Substrata
Archaeological Geophysical Surveyors

An archaeological magnetometer survey

White Rock 2, Paignton, Devon

Centred on NGR (E/N): NGR 288143,057422

Report: 1704WHI-R-1

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3 May 2017

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- GIS classification schema ..... Adobe PDF format

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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 16 February and 21 April 2017
Area:	29ha
Lead surveyor:	Mark Edwards BA
Author:	Ross Dean BSc MSc MA MIfA

1.2 Clients

Abacus Projects Limited, C/O Deeley Freed Estates, 7 Whiteladies Road, Bristol BS8 1NN

1.3 Location

Site:	White Rock 2, Paignton
Unity Authority:	Torbay
County:	Devon
Nearest Postcode:	TQ4 7SN
NGR:	SX 88143 57422 (point)
NGR (E/N):	288143,057422 (point)

1.4 Archive

OASIS number:	substrat1-284141
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 Abacus Projects Limited. The survey area location is shown in Figure 1.

At the time of the survey, an area at the northern end of the survey was under a plantation of young trees. Their density and height was such that the magnetometer (gradiometer) survey could not be undertaken within this area (Figure 2).

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.

Eighty-six magnetic anomaly groups were mapped as representing potential archaeological deposits or features. Of these, four groups represent former field boundaries mapped on historical maps. One group may represent a metalled track with flanking ditches. Two groups may represent physically adjacent ring ditches and a third group, in a separate field, may also represent a ring ditch although this is less certain. Six groups together may denoted two physically adjacent archaeological enclosures. Two groups represent former quarries also recorded on historical maps. Two other anomaly groups may represent unrecorded former quarries.

The remaining anomaly groups are linear and curvilinear anomalies that often denote fragments of former field or enclosure boundaries of unknown date and possibly of more than one phase of past land management.

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 survey area, comprises 6 plots within agricultural fields to the east of Goodrington and the north of Galmpton, Paignton as shown in Figure 1. The application area covers an area of approximately 32.3 hectares out of which 29ha were subject to survey. At the time of survey it was surrounded by agricultural land to the north, west, south and southeast. The A3022 and housing estates lay on the eastern border. The land lies between approximately 60m and 80m AOD, descending north to south, on the eastern side of a shallow, north-north-east to south-south-west running valley.

4.2 Geology

In Areas 1 and 3 (Figure 2) the bedrock comprises mudstone and limestone of the Devonian Saltern Cove Formation. In Areas 2, 4, 5 and 6 the bedrock comprises limestone of the Devonian Brixham Limestone Formation. The superficial geology across the survey area is not recorded in the source used (British Geological Survey, undated).

5 Archaeological background

5.1 Historic landscape characterisation

Area 1:

'Post-medieval enclosures'

Enclosures of post-medieval date. Fields laid out in the C18th and C19th commonly have many surveyed dead-straight field boundaries (Devon County Council, undated).

Areas 2 to 6: 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).

5.2 Summary of archaeological background

The following Historic Environment Records (HER) were examined via the Heritage Gateway (Historic England, undated) to gain an appreciation of historic assets within 500m of the survey area perimeter and deemed pertinent to the geophysical survey data.

This Section is not designed to provide a comprehensive understanding of the historic environment of the application area and should not be used as a source for further work. The

reader is referred to the Devon Country Council Historic Environment Service for a comprehensive HER data set.

Within the proposed development area
No historic environment assets have previously been recorded within the proposed development area.

To the southwest of the site
Field names of Castle on the Stoke Gabriel Tithe Map of 1840 may indicate the presence of a castle, or fortified site within the vicinity (HER number MDV111607, NGR SX 879 568).

Possible ditches of potential prehistoric date are visible as parchmarks on aerial photographs taken in 1984. They are visible as a semi-circular ditch approximately 52m in length, with a possible corner of a rectilinear enclosure to the southeast which is roughly north to south and east to west aligned. The parchmarks, which were not visible on other aerial photographs made available to the survey, are, however, slightly dubious in nature and may be geological in origin (HER number 28893, NGR SX 879 568).

A Quarry is depicted and labelled to the south of Broadland Barn on the First and Second Edition 25 inch Ordnance Survey maps, and on the Ordnance Survey Master Map (HER number MDV45667, NGR SX 877 567).

To the west of the site
A small circular mark, possibly a prehistoric ring ditch, was recorded from the air 1984 lies in a level area but nothing is visible on the ground (HER number MDV36925, NGR SX 872 575).

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 changes 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 artefacts, material deposits or disturbance of natural deposits thought to be the result of human activity, excluding recent land maintenance and farming.

Magnetic anomalies cannot be regarded as physical archaeological deposits, structures or features and the dimensions of the anomalies shown 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

Figure 2 shows the interpretation of the survey data which includes the anomaly groups identified as possibly relating to archaeological deposits. Figures 3 to 7 show the same interpretation at a higher resolution and include the anomalies 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 7 and Table 1 comprise the analysis of the survey data.

Figures 8 to 13 are plots of processed data as specified in Table 3 and correspond to Figures 2 to 7. Figure 14 is a plot of unprocessed data with its metadata.

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 along the survey area edges and within the survey area was restricted as shown in the figures due to the presence of magnetic materials. Un-mapped strong magnetic responses shown in Figures 8 to 13 are likely to relate to these materials except where otherwise indicated in Figures 2 to 7 and Table 1.

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 were mapped as potential archaeology when they were associated with other significant anomaly groups or otherwise formed recognisable patterns as listed in Table 1.

Anomalies thought to relate to recent disturbance such as ploughing, 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.

6.3.2 Data relating to historic maps and other records

Magnetic anomaly groups **1** (Area 1, Figure 3), **42** and possibly **43** (Area 2, Figure 4), and **78** (Area 4, Figure 6) coincide with and likely represent field boundaries recorded on historic maps as denoted in Table 1. Anomaly groups **80** (Area 2, Figure 4) and **81** (Area 4, Figure 6) are likely to represent former quarries also recorded on historic maps as recorded in Table 1.

6.3.3 Data with no previous archaeological provenance

Area 1 (Figure 3)

Anomaly group **6** may represent a former ditched trackway with a metalled surface.

The remaining mapped anomaly groups in Area 1 are most likely to represent fragments of former field and enclosure boundaries of more than one phase of past land management.

Area 2 (Figure 4)

Group **79** is most likely to represent the fill of a former, unmapped quarry.

The remaining mapped anomaly groups are most likely to represent fragments of former field and enclosure boundaries of more than one phase of past land management.

Area 3 (Figure 5)

Group **47** is situated in a group of similar anomaly groups which may to represent natural deposits such as sink holes. This group is mapped because of its regular shape but may be a natural deposit.

Anomaly groups **54**, **56** and **58** could be viewed as representing a disrupted semi-circular feature but are more likely to represent separate deposits as shown.

Group **59** is most likely to represent an archaeological deposit such as a ring ditch. Group **60** may represent an adjacent, larger ring ditch, possibly with a pit (group **61**). Aerial photographic evidence has been recorded for a similar feature to the west of the survey area boundary (HER number MDV36925 discussed in Section 5.2).

Group **6**3 may represent an archaeological deposit but more likely represents a palaeochannel or, possibly, dumped material.

The remaining mapped anomaly groups are most likely to represent fragments of former field and enclosure boundaries of more than one phase of past land management.

Area 4 (Figure 6)

Groups **71 to 76** are distinct in the data set and are most likely to represent two former archaeological enclosures of unknown historic relationship to each other and not recorded on historic maps.

Groups **69** and **70** are most likely to represent fragments of former field and enclosure boundaries of more than one phase of past land management.

Group **77** is most likely to represent an area of rubble, possibly associated with the adjacent pond and/or a former quarry pit.

Area 5 (Figure 7)

Anomaly group **8**3 may represent a sub-circular archaeological feature such as a ring ditch but its form is not regular which may indicate a ring ditch damaged by ploughing, coincidentally positioned natural deposits and/or ploughing disturbance.

The remaining mapped anomaly groups are most likely to represent fragments of former field and enclosure boundaries of more than one phase of past land management.

Area 6 (Figure 7)
Group **85** probably represents a former field boundary not recorded on historical maps. If this is so, then group **86** may represent associated ground disturbance or rubble.

