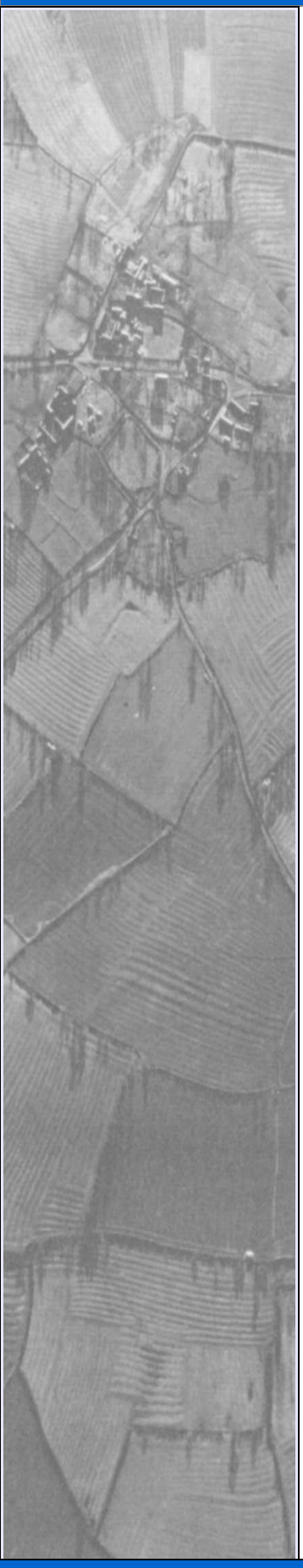

Land west of Hullavington
Wiltshire

MAGNETOMETER SURVEY REPORT

for

AC Archaeology

Kerry Donaldson & David Sabin

March 2017

Ref. no. J710

ARCHAEOLOGICAL SURVEYS LTD

Land west of Hullavington
Wiltshire

Magnetometer Survey Report

for

AC Archaeology

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

Survey date – 17th March 2017
Ordnance Survey Grid Reference – **ST 89185 81860 & ST 89567 82561**

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SUMMARY

Detailed magnetometry was carried out by Archaeological Surveys Ltd ahead of a new sewer pipe installation by Wessex Water, within two areas to the west of Hullavington in Wiltshire. At the northern end of Area 1, in the southern part of the site, are a number of positive linear and rectilinear anomalies. Due to the restricted width of the survey area and numerous anomalies relating to the shallow geology the origin of the anomalies is uncertain. However, they have linear and rectilinear elements and they are located close to an area of linear and rectilinear cropmarks and an archaeological origin should be considered. Other linear and discrete anomalies have also been located as well as widespread anomalies of natural origin. Within Area 2, forming the northern part of the survey, are a series of ridge and furrow and a zone of colluvium or alluvium. A number of discrete positive responses of uncertain origin were located and also a fragmented positive linear anomaly that may be associated with an existing sewer pipe trench.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by AC Archaeology, on behalf of Wessex Water, to undertake a magnetometer survey of two areas of land to the west of Hullavington ahead of groundworks associated with a new sewer pipe.

1.1.2 The survey was requested by Melanie Pomeroy-Kellinger, Wiltshire County Archaeologist, in discussions with Wessex Water regarding two areas: Area 1, which contained a number of cropmarks and Area 2 which was close to a zone containing metal detectorist finds.

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 the sewer pipe groundworks. 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;* European Archaeological Council (2015) *Guidelines for the Use of Geophysics in Archaeology;* 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 on the western edge of Hullavington in Wiltshire. The survey was carried out over a 30m wide corridor in two separate survey areas. Area 1 is centred on Ordnance Survey National Grid Reference (OS NGR) ST 89185 81860 and Area 2 ST 89567 82561, see Figs 01 and 02.

1.3.2 The geophysical survey covers approximately 2ha consisting of approximately 1.6ha in Area 1 and 0.4ha in Area 2. Area 1 is a 520m by 30m strip situated along the edge of an arable field immediately west of gardens associated with properties fronting The Parklands at the south western end of Hullavington. Area 2 is situated 500m to the north, within the southern part of an arable field. It covers a 130m by 30m strip.

Plate 1: Survey Area 1 looking south west

1.3.3 The survey areas contained a young arable crop at the time of survey and soil conditions were generally dry. Both areas lie close to the base of a shallow valley with land rising to the north west. The central part of Area 2 contained a steel covered inspection chamber within a second chamber located immediately beyond the north western end of the survey.

1.3.4 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Weather conditions during the survey were windy, but mainly fine.

