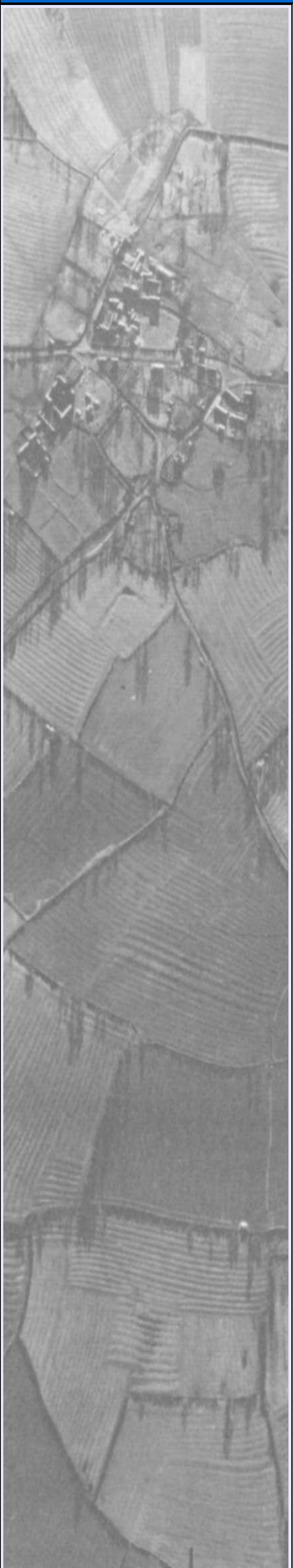
Archaeological Surveys Ltd



Land adjacent to Oxford Road, Calne, Wiltshire

MAGNETOMETER SURVEY REPORT

for

TVAS

on behalf of

Hills Homes

David Sabin and Kerry Donaldson

December 2011

Ref. no. 384

ARCHAEOLOGICAL SURVEYS LTD

Land adjacent to Oxford Road, Calne, Wiltshire

Magnetometer Survey

for

TVAS

on behalf of

Hills Homes

Fieldwork by David Sabin, Jack Cousins & Kerry Donaldson
Report by David Sabin BSc (Hons) MIFA and Kerry Donaldson BSc (Hons)

Survey date - **from 5th to 7th December 2011**
Ordnance Survey Grid Reference - **SU 0054 7218**

Archaeological Surveys Ltd
PO Box 2862, Castle Combe, Chippenham, Wiltshire, SN14 7WZ
Tel: 01249 782234 Fax: 0871 661 8804
Email: info@archaeological-surveys.co.uk
Web: www.archaeological-surveys.co.uk

Archaeological Surveys Ltd is a company registered in England and Wales under registration number 6090102, Vat Reg no. 850 4641 37.
Registered office address, Griffon House, Seagry Heath, Great Somerford, Chippenham, SN15 5EN.

CONTENTS

LIST OF FIGURES

LIST OF PLATES

LIST OF TABLES

SUMMARY

Archaeological Surveys Ltd were commissioned by Thames Valley Archaeological Services, on behalf of Hills Homes, to carry out magnetometry adjacent to Oxford Road, immediately north east of Calne, Wiltshire. The results of the survey demonstrated the presence of magnetic anomalies relating to agricultural activity and a number of positive linear and discrete anomalies of uncertain origin.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Thames Valley Archaeological Services (TVAS), on behalf of Hills Homes, to undertake a magnetometer survey of an area of land adjacent to Oxford Road, Calne, Wiltshire. The site has been outlined for a proposed residential development. 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.

1.2.2 The methodology is considered an efficient and effective approach to archaeological prospection. 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*.

1.3 Site location, description and survey conditions

1.3.1 The site is located at the north eastern edge of Calne in Wiltshire and is centred on Ordnance Survey National Grid Reference (OS NGR) SU 00545 72185, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 9ha of pasture land, used for grazing horses, split between two fields that are divided by a trackway. The northern field is referred to as Area 1, the southern as Area 2, see Plates 1 and 2. Area 2 was partly split by temporary electric fencing. The western edge of the site is bounded by the Oxford Road, beyond which lies the Porte Marsh Industrial Estate, and to the east lies Penn Hill Farm Industrial Estate. The land slopes up gently towards the east.

