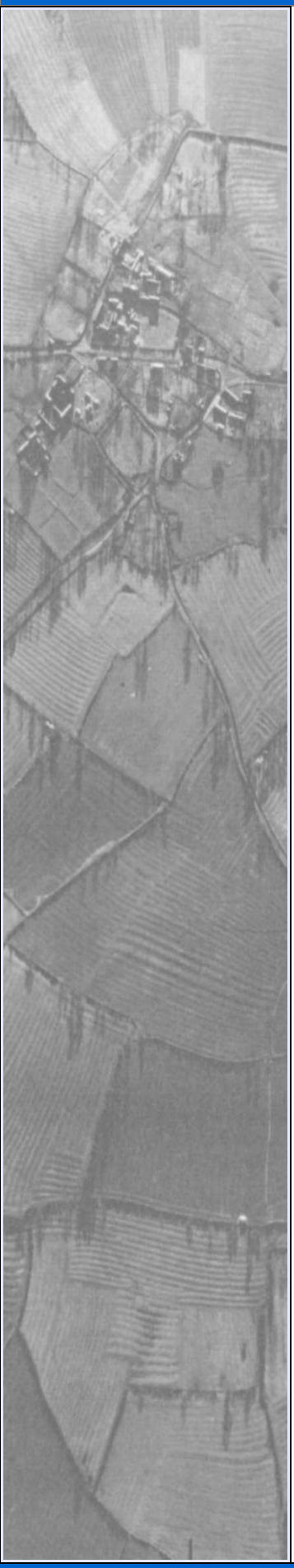

Land adjacent to Kissing Tree House
Alveston
Warwickshire

MAGNETOMETER SURVEY REPORT

for

Archaeology Warwickshire

Kerry Donaldson & David Sabin

April 2016

Ref. no. 659

ARCHAEOLOGICAL SURVEYS LTD

Land adjacent to Kissing Tree House
Alveston
Warwickshire

Magnetometer Survey Report

for

Archaeology Warwickshire

Fieldwork by David Sabin (Hons) MCIfA
Report by Kerry Donaldson BSc (Hons)
Report checked by David Sabin
Primary archive location - Archaeological Surveys Ltd, Yatesbury, Wiltshire

Survey date – 18th April 2016
Ordnance Survey Grid Reference – **SP 23405 56310**

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SUMMARY

Magnetometry was carried out over 3ha of land within four survey areas adjacent to Kissing Tree House, Alveston, Warwickshire. The work was carried out by Archaeological Surveys Ltd at the request of Archaeology Warwickshire. The results demonstrate evidence for ridge and furrow within the western and southern parts of the site. Magnetic debris and disturbance from the more modern use of the site can also be seen and this has the potential to obscure weak anomalies, predominantly within some small zones in the garden close to the house. A small number of positive linear anomalies, possibly indicating former ditch-like features, were located. Several of these appear possibly truncated by ridge and furrow which may be an indication that they are earlier in date. Several discrete positive anomalies were located and some may relate to former pit-like features.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Archaeology Warwickshire to undertake a magnetometer survey of an area of land adjacent to Kissing Tree House, in Alveston, Stratford-upon-Avon, Warwickshire. The site has been outlined for a proposed development of a new house, ha-ha, gazebo and driveway. The survey forms part of an archaeological assessment of the site.

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 in Alveston, Stratford-upon-Avon, Warwickshire. It is siteed within the grounds of Kissing Tree House between Kissing Tree Lane to the east, Kissing Tree Way to the north, Church Lane to the west and the Wellesbourne Road (B4086) to the south. It is centred on Ordnance Survey National Grid Reference (OS NGR) SP 23405 56310, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 3ha split between four survey areas. Area 1 covered the northern part of a pasture field that is to contain the new ha-ha and also an area of gardens to the north of the field (see Plate 1), which is to contain the new house. Area 2, also within the pasture field, is outlined to contain a small gazebo and a larger 30m by 30m block was surveyed. Area 3 was within the garden of Kissing Tree House and is to contain a new drive as is Area 4 to the south, which lies in an area of pasture.

Plate 1: Survey Area 1 looking west

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. The site is generally flat but contains numerous obstacles in the form of garden features, trees and shrubs. Weather conditions during the survey were mainly fine.

