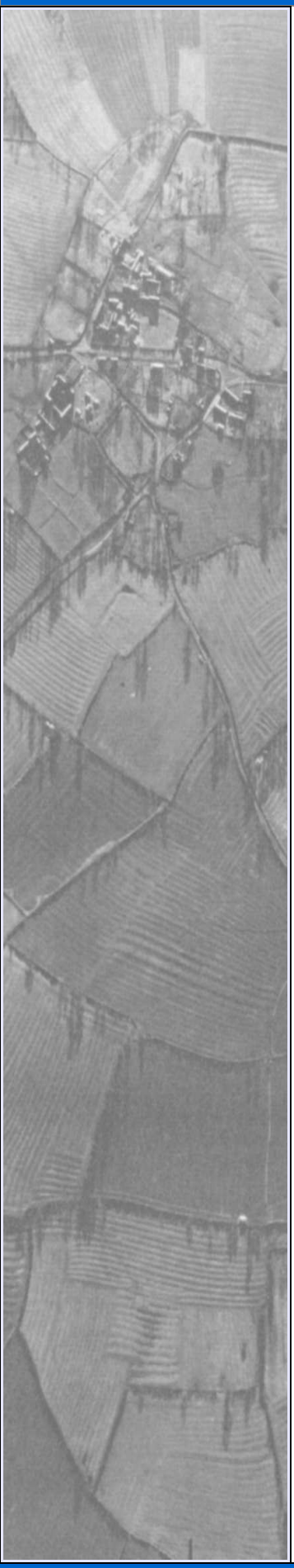

Common Farm
Wroughton
Swindon

MAGNETOMETER SURVEY REPORT

for

Foundations Archaeology

on behalf of

Public Power Solutions Ltd

David Sabin and Kerry Donaldson

February 2015

Ref. no. 589

ARCHAEOLOGICAL SURVEYS LTD

Common Farm
Wroughton
Swindon

Magnetometer Survey Report

for

Foundations Archaeology

on behalf of

Public Power Solutions Ltd

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

Survey dates – 20th to 28th January 2015
Ordnance Survey Grid Reference – **SU 13905 81875**

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SUMMARY

A detailed magnetometer survey was carried out by Archaeological Surveys Ltd, at the request of Foundations Archaeology, on behalf of Public Power Solutions Ltd ahead of a planning application for a solar farm at Common Farm, Wroughton. The survey located a number of positive and negative responses within the majority of the site, but they generally lack a coherent morphology and definition preventing confident interpretation. Several negative linear anomalies can be seen which may relate to drainage features, but these tend to lie within the existing, or recent field boundary layout. A zone of parallel positive linear anomalies can be seen in the eastern part of the site, and it is not clear if these relate to some form of agricultural or drainage activity. Discrete positive anomalies were located in most of the survey areas and some may be indicative of pit-like features. Within the western part of the site several are aligned and may indicate a former boundary feature; however, it is not possible to determine if they are ancient or relatively modern. There are also a number of amorphous positive responses that may indicate natural fluvial features such as former palaeochannels.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Foundations Archaeology, on behalf of Public Power Solutions Ltd, to undertake a magnetometer survey of an area of land at Common Farm, Wroughton. The site has been outlined for a proposed development of a solar farm, and the survey forms part of an archaeological assessment of the site.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2015) and issued to Melanie Pomeroy-Kellinger, County Archaeologist for Wiltshire 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 lies at Common Farm on the northern edge of Wroughton, south of Swindon. It is centred on Ordnance Survey National Grid Reference (OS NGR) SU 13905 81875, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 17ha within 10 parcels of land. These include the main area of solar arrays and a small section at the southern edge of the site for a proposed site compound.

1.3.3 The site is generally flat with a slight rise towards the north. A stream bounds the eastern side of the site and runs north to feed into the River Ray. Ground cover consisted of grazed pasture in all of the survey areas.

1.3.4 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Small zones of poached ground and waterlogging were encountered. Weather conditions during the survey were mainly fine and cold.

1.4 Site history and archaeological potential

1.4.1 The Wiltshire Historic Environment Record indicates that there are a number of archaeological sites in the vicinity. These include a possible double-ditched ring ditch visible on an aerial photo as a vegetation mark in 1991 and located at the eastern edge of the site (MWI16095). Other ring ditch cropmarks are also located 300m south west of the survey area, and also a possible field system and rectilinear enclosure.