Plate 1: Survey Area 1 (northern field) looking south east

Plate 2: Survey Area 2 (southern field) looking north

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Patches of long grass were encountered within both of the survey areas. Some very muddy patches within Area 2 restricted survey across a very small proportion of the site. Weather conditions during the survey generally fine.

1.4 Site history and archaeological potential

1.4.1 The northern part of the site lies approximately 500m south of Scheduled Monument No 31656; a medieval settlement 520m north east of Lower Beversbrook Farm. The monument consists of earthwork remains of a deserted medieval settlement including house platforms, trackways and ridge and furrow. The Wiltshire SMR also lists Roman pottery findspots in the vicinity of Beversbrook.

1.4.2 There is some potential for the survey to locate cut features and the remains of ridge and furrow, should they be present.

1.5 Geology and soils

1.5.1 The underlying geology is undifferentiated mudstone from the Ampthill Clay Formation and Kimmeridge Clay Formation (BGS, 2010).

1.5.2 The overlying soils across the site are from the Denchworth association which are pelo-stagnogley soils. These consist of slowly permeable, seasonally waterlogged clayey soils (Soil Survey of England and Wales, 1983).

1.5.3 Clayey and waterlogged soils can result in variable magnetic response. However, magnetometer surveys carried out on similar soils and geology in the vicinity of the site have demonstrated good contrast between cut features and the surrounding soil.

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 Bartington Grad 601-2 gradiometers. The instruments effectively measure a magnetic gradient between two fluxgate sensors mounted vertically 1m apart. Two sets of sensors are mounted on a single frame 1m apart horizontally.

2.2.2 The instruments are extremely sensitive and are able to measure magnetic variation to 0.01nanoTesla (nT), with an effective resolution of 0.03nT. The data are limited to ±100nT when surveying with the highest sensitivity. All readings are saved to an integral data logger for analysis and presentation.

2.2.3 The instruments are operated according to the manufacturer's instructions with consideration given to the local conditions. An adjustment procedure is required, prior to collection of data, in order to balance the sensors and remove the effects of the Earth's magnetic field; further adjustment is required during the survey due to instrument drift often associated with temperature change.

2.2.4 It can be very difficult to obtain optimum balance for the sensors due to localised magnetic vectors that may be associated with large ferrous objects, geological/pedological features, 'magnetic debris' within the topsoil and natural temperature fluctuations. Imperfect balance results in a heading error often visible as striping within the data; this can be effectively removed by software processing and generally has little effect on the data unless extreme. Archaeological Surveys use a non-magnetic tripod, with an additional supporting structure, to raise the instrument during the set-up procedure; this has been found to improve the sensor balance.

2.2.5 The Bartington gradiometers undergo regular servicing and calibration by the manufacturer. A current assessment of the instruments is shown in Table 1 below.

Sensor type and serial numbers	Bartington Grad - 01 – 1000 Nos. 084, 085, 242 and 396
Date of certified calibration/service	Sensors 084 and 085 - 6th August 2010 (due Aug 2012) Sensors 242 and 396 - 14th October 2011 (due Oct 2013)
Bandwidth	12Hz (100nT range) both sensors
Noise	<100pT peak to peak
Adjustable errors	<2nT

Table 1: Bartington fluxgate gradiometer sensor calibration results

The instruments were considered to be in good working order prior to the survey, with no known faults or defects.

2.2.6 Data were collected at 0.25m centres along traverses 1m apart. The survey area was separated into 40m by 40m grids (1600m²) giving 6400 measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 2008).

2.2.7 The survey grids were set out to the Ordnance Survey OSGB36 datum using a Penmap RTK GPS and oriented parallel to the eastern field boundaries. The GPS is used in conjunction with Leica's SmartNet service, where positional corrections are sent via a mobile telephone link. Positional accuracy of around 10 – 20mm is possible using the system. The instrument is regularly checked against the ETRS89 reference framework using Ordnance Survey ground marker C1ST7784 (Horton).

