

LAND AT CAERHAYS BARTON ST MICHAEL CAERHAYS CORNWALL

Results of a Geophysical Survey



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01769 573555
01872 223164

LAND AT CAERHAYS BARTON, ST MICHAEL CAERHAYS, CORNWALL

RESULTS OF A GEOPHYSICAL SURVEY

By P. Webb
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Work undertaken by SWARCH for a private client

SUMMARY

This report presents the results of a geophysical survey carried out by South West Archaeology Ltd. (SWARCH) on land at Caerhays Barton, St Michael Caerhays, Cornwall, as part of the planning submission for the proposed erection of an agricultural barn.

The site comprises the southern end of a sub-rectangular field to the north of Caerhays Barton. The survey identified nine groups of geophysical anomalies. These were predominantly linear anomalies probably related to modern services and ditch features. The identified anomaly groups include: four ditch features; one possible drainage feature; three modern services; and one pit. Evidence of metallic debris and ground disturbance was also identified.

The results of the geophysical survey would suggest that the archaeological potential for the site is moderate. The alignment of some of the identified features matches that of existing field boundaries, indicating that they may belong to an earlier phase of the same fieldsystem. Other linear features appear to follow a slightly different alignment and may belong to an earlier fieldsystem, perhaps associated with the Prehistoric settlement identified immediately to the south of the site. However, numerous buried modern services cross the site and these serve to obscure the results. One of these appears to follow the line of a cropmark visible in the field to the south.



June 2021

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CONTENTS

<i>SUMMARY</i>	2
<i>CONTENTS</i>	3
<i>LIST OF FIGURES</i>	3
<i>LIST OF TABLES</i>	3
<i>LIST OF APPENDICES</i>	3
<i>ACKNOWLEDGEMENTS</i>	3
<i>PROJECT CREDITS</i>	3
1.0 INTRODUCTION	4
1.1 PROJECT BACKGROUND	4
1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND	4
1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND	4
1.4 METHODOLOGY	5
2.0 GEOPHYSICAL SURVEY	6
2.1 INTRODUCTION	6
2.2 SITE INSPECTION	6
2.3 METHODOLOGY	6
2.4 RESULTS	7
2.5 DISCUSSION	7
2.6 ARCHAEOLOGICAL POTENTIAL	8
3.0 CONCLUSION	10
4.0 BIBLIOGRAPHY & REFERENCES	10

LIST OF FIGURES

Cover plate: View across the survey area, looking towards St Michael Caerhays; viewed from the south-west (no scale).

FIGURE 1: SITE LOCATION.	5
FIGURE 2: SHADE PLOT OF THE GRADIOMETER SURVEY DATA.	9
FIGURE 3: F1, INTERPRETATION OF THE GRADIOMETER SURVEY DATA.	9

LIST OF TABLES

TABLE 1: INTERPRETATION OF GRADIOMETER SURVEY DATA.	7
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LIST OF APPENDICES

APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY	11
APPENDIX 2: SUPPORTING PHOTOGRAPHS	14

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THE AGENT
THE CLIENT AND TENANTS FOR ACCESS

PROJECT CREDITS

DIRECTOR: DR. SAMUEL WALLS, MCIFA
FIELDWORK: JOE BAMPTON, MCIFA; PETER WEBB
REPORT & GRAPHICS: PETER WEBB
EDITING: DR. BRYN MORRIS, ACIFA

1.0 INTRODUCTION

LOCATION:	CAERHAYS BARTON
PARISH:	ST MICHAEL CAERHAYS
COUNTY:	CORNWALL
NGR:	SW 196281 041594
SWARCH REF.	SMBC21
OASIS REF.	SOUTHWES1-432783

1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by a private client to undertake a geophysical survey on land at Caerhays Barton, St Michael Caerhays, Cornwall, as part of a planning submission for the erection of an agricultural barn. This work was undertaken in accordance with best practice and ClfA guidance in order to assess the potential impact of the proposed development.

1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

The proposed site is located to the north of Caerhays Barton, c.11km south-west of St Austell, 300m south of the settlement of St Michael Caerhays, and 500m north of the south Cornish coast at Veryan Bay. The site comprises the southern end of a single field situated immediately to the north of the working farm at an altitude of c.98m. The soils of this area are the well-drained fine loamy soils of the Denbigh Association (SSEW 1983); these overlie sandstones of the Carne Formation (BGS 2021).

