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Short Report form no. 2019-06R

Magnetometry located (approximate) on Google Earth air photo

Name of site: Eye and Dunsden – Spanhill
Author: Roger Ainslie

Summary
Magnetometry located an enclosure which could be a Neolithic causewayed camp or a palisaded enclosure. Earlier professional archaeological excavators had reported that there were no remains there. Other large pit-like features were also identified.

Background
This report 2019-06R supersedes the earlier report 2016-02R as it adds more magnetometry grids and subsequent earth resistance surveys. It has also been amended to reflect the article by Janet Eastment in the South Oxfordshire Archaeology Group Bulletin no 72, 2018 pp 33-40.

Purpose of survey:
Geophysics surveys were carried out as part of Janet Eastment's research degree at Winchester University. This was to see if it could give additional information on this area which she is researching.

Client: Janet Eastment, University of Winchester

County: Oxfordshire**, District:** South Oxfordshire, **Parish:** Eye and Dunsden

NGR grid reference: Main area centred on SU753774
Nearest postcode: RG9 4LG

Start date: 19 January 2016. **End date**: 05 November 2016 **Report date**: 30 November 2019.

Geology at site
From the Geology of Britain Viewer the geology is understood to be chalk overlain by Lambeth Group - Clay, Silt and Sand. This is overlain on the east by the Boyn Hill Gravel Member - Sand and Gravel.

Topography
The area is fairly level at approx 65mOD. The ground to the south slopes down steeply to the Thames.

Known archaeological sites / monuments covered by the survey
English Heritages Pastscape system, which is no longer being updated, has monument number 917319 for the site and says:-

Site of a possible Neolithic causewayed enclosure. The cropmarks were plotted and interpreted by RCHME in 1994 as part of the Industry and Enclosure in the Neolithic Project. The site lies north of Spanhill Copse and about 900 metres north west of the River Thames, just off the floodplain, on a plateau of flat ground. The cropmarks comprise traces of two possible arcs of interrupted ditch, the innermost following a curved course for almost 100 metres. The outer ditch is represented by a single curved ditch 15 metres long. To the south is another short stretch of ditch which may relate to the enclosure. Trial-trenching by the Oxford Archaeological Unit in1974 failed to find any features which might account for the cropmarks. It is possible, therefore, that they may be due entirely to natural variations in the underlying drift deposits

Their references were:-
(1) Proceedings of the Prehistoric Society
Palmer R. Interrupted ditch enclosures in Britain: the use of aerial photography for comparative studies. 42, 1976 Page(s)161-186

(2) RCHME/EH/HE Aerial Photographers comment Carolyn Dyer/12-SEP-1994/RCHME: Eye and Dunsden Causewayed Enclosure Project

2a) Oxfordshire Archaeological Unit : newsletter 'Dunsden' October 1974

(3) RCHME/EH/HE Aerial Photographers comment Moraig Brown/22-JAN-1993/RCHME: Thames Valley NMP

This site was not on Oxfordshire HER's Heritage Search system before the surveys took place. Air photos visible on Google earth (31 December 2005) show some ditches there and the client has done fieldwalking with the

assistance of the South Oxfordshire Archaeology Group which has found flints there.

Janet Eastment has also put a summary of the surveys and other work in the SOAG Bulletin for 2008 pp33-40.

Archaeological sites / monument types detected by the survey
Possible ditches and pits of unknown date. Possibly a Neolithic causewayed camp or a palisaded enclosure.

Surveyor Abingdon Archaeological Geophysics, Roger Ainslie, Sally Ainslie

Location of:

a) Primary archive, i.e. raw data, electronic archive etc
Abingdon Archaeological Geophysics.
Also with client

b) Full report:
ditto

Copyright
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Location
The site is in a field off the A4155 between Reading and Henley, UK.
Our GPS grid references probably good to approx 0.5 metres as a Trimble pro XR gps was used with beacon differential correction.NW corner of grid 1 at 475240.0E 177520.0N

Methods
Reasons for choice
We carried out magnetometry as it has previously produced good results on this type of geology. An area of earth resistance was then tried to seek to find remains which were not detected magnetically. It had been hoped to be able to use Winchester University's ground penetrating radar equipment to test whether the large pit-like anomalies were pits or dene holes, but this was not working when needed.

