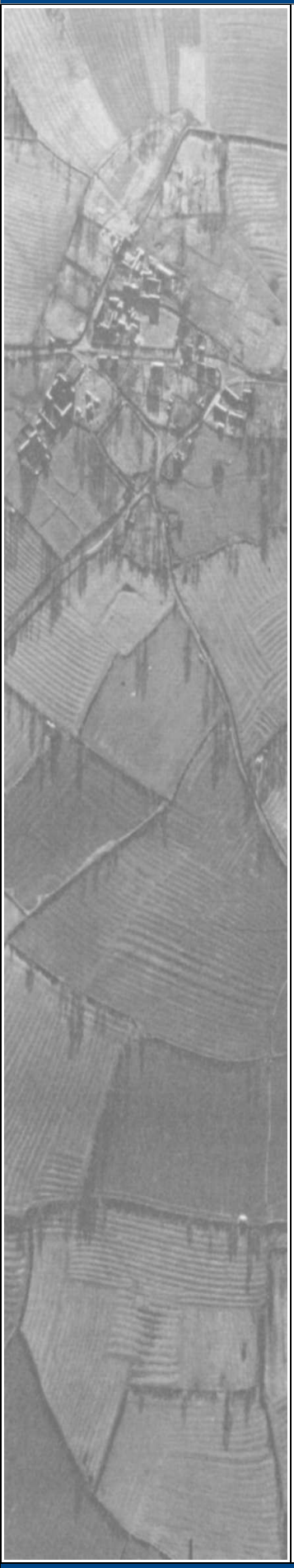

Land at Middle Hill
Chalford
Gloucestershire

MAGNETOMETER SURVEY REPORT

for

Cotswold Archaeology

Kerry Donaldson & David Sabin

July 2019

Ref. no. J796

ARCHAEOLOGICAL SURVEYS LTD

Land at Middle Hill
Chalford
Gloucestershire

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 July 2019
Ordnance Survey Grid Reference – **SO 89530 03430**

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SUMMARY

Detailed magnetometry was carried out over a 1.4ha parcel of land at Middle Hill, Chalford in Gloucestershire. The north eastern part of the field has been outlined for a potential residential development covering 0.8ha. The results indicate the presence of a possible former track or footpath extending through the south eastern corner of the site. A number of positive and negative linear anomalies have also been located; however, the majority of these relate to low and shallow features seen within LiDAR data imagery. Numerous and widespread discrete positive and curvilinear responses relate to soil filled features within the underlying shallow geology.

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 at Middle Hill, Chalford, Gloucestershire. A planning application has been made to Stroud District Council for a residential development of 31 new homes (as a rural exception site), together with associated vehicular and pedestrian access, landscaping and associated works (S.18/2698/FUL). The survey has been requested by Charles Parry, Archaeologist for Gloucestershire County Council and archaeological advisor to Stroud District Council, as part of an archaeological investigation.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2019) and approved by Charles Parry prior to commencing the fieldwork. A larger area than the proposed development was surveyed in order to gain a fuller understanding of any anomalies identified within the site.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin so that they may be assessed prior to development of the site. 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 The survey and report generally 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) *Standard and Guidance for Archaeological Geophysical Survey.* Note: currently Historic England (2018) no longer support the guidelines set out in English Heritage (2008) *Geophysical survey in archaeological field evaluation* and there are currently no plans to update the document. As a consequence other sources of written guidance referring to this document may be out of date and/or contain unsupported information (e.g. Chartered Institute for Archaeologists, 2014).

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 west of Middle Hill on the northern edge of Chalford in Gloucestershire. The development area is 0.8ha, lying within the north eastern part of a small pasture field. The entire field was surveyed for context. It is centred on Ordnance Survey National Grid Reference (OS NGR) SO 89530 03430, see Figs 01 and 02.

1.4.2 The geophysical survey covers approximately 1.4ha within a single pasture field that slopes down towards the south and west. A temporary fence had been erected outlining the development boundary, and the survey was completed within and outside of this temporary fence without removing it.

1.4.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data due to short grass cover. Weather conditions during the survey were fine.

