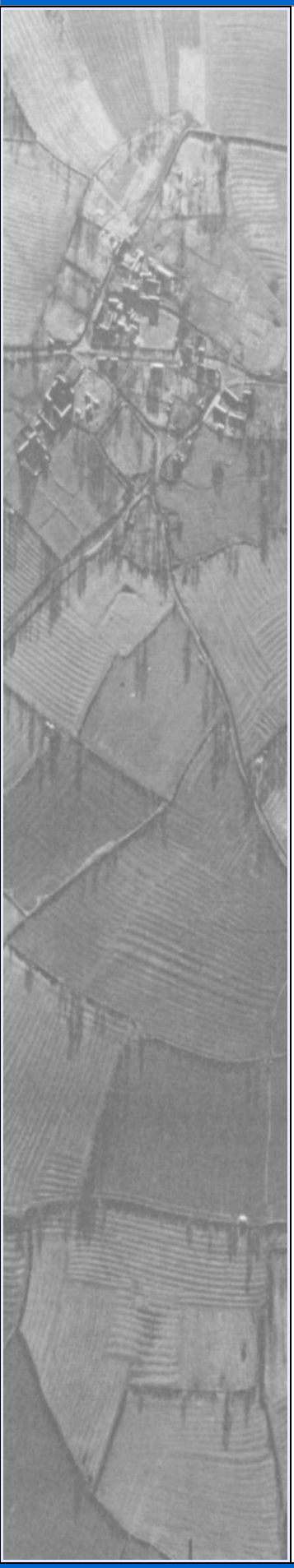

Mansell Farm
Newbold-on-Stour
Warwickshire

MAGNETOMETER SURVEY REPORT

for

Richborough Estates Ltd

David Sabin and Kerry Donaldson

February 2015

Ref. no. 590

ARCHAEOLOGICAL SURVEYS LTD

Mansell Farm
Newbold-on-Stour
Warwickshire

Magnetometer Survey Report

for

Richborough Estates Ltd

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

Survey date – 9th February 2015
Ordnance Survey Grid Reference – **SP 24530 46045**

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SUMMARY

A detailed magnetometer survey was carried out by Archaeological Surveys Ltd on land at Mansell Farm, Newbold-on-Stour, Warwickshire. The survey located a positive curvilinear anomaly indicative of a ring ditch feature with an 11m diameter. It is possible that this relates to a small Bronze Age funerary monument. Other positive curvilinear and discrete responses are located in the vicinity, but it is not clear if these relate to cut features with archaeological potential or if they are associated with the numerous and widespread pit-like responses of natural origin that extend across the site. A broad positive response that may relate to a boundary feature has also been located. It defines two sets of ridge and furrow in the western part of the site, but appears to be crossed by the ridge and furrow in the centre of the site.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Richborough Estates Ltd, at the request of Iain Soden Heritage Services Ltd, to undertake a magnetometer survey of an area of land at Mansell Farm, Newbold-on-Stour in Warwickshire. The site has been outlined for a proposed residential development and the survey forms part of an archaeological assessment.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2015) and approved by 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 at Mansell Farm and lies on the south western edge of Newbold-on-Stour in Warwickshire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SP 24530 46045, see Figures 01 and 02.

1.3.2 The geophysical survey covers 3ha within a 4.6ha site. The survey areas consist of four paddocks of differing sizes separated by fencing. An area of plantation and the farm buildings and farmyard were not suitable for survey.

Plate 1: Western part of site looking north west

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Boggy ground was encountered adjacent to gateways and survey was avoided in these small zones. No data were collected immediately adjacent to steel-framed agricultural buildings due to high levels of magnetic disturbance. Weather conditions during the survey were fine.

1.4 Site history and archaeological potential

1.4.1 An Archaeological Desk-Based Assessment has been carried out for the site by Iain Soden Heritage Services (IS Heritage, 2014). It outlines that there are no designated or undesignated heritage assets within the site and there has been little archaeological investigation within the vicinity. Within the surrounding area are several cropmark enclosures and settlement sites that are likely to be prehistoric or Roman in date. A small amount of Roman cultural material has been found close to the site, although it is not known if it relates to in-situ activity or casual losses. The site lies outside of the historic

medieval core of Newbold-on-Stour, and it is likely that it was agricultural land since the medieval period, with enclosure by 1850.

