Summary

- *A fluxgate gradiometer survey was undertaken on 4 hectares of land at Flore, Northamptonshire*

- *The survey identified widespread magnetic variation, reflecting what appear to be Romano-British settlement remains. The majority of anomalies observed resolve as a series of enclosures and possible building remains, including aspects of a villa complex which was previously believed to occupy the site*

- *A series of regularly spaced linear anomalies probably indicate traces of later ridge and furrow ploughing*

Fig.1: Location of site, scale 1:50,000

1.0 Introduction

Stephen Young, acting on behalf of the Friends of The Upper Nene Archaeology Committee, commissioned Pre-Construct Geophysics to undertake a fluxgate gradiometer survey on land at Flore in Northamptonshire.

The survey methodology used was based upon guidelines set out in the English Heritage document *'Geophysical Survey in Archaeological Field Evaluation'* (David, 1995).

2.0 Location and description

The site lies to the north of the village of Flore, just north of the M1 motorway (Fig 1). It lies close to Fore Fields House and Farm, where a cropmark enclosure has been identified from aerial photographs (see below). It comprises sub-rectangular unit of arable fields that straddle an existing trackway and hedge. The site contains a group of farm buildings (Fig 2).

The drift geology of the area is comprised of Marlstone Rock Bed to the east of the farm buildings, whilst the sloping ground to the west is made up of Middle Lias Silts and Clays approximately 100m OD (B.G.S. 1980).

3.0 Archaeological and historical background

The site is situated 1km to the north of the village of Flore and c.2km to the south of a known Roman Road that extends along a ridgeway from Duston to Whilton.

A large enclosure identified from air photographs features as cropmarks to the north of the site (SP...).

Stephen Young carried out a surface collection survey in November/December 2003 covering an area of 2.95ha. Over 5000 sherds of Roman pottery and tile fragments were recovered, dating mostly to the 3rd/4th centuries AD. These finds further enhance the probability that the site contains Roman settlement remains, such as a villa complex.

4.0 Methodology

Gradiometry is a non-intrusive scientific prospecting technique that is used to determine the presence/absence of some classes of sub-surface archaeological remains (eg pits, ditches, kilns, and occasionally stone walls). By scanning the soil surface, geophysicists identify areas of varying magnetic susceptibility and can interpret such variation by presenting data in various graphical formats and identifying images that share morphological affinities with diagnostic archaeological remains.

Gradiometry is used to establish the presence/absence of buried magnetic anomalies, which may reflect sub-surface archaeological features.

The area survey was conducted using a Bartington Grad – 01 – 1000 dual fluxgate gradiometer with DL601 data logger set to take 4 readings per metre (a sample interval of 0.25m). The zigzag traverse method of survey was used, with 1m wide traverses across 30m x 30m grids. The sensitivity of the machine was set to detect magnetic variation in the order of 0.1 nanoTesla.

The data was processed using *Geoplot* version 3.0. It was clipped to reduce the distorting effect of extremely high or low readings caused by discrete pieces of ferrous metal on the site. The results were then plotted as greyscale and trace images (Fig. 3).

Instrument	Bartington Grad-601
Grid size	30m x30m
Sample interval	0.25
Traverse interval	1.0m
Traverse method	Zigzag
Sensitivity	0.1nT
Processing software	Geoplot (*v. 3.0*)
Weather conditions	Fair
Area surveyed	4ha
Date of survey	7th and 10th November 2003
Survey personnel	Peter Masters
Central National Grid Reference	

Table 1: Summary of survey parameters

5.0 Results (Figs. 3-7)

The survey recorded a complex network of linear and curvilinear anomalies, which appear to relate to at least three periods of archaeological activity: modern, medieval and Romano-British. For ease of presentation, the Romano-British features have been highlighted on a separate interpretive plot (Fig.7).

5.1 Modern anomalies (Figs. 3-6)

A north to south aligned strong linear anomaly (**1**) appears to reflect a ferrous service. Its position matches a former boundary, as depicted on the 1st edition OS map, dated 1887-91 (see front cover). It seems likely that underlying archaeological remains were damaged or destroyed during construction of the service.

