

**LAND AT BLACKBERRY LANE NEAR COSHESTON,
PEMBROKESHIRE**

**Archaeological Geophysical Survey
2013**

Report by:

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Land at Blackberry Lane near Cosheston, Pembrokeshire

Report on Archaeological Geophysical Survey 2013

1. Introduction

This report describes a geophysical survey undertaken at the site of a proposed solar farm development near Cosheston, Pembrokeshire. The purpose of the survey was to test for evidence of archaeological features or remains at the site, and to supply information relevant to the planning process.

The survey was commissioned from Bartlett Clark Consultancy (BCC), Specialists in Archaeogeophysics of Oxford, on behalf of the developers by CgMs Consulting Ltd of Cheltenham. Fieldwork for the survey was done during a two week period, and completed on 7 November 2013. Data plots and a summary of the findings were then supplied to CgMs to meet immediate planning requirements on 22 November. The present report re-presents the previously submitted material for the record. It also includes a comprehensive set of data plots suitable for submission to the ADS Oasis archiving system.

2. The Site

The following comments are reproduced in part from the Written Scheme of Investigation which was prepared by BCC and submitted to CgMs in advance of the survey [1]. The fields within the survey area have been numbered on the survey plans in an arbitrary sequence (1-11) for identification in this report.

Topography and geology

The site is an area of mainly arable farmland to the south east of Cosheston near Pembroke. It is located to the north of the A477 and west of Blackberry Lane, and is centred approximately at NGR SN 016032. It is divided by hedges into 11 fields, with a total surveyable area of 48.5 ha.

The underlying geology of the site appears (from BGS on-line mapping) to be mainly Carboniferous limestone (Pembroke and Avon Limestone Groups), but could include Triassic Old Red Sandstone (Cosheston Group) towards the northern boundary of the survey area. The site appears to be free of drift deposits. Previous magnetometer surveys at comparable locations in Pembrokeshire have on various occasions produced distinct archaeological findings, but it is also possible on a complex ancient bedrock that the survey might additionally detect magnetic anomalies of geological origin. These may be caused by metamorphic inclusions in the bedrock, and it has also previously been observed that variations in soil depth above stratified shallow bedrock can give rise to linear or other patterns in the survey data. Such effects need to be taken into account when interpreting the survey findings.

Magnetic susceptibility readings which were taken during the survey confirmed that soil

conditions at the site should be highly responsive to magnetic investigation. The readings were mainly high (in a range $50\text{-}140\text{ m}^3\text{kg}^{-1}$), indicating that earth-filled features should be magnetically detectable. Lower readings (< 10) were obtained on rising boggy ground to the north of the site (in fields 1 and 2 as numbered on the survey plans). This indicates a high organic or peat content in the soil in this part of the site.

Archaeological background

We were not told of any previously identified archaeological findings in the vicinity of the site. A plan of HER data supplied to us by CgMs also does not show any nearby archaeological features, although there are former lime kilns in fields to the east and west of the evaluation area. One purpose of the survey was therefore to serve as a reconnaissance exercise to test for the presence of unknown or unexpected archaeological sites or features.

3. Survey Procedure

The site was investigated by means of a recorded magnetometer survey. A magnetometer survey is often able to identify the extent and character of cut features such as ditches and pits when they are silted with an increased depth of topsoil, which usually responds more strongly than the underlying natural subsoil. Fired materials, including baked clay structures such as kilns or hearths are also likely to produce a localised enhancement of the magnetic field strength, and the survey therefore responds preferentially to the presence of ancient settlement or industrial remains. The survey is also strongly affected by ferrous and other debris of recent origin.

Fieldwork

The method used for the investigation was a fluxgate gradiometer survey across the evaluation area. This followed procedures consistent with the 2008 English Heritage geophysical guidelines document [2]. A survey grid was set out at the required locations, and tied to the OS grid using a GPS system with VRS correction to provide 0.1m or greater accuracy. The plans are therefore geo-referenced, and OS co-ordinates of map locations can be read from the AutoCAD version of the plans.

The magnetometer readings were collected along transects 1m apart using Bartington 1m fluxgate gradiometers, and are plotted at 25cm intervals along each transect.

Presentation and report

The results of the survey are presented as a grey scale plot (at 1:2000 scale at A3) in figures 3-6 and as a graphical (x-y trace) plot at 1:1500 in figures 7-11. Inclusion of both types of presentation allows the detected magnetic anomalies to be examined in plan and profile respectively.

The graphical (x-y) plot represents minimally pre-processed magnetometer readings, in which adjustments are made for irregularities in line spacing caused by variations in the instrument zero setting (as is required for legibility in gradiometer data), but no further filtering or other process which could affect the anomaly profiles or influence the

interpretation of the data has been applied. A weak additional 2D low pass filter has been applied to the grey scale plot to adjust background noise levels.

An interpretation of the findings is shown in conjunction with the data plot in figures 7-11, and is reproduced separately to provide a summary of the results in figure 2. Colour coding has been used in the interpretation to distinguish different effects. Features as marked include magnetic anomalies which may be archaeologically significant, as outlined in red. Some of the more conspicuous ferrous objects (identifiable as narrow spikes in the graphical plots) are outlined in blue, and recent disturbances in grey. Irregular background magnetic anomalies of probably natural origin are shown in a light green. Pipes and cultivation effects are also indicated.

4. Results

The survey data plots show considerable background magnetic activity, much of which is likely to be of natural or geological origin, as was expected, but there are also a number of clearly defined findings which appear to be of archaeological origin. These include a distinct ovoid enclosure (labelled A on figure 2), and a group of small circular features at B. The circles at B are very clearly defined. They are about 8m in diameter and have strong central features. They look very much like hut circles, but each must have a central pit or hearth containing strongly magnetic fill. It is not impossible that they lie within an enclosure ditch visible at C. Traces of additional enclosures may be visible elsewhere, but the complex geological background also gives rise to magnetic anomalies which complicate the picture. There is another isolated hut-like feature at D, and another possible small enclosure at E.

These findings are distinguishable in terms of their plan, dimensions and distribution from the natural background magnetic anomalies, which are outlined in a light green colour in figure 2. This natural activity is most concentrated towards the south and south-west of the site (fields 7-11) where it is probable that the observed magnetic response represents irregularities in the depth of the topsoil cover above the uneven surface of a shallow bedrock. Variations in this activity across the remainder of the site relate in part to the topography. An east-west band of relatively undisturbed readings in the south-west of the site (centred around F in field 7) probably represents an increase in soil depth within a silted shallow depression or channel, and there is a quiet response from boggy soil on higher ground in fields 1 and 2 to the north.