Type of survey
A Magnetometer
Area surveyed: 2.83 hectares. Traverse separation: 1 metre

Reading / sample interval: 8 per metre.
Type, make and model of instrumentation: Bartington Grad 601/2 fluxgate gradiometer.
Other: 30 metre grids on National Grid. First line of all grids (except 18) started NW corner going east zig zag.

B Earth Resistance
2 30x30m grids (0.18ha) were surveyed on the same locations as magnetometry grids 1 and 5.
Area surveyed: 0.18 hectares.
Reading / sample interval: 1 per metre
Type, make and model of instrumentation: TR Systems earth resistance meter.
Other: Start NW corner first line going east, zig zag. Twin probe array. 0.5m mobile probe spacing.

Processing
We have used TerraSurveyor for this. Magnetometry had de-stagger to correct what appears to be a lag between the sensor and the data logger. Zero mean traverse was then used to correct for sensor drift as this happens as the equipment heats up and cools down during the day. Then the results were clipped to prevent individual readings from obscuring the overall picture.

Earth resistance data was processed to replace erroneous readings - usually caused by hitting stones. It has then been clipped to reveal features.

Land use at the time of survey
Arable – short crop.

Results (refer to plans below)
Magnetometry

General The field appears to have many small magnetic anomalies. These may well be pieces of pottery or tile and are often associated with post medieval and later manuring. The high anomaly in grid 34 is probably a large piece of buried iron.

1 Outer section of probable ditch and main ditch-like high anomalies. It could be that it is a palisade or that the magnetically responsive deposits in it are uneven.

2 Large ferrous anomaly and smaller ones consistent with bricks or similar being used to prevent vehicles being bogged down at the field entrance and iron near the hedge.

3 Slight line of high readings. This could be an inner ditch or the edge of a bank.

4 Pit –like high anomalies. These could be natural as they are both inside and outside the main ditch, but they could be archaeological.

Some also appear on the Google air photo. They could be solution hollows, tree throw holes, pits, large post holes, dene holes etc.

5 Slight high anomalies in what could be circular ditches.

6 Curving lines of low magnetic response which could relate to the outer section of ditch – 1 above.

7 More pit- like anomalies similar to 4 above.

Earth Resistance

8 Line of low and then high readings. This is probably where a tractor has compressed the soil. Modern GPS guided tractors can go over exactly the same route year after year.

9 Band of higher resistance over the magnetic ditch-like anomaly.

Discussion

This is best done by others who have researched this type of monument, if it turns out to be a causewayed camp (or whatever they are now called).

Whilst the size of a magnetic anomaly does not exactly replicate the feature causing it, the magnetic indication is that the main ditch (1) is some 2 metres wide, which is narrower than one would normally expect for causewayed camps, and 1.5 metres deep. The extent of the magnetic anomaly can be larger than the feature if it is all filled with magnetically responsive material, or smaller if there is only a narrow band of responsive deposit at the bottom of the feature.

That the earth resistance survey had high resistance over the ditch-like magnetic anomaly implies that we could be dealing with a ditch which has patches of magnetically enhanced material at its bottom and has been backfilled with the natural gravel rather than slowly silting up. This may account for the excavation not finding it.

One of the outer, apparently concentric, curves of low readings (6) aligns with the putative outer ditch which is also visible on air photos. It may be that some parts of ditches had burnt material in them and others did not

The other patches of high readings (4 and 7) may be tree throw holes, dene holes, natural solution holes or deep pits. If not natural they could be archaeologically important. Some of these anomalies in the magnetometry are also visible on the Google earth air photo, which may indicate that they are fairly widespread.