1.4.2 Early Ordnance Survey mapping shows that the general layout of the site is still the same as it was in 1886, with newer boundaries inserted since. Located 90m to the south of the eastern part of the site is a disused sewage farm, which was in use from just prior to 1889 until relatively recently.

1.4.3 The location of the possible ring ditch within the eastern part of the site indicates that there is a high potential for the survey to locate archaeological features.

1.5 Geology and soils

1.5.1 The underlying solid geology across the site is mudstone from the Ampthill Clay and Kimmeridge Clay Formations (BGS, 2015).

1.5.2 The overlying soil across the survey area is from the Denchworth association, which is a pelo-stagnogley soil. It consists of a slowly permeable, seasonally waterlogged, clayey soil (Soil Survey of England and Wales, 1983). Surface water and impeded drainage were noted in the south eastern part of the site.

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 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 compensated 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 0.20m along each survey track. Appendix C contains specific information concerning the survey and data attributes and is derived directly from TerraSurveyor. Reference should be made to Appendix B for further information on any processes, such as clipping, carried out on the data.

2.3.3 A TIFF file is produced by TerraSurveyor software along with an associated world file (.TFW) that allows automatic georeferencing (OSGB36 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 10 survey areas covering approximately 17ha.

3.1.2 Magnetic anomalies located can be generally classified as positive and negative anomalies of an uncertain origin, anomalies with a natural origin,

anomalies associated with land management, areas of magnetic debris and disturbance, strong discrete dipolar anomalies relating to ferrous objects and strong, multiple dipolar, linear anomalies.

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.

3.3 Data interpretation

3.3.1 The list of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, a basic key is indicated to allow cross referencing to the abstraction and interpretation plot. CAD layer names are included to aid reference to associated digital files (.dwg/.dxf). Sub-headings are then used to group anomalies with similar characteristics for each survey area.

Report sub-heading CAD layer names and plot colour	**Description and origin of anomalies**
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG NEG LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN AS-ABST MAG POS UNCERTAIN 	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil, or extant gullies or drainage ditches.
Anomalies with a natural origin AS-ABST MAG NATURAL PALAEOCHANNEL AS-ABST MAG NATURAL PITS	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 relating to land management AS-ABST MAG LAND DRAIN 	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 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 Western section (Areas 1, 2, 3, 9 & 10)

3.4.1 Areas 1 & 2 centred on OS NGR 413860 181880, see Figures 05 & 06.

Anomalies with an uncertain origin

(1) – Both survey areas contain a small number of isolated weak discrete anomalies (1-2nT). These may relate to pit-like features, although a natural origin or an association with the widespread magnetic responses (3) is possible.

Anomalies associated with magnetic debris

(2) – A zone of magnetic debris is evident in the north eastern corner of Area 1 and is likely to relate to dumped magnetically thermoremnant material within the field.

(3) – The survey areas contain numerous and widespread strong, discrete, dipolar anomalies which are a response to ferrous and other magnetically thermoremnant objects within the topsoil. The whole site contains a large number of these responses, which indicates that the site may have been subject to manuring with magnetically contaminated material.

3.4.2 Area 3 centred on OS NGR 413875 181770, see Figures 05 & 06.

Anomalies with an uncertain origin

(4) – Located towards the western edge of the survey area are a number of weakly positive linear responses. Their weak response (<1nT) and indistinct form prevent confident interpretation.

(5) – The northern part of Area 3 contains a number of short, weakly positive,

linear anomalies. They do not form any coherent pattern and their origin cannot be determined.

(6) – A very weakly positive response is located at the northern end of the survey area. Although of uncertain origin, it has similar response(<1nT) and orientation to anomaly (29) seen in Area 4 to the east and an association is possible.

Anomalies with a natural origin

(7) – In the south eastern corner of Area 3 are a number of amorphous positive responses (1-2nT). This type of response may indicate a natural feature, such as a palaeochannel.

Anomalies relating to land management

(8) – A multiple, weakly dipolar, linear anomaly parallel with the western edge of the survey area and then turning westwards. The response would suggest a ceramic land drain, although it is the only response of this type clearly visible within the whole site.

Anomalies associated with magnetic debris

(9) – Linear zones of magnetic debris can be seen adjacent to the eastern and western field boundaries. This type of response may indicate magnetically thermoremnant material that has been used for ground consolidation.

Anomalies with a modern origin

(10) – Magnetic disturbance is associated with an electricity pole in the north eastern part of the survey area.

