Welhams Brook, Montacute
Gradiometer Survey, October 2019

South Somerset Archaeological Research Group

Report no: SSARG/GS1023

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1.0 Introduction

The survey was carried out in a small field north of Welhams Brook adjacent to the grounds of Montacute House (NGR 350100 117400) prior to the construction of flood prevention measures. The field is situated at the bottom of a small valley and is currently used as pasture for cattle grazing. The north-eastern side of the field rises steeply towards the A3088, but the survey was carried out over a flat strip of land approximately 20m wide adjacent to the Brook (figs 1 & 2). The total survey area was approximately 0.3ha.

Montacute House is situated approximately 3km northwest of the town of Yeovil in Somerset. The geology of the site is Bridport Sand Formation – Sandstone (British Geological Survey website www.bgs.ac.uk/discovering Geology/ geologyofbritain/viewer.html Accessed 17th October 2019).

The survey was carried out by members of the South Somerset Archaeological Research Group.

1.1 Equipment

Fluxgate gradiometer – Bartington Grad 601-2

The Bartington Grad 601-2 is a dual system gradiometer, a form of magnetometer. It comprises two sensor rods carried on a rigid frame, each sensor including two fluxgates aligned at 90° to each other, one set 1m above the other. It measures variations in the magnetic field between the two fluxgates, recorded in *nanoTesla* (nT) at each sampling point within a grid. The manufacturer claims a depth range of approximately three metres. The instrument is most effective when carried at a consistent height, not exceeding 0.3m above the ground.

Magnetometers are especially effective for discovering thoroughly decayed organic materials, such as those which accumulate in ditches and pits, and matter exposed to intensive firing, including industrial areas, hearths and larger ceramics. All of these are likely to give a positive magnetic response, sometimes with a negative halo, giving a dipolar effect. Non-igneous stone features, such as walls and banks, are usually perceived as negative anomalies against a background enhanced by decayed organics.

Software – Geoscan Geoplot 4.0

Geoplot 4.0 allows the presentation of data in four graphical forms: dot-density, grey scale, pattern and X-Y (or *trace*) plots. The latter are particularly effective when used in conjunction with other graphical modes to emphasise ferrous magnetic anomalies or other distortions which show as accentuated peaks or troughs. The programme supports statistical analysis and filtering of the data.

1.2 Field method

The area was divided into 20m squares aligned with the Brook and existing field boundaries, and tied into the Ordnance Survey Grid post survey. The location of the baseline surveying pegs are shown in fig 5. Readings were logged at 0.25m intervals along northeast to southwest traverses set 1m apart in a zig zag pattern.

1.3 Processing method

Preliminary processing revealed some interference from modern ferrous magnetic features, characterised by sharp dipolar fluctuations ranging from approximately 30nT to over 3000nT. The first two processing sequences were carried out to mitigate the impact of modern ironwork.

1) Readings exceeding 30nT either side of 0 were replaced by null (dummy) entries.
2) Any anomalous isolated readings were similarly replaced.
3) Typical regular error due to the zig zag operation of the gradiometer was removed.
4) The mean reading for every traverse was reset to 0.
5) The asymmetric data collection pattern was mitigated by the positive interpolation of data points along the Y axis using the calculation of sin(x)/x.

2.0 The survey area (fig 2)

The grid comprises 11 contiguous whole and partial squares covering a flat strip of land adjacent to Welhams Brook.

3.0 Results (figs 3, 4, & 5)

The survey has detected a number of amorphous positive anomalies generally within a range of 3 to 7nT, plus ferrous magnetic anomalies of 30+nT. The results are shown in fig 4 and stronger readings over 5nT highlighted in fig 5. It is possible that the ferrous magnetic anomalies are due to modern agricultural practices. Given that the field is subject to regular flooding, it is possible that the large, amorphous positive anomalies in fig 5 could be where natural ferrous material has collected and dropped out of solution where there has been localised ponding. This leads to ambiguity in the interpretation of these anomalies.

