Survey Commissioned

By

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Surveyed

by

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registered in England

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Pentre,
Geophysical survey

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Contents

List of Illustrations

NGR

Centred on

Area 1	***SJ 13468 64472***
Area 2	***SJ 13788 64439***

Location and Topography (Figure 1)

Two small areas were investigated associated with a large enclosure on the western slopes of the Clwydian Hills. Area 1 was approximately 480 east of Pentre Farm, Llangynhafal, and Area 2 approximately 810 m east of the farm.

The enclosure consists of a series of banks in a rough triangular shape facing south west (Figures 2 and 3) and is bordered by streams on its south and west borders. The banks are approximately 2 m wide and stand up to a height of approximately 0.5 m. Measuring roughly a 180 m by a 180m, the enclosure occupies a relatively steep slope with a height difference of approximately 50 m between the lowest point on the enclosure and the highest. The south western sector of the enclosure is relatively flat, where it runs above the level of the stream along the western side of the enclosure. In this area a small enclosure is attached to the inner side of the defining bank of the main enclosure.

Two further banks are attached to the outer side of the enclosure. A short length runs from the southern side of the enclosure towards the southern stream. The other crosses the valley of the western stream and links to the southern side of a disused track which, in turn, eventually runs to Pentre Farm. This bank can be traced for approximately 330 m. It is assumed that the track is a later feature, using the line of the earlier bank, and then diverting to the north on the western side of the small stream valley.

Two areas were investigated; Area 1 was adjacent to the linear bank, near to its western end whilst Area 2 was in the south western corner of the enclosure and included the small looping enclosure on the inside of the main enclosure. At the time of survey both areas were under pasture.

The surveys took place on 24th July and 2nd August 2012.

Archaeological Background

Lying between Moel Arthur hillfort, (approximately 2.4 km to the north) and Moel y Gaer Llanbedr (approximately 2.9 km to the south east), the site lies within an area of intense archaeological activity. Of particular note are a series of Late Bronze Age and Iron Age enclosures and hillforts along the Clwydian Range.

The site is not on the online versions of either the regional Historic Environment Record or the National Monuments Record (http://www.archwilio.org.uk/ and http://www.coflein.gov.uk/)

Aims of Survey

To investigate the enclosure to the east of Pentre Farm and its associated linear bank, both on the flanks of the Clwydian Hills.

SUMMARY OF RESULTS

No anomalies were located within the survey area adjacent to the western end of the linear bank. However, within the enclosure a number of possible anomalies were located including three possible circular anomalies which may be round houses. The internal, looping enclosure has an unusually strong magnetic signature possibly suggesting a non-domestic role for this enclosure.

METHODS

Fluxgate Gradiometer Surveys

The Fluxgate Gradiometer surveys were undertaken based on a series of 20 x 20 m grids laid out as in Figures 2 and 3. Readings were taken at 0.5 m intervals along transects 0.5 m apart. These transects were walked in a zigzag pattern.

The surveys were carried out using a Geoscan FM 36 Fluxgate Gradiometer with an "ST1" sample trigger. Grey Scale plots were produced using Geoscan Research "Geoplot" v.3.00x and X - Y Plots using Golden Software "Surfer" v. 10.2.601.

RESULTS

Area

The Fluxgate Gradiometer survey covered a total area of 2400 m^2 with Area 1 covering 800 m^2 and Area 2 1600 m^2.

Display

The results of the Fluxgate Gradiometer Surveys are displayed as a grey scale images (Figures 4 and 6) and an X-Y trace plots (Figures 5 and 7). They are also summarized in Figure 9.

Area 1.

No significant anomalies were located in this survey area

Area 2

The interpretation of the Area 2 survey is shown on Figure 8. This survey area covered the south western corner of the enclosure and part of the small looping enclosure. Although there is a gap in the enclosure Anomaly A suggests that the main enclosure bank originally continued unbroken through the survey area.

The small looping enclosure has a distinctive magnetic signature. Whilst the enclosing bank general has a positive signal, approximately 20 nT above the background (Anomaly B), the internal area has readings of -10 nT (Anomaly C). These reading suggest that what may have been interpreted as a round house on topographical criteria probably has some other function. It is possible that this may include some industrial activity or the presence of relatively modern disturbance.

