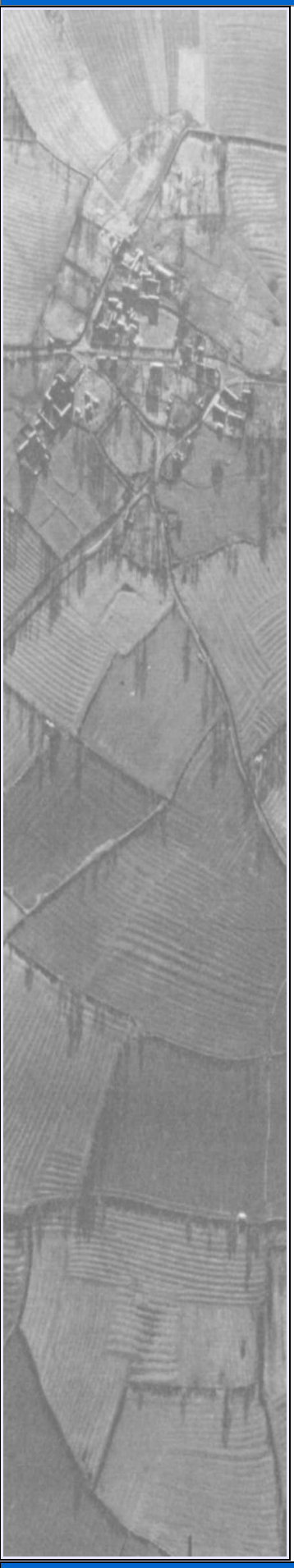

# Land east of Trewennan Road
# St Teath
# Cornwall

## MAGNETOMETER SURVEY REPORT

for

## Mr J.H. Cleave & Mrs V. Goldie

Kerry Donaldson & David Sabin

October 2016

Ref. no. J689

OASIS ID: archaeol20-269874

ARCHAEOLOGICAL SURVEYS LTD

# Land east of Trewennan Road
# St Teath
# Cornwall

Magnetometer Survey Report

for

## Mr J.H. Cleave & Mrs V. Goldie

Fieldwork by David Sabin BSc (Hons) MCIfA
Report by Kerry Donaldson BSc (Hons)
Report checked by David Sabin
Primary archive location - Archaeological Surveys Ltd, Yatesbury, Wiltshire

Survey date – 17th October 2016
Ordnance Survey Grid Reference – **SX 06210 81310**

OASIS ID: archaeol20-269874

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# SUMMARY

A detailed magnetometer survey was carried out by Archaeological Surveys Ltd across land to the east of Trewennan Road, St Teath, Cornwall. The survey covered 2ha within a single field. The results demonstrate the presence of a number of positive linear anomalies within the site that are likely to relate to ditch-like features; several end abruptly or are fragmented. The site also contains a pit-like response with an 8m diameter as well as a small number of smaller discrete anomalies. Extending across the centre of the site are two negative linear anomalies and a positive linear anomaly which correspond to shallow earthworks on the ground surface and also appear to truncate several anomalies. It is possible that they relate to former boundary features, but none are mapped from the 19th century onwards. Two orthogonal series of agricultural anomalies can also be seen in the site, several of which also appear to have truncated other anomalies.

# 1 INTRODUCTION

## *1.1 Survey background*

1.1.1 Archaeological Surveys Ltd was commissioned by landowners Mr Cleave and Mrs Goldie, as requested by Foundations Heritage, to undertake a magnetometer survey of an area of land at Trewennan, St Teath, Cornwall. The survey was carried out as part of an archaeological investigation in order to inform any future potential planning application.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2016) and approved by Sean Taylor, Archaeologist for Cornwall Council, prior to commencing the fieldwork.

## *1.2 Survey objectives and techniques*

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin so that they may be assessed prior to development of the site. The methodology is considered an efficient and effective approach to archaeological prospection.