3.4.3 Area 9 centred on OS NGR 413735 181760, see Figures 05 & 06.

Anomalies with an uncertain origin

(11) – Two parallel positive linear anomalies and a curvilinear anomaly are located at the south western corner of the survey area. It is possible that the parallel linear anomalies are associated with former drainage ditches, but they are short and indistinct and their origin is therefore uncertain.

(12) – A positive linear anomaly oriented parallel with anomalies (11).

(13) – A series of negative linear anomalies can be seen within the survey area. They may relate to drainage ditches or possible former land division; however, they appear to be contained within the current field boundary and do not extend eastwards into Area 3.

(14) – The survey area contains a number of discrete positive anomalies with a response of 5-10nT. It is possible that they relate to cut, pit-like features, but their origin is generally uncertain. Several appear to be aligned in the northern part of the area and these may indicate a former boundary feature.

Anomalies with a natural origin

(15) – In the central part of the survey area is a zone that contains numerous weakly positive discrete anomalies. They have a response of less than 1nT and may relate to naturally formed features.

Anomalies associated with magnetic debris

(16) – In the north eastern part of the survey area is a zone of magnetic debris. This type of response can indicate dumped magnetically thermoremnant material, or an infilled pond, although none is indicated on any former Ordnance Survey mapping. However, it is not possible to determine from where the material is derived.

3.4.4 Area 10 centred on OS NGR 413933 181663, see Figures 05 & 06.

Area 10 contains no significant anomalies.

3.5 Northern section (Areas 5, 6, 7 & 8)

3.5.1 Area 5 centred on OS NGR 413875 182010, see Figures 07 & 08.

Anomalies with an uncertain origin

(17) – The survey area contains a number of very weakly positive linear and possible curvilinear anomalies. These are very weak (0.5nT) and indistinct and it is not possible to determine if they are of natural or anthropogenic origin.

(18) – A number of negative linear anomalies can be seen in the northern part of the survey area, with one possibly extending westwards into Area 7. These anomalies appear to relate to drainage ditches or other boundary features.

(19) – The survey area contains a small number of isolated weakly positive discrete anomalies. It is not possible to determine if these relate to natural or anthropogenic features.

(20) – A small group of irregularly shaped anomalies is located in the central, eastern part of the survey area. It is possible that these relate to naturally formed features.

Anomalies associated with magnetic debris

(21) – Small patches of magnetic debris are evident within the centre and at the eastern edge of the survey area.

3.5.2 Area 6 centred on OS NGR 413845 182130, see Figures 07 & 08.

Anomalies with an uncertain origin

(22) – A number of very weakly positive linear, possible curvilinear and a discrete response are located in the central part of the survey area. The linear anomalies are very weak (0.5nT) and the discrete response is stronger at 5nT. It is not possible to determine if these relate to cut features.

3.5.3 Areas 7 & 8 centred on OS NGR 413740 182050 see Figures 07 & 08.

Anomalies with an uncertain origin

(23) – A negative linear anomaly may indicate a drainage ditch, possibly continuing from Area 5 to the east. Areas 5-8 were one large field until recently.

(24) – Areas 7 and 8 contain a small number of discrete positive responses. It is not possible to determine the origin of these pit-like anomalies.

Anomalies associated with magnetic debris

(25) – Patches of magnetic debris are a response to magnetically thermoremnant material.

Anomalies with a modern origin

(26) – A strong, multiple dipolar, linear anomaly crosses the north western corner of the survey area and is a response to a buried service.

3.6 Eastern section (Area 4)

3.6.1 Area 4 centred on OS NGR 414035 181810, see Figures 09 & 10.

Anomalies with an uncertain origin

(27) – A series of positive linear anomalies extend across the majority of the survey area. A small number of discrete, pit-like responses are located close to them and appear to be associated. In the northern part of the survey area the linear anomalies are uniformly parallel and spaced approximately 3m apart and oriented north to south, then extend north eastwards. This type of response would suggest

former agricultural activity; however, these anomalies then appear to converge to two small points towards the south western corner of the survey area. Although it seems that they are a result of mechanical activity, it is not possible to determine if they relate to agriculture or if they are associated with some form of drainage, possibly associated with the former sewage works to the south. During the course of the survey it was notable that the field was very waterlogged and the soil, where visible, appeared very dark possibly indicating humic material.

