Substrata

Archaeological Geophysical Surveyors

An archaeological magnetometer survey
Earthwork east of Bucks Mills, North Devon
Centred on NGR (E/N): 235888,123491

Document 1901BUC-W-1

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1 Introduction

Substrata Limited have been commissioned to undertake a level 3 archaeological geophysical survey by Cotswold Archaeology Limited as part of a programme of archaeological investigation

Most of the survey area lies within the site of the Scheduled earthworks (NHLE: 1002527), which over time have been labelled as an Iron Age hillfort/defended settlement or a Roman camp. Interpretations of the site are still in progress following the recent aerial and walkover surveys, although the results of geophysical survey across the full accessible area of the site are hoped to provide some clarification of the function of this enclosure, and whether it has been subject to more than just one phase of use (Arkley, 2019).

The purpose of the survey is to provide sufficient information on the nature of any archaeological remains to facilitate the assessment of their interest prior to the determination of the application (if applicable). This is in keeping with the National Planning Policy Framework, Chapter 16, Paragraph 189 (Ministry of Housing, Communities & Local Government, 2018).

2 Client

Client Cotswold Archaeology Ltd, No. 1 Clyst Units, Cofton Road, Marsh Barton, Exeter, EX2 8QW

3 Copyright

4 Survey type and location

4.1 Survey

Method:	shallow depth magnetometer survey
Instrument:	twin-sensor fluxgate gradiometer
Date:	22nd May 2019
Area:	0.5ha
Investigation level:	Level 3 (prospection and delineation)
Survey resolution:	1m by 0.125m

4.2 Location

Earthwork east of Bucks Mills,	
Town and Civil Parish:	Woolfardisworthy
District:	Torridge
County:	Devon
Nearest Postcode:	EX39 5DN
NGR:	SS 35888 23491(point)
NGR (E/N):	235888,123491(point)
Historic environment designation:	Schedule earthwork (NHLE: 1002527)
Oasis ID:	substrat1-350222

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 7.
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.

Thirty magnetic anomaly groups were characterised as reflecting potential buried archaeology. East of the enclosure, a number of parallel anomaly groups (32, 33, 10, 8, 9, 7, 6) may be trackways across the ridge, or alternatively natural striations in the geology. Groups 35 and 36 are spreads of negative response which are likely to be areas of disturbance including some ferrous material. Groups 12, 34 and 37 are irregular positive areas, possibly cut features like pits. Groups 15, 4 and possibly 29 are concentric to the monument's bank and therefore possibly the enclosure's external ditch. Groups 5, 11 and 39 are possibly the remains of a counterscarp to this, i.e. another bank external to the enclosure. Inside the enclosure, Group 3 is possibly an internal ditch to the enclosure bank. Groups 41 and 42 are strong sub-circular anomalies possibly pits or large postholes. Group 26 appears to be the response of the boundary on the north side of the enclosure. Groups 27 and 28 appear to be the response of the north-south field wall through the enclosure. Groups 25 and 38 are strong positive anomalies possibly cut features. Group 44 is a very strong sub-circular negative anomaly of uncertain interpretation. Group 40 is a symmetric, elliptical anomaly centrally in the enclosure, possibly anthropogenic in origin. Elsewhere inside the enclosure there are many positive and negative anomalies in irregular shapes. These are difficult to interpret and are suggested as being the response of the natural geology which is presumably close to the surface. This is not to completely discount that some are archaeological. If they are geological then there may also be archaeology that is being obscured by the strong geological response. There are also several dipolar spikes spread across the Survey Area (Group 2), which are likely to be modern ferrous rubbish.

6 Standards

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

7 Survey aims and objectives

7.1 Aims

Within the framework set out in Chartered Institute for Archaeologists (2014a), complete an archaeological geophysical survey and report to:

1. As far as possible inform on the presence of absence, character, extent and in some cases, apparent relative phasing of buried archaeology, in order to make an assessment of its merit in the appropriate context, which may lead to one or more of the following:
    a. The formulation of a strategy to ensure further recording, preservation or management of the resource
    b. The formulation of a strategy to mitigate a threat to the archaeological resource
    c. The formulation of a proposal for further archaeological investigation within a programme of research' (ibid, 2014a: 4).
2. Provide in the report sufficient objective data to enable an informed and reasonable conclusion.

7.2 Objectives

1. Complete a Level 3 magnetometry survey (analyse in detail the shape of individual anomalies) geophysical 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 technique(s) 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.