1.4.2 There is a lack of known archaeological sites or findspots within the site, but the location of a number of cropmark features in the vicinity may indicate that there is some potential for the site to contain other archaeological features. Although there is no extant ridge and furrow within the site, it is possible that the survey will locate remnants of former ridge and furrow should they be present.

1.4.3 The surface conditions within the site were not suitable for the observation of cultural material during the course of the survey. A broad earth bank was a notable feature crossing the site from south west to north east.

1.5 Geology and soils

1.5.1 The underlying solid geology across the site is Triassic limestone from the Langport Formation (BGS, 2015). The landowner indicated that solid rock was very shallow and located immediately below ploughsoil depth.

1.5.2 The overlying soil across the survey area is from the Sherborne association, which is a brown rendzina. It consists of a shallow, well drained, brashy, calcareous, clayey soil over limestone (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry survey carried out across similar soils has produced good results, although the shallow geology can produce linear and discrete anomalies that at times can be difficult to distinguish from those with an anthropogenic origin. The underlying geology and soils are therefore 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. 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. A filtered image is also displayed in Fig 04 where a high pass filter is applied to smooth data and remove slight variations caused by modern ploughing.

2.3.3 A TIFF 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.

2.3.4 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.

2.3.5 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 four survey areas covering approximately 3ha. The results of the survey within the site will be considered as a whole.

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

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. The soils and underlying geology appear to support strong magnetic contrast. The presence of very fine linear plough marks provides supporting evidence for this. Natural irregularity at the soil – solid geology interface has produced a complex pattern of anomalies that complicates abstraction and interpretation to a degree.

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 within the survey area.

Report sub-heading CAD layer names and plot colour	Description and origin of anomalies
Anomalies with archaeological potential AS-ABST MAG POS CURVILINEAR RING DITCH	Anomalies have the characteristics (mainly morphological) of a ring ditch feature. This can relate to a funerary monument (Bronze Age round barrow) or to a prehistoric dwelling (round house).
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG NEG 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 relating to land management AS-ABST MAG BOUNDARY	Anomalies are mainly linear and may be indicative of the magnetically enhanced fill of cut features (i.e. ditches). The anomalies may be long and/or form rectilinear elements and they may relate to topographic features or be visible on early mapping. Associated agricultural anomalies (e.g. headlands, plough marks and former ridge and furrow) may support the interpretation. 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.
Anomalies with an agricultural origin AS-ABST MAG AGRICULTURAL 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 with a natural origin AS-ABST MAG NATURAL FEATURES	Naturally formed magnetic anomalies are are caused by localised variability in the magnetic susceptibility of soils, subsoils and other drift or solid geologies. Anomalies may be amorphous, linear or curvilinear and may appear 'fluvial' or discrete; the latter are almost impossible to distinguished from pit-like anomalies with an anthropogenic origin. Fluvial, glacial and periglacial processes may be responsible for their formation within drift material and subsoil. Igneous and metamorphic activity can lead to anomalies within more solid geology.
Anomalies associated with magnetic debris AS-ABST MAG STRONG DIPOLAR	Strong discrete dipolar anomalies are responses to ferrous and other magnetically thermoremnant objects, such as brick and tile, within the topsoil.
Anomalies with a modern origin 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 centred on OS NGR 424530 246045, see Figures 03 – 05.

Anomalies of archaeological potential

(1) – A positive curvilinear anomaly is located close to the southern edge of the survey area. It has a range of responses, generally between 7-15nT, but peaking at 22nT. This is a response to the magnetically enhanced fill of a cut feature. It appears as a complete circle with a diameter of 11m. Although there is some variation in the response, and a possible indication of a gap along the southern edge, this appears to be due to truncation by recent agricultural activity rather than a deliberate gap. There appear to be at least two pit-like responses within the interior, and although these may be associated, they are similar to other pit-like responses seen elsewhere in the site. It is not possible to determine if the curvilinear feature relates to a prehistoric round house or a small round barrow ditch.