1.4 Site history and archaeological potential

1.4.1 A Historic Environment Desk-Based Assessment has been carried out for a new rising main between Grittleton and Hullavington sewage treatment works (AC Archaeology, 2016). Partially extending into Area 1 are a number of cropmarks indicating possible linear ditches and enclosures just to the west. The northern part of Area 1 lies 100m west of the Church of St Mary which has a 12th century nave and chancel and13th century chapel and porch. The Victoria County Histories indicates that the village of Hullavington has medieval origins and the settlement pattern suggests early planning with a main street with a number of farmhouses fronting it with farm buildings and field enclosures behind (Baggs et al, 1991). Area 2 to the north lies close to the findspot of two Roman coins of Tetricus I (271-274 AD).

1.4.2 The presence of cropmarks just encroaching into Area 1 indicates that there is potential to locate anomalies relating to these features and others should they be present within the site. The location of Roman coins close to Area 2 may indicate that a Roman settlement is in the vicinity.

1.4.3 The surface conditions within the site were suitable for the observation of cultural material during the course of the survey. No significant scatters were noted. A number of small fragments of burnt stone were noted towards the northern part of Area 1.

1.5 Geology and soils

1.5.1 The underlying geology within the southern part of Area 1 and Area 2 is Cornbrash with Forest Marble underlying the northern part of Area 1. (BGS, 2017).

1.5.2 The overlying soil across the site is from the Evesham 1 association and is a typical calcareous pelosol. It consists of a slowly permeable, calcareous, clayey soil associated with shallow, well drained, brashy, calcareous soil over limestone (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry carried out over similar geology and soil has produced good results, although anomalies associated with the shallow Cornbrash and Forest Marble geology may be encountered and at times can be difficult to distinguish from anomalies with an anthropogenic origin. The site is, therefore, considered suitable for magnetic survey.

2 METHODOLOGY

2.1 Technical synopsis

2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Magnetic susceptibility and magnetic

thermoremnance are factors associated with the formation of localised fields. Additional details are set out below and within Appendix A.

2.1.2 Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased, and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features, such as pits and ditches, may produce magnetic anomalies that can be mapped by magnetic prospection.

2.1.3 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth, oven etc. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.

2.1.4 The localised variations in magnetism are measured as sub-units of the Tesla, which is a SI unit of magnetic flux density. These sub-units are nano Teslas (nT), which are equivalent to 10^{-9} Tesla (T).

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using a SENSYS MAGNETO®MXPDA 5 channel cart-based system. The instrument has 5 fluxgate gradiometers (FGM650) spaced 0.5m apart with readings recorded at 20 Hz. The cart is pushed at walking speed and not towed. Each sensor is not zeroed in the field as the vertical axis alignment is precisely fixed leaving sensor offsets that are removed during data processing. The fixing of the vertical alignment ensures the sensors are not unduly influenced by localised magnetic fields and that the vertical component of a magnetic anomaly is measured. 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 Due to the fixed offsets within the fluxgate sensors, as a result of the manufacturing and tensioning process, the survey data do not provide a visually useful dataset until a zero median traverse algorithm is applied. It is recognised that this has the potential to affect some anomalies detrimentally by removing linear features orientated parallel to survey transects. However, this has not been noted as a particular problem with the system due to the high resolution data collection, generally long length of traverses and variability within the magnetic characteristics of a linear anomaly.

2.2.3 Data are collected along a series of parallel survey transects to achieve 100% coverage of the surveyable land. 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. 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).

2.2.4 Fluxgate sensors are highly sensitive to temperature change and this is manifest as drift during the course of a survey. This can be particularly noticeable during the morning as temperatures rise and the equipment warms or cools. Sensor drift within the course of a traverse will appear as a line trending from negative to positive after processing with a zero median traverse algorithm. To remove the potential for temperature drift data were collected after a 20 minute stabilisation period and traverses were limited to a time of generally <100s.

2.3 Data processing and presentation

2.3.1 Magnetic data collected by the MAGNETO®MXPDA cart-based system are initially prepared using SENSYS MAGNETO®DLMGPS software. The software effectively allocates a geographic position for each data point and can compensate for fixed offsets present within the FGM650 sensors. The offsets are positive or negative values present on all fluxgate gradiometer sensors. Some systems use manual or electronic balancing to effectively zero the sensors; however, this is a short term measure that is prone to drift through temperature changes and vibration and can easily be incorrectly set due to localised magnetic fields. The FGM650 sensors are very accurately aligned to the vertical magnetic gradient and are highly stable showing negligible drift on long traverses. The offset values are removed using TerraSurveyor software.

