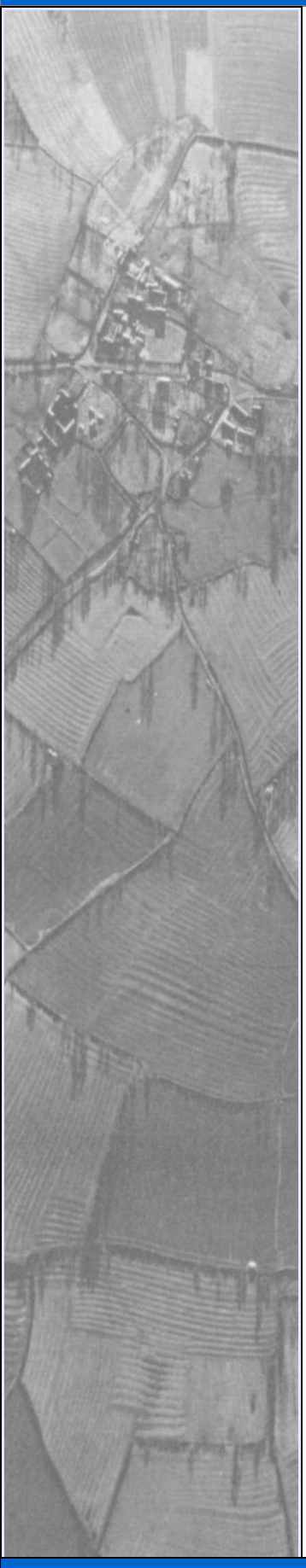

Land adjacent to the Village Hall Main Road, East Hagbourne Oxfordshire

MAGNETOMETER SURVEY REPORT

for

Cotswold Archaeology

Kerry Donaldson & David Sabin

June 2017

Ref. no. J715

ARCHAEOLOGICAL SURVEYS LTD

Land adjacent to the Village Hall Main Road, East Hagbourne Oxfordshire

Magnetometer Survey Report

for

Cotswold 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 – 18th May 2017
Ordnance Survey Grid Reference – **SU 52425 88460**

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SUMMARY

Detailed magnetometry was carried out by Archaeological Surveys Ltd over 3.5ha at East Hagbourne, Oxfordshire. The survey has located a positive rectilinear anomaly that appears to relate to the western part of a rectilinear enclosure. It contains a number of positive linear and discrete responses that indicate the presence of further cut features within the interior. To the west of the enclosure there are several positive linear, rectilinear, curvilinear and discrete responses, but they are very weak and cannot be confidently interpreted. Very weak linear anomalies associated with ridge and furrow cultivation were also located.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Cotswold Archaeology, to undertake a magnetometer survey of an area of land adjacent to the Village Hall at East Hagbourne, Didcot in Oxfordshire. The site has been outlined for a proposed residential development, 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 (2017) and approved by Richard Oram, Planning Archaeologist for Oxfordshire County Council, prior to commencing the fieldwork. The WSI considers the requirements of a Design Brief for geophysical survey issued by Richard Oram (2017). The Design Brief outlines the requirement for a geophysical survey in accordance with the National Planning Policy Framework (NPPF) (2012) as there are recorded archaeological remains in the wider vicinity.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to establish the presence/absence and extent of any archaeological deposits within the proposed development area. This will be the first stage of a mitigation procedure aimed to inform the second stage entailing archaeological evaluation through trial trenching. 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 lies within the parish of East Hagbourne, on the southern edge of Didcot, in Oxfordshire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SU 52425 88460, see Figs 01 and 02.

1.3.2 The geophysical survey covers approximately 3.5ha within a single field containing tall grass cover. It lies to the north of the village hall and is bounded to the north and east by gardens of properties fronting Harwood Road and Lake Road with Main Road to the south and a dismantled railway and sports field to the west.

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Weather conditions during the survey were fine and warm.

Plate 1: Survey area looking north east

1.4 Site history and archaeological potential

1.4.1 An Archaeological Desk-Based Assessment has been prepared for the site (Cotswold Archaeology, 2017). It outlines that it does not contain any designated or undesignated heritage assets; however, the site itself has not be subject to any archaeological investigation in the past.

