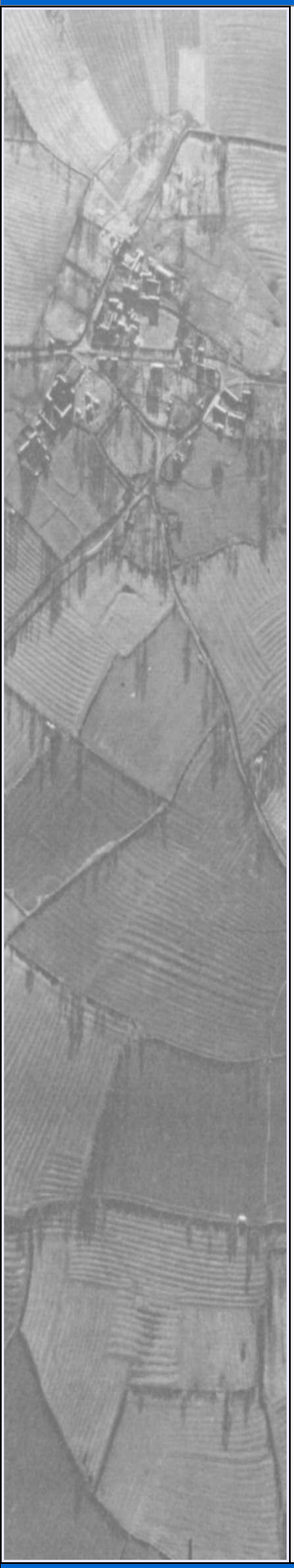

Land off Marlborough Road
Coate
Swindon

MAGNETOMETER SURVEY REPORT

for

Hannick Homes &
Mrs R Hibberd

Kerry Donaldson & David Sabin

May 2016

Ref. no. 663

ARCHAEOLOGICAL SURVEYS LTD

Land off Marlborough Road
Coate
Swindon

Magnetometer Survey Report

for

Hannick Homes &
Mrs R Hibberd

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 – 16th May 2016
Ordnance Survey Grid Reference – **SU 18780 82540**

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SUMMARY

Detailed magnetometry was carried out over an area of land at Coate, Swindon. The site comprises a lawn, bisected by a driveway in the north of the site (Area 1), a paddock (Area 2) and a narrow strip of garden (Area 3). The results demonstrate the presence of a number of enclosures, linear ditches and pits within Area 1 with evidence for phases and possible industrial activity close by. Within Area 2 the responses are generally weak, with indistinct positive and negative linear anomalies of uncertain origin located. In Area 3 positive and negative responses, along with magnetic debris, are also of uncertain origin; however, it is possible that they are related with a former path and/or the recent use of the site as a garden.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Nick Cleverley, on behalf of Hannick Homes and Mrs R Hibberd, to undertake a magnetometer survey of an area of land to the south of Marlborough Road, Coate, Swindon. The site has been outlined for a potential redevelopment and 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 close to Coate to the south of Marlborough Road and to the north-west of the Great Western Hospital, Swindon. The majority of the site lies within the parish of Liddington (Areas 1 & 2), with the south-western part of the site within the parish of Chiseldon (Area 3). It is centred on Ordnance Survey National Grid Reference (OS NGR) SU 18780 82540, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 1.3ha within a lawned area (Area 1), a small paddock (Area 2) and a garden (Area 3). Area 1 is bisected by a driveway that was magnetically noisy and excluded from the survey. The area is also surrounded by trees and shrubs that restrict survey around its periphery. Area 2 contained patches of saturated ground and very high levels of magnetic disturbance from industrial buildings immediately to the north and east. Area 3 was fragmented by numerous shrubs, trees and other obstacles.

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. In the centre of the site is a tennis court, surrounded by mature trees which prevented survey within this area. Weather conditions during the survey were fine and sunny.

1.4 Site history and archaeological potential

1.4.1 The Wiltshire Historic Environment Record lists that the northern edge of the survey area is the site of a former 19th century outfarm located to the south east of Lower Snodshill. Approximately 100m-200m to the west is the location of a number of linear ditches, a ring ditch and a rectangular enclosure with evidence for industrial activity identified through geophysical surveying by Pre-Construct Geophysics and evaluation in 2005/2006 by Oxford Archaeology (Tannahill & Pomeroy-Kellinger, 2006) and now part of the new Badbury Park development.

1.4.2 Approximately 250m-500m to the south-east a number of prehistoric pits, ditches, a kiln and Roman-British pits, settlement features and a farmstead were also located through a series of evaluations prior to the construction of the Great Western Hospital. There are two scheduled monuments in the vicinity, with the site of a Neolithic stone circle at Day House Farm (Scheduled monument no. 28956, list entry no 1016359) 600m to the south-west and a bowl barrow (Scheduled Monument no, 28971, list entry no, 1016363) 85m north-east of Day House Cottages, approximately 680m west of the site.

