

**Land at Langarth, Threemilestone
Cornwall**

Report on Archaeological Geophysical Survey 2011

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on behalf of:

Inox Group

Land at Langarth, Threemilestone, Cornwall

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Introduction

This geophysical survey forms part of an archaeological evaluation of a proposed development site at Threemilestone near Truro. The survey was commissioned from Bartlett Clark Consultancy, Specialists in Archaeogeophysics of Oxford, by CgMs Consulting of Cheltenham on behalf of Inox Group. Fieldwork for the survey was done between 22-25 February 2011.

The Site

A full account of site conditions, the planning background to the project, and of known archaeological findings from an extended area around the study site is given in the Archaeological Desk Based Assessment (DBA) which has been prepared by CgMs Consulting [1]. The following comments are summarised from this document.

Topography and Geology

The survey is located within a study site which has a total area of approximately 68ha, centred at NGR SW 775 456. The study site extends across an area of agricultural land, and occupies the southern side of an approximately east-west aligned valley. It is bounded to the north by Langarth Stream and to the south by the A390, with the Truro Park and Ride car park at its SE corner.

The southern part of the study area is located on the ridge of the valley at c. 107m AOD, with land falling sharply northwards towards the Langarth stream at c. 60m AOD (as indicated on the contoured site plan incorporated in the survey location plan; figure 1). It was assumed on the basis of the topography that the archaeological potential of the elevated and comparatively level ground to the south was greater than that of the sloping or lower lying ground to the north, and survey coverage was therefore restricted to specified areas amounting to c. 11.5ha on the southern ridge. [The area surveyed, given the need to fit a grid around the specified areas, was 11.9ha.]

The solid geology of the study site is identified in the DBA as Upper Devonian Porthtowan Formation of the Gramscatho Group (Grey slate with subordinate sandstone). Superficial deposits are limited to alluvium along the course of the stream to the north of the study site (and outside the survey area). Soil conditions in previous surveys at nearby sites on comparable Devonian bedrock have usually been found to be favourable for the magnetic detection of archaeological features.

Archaeological Background

Previously identified archaeological findings within the study area are limited to a small number of undated cropmark sites of probable medieval or later date. Of those listed in the DBA only one (MCO31889) is located within the survey area (at the NE corner of the survey in field 2; fields are numbered for reference on figures 1 and 6). This is an undated sub-circular cropmark perhaps representing a barrow, although it has also been interpreted as spoil from post-medieval mining activities. Other earthwork round barrows are recorded in the vicinity, but are located outside the study area. Two Iron Age/Romano British rounds to the north and east of the study site indicate the possibility of occupation activity of these periods.

Archaeological investigations conducted in advance of the construction of the Truro Park and Ride car park (immediately to the east of field 7) may provide a further indication of the archaeological potential of the area. A Desk-Based Assessment of the Park and Ride site suggested there was the potential here for settlement activity of prehistoric/Roman or medieval date, but findings from a geophysical survey were limited to former field boundaries and some possible pit-like features of uncertain significance. Subsequent trenching and a watching brief recorded historic field boundaries, but no other features of archaeological interest.

The present study area appears to have been in agricultural use throughout medieval and later periods, and is shown as farmland on early maps as reproduced in the DBA. An estate map of 1788-9 and a tithe map of 1840 each show field boundaries which have subsequently been removed. The only later activity recorded within the survey area is a temporary WW2 military camp. Tents are visible in fields north of the A309 (fields 1, 3, 5) in aerial photographs taken in 1944.

The DBA concludes on the basis of the limited previous nearby archaeological findings that the archaeological potential of the valley ridge (as investigated by the present survey) is only low to moderate.

Survey Procedure

The specified areas were investigated by means of a recorded magnetometer survey, supplemented by magnetic susceptibility testing. Magnetometer 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 in sections at 1:1500 scale in figures 2-3, and as a graphical (x-y trace) plot at 1:1250 scale in figures 4-5. An interpretation of the findings is shown superimposed on the graphical plots (so that the interpretation can be compared with the underlying readings), and is also reproduced separately to provide a summary of the findings in figure 6.