1.4.2 There is evidence for archaeological activity and settlement in the wider area. Along the route of the Didcot Sewerage Scheme, c.430m south west of the site, a number of flint implements were recovered, with metal detecting finds of Bronze Age copper alloy objects located c.530m south east of the site. Iron Age activity is limited to chance finds and field systems in the wider area.

1.4.3 Evidence for Roman period activity was also located along the route of the Didcot Sewerage Scheme with a number of ditches and pits c.430m south west of the site. Other Roman settlements have also been recorded within a 1km radius of the site. The Design Brief also indicates a metal detector find of a Roman vessel with a copper pot reused as a lid recovered c.200m north of the site (Oram, 2017). The site has been utilised for agriculture since at least the medieval period, and it contains as series of ridge and furrow clearly visible on LiDAR imagery.

1.4.4 Although the site does not contain any designated or undesignated heritage assets a number of archaeological sites, mainly dating to the Roman period, have been recorded in the wider vicinity. There is potential that the geophysical survey could locate anomalies that relate to previously unrecorded archaeological features should they exist within the site.

1.5 Geology and soils

1.5.1 The underlying geology is Upper Greensand with overlying head deposits (BGS, 2017).

1.5.2 The overlying soil across the survey area is from the Harwell association and is a typical argillic brown earth. It consists of well drained, loamy soil over sandstone (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry survey carried out across similar soils has produced poor to variable results caused by low magnetic susceptibility of the topsoil and, therefore, poor magnetic contrast between the fill of cut features and the material into which they are cut. It is, however, possible that where there has been long term occupation or industrial activity, sufficient magnetic contrast may exist to produce magnetic anomalies. The underlying geology and soils are considered to be less than optimum 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 Additional data processing has been carried out in the form of high pass filtering. This effectively removes low frequency variation along a traverse that has been caused by large magnetic bodies, cultivation, rapid temperature change. Data treated to additional processing has been compared to unprocessed data to ensure that no significant anomalies have been removed. The greyscale image has been clipped for display at ±2nT to enhance weak anomalies.

2.3.5 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.

2.3.6 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 are the minimally processed greyscale plot and the filtered 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.

2.3.7 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.

2.3.8 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.

2.3.9 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 the 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.

2.3.10 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 approximately 3.4ha within a single field.

3.1.2 Magnetic anomalies located can be generally classified as positive linear and discrete positive responses of archaeological potential, positive anomalies of an uncertain origin, anomalies associated with land management, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance and strong discrete dipolar anomalies relating to ferrous objects.

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 dataset.

3.2.2 Magnetic debris and disturbance are visible within the data around the perimeter of the site. A broad band of magnetic debris is visible adjacent to the northern and western field boundaries. Site observations indicate a degree of modern dumping beyond the residential boundaries, and it is possible that this

material is the source of the debris or that it relates to ferrous materials discarded during housing construction. Severe magnetic disturbance was also caused by cars parked at the village hall. Both the magnetic debris and disturbance have the potential to obscure the detail of archaeological anomalies located immediately north of the village hall and west of residential dwellings fronting Harwood Road.

3.2.3 Although the underlying geology and soil can be associated with low magnetic susceptibility, the location of clear anomalies of archaeological potential demonstrates that sufficient magnetic contrast exists for archaeological prospection. However, there may be a 'settlement effect' where soils in the immediate vicinity of a settlement become magnetically enhanced and this diminishes rapidly with distance away from core areas of activity. Very weak anomalies associated with ridge and furrow cultivation were located, and it is possible that other weak anomalies classified as uncertain in origin also have archaeological potential.

3.3 Data interpretation

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

Report sub-heading CAD layer names and plot colour	**Description and origin of anomalies**
Anomalies with archaeological potential AS-ABST MAG POS LINEAR ARCHAEOLOGY AS-ABST MAG POS DISCRETE ARCHAEOLOGY AS-ABST MAG POS ENCLOSURE DITCH	Anomalies have the characteristics (mainly morphological) of a range of archaeological features such as pits, ring ditches, enclosures, etc.
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG NEG LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil.
Anomalies 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 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	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	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 1: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 452425 188460, see Figs 03 - 05.

Anomalies of archaeological potential

(1) - A positive rectilinear anomaly appears to relate to an enclosure ditch. The southern part is likely to have been truncated by the village hall car park but the full extent of the northern part is not well defined due to the location of magnetic debris along the eastern edge of the site.

