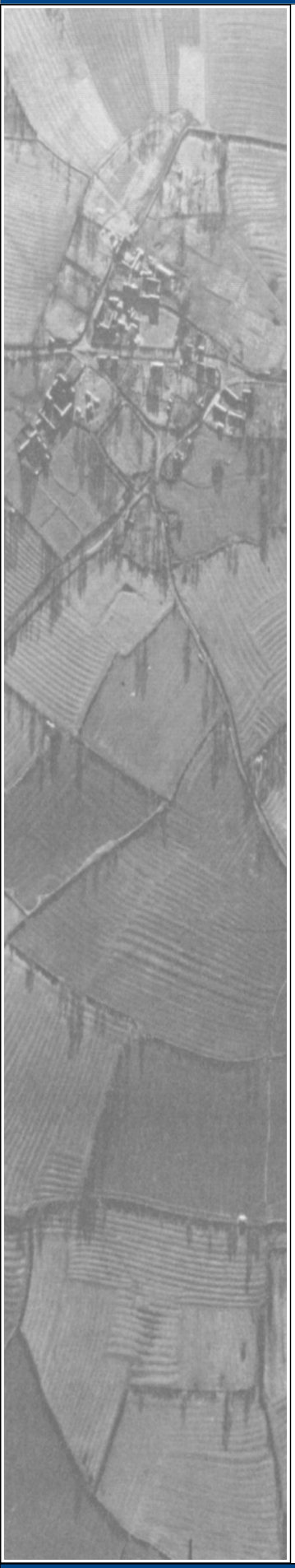

Land off Woodstock Road
Charlbury
Oxfordshire

MAGNETOMETER SURVEY REPORT

for

Mackenzie Miller Developments

Kerry Donaldson & David Sabin

July 2023

Ref. no. J965

ARCHAEOLOGICAL SURVEYS LTD

Land off Woodstock Road
Charlbury
Oxfordshire

MAGNETOMETER SURVEY REPORT

for

Mackenzie Miller Developments

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

Survey date – 12th June 2023
Ordnance Survey Grid Reference – **SP 36437 18963**

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It is a Registered Organisation with the Chartered Institute for Archaeologists.

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SUMMARY

A geophysical survey was carried out over 1ha at Charlbury, Oxfordshire, by Archaeological Surveys Ltd. The site contains a number of discrete, pit-like features, but their origin is uncertain. Amorphous zones of magnetically variable responses have also been located, but it is not clear if they relate to former quarrying or natural variations in the underlying geology.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Pegasus Group, on behalf of Mackenzie Miller Developments, to undertake a magnetometer survey of an area of land off Woodstock Road, Charlbury, Oxfordshire. The site has been outlined for a proposed residential development and the survey forms part of an archaeological assessment.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2023) and approved by Victoria Green, Planning Archaeologist for Oxfordshire County Council and archaeological adviser to West Oxfordshire District Council, prior to commencing the survey.

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 Geophysical survey can provide useful information on the archaeological potential of a site; however, the outcome of any survey relies on a number of factors and as a consequence results can vary. The success in meeting the aims and objectives of a survey is, therefore, often impossible to predetermine.

1.3 Standards, guidance and recommendations for the use of this report

1.3.1 Archaeological Surveys Ltd is a Registered Organisation with the Chartered Institute for Archaeologists (CIfA) and both company directors are Members of the Chartered Institute for Archaeologists (MCIfA) and have therefore been assessed for their technical competence and ethical suitability and abide by the CIfA Codes of Conduct. The survey and report follow the recommendations set out by: 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, updated 2020) Standard and Guidance for Archaeological Geophysical Survey.

1.3.2 Archaeological Surveys Ltd provide a detailed geophysical survey report and it is recommended that where possible the contents should be considered in full. The Summary provides a brief overview of the results with more detail available in the Discussion and/or Conclusion. The *List of anomalies* within the Results provides a detailed assessment of the anomalies within separate categories which can be useful in inferring a level of confidence to the interpretation. Quality and factors influencing the interpretation of anomalies is also set out within the results.

1.3.3 It is recommended that the full report should always be considered when using data and interpretation plots; where this is not possible, in the field for example, the abstraction and interpretation plots should retain their colour coding and be used with a corresponding legend.