A zone of high magnetic variation (**2**) towards the southwest corner of the survey reflects the close proximity of farm buildings. Elements of their fabric may comprise materials plundered from the earlier settlement remains (see below).

The results indicate that the earlier settlement remains continue beneath the site of the farm buildings.

5.2 Medieval (Figs. 3-6)

Two sets of parallel linear anomalies (Fig.6: **3, 3a**) represent traces of ridge and furrow ploughing. The examples to the east of linear **1** align north-south, whilst those to the west extend from north-east to south-west. Both groups appear to predate the current east to west aligned boundary.

5.3 Romano-British (Figs. 3-5, 7)

The ridge and furrow traverses and fragments a dense complex of underlying linear and curvilinear features. Generally, the linear anomalies align either north to south or east to west. For the most part, these almost certainly represent traces of Romano-British settlement remains, such as a villa complex, incorporating the remains or outlines of masonry structures. Linear anomalies shown as yellow (probable ditches) denote a distinctly separate phase and are possibly the earliest traces of occupation.

The largest enclosed feature (Fig.7: **4,** perimeter shown as purple) extends across most of the survey area and encompasses smaller sub-divisions. Magnetically, most of these appear to represent ditches, although it is possible that some reflect robber trenches of former walls. This would be more likely where the outlines of sub-enclosures resolve as regular squares or rectangles, for example within the boundaries of enclosure **5** (see below).

At the western edge of the site, a group of small enclosures are attached to **4**, although the results suggest that some of these have in fact been truncated by the larger enclosure (area boxed in green). This implies that some of the enclosures relate to an early phase of activity.

Sub-rectangular group **5** (shown as orange) appears to define the perimeter of an enclosure that lies c.10-15m within the northern and eastern edges of **4**. A possible trackway (**6**) extends along the western side of **5** and separates it from a series of smaller enclosures.

Within enclosure **5**, a series of rectangular ditch-like features may represent robbed wall foundations (shown as light blue lines). Of particular interest is an 'L' shaped and diffuse negative magnetic linear anomaly (**7,** shown as green), which may indicate *in situ* wall foundations (possibly a building). Adjacent (magnetically positive) linear anomalies could reflect robbed out walls of the same structure (**8**, **9**). This interpretation is tempered, however, by a lack of definition and magnetic contrast (a resistance survey would be the preferred technique for identifying stone remains, and it should also be noted that robber trenches tend to provide the best means of establishing the footprint of former stone structures by gradiometry).

Further evidence for a structure in this area is suggested by anomaly **10** (circled in pink). The magnetic signature of this variation includes dipolar readings and a suggestion of a double peak (see Fig. 4, trace plot). These may be indicative of clay walls and/or burnt residue of an oven-like feature.

Other, magnetically weaker, discrete anomalies were recorded within and adjacent to the enclosures. Some of those that were detected beyond the confines of **4** , such as **11** and **12** (circled in pink), also appear to resolve as double-peaked anomalies. The location of these (outside of the primary settlement site) could signify industrial or agricultural activities (?kilns or corn driers). Others may indicate pits or areas of less extreme burning (suggested examples circled in yellow).

An amorphous spread of weak magnetic variation (**13**) may reflect a number of possible activities, such as a midden, quarrying or post settlement plundering.

6.0 Conclusions

The survey has identified an extensive arrangement of linear and rectilinear anomalies, which for the most part represent two distinct and separate periods of activity, Romano-British and medieval.

Two groups of linear anomalies resolve as probable remnants of medieval ploughing.

The majority of the anomalies appear to reflect a palimpsest of Romano-British activities, incorporating enclosures and possible *in situ* stone walls of at least one structure, possibly a villa complex. The survey results suggest that the earliest remains lie towards the western part of the settlement complex. These may have originated during the later prehistoric period, forming the basis for later settlement.

It has not been possible to clearly identify traces of extensive stone remains, although a number of linear and rectilinear anomalies may reflect the magnetically enhanced fills of robber trenches. It is also possible that buried stone features remain undetected by the survey.

A number of discrete anomalies may indicate the sites of ovens or furnaces. Others resolve as possible pits.