(2) - A number of positive discrete and linear anomalies are located within the confines of anomaly (1) and, therefore, should be considered to relate to cut features with archaeological potential.

(3) - A discrete positive response is located 25m west of the north western corner of enclosure (1). Although there are other discrete positive responses within the site, they are generally less than 1nT while this has a response of over 3nT, similar to those seen within the enclosure.

Anomalies with an uncertain origin

(4) - A number of weakly positive linear, curvilinear and discrete responses have been located within the survey area, with a large number immediately to the west of anomaly (1). The anomalies are generally less than 1nT and they are indistinct, short and fragmented. It is not possible, therefore, to interpret their origin, but given their close proximity to the enclosure (1), they may also be of archaeological

potential.

(5) - Positive linear anomalies are located in the north western part of the site. It is not clear if they relate to cut features or if they are associated with agricultural activity.

Anomalies with associated with land management

(6) - Extending along the southern edge of the survey is a weakly dipolar linear anomaly which may relate to a land drain.

Anomalies with an agricultural origin

(7) - The survey area contains a number of parallel linear anomalies associated with ridge and furrow cultivation. They may also be associated with land drainage.

Anomalies associated with magnetic debris

(8) - The eastern edge of the survey area contains a broad zone of magnetic debris with other patches evident elsewhere. This type of response usually relates to dumped magnetically thermoremnant material. It is very strong along the eastern site boundary.

(9) - Strong, discrete, dipolar anomalies are evident throughout the site including a number within anomaly (1). The response indicates ferrous and other magnetically thermoremnant objects within the topsoil.

Anomalies with a modern origin

(10) - Along the north western edge of the site there is magnetic disturbance, either from ferrous fencing or possibly a service or pipe on the boundary of the site.

4 DISCUSSION

4.1.1 The survey located what appears to be the western part of a rectilinear enclosure at the eastern edge of the site. It contains a large number of pits, short positive linear, possible rectilinear and curvilinear responses. They have a response of generally between 2nT and 5nT which indicates a magnetically enhanced fill within cut features. A single pit-like response lies 25m west of the enclosure and has a similar response to those within. The full extent of the enclosure is not clear, it is 85m long, with the southern part likely to continue eastwards under, or truncated by, the village hall car park. The north part is not clearly defined, it may end abruptly but it is close to a zone of magnetic debris along the eastern edge of the site that may have obscured a weaker response. A number of strong dipolar responses are also evident within the confines of the enclosure. Such responses can relate to ferrous objects with

an archaeological origin, but the spread of magnetic debris nearby may infer a modern origin.

4.1.2 Located immediately west of the enclosure are a large number of weakly positive linear, curvilinear and discrete anomalies. Due to their weak response and lack of coherent morphology it is not possible to interpret their origin, but with their proximity to the enclosure an archaeological origin should be considered.

5 CONCLUSION

5.1.1 Detailed magnetometry has located a rectilinear enclosure at the eastern edge of the site. It contains a number of positive discrete and linear, rectilinear and curvilinear responses which appear to relate to further cut features. A single pit-like response to the west of the enclosure may also have archaeological potential. Several weakly positive linear and discrete responses also lie to the west of the enclosure and may also have archaeological potential, however, their weak response and poorly defined morphology prevent confident interpretation. Ridge and furrow cultivation is associated with very weak linear anomalies but can be seen throughout much of the site. Widespread magnetic debris, especially a broad zone along the eastern edge of the site, may have obscured weaker anomalies.

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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

Minimally processed magnetometer data

Filename: J715-mag-proc.xcp
Description: Imported as Composite from: J715-mag.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 452332.23910138, 188587.227208153 m
Southeast corner: 452511.33910138, 188324.727208153 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702

Source GPS Points: 1077500

Dimensions
Composite Size (readings): 1194 x 1750
Survey Size (meters): 179 m x 263 m
Grid Size: 179 m x 263 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 3.32
Min: -3.30
Std Dev: 0.90
Mean: 0.01
Median: 0.00
Composite Area: 4.7014 ha
Surveyed Area: 3.3091 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0
Processes: 1
1 Base Layer