1.3.4 Where targeting of anomalies by excavation is to be carried out, care should be taken to place trenches over solid lines or features visible on the abstraction and interpretation plots. Archaeological Surveys abstraction and interpretation avoids the use of dashed or dotted line formats, and broken or fragmented lines used in interpretive plots may well correspond closely with truncation of archaeological features.

1.4 Site location, description and survey conditions

1.4.1 The site is located on land off the B4437 (Woodstock Road) on the south eastern edge of Charlbury in Oxfordshire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SP 36437 18963, see Figs 01 and 02. The geophysical survey covers approximately 1ha within a single grassland field.

1.4.2 The survey area slopes down towards the south west from approximately 145m AODN near the north eastern corner to 130m AODN at the southern boundary. Field boundaries are mainly thick hedgerows with mature trees. Along the western boundary there are caravans and sheds with an area used for burning located within the western side of the field.

1.4.3 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.

Plate 1: Survey area looking north

1.5 Site history and archaeological potential

1.5.1 There is no record for any previous archaeological investigations within the site. The site does not contain any designated or identified non-designated heritage assets, but there are a number in the vicinity. The nearest scheduled monument is situated c485m south west and relates to a *Section of the north Oxfordshire Grim's Ditch running east from the River Evenload opposite Cornbury Park*, (National Heritage List for England (NHLE):1012902). This is a section of the Iron Age bank and ditch that forms a segmented circuit of earthworks situated between the valleys of the River Evenload, Glyme and Windrush.

1.5.2 The Grade II* Cornbury Park (NHLE: 1001092) is situated 900m to the south west of the site. The park was established by Henry I as his hunting lodge within the Royal Forest of Wychwood and now contains a 16th and 17th century country house surrounded by the 17th century landscaped parkland. Within the park are a number of scheduled monuments including a *Civil War artillery fieldwork 370m NNW of Park Farm, Cornbury Park* (NHLE: 1011225); 900m to the south west there are a *Pair of Bronze Age round barrows and surrounding Civil War fieldworks 180m north west of Park Farm* (NHLE: 1011224); 1.1km to the south west there is a *Bowl barrow 150m north west of North Lodge, Cornbury Park*, (NHLE: 1011220); a *Pair of Roman camps and a section of a post medieval sunken road situated in the north eastern corner of Cornbury Park* (NHLE: 1008399) are located 1250m to the west; located 1.3km to the east north east is *Lee's Rest Earthwork: a probable Romano-Celtic temple 200m north of Lee's Rest Farm* (NHLE: 1011226).

1.5.3 A number of non-designated heritage assets have been recorded in the vicinity of the survey area including the site of post medieval limekilns (MOX3155/HER No:8778) 150m to the east and the findspot of 3 silver Iron Age coins (MOX24010/HER No:27499) indicated to be approximately 450m to the north east, although the exact location is not accurately recorded on the HER. A Neolithic leaf arrowhead and a Bronze Age barbed and tanged arrowhead (MOX3151/HER No: 8001) were located 720m east north east of the site during fieldwalking and a number of flint implements (MOX 23405/HER No: 26043) were located 800m to the south east during fieldwalking ahead of the construction of the Charlbury to Arncott gas pipeline in the 1970s. The nearest evidence of Iron Age and Romano-British activity has been recorded approximately 175m south of the site as part of recent evaluation works near Charlbury House (EOX7309 & MOX28370). Finds comprised three pits, one of which contained eight small pottery sherds variably dated to the late Iron Age and early Roman periods. These remains were tentatively associated with the scheduled section of the North Oxfordshire Grim's Ditch, located c. 485m south west of the site at its nearest point (NHLE 1012902; MOX274).

1.6 Geology and soils

1.6.1 The underlying solid geology across the site is from the White Limestone Formation (BGS, 2022).

1.6.2 The overlying soil across the survey area is from the Elmton 1 association (343a) and is a brown rendzina. It consists of a shallow, well drained, brashy, calcareous, fine, loamy soil over limestone (Soil Survey of England and Wales, 1983).

1.6.3 Magnetometry survey carried out across similar soils has produced good results. 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 (also known as thermoremanence) are factors associated with the formation of localised magnetic fields.