1.4 Site history and archaeological potential

1.4.1 The site lies immediately to the east of an area previously investigated through geophysical survey (Archaeological Surveys, 2013) and targeted evaluation (Archaeology Warwickshire, 2013). The geophysical survey located a number of magnetic anomalies that indicated a rectilinear enclosure, possibly containing internal features, with other weaker anomalies elsewhere along with evidence for ridge and furrow. The evaluation confirmed the presence of an Iron Age enclosure containing a possible round house and pits and a possible trackway.

1.4.2 The location of an Iron Age farmstead immediately to the west of the survey

area indicates that there is potential for associated archaeological features to extend eastwards into the survey area. Ridge and furrow is also likely to be encountered as well as evidence for modern disturbance nearer the house and gardens. Extant ridge and furrow was encountered within the pasture field forming part of Area 1.

1.5 Geology and soils

1.5.1 The underlying geology is Mercia Mudstone with overlying river terrace deposits from the Wasperton Sand and Gravel Member (BGS, 2016).

1.5.2 The overlying soil across the site is from the Wick 1 association and is a typical brown earth. It consists of a deep, well drained, coarse, loamy and sandy soil over gravel (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry carried out over similar geology and soil has produced good results, although at times it can be difficult to distinguish naturally formed features from those with an anthropogenic origin. The site is, therefore, 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 20Hz. The gradiometers have a range of recording data between 0.1nT and 10,000nT. The sensors are not zeroed in the field, as the vertical axis alignment is fixed using a tension band system. In order to produce visible, useful greyscale images a zero median traverse process can be undertaken in TerraSurveyor. The system is linked to a Leica GS10 RTK GPS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged computer.

2.2.2 Data are collected along a series of parallel survey tracks wherever possible. The length of each track is variable and relates to the size of the survey area and other factors including ground conditions. A visual display aids accurate placing of tracks and their separation.

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 ±10000nT and clipped for display at ±5nT for Area 1 and ±3nT for Areas 2, 3 and 4. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m 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 (2010) 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 also drawn and plotted 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.

2.3.7 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.

2.3.8 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 four survey areas covering approximately 3ha.

3.1.2 Magnetic anomalies located can be generally classified as positive anomalies of an uncertain origin, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance, strong discrete dipolar anomalies relating to ferrous objects and strong multiple dipolar linear anomalies relating to buried services or pipelines. Anomalies located within each survey area have been numbered and are described below.

3.2 Statement of data quality

3.2.1 Data are considered representative of the magnetic anomalies present within the site. Magnetic disturbance and magnetic debris were encountered, the latter being particularly widespread within the gardens surrounding the house. The corresponding high magnitude responses have the potential to obscure minor anomalies of archaeological potential.

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 CAD layer names and plot colour	Description and origin of anomalies
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE 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 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 AS-ABST MAG DEBRIS 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 AS-ABST MAG DISTURBANCE AS-ABST MAG SERVICE 	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 423360 256345, see Figs 03 & 04.

Anomalies with an uncertain origin

(1) – Two very weak, positive, linear anomalies are located within the southern part of Area 1. Their origin is uncertain and they appear to cross a former field boundary and earlier carriageway mapped in the 19th century; however, they are parallel with the Iron age enclosure ditches and possible trackway located 130m to the west.

(2) – Two discrete positive responses can be seen in the southern part of Area 1. They appear to relate to magnetic enhancement within the ridge and furrow but the origin of this enhancement is uncertain.

Anomalies with an agricultural origin

(3 & 4) – Two series of ridge and furrow can be seen within the survey area. Anomalies (3) are oriented north-east to south-west in the southern part of the survey area. Anomalies (4) are north-west to south-east and extend across the northern part of the survey area into the gardens.

Anomalies associated with magnetic debris

(5) – The survey area contains widespread magnetic debris. In the southern part it relates to infilled formerly mapped field boundaries and small enclosures, in the northern part it relates to more modern debris within the garden and driveway. The strength of the response indicates that it could obscure weaker features.

(6) – The whole site contains widespread and numerous strong, discrete, dipolar anomalies indicative of buried ferrous and other magnetically thermoremant objects.

Anomalies with a modern origin

(7) – The survey area contains a number of buried services.

3.5 List of anomalies - Area 2

Area centred on OS NGR 423400 256212, see Figs 03 & 04.

Anomalies with an agricultural origin

(8) – A series of parallel anomalies relate to a continuation of ridge and furrow (3) seen to the north in Area 1.