Plate 1: Development area looking north

1.5 Site history and archaeological potential

1.5.1 An Archaeological Desk-Based Assessment has been carried out for the site by CgMs Heritage (Wright, 2018). It outlines that a ground flint axe was found directly to the west of the proposed development and a large collection of worked flint was also discovered at Middle Hill Farm to the north. A spread of Roman finds was also located just to the north of the site. Middle Hill road is very straight and although not listed as such, could be Roman in origin. There is evidence for possible medieval linear trackways and quarrying c300m north of the site, although it appears that the site lay away from any settlement and was likely to have been utilised for agriculture or possible quarrying during the medieval period. Former mapping shows the site sub-divided with several layouts over the past 200 years. A building is shown on mid 20th century mapping adjacent to the western boundary and the land owner indicated that the site had been used as a cricket ground and football pitch in the past.

1.6 Geology and soils

1.6.1 The underlying solid geology across the site is limestone from the Great Oolite Group (BGS, 2017).

1.6.2 The overlying soil across the survey area is from the Elmton 1 association 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 carried out over similar geology and soil has produced good results. 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 (also known as thermoremanence) are factors associated with the formation of localised 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 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). 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®MXPDA 5 channel cart-based system. The instrument has 5 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 range of recording data between ±0.1nT and ±8000nT. They are linked to a Leica GS10 RTK GNSS 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 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®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 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 ±8000nT 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. With regard to the Sensys MXPDA, 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 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 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.

3 RESULTS

3.1 General assessment of survey results

3.1.1 The detailed magnetic survey was carried out over 1.4ha within a single pasture field containing a temporary fence.

3.1.2 Magnetic anomalies located can be generally classified as anomalies associated with land management, positive and negative anomalies of an uncertain origin, linear anomalies of an agricultural origin, areas of magnetic debris 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 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 The data indicate the widespread presence of elongated possible pit-like anomalies likely to be of natural origin. They are generally 2m – 4m in length with a width of around 1m – 1.5m, some are slightly curved. The anomalies may be related to former tree-throw pits, although they could have been formed by other natural processes that have caused soil-filled features within the underlying solid geology. The density and widespread nature of these anomalies may obscure or confuse other anomalies of anthropogenic origin, and occasionally naturally formed features contain cultural evidence as they may have been utilised for temporary shelter or disposal of waste for example.

3.2.3 The data demonstrate the presence of both positive and negative anomalies with useful contrast indicating good conditions for magnetometry. The geology and soils encountered within the region typically show a strong magnetic contrast due to moderately enhanced magnetic susceptibility of the topsoil and very low magnetic susceptibility associated with underlying limestone and clays. Positive anomalies are associated with soil-filled features with negative anomalies forming where the subsoil, limestone or clay has displaced the overlying soil e.g. by agricultural activity.

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 relating to land management	Anomalies are mainly linear and may be indicative of the magnetically enhanced fill of cut features (i.e. ditches). The anomalies may be long and/or form rectilinear elements and they may relate to topographic features or be visible on early mapping.
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. Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.
Anomalies with a natural origin	Naturally formed magnetic anomalies 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 distinguish from pit-like anomalies with an anthropogenic origin. Fluvial, glacial and periglacial processes may be responsible for their formation within drift material and subsoil. Igneous and metamorphic activity can lead to anomalies within more solid geology.

Table 1: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 389530 203430, see Fig 03.

Anomalies associated with land management

(1) - A positive linear anomaly extends north eastwards from the southern edge of the survey area and just into the south eastern part of the development boundary. This appears to relate to a former footpath or trackway that extends north eastwards into the land to the north east of the site. It also corresponds to a holloway visible on LiDAR imagery that extends through the field and continues in a similar fashion to the north east. This is not indicated on any mapping and the

current footpath immediately east of the site has been in existence since at least 1869 when it is recorded on the Bisley Enclosure Map. The field and the footpath are not mapped on the 1842 Bisley Tithe Map as they are part of the open land of Bisley Common. It appears, therefore, that this is a former path or track leading north eastwards from Chalford towards the common.

(2) - A positive linear anomaly in the northern part of the site relates to a formerly mapped field boundary.

Anomalies with an uncertain origin

(3) - A positive linear anomaly approximately 32m long and 1.5m wide can be seen within the development boundary. A corresponding ditch-like feature is visible on the LiDAR imagery and the response suggests a cut feature containing topsoil.

(4) - A fragmented positive linear anomaly can be seen in the centre of the survey area, towards the south western corner of the development area. It appears to correspond to a feature visible on LiDAR imagery that may be associated with anomaly (3)

(5) - A number of narrow, positive linear anomalies can be seen in the northern part of the survey area. They are generally parallel with former plough trends seen elsewhere within the site and an association is possible.