1.2.2 A Heritage Impact Assessment is also being prepared by Foundations Heritage which will outline the known archaeological assets within the site and surrounding area and assess the potential impact of any future development on the above ground heritage in the vicinity. The geophysical survey will feed into and inform the conclusions of the Heritage Impact Assessment.

1.2.3 The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation;*

European Archaeological Council (2015) *Guidelines for the Use of Geophysics in Archaeology;* Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations*. The work has been carried out to the Chartered Institute for Archaeologists (2014) *Standard and Guidance for Archaeological Geophysical Survey.*

### *1.3 Site location, description and survey conditions*

1.3.1 The site is located east of Trewennan Road, to the north of St Teath, Cornwall. It is centred on Ordnance Survey National Grid Reference (OS NGR) SX 06210 81310, see Figs 01 and 02.

1.3.2 The geophysical survey covers approximately 2ha within a single pasture field. The land slopes down towards the south west and the site overlooks St Teath. The field contained three cattle/sheep feeders of steel construction that were considered to be strong sources of magnetic disturbance and were avoided. In addition, a small zone of boggy ground was avoided adjacent to a gateway in the north eastern boundary.

*Plate 1: Survey area looking towards the south*

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data with the exception of a small zone mentioned in 1.3.2. Weather conditions during the survey were mainly fine.

### *1.4 Site history and archaeological potential*

1.4.1 The site is located a Trewennan, which is a medieval settlement first recorded as *Trewynnan* in 1284 (MCO18027/HER17847). The present house at Trewennan dates from the 17th century with later alterations and is a Grade II listed building. Ordnance Survey mapping from the 19th and early 20th century records the remains of a mansion on the site as well as an aqueduct to the north. The Cornwall Council Interactive Map indicates that a mine (Trewenen Mine [sic]) is located 75m to the south, although no other information or records are listed about this (Cornwall Council, 2016). Approximately 300m to the north of the site are cropmarks of linear ditches relating to early medieval trackways (MCO 38341/HER57177 & MCO38342/HER57178) and a medieval or post medieval field boundary (MCO38340/HER57176). The site lies 350m north east of a sub-oval cropmark enclosure, which may indicate an Iron Age/Romano-British round (MCO38314/HER57151). It lies within Anciently Enclosed Land as outlined in the Cornwall Historic Landscape Characterisation, indicating that the land divisions date to before the 17th century, with either medieval or prehistoric origins. Mapping from 1881 onwards indicates that there have been no changes to the layout of the site.

1.4.2 Although the site does not contain any designated or non-designated heritage assets, it lies immediately south of the medieval settlement of Trewennan, and within Anciently Enclosed Land. There is potential for the geophysical survey to locate anomalies that relate to the former use and occupation of the site.

### *1.5 Geology and soils*

1.5.1 The underlying solid geology across the site is from the Middle Devonian Trevose Slate Formation and Rosenum Formation (undifferentiated) slate and siltstone (BGS, 2016).

1.5.2 The overlying soil across the survey area is from the Denbigh 1 association and is a typical argillic brown earth. It consists of a well drained, fine, loamy and silty soil over rock. Some similar soils have slowly permeable subsoils and slight seasonal waterlogging (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry survey carried out across similar soils has produced good results. The underlying geology and soils are, therefore, considered acceptable for magnetic survey.

## 2 METHODOLOGY

### *2.1 Technical synopsis*

2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Magnetic susceptibility and magnetic

thermoremnance are factors associated with the formation of localised fields. Additional details are set out below and within Appendix A.

2.1.2 Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased, and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features, such as pits and ditches, may produce magnetic anomalies that can be mapped by magnetic prospection.

2.1.3 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth, oven etc. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.

2.1.4 The localised variations in magnetism are measured as sub-units of the Tesla, which is a SI unit of magnetic flux density. These sub-units are nano Teslas (nT), which are equivalent to $10^{-9}$ Tesla (T).