(28) – A short, positive linear anomaly appears to extend westwards for 13m from the eastern field boundary. The short length of this response, and lack of any associated features, prevents confident interpretation, but it is possible that it relates to a cut feature.

(29) – A positive band extends across the survey area. It extends in a line between the electricity poles within this field and Area 3 to the east and an association is possible.

(30) – A number of negative linear anomalies are located in the northern part of the survey area. They are very indistinct and it is not possible to determine if they extend over or under the series of positive anomalies (27).

Anomalies with a natural origin

(31) – Primarily in the northern part of the survey area are a number of amorphous positive responses. It is possible that they relate to naturally formed features such as a palaeochannel.

Anomalies associated with magnetic debris

(32) – The survey area contains several small patches of magnetic debris.

4 CONCLUSION

4.1.1 The detailed magnetometer survey located a number of positive and negative linear anomalies within the site. Many are indistinct, short or fragmented and lack a coherent morphology preventing confident interpretation. Several negative linear anomalies can be seen within the site, and these may relate to drainage. In the easternmost part of the site (Area 4) there are a series of parallel positive linear anomalies which may indicate agricultural or drainage activities, although they have an unusual convergence towards the south western corner of Area 4. No anomalies within this field could be readily identified as associated with a ring ditch feature listed on the Wiltshire Historic Environment Record.

4.1.2 Many of the survey areas contain a number of isolated discrete positive

responses that may indicate pit-like features. In the western part of the site (Area 9) several appear aligned possibly indicating a former boundary feature of anthropogenic origin.

4.1.3 Discrete and amorphous positive zones in the central southern and eastern parts of the site tend to infer former fluvial features or palaeochannels of natural origin. Such features are indicative of poorly drained, clayey land prior to agricultural improvements.

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Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremnant material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field upon cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremnant features include ovens, hearths, and kilns. In addition thermoremnant material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to the topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The SENSYS gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 65cm apart. The instrument is carried about 10-20cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength the magnetic field created by the buried feature.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

Appendix B – data processing notes

Clipping

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. It has been found that clipping data to ranges between ±20nT and ±10nT often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

Appendix C – survey and data information

Area 1

COMPOSITE
Filename: J589-mag-Area1-proc.xcp
Description: Imported as Composite from: J589-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413804.703321935, 181913.505909747 m
Southeast corner: 413937.003321935, 181887.405909747 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 63300

Dimensions
Composite Size (readings): 882 x 174
Survey Size (meters): 132 m x 26.1 m
Grid Size: 132 m x 26.1 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 10.00
Min: -10.00
Std Dev: 4.16
Mean: -0.52
Median: -0.10
Composite Area: 0.3453 ha
Surveyed Area: 0.2508 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0

Processes: 2
1 Base Layer
2 Clip from -10.00 to 10.00 nT

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -15.00 to 15.00 nT

Area 2

COMPOSITE
Filename: J589-mag-Area2-proc.xcp
Description: Imported as Composite from: J589-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413781.182576229, 181886.832491856 m
Southeast corner: 413936.732576229, 181849.032491856 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 116500

Dimensions
Composite Size (readings): 1037 x 252
Survey Size (meters): 156 m x 37.8 m
Grid Size: 156 m x 37.8 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 16.58
Min: -16.50
Std Dev: 3.60
Mean: 0.06
Median: -0.04
Composite Area: 0.58798 ha
Surveyed Area: 0.42128 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -15.00 to 15.00 nT

Area 3

COMPOSITE
Filename: J589-mag-Area3-proc.xcp
Description: Imported as Composite from: J589-mag-Area3.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413787.290815718, 181865.172308514 m
Southeast corner: 413955.140815718, 181657.422308514 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 737200

Dimensions
Composite Size (readings): 1119 x 1385
Survey Size (meters): 168 m x 208 m
Grid Size: 168 m x 208 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 10.00
Min: -10.00
Std Dev: 3.37
Mean: -0.17
Median: -0.05
Composite Area: 3.4871 ha
Surveyed Area: 2.544 ha

Processes: 2
1 Base Layer
2 Clip from -10.00 to 10.00 nT

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -15.00 to 15.00 nT

Area 4

COMPOSITE
Filename: J589-mag-Area4-proc.xcp
Description: Imported as Composite from: J589-mag-Area4.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413945.139833593, 181976.54014932 m
Southeast corner: 414200.889833593, 181688.09014932 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 1196300