Within the main enclosure a number of anomalies were located. Anomalies D and E appear to define a possible round house, if so it is likely that Anomaly D represents the location of a possible hearth. Although less clear this pattern appears to be repeated with Anomalies F and G and H and I possibly also representing the presence of round houses on the site. The similarity of Anomalies J and K to Anomalies D, F and H may also suggest the possibility of other structures which have not given clear magnetic signals.

Anomaly L is not very clear, however, a series of very slight linear anomalies and discrete anomalies appear to define a rectangular area 17.7 x 8.7 m in size. Further investigation would be required to confirm this anomaly.

Conclusions

It is a fundamental axiom of archaeological geophysics that the absence of features in the survey data does not mean that there is no archaeology present in the survey area only that the techniques used have not detected it.

Although Area 1 appears not to show any anomalies of archaeological origins, Area 2 contains a number of anomalies which appear to define possible archaeological features. The main enclosure bank has a slight magnetic signature; however, the small, looping enclosure has a much higher magnetic signature. .Reaching values of +20 and -10 nT it is possible that this enclosure was associated with some sort of industrial activity. This however can only be tested by excavation.

Within the main enclosure one circular anomaly, probably a round house was located together with two possible round houses. Two other discrete anomalies may also mark the position of possible central hearths.

A very feint anomaly (Anomaly L, Figure 8) appears to define a rectangular area 17.7 x 8.7 m in size which is associated with a series of small discrete anomalies. It is possible that this anomaly group may represent a rectangular building, however, only excavation will confirm this possible interpretation.

References

http://www.archwilio.org.uk/

http://www.coflein.gov.uk/.

Acknowledgements

The survey was commissioned by Ian Brown who also defined the survey areas on site.

Techniques of Geophysical Survey:

Magnetometry:

This relies on variations in soil magnetic susceptibility and magnetic remenance which often result from past human activities. Using a Fluxgate Gradiometer these variations can be mapped, or a rapid evaluation of archaeological potential can be made by scanning.

Resistivity:

This relies on variations in the electrical conductivity of the soil and subsoil which in general is related to soil moisture levels. As such, results can be seasonally dependant. Slower than Magnetometry this technique is best suited to locating positive features such as buried walls that give rise to high resistance anomalies.

Resistance Tomography

Builds up a vertical profile or pseudosection through deposits by taking resistivity readings along a transect using a range of different probe spacings.

Magnetic Susceptibility:

Variations in soil magnetic susceptibility occur naturally but can be greatly enhanced by human activity. Information on the enhancement of magnetic susceptibility can be used to ascertain the suitability of a site for magnetic survey and for targeting areas of potential archaeological activity when extensive sites need to be investigated. Very large areas can be rapidly evaluated and specific areas identified for detailed survey by gradiometer.

Instrumentation:

1. Fluxgate Gradiometer - Geoscan FM36

2. Resistance Meter - Geoscan RM15

3. Magnetic Susceptibility Meter - Bartington MS2

4. Geopulse Imager 25 - Campus

Methodology:

For Gradiometer and Resistivity Survey 20m x 20m or 30m x 30m grids are laid out over the survey area. Gradiometer readings are logged at either 0.5m or 1m intervals along traverses 1m apart. Resistance meter readings are logged at 1m intervals. Data is down-loaded to a laptop computer in the field for initial configuration and analysis. Final analysis is carried out back at base.

For scanning transects are laid out at 10m intervals. Any anomalies noticed are where possible traced and recorded on the location plan.

For Magnetic Susceptibility survey a large grid is laid out and readings logged at 20m intervals along traverses 20m apart, data is again configured and analysed on a laptop computer.

Copyright:

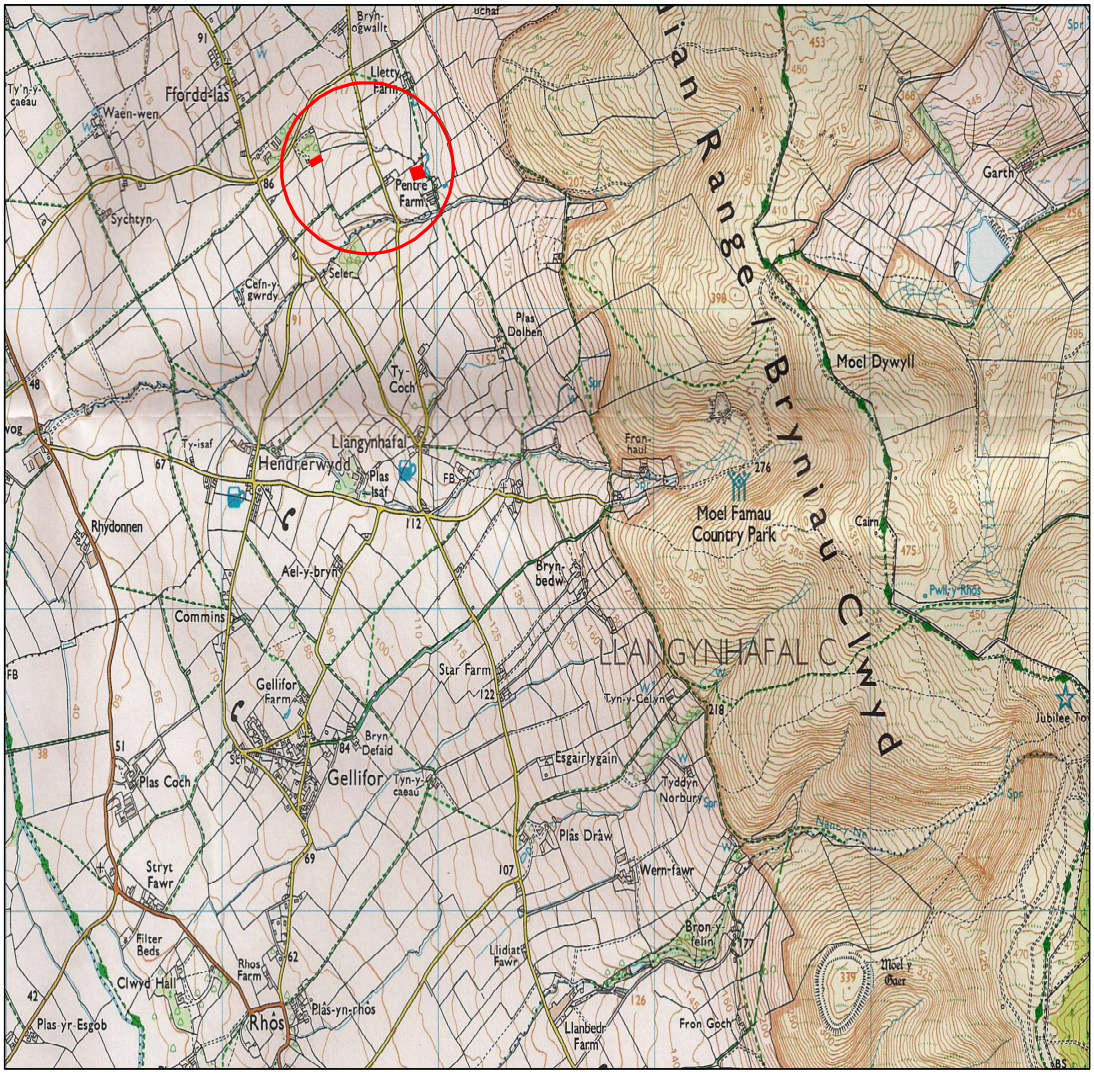