### *2.2 Equipment configuration, data collection and survey detail*

2.2.1 The detailed magnetic survey was carried out using a SENSYS MAGNETO®MXPDA 5 channel cart-based system. The instrument has 5 fluxgate gradiometers (FGM650) spaced 0.5m apart with readings recorded at 20 Hz. The cart is pushed at walking speed and not towed. Each sensor is not zeroed in the field as the vertical axis alignment is precisely fixed leaving sensor offsets that are removed during data processing. The fixing of the vertical alignment ensures the sensors are not unduly influenced by localised magnetic fields and that the vertical component of a magnetic anomaly is measured. The gradiometers have a range of recording data between ±0.1nT and ±10,000nT. They are linked to a Leica GS10 RTK GPS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged PDA computer system.

2.2.2 Due to the fixed offsets within the fluxgate sensors, as a result of the manufacturing and tensioning process, the survey data do not provide a visually useful dataset until a zero median traverse algorithm is applied. It is recognised that this has the potential to affect some anomalies detrimentally by removing linear features orientated parallel to survey transects. However, this has not been noted as a particular problem with the system due to the high resolution data collection, generally long length of traverses and variability within the magnetic characteristics of a linear anomaly.

2.2.3 Data are collected along a series of parallel survey transects to achieve 100% coverage of the surveyable land. The length of each transect is variable and relates to the size of the survey area and other factors including ground conditions. A visual display allows accurate placing of transects and helps maintain the correct separation between adjacent traverses. Data are not

collected within fixed grids and data points are considered to be random even though the data are collected in a systematic manner covering all accessible areas (Aspinall, Gaffney and Schmidt, 2009).

2.2.4 Fluxgate sensors are highly sensitive to temperature change and this is manifest as drift during the course of a survey. This can be particularly noticeable during the morning as temperatures rise and the equipment warms or cools. Sensor drift within the course of a traverse will appear as a line trending from negative to positive after processing with a zero median traverse algorithm. To remove the potential for temperature drift data were collected after a 20 minute stabilisation period and traverses were limited to a time of generally <100s.

### *2.3 Data processing and presentation*

2.3.1 Magnetic data collected by the MAGNETO®MXPDA cart-based system are initially prepared using SENSYS MAGNETO®DLMGPS software. The software effectively allocates a geographic position for each data point and can compensate for fixed offsets present within the FGM650 sensors. The offsets are positive or negative values present on all fluxgate gradiometer sensors. Some systems use manual or electronic balancing to effectively zero the sensors; however, this is a short term measure that is prone to drift through temperature changes and vibration and can easily be incorrectly set due to localised magnetic fields. The FGM650 sensors are very accurately aligned to the vertical magnetic gradient and are highly stable showing negligible drift on long traverses. The offset values are removed using TerraSurveyor software.

2.3.2 Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display within TerraSurveyor. The removal of offset values (compensation) of the sensors is also carried out in TerraSurveyor using a zero median traverse function. Data are then considered to be minimally processed. Note: without the zero median traverse function it is not possible to create a meaningful data plot as all sensors have a different offset value. Although a zero median traverse algorithm can remove anomalies aligned with the survey tracks, in practice this rarely occurs due to the use of long traverses, high resolution measurement and variability within the magnetic susceptibility of long linear features.

2.3.3 The minimally processed data are collected between limits of ±10000nT and clipped for display at ±10nT. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track.

2.3.4 Appendix C contains metadata concerning the survey and data attributes and is derived directly from TerraSurveyor. Reference should be made to Appendix B for further information on processing.

2.3.5 A TIF file is produced by TerraSurveyor software along with an associated world file (.TFW) that allows automatic georeferencing (OSGB36 datum) when

using GIS or CAD software. The main form of data display used in the report is the minimally processed greyscale plot. With regard to the Sensys MXPDA, minimally processed data is considered by the manufacturer to be data that is compensated by SENSYS MAGNETO DLMGPS software, see 2.3.1 and 2.3.2. Note: traceplots are not considered to be appropriate as they do not provide an accurate or useful assessment of the magnetic anomalies due to very high density of data collection.