Anomalies with an uncertain origin

(2) – A weakly positive curvilinear anomaly is located immediately south east of anomaly (1). It is not as clearly defined as anomaly (1) and although it may be a combination of pit-like responses, given the proximity of anomaly (1) an archaeological origin should be considered.

(3) – Two short positive curvilinear anomalies are located 40m west of anomaly (1). Although it is possible that these are naturally formed features, their appearance is similar to a truncated ring ditch.

(4) – A number of discrete positive responses are located in the south western part of the site. They may relate to natural features, but the location of the ring ditch (1) in the vicinity means an anthropogenic origin cannot be ruled out for these pit-like responses.

(5) – The western part of the survey area contains two negative linear anomalies. It is not possible to determine if these relate to anthropogenic features, or natural features such as cracks within the underlying geology.

Anomalies associated with land management

(6) – A broad, positive response extends across the majority of the survey area. It defines a former headland relating to two series of ridge and furrow (7) and (8) in the western part of the site, but appears that it may underlie the ridge and furrow (7) in the central part of the site. The feature appears to survive as a very broad low earth bank crossing the site from south west to north east.

Anomalies with an agricultural origin

(7) – A series of parallel linear anomalies are oriented parallel with the western field boundary and relate to former ridge and furrow. They appear to underlie the former boundary feature (6) in the central part of the site.

(8) – A series of parallel linear anomalies that are oriented parallel with anomaly (6) and located in the south western corner of the survey area.

(9) – The site contains two series of linear anomalies, parallel with the northern and western field boundaries and seen as a series of narrow alternate positive and negative linear responses. This has been caused by relatively modern cultivation.

Anomalies with a natural origin

(10) – Located across the majority of the site are numerous discrete positive responses. Zones of them have been abstracted, but they are apparent in every part. It is likely that they are a response to an increased depth of topsoil within depressions and pits. This can relate to periglacial features, tree throw pits, or agricultural activity, but it seems likely that they are of natural origin.

Anomalies associated with magnetic debris

(11) – The site contains a small number of strong, discrete, dipolar anomalies which are a response to ferrous and other magnetically thermoremnant objects within the topsoil.

Anomalies with a modern origin

(12) – Magnetic disturbance has been caused by adjacent ferrous material used within surrounding fencing.

4 CONCLUSION

4.1.1 The detailed magnetometer survey located a ring ditch feature with an 11m diameter in the south western part of the site. The response indicates a complete circle that does not appear to have been truncated by the ridge and furrow, but has been by more modern cultivation. There is no clear gap or entrance within the ring ditch and it is possible that it relates to an archaeological feature such as a Bronze Age round barrow rather than prehistoric round house. Other partial positive curvilinear and discrete anomalies in the vicinity may be associated; however, there are widespread discrete responses across the site that are likely to relate to natural features. It is, therefore, not clear if there are other features with archaeological potential in the vicinity.

4.1.2 The majority of the site contains numerous pit-like responses of natural origin

and evidence of former ridge and furrow. A broad positive response extends across the site from the south western to north eastern boundaries and it may indicate a former land boundary. It is visible as a very broad low earthwork. In the western part of the site this acts as a headland between two series of ridge and furrow, in the central part of the site the ridge and furrow may extend across this feature.

5 REFERENCES

Archaeological Surveys, 2015. *Mansell Farm, Newbold-on-Stour, Warwickshire, Geophysical Survey Written Scheme of Investigation.* Unpublished typescript document.

British Geological Survey, 2015. *Geology of Britain viewer, 1:50 000 scale [online]* available from http://mapapps.bgs.ac.uk/geologyofbritain/home.html [accessed 19/1/2015].

English Heritage, 2008. *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No.1.* 2nd ed. Swindon: English Heritage.

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 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 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.