7.0 Acknowledgements

Pre-Construct Geophysics would like to thank Stephen Young for this commission.

8.0 References

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Clark, A. J. 1990 *Seeing Beneath the Soil*. London, Batsford.

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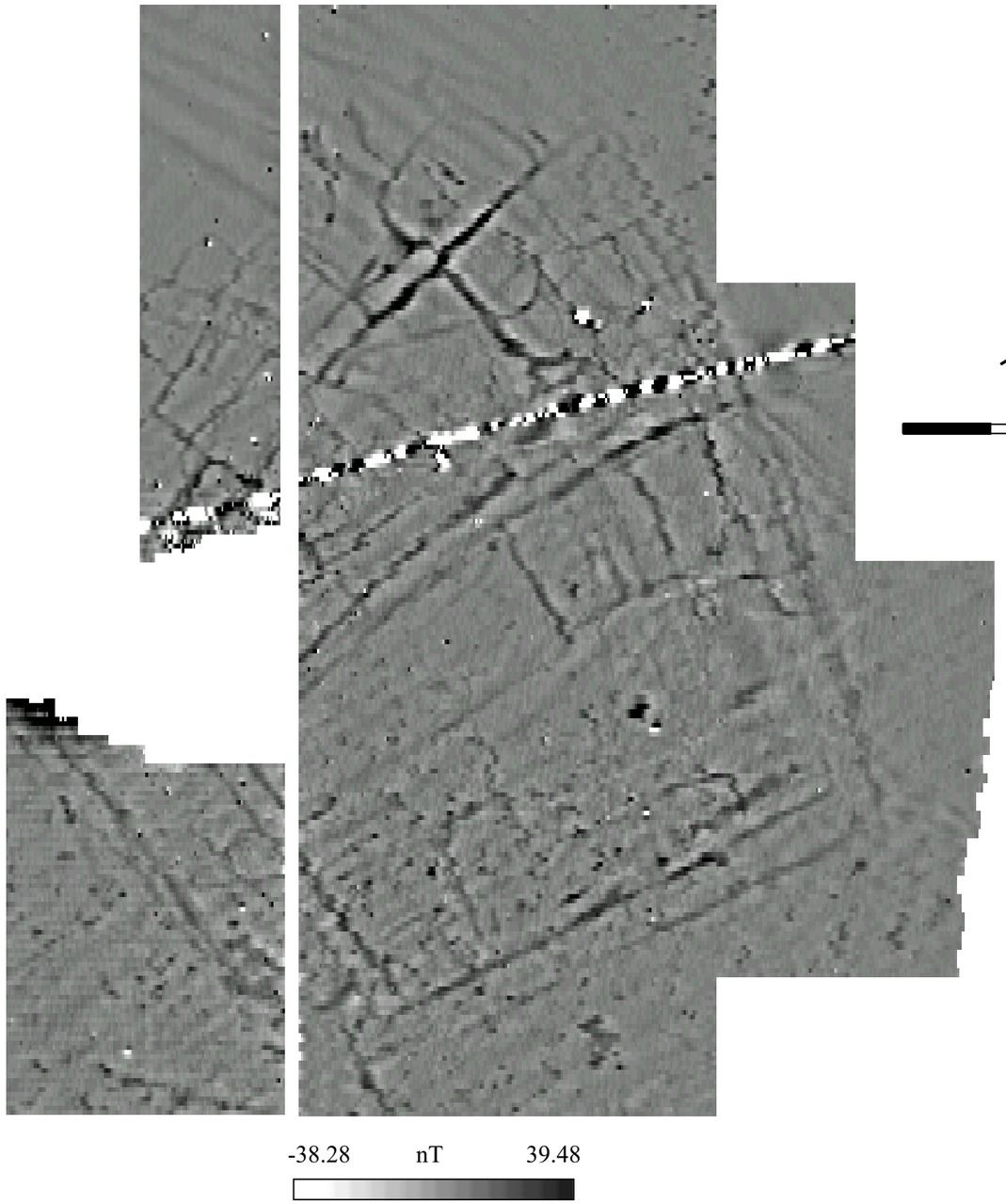