Dimensions
Composite Size (readings): 1705 x 1923
Survey Size (meters): 256 m x 288 m
Grid Size: 256 m x 288 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 16.58
Min: -16.50
Std Dev: 3.51
Mean: 0.08
Median: -0.03
Composite Area: 7.3771 ha
Surveyed Area: 4.058 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: 300
4 Clip from -15.00 to 15.00 nT

Area 5

COMPOSITE
Filename: J589-mag-Area5-proc.xcp

Description: Imported as Composite from: J589-mag-Area5.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413770.264878275, 182100.357780695 m
Southeast corner: 413998.114878275, 181909.707780695 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 1115100

Dimensions
Composite Size (readings): 1519 x 1271
Survey Size (meters): 228 m x 191 m
Grid Size: 228 m x 191 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 16.58
Min: -16.50
Std Dev: 4.50
Mean: -0.07
Median: -0.09
Composite Area: 4.344 ha
Surveyed Area: 3.4464 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -15.00 to 15.00 nT

Area 6

COMPOSITE
Filename: J589-mag-Area6-proc.xcp
Description: Imported as Composite from: J589-mag-Area6.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413774.351201966, 182173.289581387 m
Southeast corner: 413914.901201966, 182083.889581387 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 411800

Dimensions
Composite Size (readings): 937 x 596
Survey Size (meters): 141 m x 89.4 m
Grid Size: 141 m x 89.4 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 16.58
Min: -16.50
Std Dev: 4.29
Mean: -0.04
Median: 0.00
Composite Area: 1.2565 ha
Surveyed Area: 1.0999 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: 300
4 Clip from -15.00 to 15.00 nT

Area 7

COMPOSITE
Filename: J589-mag-Area7-proc.xcp
Description: Imported as Composite from: J589-mag-Area7.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413703.596566958, 182173.632205123 m
Southeast corner: 413773.796566958, 181967.982205123 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 356700

Dimensions
Composite Size (readings): 468 x 1371
Survey Size (meters): 70.2 m x 206 m
Grid Size: 70.2 m x 206 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 16.58
Min: -16.50
Std Dev: 5.90
Mean: -0.08
Median: -0.06
Composite Area: 1.4437 ha
Surveyed Area: 1.1055 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -15.00 to 15.00 nT

Area 8

COMPOSITE
Filename: J589-mag-Area8-proc.xcp
Description: Imported as Composite from: J589-mag-Area8.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413709.539291023, 181965.476164023 m
Southeast corner: 413768.579291023, 181923.176164023 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 66000

Dimensions
Composite Size (readings): 328 x 235
Survey Size (meters): 59 m x 42.3 m
Grid Size: 59 m x 42.3 m
X Interval: 0.18 m
Y Interval: 0.18 m

Stats
Max: 16.58
Min: -16.50
Std Dev: 5.31
Mean: -0.27
Median: -0.15
Composite Area: 0.24974 ha
Surveyed Area: 0.20151 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -15.00 to 15.00 nT

Area 9

COMPOSITE
Filename: J589-mag-Area9-proc.xcp
Description: Imported as Composite from: J589-mag-Area9.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413656.024606081, 181885.250883314 m
Southeast corner: 413818.174606081, 181627.700883314 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 976600

Dimensions
Composite Size (readings): 1081 x 1717
Survey Size (meters): 162 m x 258 m
Grid Size: 162 m x 258 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 16.58
Min: -16.50
Std Dev: 3.84

Mean: -0.01
Median: -0.07
Composite Area: 4.1762 ha
Surveyed Area: 3.0565 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -15.00 to 15.00 nT

Area 10

COMPOSITE
Filename: J589-mag-Area10-proc.xcp
Description: Imported as Composite from: J589-mag-Area10.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 413897.641780268, 181701.831178301 m
Southeast corner: 413967.391780268, 181629.531178301 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 111800

Dimensions
Composite Size (readings): 465 x 482
Survey Size (meters): 69.8 m x 72.3 m
Grid Size: 69.8 m x 72.3 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 16.58
Min: -16.50
Std Dev: 4.30
Mean: 0.09
Median: -0.08
Composite Area: 0.50429 ha
Surveyed Area: 0.35354 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -15.00 to 15.00 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). A printed copy and PDF copy of the report will be sent to the Wiltshire HER and a PDF copy uploaded to OASIS upon instruction by the client.

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

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

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

- TerraSurveyor 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 as PDF / PDF/A,
- PDFs of all figures.