2.3.2 Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display within TerraSurveyor. The removal of offset values (compensation) of the sensors is also carried out in TerraSurveyor using a zero median traverse function. Data are then considered to be minimally processed. Note: without the zero median traverse function it is not possible to create a meaningful data plot as all sensors have a different offset value. Although a zero median traverse algorithm can remove anomalies aligned with the survey tracks, in practice this rarely occurs due to the use of long traverses, high resolution measurement and variability within the magnetic susceptibility of long linear features.

2.3.3 The minimally processed data are collected between limits of ±10000nT and clipped for display at ±3nT. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track.

2.3.4 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 processing.

2.3.5 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. With regard to the Sensys MXPDA, minimally processed data is considered by the manufacturer to be data that is compensated by SENSYS MAGNETO DLMGPS software, see 2.3.1 and 2.3.2. Note: traceplots are not considered to be appropriate as they do not provide an accurate or useful assessment of the magnetic anomalies due to very high density of data collection.

2.3.6 The raster images are combined with base mapping using ProgeCAD Professional 2016, 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.

2.3.7 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.

2.3.8 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. Where further interpretation is possible, or where a number of possible origins should be considered, more subjective discussion is set out in Section 4.

2.3.9 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 two survey areas covering approximately 2ha.

3.1.2 Magnetic anomalies located can be generally classified as positive anomalies of an uncertain origin, anomalies relating to agricultural activity, anomalies with a natural origin, strong discrete dipolar anomalies relating to ferrous objects and strong multiple dipolar linear anomalies relating to buried services or pipelines.

3.1.3 Anomalies located within each survey area have been numbered and are described in 3.4 below with subsequent discussion in Section 4.

3.2 Statement of data quality and factors influencing the interpretation of anomalies

3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the datasets.

3.2.2 Numerous amorphous, discrete and possibly linear anomalies were located that are likely to relate to features of natural origin. However, it may not be possible to separate these from anomalies with an anthropogenic origin as both their morphology and magnitude may be similar.

3.2.3 The narrow width of the survey corridor may limit interpretation of anomalies as a number will extend beyond the surveyed zone. It may be impossible to infer the origin and age of long linear anomalies in particular.

3.3 Data interpretation

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

Report sub-heading CAD layer names and plot colour	**Description and origin of anomalies**
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil.
Anomalies with an agricultural origin AS-ABST MAG RIDGE AND FURROW	The anomalies are often linear and form a series of parallel responses or are parallel to extant land boundaries. Where the response is broad, former ridge and furrow is likely; narrow response is often related to modern ploughing.
Anomalies associated with magnetic debris AS-ABST MAG DEBRIS AS-ABST MAG STRONG DIPOLAR	Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.
Anomalies with a modern origin 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.
Anomalies with a natural origin AS-ABST MAG NATURAL FEATURES	Naturally formed magnetic anomalies are are caused by localised variability in the magnetic susceptibility of soils, subsoils and other drift or solid geologies. Anomalies may be amorphous, linear or curvilinear and may appear 'fluvial' or discrete; the latter are almost impossible to distinguished from pit-like anomalies with an anthropogenic origin. Fluvial, glacial and periglacial processes may be responsible for their formation within drift material and subsoil.

Table 1: List and description of interpretation categories

3.4 List of anomalies - Area 1 south

Area centred on OS NGR 389080 181780, see Fig 03.

Anomalies with an uncertain origin

(1) - A fragmented positive linear anomaly is located at the south western end of the survey corridor. It may relate to a former ditch truncated by agricultural activity.

(2 & 3) - Short positive linear anomalies may relate to cut features, although this is not certain.

(4) - A narrow, positive linear anomaly extends across the width of the survey area. It is not possible to determine its origin although it may be associated with cropmarks located in the vicinity.

(5) - Discrete, positive responses appear pit-like in form and are located close to anomaly (1); however, there are widespread and numerous responses within the survey area (6) that are likely to be natural in origin. It is, therefore, possible that these also have a natural origin.

Anomalies with a natural origin

(6) - The survey area contains widespread zones containing numerous positive responses. Some are linear, some more discrete while others are irregular in shape. These appear likely to be associated with the shallow underlying Cornbrash and Forest Marble geology.

Anomalies with a modern origin

(7) - A negative linear anomaly and two strong, discrete, dipolar responses relate to an existing service.

3.5 List of anomalies - Area 1 north

Area centred on OS NGR 389230 181960, see Fig 04.

Anomalies with an uncertain origin

(8) - At the northern end of the survey area are a number of positive linear and rectilinear anomalies. They are close to the field gateway which may indicate the potential for rutted ground; however, their morphology may indicate cut features with some archaeological potential.

(9) - Strongly magnetic response (>100nT) may indicate burning or highly magnetic material. It is not possible to determine the age or function, and although a modern origin is possible, an archaeological origin should be considered.