Anomalies associated with magnetic debris

(9) – Magnetic debris may be associated with an area of burning nearby, or possible former mapped field boundary.

3.6 List of anomalies - Area 3

Area centred on OS NGR 423472 256353, see Figs 03 & 04.

Anomalies with an uncertain origin

(10) – A positive linear anomaly extends through the centre of Area 3. It has the same north-north-east to south-south-west orientation as anomalies (15) seen in Area 4 to the south. It appears to relate to a cut, linear, ditch-like feature and an archaeological origin should be considered.

(11) – Two parallel positive linear anomalies are located close to the northern end of anomaly (10). It is possible that they relate to former ridge and furrow, but cut features cannot be ruled out.

(12) – Several weakly positive linear anomalies are located in the southern part of the survey area. They are generally short and lack a coherent morphology preventing interpretation.

(13) – A number of discrete positive responses can be seen in the southern part of the survey area. It is not possible to determine if they relate to cut, pit-like features, naturally formed features, or former garden features.

Anomalies associated with magnetic debris

(14) – Magnetic debris is associated with a path extending down the centre of the survey area and other magnetically thermoremnant material that relates to ground consolidation.

3.7 List of anomalies - Area 4

Area centred on OS NGR 423500 256240, see Figs 03 & 04.

Anomalies with an uncertain origin

(15) – At least three positive linear anomalies can be seen in the south-western part of the survey area. They appear to relate to a series of ditch-like responses, with some either highly fragmented or possible linear arrangements of pits. The orientation is similar to anomaly (10) in Area 3, although they are located slightly

further west. Other linear anomalies may join or cross them in places.

(16) – A number of discrete positive responses are located in the far south-eastern corner of the survey area. It is possible that they relate to a fragmented linear ditch-like feature truncated by ridge and furrow (17).

Anomalies with an agricultural origin

(17) – A series of parallel linear anomalies relate to ridge and furrow.

4 CONCLUSION

4.1.1 The results of the magnetometer survey demonstrate that much of the site contains ridge and furrow and widespread magnetic debris, especially within the grounds of Kissing Tree House. Magnetic debris and disturbance relate to ferrous material of modern origin and have the potential to obscure weak anomalies.

4.1.2 Several positive linear anomalies possibly indicative of former ditch-like features were located. Although they have been classified as uncertain in origin, some may have been partly truncated by ridge and furrow cultivation which may indicate that they have archaeological potential. The survey also located several discrete positive anomalies, and it is possible that some relate to pit-like features.

5 REFERENCES

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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 ±5nT and ±3nT 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

Area 1

COMPOSITE
Filename: J659-mag-Area1-proc.xcp
Description: Imported as Composite from: J659-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 423245.250887159, 256440.83816541 m
Southeast corner: 423437.250887159, 256251.83816541 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 551000
Dimensions
Composite Size (readings): 1280 x 1260
Survey Size (meters): 192 m x 189 m
Grid Size: 192 m x 189 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats
Max: 5.53
Min: -5.50
Std Dev: 2.72
Mean: -0.08
Median: 0.01
Composite Area: 3.6288 ha
Surveyed Area: 1.5611 ha
PROGRAM
Name: TerraSurveyor
Version: 3.0.29.1
Processes: 1
1 Base Layer
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -5.00 to 5.00 nT

Area 2

COMPOSITE
Filename: J659-mag-Area2-proc.xcp
Description: Imported as Composite from: J659-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 423380.179112298, 256232.97576363 m
Southeast corner: 423423.229112298, 256189.77576363 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 48900
Dimensions
Composite Size (readings): 287 x 288
Survey Size (meters): 43.1 m x 43.2 m
Grid Size: 43.1 m x 43.2 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats
Max: 3.00
Min: -3.00
Std Dev: 1.37
Mean: -0.02
Median: 0.07
Composite Area: 0.18598 ha
Surveyed Area: 0.112 ha
Processes: 2
1 Base Layer
2 Clip from -3.00 to 3.00 nT
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -5.00 to 5.00 nT

Area 3

COMPOSITE
Filename: J659-mag-Area3.xcp
Description: Imported as Composite from: J659-mag-Area3.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 423424.455003322, 256429.685502512 m
Southeast corner: 423531.255003322, 256278.035502512 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 247700
Dimensions
Composite Size (readings): 712 x 1011
Survey Size (meters): 107 m x 152 m
Grid Size: 107 m x 152 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.95
Mean: -0.05
Median: 0.04
Composite Area: 1.6196 ha
Surveyed Area: 0.67663 ha
Processes: 1
1 Base Layer
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Area 4

