

**YEW TREE COTTAGE
TREVERA, BUDOCK WATER, CORNWALL**

Report on Archaeological Geophysical Survey 2012

A. Bartlett

Surveyed by:

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Yew Tree Cottage Trevera, Budock Water, Cornwall

Report on Archaeological Geophysical Survey, 2012

Summary

This report describes findings from a geophysical survey which has been undertaken as part of an archaeological evaluation of the site of a proposed solar farm in Cornwall. The solar panels are to be located in fields within an evaluation area amounting to c 15.8ha, and centred at NGR SW 744328. The site is at Halvosso, about 4km west of Budock Water, and 6km west of Falmouth.

The survey was commissioned from Bartlett Clark Consultancy, Specialists in Archaeogeophysics of Oxford, by CgMs Consulting of Cheltenham on behalf of Lightsource Renewable Energy Ltd. Fieldwork for the survey was done in October 2012.

The Site

The site is described in the Archaeological Desk Based Assessment (DBA) prepared and supplied to us by CgMs [1]. This document also lists known archaeological sites in the surrounding area. The following notes are summarised in part from the DBA.

Topography and geology

The site is currently arable and pasture farmland located on an undulating east facing slope at heights between 145m and 170m AOD. The evaluation area extends across 11 fields divided by stone-walled hedges, as indicated on the enclosed site plans. A magnetometer survey was carried out in seven of the fields (as labelled 1-7 for reference in figure 4), in which solar panels are to be located. Two of the fields (6 and 7 to the NE of the site) were obstructed at the time of the survey by numerous large straw bales, and only sample areas could be surveyed. The total survey coverage amounts to 6.97ha.

The site is on a granite bedrock which, in common with other igneous geology, will usually be associated with a strongly magnetic topsoil. This was confirmed by magnetic susceptibility readings taken on soil samples from the site. Readings from the northern and southern groups of fields were both high (149 and 230×10^{-5} SI/kg), which means that any minor displacements of the topsoil could give rise to detectable magnetic anomalies. It is also possible that stones buried within the topsoil could be detected, either as positive (if they are igneous) or negative magnetic anomalies. The susceptibility reading (22×10^{-5} SI/kg) from one piece of stone was much lower than the soil, which indicates that buried rocks of similar composition could cause negative anomalies (white in grey scale plot).

Archaeological background

The DBA has not identified any archaeological sites or remains within the evaluation area itself, other than cropmarks which may indicate a medieval field system in the NE of the site (MCO34170). An enclosed settlement site, or round, of prehistoric or later date is recorded 500m to the SE of the evaluation area, and there are other such sites at similar or greater distances in the vicinity. It is concluded in the DBA that the site is likely always to have been in agricultural use, and there is only a low potential for settlement activity from prehistoric periods onwards.

Survey procedure

The method used for the geophysical survey was a full recorded magnetometer survey. Readings were collected using Bartington 1m fluxgate magnetometers, and are plotted at 25cm intervals along transects 1m apart. The results of the survey are shown as a grey scale plot at 1:2000 scale in figure 1, and as a graphical (x-y trace) plot in figures 2-3. These alternative representations allow the detected magnetic anomalies to be seen in plan and profile respectively. The x-y plots represent the readings after minimal pre-processing operations. These include adjustment for irregularities in line spacing caused by heading errors (direction sensitivity in the instrument zero setting), and truncation of extreme values. The grey scale plots show a lightly processed version after additional low pass filtering to control background noise levels.

The magnetometer responds to cut features such as ditches and pits when they are silted with topsoil, which usually has a higher magnetic susceptibility than the underlying natural subsoil. It also detects the thermoremanent magnetism of fired materials, notably baked clay structures such as kilns or hearths, and so responds preferentially to the presence of ancient settlement or industrial remains. The readings are also strongly affected by ferrous and other debris of recent origin.

Presentation

An interpretation of the findings is shown superimposed (for comparison) on the graphical plots (figures 2-3), and is reproduced separately to provide a summary of the findings in figure 4. Features as marked include distinct magnetic anomalies corresponding to former field boundaries (in red). Other weaker linear features are shown in light brown, and individual magnetic anomalies which may relate to silted pits or other variations in soil depth are in a blue/purple.

