

An archaeological magnetometer survey

East Park, Tregadillett, Launceston

Centred on NGR (E/N): 230061,083865 (point)

Report: 1601TRE-R-1

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Project archive

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

Website: substrata.co.uk

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

1 Survey description and summary

1.1 Survey

J	
Туре:	twin-sensor fluxgate gradiometer
Date:	20 January 2017
Area:	0.76ha
Lead surveyor:	Mark Edwards BA
Author:	Ross Dean BSc MSc MA MIfA

1.2 Clients

Mr. Stevens, 43 Race Hill, Launceston PL15 9BB

1.3 Location

Site:	East Park, Tregadillett, Launceston
Civil Parish:	South Petherwin
District:	North Cornwall
County:	Cornwall
Nearest Postcode:	PL15 7FA
NGR:	SX 30061 83865 (point)
NGR (E/N):	230061,083865 (point)

1.4 Archive

OASIS number:
Archive:

substrat1-278905 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 under the instruction of GM Planning Services on behalf of Mr Stevens. The survey area location is shown in Figure 1.

1.6 Summary

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

One magnetic anomaly group was mapped as representing potential archaeological deposits. The group represents the footings of a former Cornish hedge with flanking ditches. Whilst the anomalies have a similar orientation to the adjacent extant field boundaries, this field boundary was not recorded on the first edition Ordnance Survey map of AD 1884 or on subsequent Ordnance Survey maps.

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 a plot within a single field on the east side of Tregadillett which lies approximately 2.5km west of Launceston. It is bounded to the north by a minor road, to the west by a housing estate and agricultural land, to the south by the agricultural land and to the east by agricultural land and a house. The survey area lies on a gentle south-facing slope between approximately 185m and 190m AOD.

4.2 Geology

The bedrock across the site is of the Carboniferous Crackington Formation. Generically these rocks are rhythmically bedded, dark blue-grey mudstones and subordinate predominantly grey sandstones and siltstones. Sandstone percentage varies from 20-75%, both vertically and geographically (British Geological Survey, undated).

The superficial geology is not recorded for the site in the source consulted but a nearby borehole record (ibid) provided an indication of the sediments at the limit of the magnetometers (a Bartington 601-2 gradiometer) ground penetration capacity:

BGS ID: 647846 : BGS Reference: SX28SE59, British National Grid: 229960,83760

0m to 1.5m: no core recovery

1.5m to 2m: light brown to light grey clay shale matrix containing sub-angular, variably sized clasts of light grey to light green shale and approximately 25% larger fragments of highly weathered light grey to grey/green sandstone. All clasts and fragments are highly stained brown on the faces and red on cleave and fracture lines.

5 Archaeological background

5.1 Historic landscape characterisation

'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. Generally in relatively high, exposed or poorly-drained parts of the county (Cornwall Council, undated)

5.2 Summary of archaeological background

The following is a summary of information held in the Cornwall Council Historic Environment Record (HER) as taken from the Heritage Gateway (Historic England, undated) and provides context for this survey only. If required, an assessment of the historic environment of the area should be obtained from Cornwall Council.

Table 1 provides a summary of HER entries within approximately 1000m radius of the centre of the survey area and thought potentially relevant to understanding the survey data and analysis. The entries record archaeological structures, artefacts and placename evidence. Early structures include a possible bronze age barrow and an iron age to Romano British round. A findspot of Romano British coins and spoon lies approximately 785m southeast of the survey

area. The two nearby settlements Tregadillett and Trebursye are early medieval to medieval in date, as are a number of remnant field boundaries and enclosures. The relevant post medieval structures comprise two post medieval quarries and two likely paddocks.

Two undated, linear features were recorded in an adjacent field immediately north of the survey area as part of the National Mapping Programme. They appear to represent possible field or enclosure boundaries and are not on the alignment of the current fields or the field boundary recorded in the survey data as discussed in Section 6.

6 Results, discussion and conclusions

6.1 Scope and definitions

This survey was designed to record magnetic anomalies. A magnetic anomaly is a local variation in the Earth's magnetic field. Such variations can result from 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 along with their identifying numbers.

Figure 2 comprises the analysis of the survey data.

Figures 3 and 4 are plots of processed data as specified in Table 3. Figure 5 is a plot of unprocessed data with its metadata.

6.3 Discussion

6.3.1 General points

Data collection

Data collection along the survey area edges was restricted as shown in the figures due to the presence of magnetic materials within and adjacent to boundaries. Strong magnetic responses mapped close to the boundaries are likely to relate to these materials except where otherwise indicated in Figure 2 and Section 6.3.2.