1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

St Michael Caerhays, from the dedication of the church of St Michael the Archangel and the manor of Caerhays (the latter of obscure meaning – Mills 2011), lies in the parish of the same name, within the deanery and east division of the Hundred of *Powder* (Lysons 1814). Settlement is first recorded in 1259 when one of two parochial chapels was annexed to the parish of St Stephen-in-Brannel by Bishop Bronescombe; the church itself has Norman origins. The manor and barton both belonged to the Arundell family, passing to the Trevanions in the 14th century. The manor was pulled down in the early 19th century, to be replaced by the castellated mansion that stands on the site today.

The site falls within land designated by the Cornwall and Scilly Historic Landscape Characterisation as *Post-medieval Enclosed Land*: land enclosed in the 17th, 18th, and 19th centuries, usually from land that was previously Upland Rough Ground and often medieval commons. It is surrounded to the north by Medieval Farmland; to the east by the ornamental park of Caerhays Castle; to the south by Coastal Rough Ground; and to the west by Plantations and Scrub. The field appears as *House Close* in the 1840 tithe apportionment.

The site lies within an area rich in Prehistoric archaeology: the extensive cropmarks of a Prehistoric settlement lie immediately to the south (MCO50247), with other settlements at Polgrain (MCO50238) and Treberrick (MCO50237) to the north. A group of destroyed barrows are also recorded to the north (MCO3328-MCO3333). The pattern of dispersed small-scale settlement appears to have continued into the medieval period, with settlement recorded at Caerhays in 1259 (MCO13687); Polmenna in 1293 (MCO16395); Polgrain in 1300 (MCO16359); and Trevanion in 1302 (MCO11548), with a surrounding landscape of agricultural fields. During the post-medieval periods settlement at Caerhays grew, whilst the Caerhays estate was turned from a deer park to woodland gardens (MCO10681).

No archaeological investigations have been carried out on the proposed development site; in the wider area, Caerhays Castle and estate has been subject to site surveys (ECO756, ECO2430, ECO4630) and an archaeological watching brief (Dudley 2003), the latter identifying stone drains and evidence for landscaping.

1.4 METHODOLOGY

This work was undertaken in accordance with current best practice, CifA guidance. The geophysical (gradiometer) survey follows the general guidance as outlined in: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider* (Europae Archaeologiae Consilium/European Archaeological Council 2016) and *Standard and Guidance for Archaeological Geophysical Survey* (CifA 2014b).



FIGURE 1: SITE LOCATION (THE SITE IS INDICATED).

2.0 GEOPHYSICAL SURVEY

2.1 INTRODUCTION

An area of c.0.8ha was the subject of a magnetometry (gradiometer) survey. The purpose of this survey was to identify and record magnetic anomalies within the proposed site. While identified anomalies may relate to archaeological deposits and structures the dimensions of recorded anomalies may not correspond directly with any associated features. The following discussion attempts to clarify and characterise the identified anomalies. The survey was undertaken on 27th May 2021 by P. Webb; the survey data was processed by P. Webb. Additional graphic images of the survey data and numbered grid locations can be found in Appendix 1; supporting photographs for the site inspection can be seen in Appendix 2.

2.2 SITE INSPECTION

The site comprises the southern end of a sub-rectangular field immediately to the north of Caerhays Barton and to the west of the Caerhays Estate. At the time of the survey the field was laid to pasture. The survey area was relatively level, although the rest of the field slopes slightly down to the north. The site is bounded to all sides by overgrown stone-faced hedgebanks with internal post-and-wire fencing; the southern boundary (to Caerhays Barton) incorporates a stone wall and wooden fence. No earthwork features were observed within the survey area.

2.3 METHODOLOGY

The gradiometer survey follows the general guidance as outlined in: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider* (Europae Archaeologiae Consilium/European Archaeological Council 2016) and *Standard and Guidance for Archaeological Geophysical Survey* (ClfA 2014b).