2.3 Data processing and presentation

2.3.1 Magnetometry data downloaded from the Grad 601-2 data logger are analysed and processed in specialist software known as ArcheoSurveyor. The software allows greyscale and trace plots to be produced for presentation and display. Survey grids are assembled to form an overall composite of data (composite file) creating a dataset of the complete survey area. Appendix C contains specific information concerning the survey and data attributes and is derived directly from ArcheoSurveyor; this should be used in conjunction with information provided by Figure 02.

2.3.2 Only minimal processing is carried out in order to enhance the results of the survey for display. Raw data are always analysed, as processing can modify anomalies. The following schedule sets out the data and image processing used in this survey:

- clipping of the raw data at ±30nT to improve greyscale resolution,
- clipping of processed data at ±3nT to enhance low magnitude anomalies,
- de-stagger is used to enhance linear anomalies,
- zero median/mean traverse is applied in order to balance readings along each traverse.

Reference should be made to Appendix B for further information on the specific processes carried out on the data. Appendix C metadata includes details on the processing sequence used for each survey area.

2.3.3 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.

2.3.4 The main form of data display prepared for this report is the greyscale plot. Both 'raw' and 'processed' data have been shown followed by an abstraction and interpretation plot. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.

2.3.5 Graphic raster images in bitmap format (.BMP) are initially prepared in ArcheoSurveyor. Regardless of survey orientation, data captured along each traverse are displayed and processed by ArcheoSurveyor from left to right.Prior to displaying against base mapping, raster graphics require a rotation of 61° anticlockwise to restore north to t he top of the image. Greyscale images are rotated by AutoCAD.

2.3.6 The raster images are combined with base mapping using ProgeCAD Professional 2009 and AutoCAD LT 2007, creating DWG file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. Quality can be compromised by rotation of graphics in order to allow the data to be orientated with respect to grid north; this is considered acceptable as the survey results are effectively georeferenced allowing relocation of features using GPS, resection method etc.. A digital archive, including raster images, is produced with this report allowing separate analysis if necessary, see Appendix D below.

3 RESULTS

3.1 General overview

3.1.1 The detailed magnetic survey was carried out over a total of two survey areas covering approximately 9ha. Geophysical anomalies located can be generally classified as positive linear and discrete positive responses of an uncertain origin, linear anomalies of an agricultural origin, areas of magnetic disturbance and strong discrete dipolar anomalies relating to ferrous objects. Anomalies located within each survey area have been numbered and are listed below.

3.1.2 Data are considered representative of the magnetic anomalies across the site. Magnetic disturbance was caused by an electricity sub-station to the north of Area 1 and industrial buildings and services to the west of Area 1. Small areas of magnetic disturbance in both areas are associated with steel water troughs and wire fencing. It is unlikely that the disturbance has obscured minor anomalies of archaeological potential.

3.1.3 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 AS-ABST MAG NEG AREA 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 AGRICULTURAL	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 STRONG DIPOLAR	Strong discrete dipolar anomalies are responses to ferrous objects 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.

Table 2: List and description of interpretation categories

3.2 List of anomalies - Area 1

Area centred on OS NGR 400595, 172275, see Figures 03 – 07.

Anomalies with an uncertain origin

(1 & 2) – Very weak positive linear anomalies extend across some of the northern part of the survey area. The anomalies may indicate former ditch-like features.

(3) – Weakly positive linear anomalies have been located throughout the survey area. Their form and magnitude prevent confident interpretation.

(4) – The survey area contains several discrete positive responses, with a particular linear cluster towards the northern edge. It is possible that they have been caused

by agricultural activity. Their origin is uncertain, although they may indicate former pit-like features.

(5) – A broad, generally negative band extends across the central part of the area. It may indicate a former headland, boundary or track.

Anomalies with an agricultural origin

(6) – The survey area contains a series of parallel linear anomalies and only the general trend has been shown. Some have moderately strong responses indicating that magnetically enhanced material has become incorporated into them. Although the linear anomalies relate to agricultural activity, the origin of the magnetic enhancement is uncertain.

