

**Land off Broadfield Road  
Eastington  
Gloucestershire**

**MAGNETOMETER SURVEY REPORT**

for

**Cotswold Archaeology**

David Sabin and Kerry Donaldson

March 2015

Ref. no. 596

ARCHAEOLOGICAL SURVEYS LTD

**Land off Broadfield Road  
Eastington  
Gloucestershire**

Magnetometer Survey Report

for

**Cotswold Archaeology**

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Primary archive location - Archaeological Surveys Ltd, Yatesbury, Wiltshire

Survey dates – 6<sup>th</sup> March 2015

Ordnance Survey Grid Reference – **SO 77505 05632**



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## SUMMARY

A detailed magnetometer survey was carried out by Archaeological Surveys Ltd, at the request of Cotswold Archaeology, over 1ha within the south western part of a single arable field off Broadfield Road, Eastington, Gloucestershire. A small number of very weakly positive linear anomalies have been located, these appear to have been truncated by land drains, but their weak and fragmented response prevents confident interpretation. A small patch of magnetic debris in the north eastern part of the survey area is of uncertain origin, but may indicate brick, tile or slag.

## 1 INTRODUCTION

### 1.1 Survey background

- 1.1.1 Archaeological Surveys Ltd was commissioned by Cotswold Archaeology, to undertake a magnetometer survey of an area of land off Broadfield Road, Eastington. The site has been outlined for a forthcoming proposed planning application for a housing development and the survey forms part of an archaeological assessment of the site.
- 1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2015) and issued to Charles Parry, Archaeologist for Gloucestershire County Council.

### 1.2 Survey objectives and techniques

- 1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin so that they may be assessed prior to development of the site. The methodology is considered an efficient and effective approach to archaeological prospection.
- 1.2.2 The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation*; and Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations*. The work has been carried out to the Chartered Institute for Archaeologists (2014) *Standard and Guidance for Archaeological Geophysical Survey*.

### 1.3 Site location, description and survey conditions

- 1.3.1 The site is located at north of Broadfield Road, Eastington in Gloucestershire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SO 77505 05632, see Figures 01 and 02.
- 1.3.2 The geophysical survey covers approximately 1ha within the south western part of an arable field. The area was generally flat and had a cover over

stubble with some grass and weed regrowth. The south western corner was waterlogged and boggy.

- 1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Weather conditions during the survey were fine.

#### 1.4 *Site history and archaeological potential*

- 1.4.1 The site lies to the south of the location of a number of Roman and possibly Saxon finds, discovered during gravel extraction in the 1920s and 1930s and also during construction of the M5 motorway during the 1970s. Finds include pottery, burials and building remains of a possible Roman villa complex. The postulated Roman road from Easton Grey to Arlingham (Margary, 1955 road 543) is believed to be located nearby.
- 1.4.2 There is potential for the geophysical survey to locate anomalies that may relate to archaeological features should they be present within the site.

#### 1.5 *Geology and soils*

- 1.5.1 The underlying solid geology is mudstone of the Blue Lias Formation and Charmouth Mudstone Formation (BGS, 2015)
- 1.5.2 The overlying soil across the survey area is from the Evesham 2 association and is a typical calcareous pelosol. It consists of a slowly permeable, calcareous clayey soil (Soil Survey of England and Wales, 1983).
- 1.5.3 Magnetometry survey carried out across similar soils has produced good results although at times they can be associated with low magnetic susceptibility. The underlying geology and soils are considered acceptable for magnetic survey.

## 2 METHODOLOGY

### 2.1 *Technical synopsis*

- 2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Magnetic susceptibility and magnetic thermoremnance are factors associated with the formation of localised fields. Additional details are set out below and within Appendix A.
- 2.1.2 Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased, and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within

features, such as pits and ditches, may produce magnetic anomalies that can be mapped by magnetic prospection.

- 2.1.3 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth, oven etc. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.
- 2.1.4 The localised variations in magnetism are measured as sub-units of the Tesla, which is a SI unit of magnetic flux density. These sub-units are nano Teslas (nT), which are equivalent to  $10^{-9}$  Tesla (T).