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: J590-mag-Area1-proc.xcp
Description: Imported as Composite from: J590-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 424392.000463538, 246095.957855587 m
Southeast corner: 424571.100463538, 245915.957855587 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 466700

Dimensions
Composite Size (readings): 995 x 1000
Survey Size (meters): 179 m x 180 m
Grid Size: 179 m x 180 m
X Interval: 0.18 m
Y Interval: 0.18 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 14.54
Mean: 0.40
Median: 0.00
Composite Area: 3.2238 ha
Surveyed Area: 1.6979 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 Clip from -30.00 to 30.00 nT

Area 1 filtered data

COMPOSITE
Filename: J590-mag-Area1-proc-hpf.xcp
Description: Imported as Composite from: J590-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 424392.000463538, 246095.957855587 m
Southeast corner: 424571.140463538, 245915.907855587 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 466700

Dimensions
Composite Size (readings): 1378 x 1385
Survey Size (meters): 179 m x 180 m
Grid Size: 179 m x 180 m
X Interval: 0.13 m
Y Interval: 0.13 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 12.43
Mean: 0.60
Median: -0.10
Composite Area: 3.2254 ha
Surveyed Area: 1.6999 ha

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 High pass Uniform (median) filter: Window dia: 150
4 Clip from -30.00 to 30.00 nT

Area 2

COMPOSITE
Filename: J590-mag-Area2-proc.xcp
Description: Imported as Composite from: J590-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 424485.434429425, 246117.024516944 m
Southeast corner: 424585.184429425, 246003.174516944 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 100900

Dimensions
Composite Size (readings): 665 x 759
Survey Size (meters): 99.8 m x 114 m
Grid Size: 99.8 m x 114 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 13.84
Mean: 0.36
Median: -0.05
Composite Area: 1.1357 ha
Surveyed Area: 0.35118 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 Clip from -30.00 to 30.00 nT

Area 3

COMPOSITE
Filename: J590-mag-Area3-proc.xcp
Description: Imported as Composite from: J590-mag-Area3.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 424508.765738483, 246134.691742484 m
Southeast corner: 424614.845738483, 246018.851742484 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 117900

Dimensions
Composite Size (readings): 663 x 724
Survey Size (meters): 106 m x 116 m
Grid Size: 106 m x 116 m
X Interval: 0.16 m
Y Interval: 0.16 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 14.39
Mean: 0.52
Median: -0.16
Composite Area: 1.2288 ha
Surveyed Area: 0.41029 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 Clip from -30.00 to 30.00 nT

Area 4

COMPOSITE
Filename: J590-mag-Area4-proc.xcp
Description: Imported as Composite from: J590-mag-Area4.asc
Instrument Type: Sensys DLMGPS

Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 424567.776479226, 246141.015539089 m
Southeast corner: 424638.876479226, 246077.265539089 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 68400

Dimensions
Composite Size (readings): 474 x 425
Survey Size (meters): 71.1 m x 63.8 m
Grid Size: 71.1 m x 63.8 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 15.13
Mean: 0.63
Median: -0.11
Composite Area: 0.45326 ha
Surveyed Area: 0.23478 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 Clip from -30.00 to 30.00 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). Three copies of the printed report will be issued to Warwickshire County Council (Archaeological Planning and Advice and the Historic Environment Record) and a PDF uploaded to Oasis. A summary of the report will also be submitted to the editor of *West Midlands Archaeology*.

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),
- OpenOffice.org 3.0.1 Writer (document text),
- PDF Creator version 0.9 (PDF)
- Solid PDF Creator version 8 (PDF archive).

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 TIF images,
- CAD DWG files in 2007 version,
- report text as OpenOffice.org ODT file,
- report text and Figures as PDF / PDF/A.