A ditch-like linear feature (G) is clearly visible against the quiet background in field 2. This aligns approximately with extant field boundaries, and so probably represents a relatively recent former boundary. A probable double-ditched trackway is visible at H in field 4. This diverges from the alignment of the modern field boundaries in field 8, and so perhaps pre-dates the present field system. The same may be true of additional possible fragmentary ditch-like features which are dispersed across the site at locations including I, J and K.

Other findings include extensive sequences of narrow parallel linear markings (visible in the grey scale plot, and shown in green in figure 2). These probably relate to current or recent ploughing. There are iron pipes (blue in figure 2) along the southern boundary of the survey, and at L in field 1. A further linear feature (M) in field 1 could be a non-ferrous pipe. There are few other disturbances of clearly recent origin except for a group of strong magnetic anomalies at N in field 4. The strength and orientation of the anomaly profiles here (as seen in figure 10) suggests these disturbances are more likely to represent a group of buried ferrous objects than a lime kiln.

5. Conclusions

The survey has detected a number of clearly defined features which are likely to indicate the presence of previously unknown archaeological remains at several locations within the evaluation area. The most conspicuous of these are the probable hut circles at B and D in field 5 (as labelled on figure 2), and the irregular ditched enclosure at A. The hut circles at B may be located within a larger incompletely detected enclosure at C.

There may be additional traces of a field system or enclosures, as indicated by various ditch-like features (including I, J, K), but these are more difficult to distinguish from the general level of natural background magnetic activity than features A-D. Other findings include a probable former field boundary (G), and a trackway of uncertain origin (H).

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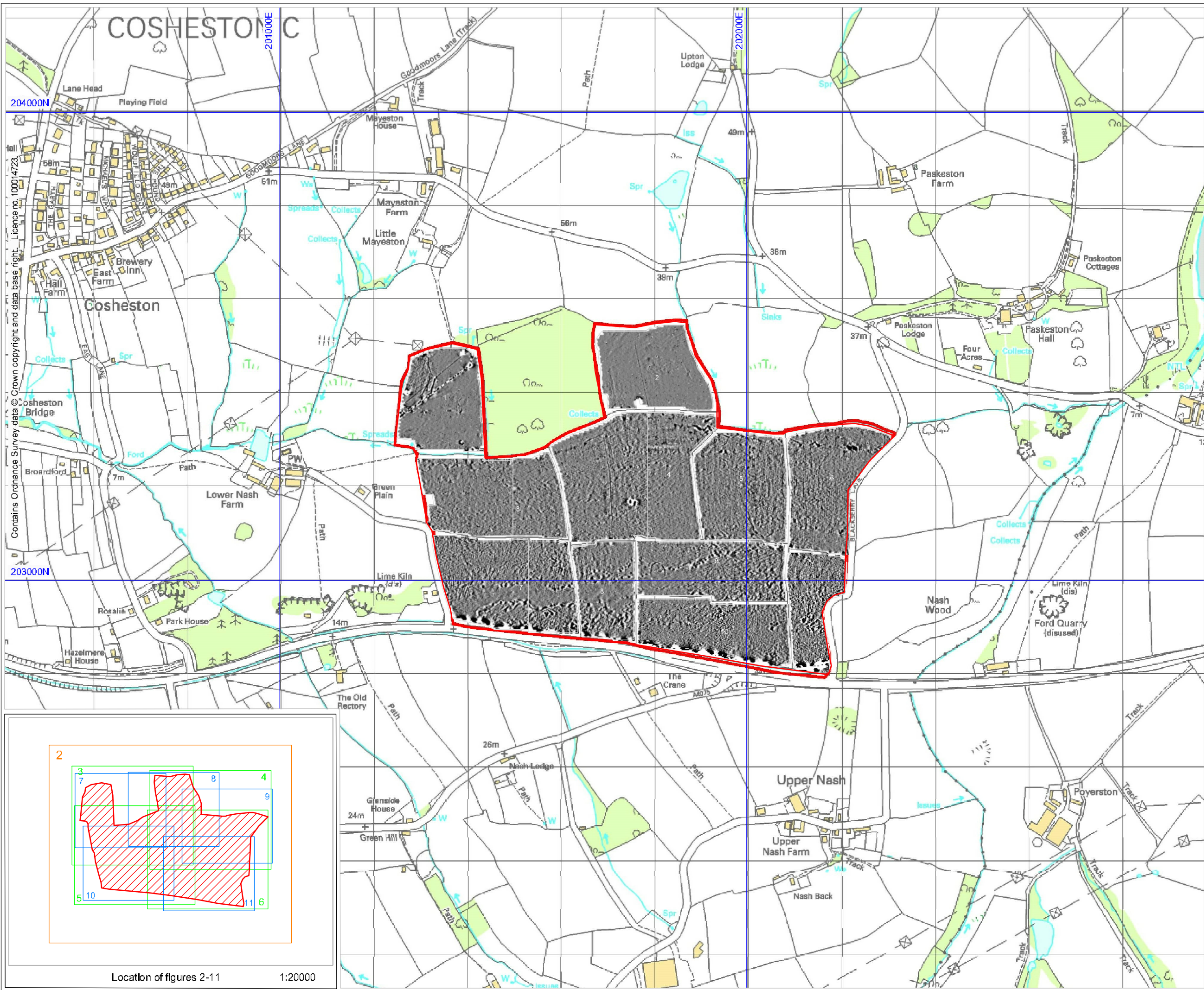
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11 December 2017

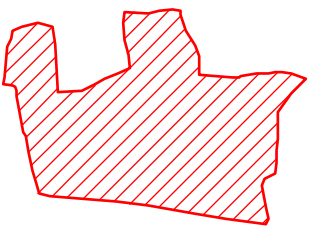
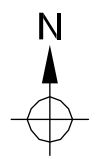
Fieldwork for this survey was done by C. Oatley, P. Heykoop and N. Paveley. Data processing was done by P. Cottrell.

References

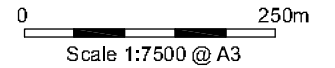
- [1] *Land at Blackberry Lane near Cosheston, Pembrokeshire: Written Scheme of Investigation for Archaeological Geophysical Survey 2013*. Document prepared by Bartlett Clark Consultancy for CgMs; 17 October 2013.
- [2] *Geophysical Survey in Archaeological Field Evaluation*. English Heritage: Swindon, 2008.