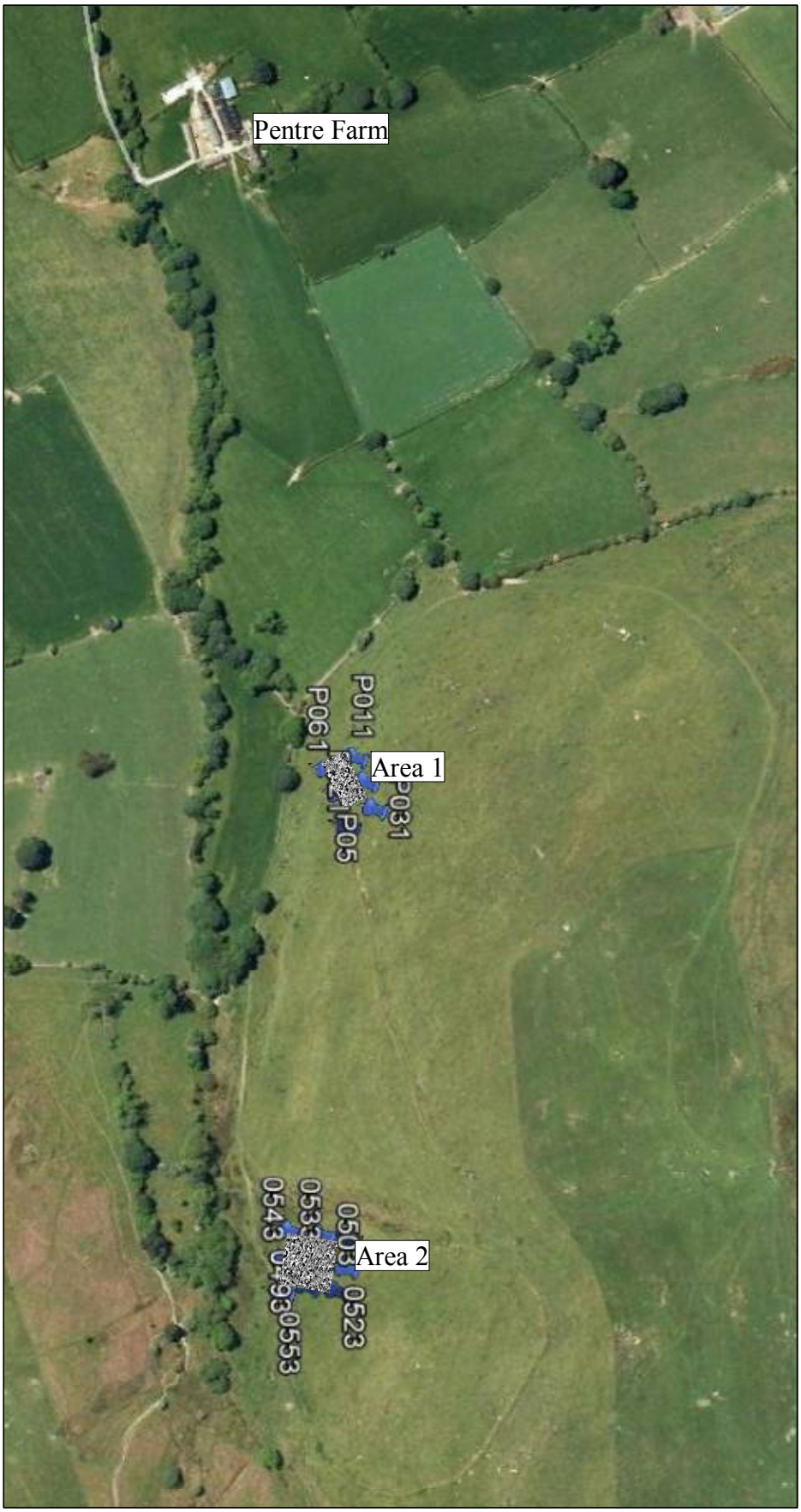