Probable recent or non-archaeological disturbances are indicated in a black and ferrous debris in blue. A few particularly distinct negative anomalies are shown in grey. Linear markings which may represent cultivation effects and a pipe are also indicated (in green and blue).

Survey location

The survey was located by reference to a temporary site grid which was set out and tied to national grid co-ordinates by means of a differential GPS system. OS co-ordinates of map

locations can be read from the AutoCAD version of the plans which can be supplied with this report.

Results

The survey has responded clearly to a variety of sub-surface features and disturbances, although their archaeological significance in some cases is less apparent. The more distinct findings include former boundaries, some of which are identifiable in the 1840 tithe map (reproduced from the DBA, and inset for comparison in figure 4). Boundaries labelled at A, B, D, E, F in fields 1, 2, 4, 5 and 6 correspond to features on the 1840 map, but B, D and F had disappeared by 1888 (as indicated on OS maps supplied to us by CgMs). The boundaries are represented in the grey scale plot by double linear features corresponding to the two sides of the Cornish hedges. A similar feature at C in field 2 is not shown on the 1840 map. A further linear feature at G in field 7 is at a location corresponding to the cropmark field system (MCO34170). Other similar double linear features at H in field 5 and J in field 2 could perhaps also indicate traces of field systems or enclosures, but are too fragmentary to be clearly interpretable.

A pipe (blue) was detected in field 1. It gives a negative response, and so could be a modern plastic water pipe. Parallel linear cultivation markings (green) are visible, particularly in fields 2, 3 and the western part of field 5. Other linear features are shown in light brown, as at J in field 5. These are less clearly defined than the former boundaries, and could perhaps indicate minor or natural silted channels or hollows. A path or track may have been detected at K in field 1.

Various individual magnetic anomalies are outlined, and could in some cases be silted pits or hollows (as indicated by rounded profiles in the graphical plots 2-3). There are distinct groups of such features at locations including the southern half of field 2 (L), and the north of field 3 (M). Silted pits are often detected at ancient settlement sites, but in this case the magnetic anomalies are mainly broad and indistinct, with no pattern or coherence in their plan. It is possible therefore that most of them represent minor natural or other irregularities in the depth of the strongly magnetic topsoil, rather than archaeological features.

Various negative magnetic anomalies are also visible. Some, as mentioned previously, could represent relatively non-magnetic buried stones. Two clusters of such features are indicated in the interpretation (in grey, at N and P in field 1) because they appear (in plan) to form curved or circular groups, but this effect could be fortuitous.

Conclusions

The survey has detected a number of former field boundaries, some of which are identifiable in the 1840 tithe map, as well as others which may relate to earlier enclosures or field systems. Other findings, in addition to cultivation effects and a pipe, include groups of mainly amorphous magnetic anomalies, some of which could represent minor natural variations in topsoil depth. The irregular distribution of these findings means they

cannot be confirmed to be archaeologically significant on the basis of the survey evidence alone. It is also possible that buried stones give rise to negative magnetic anomalies at various locations.