LEGEND



evaluation area
(c.49 ha)



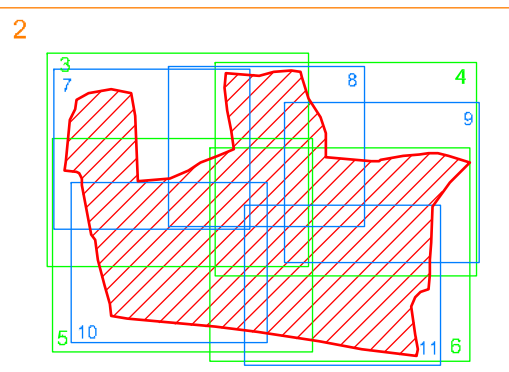
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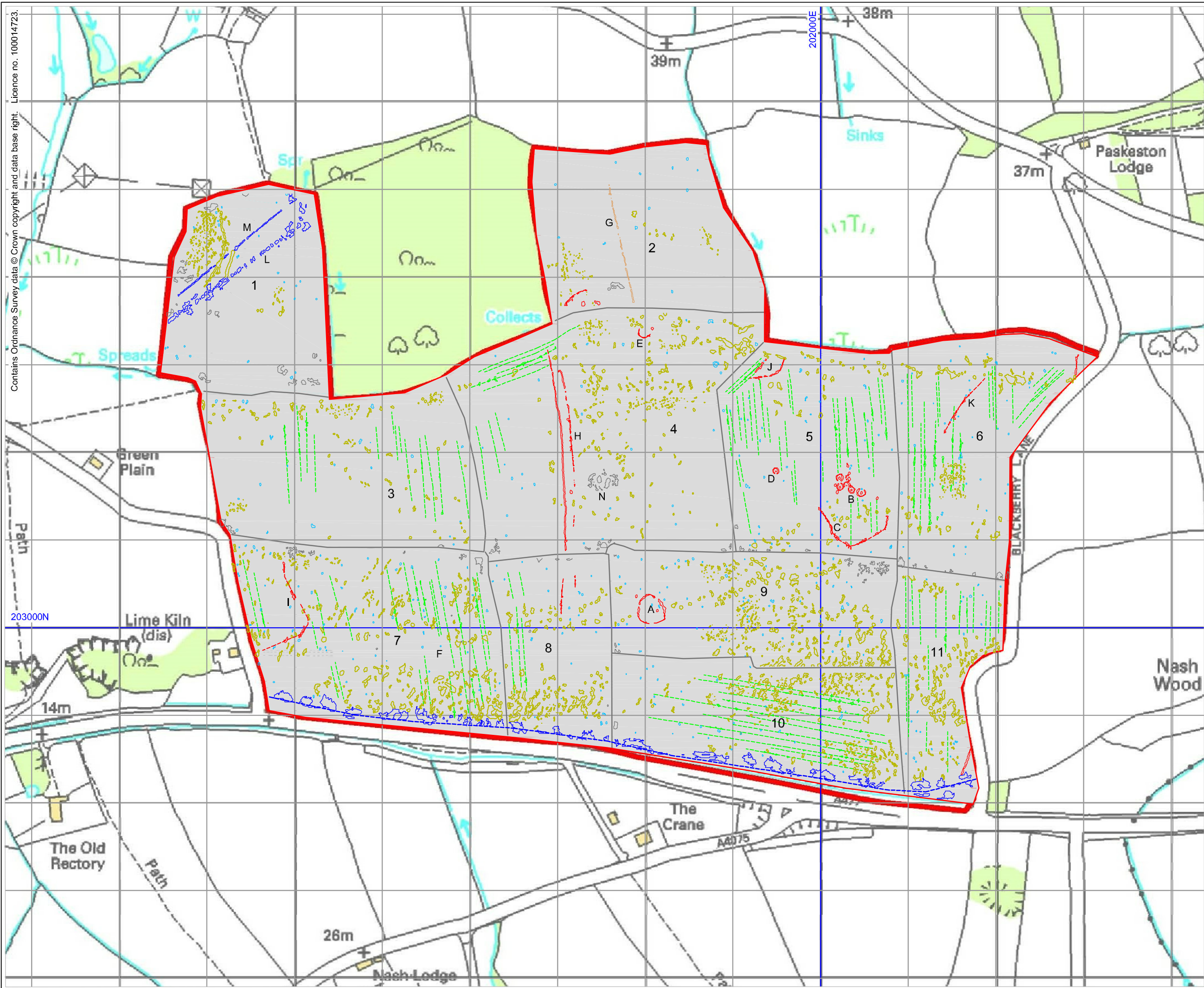
Figure 1
Survey location
(with summary
grey scale plot)










Location of figures 2-11 1:20000

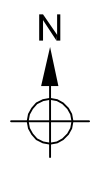
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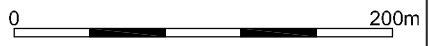
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-  magnetic anomalies (archaeological ?)
-  strong (recent ?) magnetic disturbances
-  broad / irregular magnetic anomalies (topographic / natural ?)
-  former boundary ?
-  cultivation
-  pipe
-  strong (ferrous) magnetic anomalies