Anomalies associated with magnetic debris

(7) – The survey area contains numerous strong discrete dipolar anomalies which indicate the presence of ferrous objects within the topsoil.

Anomalies with a modern origin

(8) – Magnetic disturbance is a response to ferrous material within and surrounding the site.

3.3 List of anomalies - Area 2

Area centred on OS NGR 400505, 172070, see Figures 03, 04, 05, 08 and 09.

Anomalies with an uncertain origin

(9) – A weakly positive linear anomaly extends across the north of the survey area, from close to the eastern edge towards a water trough in the north western corner.

(10) – Weakly positive linear anomalies oriented north east to south west. It is possible that they relate to agricultural activity, but this is uncertain.

(11) – Weak, discrete anomalies may relate to pit-like features; however their origin cannot be confidently determined.

Anomalies with an agricultural origin

(12) – A general trend of positive linear anomalies can be seen extending across all of the survey area. They are oriented parallel with the northern field boundary (and anomalies (6) in Area 1). The strength of the anomalies indicates that magnetically enhanced material has been incorporated into them, although the origin of this is

uncertain.

(13) – A very weak series of positive linear anomalies can mainly be seen in the southern half of the survey area. They appear to relate to agricultural activity on a different orientation to anomalies (12).

4 CONCLUSION

4.1.1 The detailed magnetometer survey located a number of very weak positive linear anomalies within both survey areas. Due to their very low magnitude and lack of distinctive morphology, the origin of the anomalies could not be established. Several discrete positive anomalies were also located in both survey areas and although they may indicate former pit-like features, their origin cannot be confidently determined.

4.1.2 The survey areas contained parallel linear anomalies of agricultural origin, although it is unclear as to whether they have been caused by ploughing or whether they are related to drainage operations affecting the subsoil. The clayey underlying geology is frequently a cause of waterlogging in the area.

5 REFERENCES

British Geological Survey, 2010. *Geology of Britain viewer, 1:50 000 scale [online]* available from http://maps.bgs.ac.uk/geologyviewer/ [accessed 12/12/2011].

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.

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 gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 1m apart. The instrument is carried about 30cm 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. If no enhanced feature is present the field measured by both sensors will be similar and the difference close to zero.

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 ±1nT 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 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 slight differences between the set-up and stability of gradiometer sensors and can remove striping. The process can remove archaeological features that run along a traverse so data analysis is also carried out prior its application.

De-stagger

Compensates for small positional errors within data collection by shifting the position of the readings along each traverse by a specified amount. Data lost at the end of each traverse are extrapolated from adjacent value in the same row.

Deslope

Corrects for striping and distortion caused by metal objects/services etc.. The process calculates a curve based on a polynomial best fit mathematical function for each traverse. This curve is then subtracted from the actual data.

Edge Match

Calculates the mean of the 2 lines (rows or columns) of data either side of the edge to match. It then subtracts the difference between the means from all datapoints in the selected area.

FFT (Fast Fourier Transform) spectral filtering

A mathematical process used to determine the frequency components of a traverse. Repetitive features, such as plough marks, produce characteristic spectral zones that can be suppressed allowing greyscale images to appear clearer.

Appendix C – survey and data information

Area 1 raw data

COMPOSITE
Filename: J384-mag-Area1-raw.xcp
Instrument Type: Grad 601 (Magnetometer)
Units: nT
Surveyed by: on 06/12/2011
Assembled by: on 06/12/2011
Direction of 1st Traverse: 45 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702