COMPOSITE
Filename: J659-mag-Area4-proc.xcp
Description: Imported as Composite from: J659-mag-Area4.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y): OSGB36
Northwest corner: 423439.413428247, 256288.682211017 m
Southeast corner: 423565.713428247, 256196.432211017 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 226700
Dimensions
Composite Size (readings): 842 x 615
Survey Size (meters): 126 m x 92.3 m
Grid Size: 126 m x 92.3 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.36
Mean: 0.01
Median: 0.02
Composite Area: 1.1651 ha
Surveyed Area: 0.61527 ha
Processes: 1
1 Base Layer
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 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.

Three printed copies of the report and a PDF copy will be supplied to the Warwickshire Historic Environment Record. The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS). A summary of the survey will also be supplied to *West Midlands Archaeology.*

Geophysical data path: J659 Alveston\Data				
Path and Filename	**Software**	**Description**	**Date**	**Creator**
alveston1\MX\ alveston2\MX\ alveston2\MX\ alveston2\MX\ .prm .dgb .disp	Sensys MXPDA	Proprietary data formats representing magnetometer survey traverses logged to a PDA.	18/04/16	D.J.Sabin
alveston1\MX\J659-mag-Area1.asc alveston2\MX\J659-mag-Area2.asc alveston3\MX\J659-mag-Area3.asc alveston4\MX\J659-mag-Area4.asc	Sensys DLMGPS	ASCII CSV (tab) file representing survey Area 1 in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number.	21/04/16	D.J.Sabin
Area1\comps\J659-mag-Area1.xcp Are2\comps\J659-mag-Area2.xcp Area3\comps\J659-mag-Area3.xcp Area4\comps\J659-mag-Area4.xcp	TerraSurveyor 3.0.23.0	Composite data file derived from ASCII CSV.	22/04/16	D.J.Sabin
Area1\comps\J659-mag-Area1-proc.xcp Area2\comps\J659-mag-Area2-proc.xcp Area3\comps\J659-mag-Area3-proc.xcp Area4\comps\J659-mag-Area4-proc.xcp	TerraSurveyor 3.0.23.0	Processed composite data file (zmt and clipping to ±5nT for Area 1 ±3nT for Areas 2, 3 & 4).	22/04/16	D.J.Sabin
Graphic data - path: J659 Alveston\Data				
Area1\graphics\ J659-mag-Area1-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±5nT.	22/04/16	K.T.Donaldson
Area1\graphics\ J659-mag-Area1-proc.tif	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	22/04/16	K.T.Donaldson
Area2\graphics\ J659-mag-Area2-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±3nT.	22/04/16	K.T.Donaldson
Area2\graphics\ J659-mag-Area2-proc.tif	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	22/04/16	K.T.Donaldson
Area3\graphics\ J659-mag-Area3-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±3nT.	22/04/16	K.T.Donaldson
Area3\graphics\ J659-mag-Area3-proc.tif	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	22/04/16	K.T.Donaldson
Area4\graphics\ J659-mag-Area4-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±3nT.	22/04/16	K.T.Donaldson
Area4\graphics\ J659-mag-Area4-proc.tif	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	22/04/16	K.T.Donaldson
CAD data - path: J659 Alveston\CAD				
J659 version 3.dwg	ProgeCAD 2016	CAD file for creating plots of greyscales, abstraction, interpretation and mapping. Grid coordinates as OSGB. AutoCAD 2010 format.	22/04/16	K.T.Donaldson
Text data - path: J659 Alveston \Documentation				
J659 report.odt	OpenOffice.org 3.0.1 Writer	Report text as an Open Office document.	26/04/16	