6.4 Conclusions

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

Eighty-six magnetic anomaly groups were mapped as representing potential archaeological deposits or features. Of these, four groups (1, 42, 43 and 78) represent former field boundaries mapped on historical maps. One group (6) may represent a metalled track with flanking ditches. Two groups (59 and 60) may represent physically adjacent ring ditches and a third group (83), in a separate field, may also represent a ring ditch although this is less certain. Six groups together (71 to 76) may denoted two physically adjacent archaeological enclosures. Two groups (80 and 81) represent former quarries also recorded on historical maps. Two other anomaly groups (77 and 79) may represent unrecorded former quarries.

The remaining anomaly groups are linear and curvilinear anomalies that often denote fragments of former field or enclosure boundaries of unknown date and possibly of more than one phase of past land management.

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.

8 Acknowledgements

Substrata would like to thank Stuart Butson of Deely Freed and Mike Harris of Stride Treglown for their assistance in completing this project.

9 Bibliography

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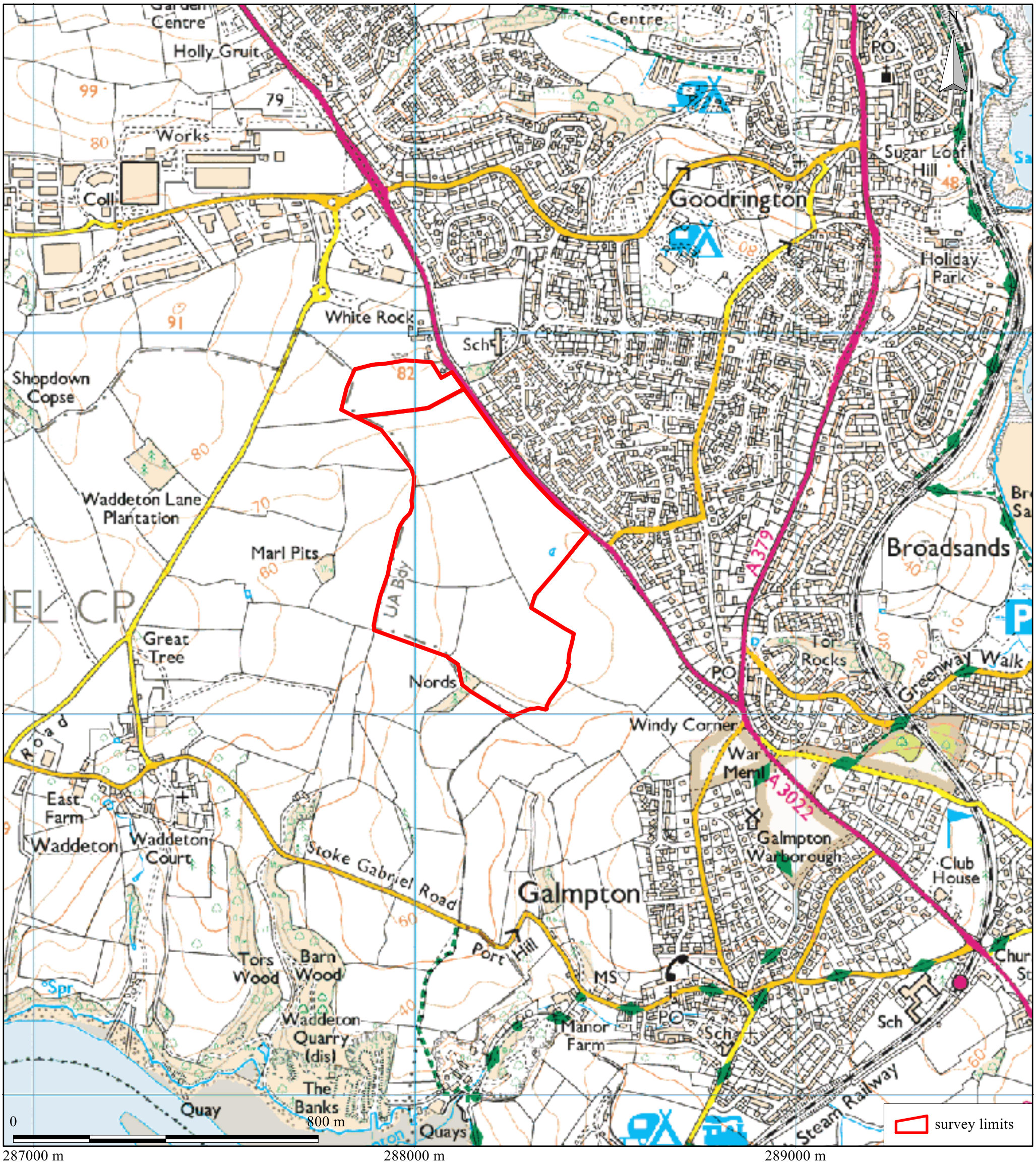
Appendix 1 Figures

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

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Figure 1: location map

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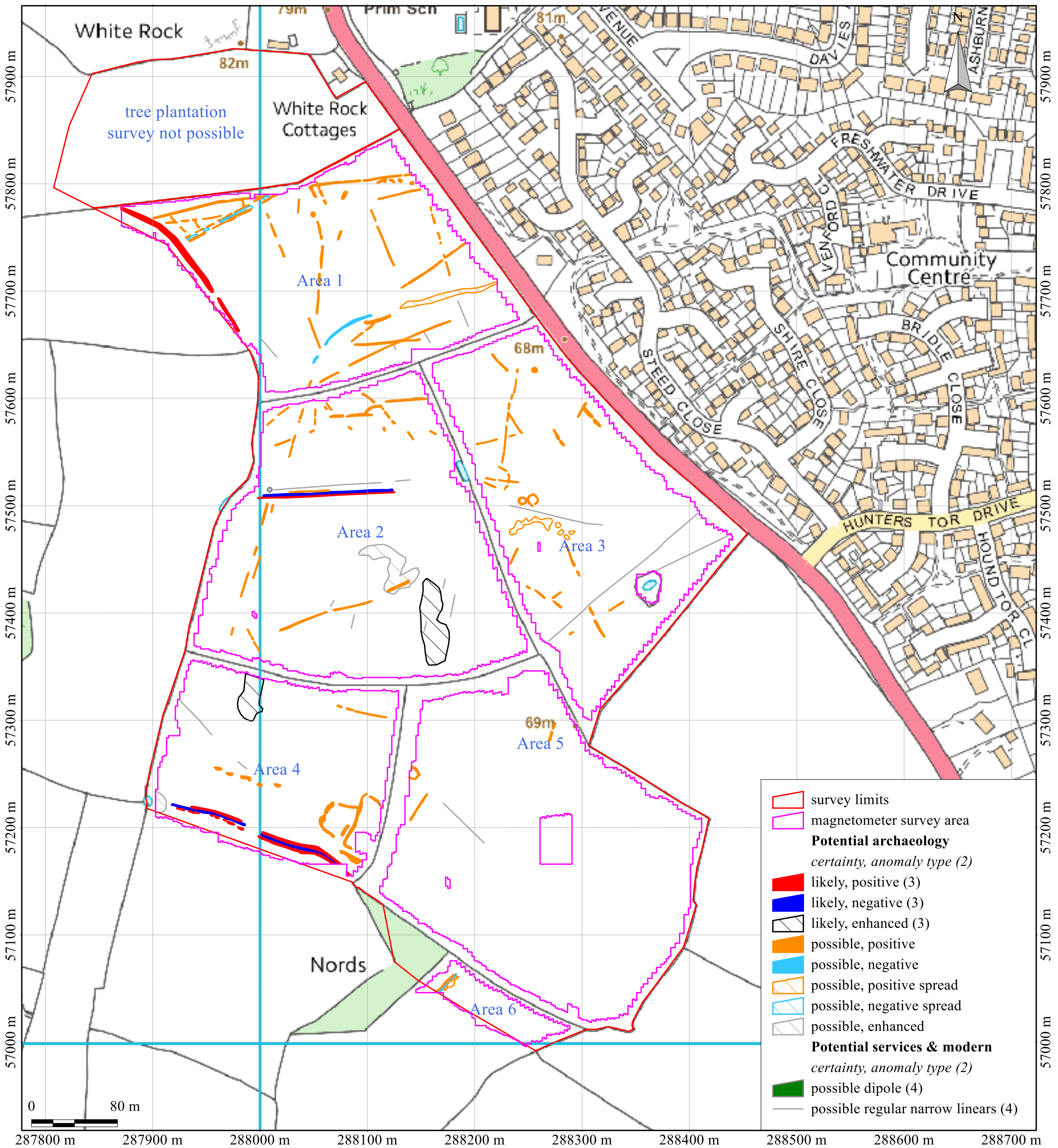