2.3.6 The raster images are combined with base mapping using ProgeCAD Professional 2016, creating DWG (2010) file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. The CAD plots are effectively georeferenced facilitating relocation of features using GPS, resection method, etc.

2.3.7 An abstraction and interpretation is also drawn and plotted for all geophysical anomalies located by the survey. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.

2.3.8 A brief summary of each anomaly, with an appropriate reference number, is set out in list form within the results (Section 3) to allow a rapid and objective assessment of features within the survey area.

2.3.9 A digital archive is produced with this report, see Appendix D below. The main archive is held at the offices of Archaeological Surveys Ltd.

# 3 RESULTS

## *3.1 General assessment of survey results*

3.1.1 The detailed magnetic survey was carried out within a single pasture field covering approximately 2ha.

3.1.2 Magnetic anomalies located can be generally classified as positive and negative anomalies of an uncertain origin, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance and strong discrete dipolar anomalies relating to ferrous objects. Anomalies have been numbered and are described in 3.4 below.

## *3.2 Statement of data quality*

3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the dataset.

## *3.3 Data interpretation*

3.3.1 The list of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, a basic key is indicated to allow cross referencing to the abstraction and interpretation plot. CAD layer names are included to aid reference to associated digital files (.dwg/.dxf). Sub-headings are then used to group anomalies with similar characteristics within the survey area.

| **Report sub-heading<br>CAD layer names and plot colour** | **Description and origin of anomalies** |
|---|---|
| ***Anomalies with an uncertain origin***<br><br>AS-ABST MAG POS LINEAR UNCERTAIN<br>AS-ABST MAG NEG LINEAR UNCERTAIN<br>AS-ABST MAG POS DISCRETE UNCERTAIN<br>AS-ABST MAG POS UNCERTAIN | The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil. |
| ***Anomalies with an agricultural origin***<br><br>AS-ABST MAG AGRICULTURAL | The anomalies are often linear and form a series of parallel responses or are parallel to extant land boundaries. Where the response is broad, former ridge and furrow is likely; narrow response is often related to modern ploughing. |
| ***Anomalies associated with magnetic debris***<br><br>AS-ABST MAG DEBRIS<br>AS-ABST MAG STRONG DIPOLAR | Magnetic debris often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. It often occurs where there has been dumping or ground make-up and is related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material. This type of response is occasionally associated with kilns, furnace structures, or hearths and may therefore be archaeologically significant. It is also possible that the response may be caused by natural material such as certain gravels and fragments of igneous or metamorphic rock. Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil. |
| ***Anomalies with a modern origin***<br><br>AS-ABST MAG DISTURBANCE | The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc.. Often a significant area around such features has a strong magnetic flux which may create magnetic disturbance; such disturbance can effectively obscure low magnitude anomalies if they are present. Fluxgate sensors may respond erratically and with hysteresis adjacent to strong magnetic sources. |

Table 1: List and description of interpretation categories

### *3.4 List of anomalies*

Area centred on OS NGR 206210 81310, see Figs 03 & 04.

*Anomalies with an uncertain origin*

(1) – A positive linear anomaly located along the western edge of the survey area appears to relate to a broad linear ditch and an archaeological origin is possible. It may have been truncated by anomaly (2).

(2) - A strongly positive linear anomaly extends across the south western part of the site but appears to end abruptly at linear anomaly (5). The response is much stronger at 50nT, compared to all of the other positive responses within the site (4-15nT). It may truncate or cross anomalies (1) and (3), but it may be truncated by negative linear anomaly (6).

(3) – A fragmented positive linear anomaly extends across much of the site. It appears to extend towards a gateway in the north eastern field boundary, but it ends abruptly at the western end. It is parallel with anomaly (8) in the northern part of the site.

(4) - A large, discrete, positive response is located in the central eastern part of the site. It appears to relate to a pit-like feature 8.5m in diameter with magnetically variable fills and a second smaller discrete response extending from it to the south west.

(5) - A narrow, positive, linear anomaly extends through the centre of the survey area. It corresponds to a low linear bank, and it is possible that it is associated with an unmapped field boundary.