(10) - A positive response adjacent to the edge of the survey area. Although it appears pit-like, it is not possible to determine if it has an archaeological origin, or if it is associated with an existing service or possibly has a natural origin as it lies within a zone of natural features.

3.6 List of anomalies - Area 2

Area centred on OS NGR 389567 182561, see Fig 05.

Anomalies with an uncertain origin

(11) - The survey area contains several discrete, pit-like responses. It is not possible to determine their origin.

(12) - A positive linear anomaly appears to be fragmented; however, it is possible that this relates to backfilled material within a sewer pipe trench.

Anomalies with an agricultural origin

(13) - A series of parallel, broad, linear anomalies relates to ridge and furrow. The responses are more pronounced within a zone of natural anomalies (14).

Anomalies with a natural origin

(14) - Area of magnetically variable responses lie within a shallow valley and are likely to relate to colluvial or alluvial deposits. The ridge and furrow (13) have more pronounced positive and negative responses where they have crossed this zone.

Anomalies with a modern origin

(15) - A negative linear anomaly extend towards the centre of the survey area and

an inspection chamber. It relates to an existing sewer. It is possible that anomaly (12) is also associated with this service.

4 DISCUSSION

4.1.1 At the northern end of Area 1 are a group of positive linear and rectilinear anomalies (8). The limited width of the survey corridor, coupled with widespread naturally formed anomalies, prevents confident interpretation. However, they are located 100m west of the Church of St Mary which may represent the core of the medieval settlement of Hullavington and they are close to a number of cropmarks indicating linear ditches and enclosures and an archaeological origin should be considered. Located 35m south of these anomalies is a strongly magnetic response (9) indicative of intense burning. While this type of response may relate to modern activity or material, an archaeological origin is also possible. At the southern end of Area 1 there appears to be a fragmented linear anomaly (1). However, given the widespread location of anomalies associated with the shallow underlying geology, it is not possible to determine if it relates to a cut, ditch-like feature that has been truncated by agricultural activity, possibly ridge and furrow, or if it is also associated with the natural features. Other linear and discrete anomalies are also difficult to interpret for this reason.

4.1.2 Within Area 2, the anomalies primarily relate to ridge and furrow and natural anomalies associated with colluvium or alluvium. There are a number of discrete positive responses but it is not possible to determine their origin. One fragmented positive linear anomaly may be associated with an existing sewer trench.

5 CONCLUSION

5.1.1 The detailed magnetometer survey was carried out within two linear corridors and located several positive linear and rectilinear anomalies at the northern end of Area 1 in the southern part of the site. Although the origin of these anomalies is not clear, it is possible that they relate to cut features and an archaeological origin should be considered. Other linear and discrete anomalies have also been located elsewhere within Area 1 but the location of widespread zones of natural anomalies within the underlying geology prevents confident interpretation. Within Area 2 to the north is a series of ridge and furrow and a zone of naturally formed anomalies likely to relate to colluvium in the shallow valley or alluvium associated with the adjacent stream.

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Appendix A – basic principles of magnetic survey

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

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

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

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

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

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

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

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

Appendix B – data processing notes

Clipping

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. It has been found that clipping data to ranges between ±5nT and ±3nT often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

Zero (destripe) Median/Mean Traverse

The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise differences between the baseline value of gradiometer sensors.

High Pass Filtering

A mathematical process used to remove low frequency anomalies relating to survey tracks, modern agricultural features and other large magnetic bodies within or adjacent to survey areas.

Low Pass Filtering

A mathematical process used to remove high frequency anomalies relating to uneven ground, vibration, etc.

Appendix C – survey and data information

Area 1

Filename: J710-mag-Area1-proc.xcp
Description: Imported as Composite from: J710-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 388966.935804733, 182072.972269562 m
Southeast corner: 389308.185804733, 181717.922269562 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 478000
Dimensions
Composite Size (readings): 2275 x 2367
Survey Size (meters): 341 m x 355 m
Grid Size: 341 m x 355 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.05
Mean: 0.04
Median: 0.00
Composite Area: 12.116 ha
Surveyed Area: 1.5493 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Area 2

Filename: J710-mag-Area2-proc.xcp
Description: Imported as Composite from: J710-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 389512.959970063, 182616.079214685 m
Southeast corner: 389624.859970063, 182511.979214685 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702

Source GPS Points: 109900

Dimensions
Composite Size (readings): 746 x 694
Survey Size (meters): 112 m x 104 m
Grid Size: 112 m x 104 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 3.32
Min: -3.30
Std Dev: 1.21
Mean: 0.04
Median: 0.01
Composite Area: 1.1649 ha
Surveyed Area: 0.41771 ha