3.1 Positive anomalies (fig 5)

A & B Large, diffuse positive magnetic anomalies generally within a range of 7 to 11nT. Within the range for deposits of ferrous magnetic material (see **3.0** above).

C Very weak linear anomaly within a range of 0.5 to 1nT. Possibly caused by an informal footpath at the bottom of the slope. Proximity to a major ferrous magnetic anomaly to the north limits confidence in the interpretation of **C**.

4.0 Conclusion

The degree of confidence in identified anomalies is generally fairly low. Although the survey has detected a number of amorphous anomalies it is possible these are due to flooding and farming practices. The survey does not appear to have detected any anomalies within the range for archaeological features.

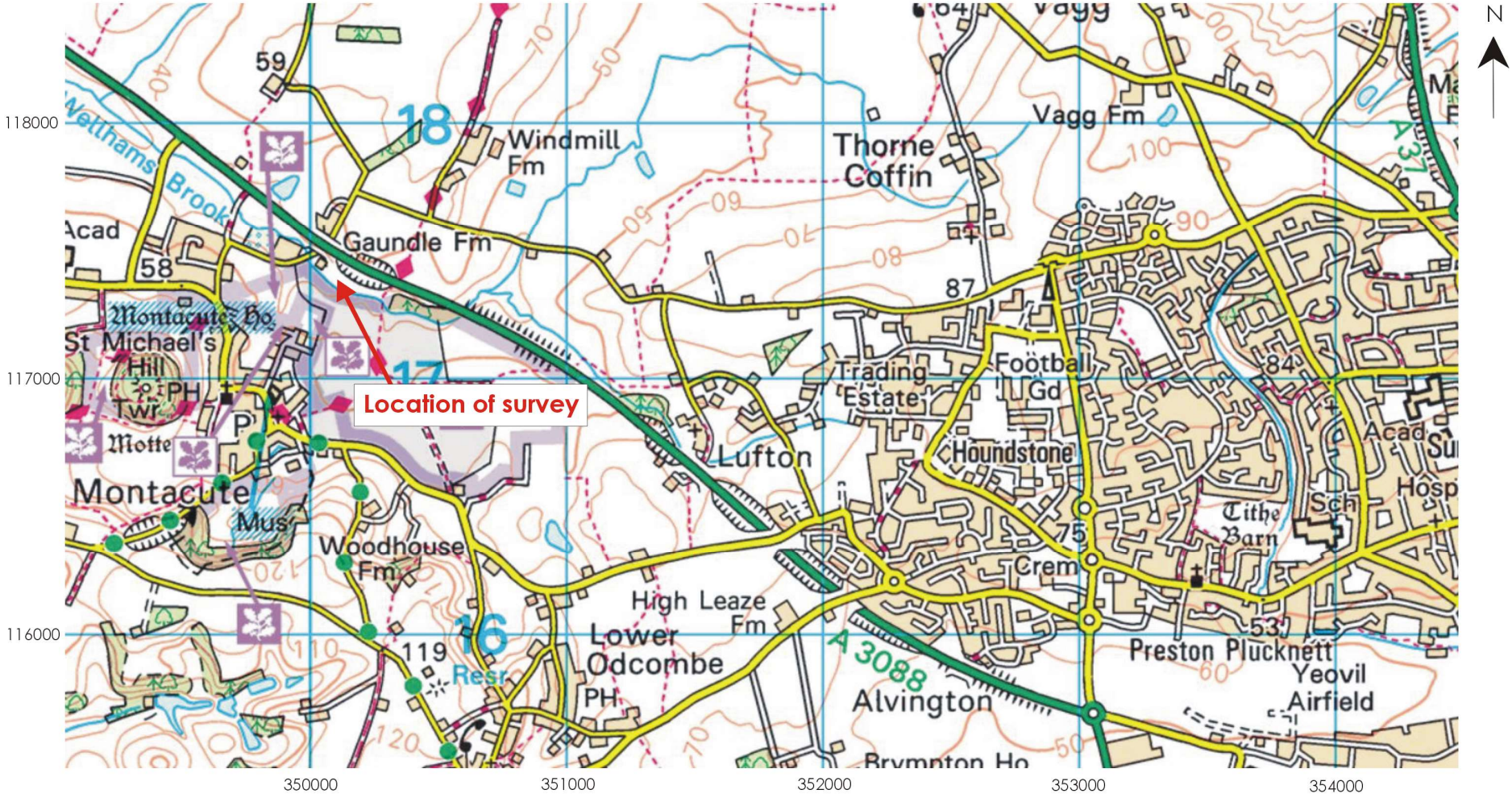
Bibliography

Standard and Guidance for Archaeological Geophysical Survey. Amended 2016.
CIfA Guidance notes. Chartered Institute for Archaeologists, Reading.

Geophysical Survey in Archaeological Field Evaluation. Historic England, Swindon, 2008.

British Geological Survey website www.bgs.ac.uk/discovering Geology/ geologyofbritain/viewer.html Accessed 17th October 2019).