The survey plots show the magnetometer readings after minimal processing which includes adjustment for irregularities in line spacing caused by variations in the instrument zero setting, and slight linear smoothing. The readings in the grey scale plot have

additionally been subjected to weak 2D low pass filtering, which is applied to reduce background noise levels.

Colour coding has been used in the interpretation to distinguish different effects. Magnetic anomalies which appear to show archaeological characteristics are outlined in red (or indicated by red broken lines). Background geological disturbances are indicated in a light green, and stronger (perhaps recent) disturbances in brown. Linear cultivation effects are in green, and other linear features which appear to be recent tractor tracks are indicated in light brown. Some individual magnetic anomalies which may be caused by ferrous objects are marked in blue.

The survey grid was set out and located at the required national grid co-ordinates by means of a differential GPS system. OS co-ordinates of map locations can be read from the AutoCAD (.dwg) version of the plans which can be supplied with this report.

The magnetometer survey was supplemented by a background magnetic susceptibility survey with readings taken at 30m intervals using a Bartington MS2 meter and field sensor loop. A plot of the readings is inset in figure 6.

Susceptibility readings can provide a broad indication of previously occupied or disturbed areas in which burning associated with past human occupation has enhanced the magnetic susceptibility of the topsoil, although the readings may be affected by a number of non-archaeological factors, including geology and land use.

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. It is also strongly affected by ferrous and other debris of recent origin.

Results

Fields within the survey area have been numbered (1-7) from west to east. Of these, fields 1 and 7 contained standing remains of a broccoli crop at the time of the survey, fields 2 and 3 were cultivated but with no visible crop, and the small paddocks near the road (3-5) were pasture. Findings are described by fields in sequence.

Field 1

The grey scale plot shows parallel linear markings (as indicated by broken brown lines, and seen also in field 7). These correspond to visible tractor ruts through the broccoli crop. The strength of response from these superficial disturbances confirms that soil conditions at the site should be favourable for a magnetometer survey. This is indicated also by the magnetic susceptibility readings, which have a relatively high mean value (44×10^{-5} SI), as noted on the plot in figure 6. This result suggests that earth-filled features

should respond well to the survey.

Other findings from field 1 include a broad diffuse linear disturbance at the NW end of the field (as labelled A on figure 6). This is similar to other large irregular features seen elsewhere in the survey (C in field 2 and F in field 3), all of which appear too large and ill-defined to represent archaeological features. They perhaps represent minor (natural ?) variations in the depth of topsoil. A narrower linear disturbance at B could represent a ditch-like feature, but does not appear to be associated with any other significant findings (and does not correspond to any of the field boundaries on old maps).

A few individual pit-like magnetic anomalies are outlined in red. These are characterised in the graphical plots (figures 4-5) by rounded profiles, which may be indicative of silted pits. They are widely dispersed across the site, and fail to form any groups or clusters, as would perhaps be expected at an ancient settlement site.

Field 2

There is a further diffuse and perhaps natural disturbance (similar to A in field 1) at C near the eastern boundary. To the west of this there are parallel markings (indicated in green at E) which could relate to past or present cultivation, and two linear magnetic anomalies, one of which is a distinct ditch-like feature at D. This could perhaps be a former boundary (if it is not a cultivation effect), but it does not relate to any of the recorded boundaries.

There does not appear to be any ground disturbance relating to cropmark MCO31889 in the NE corner of the survey in this field. The cropmark feature is perhaps therefore located a little to the north of the survey area.