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Appendix D – digital archive

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

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: J710 Hullavington\Data				
Path and Filename	**Software**	**Description**	**Date**	**Creator**
hulla1\MX\ hulla2\MX\ .prm .dgb .disp	Sensys MXPDA	Proprietary data formats representing magnetometer survey traverses logged to a PDA.	17/03/17	D.J.Sabinh
hulla1\MX\J710-mag-Area1.asc hulla2\MX\J710-mag-Area2.asc	Sensys DLMGPS	ASCII CSV (tab) file representing survey area in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number.	21/03/17	D.J.Sabin
Area1\comps\J710-mag-Area1.xcp Area2\comps\J710-mag-Area2.xcp	TerraSurveyor 3.0.23.0	Composite data file derived from ASCII CSV.	21/03/17	D.J.Sabin
Area1\comps\J710-mag-Area1-proc.xcp Area2\comps\J710-mag-Area2-proc.xcp	TerraSurveyor 3.0.23.0	Processed composite data file (zmt and clipping to ±3nT).	21/03/17	D.J.Sabin
Graphic data - path: J710 Hullavington\Data				
Area1\graphics\ J710-mag-Area1-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±3nT.	21/03/17	D.J.Sabin
Area1\graphics\ J710-mag-Area1-proc.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	21/03/17	D.J.Sabin
Area2\graphics\ J710-mag-Area2-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±3nT.	21/03/17	D.J.Sabin
Area2\graphics\ J710-mag-Area2-proc.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	21/03/17	D.J.Sabin
CAD data - path: J710 Hullavington\CAD				
J710 version 1.dwg	ProgeCAD 2016	CAD file for creating plots of greyscales, abstraction, interpretation and mapping. Grid coordinates as OSGB. AutoCAD 2010 format.	14/03/17	K.T.Donaldson
Text data - path: J710 Hullavington\Documentation				
J710 report.odt	OpenOffice.org 3.0.1 Writer	Report text as an Open Office document.	27/03/17	K.T.Donaldson

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Survey location

N

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Geophysical Survey
Land west of Hullavington
Wiltshire

Map of survey area

● Survey location

Site centred on OS NGR
ST 89185 81860 & ST 89567 82561

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01

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Referencing information

Referencing grid to OSGB36 datum at 100m intervals

Data collected at 20Hz and georeferenced to ETRS89 zone 30 with conversion to OSGB36 using OSTN02

● 389100 181800

SCALE 1:4000

0m 40 80 120 160 200m

SCALE TRUE AT A3

FIG 02

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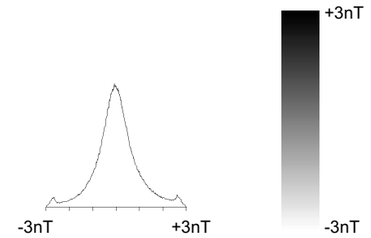
Greyscale plot of processed magnetometer data - Area 1 south



Abstraction and interpretation of magnetic anomalies

- Positive linear anomaly - possible ditch-like feature
- Discrete positive response - possible pit-like feature
- Variable magnetic response - of natural origin
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