Figure 1: Location
Scale 1:25,000



0 200 m

Figure 2: Location of the Survey Areas
Based on Image from Google Earth
Scale 1:5000

Figure 3: Relationship between the Survey Areas and the Enclosure
Scale 1:2000

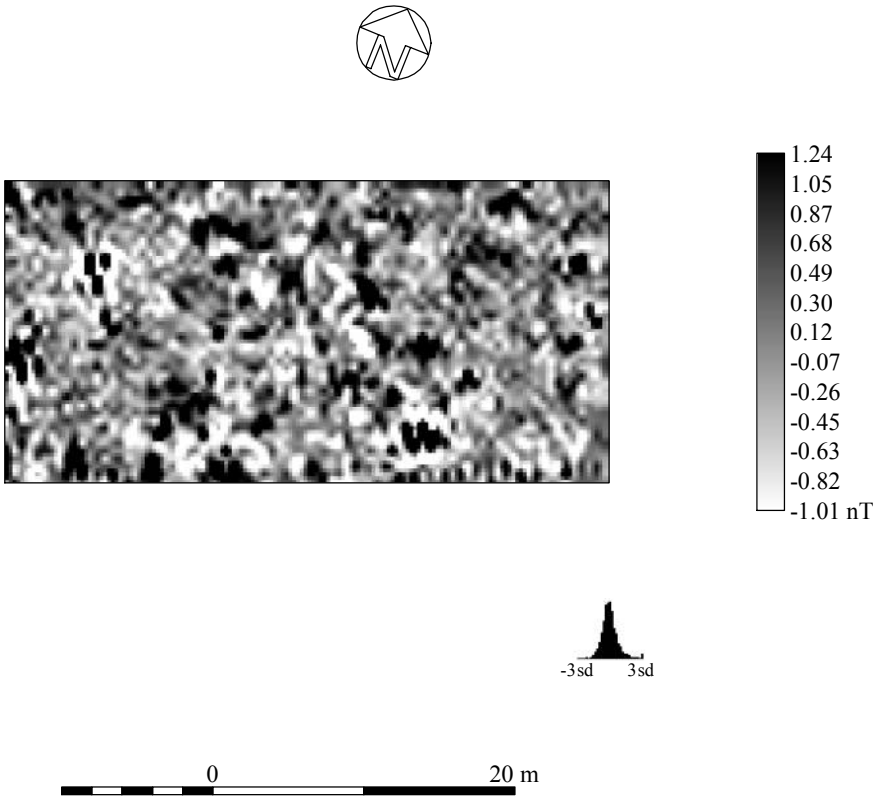


Figure 4: Area 1, Grey Scale Plot
Scale 1:500

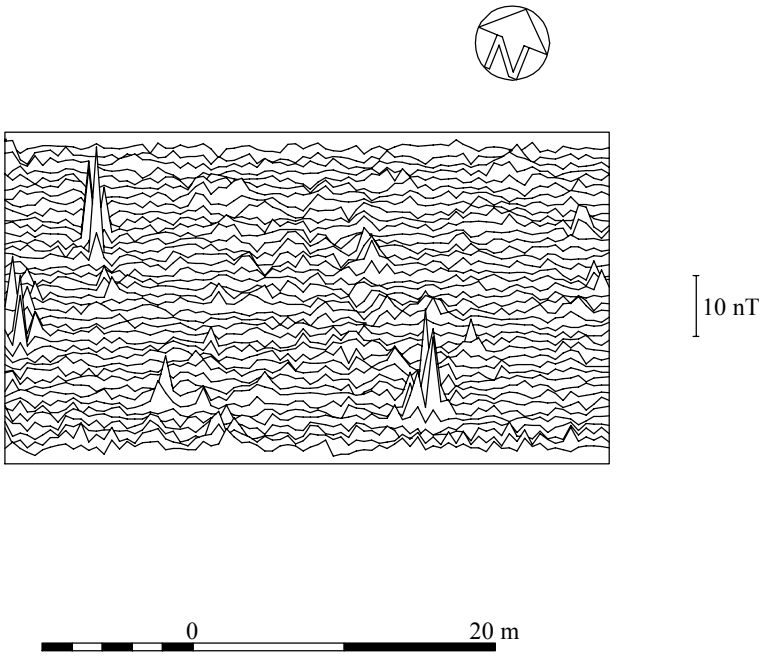


Figure 5: Area 1, X-Y Plot