(6) - A negative linear anomaly extends through the centre of the site parallel with the north east south west trend of the agricultural anomalies (9). However, at anomaly (3) it appears to veer to the north west and also appears to end at a T formation at its southern end. It is not clear if this relates to agricultural activity or a possible service/drain.

(7) – A negative linear anomaly has a similar orientation to anomaly (3) and corresponds to a feature visible on LiDAR imagery. It could relate to agricultural activity, but this is uncertain.

(8) - A negative linear anomaly extends north eastwards from the south western corner of the field. It corresponds to a short low linear bank visible on LiDAR imagery.

Anomalies with an agricultural origin

(9) - The site has two series of agricultural cultivation, one parallel with the eastern boundary and another parallel with the southern.

Anomalies associated with magnetic debris

(10) - A patch of strongly magnetic debris is evident adjacent to the western field boundary. This corresponds to the site of a building seen on mid 20th century mapping and aerial photographs and is likely to relate to the former cricket pavilion. Other patches can also be seen elsewhere in the site and these may also relate to

relatively modern ferrous material.

(11) - A series of discrete negative anomalies are a response to the steel spikes of the temporary fence posts that marked out the development boundary.

Anomalies with a natural origin

(12) - The entire site contains numerous and widespread positive discrete, curvilinear and short linear anomalies. These appear to relate to an increased depth of topsoil within naturally formed features such as tree throw pits and variations in the underlying shallow geology.

4 CONCLUSION

4.1.1 The geophysical survey located a positive linear anomaly in the south eastern part of the survey area that appears to relate to a former footpath or track that pre-dates the current field layout. A number of other anomalies have also been located and the majority of these correspond to shallow surface features and agricultural activity. Widespread naturally formed anomalies are also evident within the results.

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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.

Despike

Removal of data points that exceed the mean/median/threshold by selecting a window size of data points and replace by mean/median/threshold. Magnetic spikes can be caused iron objects on the surface or within the topsoil. Despike can improve the appearance of data and remove extreme readings that may affect further processing.

High Pass Filter

Removes low frequency anomalies within the data that are not considered to be archaeologically significant and may be natural in origin. A window passes over the data, the mean of all the data within the window is subtracted from the centre value. The size of the window is adjusted as is the weighting which may be uniform or Gaussian. The process is used to improve the visibility of anomalies of interest.

Low Pass Filter

Removes high frequency anomalies or 'noise' within datasets and provides a smoother output. A window passes over the data, the mean of all the data within the window is used to replace the centre value. The size of the window is adjusted as is the weighting. The process is used to improve the visibility of anomalies of interest.

Zero Median/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: J796-mag-proc.xcp
Description: Imported as Composite from: J796-mag.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 389468.61, 203545.41m
Southeast corner: 389583.81, 203327.61m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 412400
Dimensions
Composite Size (readings): 768 x 1452
Survey Size (meters): 115 m x 218 m
Grid Size: 115 m x 218 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats

Max: 5.53
Min: -5.50
Std Dev: 1.78
Mean: 0.13
Median: -0.01
Composite Area: 2.5091 ha
Surveyed Area: 1.3847 ha
PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long 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 copy of the report in PDF/A format will be supplied to the Gloucestershire Historic Environment Record, together with a DXF of the survey boundary. In order to comply with the Gloucestershire Archaeological Archive Standards (SWMDP, 2017) the data will be archived with the Archaeology Data Service (ADS) and the report uploaded to Online AccesS to the Index of archaeological investigationS (OASIS) in the formats stated below for archiving:

Archive contents:

File type	Naming scheme	Description
Data	J796_mag_raw.csv J796-mag_proc.csv	Raw data as ASCII CSV TerraSurveyor minimally processed data
Graphics	J796_mag_proc.tif	Image in TIF format georeferenced with TFW
Drawing	J796_CAD.dwg	CAD file in 2010 dwg format
Report	J796 _Chalford_mag_survey_report.odt	Report as PDF/A uploaded to OASIS

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 LINEAR UNCERTAIN		255,127,0	Line, polyline or polygon (solid)
AS-ABST MAG NEG LINEAR UNCERTAIN		Blue 0,0,255	Line, polyline or polygon (solid)
Anomalies relating to land management			
AS-ABST MAG BOUNDARY		127,0,0	Line, polyline or polygon (solid or cross hatched ANSI37)
AS-ABST MAG PATH/ROAD/TRACK		0, 153,153	Line, polyline or polygon (solid or partly cross hatched ANSI38)
Anomalies with an agricultural origin			
AS-ABST MAG AGRICULTURAL		Green 0,255,0	Line or polyline
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 natural origin			
AS-ABST MAG NATURAL FEATURES		Yellow 255,255,0	Polygon (cross hatched ANSI37)

