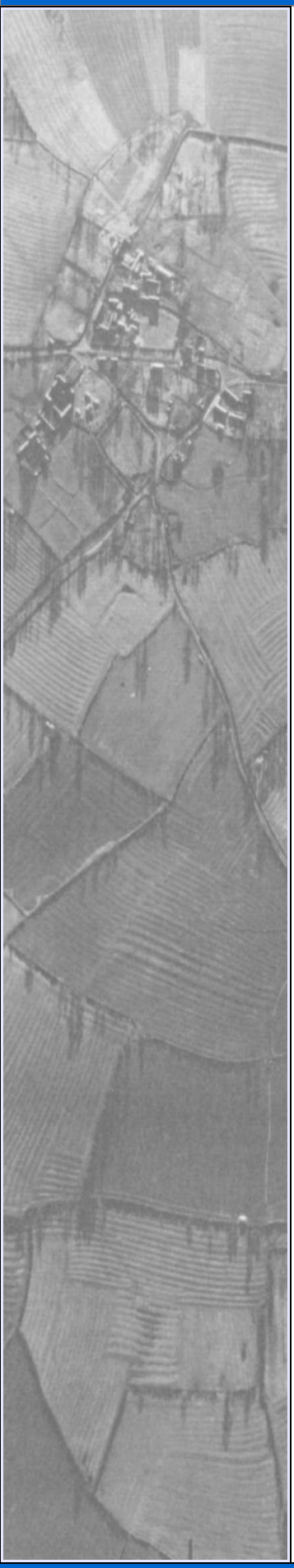


# Land south of Campden Road
# Shipston-on-Stour
# Warwickshire

## MAGNETOMETER SURVEY REPORT

for

## Cotswold Archaeology

David Sabin and Kerry Donaldson

January 2015

Ref. no. 585

ARCHAEOLOGICAL SURVEYS LTD

# Land south of Campden Road
# Shipston-on-Stour
# Warwickshire

Magnetometer Survey Report

for

**Cotswold Archaeology**

Fieldwork by David Sabin
Report by David Sabin BSc (Hons) MIFA and Kerry Donaldson BSc (Hons)

Survey dates – 5th, 18th & 20th January 2015
Ordnance Survey Grid Reference – **SO 24950 40350**

Archaeological Surveys Ltd
1 West Nolands, Nolands Road, Yatesbury, Calne, Wiltshire, SN11 8YD
Tel: 01249 814231 Fax: 0871 661 8804
Email: info@archaeological-surveys.co.uk
Web: www.archaeological-surveys.co.uk

# CONTENTS

LIST OF FIGURES



LIST OF TABLES

# SUMMARY

A detailed magnetometry survey was carried out by Archaeological Surveys Ltd on land to the south of Campden Road, Shipston-on-Stour in Warwickshire. The work was commissioned as part of an archaeological investigation by Cotswold Archaeology into the archaeological potential of a site outlined for a proposed residential development. The results of the survey show two weakly positive linear anomalies that may relate to linear ditches with an archaeological origin in the northern and western part of the site. They are parallel with other recorded cut features located just to the north of the site beyond the Campden Road. There are a number of other weakly positive and some negative linear anomalies within the site, and although it is possible that some may relate to cut features or boundary features, they are generally short, weak or lack definition preventing confident interpretation. Three series of former ridge and furrow have also been located.


# 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 to the south of Campden Road, Shipston-on-Stour in Warwickshire. The site has been outlined for a proposed residential 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 (2014) and issued to Anna Stocks, Planning Archaeologist for Warwickshire County Council prior to commencing the fieldwork.

## *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 Institute for Archaeologists (2011) *Standard and Guidance for Archaeological Geophysical Survey.*

### *1.3 Site location, description and survey conditions*

1.3.1 The site is located south of Campden Road, just to the west of Shipston-on-Stour in Warwickshire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SP 24950 40350, see Figures 01 and 02. The entire site covers 6.5ha within two fields; however, the survey was carried out only within the parts of the development area that are outlined to contain housing and not the western part of the site which is proposed open space.