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 positive magnetic anomalies

that can be mapped by magnetic prospection. In addition, where soil is displaced by material of comparatively low magnetic susceptibility, such as many types of sedimentary rock, anomalies of negative value may occur which could be indicative of structural remains.

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). Additional details are set out in 2.2 below and within Appendix A.

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using a SENSYS MAGNETO® MX V3 6 channel cart-based system. The instrument has 6 fluxgate gradiometers (FGM650) spaced 0.5m apart with readings recorded at 20Hz. 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 recorded range of ±3000nT, and resolution is approximately 0.1nT. They are linked to a Leica GS10 RTK GNSS with data recorded by SENSYS MonMX software on a rugged notebook 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 manifests 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® MX V3 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 the 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 ±3000nT and clipped for display at ±5nT. 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. Minimally processed data are considered by the manufacturer to be data that are 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 the very high density of data collection. In addition, traceplots cannot be meaningfully plotted against base mapping and in areas of complexity traces may be lost or highly confused. Traceplots may be used to demonstrate characteristic magnetic profiles across discrete features where it is considered beneficial.

2.3.6 The raster images are combined with base mapping using ProgeCAD Professional 2021, creating DWG (2018) 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 GNSS, resection method, etc.

2.3.7 An abstraction and interpretation is 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. Appendix E sets out CAD layer names with colour and graphic content for each interpretation category, see 3.3.

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 the survey area.

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.

2.4 Supplementary measurement of magnetic susceptibility

2.4.1 Magnetic susceptibility is an important factor in the formation of magnetic anomalies located by a magnetometry survey, see 2.1. Accurate measurement of the magnetic susceptibility of soil, subsoil and underlying geology may enhance the results of the magnetometry survey by providing an assessment of magnetic contrast within a site. Where sampling of topsoil only is possible, measurement may assist in understanding whether the soil is likely to be associated with strong, moderate or weak anomalies, which may be a result of low levels of iron minerals, waterlogging, etc. Accurate measurement may also assist in determining industrial activity and the presence of layers or features not visually or texturally apparent on excavation.

2.4.2 Supplementary measurement of soil magnetic susceptibility is not considered part of the main objective of the survey and is discussed in section 3.2 below as a factor influencing the formation of anomalies.

2.4.3 Measurements are achieved using a Bartington MS2 Magnetic Susceptibility Meter with MS2B sensor. Small soil samples are measured in 10 cubic centimetre plastic pots after accurately weighing, generally each sample is subdivided and at least 3 separate measurements are made in order to

provide a mean value, or assess variability due to ferrous contamination and other factors. Measurement can be made at low or high frequency, generally low frequency measurements are made but occasionally high frequency measurements are also recorded as the frequency dependence of a soil may be informative.

2.4.4 The measurements are converted to mass specific readings using SI units for bulk density. Archaeological Surveys express the measurements as X_{lf} or X_{hf} for low frequency or high frequency magnetic susceptibility respectively with units of $10^{-8}m^3kg^{-1}$.

3 RESULTS

3.1 General assessment of survey results

3.1.1 The detailed magnetic survey was carried out over a total of 1ha within a single grassland field.

3.1.2 Magnetic anomalies located can be generally classified as positive and magnetically variable anomalies of an uncertain origin, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance and strong discrete dipolar anomalies relating to ferrous objects. Anomalies located within each survey area have been numbered and are described in 3.4 below.

3.2 Data quality and factors affecting the interpretation or formation of anomalies

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

3.2.2 In order to provide further understanding of the magnetic characteristics of the soil, samples of the topsoil and subsoil were obtained from a small pre-existing trench, at the western edge of the field, and their mass specific magnetic susceptibility was measured, see 2.4. The topsoil sample produced an average low frequency mass specific magnetic susceptibility (X_{lf}) of 50 $10^{-8}m^3kg^{-1}$; the subsoil sample produced a value of 12 $10^{-8}m^3kg^{-1}$. The topsoil value is considered moderately high but typical of soils located over limestone within the Cotswolds; the comparatively low subsoil value infers conditions suitable for the creation of strongly contrasting anomalies of moderately high magnitude. However, the soils, subsoil and solid geology are frequently associated with naturally formed magnetic anomalies that may well be difficult to separate from those with an anthropogenic origin.