Fields 3-5

These fields gave lower susceptibility readings than elsewhere because of the pasture ground cover, but various findings are visible. The broad weak anomalies at F and elsewhere in field 3 could be natural, as previously suggested, but these fields also contain more distinct linear features at G in field 4 and H in field 5. These both correspond to former boundaries shown on the 1887 OS map as reproduced in the DBA (but not on the earlier tithe map). The significance of an additional linear feature (J) extending to the NW from G is less clear. It could perhaps be a land drain leading to a ditch at G.

Other findings are again limited to a few ill-defined possible pit-like features. There do not appear to be any ground disturbances which could be associated with the 1944 army camp in these fields.

Field 6

The only identifiable finding in field 6, other than a possible headland or cultivation effect alongside the eastern boundary (K), is a distinct linear feature (L). This clearly aligns with a change in direction of the extant (western) field boundary, and corresponds to a former

boundary shown on the maps of 1788 and 1840 (but not 1887; see figures 2, 3, 4 in DBA).

Field 7

The survey here has detected visible tractor ruts (as in field 1), but also some ditch-like linear features on a slightly different alignment to the east of the field (M). These could perhaps represent a former trackway or boundary converging on the NE corner of the field. (The present eastern field boundary appears to follow a course slightly to the east of that indicated on the 1840 tithe map.)

Conclusions

Ground conditions at the site appear to be favourable for magnetic investigation, but the survey has produced only limited findings. These include linear features which relate to historic boundaries (G, H, L and perhaps M). Another linear feature (J) could be a drain, and others (B, D) could be drains, cultivation effects, or unrecorded boundaries. A few pit-like magnetic anomalies of a kind which might be associated with ancient settlement activity were detected, but are sparsely distributed across the site. It is therefore probably the case (as for similar findings at the Park and Ride site) that these features are not archaeologically significant.

The survey findings in total are therefore consistent with the conclusion as stated in the DBA that the site is of only low or limited archaeological potential.

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14 March 2011

The fieldwork for this project was done by P. Cottrell and P. Heykoop.

Reference

[1] Archaeological Desk Based Assessment; Land at Langarth, Threemilestone, Cornwall. S. Weaver, CgMs Consulting, Cheltenham. March 2010.

Background mapping reproduced from site survey by Nationwide Surveys, St Austell, Cornwall

177000E

178000E

46000N

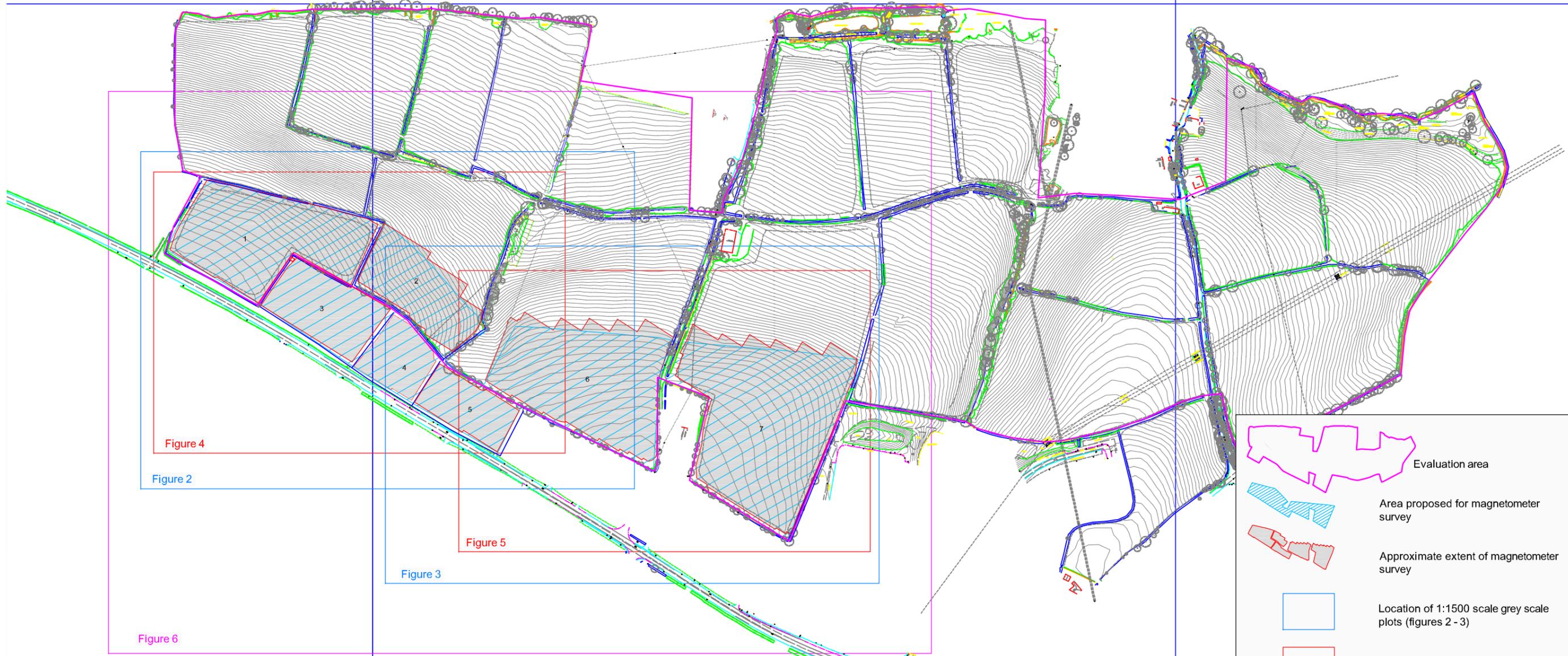
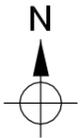