1.4.3 The location of a number of archaeological features including linear ditches, pits and enclosures in the vicinity of the site may indicate that there is potential for further features to be located within the survey area.

1.5 Geology and soils

1.5.1 The underlying geology is mudstone from the Gault Formation in the southern half of the site, with Lower Greensand in the northern half (BGS, 2016).

1.5.2 The overlying soil across the site is from the Wickham 3 association and is a typical stagnogley soil. It consists of a slowly permeable, seasonally waterlogged, fine loamy over clayey soil (Soil Survey of England and Wales, 1983).

1.5.3 The underlying geology and soils are frequently associated with low magnetic

contrast and low levels of magnetic susceptibility. However, cut features of archaeological potential may be located where human activity has altered the magnetic characteristics of the soil sufficiently. 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 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 is 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 The data are collected between limits of ±10000nT and clipped for display at ±8nT for Areas 1 & 3 and ±2nT for Area 2. 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.

2.3.2 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. A filtered image for Area 2 is also displayed in Fig 04 where a high pass filter is applied to smooth data caused by very strong magnetic interference.

2.3.3 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.

2.3.4 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.

2.3.5 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.

2.3.6 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.

2.3.7 A digital archive is produced with this report, see Appendix D below. The main

archive is held at the offices of Archaeological Surveys Ltd.

3 RESULTS

3.1 General assessment of survey results

3.1.1 The detailed magnetic survey was carried out over a total of three survey areas covering approximately 1ha.

3.1.2 Magnetic anomalies located can be generally classified as positive responses of archaeological potential, positive and negative anomalies of an uncertain 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.

3.2 Statement of data quality

3.2.1 Data are considered representative of the magnetic anomalies present within the site. Very high levels of magnetic disturbance were encountered within some parts of the site. It is related to modern ferrous material and has the potential to obscure weak 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 archaeological potential AS-ABST MAG POS LINEAR ARCHAEOLOGY AS-ABST MAG POS DISCRETE ARCHAEOLOGY AS-ABST MAG POS ENCLOSURE DITCH 	Anomalies have the characteristics (mainly morphological) of a range of archaeological features such as pits, ring ditches, enclosures, etc..
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 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 418740 182643, see Figs 03 - 05.

Anomalies of archaeological potential

(1) - Positive rectilinear anomaly forming a rectangular enclosure. The response is strongest on the north-eastern and south-western sides (>60nT) which may indicate the fill of the enclosure ditch is magnetically enhanced through former industrial activity. It appears to overlie or cut anomaly (2) and it may have an entrance on the northern edge.

(2 & 3) - A positive rectilinear anomaly (2) appearing to form a partial enclosure and which appears to have been cut by anomaly (1). Anomaly (3) also relates to a small enclosure with a similar response to anomaly (2), (5-10nT).

(4) - Positive linear anomalies extend towards anomaly (1) and relate to cut linear ditches and other possible enclosure ditches. Discrete positive responses may indicate associated pits.

Anomalies with an uncertain origin

(5) - The survey area contains a number of discrete positive responses. It is not clear if they relate to further pits associated with the archaeology or if they are related to more recent ground disturbance.

Anomalies associated with magnetic debris

(6) - Strong, discrete, dipolar anomalies relate to ferrous and other magnetically thermoremnant objects within the topsoil.

Anomalies with a modern origin

(7) - A strong, multiple dipolar, linear anomaly extends along the northern edge of the site and is a response to a buried service.

3.5 List of anomalies - Area 2

Area centred on OS NGR 418810 182528, see Figs 03 - 05.

Anomalies with an uncertain origin

(8) - The survey area contains a small number of very weakly positive linear and negative rectilinear anomalies. It is not possible to determine the age or function of the responses.

(9) - The survey area contains a small number of discrete positive responses that may indicate pit-like features.

Anomalies with a modern origin

(10) - Very strongly magnetic disturbance is a response to steel buildings and vehicles located to the north and east.

3.6 List of anomalies - Area 3

Area centred on OS NGR 418810 182528, see Figs 03 - 05.

Anomalies with an uncertain origin

(11) - Area 3 contains a number of discrete positive responses, many associated with the areas of magnetic debris (13). While this type of response may relate to pit-like features, the location within a garden may indicate that they relate to more recent ground disturbance.

(12) - The survey area contains a number of short, parallel, negative linear anomalies. This type of response may relate to land drainage; however, their origin is uncertain.