8 Methodology

The magnetometer survey was undertaken in accordance a Survey Method Statement (Substrata Ltd, 2018) using the standards specified in Section 6 to achieve the aims and objectives set out 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 (Chartered Institute for Archaeologists, 2014b) and Europae Archaeologiae Consilium (undated).

Magnetometry:
Survey area: 0.5ha
Traverse heading: North
Equipment: Bartington grad601-2 gradiometer, gradiometer sensor separation 1m
Sample Interval: 0.125 metre
Traverse Interval: 1 metre
Data capture: automatic data logger
Traverse Method: Zig Zag (Best option due to vegetation)
Grid: 20m

9 Survey Area

9.1 Location and description

The Survey Area is located on the north Devon coast, 400m east-southeast of the village of Buck's Mills (see Figure 1). It lies on a high bluff at c. 144m a.s.l. with the land sloping down sharply on all sides except east, where the plateau of the bluff continues in an east-west direction. The Survey Area is enclosed by the substantial banks of an enclosure, and bisected centrally by a low north-south field wall. The east side is grassed, and the west overgrown heather-scrub. A public footpath skirts the southern bank, and the Southwest Coastal Path the north.

9.2 Geology and sub-surface deposits

The solid geology of the Survey Area is the Bude Formation - sedimentary sandstone bedrock formed approximately 310 to 319 million years ago in the Carboniferous Period, in a local environment previously dominated by sub-aqueous slopes. The superficial geology is not recorded (BGS Geology of Britain Viewer, undated).

9.3 Soils

Freely draining slightly acid loamy soils over rock (LandIS, undated).

10 Archaeological background

10.1 Historic landscape characterisation

HLC Post-medieval
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
Other woodland: broad-leaved plantations, re-planted ancient woodland or secondary woodland that has grown up from scrub
HLC Modern
Modern enclosures: these modern fields have been created out of probable medieval enclosures. The sinuous medieval boundaries survive in places
Other woodland: broad-leaved plantations, re-planted ancient woodland or secondary woodland that has grown up from scrub
(Devon County Council, undated)

10.2 Summary of the archaeological background

This section summarises heritage assets that are thought relevant to the survey data analysis and is not designed to be a comprehensive description of the archaeological background.
There are findspots of prehistoric handaxes from the cliffs east of Buck's Mills (MDV23201)
The enclosure which is the focus for this project is a recorded in the Devon HER as a sub-rectangular earthwork enclosure, interpreted as an Iron Age promontory fort, visible on aerial photographs and images derived from Lidar data, to the east of Buck's Mills (MDV181). It is scheduled monument 1002527.
Two kilometres east along the coastal bluff from the Survey Area is Peppercombe Castle, recorded in the HER as an Iron Age promontory fort (MDV11687) where a substantial bank and ditch protect a small headland area.
The historic village of Buck's Mills, 300m west of the Survey Area was formerly the mill of the manor of Bucks, the stream passing through the village powering at least one mill. At least one possible site for the former mill is recorded in the HER (MDV75415). A number of limekilns were also present on the beach in the 19th century (MDV11689). In the 18th century a platform was cut in the rocks on the foreshore for the landing of limestone for processing (MDV58160).

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 differences in the magnetic properties 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 buried archaeology 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.

Figure 3 is a plot of the processed data as specified in Table 3. Figure 4 is a plot of minimally processed data as specified in Table 4. Figure 5 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 magnetic materials within and adjacent to the plot boundaries. Strong magnetic responses mapped close to the boundaries are likely to relate to the magnetic 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 well defined in the data, 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.

12.2 Data relating to historic maps and other records

Anomaly Groups 27, 28 appear to be the north-south field wall that bisects the enclosure that is present on modern OS maps e.g. 1:25000 Explorer.

12.3 Data with no previous archaeological provenance

Beginning with the eastern side of the Survey Area, outside of the enclosure, there are a set of parallel positive and negative anomaly groups running in an east-northeast/west-southwest direction (32, 10, 8, 9, 33, 7, 6). These are suggestive of former trackways, and Anomaly Group 32 appears to enter the enclosure through an apparent gap in the bank. However the fact that this patterning is so regular and manifest across a wide band (c. 20m), with no sensible destination for some of the linears, would suggest they are geological in origin. Groups 35 and 36 are spreads of negative magnetism, with both of these groups exhibiting a wide range of values within them including the maximum -3000nT. This would perhaps indicate ferrous materials nearby, such as modern fencing, or disturbed ground that contained some, probably modern, ferrous materials. Group 37 is an area of weak positive magnetism of uncertain interpretation, perhaps natural minerals in the soil. Groups 12 and 34 are strong positive anomalies (c.20nT) possibly cut features like pits, or areas of burning. Groups 4, 15 and possibly 29 appear to be an external ditch to the enclosure. Groups 5, 11 and possibly 39 appear to be concentric to this possible ditch suggesting a counterscarp bank. This may indicate the enclosure was once multivallate.