The survey was carried out using a twin-sensor fluxgate gradiometer (Bartington Grad601). These machines are sensitive to depths of up to 1.50m. The survey parameters were: sample intervals of 0.25m, traverse intervals of 1m, a zigzag traverse pattern, traverse orientation was circumstantial, grid squares of 30×30m. The gradiometer was adjusted ('zeroed') every 0.5-1ha. The survey grid was tied into the Ordnance Survey National Grid- and set out using a Leica CS15 GNSS Rover GPS. The data was downloaded onto *Grad601 Version 3.16* and processed using *TerraSurveyor Version 3.0.36.0*. The primary data plots and analytical tools used in this analysis were *Shade* and *Metadata*. The details of the data processing are as follows:

Processes:

Clip +/- 1SD; removes extreme data point values.

DeStripe all traverses, median; used to equalise underlying differences between grids (potentially caused by instrument drift or orientation, directional effects inherent in magnetic instrument, or differences in instrument set up during survey e.g. using two gradiometers).

DeStagger all traverses out- and inbound by 0.50m; reduces staggering effects within data derived from zig-zag collection method.

Details:

0.80925ha surveyed

Stats unadjusted; Max. 98.18nT, Min. -100.00nT; Standard Deviation 30.34nT, mean -0.08nT, median 0.22nT.

2.4 RESULTS

Table 1 with the accompanying Figures 2 and 3 show the analyses and interpretation of the geophysical survey data.

TABLE 1: INTERPRETATION OF GRADIOMETER SURVEY DATA.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
1	Weak positive, probable	Linear	Ditch	Indicative of a cut and infilled feature such as a ditch. Aligned approximately north-east to south-west and north-west to south-east. Responses of between +3.42nT and +14.02nT.
2	Moderate positive, probable	Linear	Ditch	Indicative of a cut and infilled feature such as a ditch. Aligned approximately north to south. Responses of between +4.71nT and +24.63nT.
3	Weak to moderate positive, possible	Linear	Ditch	Indicative of a cut and infilled feature such as a ditch. Aligned approximately north-west to south-east. Responses of between +4.98nT and +15.81nT.
4	Moderate negative, probable	Linear	Drainage	Indicative of a ceramic or stone feature such as a drain. Aligned approximately north-east to south-west. Responses of between -32.44nT and -5.51nT.
5	Very strong bipolar, probable	Linear	Modern service	Indicative of a buried modern service. Aligned between approximately east to west and north-west to south-east. Responses of between -198.08nT and +135.44nT
6	Very strong positive with associated negative, probable	Linear	Modern service	Indicative of a buried modern service. Aligned approximately north-east to south-west. Responses of between -110.98nT to +101.52nT
7	Strong bipolar, probable	Linear	Modern service	Indicative of a buried modern service. Aligned approximately north-west to south-east. Responses of between -31.97nT and +51.99nT.
8	Moderate positive with associated negative, probable	Linear	Ditch and banked material	Indicative of a cut and infilled feature such as a ditch with associated compacted/banked material. Aligned approximately north-east to south-east. Responses of between -16.32nT and +25.61nT.
9	Moderate dipolar, probable	Discrete ovoid	Pit	Indicative of a cut and infilled feature such as a pit with associated banked material. Responses of between -18.78nT and +35.99nT.
	Strong dipolar (mixed response)	Discrete	Ferrous anomaly	Indicative of metallic object. Responses of between c./-100nT.
	Strong bipolar (mixed response)	Irregular	Modern disturbance	Indicative of disturbed ground and disturbance caused by proximity to metallic fences and debris. Responses of between c./-200nT.

2.5 DISCUSSION

The survey identified nine groups of anomalies. These were predominantly linear anomalies probably representing modern services and ditch features. The identified anomaly groups include: four ditch features; one possible drainage feature; three modern services; and one pit. Evidence of metallic debris and ground disturbance was also identified.

The weak responses of some of the anomalies indicates that the majority are only likely to survive to a shallow depth. The background geological variation across the site was between +/-5nT.

Anomaly Group 1 consists of two weak positive (+3.42nT to +14.02nT) linear responses indicative of cut and infilled features such as ditches. They are orientated approximately north-east to south-west and north-west to south-east along the lines of the existing fieldsystem and may belong to an earlier phase.

Anomaly Group 2 consists of a moderate positive (+4.71nT to +24.63nT) linear response indicative of a cut and infilled feature such as a ditch. It is orientated approximately north to south. Whilst broadly along the lines of the existing fieldsystem, it does appear to be slightly off-set and may form part of a different earlier field layout.