1.3.2 The geophysical survey covers approximately 3.3ha within the eastern parts of two arable fields that contained an emerging crop at the time of survey. The fieldwork was undertaken over 3 days due to poor ground conditions (see below). The site slopes down towards the north east with an increasing gradient to the west.

1.3.3 The ground conditions across the site were generally considered very poor for survey. The first day of work was abandoned due to the very wet clayey soil that could not be traversed. Two further days of survey were required to complete the work over frozen ground. Weather conditions during the survey were generally fine and cold.

### *1.4 Site history and archaeological potential*

1.4.1 Land immediately to the north of the site and the Campden Road has been subject to desk-based investigations, including the former Norgren factory site (Cotswold Archaeology, 2011), and arable land immediately to the east (Cotswold Archaeology, 2012a). This has also been subject to a geophysical survey by Stratascan (2012) where a number of rectilinear and curvilinear enclosures, linear ditches, a possible trackway and pits were located. Subsequent archaeological evaluation by Cotswold Archaeology (2012b) identified that these features related to a Roman agricultural settlement site. Later ridge and furrow and more modern agricultural practices had truncated much of the archaeological features.

1.4.2 The site lies within two fields which have been unaltered in layout since the 1842 Tithe Map to the present day (Cotswold Archaeology, 2014). Ridge and furrow is evident within the eastern part of the eastern field.

1.4.3 The proximity and morphology of the archaeological features seen immediately to the north of the Campden Road suggest that they may continue southwards into the current survey area. There is therefore potential that the survey will locate cut features should they exist within the site. Evidence for former ridge and furrow is also likely.

1.4.4 The surface conditions within the site were suitable for the observation of cultural material during the course of the survey. No significant scatters were noted.

### *1.5 Geology and soils*

1.5.1 The underlying solid geology across the site is from the Charmouth Mudstone Formation (BGS, 2014).

1.5.2 The overlying soil across the survey area is from the Denchworth association and is a pelo-stagnogley. It consists of a slowly permeable, seasonally waterlogged, clayey soil (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry carried out over similar geology and soil has produced variable results. The soils and geology can produce low magnetic susceptibility; however, where long term and intense occupation of a site occurs, there can be a corresponding strong magnetic contrast between the fill of cut features and the material into which they are cut. The site is considered suitable 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. They are 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.

### *2.3 Data processing and presentation*

2.3.1 Magnetic data collected by the MAGNETO®MXPDA cart-based system are initially prepared and automatically compensated using SENSYS MAGNETO®DLMGPS software. Georeferenced raw data are then exported in ASCII format for further analysis and display using TerraSurveyor.

2.3.2 The data are collected at ±10000nT and clipped for display at ±20nT. Data are resampled to a resolution of effectively 0.5m between tracks and 0.15m along each survey track. Appendix C contains specific information 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.

2.3.3 A TIFF file is produced by TerraSurveyor software along with an associated world file (.TFW) that allows automatic georeferencing (OSGB36) when using GIS or CAD software. The main form of data display used in the report is the minimally processed greyscale plot.

2.3.4 The raster images are combined with base mapping using ProgeCAD Professional 2014 and AutoCAD LT 2007, creating DWG file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. Quality can be compromised by rotation of graphics in order to allow the data to be orientated with respect to grid north; this is considered acceptable as the survey results are effectively georeferenced allowing relocation of features using GPS, resection method, etc.

2.3.5 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. 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 each survey area. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.

2.3.6 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 a total of 2 survey areas covering approximately 3.3ha.

3.1.2 Magnetic anomalies located can be generally classified as positive linear anomalies of archaeological potential, positive and negative anomalies of an uncertain origin, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance and strong discrete dipolar anomalies relating to ferrous objects.

3.1.3 Anomalies located within each survey area have been numbered and are described below with subsequent discussion in Section 4.

## *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. Soil 'noise' appears high and this probably relates to small fragments of magnetically thermoremnant material (e.g. tile, brick and slag) spread along with manure.