Moving to the enclosure interior, Anomaly Group 3 is possibly an internal ditch to the enclosure bank. Interestingly the enclosure bank itself is not discernible in the geophysical data. Groups 41 and 42 are strong (c. 15nT) sub-circular positive anomalies possibly pits or large post-holes. Group 26 from its position would appear to be the response of the east-west bank on the northern perimeter of the Survey Area. Interestingly it presents as a positive anomaly, whereas there is negligible response from the enclosure bank on the east and southern side, which may indicate a different material constitution. Groups 25, 38, 43 and 45 are strong irregular positive anomalies which may be archaeological, possibly cut-features, or may be geological. Group 44 is a very strong (-94nT) sub-circular negative anomaly that does not appear to have a counter-spike indicating a dipolar. The interpretation of this in uncertain. Group 40 is an apparent, symmetrical, elliptical, positive anomaly in the centre of the enclosure. Its geometric form may indicate that it is of anthropogenic origin, or alternatively may be a result of bedding in the geology. Elsewhere in the study area there are many positive and negative irregularly-shaped anomalies, clustered in interleaved sinuous patterns (anomalies in this category are unlabelled in the Figure). The origin of these is unclear and they do not readily lend themselves to archaeological interpretation. It is suggested that they are the result of the natural geological bedrock, perhaps just below a thin topsoil having a strong effect on the gradiometer. A gradiometer survey a kilometre to the south in 2014 found similar, strong, contrasted responses across a significant portion of the site which the author considered to be either land improvement measures or the natural geology (Harrison 2014). This may indicate that in this region of north Devon the sandstone

solid geology has weathered in places into more magnetic forms. This is not to discount the fact that some of these anomalies in the Survey Area may be archaeological. It may also be the case that the possible strong geological response has masked more subtle archaeological signals. Group 1 is likely a mixture of natural deposits and possible quarrying.

There are occasional, dispersed dipolar spikes across the Survey Area (Group 2). These are likely to be modern ferrous rubbish, however their position internal to the enclosure may raise their archaeological potential.

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.

The survey area is magnetically noisy with many anomalies appearing in irregular organic shapes which do not lend themselves readily to archaeological interpretation. However within this there are some anomalies which can be labelled as anthropogenic with some degree of confidence. Following the line of the eastern enclosure bank, there are parallel curvilinear anomalies which may suggest there are possibly ditches both internally and externally to the enclosure bank. There may also be an additional external bank indicating multivallate earthworks. Some of the stronger, isolated anomaly groups within the enclosure maybe cut features like pits or post-holes.

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)

substrat1-350222

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 Zoe Arkley of Cotswold Archaeology for commissioning us to complete this survey.

