m spacing. Dummy Value: 32702</p> <p>PROGRAM Name: TerraSurveyor Version: 3.0.31.0</p>	
<p>Stats Max: 121.38 Min: -176.19 Std Dev: 7.07 Mean: -0.13 Median: -0.02</p>	<p>Processes: 22 1 Base Layer 2 Clip at 1.00 SD 3 Clip at 4.00 SD 4 De Stagger: Grids: All Mode: Both By: -2 intervals 5 De Stagger: Grids: c26.xgd c27.xgd d8.xgd c28.xgd d7.xgd d9.xgd c29.xgd d6.xgd d10.xgd c30.xgd d5.xgd d11.xgd d13.xgd c31.xgd d4.xgd d12.xgd d14.xgd c32.xgd d3.xgd d15.xgd c33.xgd d2.xgd d16.xgd d19.xgd d20.xgd d23.xgd d24.xgd c34.xgd d1.xgd d17.xgd d18.xgd d21.xgd d22.xgd d25.xgd Mode: Both By: -1 intervals 6 De Stagger: Grids: c15.xgd Mode: Both By: 2 intervals 7 De Stagger: Grids: c15.xgd Mode: Outbound By: 1 intervals 8 De Stagger: Grids: c16.xgd Mode: Both By: -2 intervals 9 De Stagger: Grids: c17.xgd c19.xgd Mode: Both By: -3 intervals 10 De Stagger: Grids: c20.xgd Mode: Both By: 1 intervals 11 DeStripe Median Sensors: Grids: All 12 Edge Match (Area: Top 120, Left 1320, Bottom 269, Right 1439) to Top edge 13 Edge Match (Area: Top 120, Left 1320, Bottom 149, Right 1439) to Top edge 14 Edge Match (Area: Top 180, Left 1320, Bottom 209, Right 1439) to Left edge 15 Edge Match (Area: Top 210, Left 1320, Bottom 239, Right 1439) to Left edge 16 Edge Match (Area: Top 240, Left 1320, Bottom 269, Right 1439) to Left edge 17 Edge Match (Area: Top 270, Left 1320, Bottom 299, Right 1439) to Left edge 18 Edge Match (Area: Top 300, Left 1320, Bottom 329, Right 1439) to Top edge 19 Edge Match (Area: Top 330, Left 1320, Bottom 359, Right 1439) to Top edge 20 Edge Match (Area: Top 0, Left 1440, Bottom 179, Right 1559) to Left edge 21 Edge Match (Area: Top 30, Left 0, Bottom 59, Right 119) to Right edge 22 Interpolate: Match X & Y Doubled.</p>

Appendix 4: Unprocessed data plot



Processes: 1
1 Base Layer

Instrument Type: Bartington Grad 601
Units: nT
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m

Figure 6: shade plot of unprocessed data