## *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 each survey area.

| **Report sub-heading<br>CAD layer names and plot colour** | **Description and origin of anomalies** |
|---|---|
| ***Anomalies with archaeological potential***<br><br>AS-ABST MAG POS LINEAR ARCHAEOLOGY | Anomalies have the characteristics (mainly morphological) of a range of archaeological features such as pits, ring ditches, enclosures, etc.. |
| ***Anomalies with an uncertain origin***<br><br>AS-ABST MAG POS LINEAR UNCERTAIN<br>AS-ABST MAG NEG LINEAR UNCERTAIN<br>AS-ABST MAG POS DISCRETE UNCERTAIN<br>AS-ABST MAG POS UNCERTAIN | The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. 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. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil. |

| | |
|---|---|
| ***Anomalies with an agricultural origin***<br><br>AS-ABST MAG RIDGE AND FURROW  | 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. |
| ***Anomalies associated with magnetic debris***<br><br>AS-ABST MAG DEBRIS  <br>AS-ABST MAG STRONG DIPOLAR  | 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 may therefore be archaeologically significant. 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. |
| ***Anomalies with a modern origin***<br><br>AS-ABST MAG DISTURBANCE  | 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. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction. |

Table 1: List and description of interpretation categories

## *3.4 List of anomalies - Area 1*

Area centred on OS NGR 424910 240270, see Figures 03 & 04.

*Anomalies of archaeological potential*

(1) – A weakly positive linear anomaly, with a response of generally less than 1.5nT, extends across the north eastern part of the survey area. It corresponds to a zone where former ridge and furrow (7) is less visible in the data, and to waterlogged ground. It appears to continue eastwards into Area 2 as anomaly (10) and also to be associated with anomaly (2) which extends southwards from its western end.

(2) – A weakly positive linear anomaly appears to extend southwards from the western end of anomaly (1). It has a similar response to anomaly (1) and appears to have been truncated by the ridge and furrow (7).

*Anomalies with an uncertain origin*

(3) – There are a number of short, weakly positive linear anomalies within the survey area. Some of them are oriented parallel with anomalies (1) and (2), and although an association is possible, their weak response and short form lack definition.

(4) – A weakly positive linear anomaly (0.5nT) extends north westwards from close to the south eastern corner of the field. Although it is possible that this relates to a cut, ditch-like feature, it is not possible to determine its origin or if it is associated with anomalies (1) and (2).

(5) – Several weakly positive anomalies are located immediately east of and parallel with anomaly (2). Another is located to the south of anomaly (1). They appear to have been truncated by the ridge and furrow; however, it is not possible to determine their form and function.

(6) – The survey area contains a small number of discrete positive responses. It is not possible to determine if they relate to pit-like features with an anthropogenic origin.

*Anomalies with an agricultural origin*

(7) – The survey area contains a series of linear anomalies, parallel with the north western and south eastern field boundaries, that relate to former ridge and furrow cultivation.

*Anomalies associated with magnetic debris*

(8) – Patches of magnetic debris are evident in the northern part of the survey area. These are associated with the demolition of two small structures that were mapped from at least 1887, with the one close to the northern edge removed after 1923 and the other close to the north western edge removed in the late 20th century.

(9) – Strong, discrete, dipolar anomalies are a response to ferrous and other magnetically thermoremnant objects within the topsoil.

## *3.5 List of anomalies - Area 2*

Area centred on OS NGR 425005 240265, see Figures 03 & 04.

*Anomalies of archaeological potential*

(10) – A weakly positive linear anomaly extends across the northern part of the survey area. It appears to have been truncated by the ridge and furrow (16), but in places has a response of 2nT. It appears that it may be a continuation of anomaly (1) and it is parallel with archaeological features located 60m north of the site.

*Anomalies with an uncertain origin*

(11) – A positive linear anomaly is located to the north of and parallel with anomaly (10). It is possible that is associated with (10); however, it only extends partially

across the survey area and its extent is unclear.

(12) – A positive linear anomaly appears to extend from the northern edge of the survey area towards anomaly (10). It is possible that there is an associated, but this is not certain.

(13) – A positive linear anomaly extends across much of the central part of the survey area. It is possible that it has been truncated by ridge and furrow, but it is indistinct. It may relate to a cut, ditch-like feature and a negative linear anomaly is located parallel with it to the north east. A former field boundary is possible, but it is not mapped and it appears to be crossed by ridge and furrow (16).