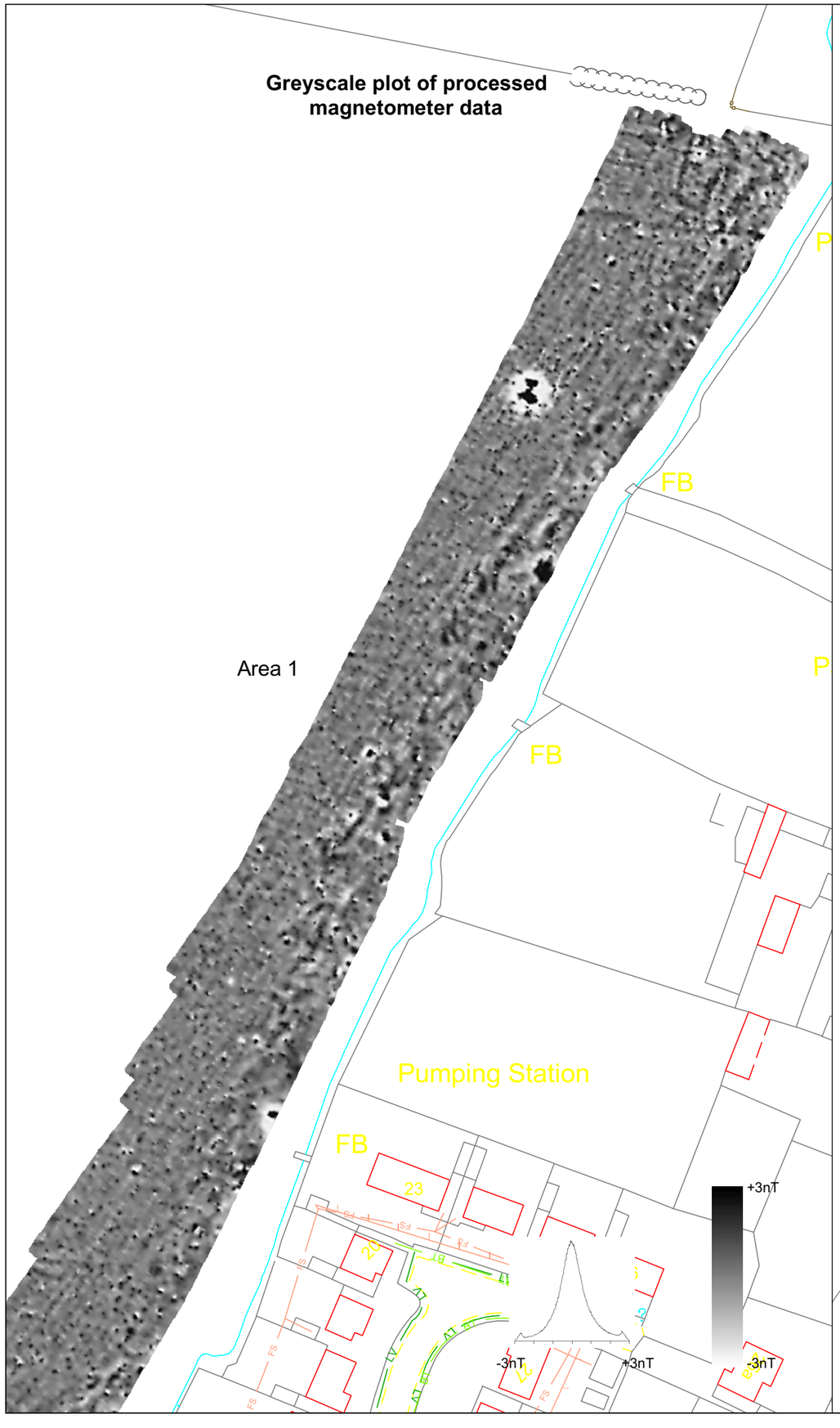
SCALE 1:1000

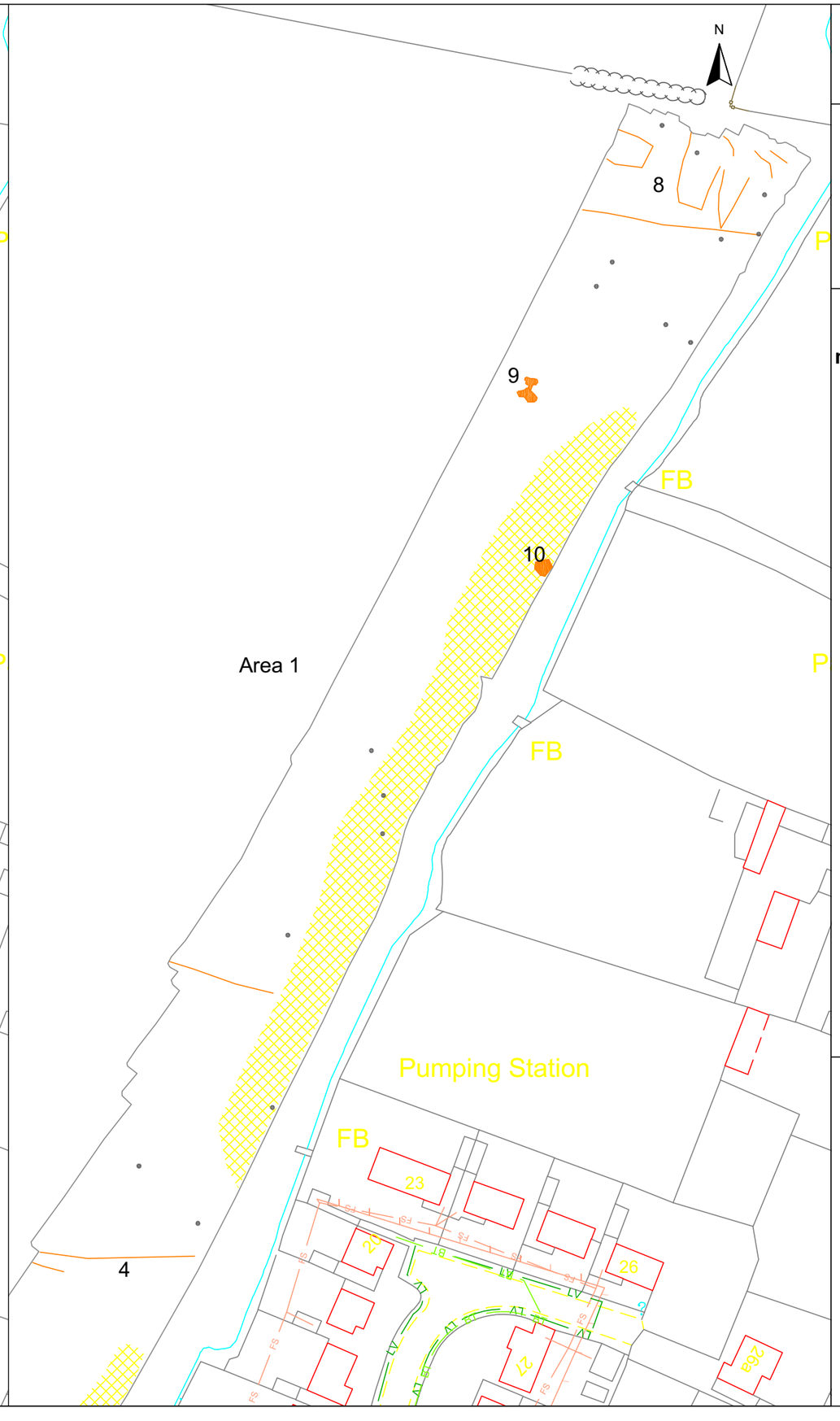
0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 03