Anomalies associated with magnetic debris

(13) - A number of patches of weakly magnetic debris have been located. Although this type of response may relate to dumping of magnetically thermoremnant material, the response is relatively weak. A path is mapped extending the length of the garden towards the pond to the south-east in 1969 and an association is possible.

4 CONCLUSION

4.1.1 The detailed magnetometer survey located a number of rectangular enclosures and linear ditches and pits in the north-western part of the site (Area 1). The strength of the response within parts of the enclosure ditches may indicate nearby industrial activity. There is evidence for phases of use and construction of the enclosures.

4.1.2 Within Area 2 the magnetic response was generally very weak, but a small number of weakly positive linear and discrete anomalies were located and a number of negative linear and rectilinear anomalies. It is not possible to determine the origin of these responses.

4.1.3 Area 3 lies within a narrow strip of garden and a number of positive discrete responses, negative linear anomalies and weakly magnetic debris have been located. A path is recorded along the length of the garden in 1969 and an association is possible.

5 REFERENCES

Aspinall, A., Gaffney, C. and Schmidt, A. 2009. *Magnetometry for Archaeologists*. Lanham (US), AltaMira Press.

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Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 5 South West England.*

Tannahill, R. & Pomeroy-Kellinger, M., 2006. *Swindon Gateway, Coate, Swindon, Wiltshire, Archaeological Evaluation and Fieldwalking Survey* Report. Ref 2961. Oxford Archaeology.

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

Filename: J663-mag-Area1-proc.xcp
Description: Imported as Composite from: J663-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 418703.79689925, 182675.905555543 m
Southeast corner: 418784.94689925, 182598.205555543 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 85100
Dimensions
Composite Size (readings): 541 x 518
Survey Size (meters): 81.2 m x 77.7 m
Grid Size: 81.2 m x 77.7 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats
Max: 8.00
Min: -8.00
Std Dev: 4.27
Mean: 0.21
Median: 0.17
Composite Area: 0.63054 ha
Surveyed Area: 0.24435 ha
PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0
Processes: 2
1 Base Layer
2 Clip from -8.00 to 8.00 nT
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -8.00 to 8.00 nT

Area 2

Filename: J663-mag-Area2-proc.xcp
Description: Imported as Composite from: J663-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 418765.737398575, 182623.793221142 m
Southeast corner: 418861.137398575, 182432.993221142 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 234200
Dimensions
Composite Size (readings): 636 x 1272
Survey Size (meters): 95.4 m x 191 m
Grid Size: 95.4 m x 191 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 2.00
Min: -2.00
Std Dev: 1.18
Mean: 0.11
Median: -0.03
Composite Area: 1.8202 ha
Surveyed Area: 0.68867 ha
Processes: 2
1 Base Layer
2 Clip from -2.00 to 2.00 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 2 filtered data

Filename: J663-mag-Area2-proc-hpf.xcp
Description: Imported as Composite from: J663-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 418765.737398575, 182623.793221142 m
Southeast corner: 418861.137398575, 182432.993221142 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702

Source GPS Points: 234200
Dimensions
Composite Size (readings): 636 x 1272
Survey Size (meters): 95.4 m x 191 m
Grid Size: 95.4 m x 191 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats
Max: 2.00
Min: -2.00
Std Dev: 0.76
Mean: -0.01
Median: -0.01
Composite Area: 1.8202 ha
Surveyed Area: 0.68867 ha
Processes: 2
1 Base Layer
2 Clip from -2.00 to 2.00 nT
GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -5.00 to 5.00 nT
5 High pass Uniform (median) filter: Window dia: 330

Area 3

Filename: J663-mag-Area3-proc.xcp
Description: Imported as Composite from: J663-mag-Area3.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 418753.262024318, 182497.025994093 m
Southeast corner: 418793.912024318, 182429.975994093 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 35900
Dimensions
Composite Size (readings): 271 x 447
Survey Size (meters): 40.7 m x 67.1 m
Grid Size: 40.7 m x 67.1 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats
Max: 8.84
Min: -8.80
Std Dev: 4.09
Mean: 0.25
Median: 0.17
Composite Area: 0.27256 ha
Surveyed Area: 0.082874 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 -8.00 to 8.00 nT

Appendix D – digital archive

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

A printed copy of the report and a PDF copy will be supplied to the Wiltshire Historic Environment Record. The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