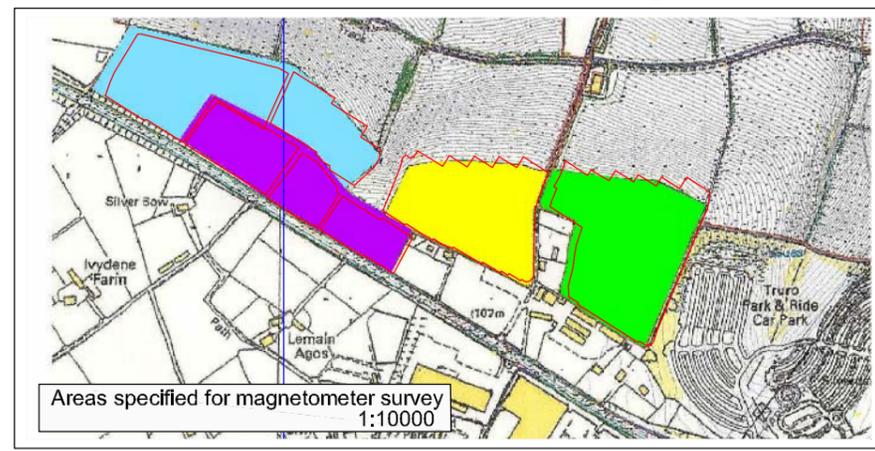
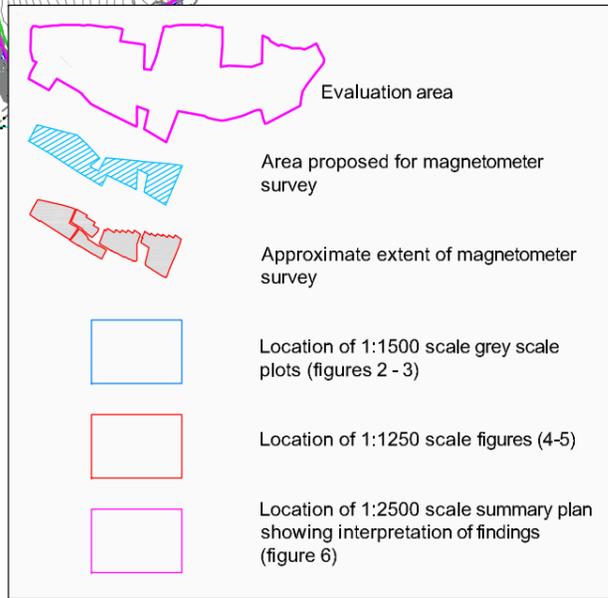
Figure 4