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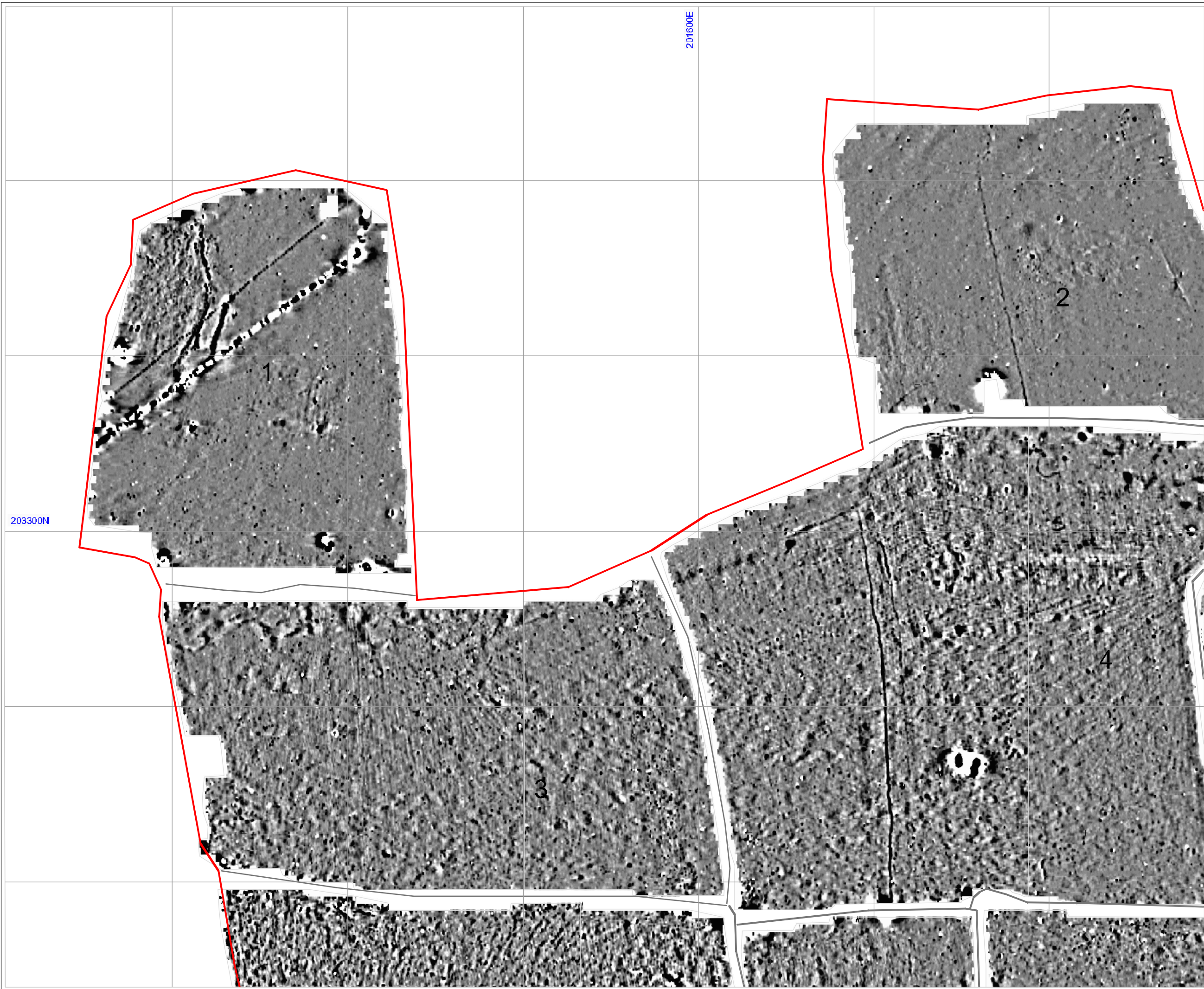
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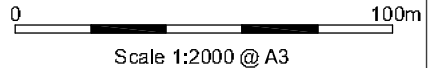
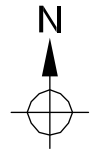
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Figure 2
Magnetometer survey:
summary of findings



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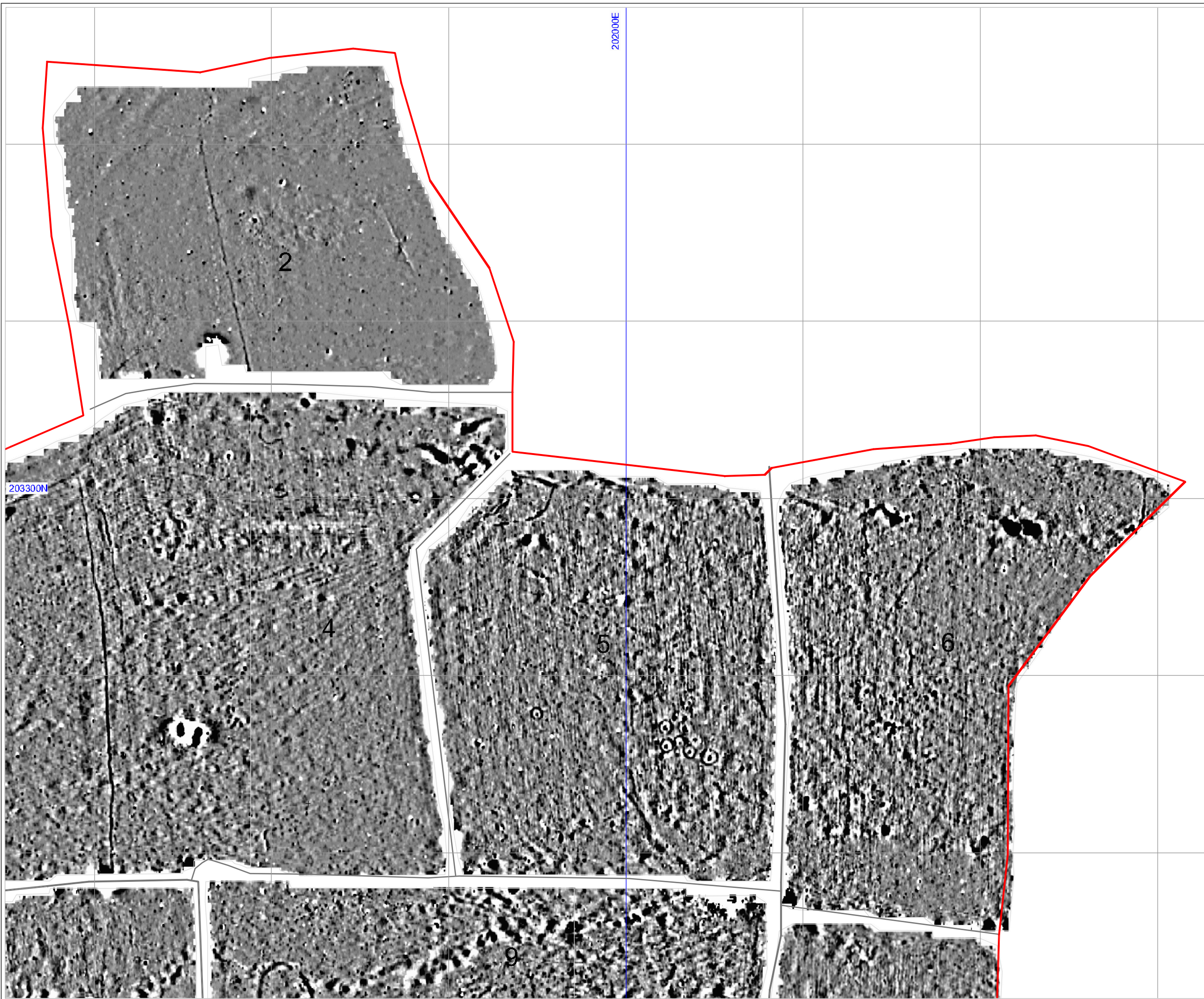
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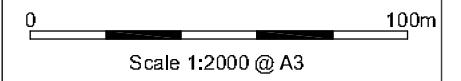
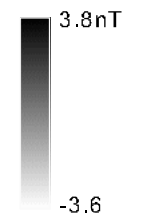
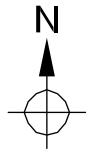
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Figure 3
Magnetometer survey:
grey scale plot
(1/4)