(14) – The survey area contains a number of weakly positive and negative linear and possibly curvilinear anomalies. It is not possible to determine their origin as they are indistinct and lack a coherent morphology.

(15) – A positive linear anomaly is located in the central southern part of the survey area. Although it has a different orientation to anomalies (16), is it possible that it indicates that there was another series of such features on a slightly different alignment.

*Anomalies with an agricultural origin*

(16) – A series of parallel linear anomalies, orientated north north west to south south east are located in the eastern part of the survey area and relate to former ridge and furrow.

(17) – A series of parallel linear anomalies, oriented north east to south west and located in the western part of the survey area also relate to ridge and furrow.

*Anomalies associated with magnetic debris*

(18) – The survey area contains a number of strong, discrete, dipolar anomalies with a linear cluster extending southwards from the junction with Area 1.

*Anomalies with a modern origin*

(19) – Magnetic disturbance has been caused by ferrous material within the adjacent field boundaries on the northern and north eastern edges of the survey area.

# 4 DISCUSSION

4.1.1 The survey area contains evidence for at least two positive linear anomalies that may indicate cut features with archaeological potential. One weakly positive linear anomaly (1) extends for at least 130m along the northern part of

the site. It appears truncated by ridge and furrow in places and it is generally parallel with the orientation of linear features and enclosures located 60m to the north during a previous geophysical survey (Stratascan, 2012).

4.1.2 A second weakly positive linear anomaly (2) appears to extend southwards for at least 90m from the western end of (1) and may continue beyond the limit of the survey area. The two features may relate to boundary ditches but there is no clear evidence for concentrated cut features that would indicate a continuation of the settlement site located to the north. There are a small number of weakly positive linear and amorphous anomalies that are generally parallel with the orientation of anomalies (1) and (2), and although they may be associate, they lack definition preventing confident interpretation.

4.1.3 The site also contains a number of weakly positive and some negative linear anomalies on a variety of orientations, that again lack a coherent morphology. One anomaly (13), appears to be in the position that would indicate a continuation of the field boundary at the southern edge of Area 1 in the western part of the site, although no field boundary has been mapped, either on the Tithe Map of 1842 or any subsequent Ordnance Survey mapping.

# 5 CONCLUSION

5.1.1 The detailed magnetometer survey located two weakly positive linear anomalies that have a similar orientation to archaeological features recorded 60m to the north of the site. It is possible that they relate to cut features such as linear boundaries, and they appear in places to have been truncated by later ridge and furrow.

5.1.2 The site also contains a number of positive and negative anomalies that are either short, weak or poorly defined and so an origin cannot be confidently determined. Three series of ridge and furrow indicate the former agricultural regime within the site.

# 6 REFERENCES

Archaeological Surveys, 2014. *Land south of Campden Road, Shipston-on-Stour, Warwickshire, Geophysical Survey Written Scheme of Investigation.* Unpublished typescript document.

British Geological Survey, 2014. *Geology of Britain viewer, 1:50 000 scale [online]* available from http://mapapps.bgs.ac.uk/geologyofbritain/home.html [accessed 18/12/2014].

Cotswold Archaeology, 2011. *Campden Road, Shipston-on-Stour, Warwickshire, Heritage Desk-based Assessment.* CA report ref: 11205

Cotswold Archaeology, 2012a. *Shipston-on-Stour, Warwickshire, Heritage Desk-based Assessment*. CA report ref: 11204.

Cotswold Archaeology, 2012b. *Campden Road, Shipston-on-Stour, Warwickshire, Archaeological Evaluation.* CA report ref: 12263.

Cotswold Archaeology, 2014. *Land south of Campden Road, Shipston-on-Stour, Warwickshire, Heritage Statement.* CA report ref: 14316.

English Heritage, 2008. *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline.*

Institute for Archaeologists, 2002. *The use of Geophysical Techniques in Archaeological Evaluations*. IFA Paper No. 6. IFA, University of Reading.

Institute for Archaeologists, 2011. *Standard and Guidance for archaeological geophysical survey*. IfA, University of Reading.

Soil Survey of England and Wales, 1983. Soils of England and Wales, Sheet 3 Midland and Western England.