(6) - Two negative linear anomalies extend through the centre of the survey area. They also correspond to linear earthworks within the site and the response may indicate a boundary feature.

(7) - A number of positive linear anomalies with no coherent morphology can be seen within the survey area. It is not possible to determine if they relate to anthropogenic or naturally formed features.

(8) - In the northern part of the site is a positive linear anomaly, parallel with anomaly (3) and oriented north east to south west. It appears to have been truncated by anomaly (5) and may relate to a cut feature.

(9) - A broad, weakly positive response extends across the northern part of the site. It is parallel with agricultural anomalies (12), with what appears to be associated responses extending northwards, parallel with agricultural anomalies (11). However, the broad response, appearing to have been truncated by anomalies (11), is different in appearance to the agricultural anomalies. It is, therefore, not certain if it relates to agricultural activity or to a linear ditch-like feature.

(10) - In the southern part of the survey area are a number of positive linear anomalies. Some, like (7), have no coherent morphology, others appear parallel with agricultural anomalies (12). It is possible that they also relate to agricultural activity, but this is not certain.

*Anomalies with an agricultural origin*

(11 &12) - Two series of parallel linear anomalies relate to agricultural activity, possibly ridge and furrow. One series is parallel with the eastern and western field boundaries (11), the other the northern and southern boundaries (12).

*Anomalies associated with magnetic debris*

(13) - Magnetic debris is evident at the northern end of the survey area. This is generally a response to dumped magnetically thermoremnant material, although there are also negative linear anomalies that appear to be located within it, and it has partially obscured anomaly (8).

# 4 CONCLUSION

4.1.1 The geophysical survey located a number of positive and negative linear anomalies that may relate to formerly unmapped field boundaries and possible linear ditches. A large pit-like anomaly has also been located. A number of the linear responses are very strongly magnetic and several of the anomalies appear fragmented and end abruptly. Although there is no coherent morphology or layout they do have a ditch-like appearance, with several truncated by other anomalies and agricultural activity.

4.1.2 Several linear anomalies extending along the centre of the site, generally parallel with the eastern and western field boundaries, correspond to low earthwork features on the ground surface and may relate to unmapped boundaries. Evidence for agricultural activity can be seen as two perpendicular series of linear anomalies within the field. Several other positive linear anomalies are parallel with these agricultural anomalies, and while an association is uncertain, it should be considered.

# 5 REFERENCES

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## Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremnant material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field upon cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremnant features include ovens, hearths, and kilns. In addition thermoremnant material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to the topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The SENSYS gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 65cm apart. The instrument is carried about 10-20cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength the magnetic field created by the buried feature.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

# Appendix B – data processing notes

*Clipping*

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. It has been found that clipping data to ranges between ±5nT and ±3nT often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

*Zero (destripe) Median/Mean Traverse*

The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise differences between the baseline value of gradiometer sensors.

*High Pass Filtering*

A mathematical process used to remove low frequency anomalies relating to survey tracks, modern agricultural features and other large magnetic bodies within or adjacent to survey areas.

*Low Pass Filtering*

A mathematical process used to remove high frequency anomalies relating to uneven ground, vibration, etc.

# Appendix C – survey and data information

COMPOSITE
Filename: J689-mag-proc.xcp
Description: Imported as Composite from: J689-mag.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 206118.442805067, 81410.4276290738 m
Southeast corner: 206305.792805067, 81210.4776290738 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 638600

Dimensions
Composite Size (readings): 1249 x 1333
Survey Size (meters): 187 m x 200 m
Grid Size: 187 m x 200 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 11.05
Min: -11.00
Std Dev: 4.22
Mean: 0.13
Median: 0.01
Composite Area: 3.7461 ha
Surveyed Area: 1.9224 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -10.00 to 10.00 nT

# Appendix D – digital archive

Archaeological Surveys Ltd hold the primary digital archive at their offices in Wiltshire. Data are backed-up onto an on-site data storage drive and at the earliest opportunity data are copied to CD ROM for storage on-site and off-site.