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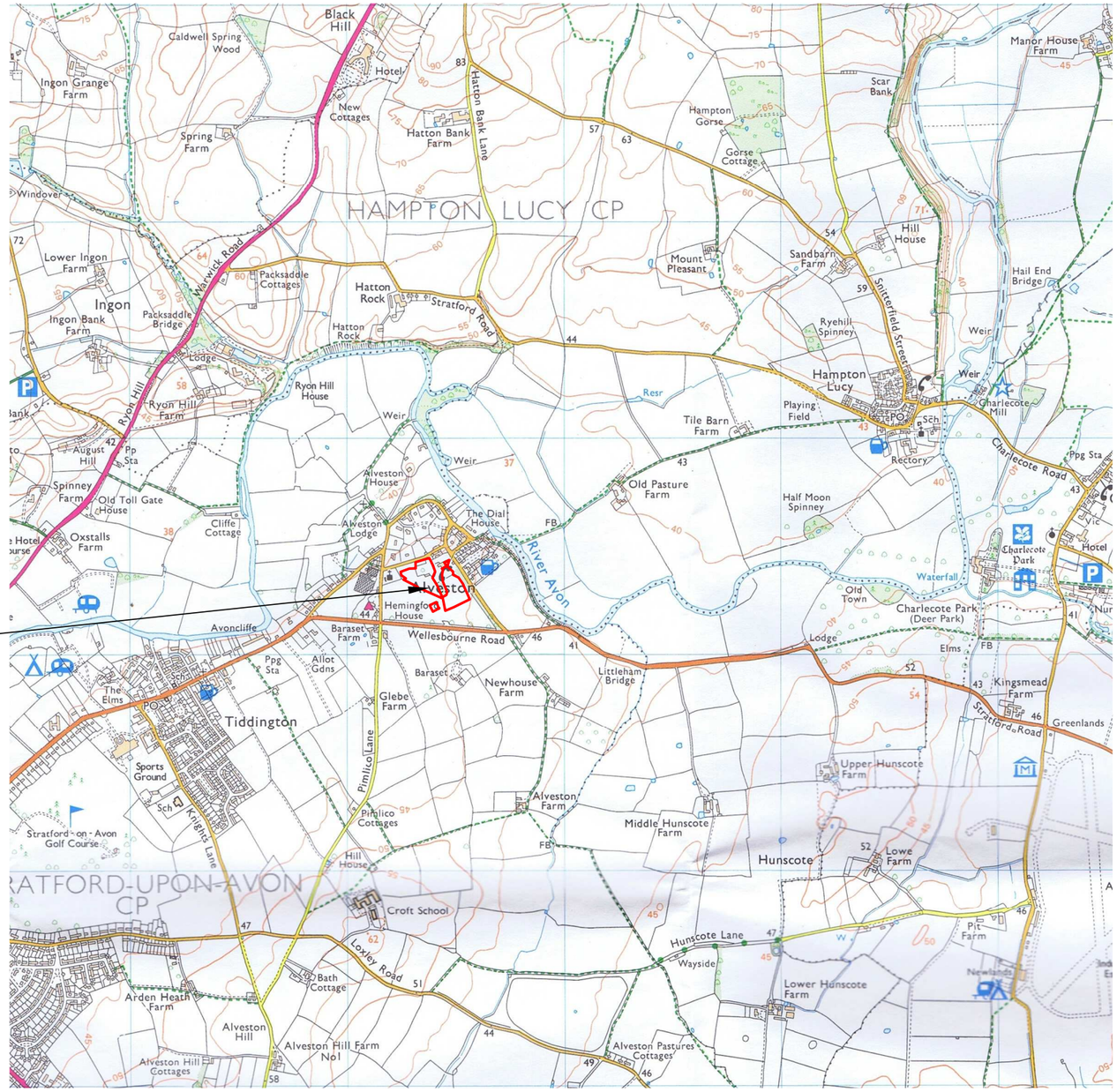
Survey location



N

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Geophysical Survey
Land adjacent to Kissing Tree House
Alveston
Warwickshire