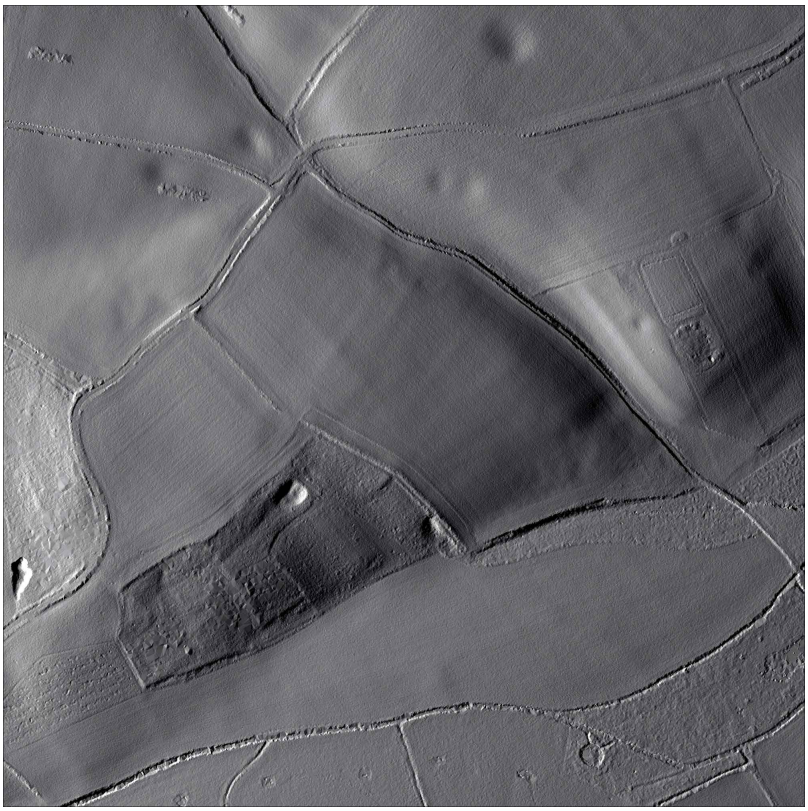
Conclusions

There are quite a lot of remains which could be detected magnetically. In addition to the main enclosure anomaly, the possible outer rings are of interest as it is rare for these to be detected and their existence should be tested.

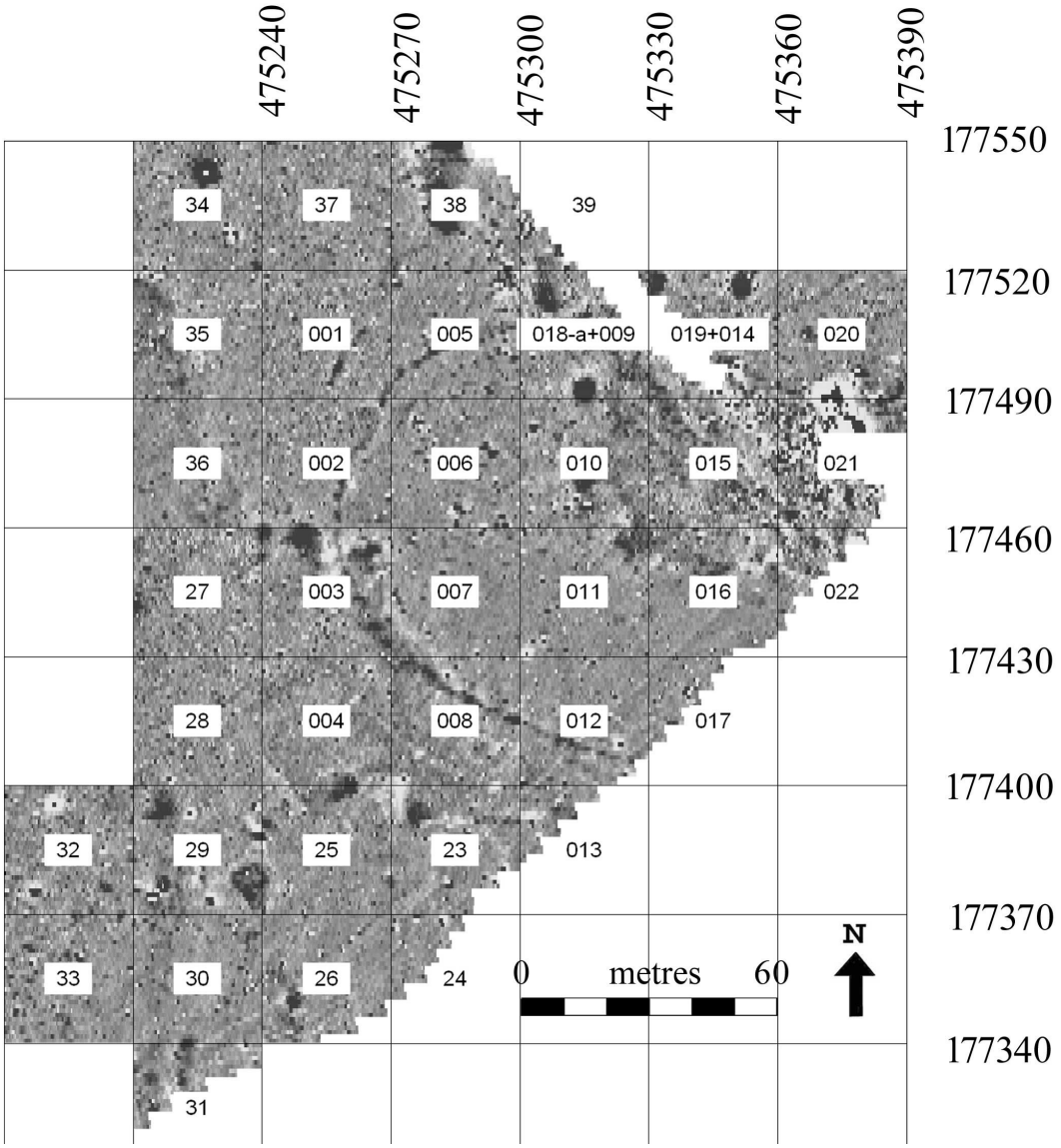
The small areas of high readings which are both inside and outside the enclosure also warrant further investigation. These could be pits or dene holes.
Geophysics is unable to give a date or purpose to remains, although inferences can be drawn from sites producing similar results. Those aspects will have to be confirmed by other means.
The main conclusion is not to rely on professional excavation results, particularly when they are negative. This site could have had a road put through it.