Dimensions
Composite Size (readings): 1280 x 280
Survey Size (meters): 320 m x 280 m
Grid Size: 40 m x 40 m
X Interval: 0.25 m
Y Interval: 1 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 2.21
Mean: -0.16
Median: -0.26
Composite Area: 8.96 ha
Surveyed Area: 5.5285 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 45
1 Col:0 Row:1 grids\21.xgd
2 Col:0 Row:2 grids\22.xgd
3 Col:0 Row:3 grids\23.xgd
4 Col:0 Row:4 grids\20.xgd
5 Col:1 Row:1 grids\24.xgd
6 Col:1 Row:2 grids\25.xgd
7 Col:1 Row:3 grids\26.xgd
8 Col:1 Row:4 grids\17.xgd
9 Col:1 Row:5 grids\18.xgd
10 Col:1 Row:6 grids\19.xgd
11 Col:2 Row:1 grids\27.xgd
12 Col:2 Row:2 grids\28.xgd
13 Col:2 Row:3 grids\29.xgd
14 Col:2 Row:4 grids\14.xgd
15 Col:2 Row:5 grids\15.xgd
16 Col:2 Row:6 grids\16.xgd
17 Col:3 Row:0 grids\39.xgd
18 Col:3 Row:1 grids\30.xgd
19 Col:3 Row:2 grids\31.xgd
20 Col:3 Row:3 grids\32.xgd
21 Col:3 Row:4 grids\11.xgd
22 Col:3 Row:5 grids\12.xgd
23 Col:3 Row:6 grids\13.xgd
24 Col:4 Row:0 grids\40.xgd
25 Col:4 Row:1 grids\33.xgd
26 Col:4 Row:2 grids\34.xgd
27 Col:4 Row:3 grids\35.xgd
28 Col:4 Row:4 grids\08.xgd
29 Col:4 Row:5 grids\09.xgd
30 Col:4 Row:6 grids\10.xgd
31 Col:5 Row:0 grids\41.xgd
32 Col:5 Row:1 grids\36.xgd
33 Col:5 Row:2 grids\37.xgd
34 Col:5 Row:3 grids\38.xgd
35 Col:5 Row:4 grids\05.xgd
36 Col:5 Row:5 grids\06.xgd
37 Col:5 Row:6 grids\07.xgd
38 Col:6 Row:0 grids\42.xgd
39 Col:6 Row:1 grids\43.xgd
40 Col:6 Row:2 grids\44.xgd
41 Col:6 Row:3 grids\45.xgd
42 Col:6 Row:4 grids\02.xgd
43 Col:6 Row:5 grids\03.xgd
44 Col:6 Row:6 grids\04.xgd
45 Col:7 Row:4 grids\01.xgd

Area 1 processed data

COMPOSITE
Filename: J384-mag-Area1-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 0.85
Mean: 0.03
Median: -0.04
Composite Area: 8.96 ha
Surveyed Area: 5.5278 ha

Processes: 9
1 Base Layer
2 DeStripe Mean Traverse: Grids: All Threshold: 1 SDs
3 Clip from -3.00 to 3.00 nT
4 De Stagger: Grids: 34.xgd Mode: Outbound By: -1 intervals
5 De Stagger: Grids: 35.xgd Mode: Outbound By: -1 intervals
6 De Stagger: Grids: 33.xgd Mode: Outbound By: -1 intervals
7 De Stagger: Grids: 45.xgd Mode: Both By: 1 intervals
8 De Stagger: Grids: 02.xgd Mode: Both By: 1 intervals
9 Clip from -3.00 to 3.00 nT

Area 2 raw data

COMPOSITE
Filename: J384-mag-Area2-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 07/12/2011
Assembled by: on 07/12/2011
Direction of 1st Traverse: 45 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702