Anomaly characterisation and mapping

There are a number of anomaly groups that could be interpreted as relating to large postholes or pits although most will have natural origins. Anomalies of this sort are only mapped as potential archaeology if they were associated with other significant anomaly groups or otherwise formed recognisable patterns. No such anomalies were recorded in this survey.

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 comprised significant magnetic responses across the dataset that needed clarification. No such anomalies were recorded in this survey.

Numerous dipole magnetic anomalies are scattered across the data set. These are likely to represent recent ferrous objects. They are only mapped if they could influence the analysis of anomaly groups thought to have an archaeological origin.

Data trends

There are a number of indistinct, parallel, linear anomaly groups across the data set trending north-north-west to south-south-east (Figures 3 and 4). These are likely to represent former ridge-and-furrow ploughing.

A second set of linear, parallel anomalies trend approximately north-north-east to southsouth-west. These are likely to represent recent vehicle and ploughing disturbance.

6.3.2 Data relating to historic maps and other records

No magnetic anomaly groups recorded in the dataset related to known archaeological or historical assets.

6.3.3 Data with no previous archaeological provenance

Only one magnetic anomaly group represented possible archaeological deposits; group 1 has the characteristics of anomalies reflecting the footings of a former Cornish hedge which would originally have been a stone-faced earth bank with bushes or trees growing along the top. From the anomaly patterns, it is likely that this example also had flanking ditches, a feature frequently recorded in geophysical surveys across Cornwall. Whilst the anomalies have a similar orientation to the adjacent extant field boundaries, this field boundary was not recorded on the first edition Ordnance Survey map of AD 1884 or on subsequent Ordnance Survey maps.

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.

One magnetic anomaly group was mapped as representing potential archaeological deposits. The group represents the footings of a former Cornish hedge with flanking ditches. Whilst the anomalies have a similar orientation to the adjacent extant field boundaries, this field boundary was not recorded on the first edition Ordnance Survey map of AD 1884 or on subsequent Ordnance Survey maps.

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.

Substrata Ltd will assign copyright to the client upon written request but retains the right to be identified as the author of all project documentation and reports as defined in the Copyright, Designs and Patents Act 1988 (Chapter IV, s.79). This report contains material that is non-Substrata Limited copyright or the intellectual property of third parties. Such material is labelled with the appropriate copyright and is non-transferrable by Substrata Ltd.

8 Acknowledgements

Substrata would like to thank Gill Makin of GM Planning Services for commissioning us to complete this survey on behalf of their client Mr Stevens.

9 Bibliography

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zoomlevel=3&xcoord=181424&ycoord=50321&maptype=basemap&wsName=ccmap&layer Name= [March 2017]

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zoomlevel=3&xcoord=181424&ycoord=50321&maptype=basemap&wsName=ccmap&layer Name= [March 2017]

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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.



An archaeological magnetometer survey East Park, Tregadillett, Launceston Centred on NGR (E/N): 230061,83865 (point) Report: 1601TRE-R-1

Figure 1: location map

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Report: 1601TRE-R-1

Figure 2: survey interpretation

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





-10	0	10	20
E E			



Instrument type: Bartington grad601-2 Units: nT Collection of 1st Traverse: 0 deg Collection Method: ZigZag Sensors: 2 @ 0.00 m spacing. Dummy Value: 32702 0.25 m X Interval: Y Interval: 1 m Stats 3000.00 -3000.00 Max: Min: 77.53 Std Dev: Mean: 0.04 Median: 0.00 Surveyed Area: PROGRAM 0.7666 ha TerraSurveyor 3.0.31.0 Name: Version:

Processes: 1 1 Base Layer Appendix 2 Tables

An archaeological magnetometer survey East Park, Tregadillett, Launceston Centred on NGR (E/N): 230061,83865 (point) Report: 1601TRE-R-1