Archaeological Surveys Ltd

Geophysical Survey
Mansell Farm
Newbold-on-Stour
Warwickshire

Map of survey area

Survey location

Survey location

Site centred on OS NGR
SP 42530 46045

SCALE 1:25 000

0m 500m 1000m

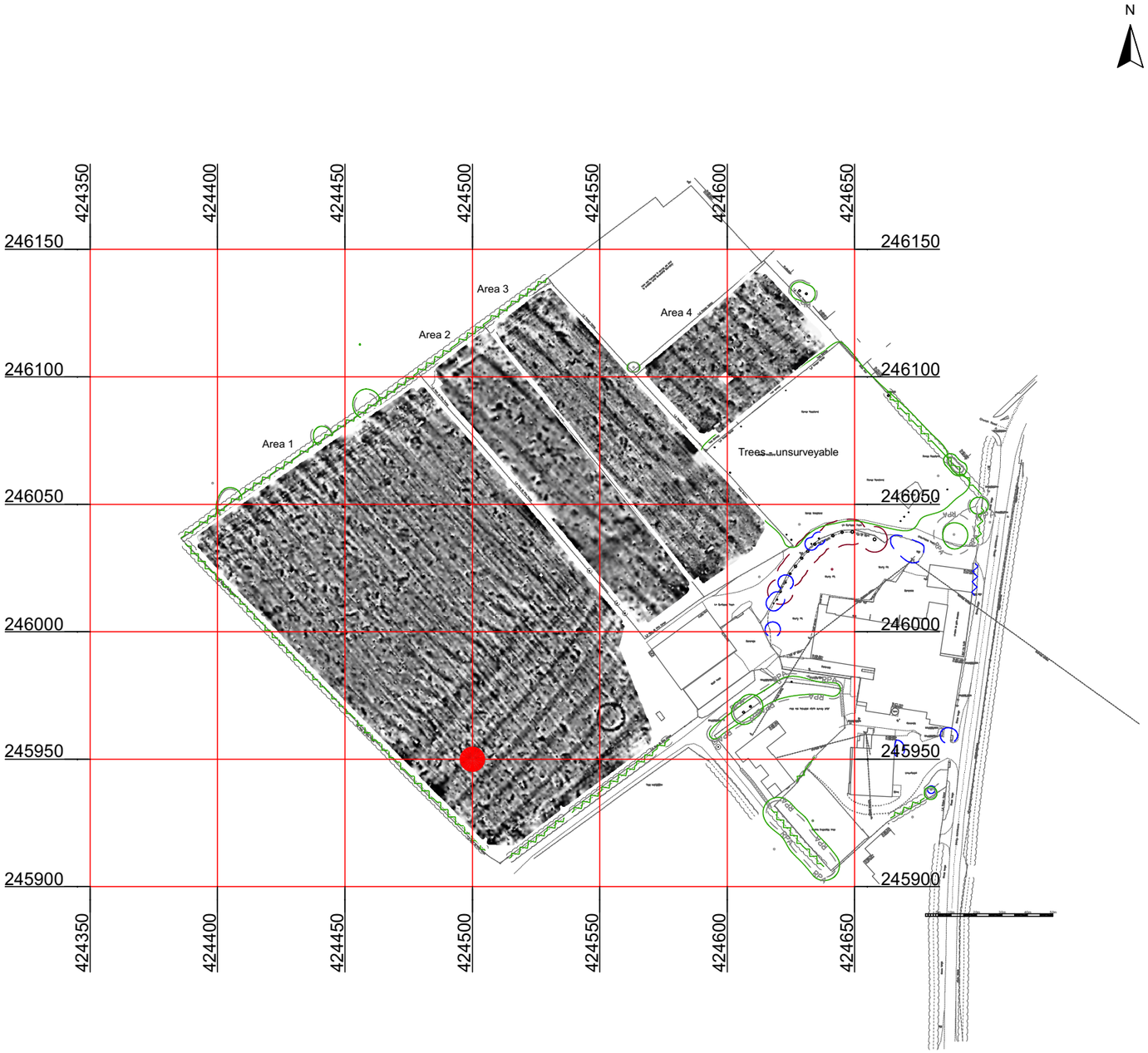
SCALE TRUE AT A3

FIG 01

Archaeological Surveys Ltd

Geophysical Survey
Mansell Farm
Newbold-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