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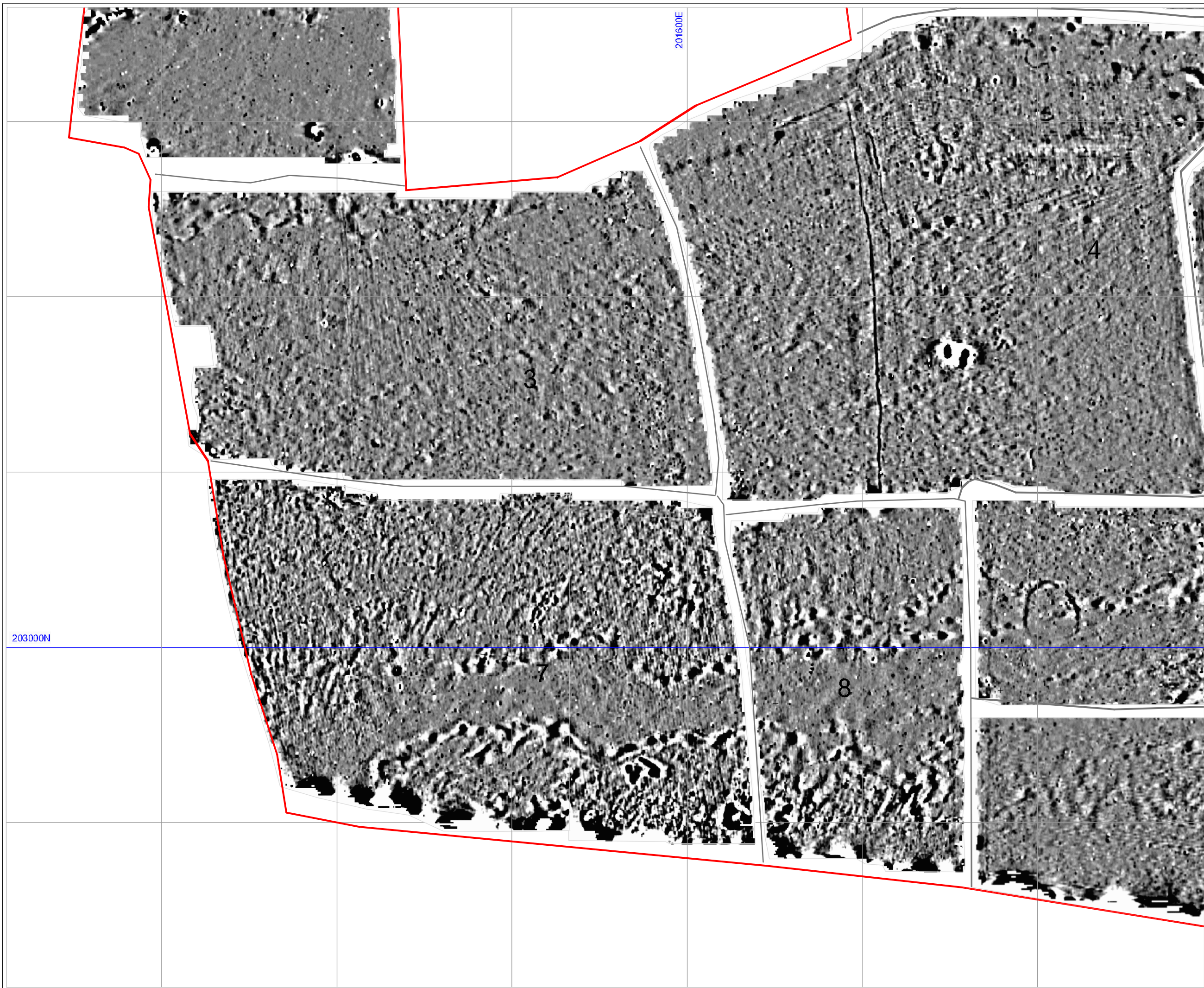
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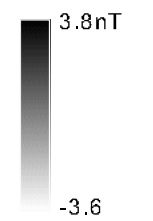
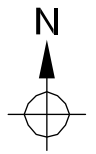
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Figure 4

Magnetometer survey:
grey scale plot
(2/4)