## *2.2 Equipment configuration, data collection and survey detail*

- 2.2.1 The detailed magnetic survey was carried out using a SENSYS MAGNETO®MXPDA 5 channel cart-based system. The instrument has 5 fluxgate gradiometers spaced 0.5m apart with readings recorded at 20 Hz. The gradiometers have a range of recording data between 0.1nT and 10,000nT. The system is linked to a Leica GS10 RTK GPS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged PDA computer system.
- 2.2.2 Data are collected along a series of parallel survey transects wherever possible. The length of each transect is variable and relates to the size of the survey area and other factors including ground conditions. A visual display allows accurate placing of transects and helps maintain the correct separation between adjacent traverses.
- 2.2.3 Data are not collected within fixed grids and data points are considered to be random, even though the data are collected in a systematic manner covering all accessible areas (Aspinall, Gaffney and Schmidt, 2009).

## *2.3 Data processing and presentation*

- 2.3.1 Magnetic data collected by the MAGNETO®MXPDA cart-based system are initially prepared using SENSYS MAGNETO®DLMGPS software. Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display using TerraSurveyor.
- 2.3.2 The data are collected between limits of  $\pm 10000$ nT and clipped for display at  $\pm 5$ nT. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.12m along each survey track. A zero median traverse function is required in order to remove fixed offset values present within the sensors which do not undergo a zeroing procedure in the field. The approach ensures that the gradiometer sensors are very accurately aligned and fixed to the vertical magnetic field and are not influenced by localised magnetic fields or disturbed by vibration. Although a zero median traverse algorithm can remove

anomalies aligned with the survey tracks, in practice this rarely occurs due to the use of long traverses, high resolution measurement and variability within the magnetic susceptibility of long linear features.

- 2.3.3 Appendix C contains metadata concerning the survey and data attributes and is derived directly from TerraSurveyor. Reference should be made to Appendix B for further information on any processes, such as clipping, carried out on the data.
- 2.3.4 A TIF file is produced by TerraSurveyor software along with an associated world file (.TFW) that allows automatic georeferencing (OSGB36 datum) when using GIS or CAD software. The main form of data display used in the report is the minimally processed greyscale plot.
- 2.3.5 The raster images are combined with base mapping using ProgeCAD Professional 2014, creating DWG file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. The CAD plots are effectively georeferenced facilitating relocation of features using GPS, resection method, etc.
- 2.3.6 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing. A brief summary of each anomaly, with an appropriate reference number, is set out in list form within the results (Section 3) to allow a rapid and objective assessment of features within the survey area.
- 2.3.7 A digital archive is produced with this report, see Appendix D below. The main archive is held at the offices of Archaeological Surveys Ltd.

## 3 RESULTS

### 3.1 *General assessment of survey results*

- 3.1.1 The detailed magnetic survey was carried out over 1ha within the south western part of a single arable field.
- 3.1.2 Magnetic anomalies located can be generally classified as positive anomalies of an uncertain origin, anomalies associated with land management, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance and strong discrete dipolar anomalies relating to ferrous objects. Anomalies located within each survey area have been numbered and are described in 3.4 below.

### 3.2 *Statement of data quality*

- 3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the dataset. Some localised



magnetic disturbance is related to ferrous material on an electricity pole and associated with the residential area immediately to the south of the site.

### 3.3 Data interpretation

3.3.1 The list of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, a basic key is indicated to allow cross referencing to the abstraction and interpretation plot. CAD layer names are included to aid reference to associated digital files (.dwg/.dxf). Sub-headings are then used to group anomalies with similar characteristics for the survey area.







Report sub-heading CAD layer names and plot colour	Description and origin of anomalies
<p><b>Anomalies with an uncertain origin</b></p> <p>AS-ABST MAG POS LINEAR UNCERTAIN </p>	<p>The category applies to a range of anomalies where <u>there is not enough evidence to confidently suggest an origin</u>. Anomalies in this category <u>may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered</u>. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies.</p>
<p><b>Anomalies relating to land management</b></p> <p>AS-ABST MAG LAND DRAIN </p>	<p>Land drains can appear in a classic herringbone pattern of interconnected multiple dipolar linear anomalies, or as parallel linear anomalies. The multiple dipolar response indicates a ceramic land drain.</p>
<p><b>Anomalies with an agricultural origin</b></p> <p>AS-ABST MAG AGRICULTURAL </p>	<p>The anomalies are often linear and form a series of parallel responses or are parallel to extant land boundaries. Where the response is broad, former ridge and furrow is likely; narrow response is often related to modern ploughing.</p>
<p><b>Anomalies associated with magnetic debris</b></p> <p>AS-ABST MAG DEBRIS  AS-ABST MAG STRONG DIPOLAR </p>	<p>Magnetic debris often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. It often occurs where there has been dumping or ground make-up and is related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material. This type of response is occasionally associated with kilns, furnace structures, or hearths and <u>may therefore be archaeologically significant</u>. It is also possible that the response may be caused by natural material such as certain gravels and fragments of igneous or metamorphic rock. Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.</p>
<p><b>Anomalies with a modern origin</b></p> <p>AS-ABST MAG DISTURBANCE </p>	<p>The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc.. Often a significant area around such features has a strong magnetic flux which may create magnetic disturbance; such disturbance can effectively obscure low magnitude anomalies if they are present. Fluxgate sensors may respond erratically and with hysteresis adjacent to strong magnetic sources.</p>