Stratascan, 2012. *Geophysical Survey Report, Shipston-on-Stour.* Ref J3004. Unpublished typescript document.

## 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 thermoremnant 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.

Thermoremnant 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. Thermoremnant features include ovens, hearths, and kilns. In addition thermoremnant 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 ±20nT and ±10nT 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.

# Appendix C – survey and data information

**Area 1**

COMPOSITE

Filename: J585-mag-Area1-proc.xcp
Description: Imported as Composite from: J585-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 424814.793923251, 240354.197523952 m
Southeast corner: 424990.293923251, 240179.297523952 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 647200

Dimensions
Composite Size (readings): 1170 x 1166
Survey Size (meters): 176 m x 175 m
Grid Size: 176 m x 175 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 22.10
Min: -22.00
Std Dev: 5.94
Mean: 0.19
Median: 0.01
Composite Area: 3.0695 ha
Surveyed Area: 1.6117 ha

Processes: 2
1 Base Layer
2 Clip from -15.00 to 15.00 nT

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -20.00 to 20.00 nT

**Area 2**

COMPOSITE

Filename: J585-mag-Area2-proc.xcp
Description: Imported as Composite from: J585-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 424943.777718466, 240363.974200709 m
Southeast corner: 425102.177718466, 240157.574200709 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 728400

Dimensions
Composite Size (readings): 1056 x 1376
Survey Size (meters): 158 m x 206 m
Grid Size: 158 m x 206 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 15.00
Min: -15.00
Std Dev: 6.62
Mean: 0.22
Median: 0.04
Composite Area: 3.2694 ha
Surveyed Area: 1.7231 ha

Processes: 2
1 Base Layer
2 Clip from -15.00 to 15.00 nT

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -20.00 to 20.00 nT

# Appendix D – digital archive

Archaeological Surveys Ltd hold the primary digital archive at their offices in Wiltshire (see inside cover for address). 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. Surveys are reported on in hardcopy (recycled paper) using A4 for text and A3 for plots (all plots are scaled for A3) and will be supplied to the HER and uploaded to OASIS upon instruction by the client.



This report has been prepared using the following software on a Windows XP platform:

- TerraSurveyor version 3.0.23.0 (geophysical data analysis),
- SENSYS MAGNETO®ARCH version 1.00-04(geophysical data analysis),
- ProgeCAD Professional 2014 (report graphics),
- AutoCAD LT 2007 (report figures),
- OpenOffice.org 3.0.1 Writer (document text),
- PDF Creator version 0.9 (PDF).