Fig 1: Location of survey



0 0.5 km 2.0

Fig 2: Location of survey - detail

Fig 3: Survey results

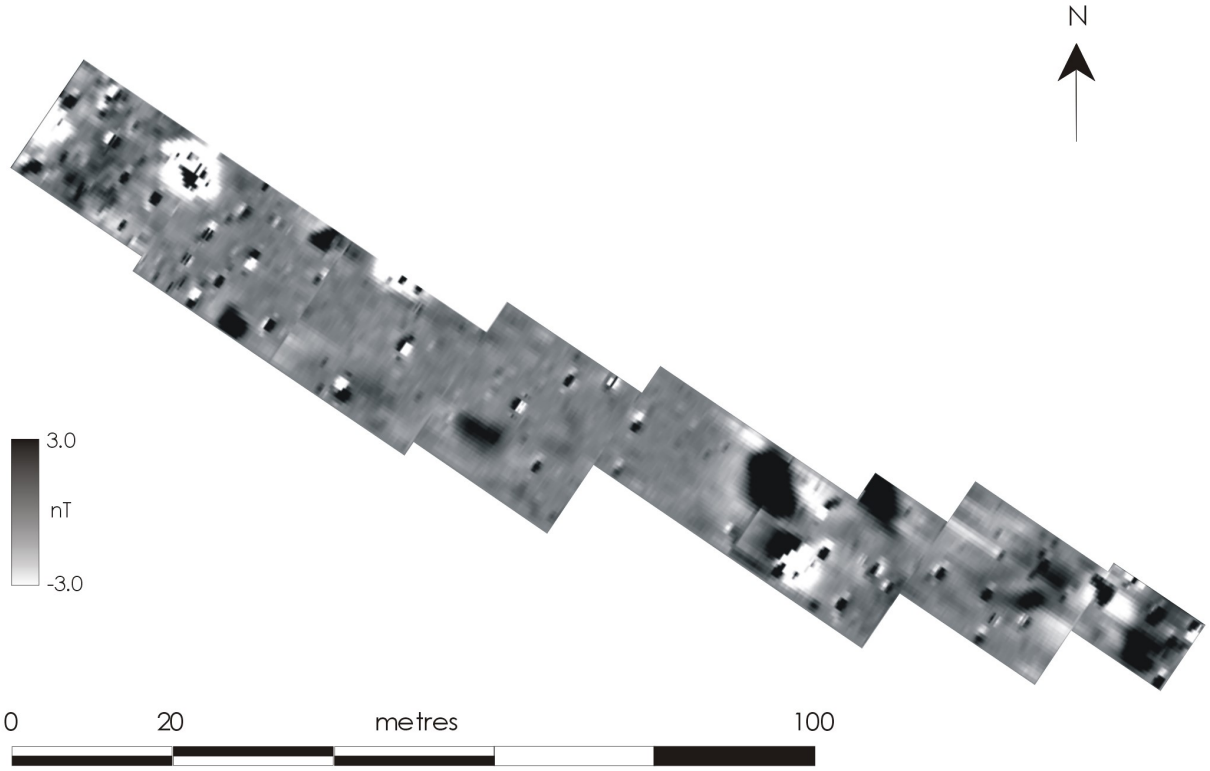


Fig 4: Highlighted survey results

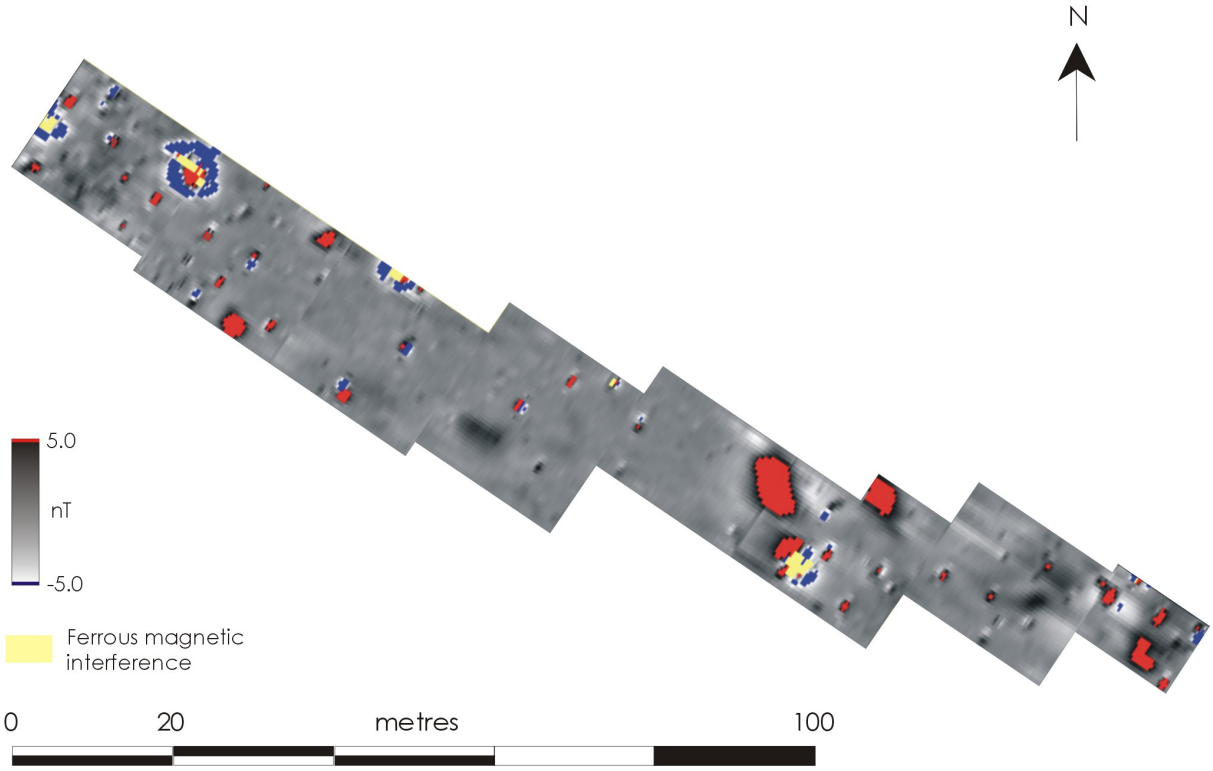