British Grid
centre X: 288250.54 m, centre Y: 57441.83 m

Scale: 1:3500 @ 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 geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

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Figure 2: survey interpretation, entire area

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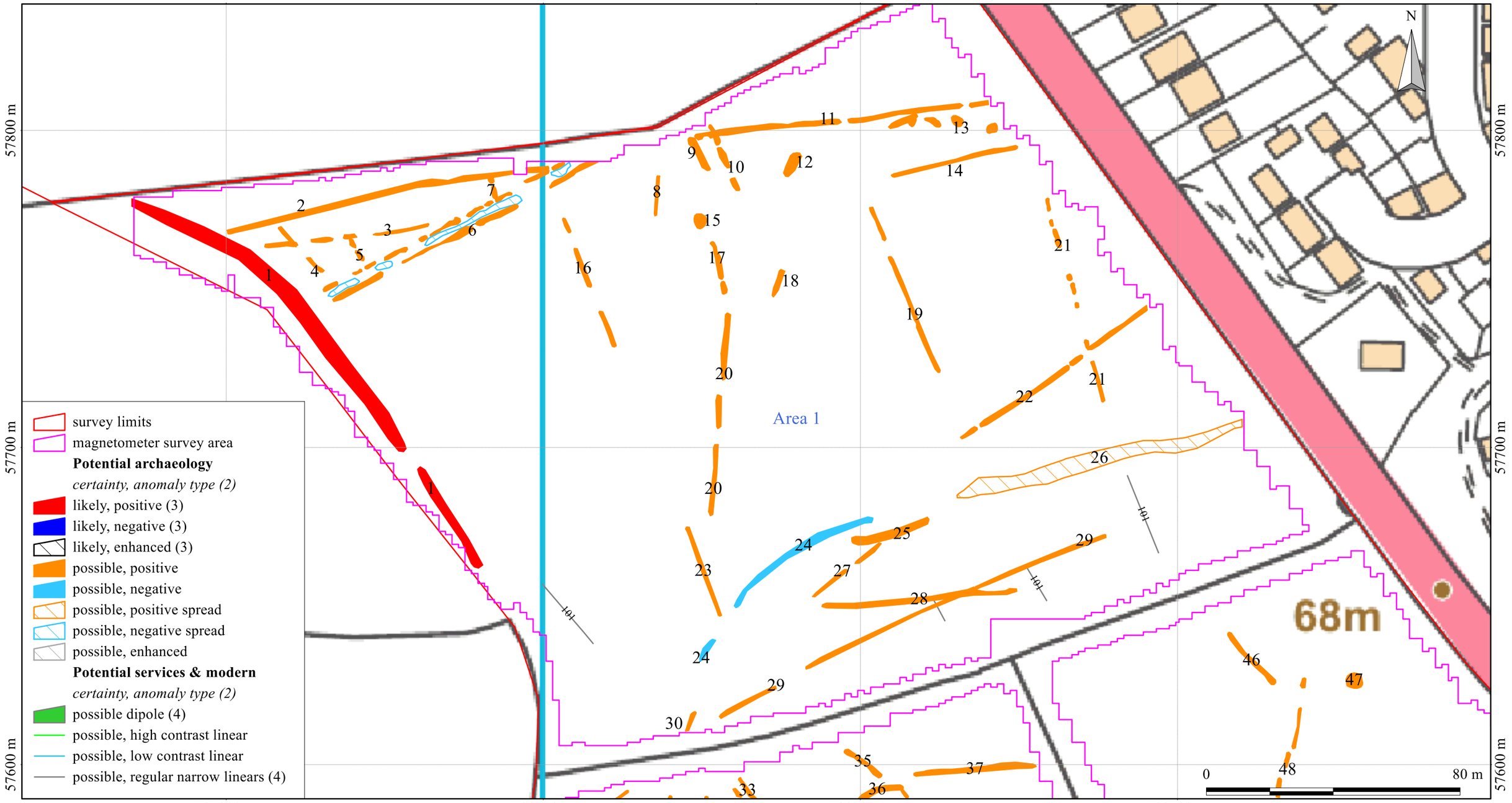

British Grid
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Scale: 1:1200 @ A3. Spatial Units: Meter. Do not scale off this drawing

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. 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.

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Figure 3: survey interpretation, Area 1

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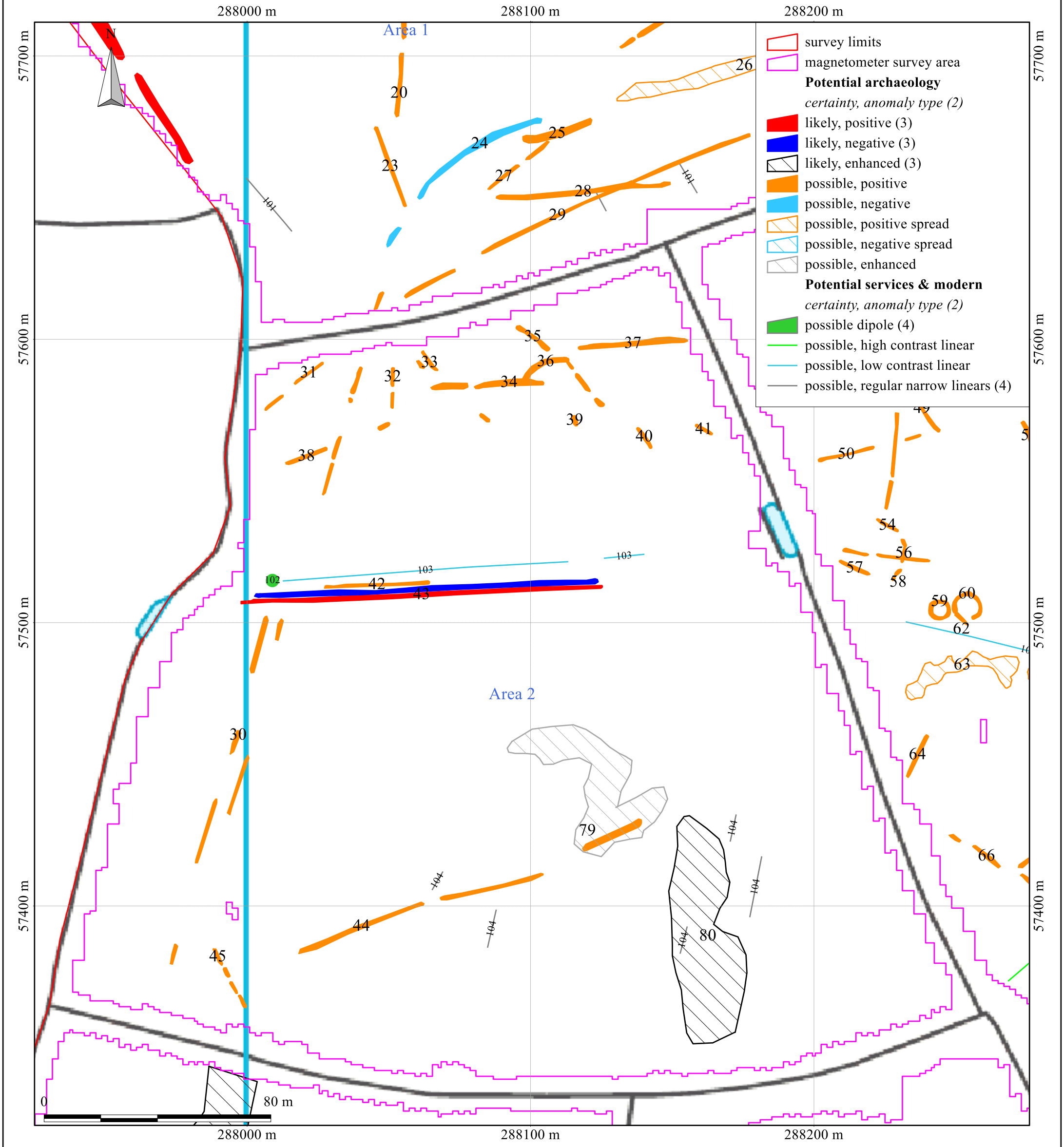