17 Bibliography

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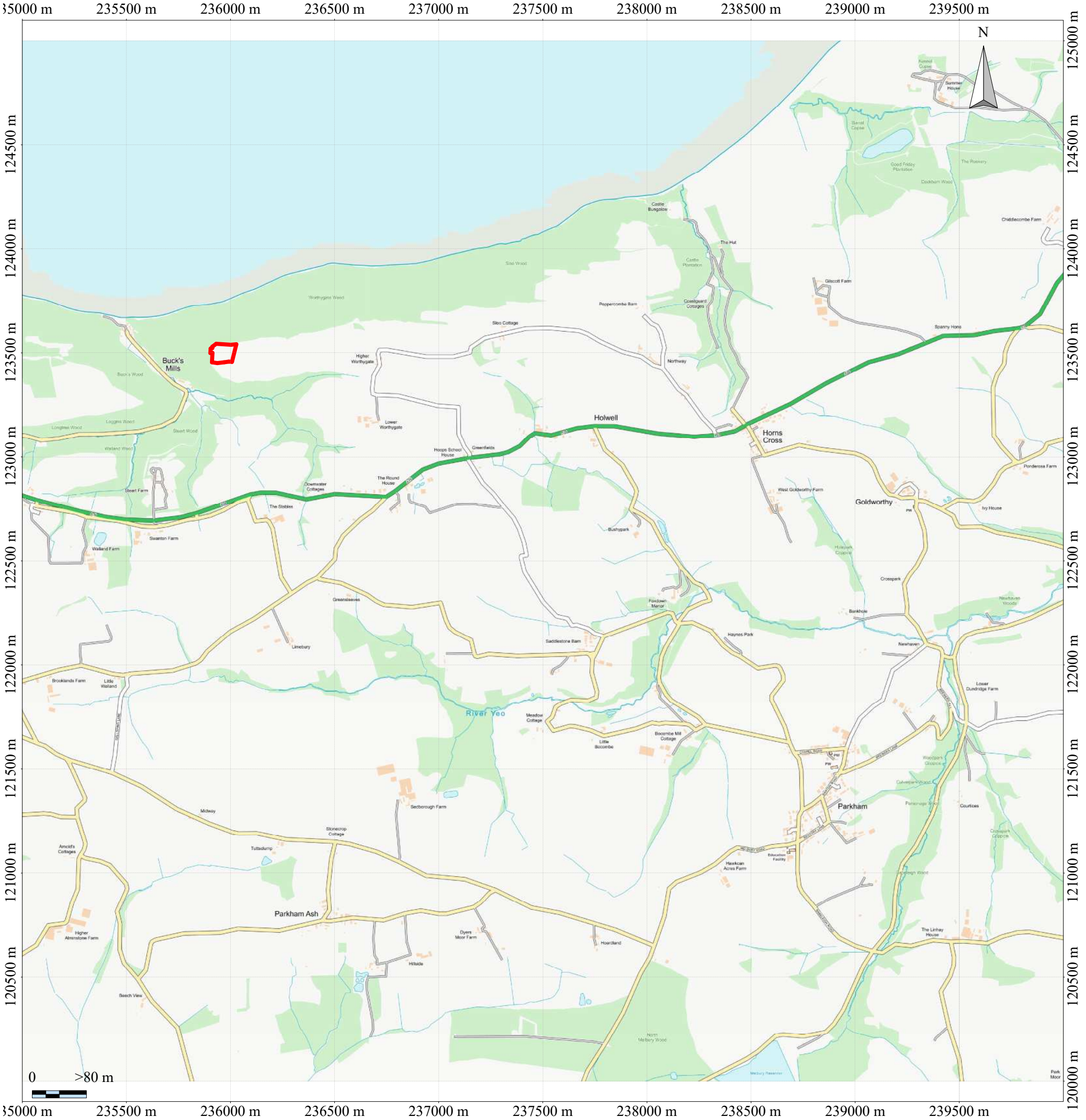
05 July. 2019).

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: 237500.00 m, centre Y: 122500.00 m