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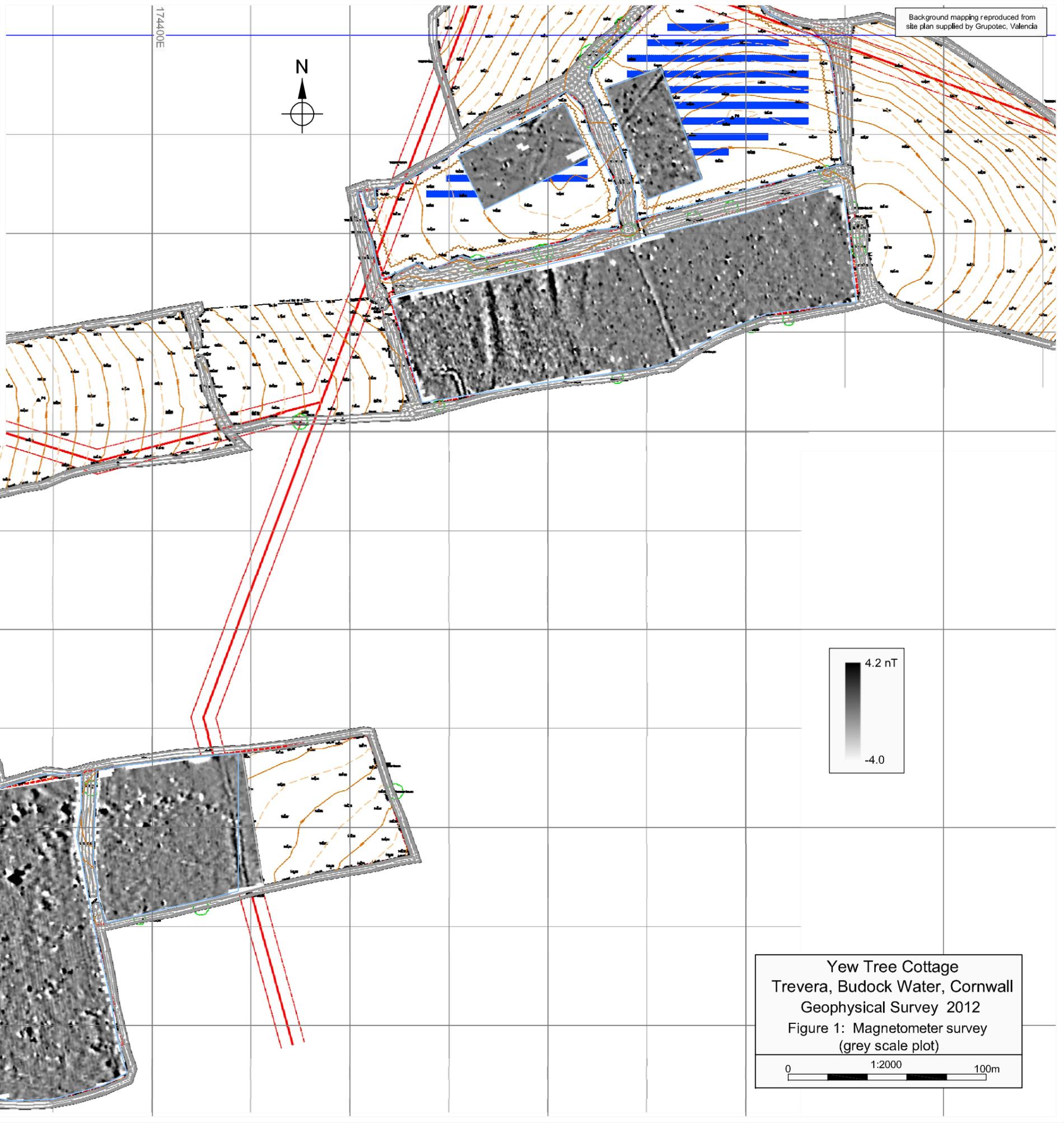
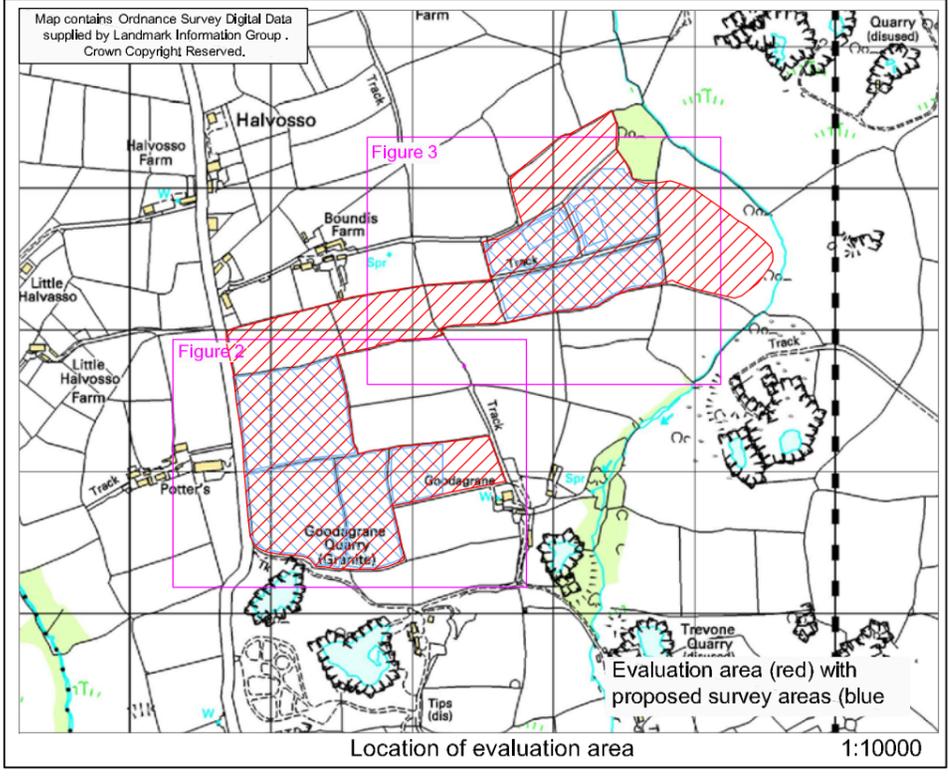
email: bcc123@ntlworld.com