British Grid
centre X: 288100.52 m, centre Y: 57517.24 m

Scale: 1:1300 @ 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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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 geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

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Figure 4: survey interpretation, Area 2

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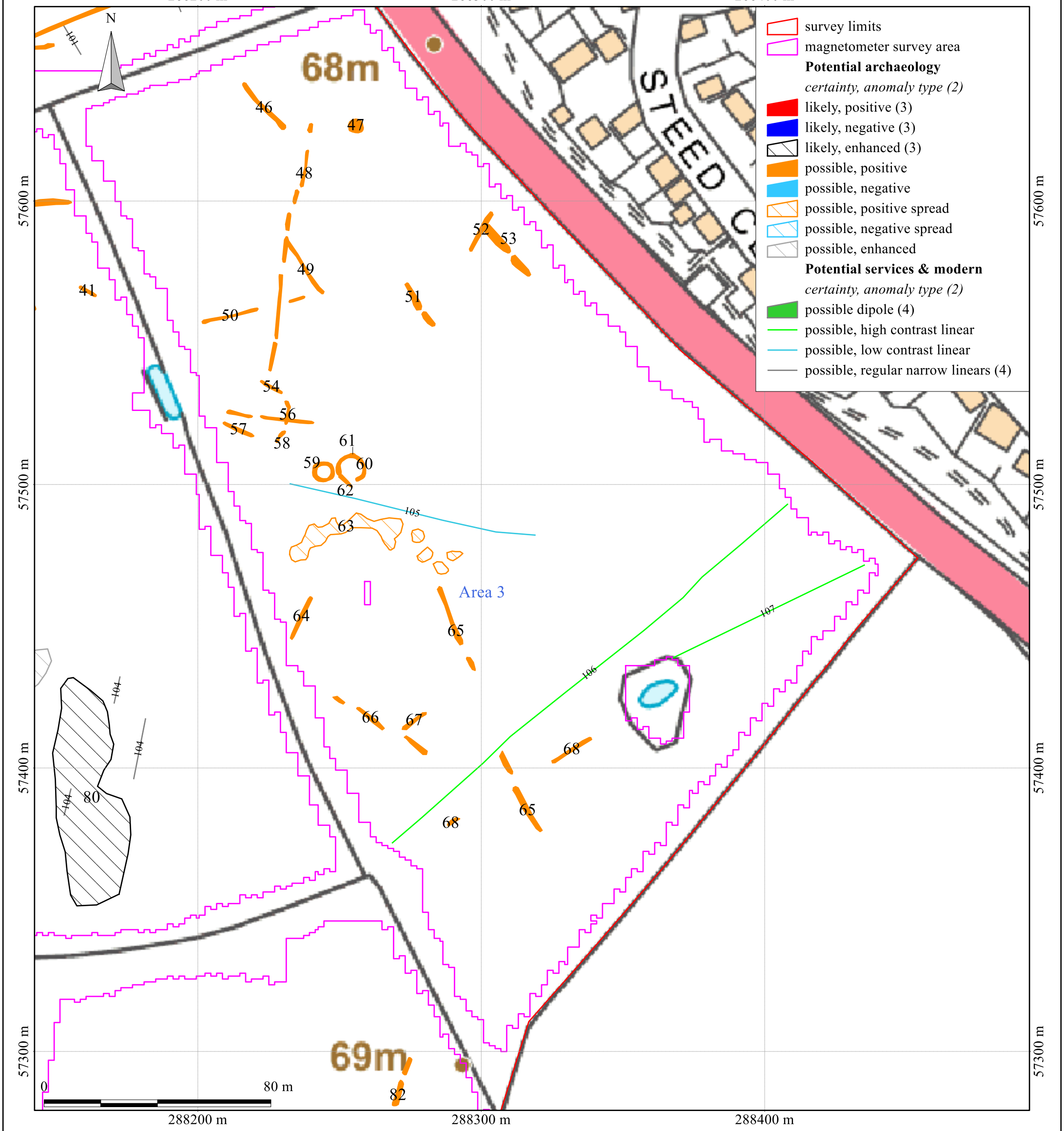

British Grid
centre X: 288317.90 m, centre Y: 57473.90 m

Scale: 1:1300 @ 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 geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

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Figure 5: survey interpretation, Area 3

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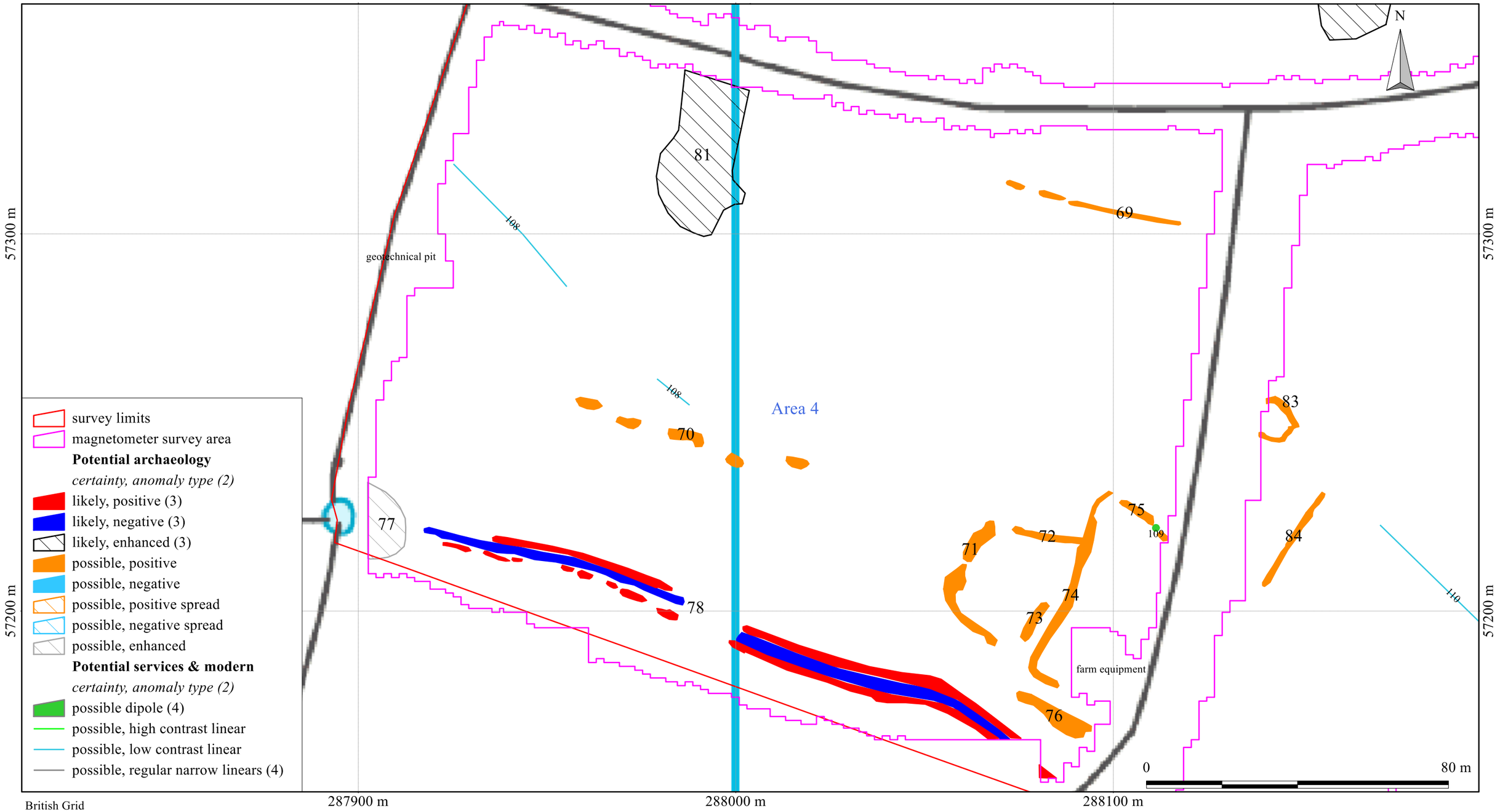

British Grid
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Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

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. 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.