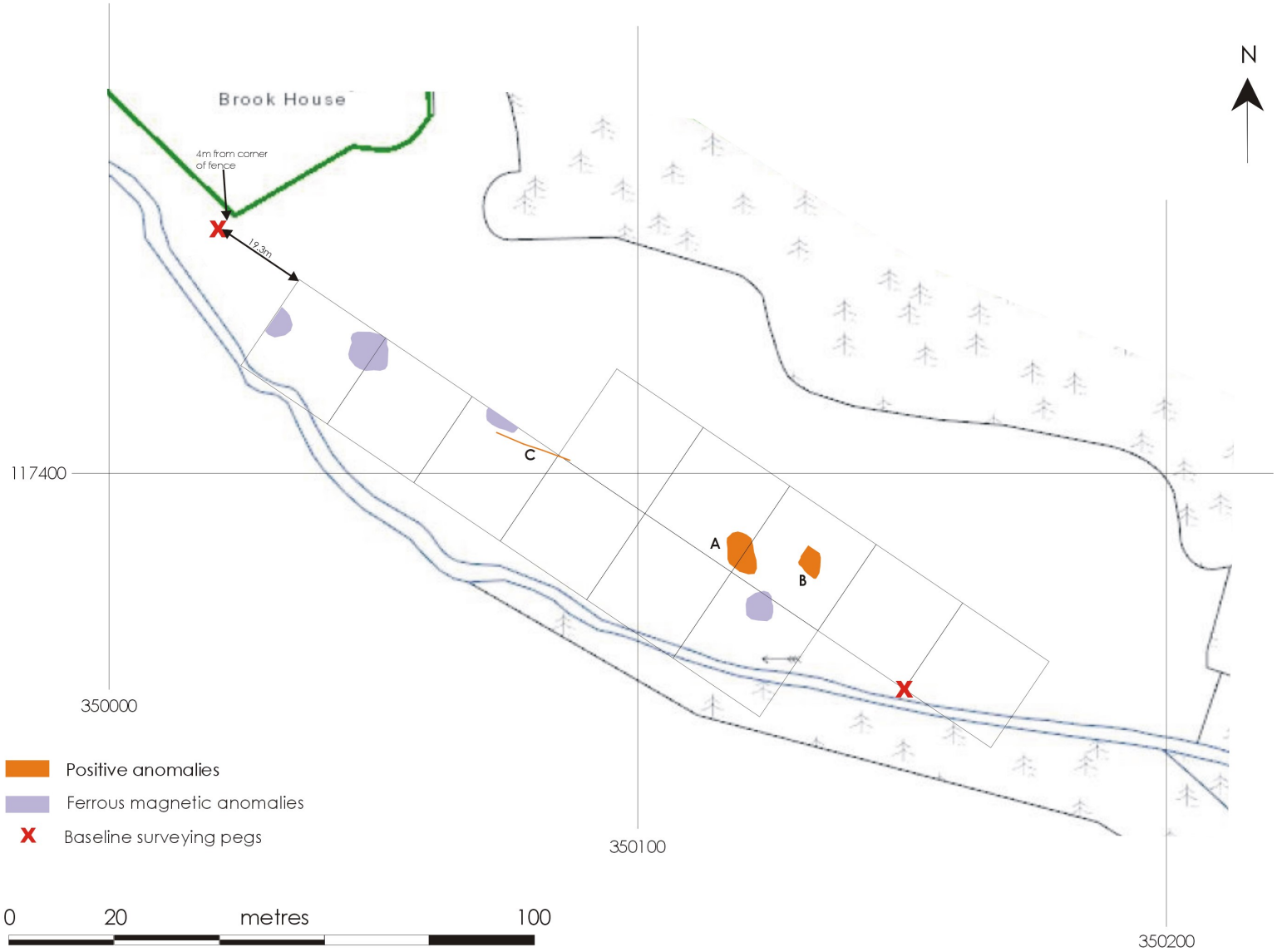


Fig 5: Interpretation



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