Dimensions
Composite Size (readings): 960 x 200
Survey Size (meters): 240 m x 200 m
Grid Size: 40 m x 40 m
X Interval: 0.25 m
Y Interval: 1 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 2.44
Mean: -0.46
Median: -0.34
Composite Area: 4.8 ha
Surveyed Area: 3.3791 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 29
1 Col:0 Row:1 grids\16.xgd
2 Col:0 Row:2 grids\17.xgd
3 Col:0 Row:3 grids\18.xgd
4 Col:0 Row:4 grids\19.xgd
5 Col:1 Row:0 grids\13.xgd
6 Col:1 Row:1 grids\14.xgd
7 Col:1 Row:2 grids\15.xgd
8 Col:1 Row:3 grids\20.xgd
9 Col:1 Row:4 grids\21.xgd
10 Col:2 Row:0 grids\10.xgd
11 Col:2 Row:1 grids\11.xgd
12 Col:2 Row:2 grids\12.xgd
13 Col:2 Row:3 grids\22.xgd
14 Col:2 Row:4 grids\23.xgd
15 Col:3 Row:0 grids\07.xgd
16 Col:3 Row:1 grids\08.xgd
17 Col:3 Row:2 grids\09.xgd
18 Col:3 Row:3 grids\24.xgd
19 Col:3 Row:4 grids\25.xgd
20 Col:4 Row:0 grids\04.xgd
21 Col:4 Row:1 grids\05.xgd
22 Col:4 Row:2 grids\06.xgd
23 Col:4 Row:3 grids\26.xgd
24 Col:4 Row:4 grids\27.xgd
25 Col:5 Row:0 grids\01.xgd
26 Col:5 Row:1 grids\02.xgd
27 Col:5 Row:2 grids\03.xgd
28 Col:5 Row:3 grids\28.xgd
29 Col:5 Row:4 grids\29.xgd

Area 2 processed data

COMPOSITE

Filename: J384-mag-Area2-proc.xcp

Stats
Max: 3.00
Min: -3.07
Std Dev: 0.90
Mean: 0.03
Median: 0.00
Composite Area: 4.8 ha
Surveyed Area: 3.3692 ha

Processes: 16
1 Base Layer
2 DeStripe Median Traverse: Grids: All
3 Clip from -3.00 to 3.00 nT
4 De Stagger: Grids: 18.xgd Mode: Both By: 1 intervals
5 De Stagger: Grids: 19.xgd Mode: Outbound By: 1 intervals
6 De Stagger: Grids: 19.xgd Mode: Outbound By: 1 intervals
7 De Stagger: Grids: 17.xgd Mode: Both By: 1 intervals
8 De Stagger: Grids: 24.xgd Mode: Outbound By: 1 intervals
9 De Stagger: Grids: 25.xgd Mode: Outbound By: 1 intervals
10 Clip from -3.00 to 3.00 nT
11 De Stagger: Grids: 27.xgd Mode: Outbound By: 1 intervals
12 De Stagger: Grids: 26.xgd Mode: Outbound By: 1 intervals
13 De Stagger: Grids: 05.xgd Mode: Outbound By: 1 intervals
14 De Stagger: Grids: 04.xgd Mode: Outbound By: 1 intervals
15 Search & Replace From: -100 To: 100 With: Dummy (Area: Top 1, Left 916, Bottom 37, Right 959)
16 Search & Replace From: -100 To: 100 With: Dummy (Area: Top 21, Left 800, Bottom 37, Right 828)

Appendix D – digital archive

Archaeological Surveys Ltd hold the primary digital archive at Castle Combe, 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. Digital data may also supplied to the client on CD ROM, see below.

Surveys are reported on in hardcopy (recycled paper) using A4 for text and A3 for plots (all plots are scaled for A3). The distribution of both hardcopy report and digital data is considered the responsibility of the Client unless explicitly stated in the survey Brief, Written Scheme of Investigation or other contractual agreement.

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

- ArcheoSurveyor version 2.5.14.0 (geophysical data analysis),
- ProgeCAD Professional 2009 (report graphics),
- AutoCAD LT 2007 (report figures),
- OpenOffice.org 3.0.1 Writer (document text),
- PDF Creator version 0.9 (PDF archive).

Digital data may include the following files:

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

The CD ROM structure is formed from a tree of directories under the title J384 Calne – CD. Directory titles include Data, Documentation, CAD and PDFs. Multiple directories exist under Data and hold Grid, Composite and Graphic files with CSV composite data held in Export.

The CAD file contains externally referenced graphics that are rotated with separate A3 size layouts for each figure. Layouts are fixed using frozen layers and named views allowing straightforward plotting or analysis on screen. (Note – CAD files are prepared using AutoCAD's e Transmit function to produce a directory containing the digital drawing along with any externally referenced graphics which may need reloading).