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Figure 6: survey interpretation, Area 4

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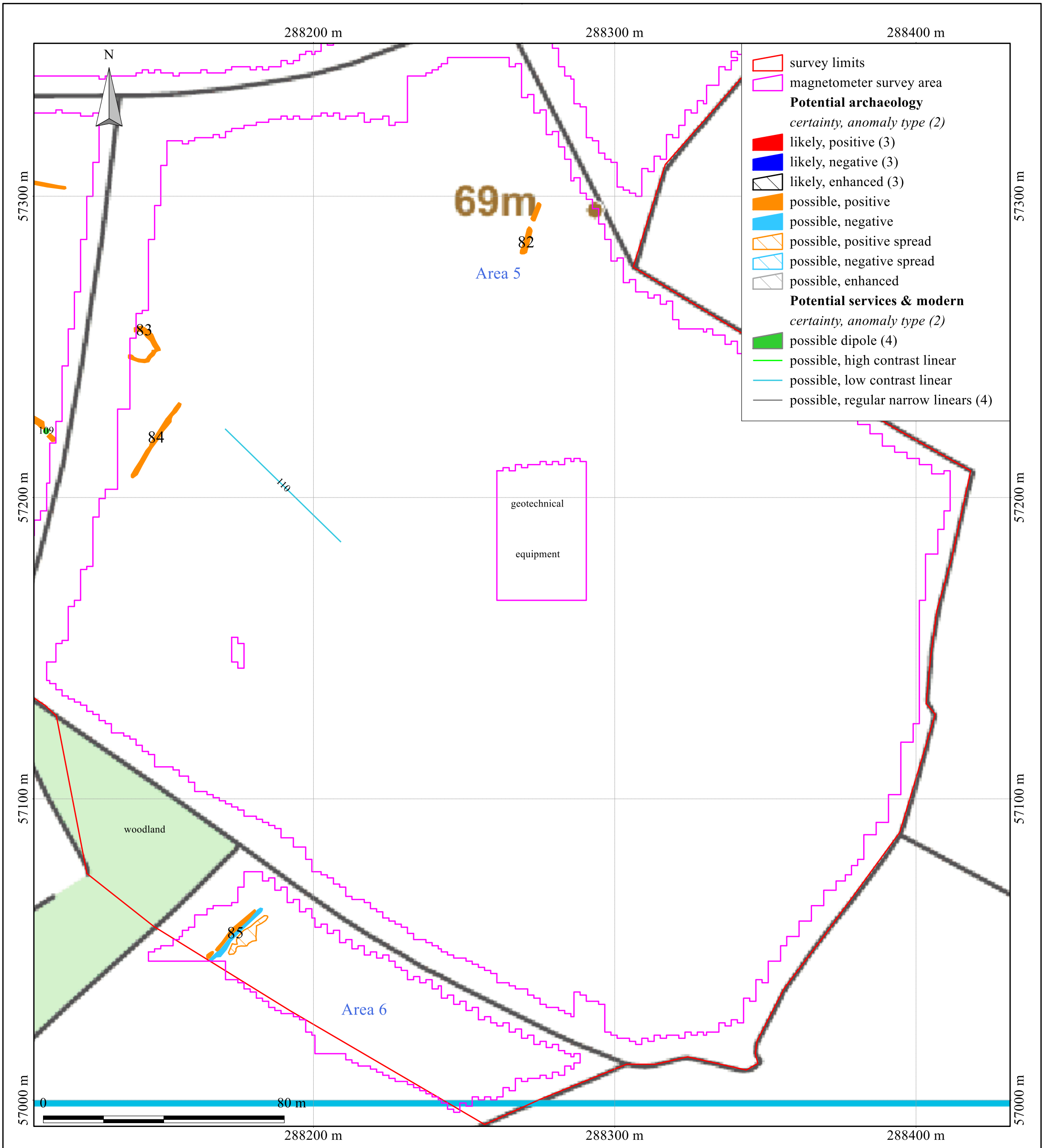

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Notes:
1. All interpretations are provisional and represent potential archaeological deposits.
2. 'Anomaly type' is a description of the magnetic anomaly. See the report text or GIS for an archaeological characterisation.
3. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.
4. 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.

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Figure 7: survey interpretation, Area 5 and 6

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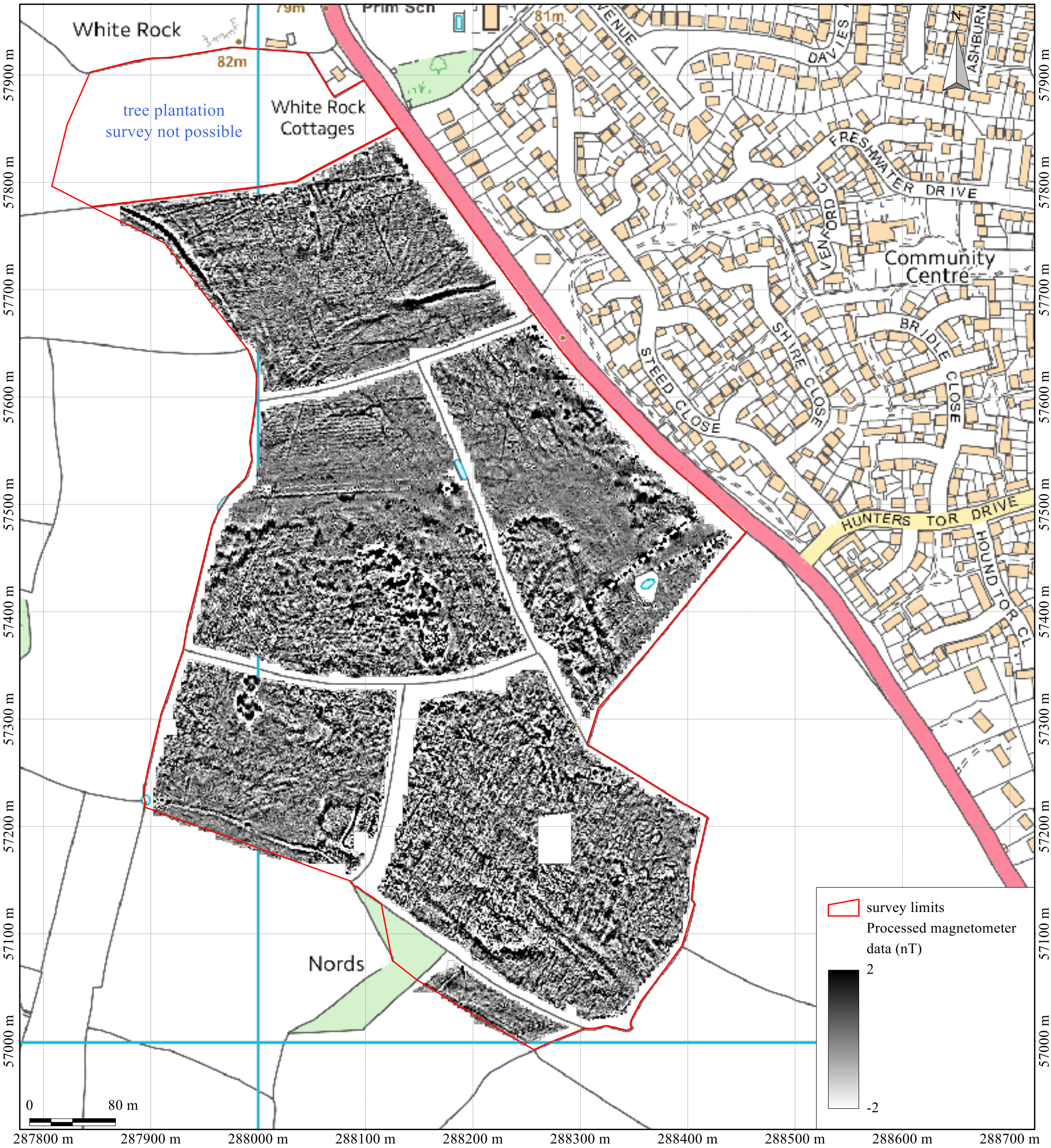

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Figure 8: shade plot of processed data, entire area