Table 1: List and description of interpretation categories

### 3.4 List of anomalies

Area centred on OS NGR 377505 205632, see Figures 03 & 04.

#### *Anomalies with an uncertain origin*

(1) – The northern part of the survey area contains several short or fragmented weakly positive linear anomalies. They appear to have been truncated by land drains and agricultural anomalies; however, they are so weak (<1nT) and indistinct that it is not possible to determine their origin.

#### *Anomalies associated with land management*

(2) – The survey area contains a set of land drains with a herringbone formation.

#### *Anomalies with an agricultural origin*

(3) – A number of narrow, closely spaced linear anomalies can be seen within the site, oriented north east to south west. These are associated with a modern cultivation trend.

#### *Anomalies associated with magnetic debris*

(4) – A small zone of weakly magnetic debris is located towards the north eastern corner of the site. The origin of the material is uncertain. Another small patch is evident at the south western corner, but this is likely to relate to dumped magnetically thermoremanent material.

(5) – Strong, discrete, dipolar anomalies are a response to ferrous objects within the topsoil.

#### *Anomalies associated with magnetic disturbance*

(6) – Magnetic disturbance within the southern part of the field is a response to an electricity pole. Further south it is a response to ferrous material adjacent to the edge of the survey area.

## 4 CONCLUSION

- 4.1.1 The detailed magnetometer survey located a small number of very weak, fragmented positive linear responses. They appear to have been truncated by land drains indicating that they pre-date them, but their function and date is uncertain.
- 4.1.2 The survey area also contains a set of land drains, agricultural anomalies and also a small patch of weakly magnetic debris near the north eastern corner of the survey area. The latter may indicate the presence of magnetically thermoremanent material, such as brick, tile or slag, and it can also be associated with industrial activity.

## 5 REFERENCES

- Archaeological Surveys, 2015. *Land off Broadfield Road, Eastington, Gloucestershire, Geophysical Survey Written Scheme of Investigation*. Unpublished typescript document.
- Aspinall, A., Gaffney, C. and Schmidt, A., *Magnetometry for Archaeologists*. Lanham (US), AltaMira Press.
- British Geological Survey, 2013. *Geology of Britain viewer, 1:50 000 scale [online]* available from <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> [accessed 3/3/2015].
- Chartered Institute for Archaeologists, 2014. *Standard and Guidance for archaeological geophysical survey*. IfA, University of Reading.
- English Heritage, 2008. *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No.1*. 2<sup>nd</sup> ed. Swindon: English Heritage.
- Institute for Archaeologists, 2002. *The use of Geophysical Techniques in Archaeological Evaluations*. IfA Paper No. 6. IfA, University of Reading.
- Margary, I. D., 1955. *Roman Roads in Britain. Vol I. South of the Foss Way – Bristol Channel*. London: Phoenix House.
- Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 5 South West England*.

## Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremanent material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremanent magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field upon cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremanent features include ovens, hearths, and kilns. In addition thermoremanent material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to the topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The SENSYS gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 65cm apart. The instrument is carried about 10-20cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength the magnetic field created by the buried feature.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

## Appendix B – data processing notes

### *Clipping*

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. It has been found that clipping data to ranges between  $\pm 20\text{nT}$  and  $\pm 3\text{nT}$  often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

### *Zero (destripe) Median/Mean Traverse*

The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise differences between the baseline value of gradiometer sensors.

### *High Pass Filtering*

A mathematical process used to remove low frequency anomalies relating to survey tracks and modern agricultural features.