Geophysical data - path: J663 Coate, Swindon\Data				
Path and Filename	**Software**	**Description**	**Date**	**Creator**
coate1\MX\ coate2\MX\ coate3\MX\ .prm, .dgb.,.disp	Sensys MXPDA	Proprietary data formats representing magnetometer survey traverses logged to a PDA.	16/05/16	D.J.Sabin
coate1\MX\J663-mag-Area1.asc coate2MX\J663-mag-Area2.asc coate3\MX\J663-mag-Area3.asc	Sensys DLMGPS	ASCII CSV (tab) file representing survey Area 1 in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number.	17/05/16	K.T.Donaldson
Area1\comps\J663-mag-Area1.xcp Area2\comps\J663-mag-Area2.xcp Area3\comps\J663-mag-Area3.xcp	TerraSurveyor 3.0.23.0	Composite data file derived from ASCII CSV.	17/05/16	K.T.Donaldson
Area1\comps\J663-mag-Area1-proc.xcp Area2\comps\J663-mag-Area2-proc.xcp Area3\comps\J663-mag-Area3-proc.xcp	TerraSurveyor 3.0.23.0	Processed composite data file (zmt and clipping to ±8nT, Areas 1 & 3, ±2nT, Area 2).	17/05/16	K.T.Donaldson
Graphic data - path: J663 Coate, Swindon\Data				
Area1\graphics\ J663-mag -Area1-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±8nT.	17/05/16	K.T.Donaldson
Area1\graphics\ J663-mag -Area1-proc.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	17/05/16	K.T.Donaldson
Area2\graphics\ J663-mag -Area2-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±2nT.	17/05/16	K.T.Donaldson
Area2\graphics\ J663-mag -Area2-proc.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	17/05/16	K.T.Donaldson
Area2\graphics\ J663-mag -Area2-proc-hpf.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±2nT, with high pass filter.	17/05/16	K.T.Donaldson
Area2\graphics\ J663-mag -Area2-proc-hpf.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	17/05/16	K.T.Donaldson
Area3\graphics\ J663-mag -Area3-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±8nT.	17/05/16	K.T.Donaldson
Area3\graphics\ J663-mag -Area3-proc.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	17/05/16	K.T.Donaldson
CAD data - path: J663 Coate, Swindon\CAD				
J663 version 1.dwg	ProgeCAD 2016	CAD file for creating plots of greyscales, abstraction, interpretation and mapping. Grid coordinates as OSGB. AutoCAD 2010 format.	13/05/16	K.T.Donaldson
Text data - path: J663 Coate, Swindon\Documentation				
J663 report.odt	OpenOffice.org 3.0.1 Writer	Report text as an Open Office document.	16/05/16	K.T.Donaldson

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Survey location

N

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Geophysical Survey
Land off Marlborough Road
Coate
Swindon

Map of survey area

● Survey location

Site centred on OS NGR
SU 18775 82560

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01

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Swindon

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

418750 182650

Site boundary

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

FIG 02

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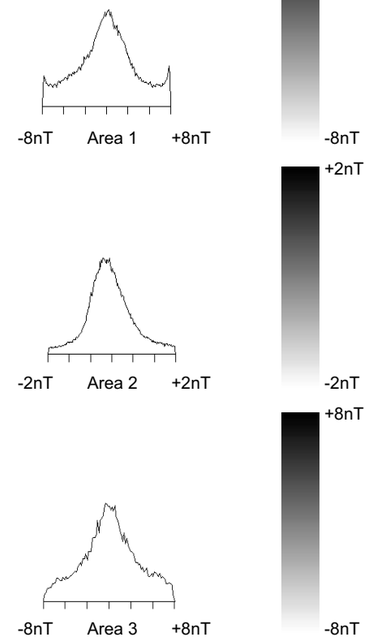
Greyscale plot of minimally processed magnetometer data



SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 03

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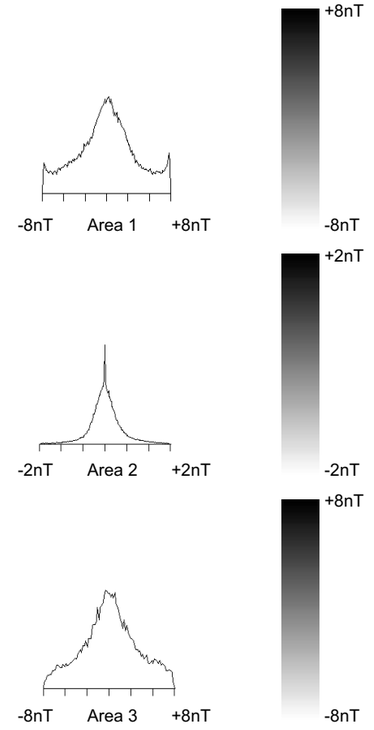
Swindon

Greyscale plot of minimally processed magnetometer data with filtered data in Area 2



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 linear anomaly - cut feature of archaeological potential
- Positive rectilinear anomaly - enclosure ditch
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - cut feature of archaeological potential
- 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 05