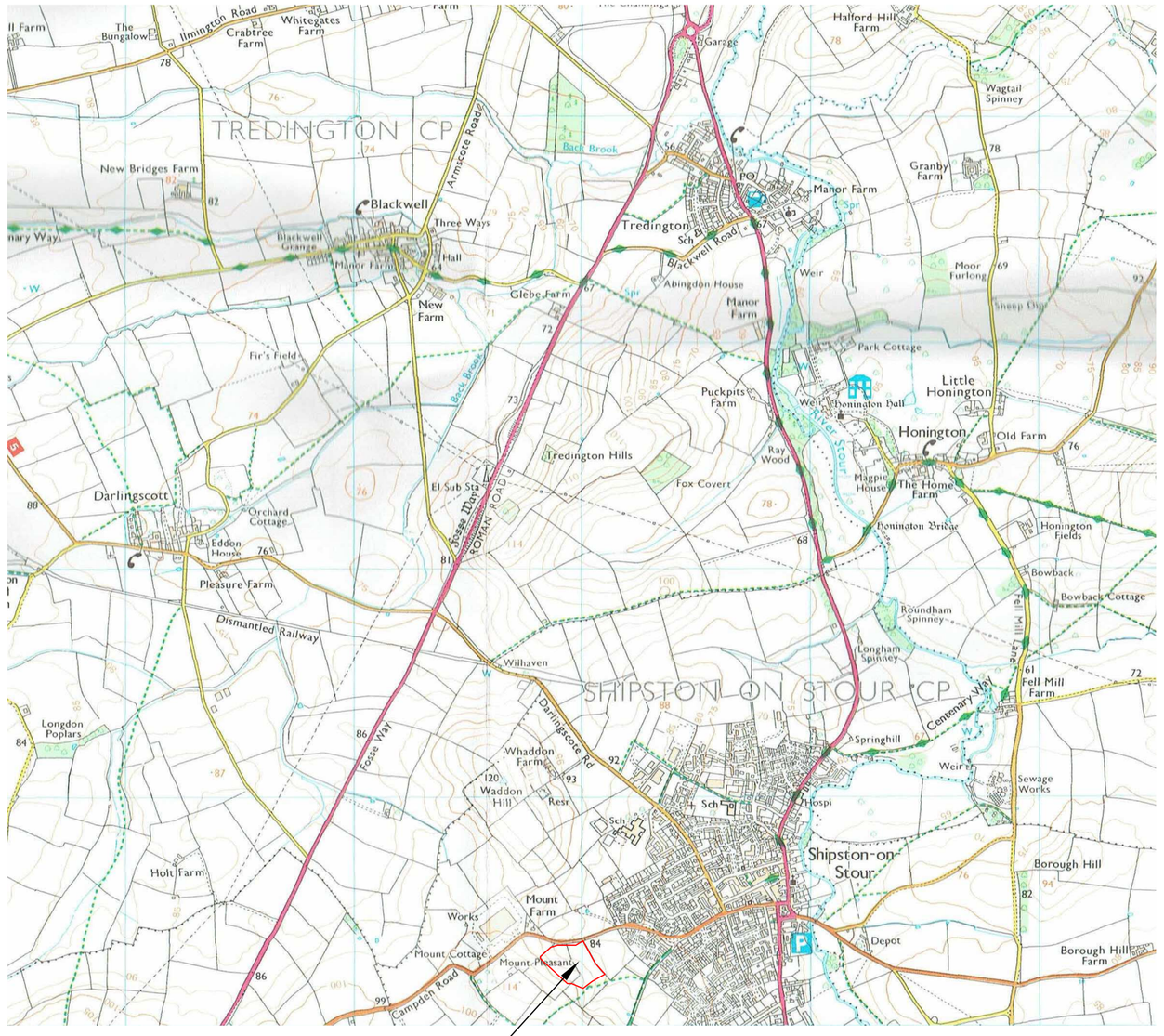
Digital data produced by the survey and report include the following files:

- TerraSurveyor grid and composite files for all geophysical data,
- CSV files for raw and processed composites,
- geophysical composite file graphics as Bitmap images,
- AutoCAD DWG files in 2000 and 2007 versions,
- report text as OpenOffice.org ODT file,
- report text as Word 2000 doc file,
- report text as rich text format (RTF),
- report text as PDF / PDF/A,
- PDFs of all figures.