Figure 2

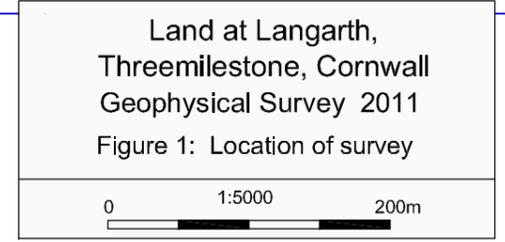
Figure 5

Figure 3

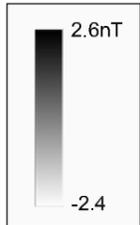
Figure 6



45000N



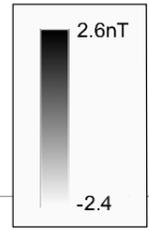
Background mapping reproduced from site survey by Nationwide Surveys, St Austell, Cornwall



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Figure 2: Magnetometer survey
(grey scale plot)

0 1:1500 50m

Background mapping reproduced from site survey by Nationwide Surveys, St Austell, Cornwall



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Figure 3: Magnetometer survey
(grey scale plot)



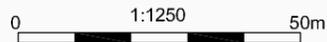
Background mapping reproduced from site survey
by Nationwide Surveys, St Austell, Cornwall



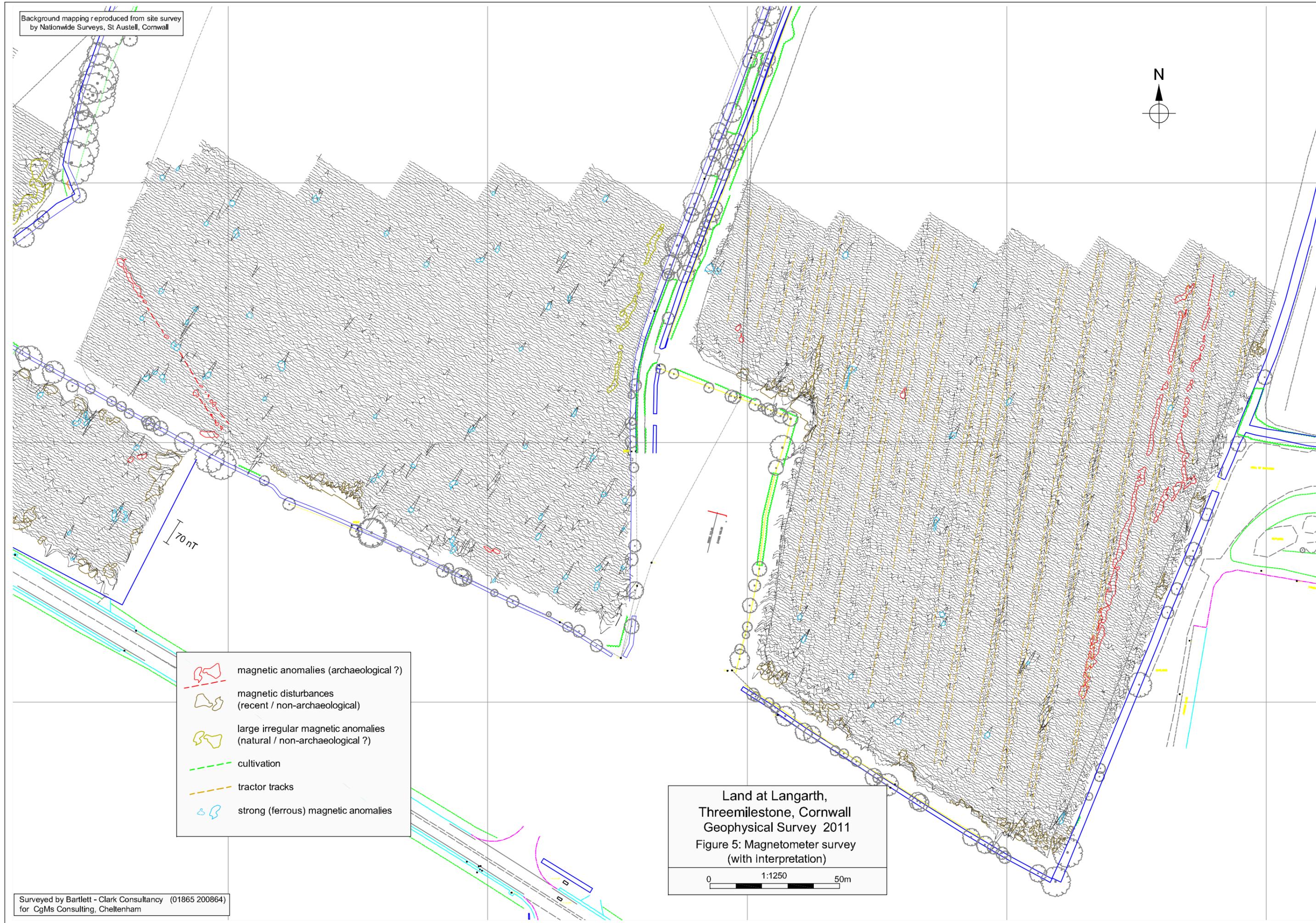
70 nT

-  magnetic anomalies (archaeological ?)
-  magnetic disturbances (recent / non-archaeological)
-  large irregular magnetic anomalies (natural / non-archaeological ?)
-  cultivation
-  tractor tracks
-  strong (ferrous) magnetic anomalies