Map of survey area

● Survey location

Site centred on OS NGR SP 23405 56310

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01

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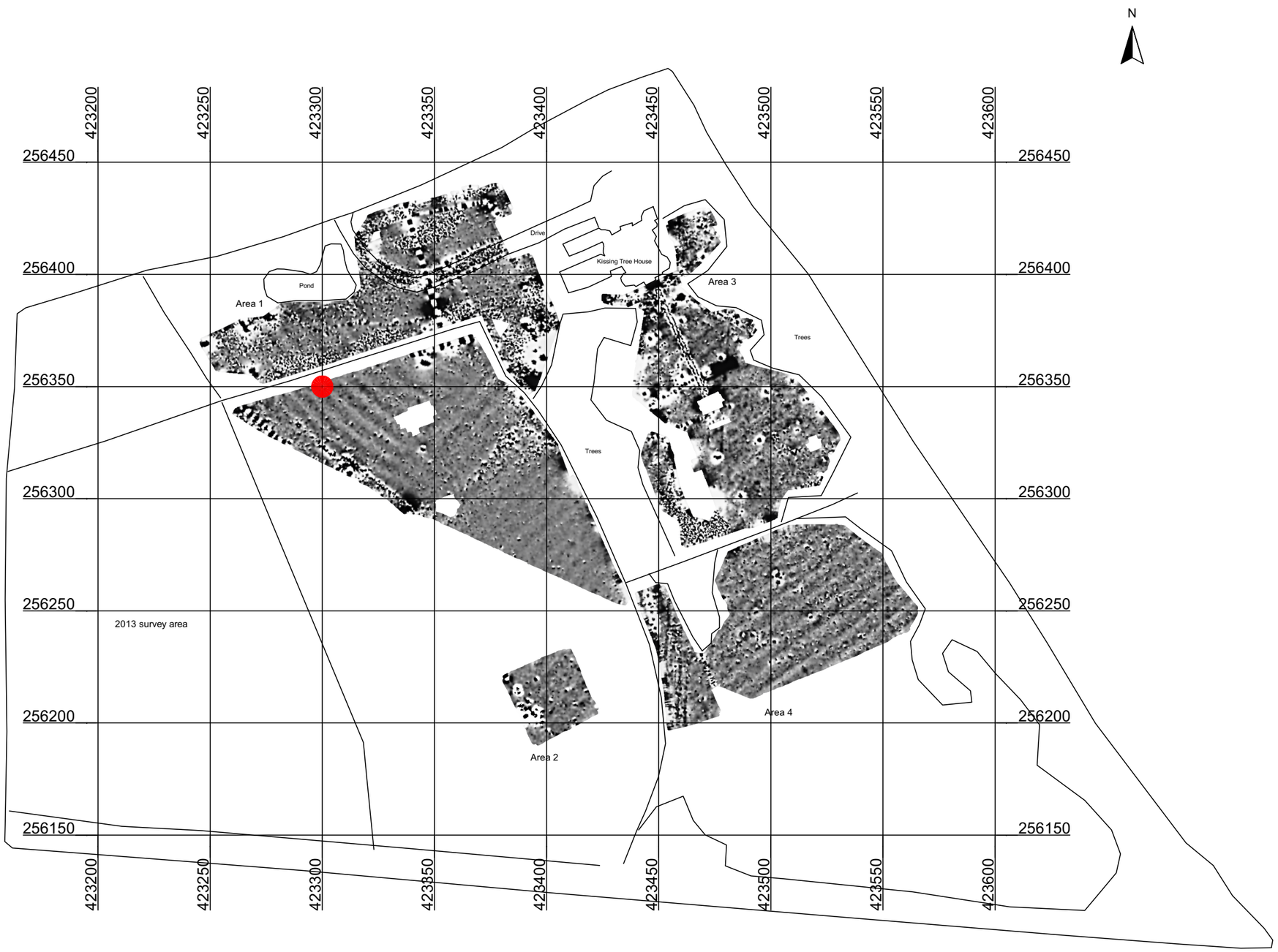
Geophysical Survey
Land adjacent to Kissing Tree House Alveston Warwickshire

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

● 423300 256350

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

FIG 02

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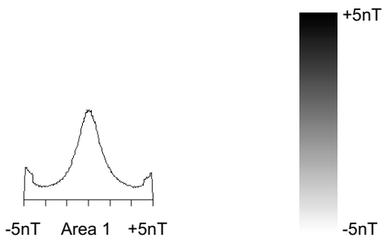
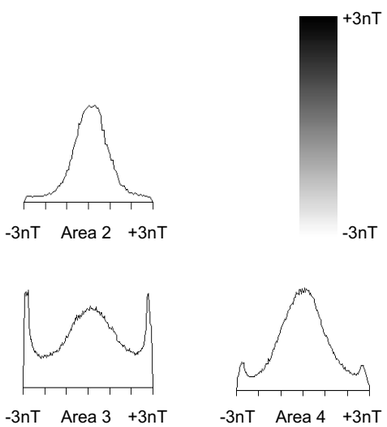
Greyscale plot of minimally processed magnetometer data





SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 03

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Alveston
Warwickshire

Abstraction and interpretation of magnetometer anomalies

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 04