3.2.3 A visual assessment of the data, as represented by greyscale plots, confirms the presence of numerous discrete and amorphous anomalies with good contrast. Interpretation is, however, limited as anomalies generally lack characteristic patterns.

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 general explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, see Table 1.

Interpretation category	Description and origin of anomalies
Anomalies with an uncertain origin	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. Morphology may be unclear or uncharacteristic and there may be a lack of additional supporting information. 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	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. This category does not include agricultural features of early date or considered to be of archaeological potential (e.g. animal stockades, enclosures, farmsteads, etc).
Anomalies associated with magnetic debris	Magnetic debris often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. They often occur where there has been dumping or ground make-up and are 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, hearths and nail spreads from former wooden structures or rooves 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	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 these 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 adjacent to strong magnetic sources. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction.

Table 1: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 436437 218963, see Fig 03.

Anomalies with an uncertain origin

(1) – The survey area contains a number of discrete, pit-like features. Several are elongated or appear as conjoined pairs of features with dimensions of 0.75-1.5m by 3.5-4.5m while others appear more circular with a diameter of c1.5m. They have a response of 15-40nT which indicates that the magnetic enhancement may be associated with burnt material. Although an increased depth of topsoil within naturally formed features is also possible, the magnitude could indicate that they have some archaeological potential.

(2) – Two large conjoined discrete positive responses are located in the central, northern part of the survey area. They have a response of 2-10nT, with increasing magnitude towards the centre. Although they could relate to natural features, or

quarrying, discrete pit-like features with an archaeological origin is possible.

(3) – Magnetically variable zones, within the majority in the southern part of the survey area, have the appearance of a zone of former quarrying. However, there does not appear to be any surface expression that would indicate quarrying and there are several discrete responses (2) within the feature; it is therefore possible that the responses relate to natural variation within the underlying geology.

Anomalies with an agricultural origin

(4) – A series of parallel linear anomalies extend along the length of the field and relate to former agricultural activity, possibly ridge and furrow.

Anomalies associated with magnetic debris

(5) – A circular patch of magnetic debris, 4m in diameter, is located close to the north western corner of the site. It is possible that this relates to the site of a bonfire.

(6) – Magnetic debris in the southern part of the site relates to dumped material.

(7) – Strong, discrete, dipolar anomalies are a response to ferrous and other magnetically thermoremnant objects, such as brick and tile in the topsoil.

4 CONCLUSION

4.1.1 Detailed magnetometry has revealed a number of discrete positive magnetic responses with a moderate to strongly enhanced fill that could relate to pit-like features. Some appear as elongated features, others conjoined pairs. Amorphous zones of magnetically variable responses could relate to former quarrying, although there is no surface expression and a response to variations in the underlying geology is possible.

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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 magnetic field. The difference between the two sensors will relate to the strength of 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. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

Mean Traverse

The median (or mean) of data from 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 offset values of the gradiometer sensors. The process can remove archaeological features that run along a traverse but with the high resolution datasets created by the Sensys FGM650 sensors and the method of data collection this has not been a notable problem. In fact, the removal of offsets using software avoids carrying out a balancing procedure on site, which inevitably can never be done in magnetically clean conditions and results in improperly aligned fluxgate sensors and/or electronic adjustment values.

Appendix C – survey and data information

Filename: J965-mag-proc.xcp
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 436382.99, 219038.71 m
Southeast corner: 436497.59, 218887.81 m
Collection Method: Randomised
Sensors: 6
Dummy Value: 32702

Dimensions
Survey Size (meters): 115 m x 151 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 340166, Recorded: 340172
Stats
Max: 5.53
Min: -5.50
Std Dev: 1.36
Mean: 0.12

Median: 0.00
Composite Area: 1.7293 ha
Surveyed Area: 0.9893 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -5.00 to 5.00 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 copy will be supplied to the Oxfordshire county archaeological officer for comment and the agreed final copy supplied in PDF format to the Oxfordshire Historic Environment Record. The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS) and the digital data archived with the Archaeology Data Service.