19 October 2012

The fieldwork for this project was done by R. Ainslie and S. Ainslie.

Reference

- [1] Archaeological Desk Based Assessment; Yew Tree Cottage, Cornwall. W. Bedford, CgMs. August 2012. CgMs Reference WB/14337



Yew Tree Cottage
 Trevera, Budock Water, Cornwall
 Geophysical Survey, 2012
 Figure 1: Magnetometer survey
 (grey scale plot)

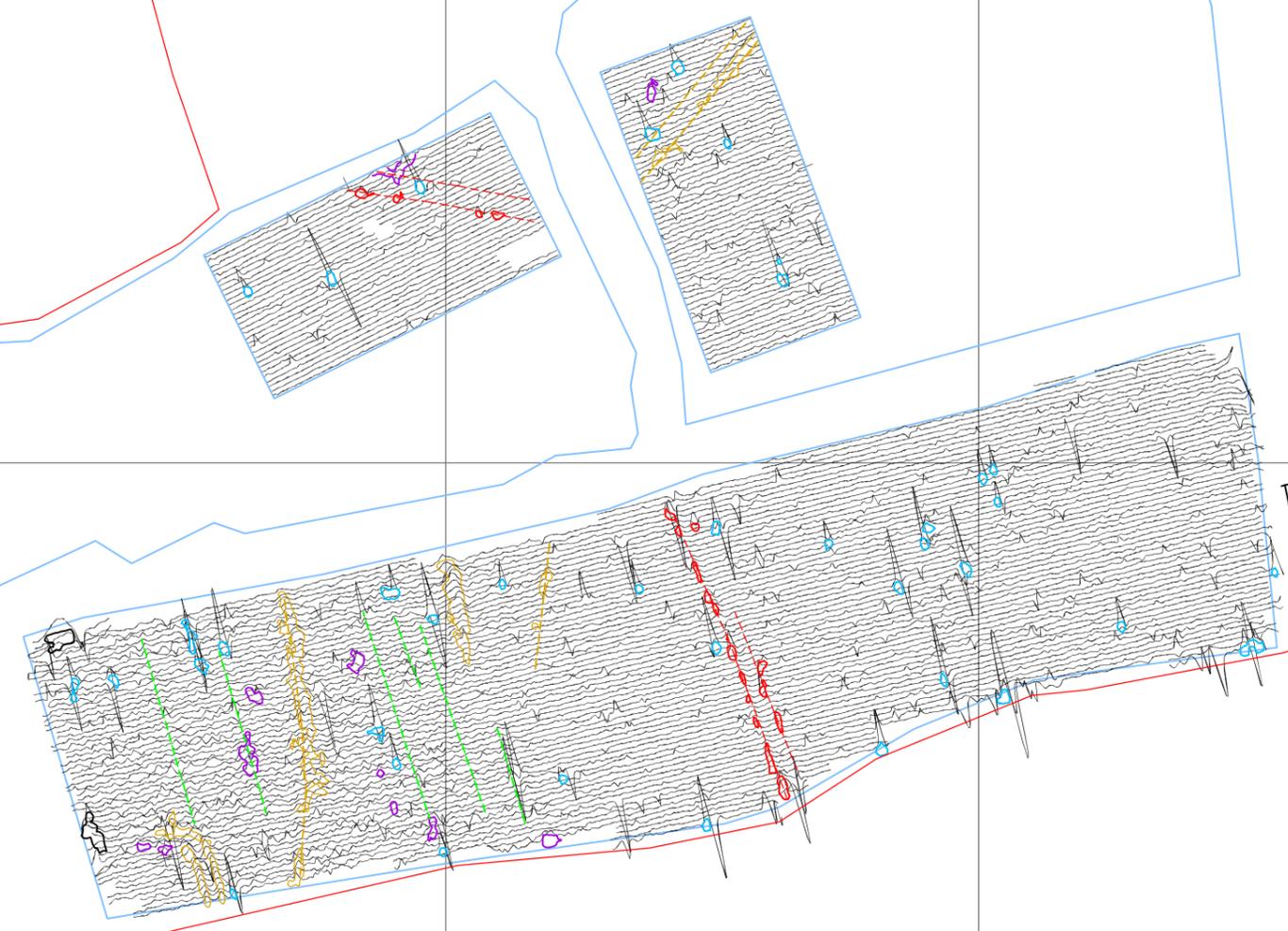
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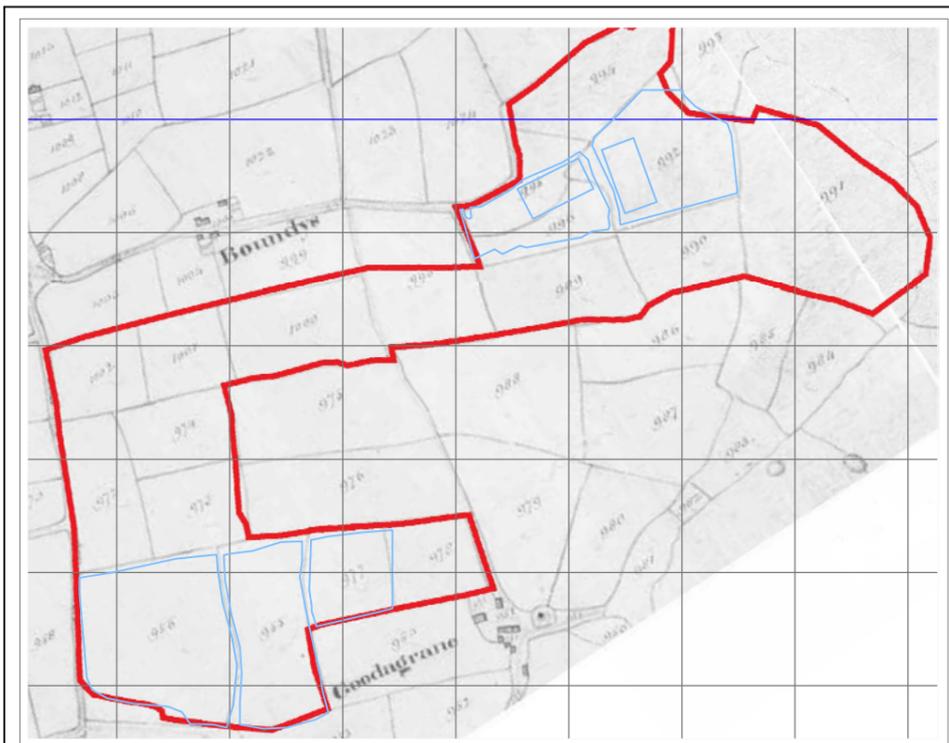
Yew Tree Cottage
Trevera, Budock Water, Cornwall
Geophysical Survey 2012
Figure 2: Magnetometer survey
(with interpretation)
1:1250
0 50m