Acknowledgements
We would like to thank Janet Eastment and Mike Green for asking us to do the survey and Simon Beddows for permitting access.

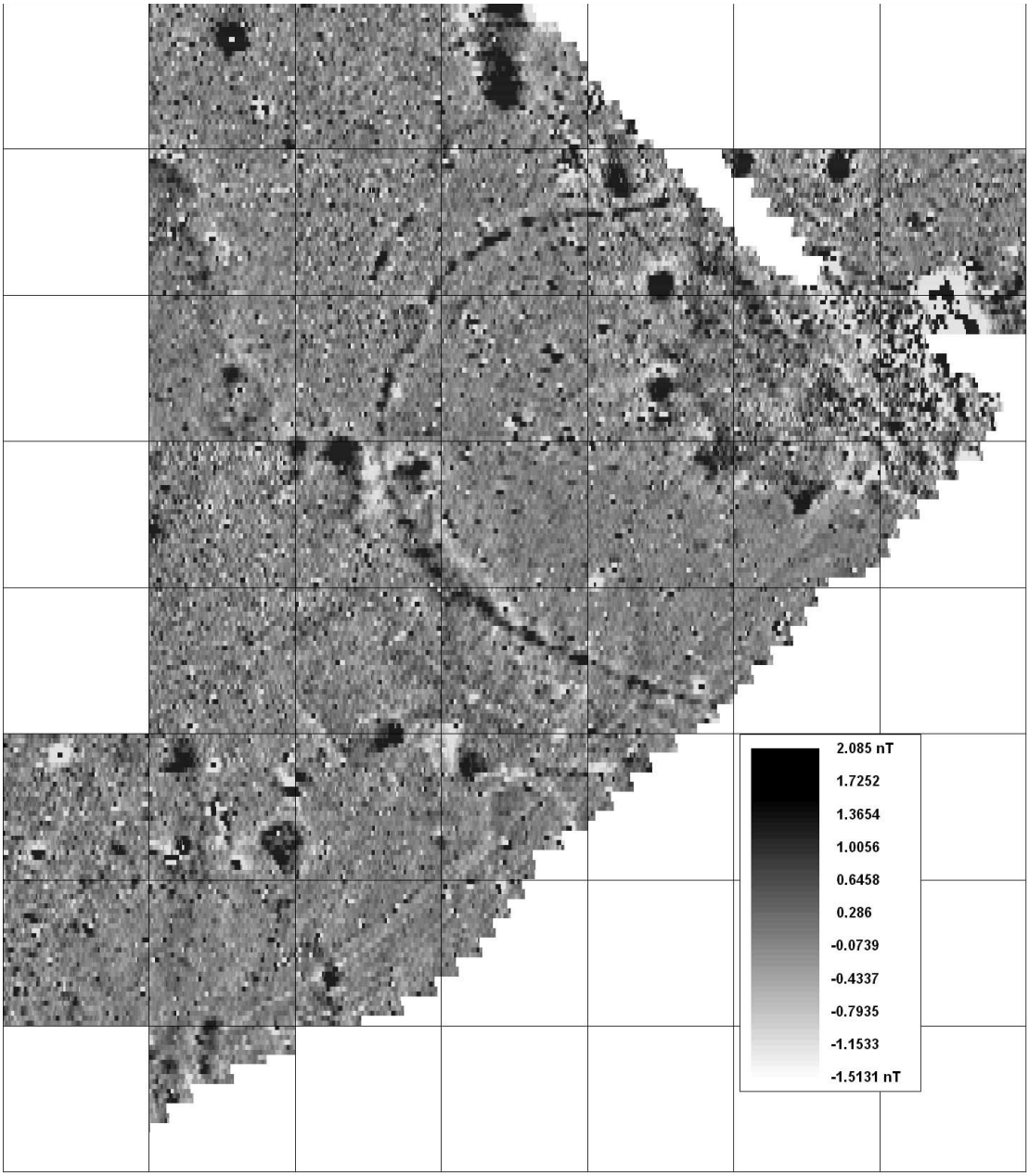
REMINDER
Many features cannot be located by using geophysical methods. Features including flint scatters and burials may well exist which are not detectable by these survey methods. Failure to locate features does not mean that they are not there.