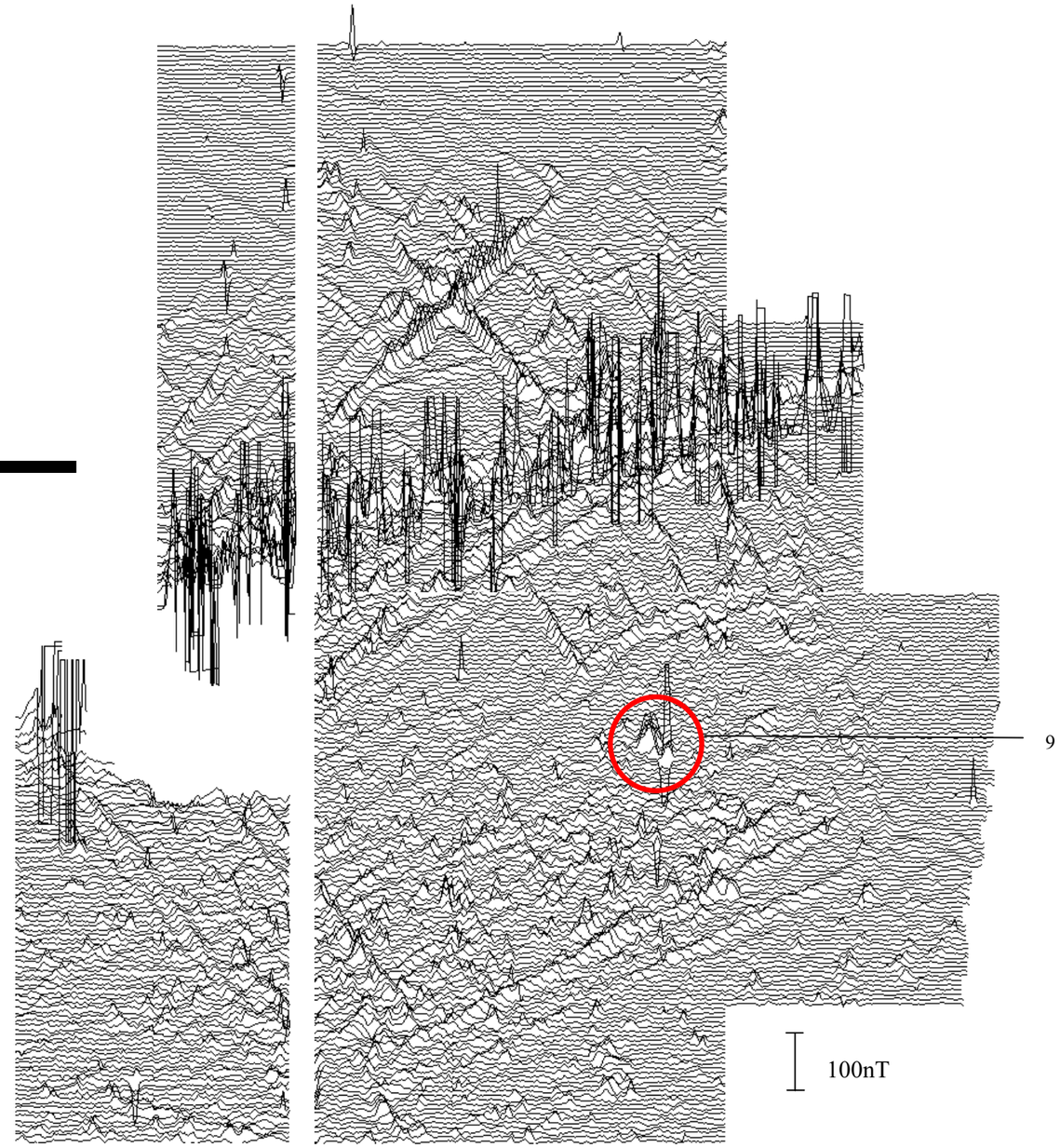
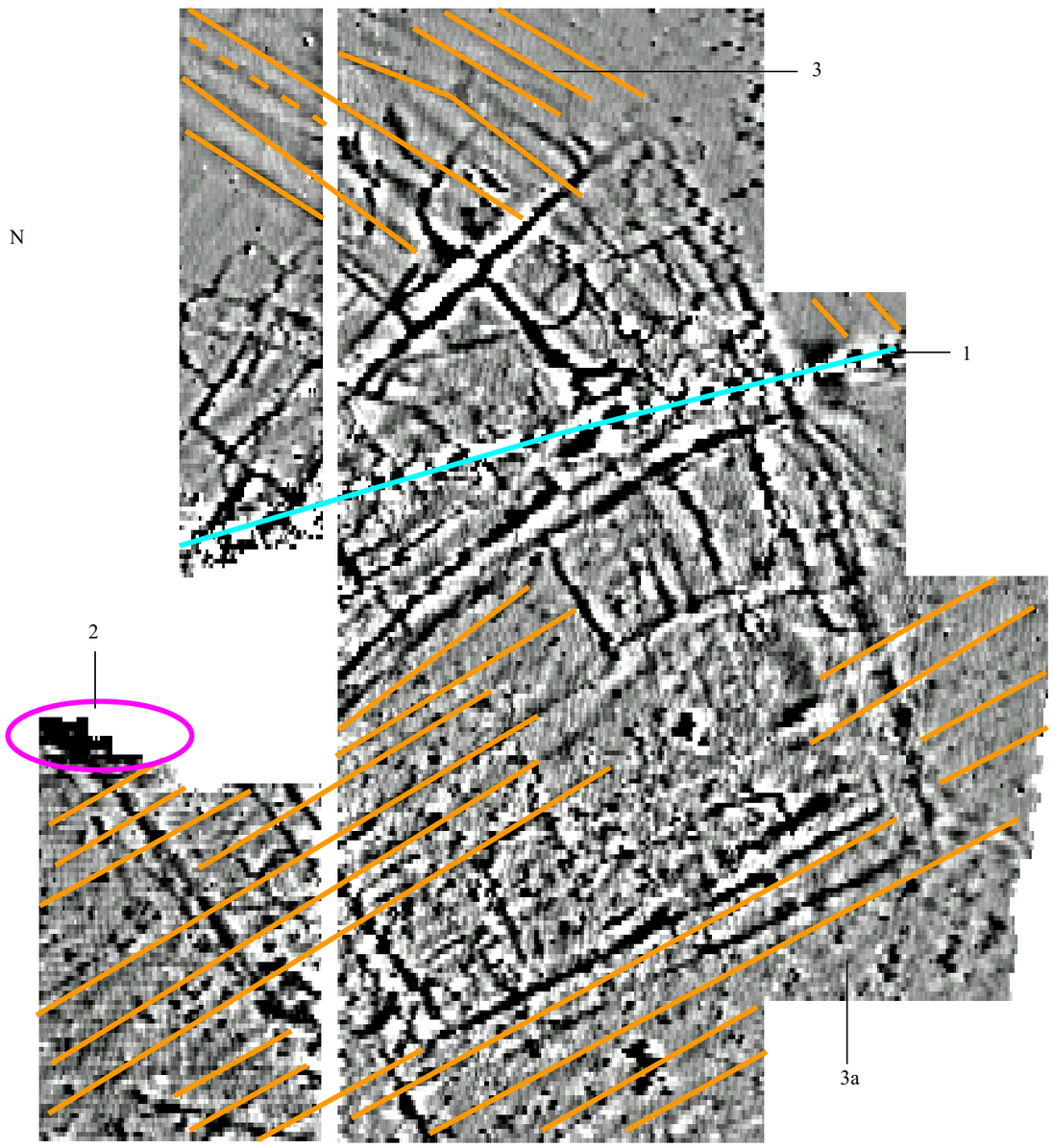


Fig.3: Greyscale image of unclipped data **1:1250** **Fig.4:T race plot of unclipped data**

Fig.5: Greyscale image of clipped data 1:1250

A

B



60m

1:1250

Fig.6: Interpretive image of probable modern and medieval features

Fig.7: Interpretive image of probable Romano-British features