Anomaly Group 3 consists of a weak positive (+4.98nT to +15.81nT) linear response indicative of a cut and infilled feature such as a ditch. It is aligned approximately north-west to south-east, along the lines of the existing field system, parallel to elements of Group 1, and is likely to form part of the same phase of fieldsystem.

Anomaly Group 4 consists of a moderate negative (-32.44nT to -5.51nT) linear response indicative of a ceramic or stone feature such as a drain. It is orientated approximately north-east to south-west.

Anomaly Groups 5 and 7 consist of very strong bipolar (-198.08nT to -4.41nT and +6.47nT to +135.44nT) linear responses indicative of buried modern services. They are aligned between approximately east to west and north-west to south-east. (Note that one of these (5a) appears to line up with the cropmarks of a field boundary approaching from the south-west. It is unclear whether this indicates the cropmark is of a relatively recent feature, or if a Prehistoric feature has generated a very strong magnetic response).

Anomaly Group 6 consists of a very strong positive (+6.47nT to +101.52nT) with associated negative (-110.98nT to -4.56nT) linear response indicative of a buried modern service. It is aligned approximately north-east to south-west.

Anomaly Group 8 consists of a moderate positive (+3.95nT to +25.61nT) with associated negative (-16.32nT to -3.48nT) linear response indicative of a cut and infilled feature such as a ditch with associated compacted/banked material. It is aligned approximately north-east to south-west, along the lines of the existing fieldsystem and may form part of an earlier phase.

Anomaly Group 9 consists of a moderate dipolar (-18.77nT to -3.06nT and +10.36nT to +35.99nT) discrete ovoid response indicative of a cut and infilled feature such as a pit. Its position at the end of a linear feature may suggest that the two form part of a modern service such as a drain.

Modern disturbance, dipolar anomalies and magnetic disturbance are also located across the field, particularly around the site boundaries. This is likely due to the presence of ferrous objects and other metallic debris and the metallic components of fence lines and field boundaries.

2.6 ARCHAEOLOGICAL POTENTIAL

The results of the geophysical survey would suggest that the archaeological potential for the site is *moderate*. The alignment of some of the identified features matches that of existing field boundaries (anomaly Groups 1, 3 and 8) indicating that these may reflect an earlier phase of the same fieldsystem. Other linear features, however, appear to follow a slightly different alignment (Group 2) and may represent an earlier phase of fieldsystem, perhaps one associated with the Prehistoric settlement located immediately to the south.

Several buried modern services (Groups 5, 6 and 7) cross the site, particularly towards the north- and south-eastern boundaries. One appears to follow the line of a cropmark visible in the field to the south.