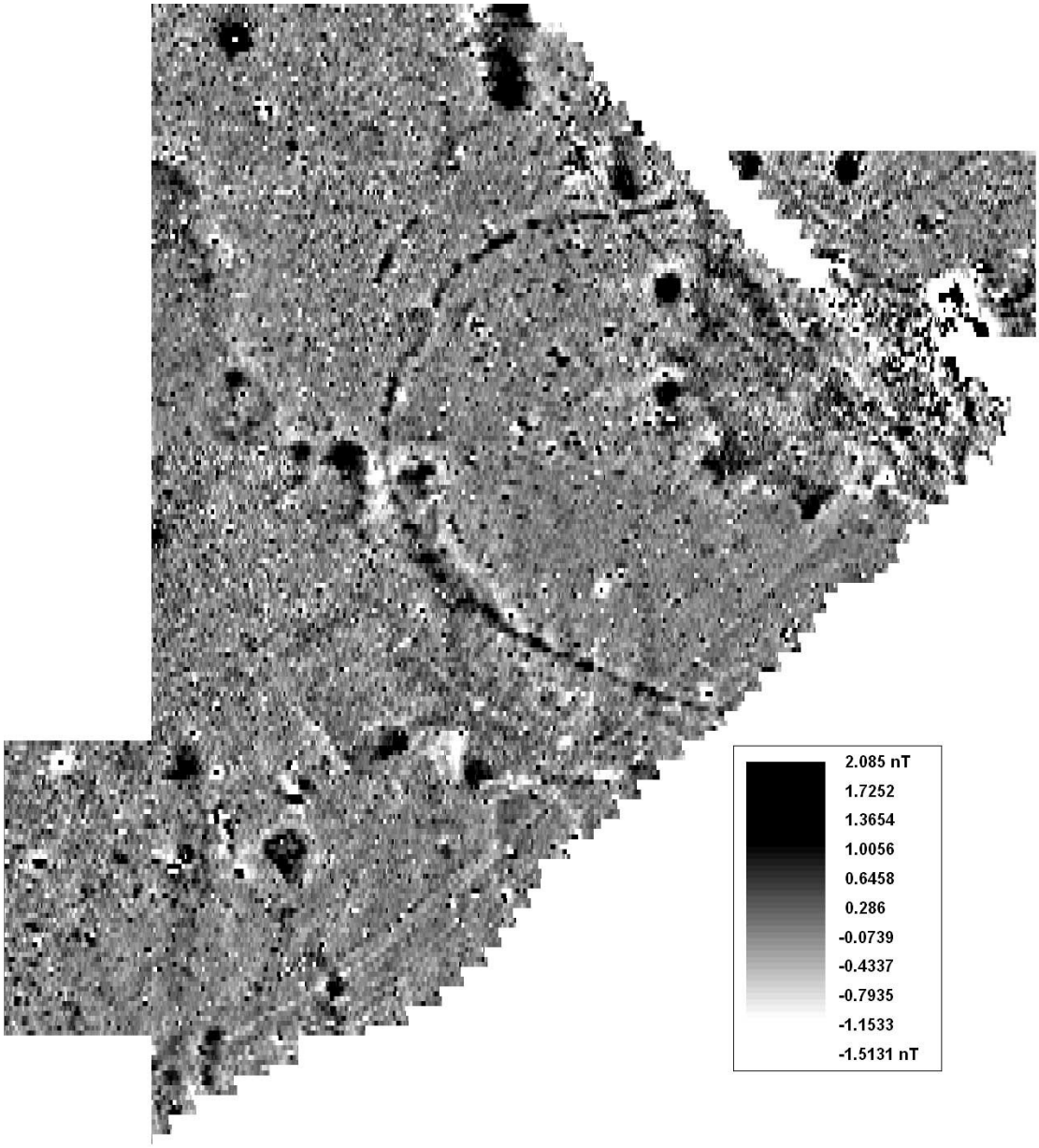
Lidar relief view of 1km national grid square