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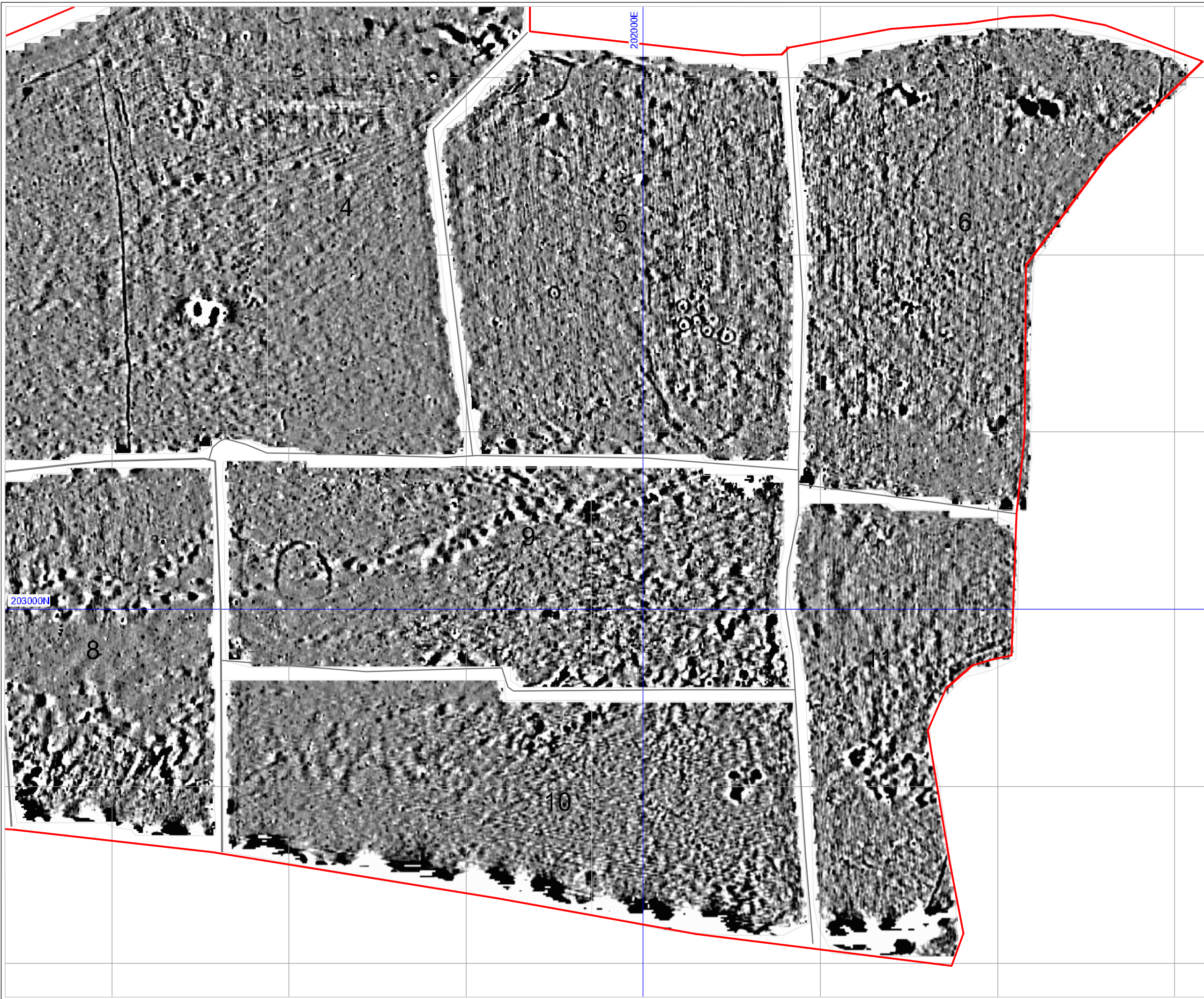
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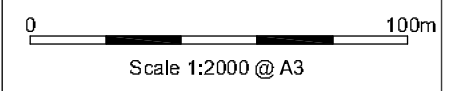
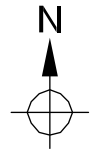
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Figure 5
Magnetometer survey:
grey scale plot
(3/4)



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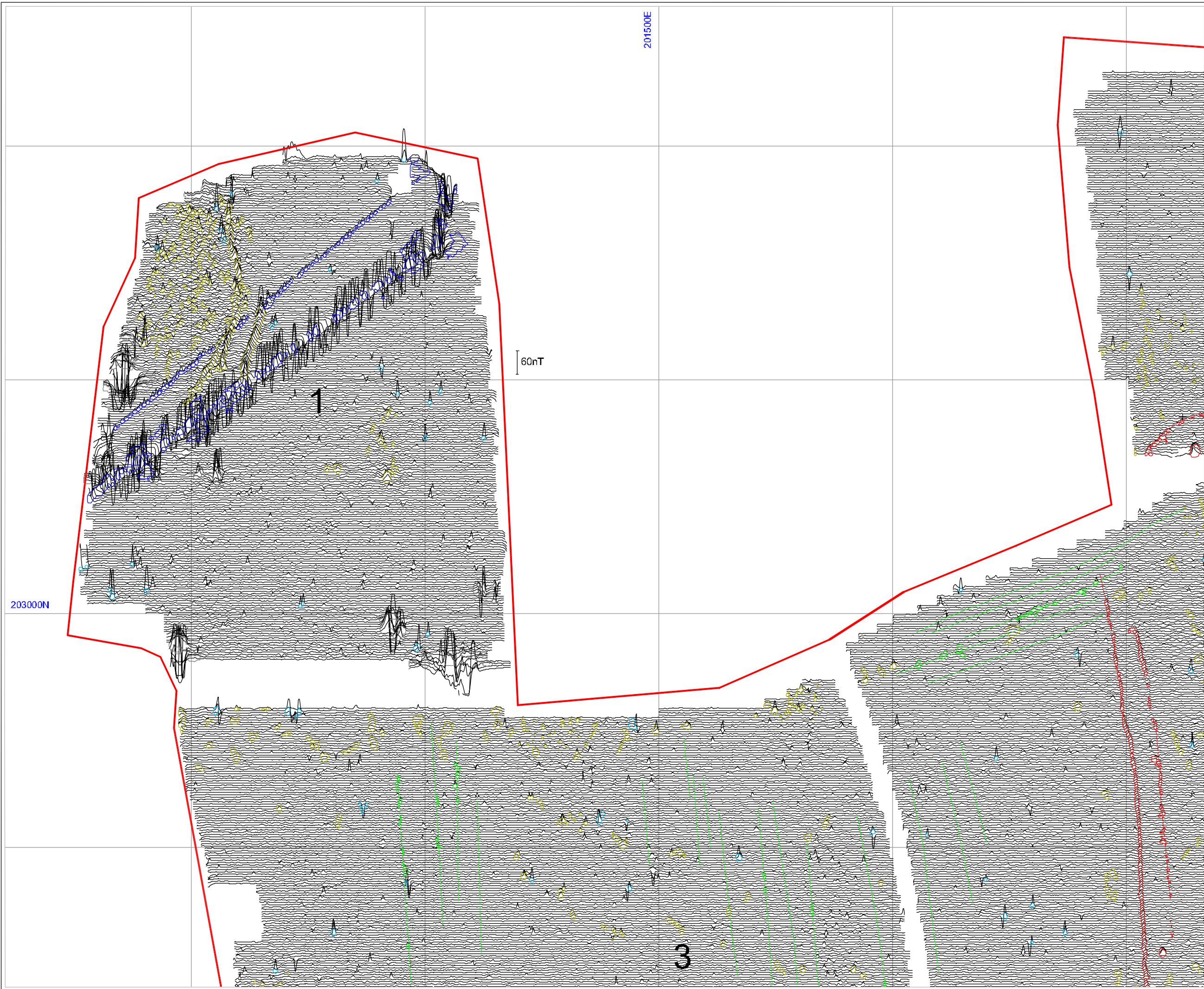
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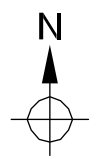
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


Figure 6

Magnetometer survey:
grey scale plot
(4/4)



LEGEND



-  magnetic anomalies (archaeological ?)
-  strong (recent ?) magnetic disturbances
-  broad / irregular magnetic anomalies (topographic / natural ?)
-  former boundary ?
-  cultivation
-  pipe
-  strong (ferrous) magnetic anomalies