Archive contents:

File type	Naming scheme	Description
Data	J965-mag-**[area number/name]**.asc J965-mag-**[area number/name]**.xcp J965-mag-**[area number/name]**-proc.xcp	Raw data as ASCII CSV TerraSurveyor raw data TerraSurveyor minimally processed data
Graphics	J965-mag-**[area number/name]**-proc.tif	Image in TIF format
Drawing	J965-**[version number]**.dwg	CAD file in 2018 dwg format
Report	J965 report.odt	Report text in LibreOffice odt format

Table 2: Archive metadata

Appendix E – CAD layers for abstraction and interpretation plots

The table below sets out Archaeological Surveys Ltd CAD layer names with associated colours and graphical content. Where CAD files are available layers may be extracted for further CAD/GIS use. Note: hatched polygon boundaries are contained within layers with the RGB colour code 254, 255, 255 (near white) in order to prevent their visibility.

Report sub-heading and associated CAD layer names	Colour with RGB index		Layer content
Anomalies with an uncertain origin			
AS-ABST MAG POS DISCRETE UNCERTAIN		255,127,0	Solid donut, point or polygon (solid)
AS-ABST MAG POS UNCERTAIN		255,127,0	Polygon (cross hatched ANSI37)
Anomalies with an agricultural origin			
AS-ABST MAG RIDGE AND FURROW		0,127,63	Line, polyline or polygon (cross hatched ANSI37)
Anomalies associated with magnetic debris			
AS-ABST MAG DEBRIS		132, 132, 132	Polygon (cross hatched ANSI37)
AS-ABST MAG STRONG DIPOLAR		132, 132, 132	Solid donut, point or polygon (solid)
Anomalies with a modern origin			
AS-ABST MAG DISTURBANCE		132, 132, 132	Polygon (hatched ANSI31)

Table 3: CAD layering

Appendix F – copyright and intellectual property

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Archaeological Surveys
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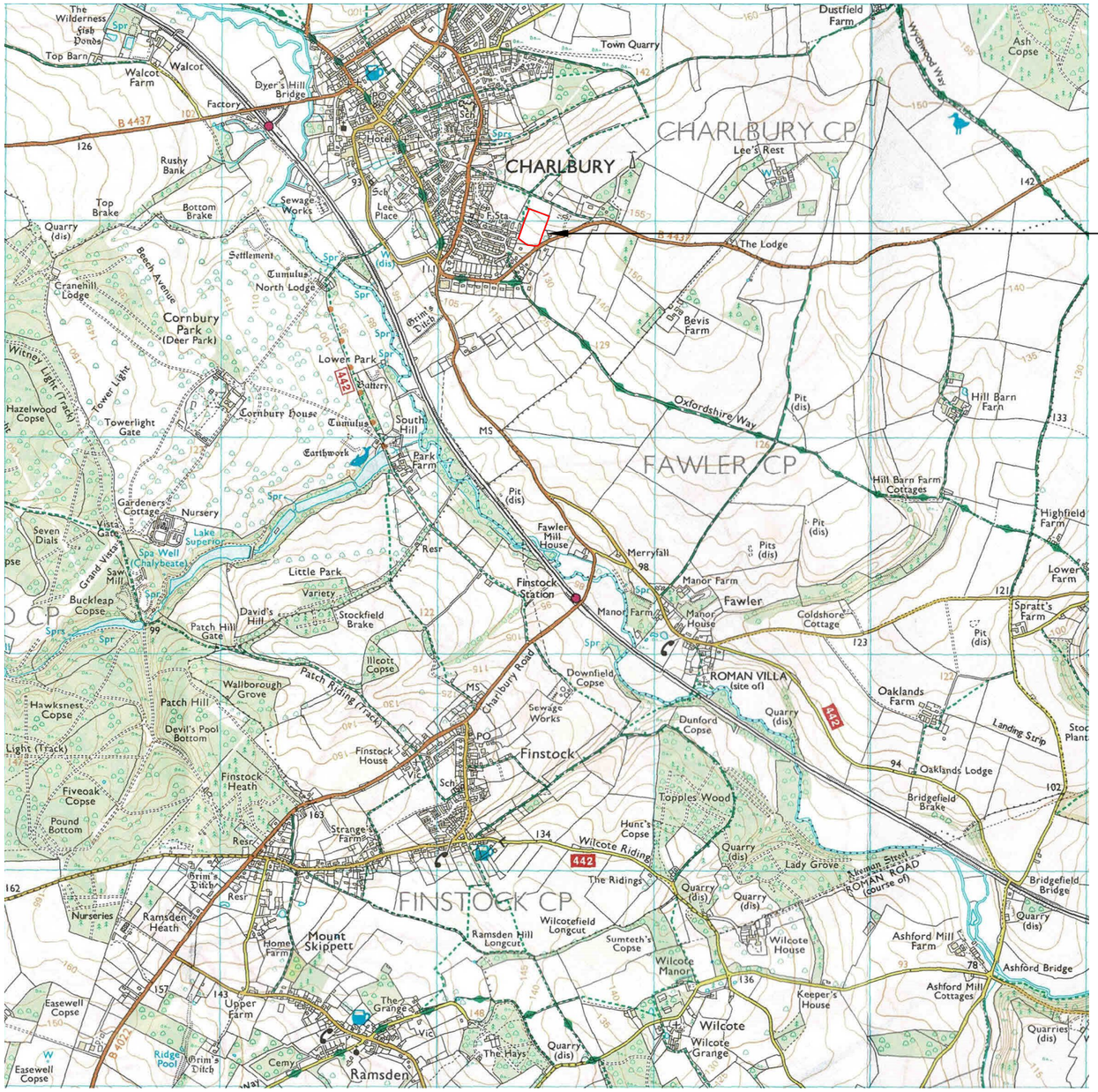
Geophysical Survey
Land off Woodstock Road
Charlbury
Oxfordshire