● 424500 245950

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

FIG 02

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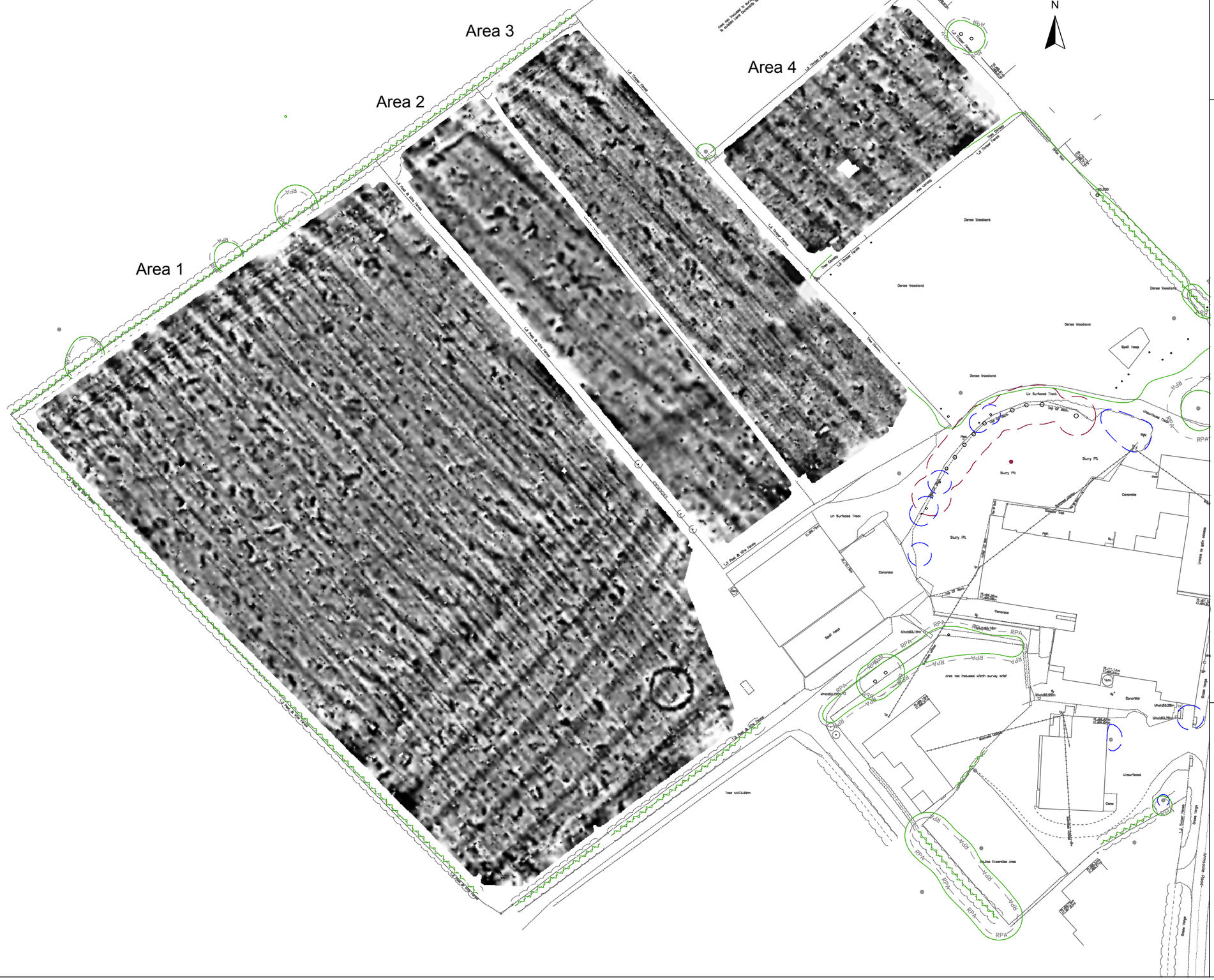
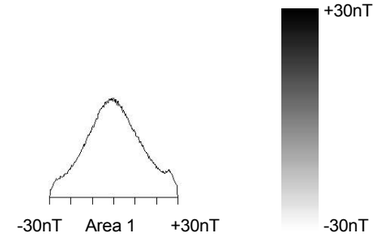
Greyscale plot of minimally processed magnetometer data





SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 03

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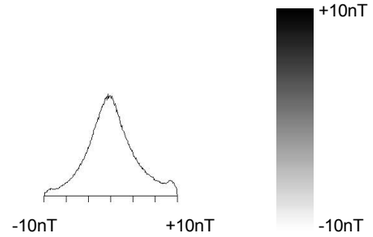
Greyscale plot of filtered magnetometer data - Area 1



Area 1

Area 2

Area 3

Area 4

N

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 04

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Abstraction and interpretation of magnetometer anomalies

- Positive curvilinear anomaly - ring ditch of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Linear anomaly - ridge and furrow
- Linear anomaly - of agricultural origin
- Discrete positive response - possible pit-like feature
- Positive linear anomaly - possible former field boundary
- Zone of discrete positive responses - of possible natural origin
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 05