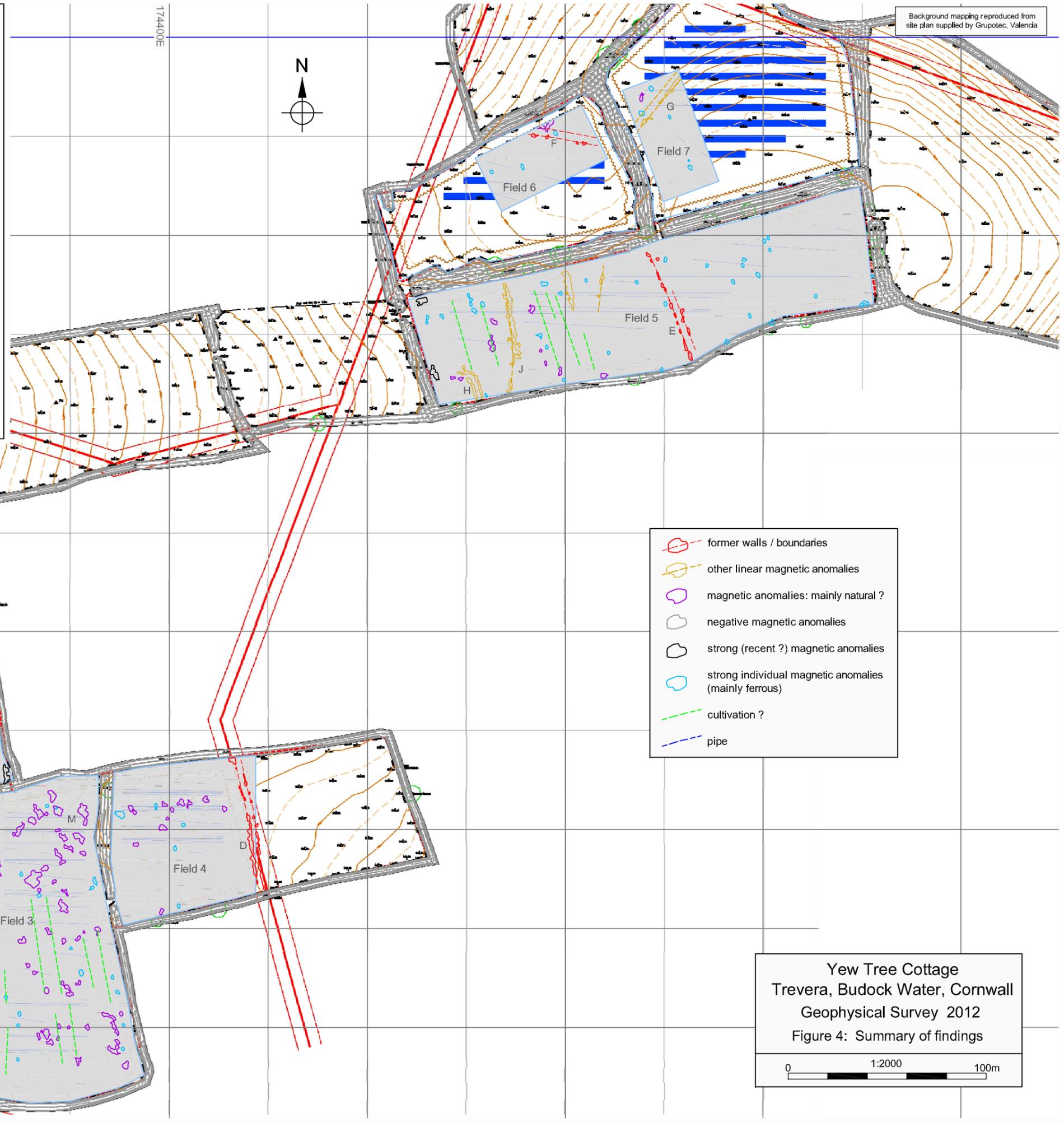
-  former walls / boundaries
-  other linear magnetic anomalies
-  magnetic anomalies: mainly natural ?
-  negative magnetic anomalies
-  strong (recent ?) magnetic anomalies
-  strong individual magnetic anomalies (mainly ferrous)
-  cultivation ?
-  pipe



Yew Tree Cottage
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Geophysical Survey 2012
Figure 3: Magnetometer survey
(with interpretation)
1:1250
0 50m



Tithe map, 1840 (from DBA, figure 2) 1:6250



Background mapping reproduced from site plan supplied by Grupotec, Valencia

- former walls / boundaries
- other linear magnetic anomalies
- magnetic anomalies: mainly natural ?
- negative magnetic anomalies
- strong (recent ?) magnetic anomalies
- strong individual magnetic anomalies (mainly ferrous)
- cultivation ?
- pipe

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174400E