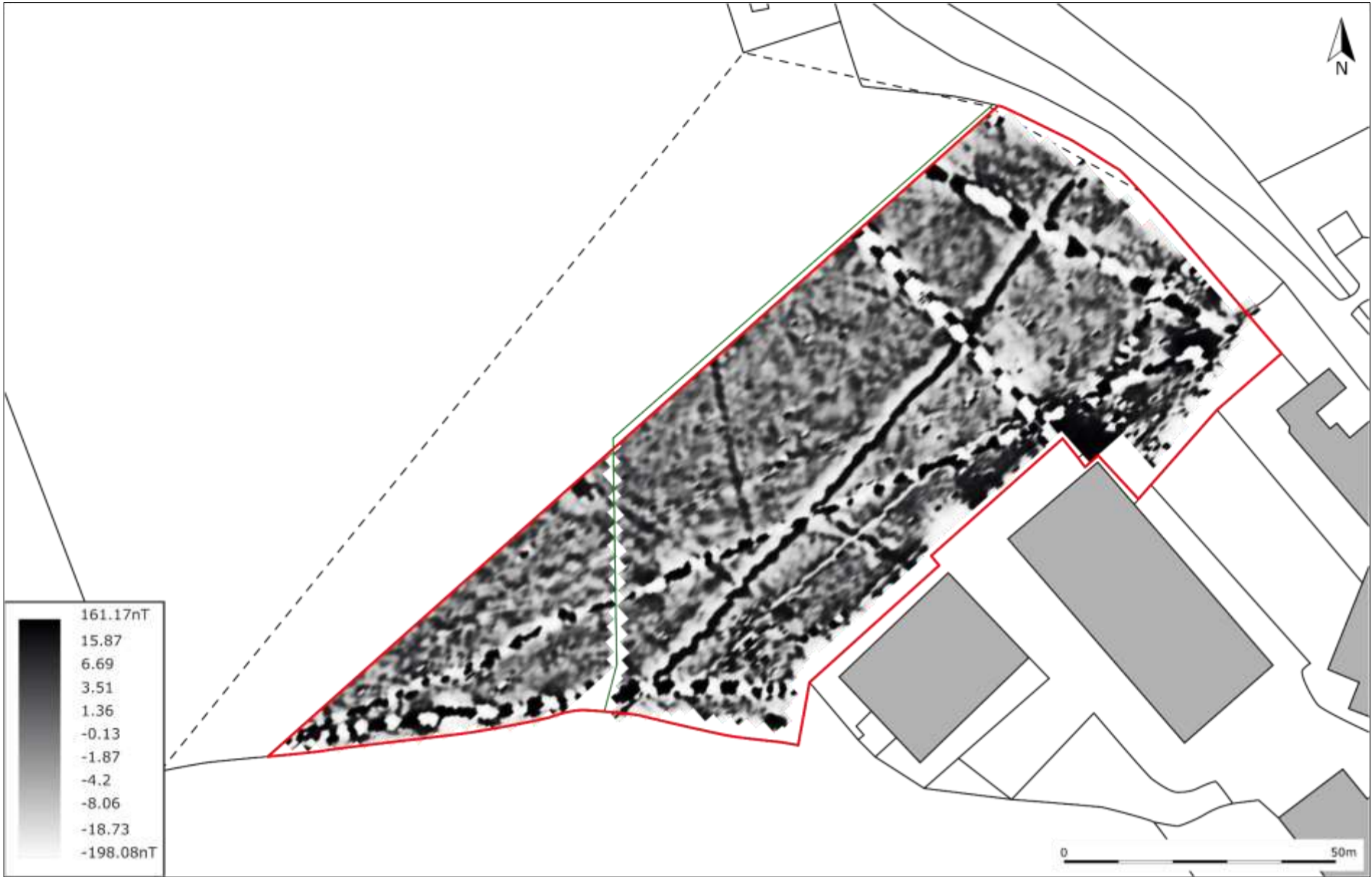


FIGURE 2: SHADE PLOT OF THE GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALIZED, GRADIATED SHADING.



FIGURE 3: F1, INTERPRETATION OF THE GRADIOMETER SURVEY DATA.

3.0 CONCLUSION

The site comprises the southern end of a sub-rectangular field to the north of Caerhays Barton. The geophysical survey identified nine groups of anomalies. These were predominantly linear anomalies probably representing modern services and ditch features. The identified anomaly groups include: four ditch features; one possible drainage feature; three modern services; and one pit. Evidence of metallic debris and ground disturbance was also identified.

The results of the geophysical survey would suggest that the archaeological potential for the site is *moderate*. The alignment of some of the identified features matches that of existing field boundaries indicating that these may belong to an earlier phase of the same fieldsystem. Other linear features, however, follow a slightly different alignment and may represent an earlier phase of fieldsystem, perhaps associated with the Prehistoric settlement located immediately to the south of the site. Several buried modern services cross the site, particularly towards the north- and south-eastern boundaries, and these responses may mask other anomalies; one appears to follow the line of a cropmark visible in the field to the south.