Scale 1:500

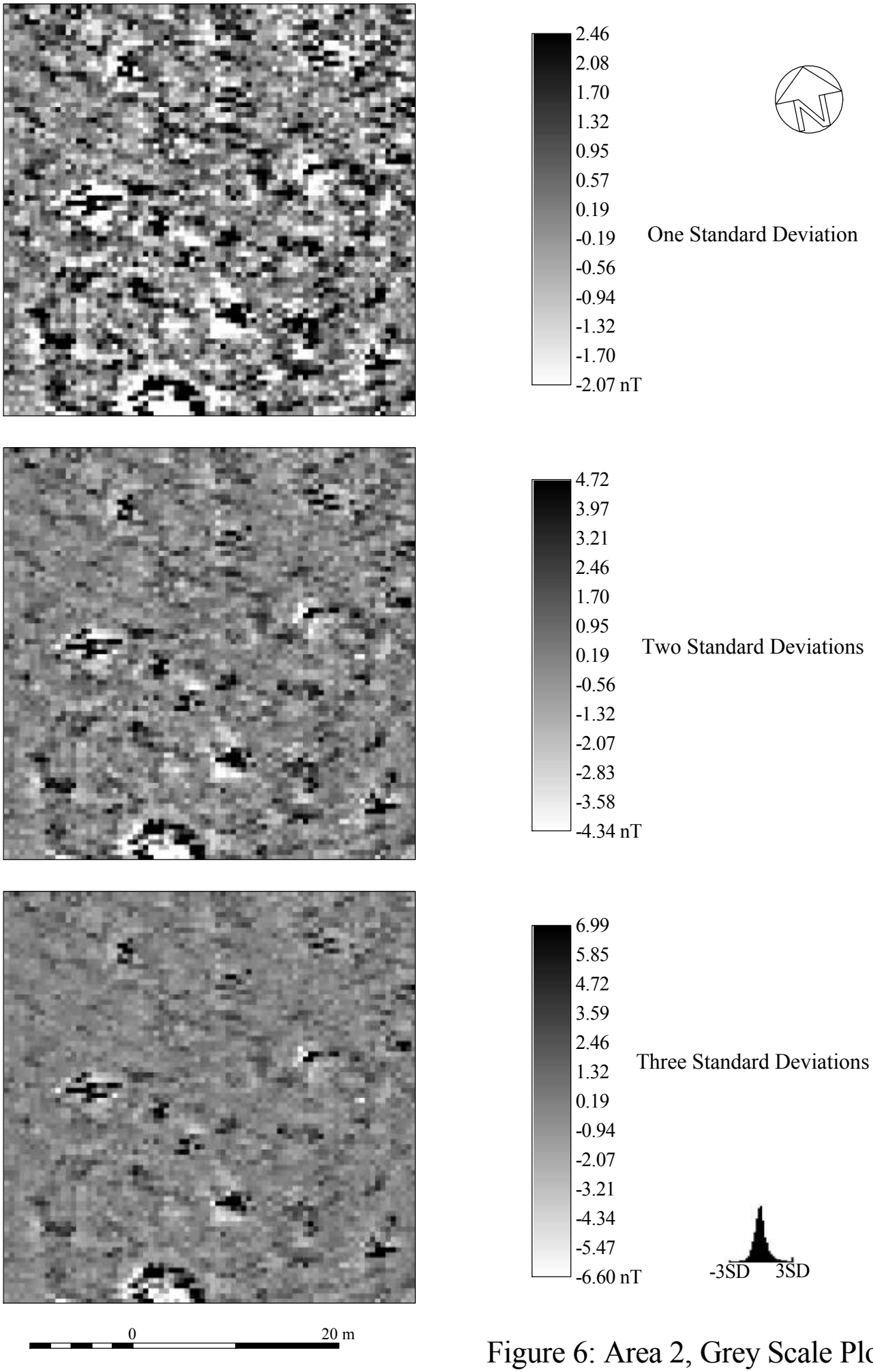


Figure 6: Area 2, Grey Scale Plots
Scale 1:500

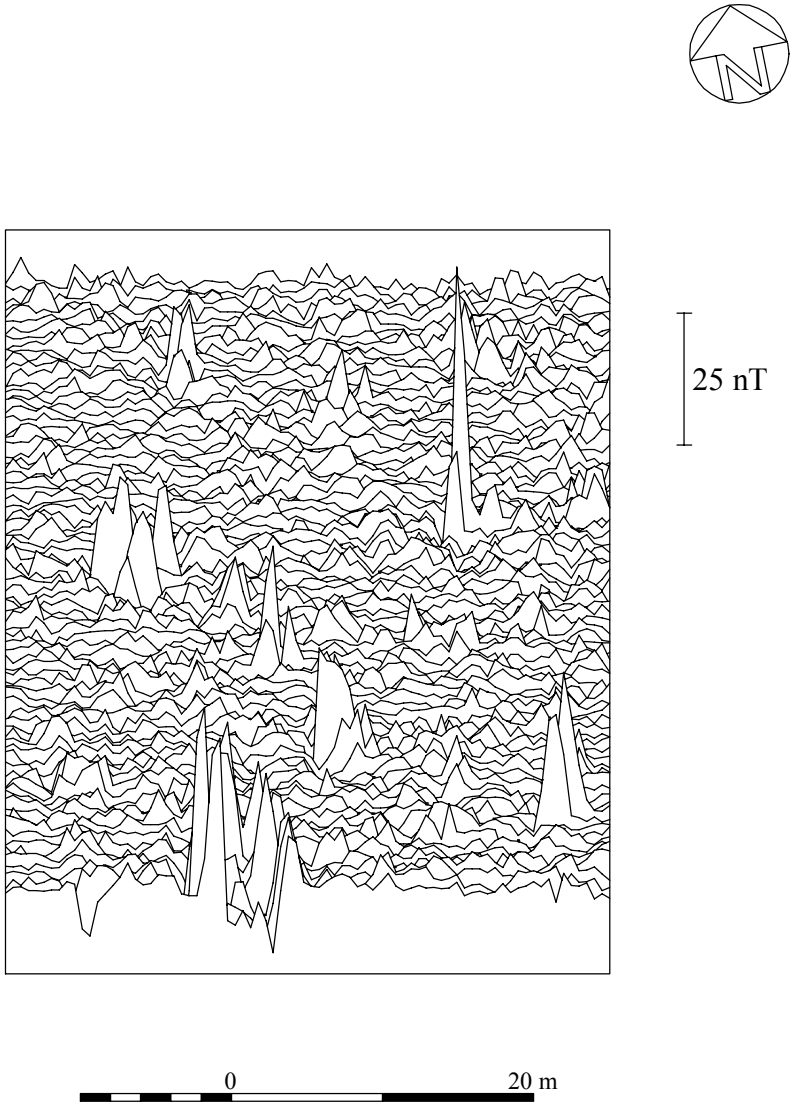


Figure 7: Area 2, X-Y Plot