Scale: 1:18000 @ 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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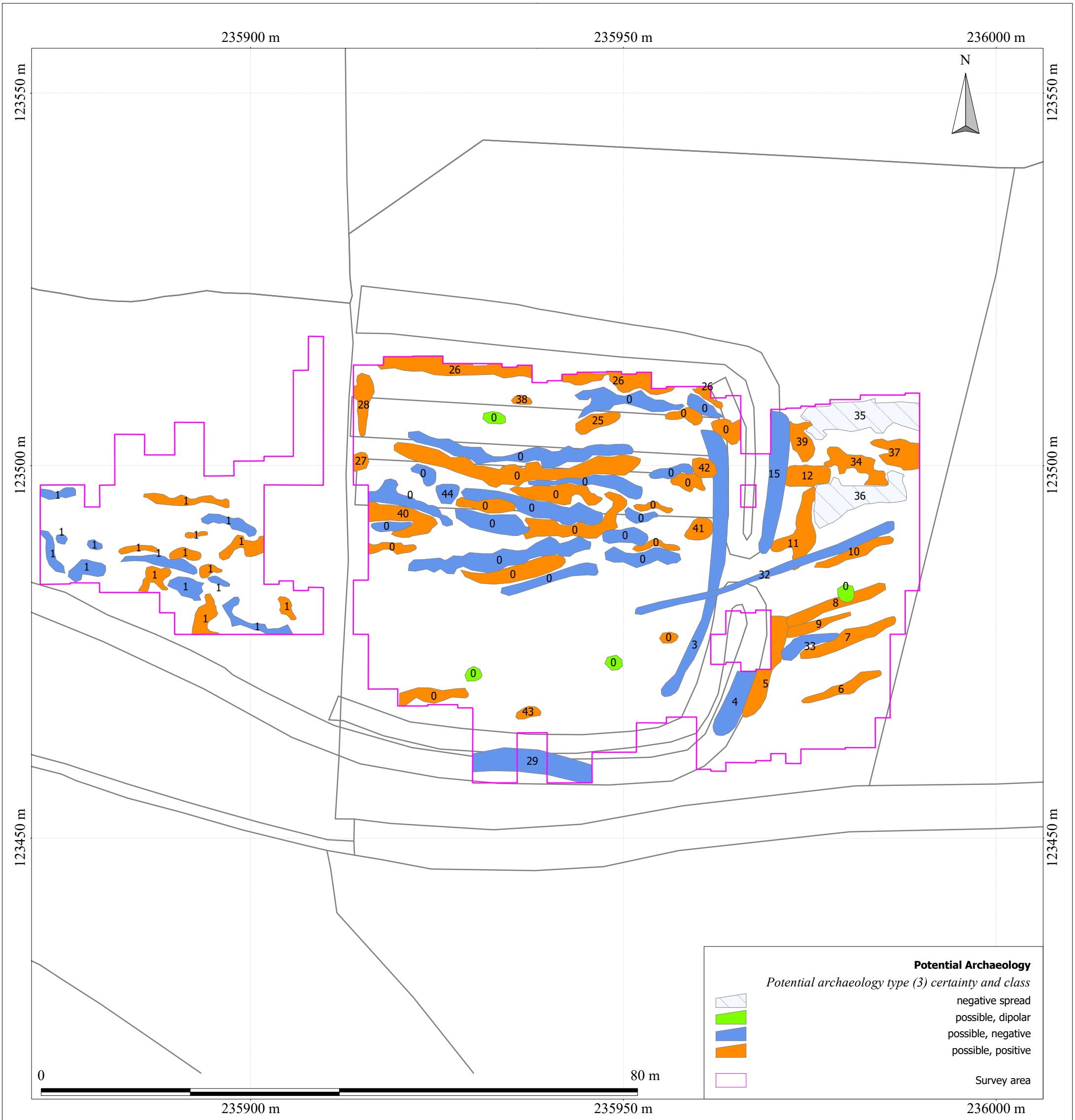
Figure 1: Location plan