4.0 BIBLIOGRAPHY & REFERENCES

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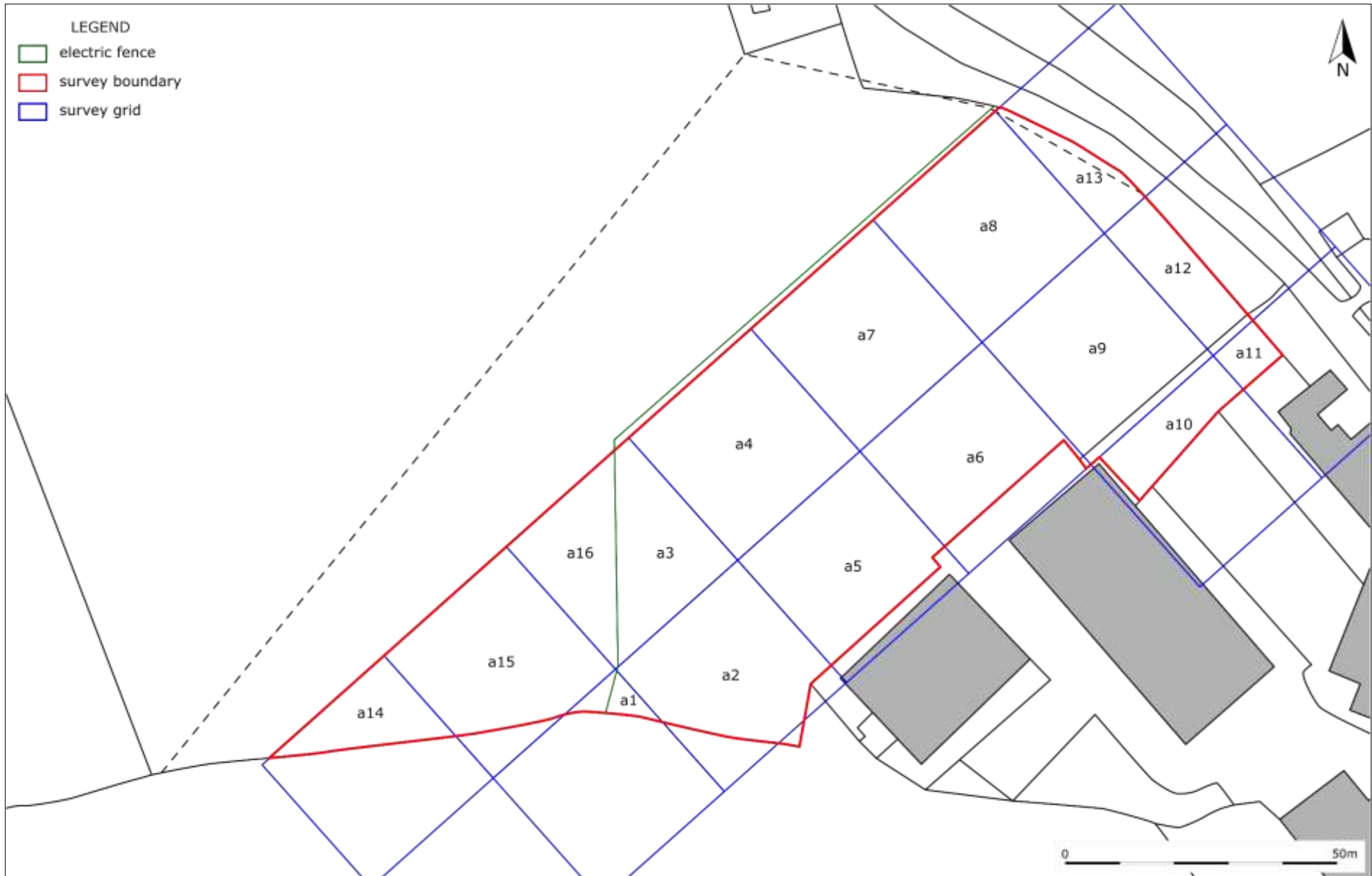
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