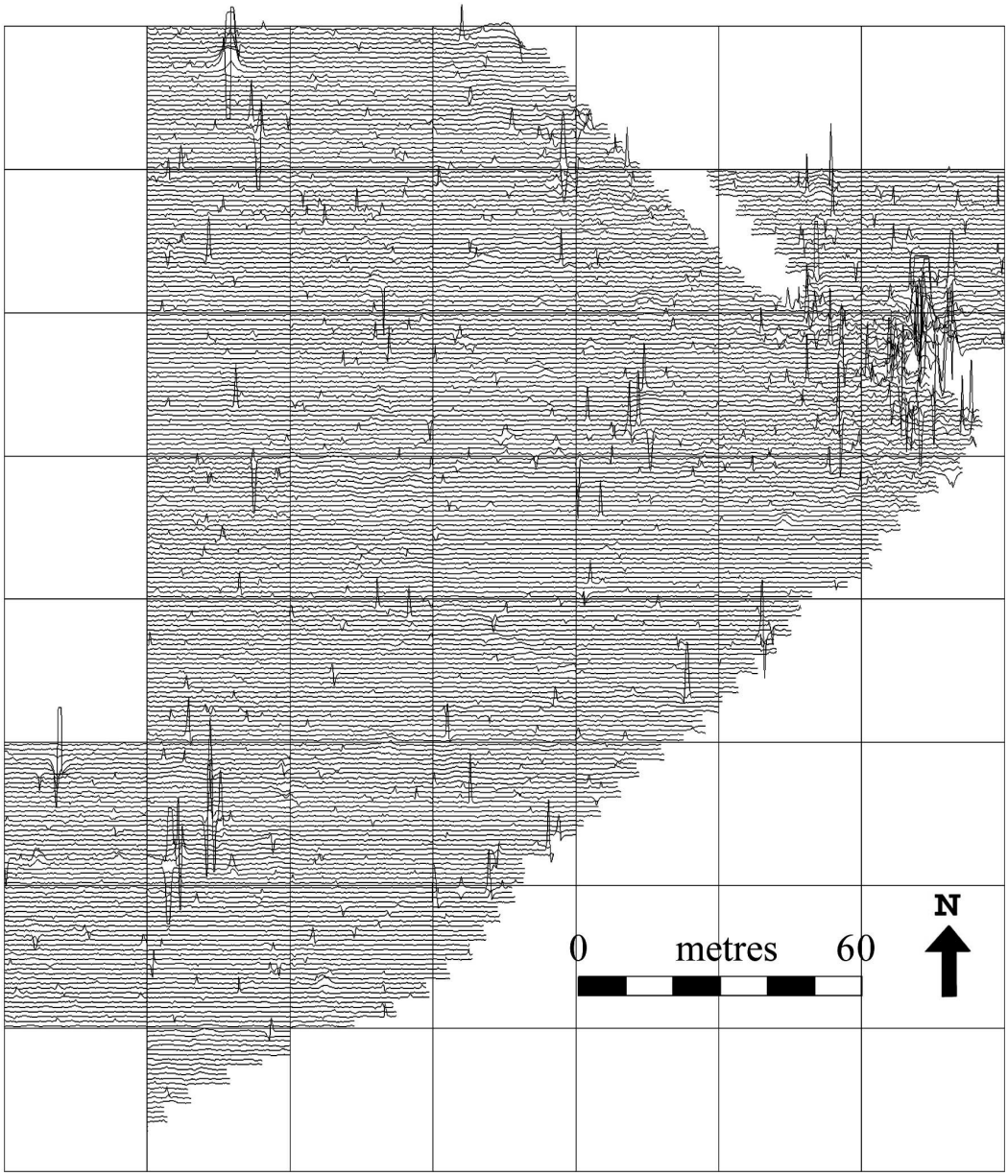
Magnetometry Location and grid order



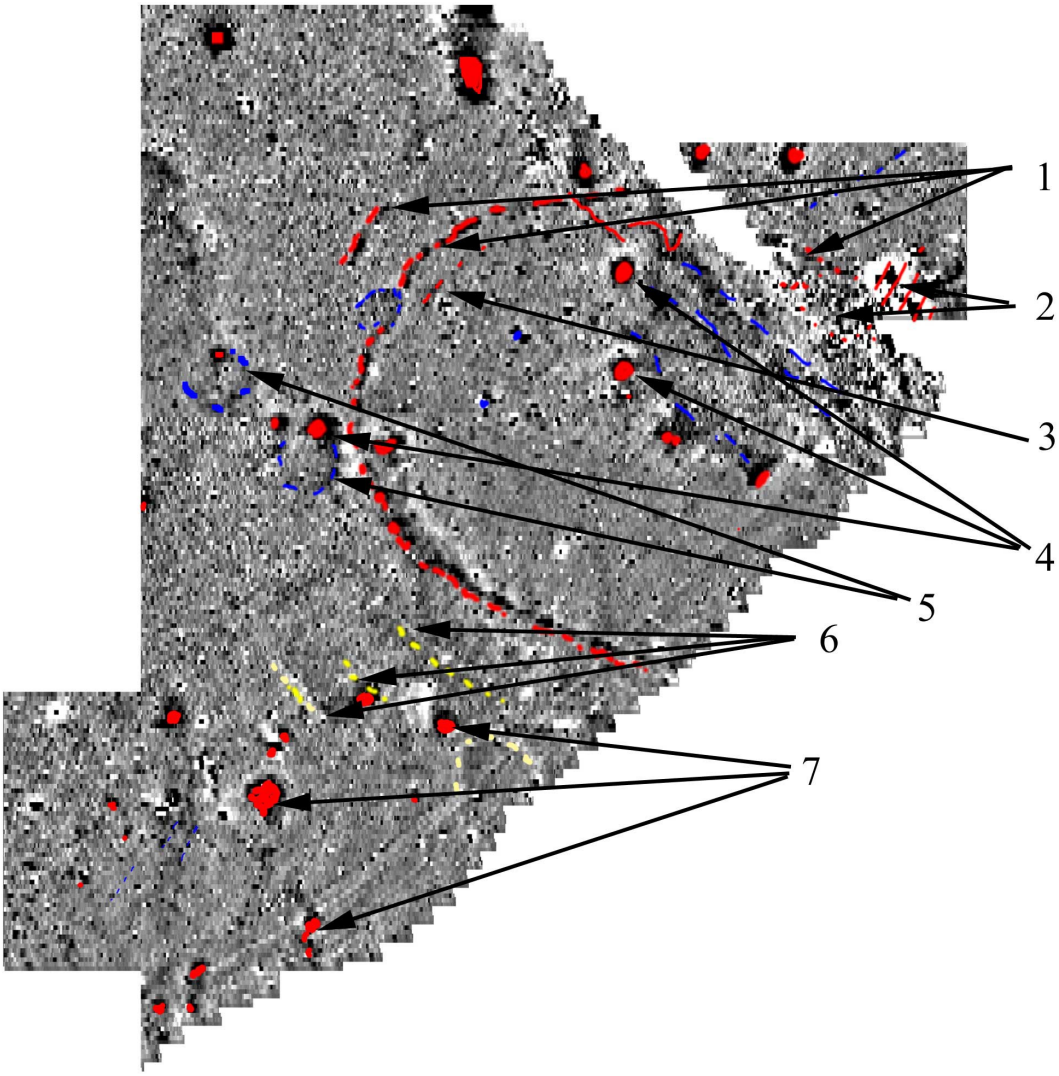
Magnetometry Greyscale with scale



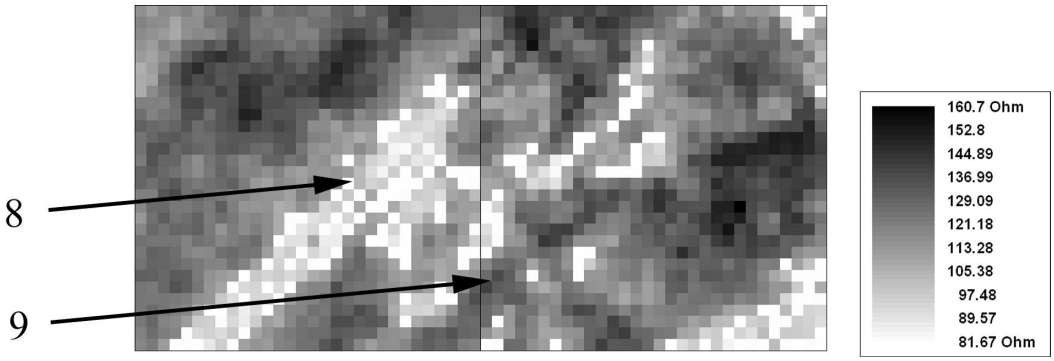