Map of survey area



Survey location

Site centred on OS NGR
SP 36437 18963

Survey location

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 01

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436300
436350
436400
436450
436500
436550
219050
219000
218950
218900
218850
N
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Referencing information

Referencing grid to OSGB36 datum at 50m intervals

436450 218950

Survey tracks

Survey track start

Survey track stop

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 02

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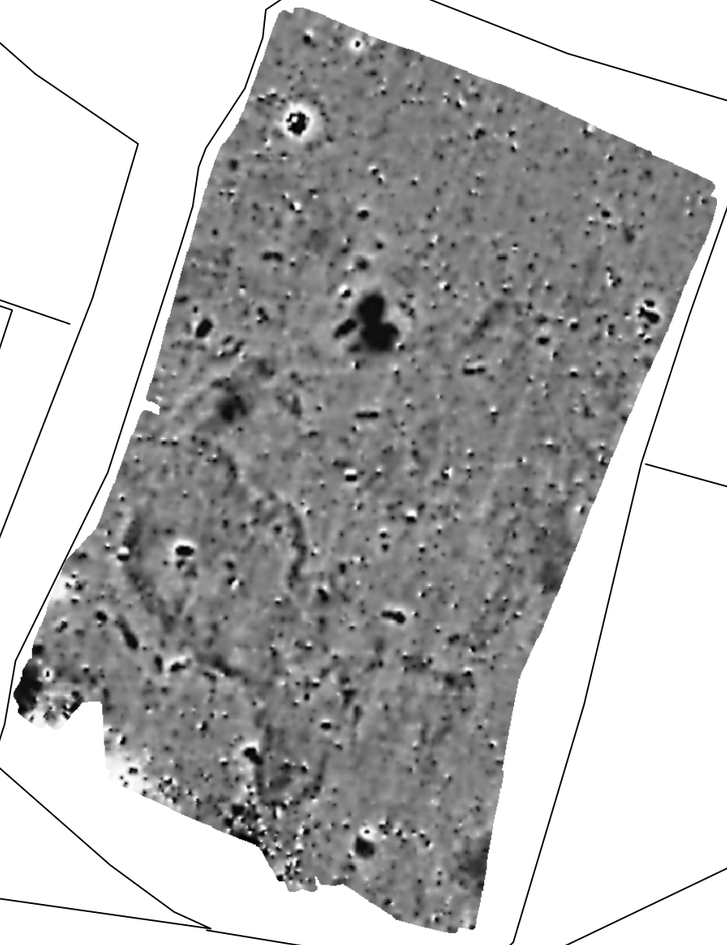
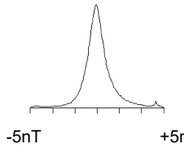
Greyscale plot of processed magnetometer data