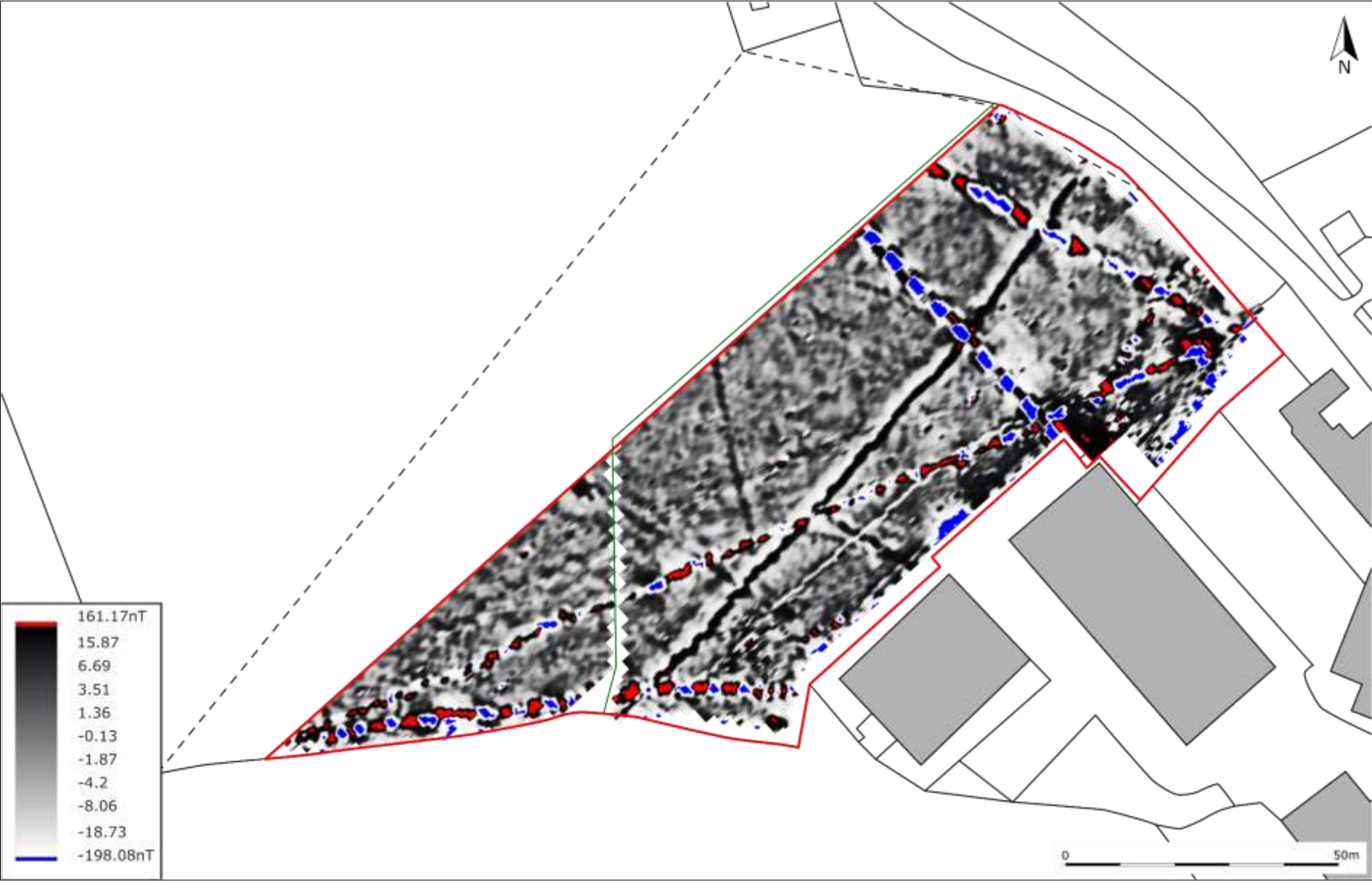
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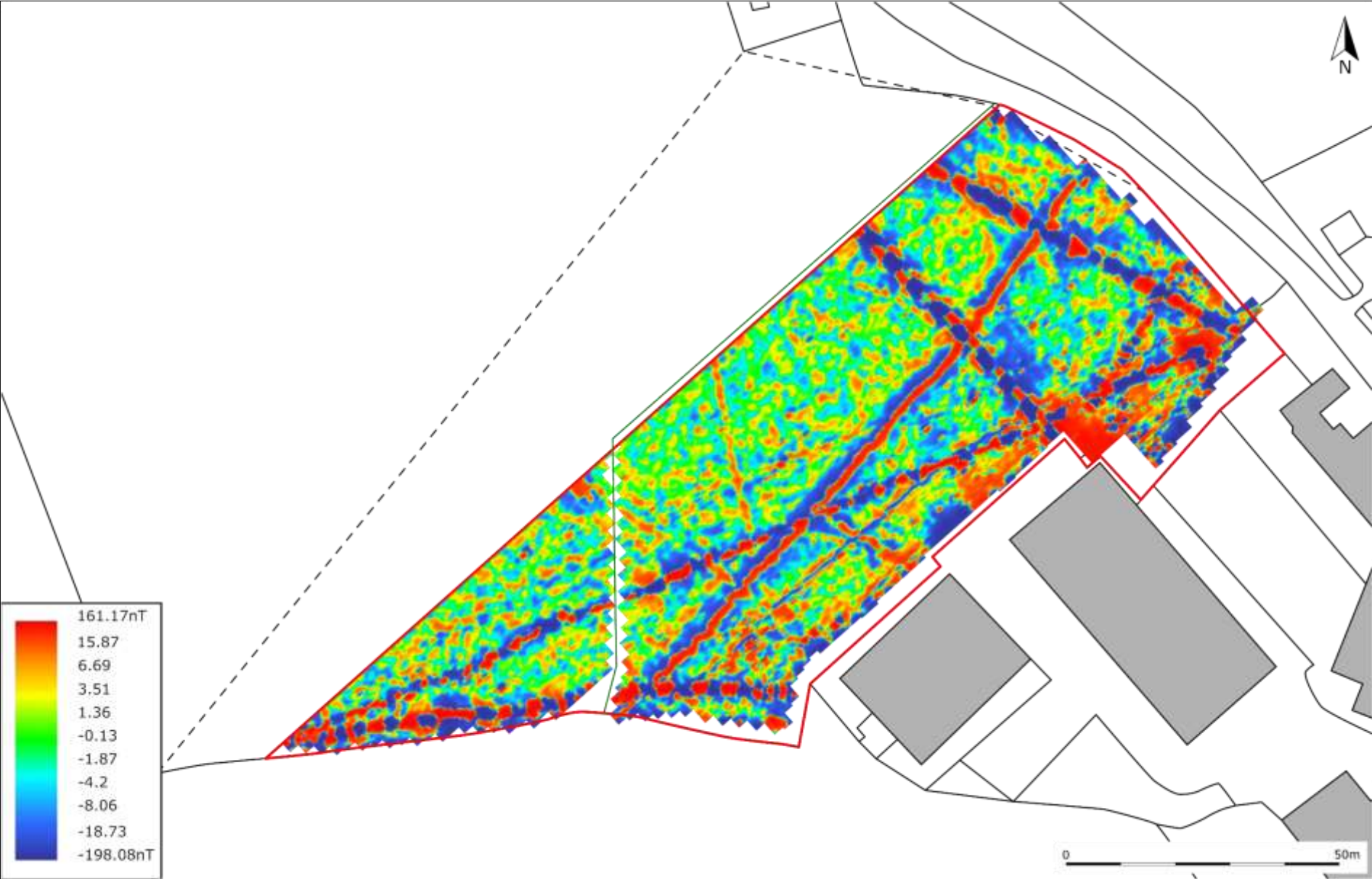
APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY