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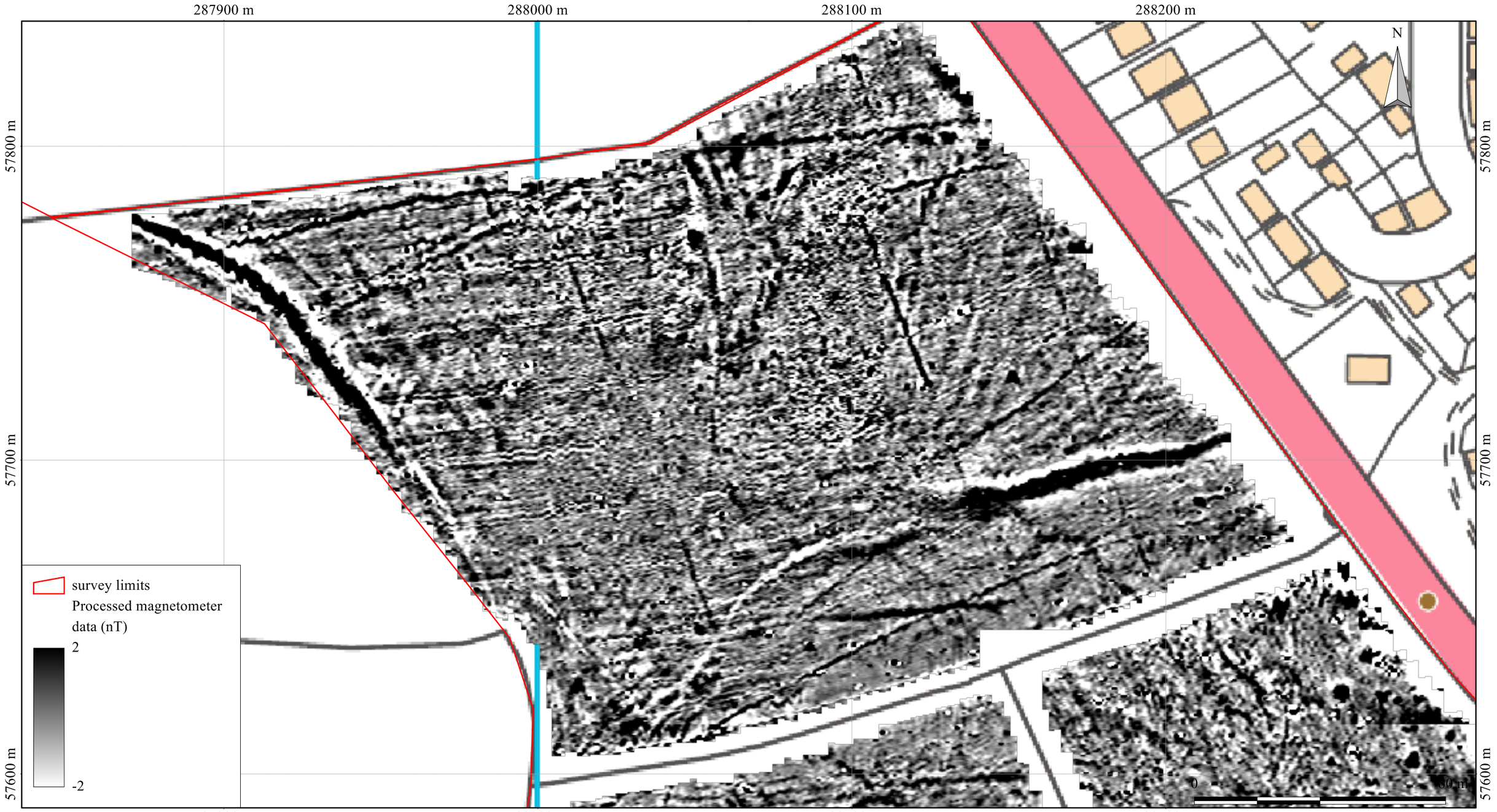

British Grid
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Scale: 1:1200 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 9: shade plot of processed data, Area 1

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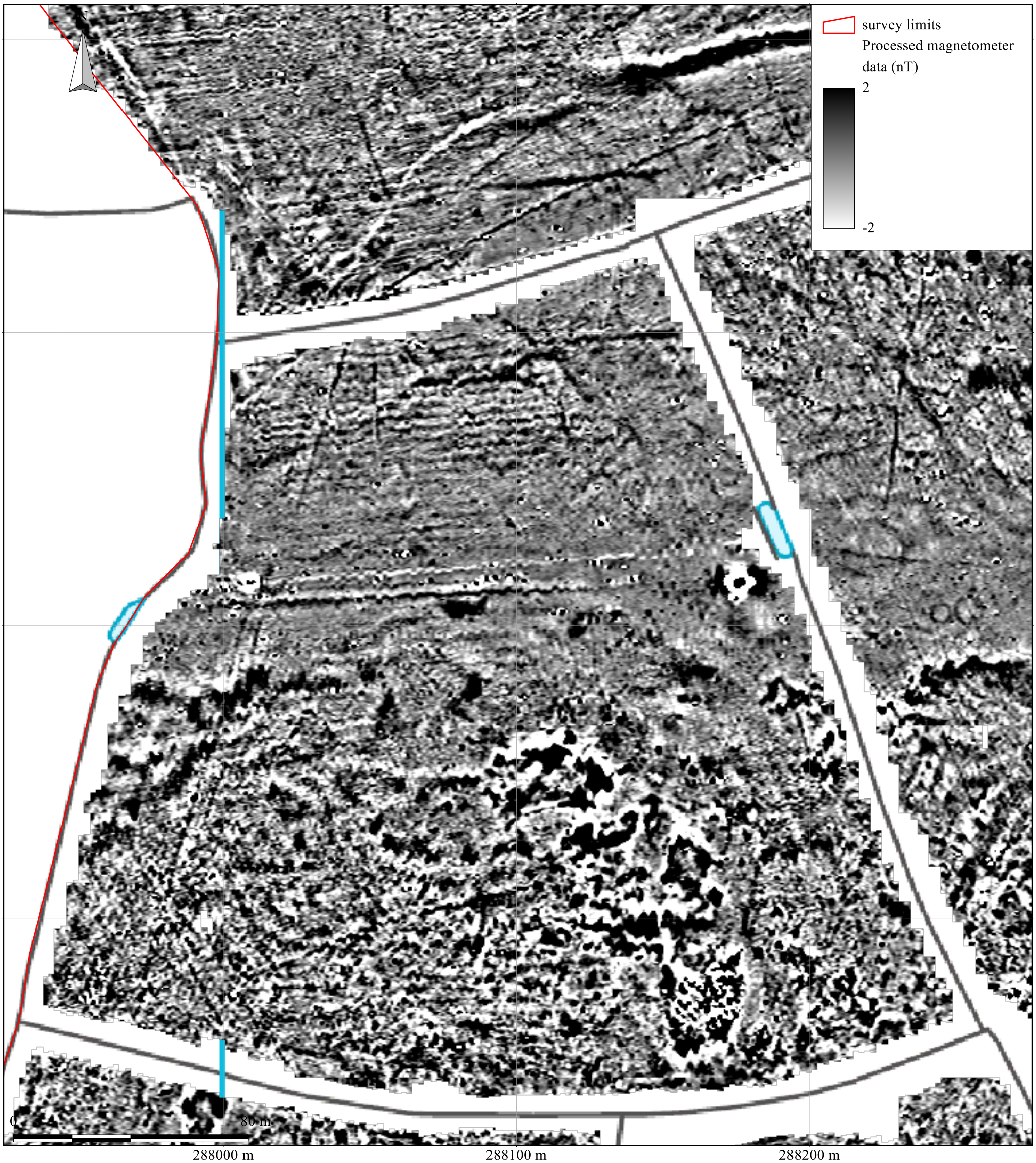

British Grid
centre X: 288100.52 m, centre Y: 57517.24 m

Scale: 1:1300 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 10: shade plot of processed data, Area 2

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British Grid
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Scale: 1:1300 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 11: shade plot of processed data, Area 3

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287900 m

288000 m

288100 m

57300 m

57200 m

survey limits

Processed magnetometer data (nT)

2

-2

0

80 m

British Grid
centre X: 288003.84 m, centre Y: 57256.50 m

Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 12: shade plot of processed data, Area 4

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

British Grid
centre X: 288269.22 m, centre Y: 57171.03 m

Scale: 1:1200 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological magnetometer survey
White Rock 2, Paignton, Devon
NGR 288143,057422
Report: 1704WHI-R-1