+5nT
-5nT



-5nT +5nT

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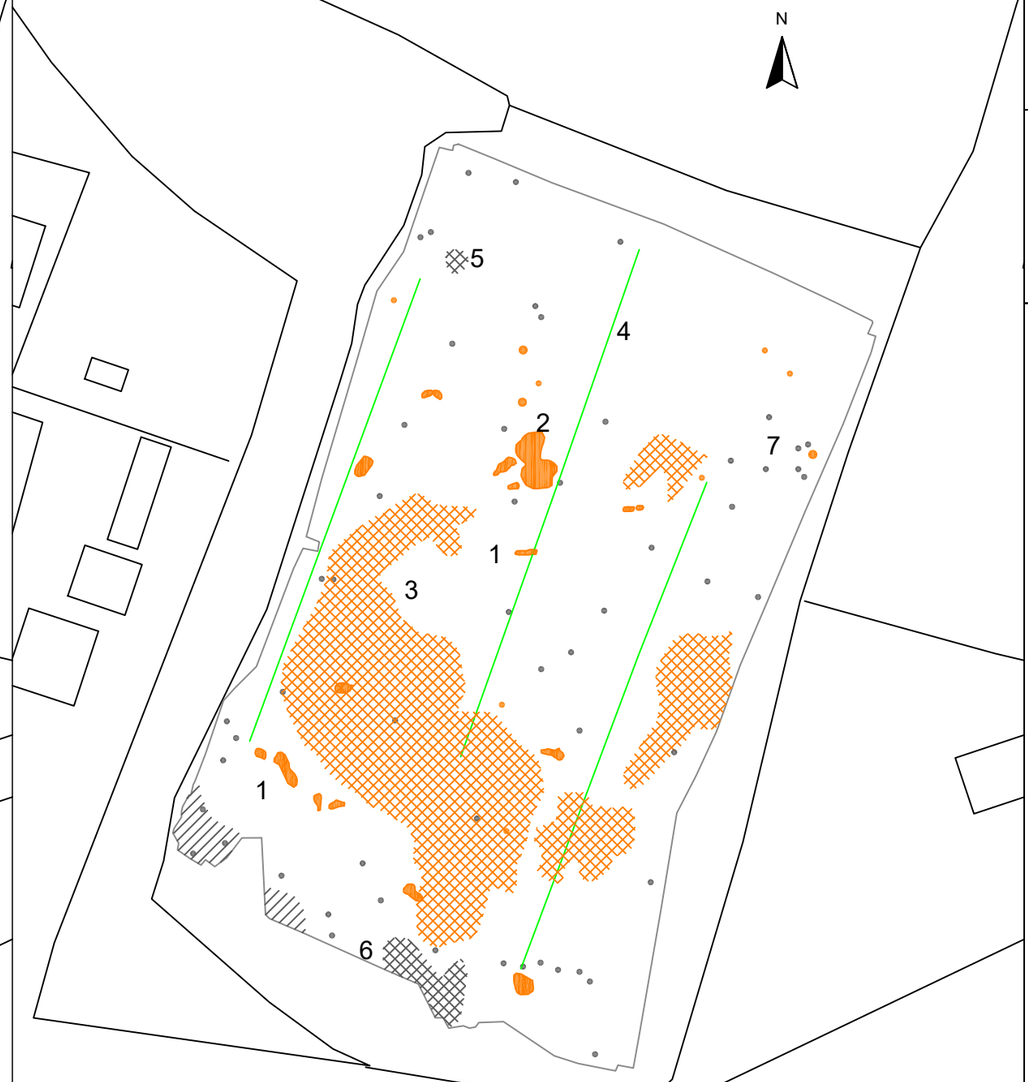
Abstraction & interpretation of magnetic anomalies



Greyscale plot of processed magnetometer data & abstraction & interpretation of magnetic anomalies

- Discrete positive response - possible pit-like feature
- Magnetically variable response - possible quarrying / geology
- Linear anomaly - of agricultural origin
- 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

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KTD	DJS	FIG 03