1. GEOPHYSICAL SURVEY GRID LOCATION AND NUMBERING.



2. F1, RED-GREY-BLUE SHADE PLOT OF THE GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.



3. F1, RED-GREEN-BLUE2 SHADE PLOT OF THE GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.

APPENDIX 2: SUPPORTING PHOTOGRAPHS



1. DETAIL OF THE NORTH-EASTERN STONE-FACED BOUNDARY; VIEWED FROM THE NORTH-WEST (1M SCALE).



2. DETAIL OF THE SOUTH-EASTERN SITE BOUNDARY, SHOWING THE OLD TELEGRAPH POLES; VIEWED FROM THE NORTH-WEST (NO SCALE).



3. VIEW ACROSS THE SURVEY AREA; VIEWED FROM THE SOUTH-EAST (NO SCALE).



4. VIEW ALONG THE SOUTHERN BOUNDARY OF THE SURVEY AREA; VIEWED FROM THE SOUTH-WEST (NO SCALE).



5. VIEW ACROSS THE SURVEY AREA; VIEWED FROM THE SOUTH-SOUTH-EAST (NO SCALE).



6. DETAIL OF MODERN REPAIRS TO THE SOUTHERN BOUNDARY; VIEWED FROM THE NORTH (1M SCALE).



7. VIEW ACROSS THE SURVEY AREA; VIEWED FROM THE SOUTH-WEST (NO SCALE).



8. VIEW ACROSS THE SURVEY AREA TOWARDS THE EXISTING BARN; VIEWED FROM THE SOUTH (NO SCALE).



THE OLD DAIRY
HACCHE LANE BUSINESS PARK
PATHFIELDS BUSINESS PARK
SOUTH MOLTON
DEVON
EX36 3LH

01769 573555
01872 223164
MAIL@SWARCH.NET