Archaeological Surveys Ltd

# Geophysical Survey
# Land south of
# Campden Road
# Shipston-on-Stour
# Warwickshire

## Map of survey area







● Survey location

Site centred on OS NGR
SP 24950 40350

SCALE 1:25 000

0m 500m 1000m

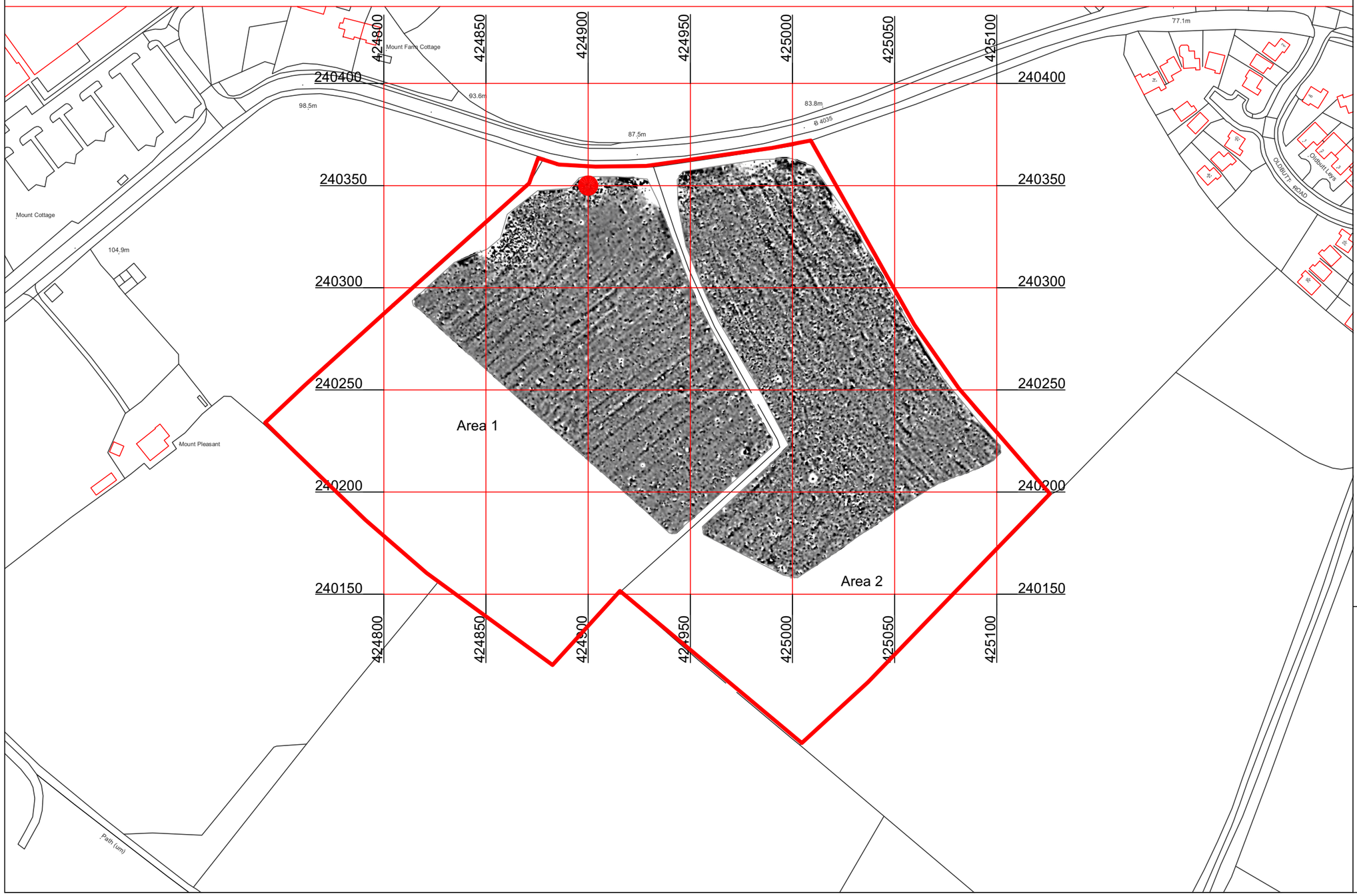
SCALE TRUE AT A3



FIG 01

Archaeological Surveys Ltd

# Geophysical Survey
# Land south of
# Campden Road
# Shipston-on-Stour
# Warwickshire




## 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

424900 240350

Site boundary

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

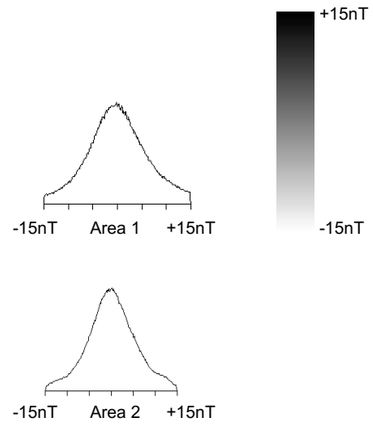


FIG 02


Archaeological Surveys Ltd

# Geophysical Survey
# Land south of
# Campden Road
# Shipston-on-Stour
# Warwickshire

**Greyscale plot of minimally processed magnetometer data**




SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3



FIG 03

Archaeological Surveys Ltd

# Geophysical Survey
# Land south of
# Campden Road
# Shipston-on-Stour
# Warwickshire

## Abstraction and interpretation of magnetometer anomalies

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3



FIG 04

95.6m
87.5m
83.8m
B 4035
N
Area 1
Area 2
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19