0 50m
Scale 1:1500 @ A3

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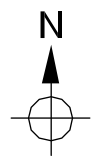
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Drawing title:
Figure 7
**Magnetometer survey
(with interpretation)**
1/5



LEGEND



-  magnetic anomalies (archaeological ?)
-  strong (recent ?) magnetic disturbances
-  broad / irregular magnetic anomalies (topographic / natural ?)
-  former boundary ?
-  cultivation
-  pipe
-  strong (ferrous) magnetic anomalies

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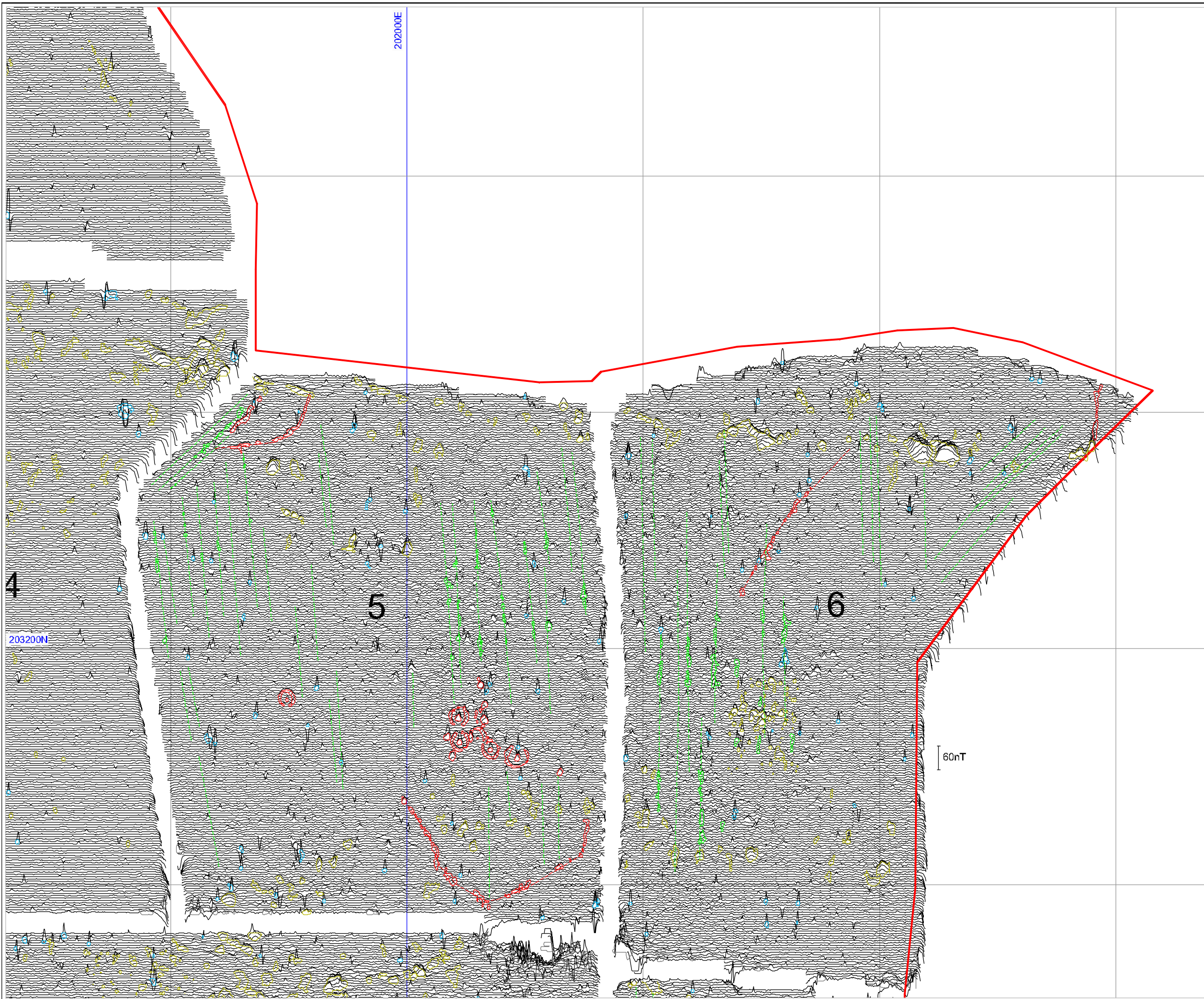
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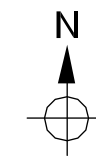
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Figure 8
Magnetometer survey
(with interpretation)
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- magnetic anomalies (archaeological ?)
- strong (recent ?) magnetic disturbances
- broad / irregular magnetic anomalies (topographic / natural ?)
- former boundary ?
- cultivation
- pipe
- strong (ferrous) magnetic anomalies