Figure 13: shade plot of processed data, Areas 5 and 6

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Barnstaple, Devon EX32 7LZ
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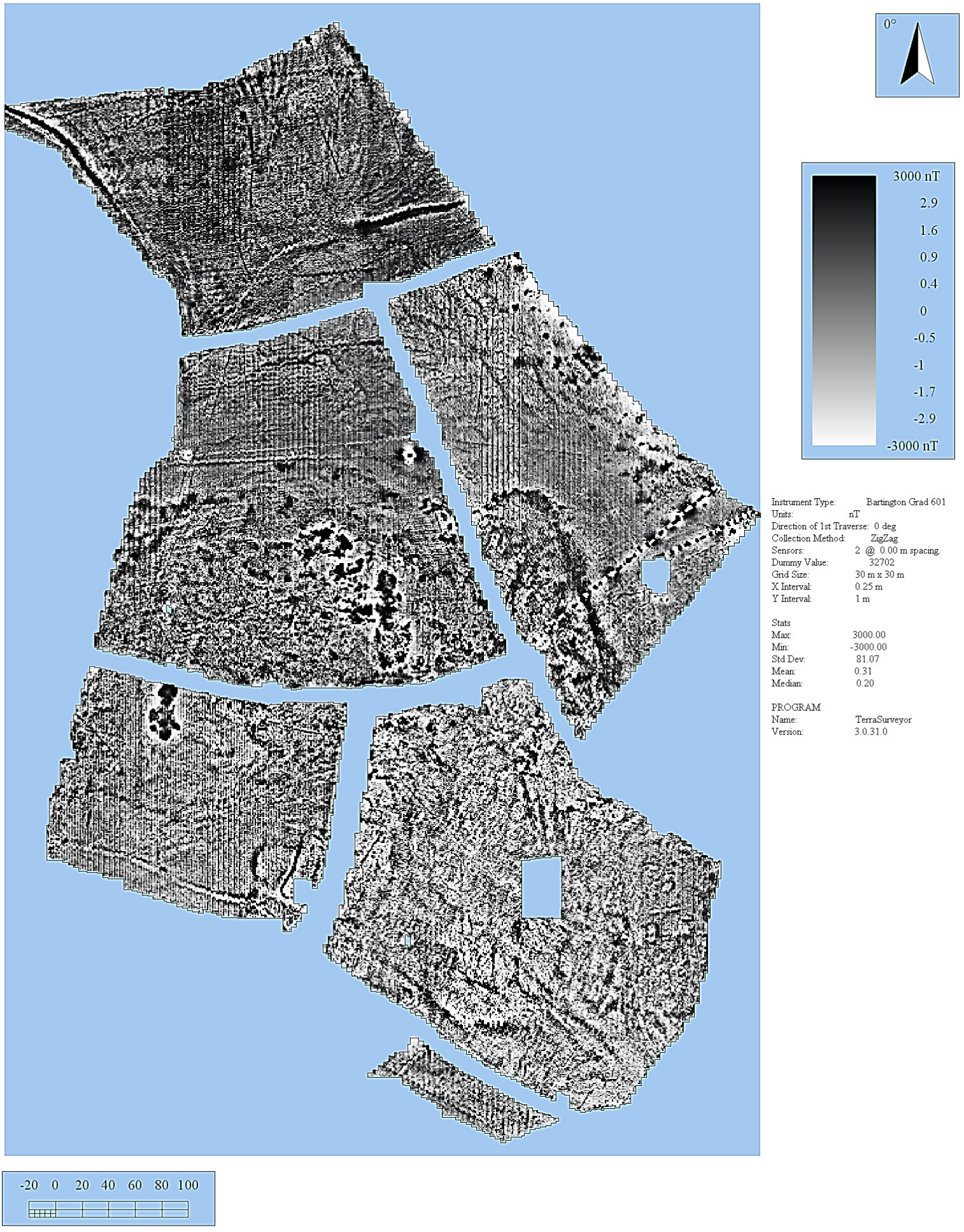

Figure 14: shade plot of unprocessed data

Appendix 2 Tables

Site: An archaeological magnetometer survey
White Rock 2, Paignton, Devon
NGR 288143,057422
Report: 1704WHI-R-1

area number	anomaly group	associated anomalies	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
1	1		likely, positive	disrupted curvilinear	field boundary	anomaly group coincides with a former field boundary recorded on historical maps	Ordnance survey 1862-1890 1:10560 to 1968-81 1:10560
	2		possible, positive	disrupted linear			
	3		possible, positive	disrupted linear			
	4		possible, positive	disrupted linear			
	5		possible, positive	disrupted linear			
	6		possible, positive/negative spread	disrupted linear	ditch-flanked, metalled routeway		
	7		possible, positive	disrupted linear			
	8		possible, positive	linear			
	9		possible, positive	linear	ditch-flanked track	anomaly group is on a similar alignment to a former track mapped on historical maps to the south between the northern parts of areas 2 and 3	1839 Churston Ferriers tithe map, Ordnance survey 1862-1890 1:10560 to 1968-81 1:10560
	10		possible, positive	disrupted linear	ditch-flanked track	anomaly group is on a similar alignment to a former track mapped on historical maps to the south between the northern parts of areas 2 and 3	1839 Churston Ferriers tithe map, Ordnance survey 1862-1890 1:10560 to 1968-81 1:10560
	11		possible, positive	disrupted linear			
	12		possible, positive	broad linear	archaeological or natural deposits		
	13		possible, positive	curvilinear group	archaeological or natural deposits	anomaly groups may represent a disrupted archaeological deposit such a former ditch or natural deposits	
	14		possible, positive	linear			
	15		possible, positive	oval	archaeological or natural deposits		
	16		possible, positive	disrupted linear			
	17		possible, positive	disrupted linear			
	18		possible, positive	linear			
	19		possible, positive	disrupted linear			
	20		possible, positive	disrupted linear			
	21		possible, positive	disrupted linear			
	22		possible, positive	disrupted linear			
	23		possible, positive	linear			
	24	30?	possible, negative	disrupted curvilinear			
	25		possible, positive	linear			
	26		possible, positive spread	linear		anomaly group may represent a spread of archaeological material such as a substantial ditch disrupted by later ploughing	
	27		possible, positive	disrupted linear			
	28		possible, positive	linear			
	29		possible, positive	disrupted linear			
1 & 2	30	24?	possible, positive	disrupted double linear	ditched track, parallel field boundaries or modern service trench		
1	101		possible, regular narrow linears		field drain		
2	31		possible, positive	disrupted linear			
	32		possible, positive	disrupted linear			
	33		possible, positive	disrupted double linear			
	34		possible, positive	disrupted linear			
	35		possible, positive	disrupted curvilinear			
	36		possible, positive	curvilinear			
	37		possible, positive	linear			
	38		possible, positive	disrupted linear			
	39		possible, positive	linear			
	40		possible, positive	linear			
	41		possible, positive	linear			
	42	43	possible, positive	linear	field boundary - possible Devon bank	anomaly group either represents part of a field boundary recorded on historical maps or recent ploughing disturbance	
	43	42	likely, positive/negative	linear	field boundary - possible Devon bank	anomaly group coincides with a former field boundary recorded on historical maps	Ordnance survey 1862-1890 1:10560 to 1968-81 1:10560
	44		possible, positive	disrupted curvilinear			
	45		possible, positive	disrupted linear			
	102		possible, dipole		ferrous material		
	103		possible, low contrast linear		service trench		
	104		possible, regular narrow linears		field drain		
	79		possible, enhanced	irregular	quarry or quarry material		
	80		likely, enhanced	broad linear	quarry	anomaly group coincides with a quarry recorded on historic maps	1839 Churston Ferriers tithe map, Ordnance survey 1865 to 1888 1:2500
3	46		possible, positive	linear			
	47		possible, positive	oval	pit or natural deposit	anomaly group is within an extended group of similar anomalies which probably represent natural deposits but this one has a regular shape and so may have an archaeological origin	
	48		possible, positive	disrupted linear			
	49		possible, positive	linear			
	50		possible, positive	disrupted linear			
	51		possible, positive				
	52		possible, positive	linear			
	53		possible, positive	disrupted linear			
	54		possible, positive	linear			
	55		possible, positive	disrupted linear			
	56		possible, positive				
	57		possible, positive	linear			
	58		possible, positive	disrupted linear			
	59		possible, positive	subcircular	ring ditch		
	60		possible, positive	subcircular	ring ditch	anomaly group may represent a ring ditch or similar feature but this is not certain	
	61		possible, positive	oval	pit		
	62		possible, positive	linear			
	63		possible, positive spread	disrupted curvilinear	archaeological or natural deposits such as a palaeochannel		
	64		possible, positive	linear			
	65		possible, positive	disrupted linear			
	66		possible, positive	disrupted linear			
	67		possible, positive	linear			
	68		possible, positive	disrupted linear			
	105		possible, low contrast linear		service trench		
	106		possible, high contrast linear		ferrous drain, pipe or cable		
	107		possible, high contrast linear		ferrous drain, pipe or cable		
4	69		possible, positive	disrupted linear			
	70		possible, positive	disrupted linear			
	71		possible, positive	disrupted curvilinear			
	72		possible, positive	linear			
	73		possible, positive	linear			
	74		possible, positive	disrupted return			
	75		possible, positive	disrupted linear			
	76		possible, positive	linear			
	77		possible, enhanced	irregular	rubble or near-surface bedrock - quarry?		
	78		likely, positive/negative/positive	disrupted linear	field boundary - Devon bank	anomaly group coincides with a former field boundary recorded on historical maps as complete in 1839, partial in 1862 and later	1839 Churston Ferriers tithe map, Ordnance survey 1862-1890 1:10560 to present
	109		possible, dipole		ferrous material		
	108		possible, low contrast linear		service trench		
	108		possible, low contrast linear		service trench		
	81		likely, enhanced	broad linear	quarry	anomaly group coincides with a quarry recorded on historic maps	1839 Churston Ferriers tithe map
5	82		possible, positive	disrupted linear			
	83		possible, positive	sub-circular	ring ditch or similar?	anomaly group may represent an archaeological deposit but the shape is not clear cut	
	84		possible, positive	linear			
	110		possible, low contrast linear		service trench		
6	85	86	possible, positive/negative	linear	Devon bank field boundary?		
	86	85	possible, positive spread	broad linear	rubble spread - Devon bank field boundary?		