Processes: 1
1 Base Layer

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

Filtered magnetometer data

Filename: J715-mag-proc-hpf.xcp
Dimensions
Composite Size (readings): 1194 x 1750
Survey Size (meters): 179 m x 263 m
Grid Size: 179 m x 263 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 2.21
Min: -2.20
Std Dev: 0.66
Mean: 0.01
Median: 0.00

Processes: 1
1 Base Layer

GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 300
5 Clip from -2.00 to 2.00 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 draft digital copy of the summary report (in PDF format) shall be supplied to the office of the County Archaeological Officer; for verification and assessment by the CAO or his representative; when the report has been agreed a final digital copy will then be supplied to the Oxfordshire Historic Environment Record (HER) on the understanding that it will become a public document after an appropriate period of time (generally not exceeding six months). The report will also uploaded to Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

Geophysical data - path: J715 East Hagbourne\Data				
Path and Filename	**Software**	**Description**	**Date**	**Creator**
ehag1\MX\.prm,.dgb,.disp	Sensys MXPDA	Proprietary data formats representing magnetometer survey traverses logged to a PDA.	18/05/17	D.J.Sabin
ehag1\MX\J715-mag.asc	Sensys DLMGPS	ASCII CSV (tab) file representing survey area in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number.	19/05/17	D.J.Sabin
Mag\comps\J715-mag.xcp	TerraSurveyor 3.0.23.0	Composite data file derived from ASCII CSV.	19/05/17	K.T.Donaldson
Mag\comps\J715-mag.proc.xcp	TerraSurveyor 3.0.23.0	Processed composite data file (zmt and clipping to ±3nT).	19/05/17	K.T.Donaldson
Mag\comps\J715-mag.proc-hpf.xcp	TerraSurveyor 3.0.23.0	Filtered composite data file (zmt, high pass filtering and clipping to ±2nT).	19/05/17	K.T.Donaldson
Graphic data - path: J715 East Hagbourne\Data				
Mag\graphics\ J715-mag-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±3nT.	19/05/17	K.T.Donaldson
Mag\graphics\ J715-mag-proc.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	19/05/17	K.T.Donaldson
Mag\graphics\ J715-mag-proc-hpf.tif	TerraSurveyor 3.0.23.0	TIF file showing a filtered processed greyscale plot clipped to ±2nT.	19/05/17	K.T.Donaldson
Mag\graphics\ J715-mag-proc-hpf.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	19/05/17	K.T.Donaldson
CAD data - path: J715 East Hagbourne\CAD				
J715 version 1.dwg	ProgeCAD 2016	CAD file for creating plots of greyscales, abstraction, interpretation and mapping. Grid coordinates as OSGB. AutoCAD 2010 format.	16/05/17	K.T.Donaldson
Text data - path: J715 East Hagbourne\Documentation				
J715 report.odt	OpenOffice.org 3.0.1 Writer	Report text as an Open Office document.	30/05/17	K.T.Donaldson