British Grid
centre X: 235938.44 m, centre Y: 123485.49 m

Scale: 1:500 @ 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.
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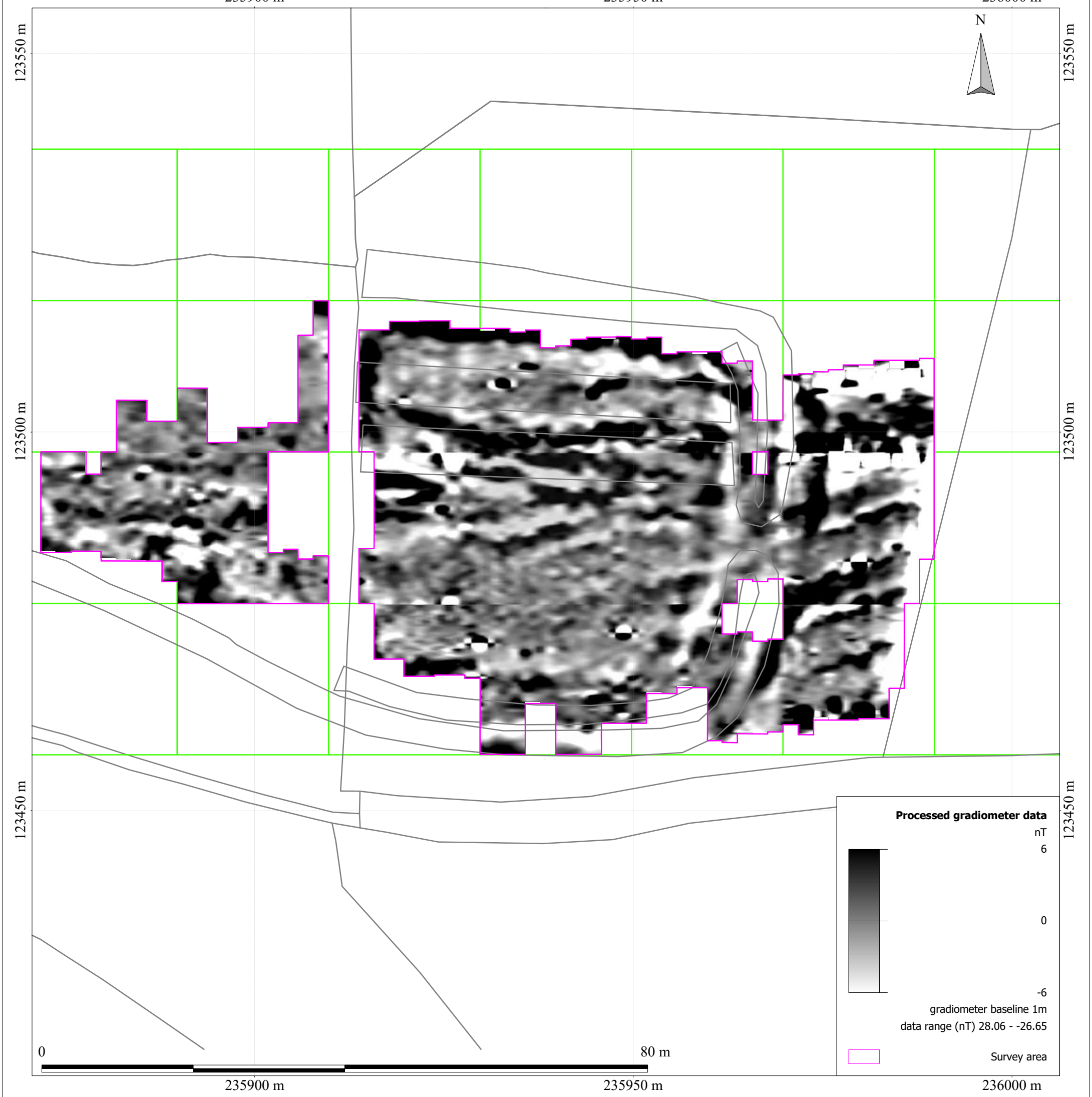
Figure 2: survey interpertation



British Grid
centre X: 235938.44 m, centre Y: 123485.49 m

Scale: 1:500 @ 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.
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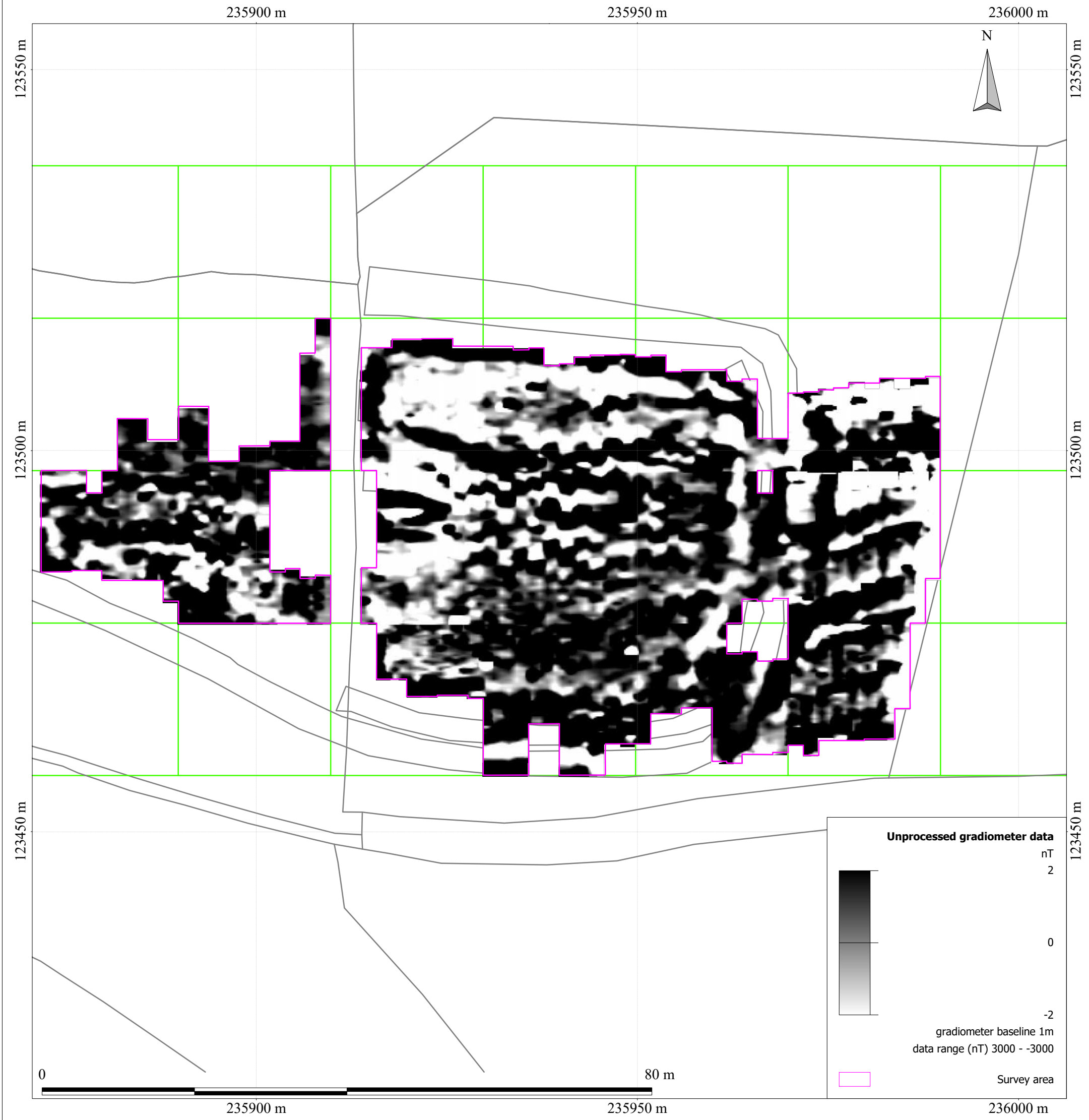
Figure 3: processed gradiometer data