## Appendix C – survey and data information

COMPOSITE  
 Filename: J596-mag-proc.xcp  
 Description: Imported as Composite from: J596-mag.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates OSGB36  
 Northwest corner: 377438.829119732, 205689.949972306 m  
 Southeast corner: 377588.709119732, 205581.229972306 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702  
 Source GPS Points: 308200

Dimensions  
 Composite Size (readings): 1249 x 906  
 Survey Size (meters): 150 m x 109 m  
 X Interval: 0.12 m  
 Y Interval: 0.12 m

Stats  
 Max: 5.53  
 Min: -5.50  
 Std Dev: 1.53  
 Mean: 0.00  
 Median: 0.02  
 Composite Area: 1.6295 ha  
 Surveyed Area: 0.92309 ha

PROGRAM  
 Name: TerraSurveyor  
 Version: 3.0.23.0

Processes: 1  
 1 Base Layer

GPS based Process  
 1 Base Layer.  
 2 Unit Conversion Layer (Lat/Long to OSGB36).  
 3 DeStripe Median Traverse:  
 4 Clip from -10.00 to 10.00 nT  
 5 Clip from -10.00 to 10.00 nT  
 6 Clip from -5.00 to 5.00 nT  
 7 High pass Uniform (median) filter: Window dia: 400  
 8 Clip from -5.00 to 5.00 nT

## Appendix D – digital archive

Archaeological Surveys Ltd hold the primary digital archive at their offices in Wiltshire. Data are backed-up onto an on-site data storage drive and at the earliest opportunity data are copied to CD ROM for storage on-site and off-site.

A copy of the report in PDF/A format will be issued to the Gloucestershire Historic Environment Record, together with a DXF of the survey boundary.

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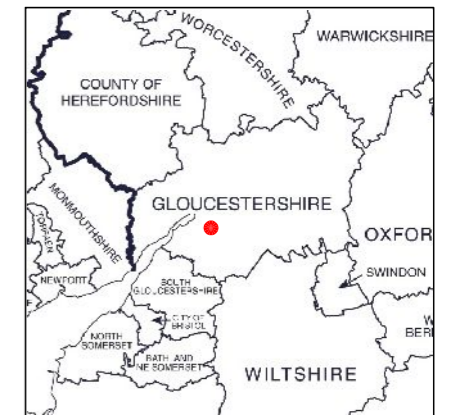
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**Geophysical Survey  
Land off Broadfield Road  
Eastington  
Gloucestershire**

**Map of survey area**

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● Survey location

Site centred on OS NGR  
SO 77505 05635

SCALE 1:25 000



SCALE TRUE AT A3



Survey location

**Geophysical Survey  
Land off Broadfield Road  
Eastington  
Gloucestershire**

**Referencing information**

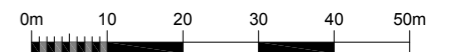
Referencing grid to OSGB36 datum at 50m intervals

Data collected at 20Hz and georeferenced to ETRS89 zone 30 with conversion to OSGB36 using OSTN02

● 377450 205600

Site boundary

SCALE 1:1000



SCALE TRUE AT A3

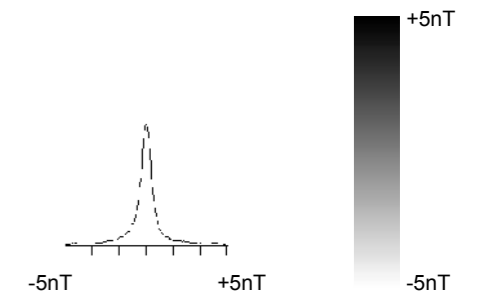
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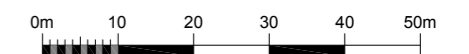


**Geophysical Survey  
Land off Broadfield Road  
Eastington  
Gloucestershire**

**Greyscale plot of minimally  
processed magnetometer data**



SCALE 1:1000









SCALE TRUE AT A3

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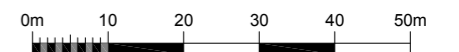
**Geophysical Survey  
Land off Broadfield Road  
Eastington  
Gloucestershire**

**Abstraction and interpretation of  
magnetometer anomalies**

-  Positive linear anomaly - possible ditch-like feature
-  Linear anomaly - agricultural origin
-  Positive linear anomaly - land drain
-  Magnetic debris - spread of magnetically thermoremanent/ferrous material
-  Magnetic disturbance from ferrous material
-  Strong dipolar anomaly - ferrous object



SCALE 1:1000



SCALE TRUE AT A3

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