Magnetometry Greyscale without grid lines



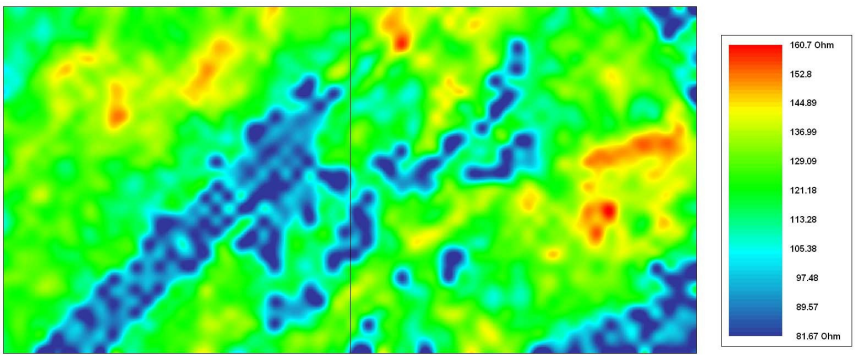
Magnetometry Trace plot clipped to +/-100nT



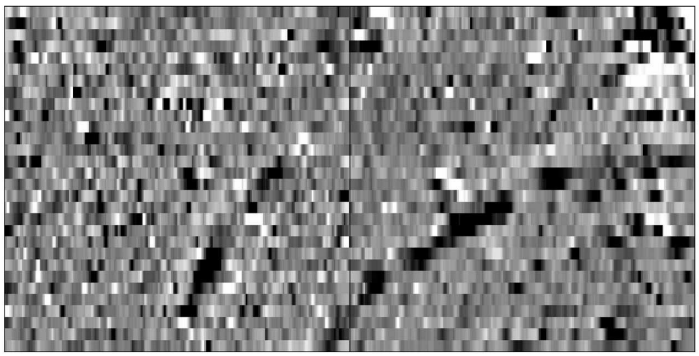
Magnetometry Interpretation



Earth Resistance greyscale



Earth Resistance colour



magnetometry (for comparison)

Grids 1 and 5

Earth Resistance Survey and Interpretation