British Grid
centre X: 235938.44 m, centre Y: 123485.49 m

Scale: 1:500 @ 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 4: Unprocessed gradiometer data

British Grid
centre X: 235916.33 m, centre Y: 123501.46 m

Scale: 1:800 @ 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 1: Grid map

Appendix 2 Tables

Site: Land at Bucks Mills, North Devon
Centred on NGR: 235888, 123491

plot	anomaly group	associated anomaly groups	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
	0		possible, negative/Positive		geology?		
	0		possible, dipolar		geology?		
	1		possible, positive		geology/ possible quarrying	ranging from 7 nT - 15 nT	
	1		possible, positive		geology/ possible quarrying	ranging from 7 nT - 15 nT	
	1		possible, positive		geology/ possible quarrying	ranging from 7 nT - 15 nT	
	1		possible, positive		geology/ possible quarrying	ranging from 7 nT - 15 nT	
	1		possible, positive		geology/ possible quarrying	ranging from 7 nT - 15 nT	
	1		possible, positive		geology/ possible quarrying	ranging from 7 nT - 15 nT	
	1		possible, positive		geology/ possible quarrying	ranging from 7 nT - 15 nT	
	1		possible, positive		geology/ possible quarrying	ranging from 7 nT - 15 nT	
	1		possible, negative		geology/ possible quarrying		
	1		possible, negative		geology/ possible quarrying		
	1		possible, negative		geology/ possible quarrying		
	1		possible, negative		geology? possible quarrying		
	1		possible, positive		geology? possible quarrying		
	1		possible, negative		geology? possible quarrying		
	1		possible, negative		geology/ possible quarrying		
	1		possible, negative		geology/ possible quarrying		
	1		possible, negative		geology? possible quarrying		
	1		possible, negative		geology? possible quarrying		
	1		possible, negative		geology? possible quarrying		
	3		possible, negative	curvilinear	ditch?		
	4	15	possible, negative	curvilinear	ditch?		
	5	4?	possible, positive	curvilinear	bank?		
	6		possible, positive	curvilinear	track? natural?		
	7		possible, positive	linear	natural?track?		
	8		possible, positive	linear	natural?track?		
	9		possible, positive	linear	natural?track?		
	10	32,9,8	possible, positive	linear	track?natural?		
	11		possible, positive	irregular	bank?		
	12		possible, positive	irregular	cut feature		
	15	4?	possible, negative	irregular	ditch?		
	25		possible, positive	irregular	pit?post hole?	29nT	
	26		possible, positive	irregular	bank?		
	26		possible, positive	irregular	bank?		
	26		possible, positive	irregular	bank?	24nT	
	27		possible, positive	irregular	bank?		
	28		possible, positive	irregular	uncertain		
	29	4?	possible, negative	curvilinear	ditch?		
	32	10, 8,9	possible, negative	curvilinear	track? natural?		
	33		possible, negative	curvilinear	natural?		
	34		possible, positive	irregular	cut features?	34nT	
	35		negative spread	irregular	disturbance inc ferrous	-30 -40 -3000 nT	
	36		negative spread	irregular	disturbance inc ferrous	-20 -80 -3000 nT	
	37		possible, positive	irregular	natural?	15nT	
	38		possible, positive	oval	pit?posthole?	33nT	
	39		possible, positive	irregular	external bank?	11nT	
	40		possible, positive	elliptical	natural? enc. central feature?		
	41	42?	possible, positive	oval	pit?post-hole?	15nT	
	42	41?	possible, positive	oval	pit? posthole?	15nT	
	43		possible, positive	irregular	cut feature?		
	44		possible, negative	oval	pit?	-94nT. strong negative feature.	