A PDF copy of the report will be supplied to the Cornwall and Scilly Historic Environment Record, together with the abstraction CAD layers as a DWG/DXF and also the greyscale image as a TIF. The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

| **Geophysical data - path: J689 St Teath\Data** | | | | |
|---|---|---|---|---|
| **Path and Filename** | **Software** | **Description** | **Date** | **Creator** |
| stteath1\MX\<br><br>.prm<br>.dgb<br>.disp | Sensys MXPDA | Proprietary data formats representing magnetometer survey traverses logged to a PDA. | 17/10/16 | D.J.Sabin |
| stteath11\MX\J689-mag.asc | Sensys DLMGPS | ASCII CSV (tab) file representing survey area in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number. | 19/10/16 | D.J.Sabin |
| Mag\comps\J689-mag.xcp | TerraSurveyor 3.0.23.0 | Composite data file derived from ASCII CSV. | 19/10/16 | K.T.Donaldson |
| Mag\comps\J689-mag-proc.xcp | TerraSurveyor 3.0.23.0 | Processed composite data file (zmt and clipping to ±10nT). | 19/10/16 | K.T.Donaldson |
| **Graphic data - path: J689 St Teath\Data** | | | | |
| Mag\graphics\ J689-mag-proc.tif | TerraSurveyor 3.0.23.0 | TIF file showing a minimally processed greyscale plot clipped to ±10nT. | 19/10/16 | K.T.Donaldson |
| Mag\graphics\ J689-mag-proc.tfw | TerraSurveyor 3.0.23.0 | World file for georeferencing TIF to OSGB36. | 19/10/16 | K.T.Donaldson |
| **CAD data - path: J689 St Teath\CAD** | | | | |
| J689 version 1.dwg | ProgeCAD 2016 | CAD file for creating plots of greyscales, abstraction, interpretation and mapping. Grid coordinates as OSGB. AutoCAD 2010 format. | 19/10/16 | K.T.Donaldson |
| **Text data - path: J689 St Teath\Documentation** | | | | |
| J689 report.odt | OpenOffice.org 3.0.1 Writer | Report text as an Open Office document. | 28/10/16 | K.T.Donaldson |

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Survey location


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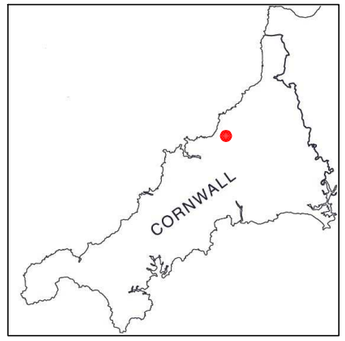
# Archaeological Surveys Ltd