Greyscale plot of processed magnetometer data





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Wiltshire

Abstraction and interpretation of magnetic anomalies - Area 1 north

- Positive linear anomaly - possible ditch-like feature
- Discrete positive response - possible pit-like feature
- Variable magnetic response - of natural origin
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 04

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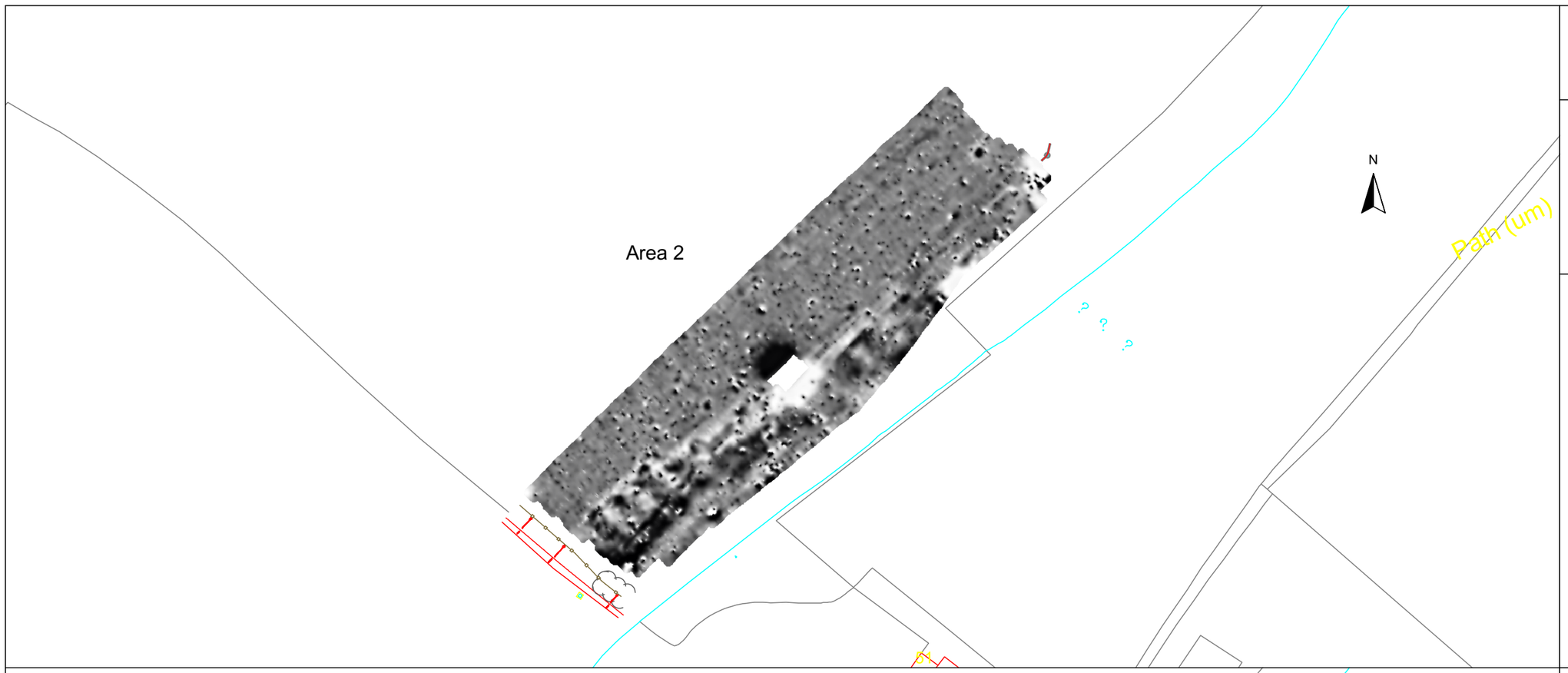
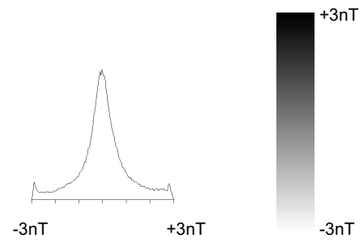
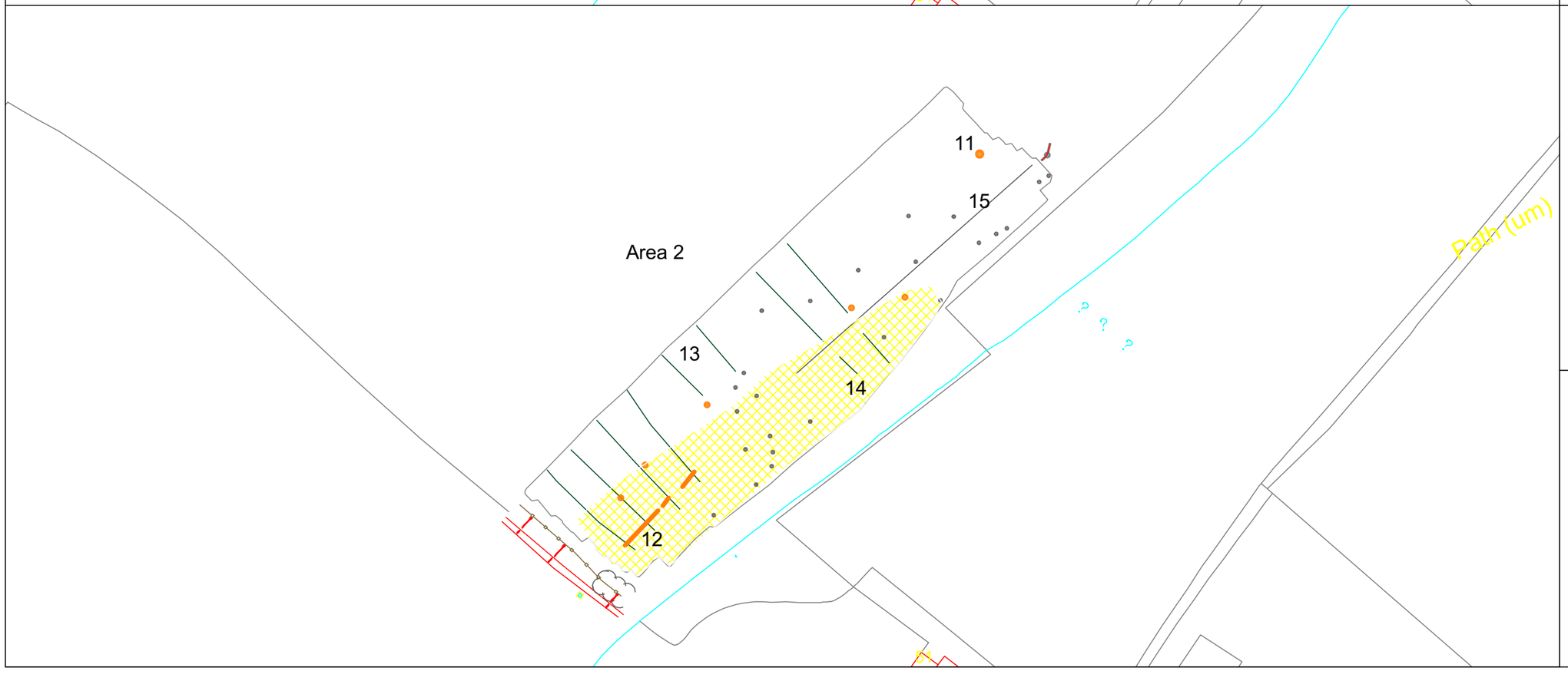
Wiltshire



Greyscale plot of processed magnetometer data - Area 2





Abstraction and interpretation of magnetic anomalies

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Discrete positive response - possible pit-like feature
- 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