Table 1: Data analysis

<table>
<tr><td colspan="2">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.</td></tr>
<tr><td>Equipment
Instrument: Bartington Instruments grad601-2
Firmware: version 6.1</td><td>Data Capture
Sample Interval: 0.25m
Traverse Interval: 1 metre
Traverse Method: zigzag
Traverse Orientation: GN</td></tr>
<tr><td colspan="2">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</td></tr>
</table>

Table 2: methodology information

Instrument Type: Grad 601 (Magnetometer)
Units: nT
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702

Dimensions
Composite Size (readings): 1600 x 280
Survey Size (meters): 100 m x 140 m
Grid Size: 20 m x 20 m
X Interval: 0.0625 m (surveyed @ 0.125 m)
Y Interval: 0.5 m (surveyed @ 1 m)

Stats
Max: 190.52
Min: -319.65
Std Dev: 15.88
Mean: -0.57
Median: -0.02

PROGRAM
Name: TerraSurveyor
Version: 3.0.34.10

Processes: 4
Processes: 13
1 Base Layer
2 Clip at 1.00 SD (Area: Top 60, Left 320, Bottom 79, Right 479)
3 DeStripe Median Sensors: All
4 De Stagger: Grids: b02.xgd Mode: Both By: -4 intervals
5 De Stagger: Grids: b02.xgd b01.xgd Mode: Both By: -2 intervals
6 De Stagger: Grids: b04.xgd b05.xgd b06.xgd Mode: Both By: -2 intervals
7 De Stagger: Grids: c02.xgd Mode: Both By: -1 intervals
8 De Stagger: Grids: c01.xgd Mode: Both By: -2 intervals
9 De Stagger: Grids: b07.xgd Mode: Both By: -1 intervals
10 De Stagger: Grids: b10.xgd Mode: Both By: -3 intervals
11 De Stagger: Grids: b03.xgd Mode: Both By: -2 intervals
12 Clip at 1.00 SD
13 Interpolate: X & Y Doubled.

Note: Input to the GIS results in slight changes to the stats shown above. The data stored in the archives (Appendix 3) will have the above metadata and the values quoted in the report figures will be those quoted in this metadata table.

Table 3: processed data metadata

Instrument Type:	Grad 601 (Magnetometer)
Units:	nT
Direction of 1st Traverse:	0 deg
Collection Method:	ZigZag
Sensors:	2 @ 1.00 m spacing.
Dummy Value:	32702
Dimensions	
Composite Size (readings):	800 x 140
Survey Size (meters):	100 m x 140 m
Grid Size:	20 m x 20 m
X Interval:	0.125 m
Y Interval:	1 m
Stats	
Max:	98.16
Min:	-100.00
Std Dev:	6.17
Mean:	1.68
Median:	1.33
PROGRAM	
Name:	TerraSurveyor
Version:	3.0.34.10
Processes:	1
1	Base Layer

Note: Input to the GIS results in slight changes to the stats shown above. The data stored in the archives (Appendix 3) will have the above metadata and the values quoted in the report figures will be those quoted in this metadata table.

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
Raw data composite files:	CSV (.xyz)
Minimally processed data composite files:	DW Consulting TerraSurveyor 3 (.xgd) and CSV (.xyz)
Final data processing composite files:	DW Consulting TerraSurveyor 3 (.xgd) and CSV (.xyz)
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:	CSV (xyz)
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.