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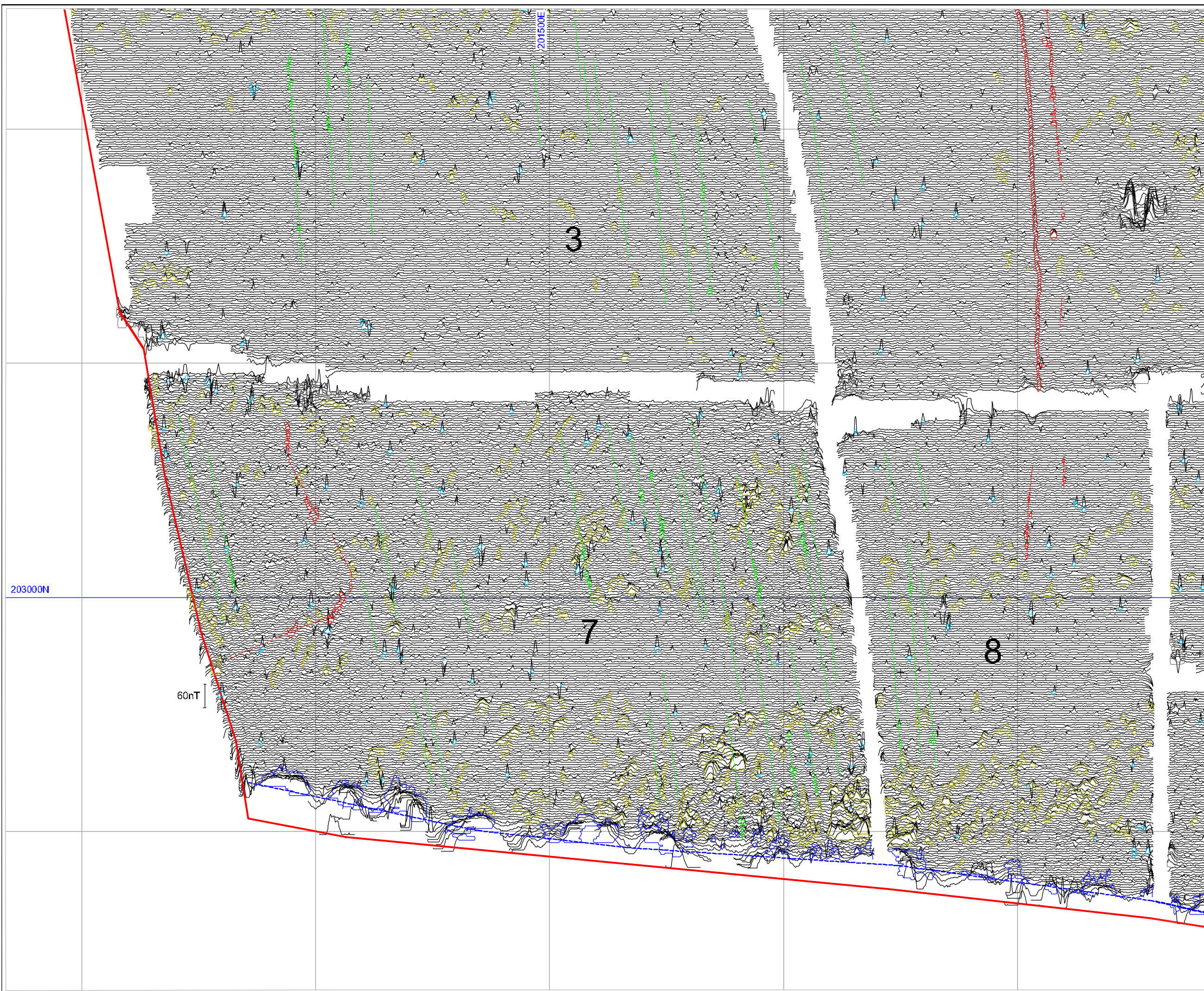
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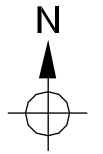
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Figure 9

Magnetometer survey
(with interpretation)
3/5



LEGEND



- magnetic anomalies (archaeological ?)
- strong (recent ?) magnetic disturbances
- broad / irregular magnetic anomalies (topographic / natural ?)
- former boundary ?
- cultivation
- pipe
- strong (ferrous) magnetic anomalies

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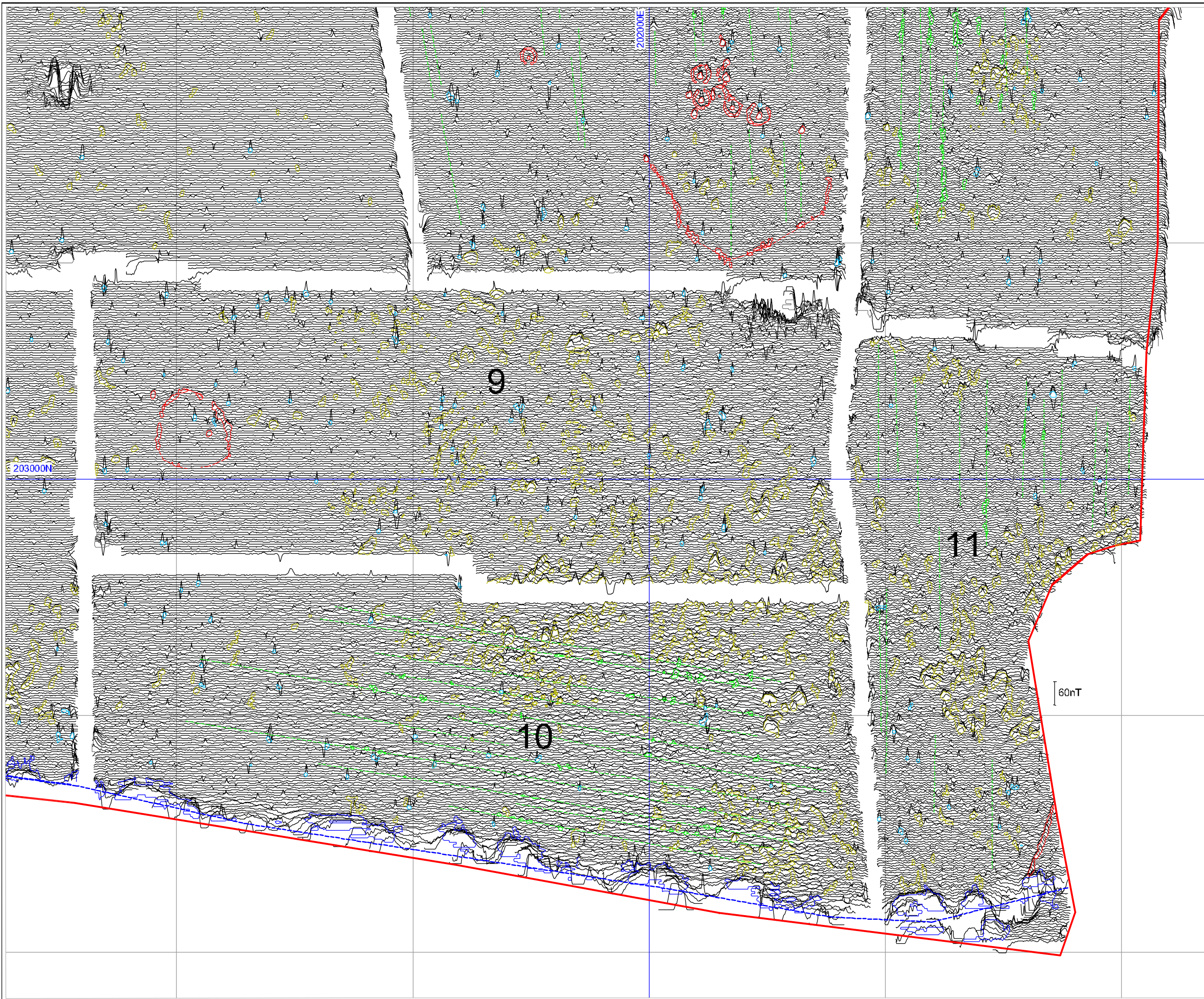
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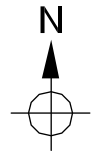
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Figure 10

Magnetometer survey
(with interpretation)
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-  magnetic anomalies (archaeological ?)
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Figure 11

Magnetometer survey
(with interpretation)
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