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Figure 4: Magnetometer survey
(with interpretation)



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-  magnetic anomalies (archaeological ?)
-  magnetic disturbances (recent / non-archaeological)
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-  cultivation
-  tractor tracks
-  strong (ferrous) magnetic anomalies

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Figure 5: Magnetometer survey
(with interpretation)

0 1:1250 50m

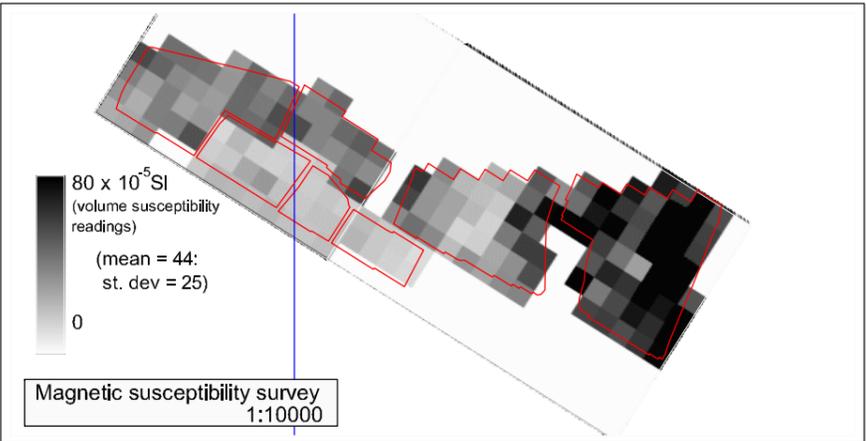
Background mapping reproduced from site survey by Nationwide Surveys, St Austell, Cornwall



45500N

177000E

-  magnetic anomalies (archaeological ?)
-  magnetic disturbances (recent / non-archaeological)
-  large irregular magnetic anomalies (natural / non-archaeological ?)
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-  strong (ferrous) magnetic anomalies



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Figure 6: Summary of Findings