## Geophysical Survey
## Land east of Trewennan Road
## St Teath
## Cornwall

### Map of survey area






Survey location

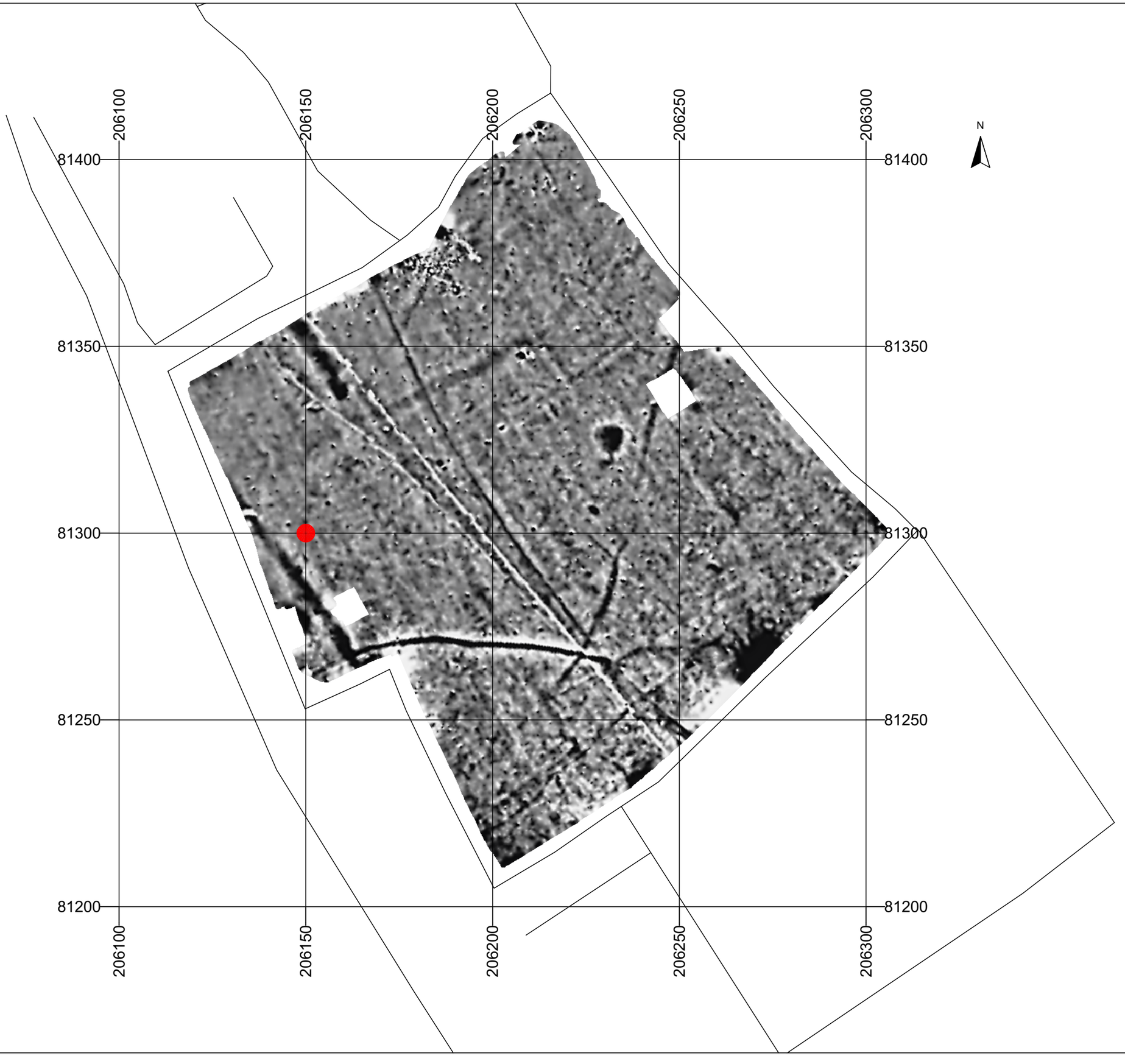
Site centred on OS NGR
SX 06210 81310

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01




Archaeological Surveys Ltd

# Geophysical Survey
# Land east of Trewennan Road
# St Teath
# Cornwall

## Referencing information

Referencing grid to OSGB36 datum at 50m intervals

Data collected at 20Hz and georeferenced to ETRS89 zone 30 with conversion to OSGB36 using OSTN02

206150 81300

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 02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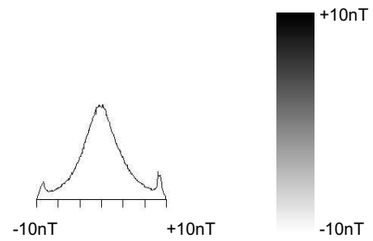
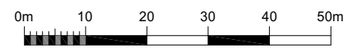
**Geophysical Survey**
**Land east of Trewennan Road**
**St Teath**
**Cornwall**

**Greyscale plot of minimally processed magnetometer data**




SCALE 1:1000




SCALE TRUE AT A3

FIG 03

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# Geophysical Survey
# Land east of Trewennan Road
# St Teath
# Cornwall

## Abstraction and interpretation of magnetometer anomalies


- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 04