Table 1: data analysis

Documents
Survey methodology statement: Dean (2017)

Methodology

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.

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	**Data Capture**
Instrument: Bartington Instruments grad601-2 *Firmware:* version 6.1	*Sample Interval:* 0.25m *Traverse Interval:* 1 metre *Traverse Method:* zigzag *Traverse Orientation:* GN

Data Processing, Analysis and Presentation Software
IntelliCAD Technology Consortium IntelliCAD 8.0
DW Consulting TerraSurveyor3
Manifold System 8 GIS
Microsoft Corp. Office Excel 2013
Microsoft Corp. Office Publisher 2013
Adobe Systems Inc Adobe Acrobat 9 Pro Extended

Table 2: methodology summary

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

PROGRAM

Name:	TerraSurveyor
Version:	3.0.31.0

Stats	
Max:	21.02
Min:	-20.76
Std Dev:	2.91
Mean:	0.13
Median:	0.01

Processes: 43

1 Base Layer
2 Clip at 1.00 SD
3 De Stagger: Grids: All Mode: Both By: -2 intervals
4 DeStripe Median Traverse: Grids: All
5 Range Match (Area: Top 120, Left 2760, Bottom 149, Right 2879) to Top edge
6 Range Match (Area: Top 150, Left 2760, Bottom 179, Right 2879) to Left edge
7 Range Match (Area: Top 150, Left 2880, Bottom 179, Right 2999) to Left edge
8 Range Match (Area: Top 120, Left 2880, Bottom 149, Right 2999) to Left edge
9 Range Match (Area: Top 210, Left 2880, Bottom 239, Right 2999) to Bottom edge
10 Range Match (Area: Top 210, Left 3000, Bottom 239, Right 3119) to Top edge
11 De Stagger: Grids: c36.xgd d7.xgd d20.xgd d27.xgd e4.xgd f8.xgd d1.xgd d6.xgd d21.xgd d26.xgd e5.xgd f7.xgd d2.xgd d5.xgd d22.xgd d25.xgd f1.xgd f6.xgd g9+d3.xgd d4+g23.xgd d23+g24.xgd d24.xgd f2.xgd a1+f5.xgd Mode: Both By: 3 intervals
12 De Stagger: Grids: g12.xgd Mode: Both By: 2 intervals
13 Range Match (Area: Top 210, Left 3000, Bottom 239, Right 3119) to Top edge
14 De Stagger: Grids: f31.xgd f34.xgd f32.xgd f33.xgd Mode: Both By: 1 intervals
15 De Stagger: Grids: f32.xgd f33.xgd Mode: Both By: 1 intervals
16 De Stagger: Grids: g5.xgd Mode: Both By: -2 intervals
17 De Stagger: Grids: g15.xgd Mode: Both By: 1 intervals
18 De Stagger: Grids: h10.xgd Mode: Both By: -1 intervals
19 De Stagger: Grids: h9.xgd Mode: Both By: -1 intervals
20 De Stagger: Grids: i5.xgd Mode: Both By: 1 intervals
21 De Stagger: Grids: m13+c21.xgd n16+c30.xgd c31.xgd d12.xgd d15.xgd c22.xgd c29.xgd c32.xgd d11.xgd d16.xgd c23.xgd c28.xgd c33.xgd d10.xgd d17.xgd c24.xgd c27.xgd c34.xgd d9.xgd d18.xgd c26.xgd c35.xgd d8.xgd d19.xgd c25.xgd c36.xgd d7.xgd d20.xgd d1.xgd d6.xgd d21.xgd d2.xgd d5.xgd d22.xgd g9+d3.xgd d4+g23.xgd d23+g24.xgd Mode: Both By: -1 intervals
22 De Stagger: Grids: c27.xgd c34.xgd d9.xgd c26.xgd c35.xgd d8.xgd Mode: Both By: 2 intervals
23 De Stagger: Grids: d20.xgd d27.xgd Mode: Both By: 1 intervals
24 De Stagger: Grids: d36.xgd e1.xgd e2.xgd Mode: Both By: 2 intervals
25 De Stagger: Grids: e3.xgd e4.xgd e5.xgd f1.xgd f2.xgd Mode: Both By: -2 intervals
26 De Stagger: Grids: e4.xgd Mode: Both By: 1 intervals
27 De Stagger: Grids: f13.xgd f12.xgd f11.xgd f10.xgd f9.xgd f8.xgd f7.xgd Mode: Both By: 2 intervals
28 De Stagger: Grids: f18.xgd Mode: Both By: 3 intervals
29 De Stagger: Grids: a9.xgd a20.xgd a10.xgd a19.xgd a11.xgd a18.xgd a12.xgd a17.xgd a13.xgd a16.xgd a14+i11.xgd a15+i12.xgd Mode: Both By: 2 intervals
30 De Stagger: Grids: f30+b3-a.xgd b2-a.xgd b1.xgd a21.xgd Mode: Both By: 2 intervals
31 De Stagger: Grids: a16.xgd a15+i12.xgd Mode: Both By: 2 intervals
32 De Stagger: Grids: c3.xgd c9.xgd c17.xgd c4.xgd c8.xgd c18.xgd c5.xgd c7.xgd Mode: Both By: 2 intervals
33 De Stagger: Grids: c1.xgd c2.xgd Mode: Both By: 2 intervals
34 De Stagger: Grids: c8.xgd Mode: Both By: 1 intervals
35 De Stagger: Grids: f8.xgd f21.xgd f7.xgd a6+f22.xgd Mode: Both By: 1 intervals
36 De Stagger: Grids: n21.xgd n20.xgd n19.xgd n18.xgd n17.xgd Mode: Both By: 2 intervals
37 De Stagger: Grids: n22.xgd Mode: Both By: 1 intervals
38 De Stagger: Grids: o3.xgd k4+o12.xgd o4.xgd o11+k5.xgd o5.xgd o10.xgd o6.xgd o9.xgd d33+o7.xgd o8+d34.xgd Mode: Both By: 2 intervals
39 De Stagger: Grids: k4+o12.xgd o11+k5.xgd o10.xgd o9.xgd o8+d34.xgd Mode: Both By: 2 intervals
40 De Stagger: Grids: k17.xgd k18.xgd k19.xgd Mode: Both By: -2 intervals
41 De Stagger: Grids: m5.xgd m6.xgd n1.xgd m7.xgd n2.xgd n9.xgd n3.xgd n8.xgd n4.xgd n7.xgd n5.xgd n6.xgd Mode: Both By: 2 intervals
42 Interpolate: Match X & Y Doubled.
43 Clip at 5.00 SD

Table 3: processed data metadata