HER	grid	designationstype	period	description	distance (m)	bearing (GN)
number	reference				from site centre	from site centre
2662	SX 3069 8393	settlement, country house	early medieval/medieval settlement,	The settlement of Trebursye is first recorded in 1199. The name is a combination of the Cornish element	632	84
			post medieval country house	tre meaning 'estate, farmstead' (early medieval origin), plus an Old English personal name, 'Burgsige'.		
				There may have been a house of some importance at Trebursye in the C17		
2680	SX 310 841	strip field	medieval	The fields shown have long, parallel curving boundaries, which may be the enclosed strips of a	968	76
				medieval open field system associated with the settlement of Tresmarrow.		
2692	SX 308 836	findspot: coins & spoon	Romano British	Cornish and Devon Post, 02/02/1924: Roman coins and a spoon were found at Trebursye whilst a drain	785	110
				was being dug. The spoon in undoubtedly Roman but of uncertain date. Roman coins had been found		
				previously on or near Trebursye Estate, these being somewhat larger in size and of copper or bronze.		
2844	SX 3013 8323	quarry	post medieval	A quarry is marked at this location on the 1880 1st Edition OS map.	639	174
17575	SX 3000 8441	round	iron age, Romano British	The Tithe Award for St Thomas records the field-names of 'Little Berry Down' and 'Great Berry Down',	548	354
				suggesting the site of a round. No remains are recorded in the St Thomas checklist. An oval, univallate		
				enclosure, 55m by 33m, is visible on air photographs. The banks forming the west and southern sides are		
				fossilised in the line of the field hedge shown on the 1880 1st Edition OS map. The eastern and northern		
				sides are visible as a low earth bank on the photos.		
17633	SX 2980 8374	settlement	early medieval/medieval	The settlement of Tregadillett is first recorded c1150 when it is spelt "Tregudilet". The name is Cornish	289	244
				and contains the element tre meaning 'estate, farmstead' (early medieval origin) and the personal name		
				'Cadyled'.		
50140	SX 3044 8344	enclosure	post medieval/undated	Two small rectangular earth and stone enclosures at this location are visible on air photographs. These	569	138
				enclosures are likely to be paddocks, probably of post medieval origin.		
50141	SX 3111 8359	quarry	post medieval	An overgrown mound in the grounds of Trebursye House; possibly a disused quarry. The site is visible	1084	105
				on air photographs.		
58492	SX 2941 8413	field boundary	early medieval	Banked field boundaries are visible as earthworks on aerial photographs.	703	292
75130	SX 3067 8377	drain, field system	early medieval/medieval	A series of field boundaries are visible, some as ditches some as banks, on air photographs. The	616	99
				boundaries are forming rectilinear fields typically 66m x 50m and are likely to be associated with the		
				mansion at Trebursye (2662). To the north, at SX 30582 83910, is a ditched boundary that appears to be		
				also serving as a drain or leat.		
75131	SX 3083 8419	barrow or quarry	bronze age or post medieval	An oblong mound, 18m by 8.0m, is visible on air photographs. Its function is uncertain, but it may be a	835	67
				denuded spoil tip associated with quarrying. Alternatively it might be a plough-damaged round barrow.		
75132	SX 3063 8430	field boundary	early medieval	A field boundary or ornamental boundary around Old Tree Lodge at Trebursye is visible as a ditch,	716	53
				120m long, on air photographs.		
75133	SX 3032 8445	hollow way, field system	early medieval/medieval	A series of field boundaries are visible as ditches on air photographs. The boundaries are forming	640	24
				rectinilear fields typically 95m x 70m. They lie within an area of Anciently Enclosed Land and are likely to		
				be medieval in origin. To the north, at SX 30260 84583, is an 80m length of holloway which is marked as		
				a track on the 1880 1st Edition OS map.		
NMP 123		linears		In the adjacent field to the north two linears were recorded during the National Mapping Programme		
				(NMP). They form an sideways 'T' with a long north-south axis and a shorter east-west axis intersecting		
				approximately half way along the north-south axis and trending east.		

Table 1: Historic Environment Entries thought relevant to the geophysical survey

Documents Survey methodology statement: Dean (2017)			
 Methodology The work was undertaken in accordance geophysical (magnetometer) survey was provided by the Chartered Institute for Arr (undated). The survey grid location information and guitable CIS sustam 	we with the survey methodology statement. The undertaken with reference to standard guidance chaeologists (2014) and Archaeology Data Service grid plan was recorded as part of the project in a		
 Suitable GIS system. 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 <i>Instrument:</i> Bartington Instruments grad601-2 <i>Firmware:</i> version 6.1	Data Capture 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:	В	Bartington Grad-601 gradiometer		
Units:	'n	Т		
Direction of 1st Trav	verse: se	ee below		
Collection Method:	Zi	igZag		
Sensors:	2	@ 1.00 m spacing.		
Dummy Value:	32	2702		
PROGRAM				
Name:	Name: TerraSurveyor			
Version: 3.0.31.0				
Stats		Processes: 5		
Max: 112.	.66	1 Base Layer		
Min: -95.	.37	2 Clip at 1.00 SD		
Std Dev: 6.	.24	3 DeStripe Median Traverse: Grids: All		
Mean: 0.	.20	4 De Stagger: Grids: All Mode: Both By: -2 intervals		
Median: 0.	.02	5 Interpolate: X & Y Doubled.		
Surveyed Area: 0.	.76 ha	-		

Table 3: processed data metadata