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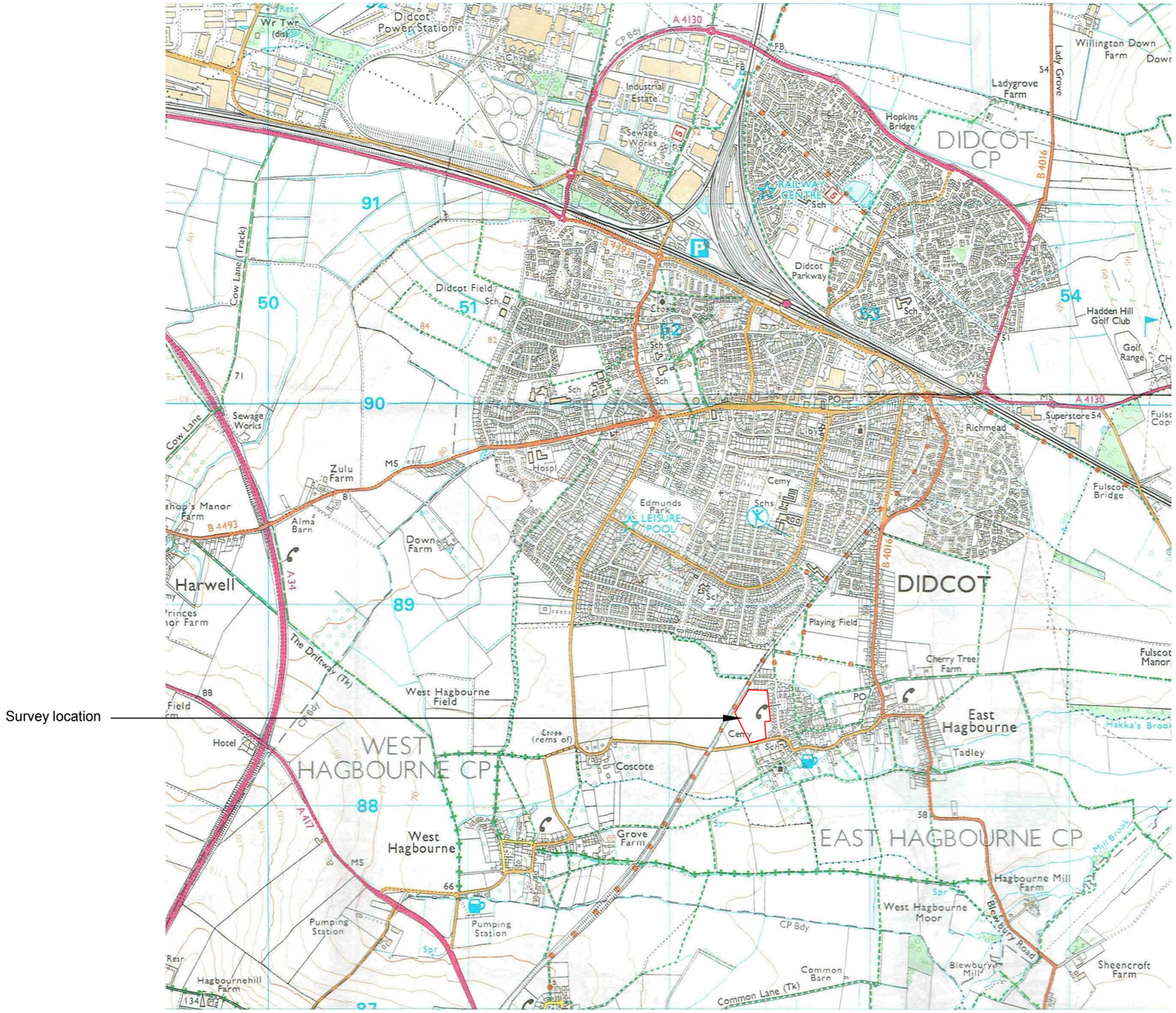

Survey location

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Geophysical Survey
Land adjacent to the Village Hall
Main Road, East Hagbourne
Oxfordshire

Map of survey area

● Survey location

Site centred on OS NGR
SU 52425 88460

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01

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Land adjacent to the Village Hall
Main Road, East Hagbourne
Oxfordshire

Referencing information

Referencing grid to OSGB36 datum at 50m intervals

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

- 452400 188350
- Survey tracks
- Survey track start
- Survey track stop

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

FIG 02

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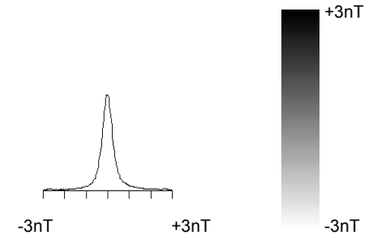
Oxfordshire

Greyscale plot of minimally processed magnetometer data



SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 03

Track
Graveyard
Village Hall
MAIN ROAD
HARWOOD ROAD
TCB
LB
N
14
21
12a
12
11
10a
10
9a
9
8a
8
7a
7
6a
6
5a
5
4a
4
3
1
22
23
50
56
52
2
1
14

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Greyscale plot of filtered magnetometer data

+2nT
-2nT
+2nT
-2nT

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 04

Track
Graveyard
Village Hall
MAIN ROAD
HARWOOD ROAD
TCB
LB
N
14
21
12a
12
11
10a
10
9a
9
8a
8
7a
7
6a
6
5a
5
4a
4
3
1
22
23
50
56
52
2

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Geophysical Survey
Land adjacent to the Village Hall
Main Road, East Hagbourne
Oxfordshire

Abstraction and interpretation of magnetic anomalies

- Positive linear anomaly - cut feature of archaeological potential
- Positive curvilinear/rectilinear anomaly - enclosure ditch
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - possible land drain
- Linear anomaly - ridge and furrow
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 05