Scale 1:500

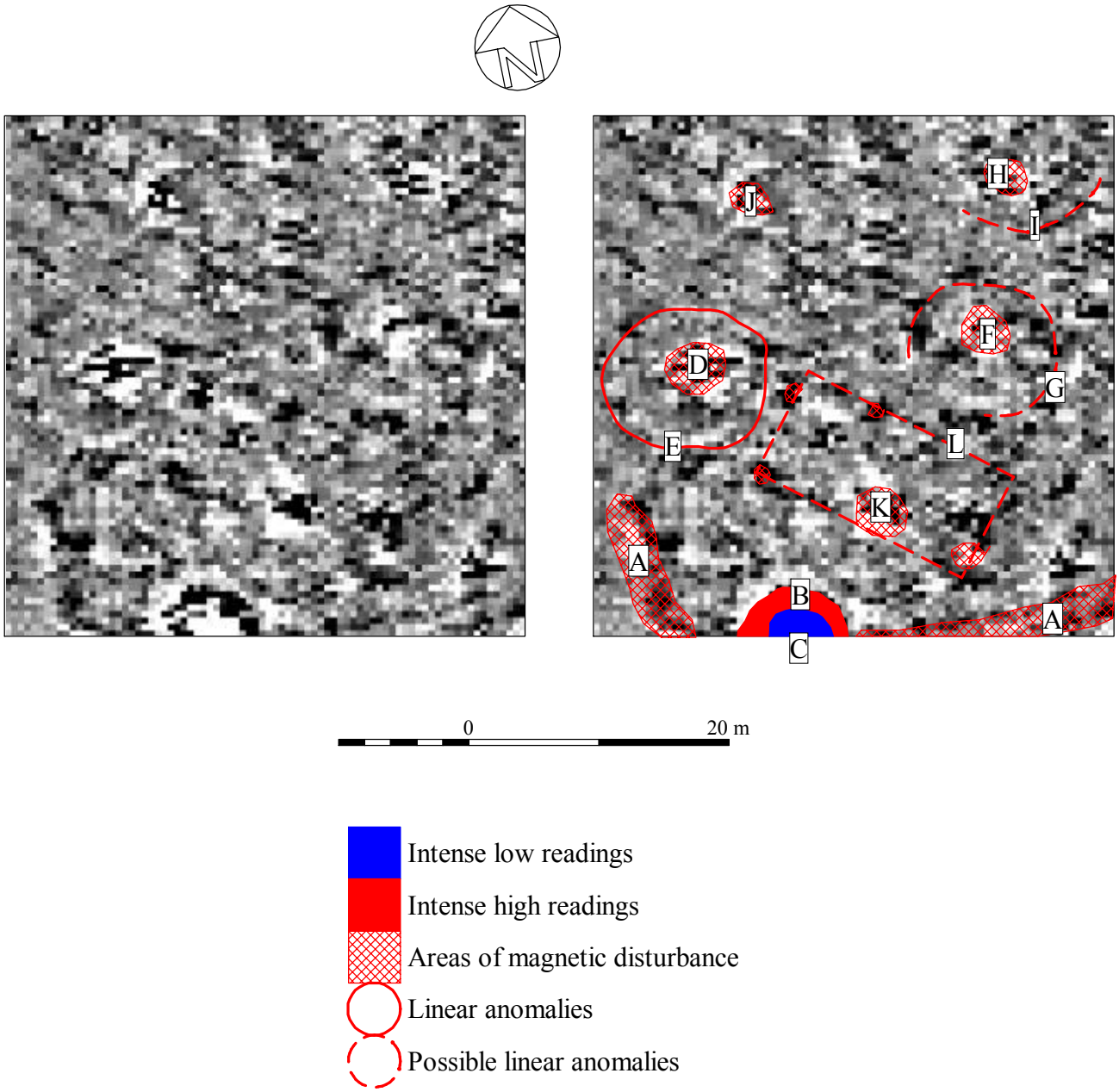


Figure 8: Area 2, Interpretation
Scale 1:500

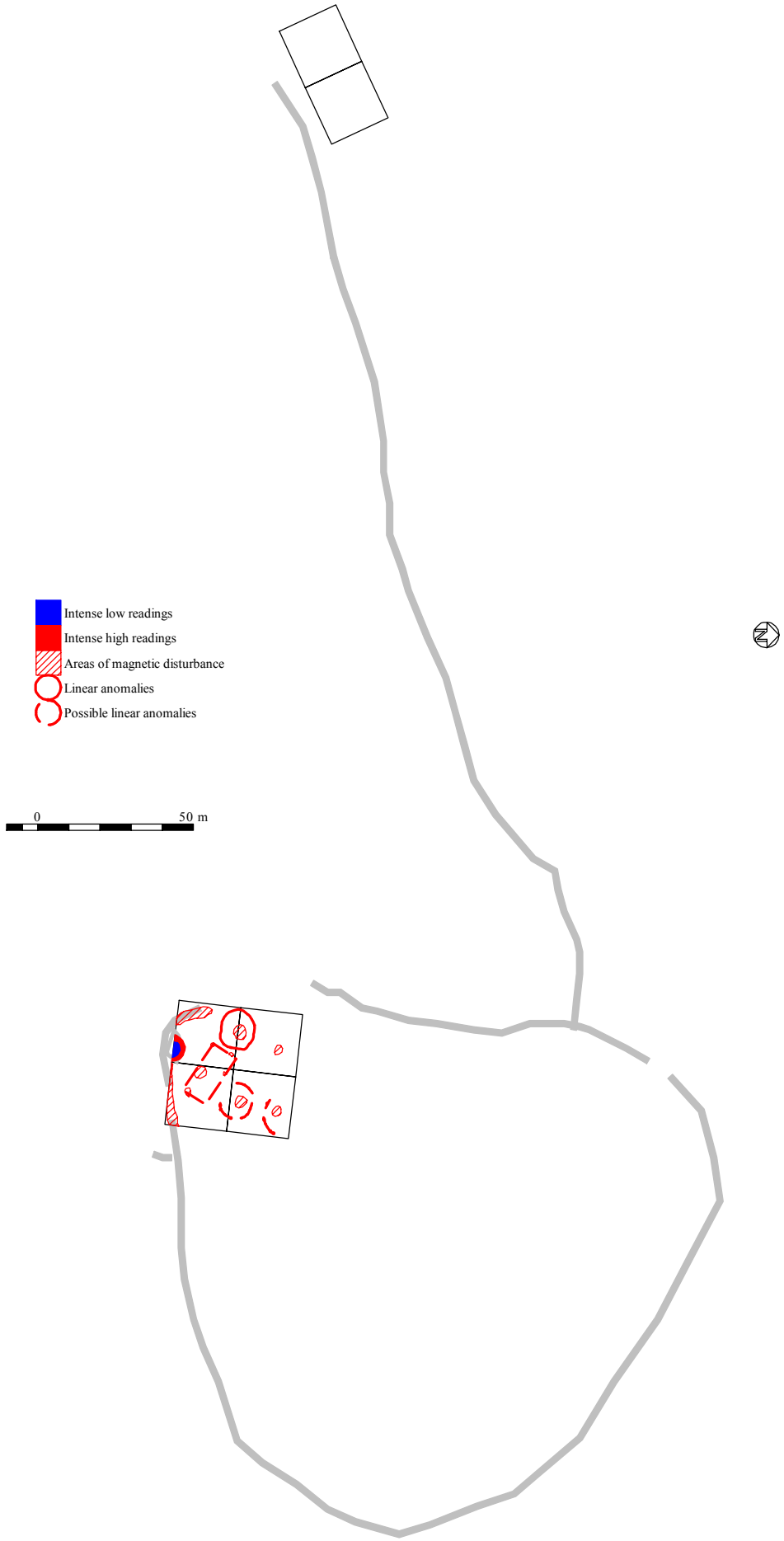


Figure 8: Summary
Scale 1:2000