Table 3: CAD layering

Appendix F – copyright and intellectual property

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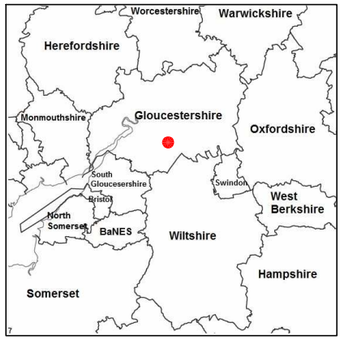
Tel: 01249 814 231

Development area

Survey location

N



Survey location

Site centred on OS NGR
SO 89530 03430

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 01

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Gloucestershire

Map of survey area

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Chalford
Gloucestershire

Referencing information

Referencing grid to OSGB36 datum at 50m intervals

389550 203450

Survey tracks

Survey track start

Survey track stop

Development boundary

389400
389450
389500
389550
389600
389650
203550
203500
203450
203400
203350
203300

N

Stoney Croft
Cherry Trees
Sans Souci
Greystones
Annecy
Bri-mar
Sycamores
Stoney Way
Middle Hill Crescent
Oakhurst
12
5

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SCALE TRUE AT A3

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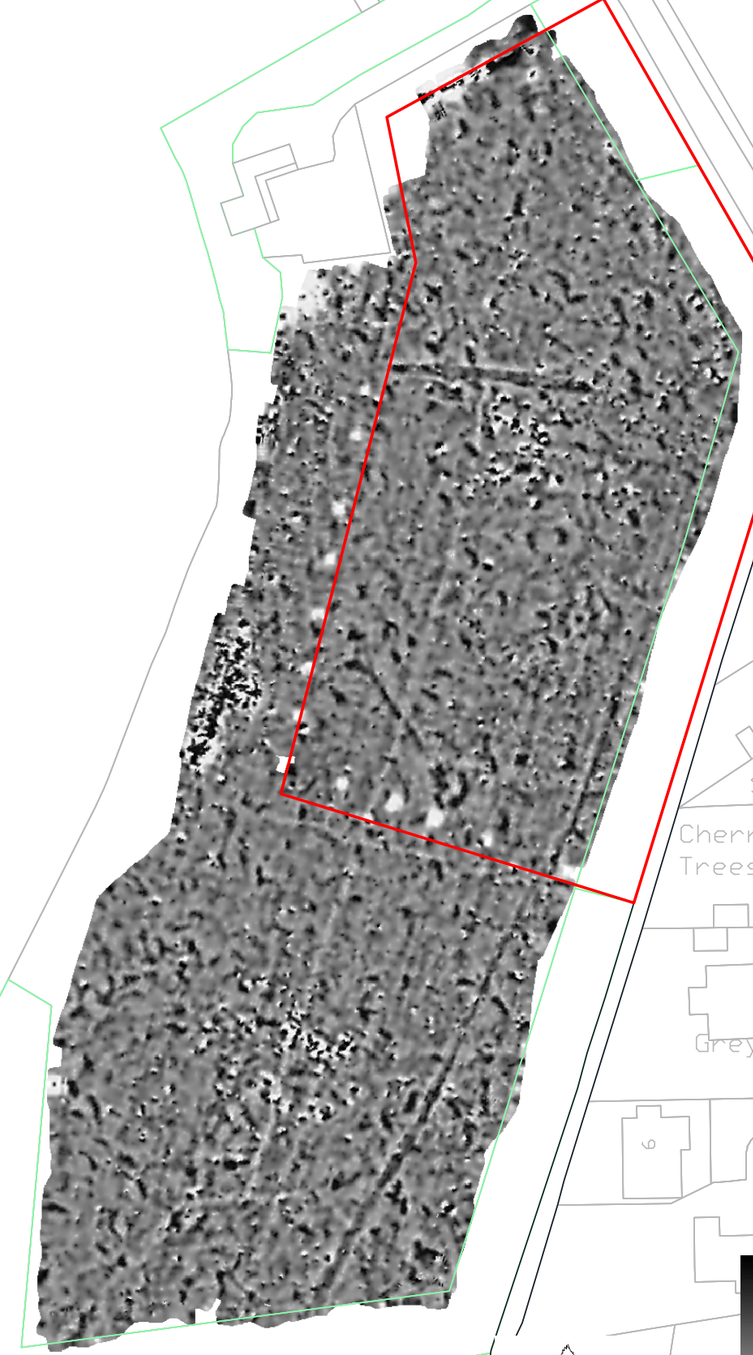
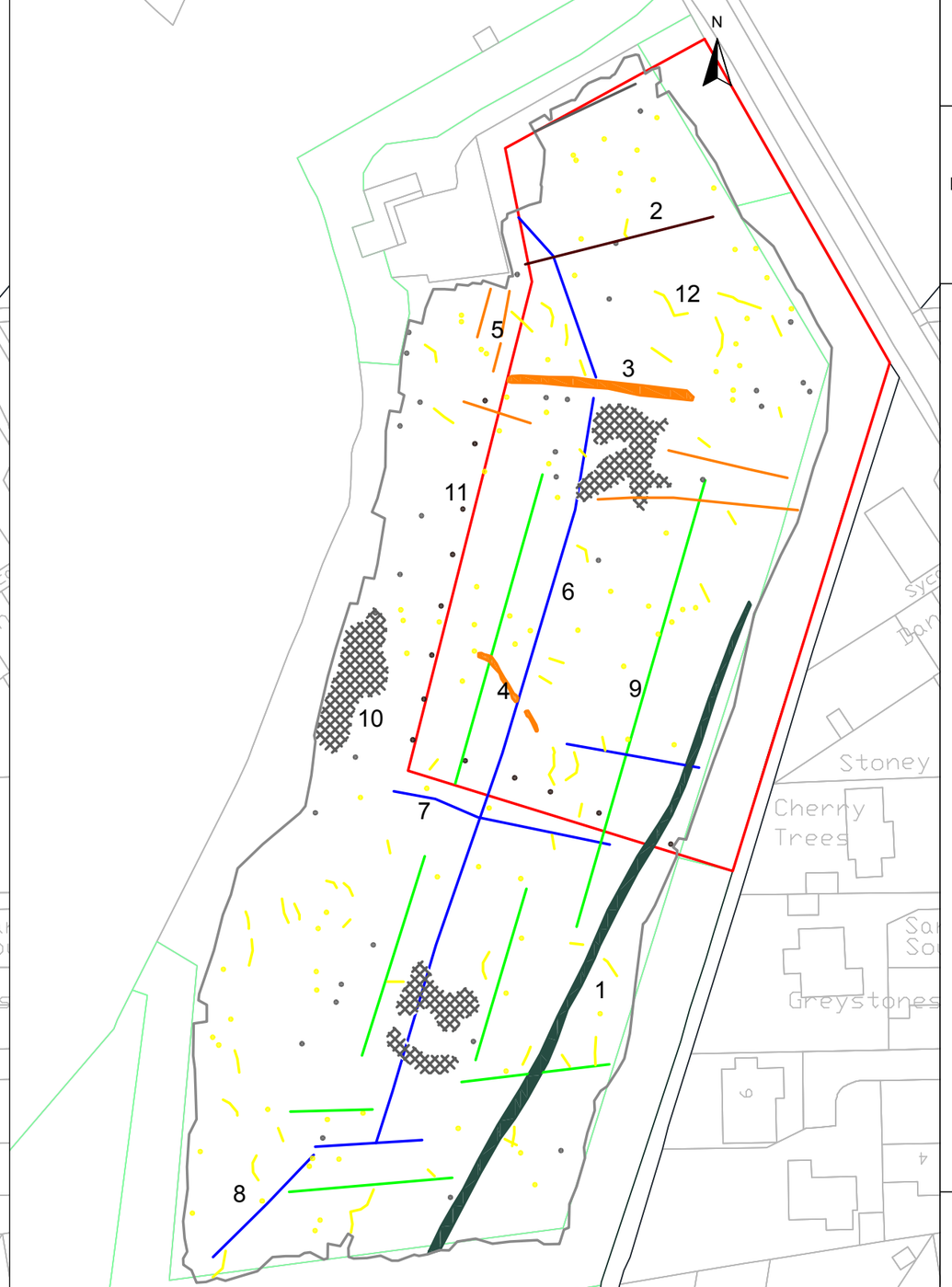
KTD	DJS	FIG 02

Greyscale plot of processed magnetometer data



+5nT

-5nT +5nT -5nT



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

- Positive linear anomaly - possible former path/trackway
- Positive linear anomaly - possible former field boundary
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Linear anomaly - of agricultural origin
- Positive linear/curvilinear response - of natural origin
- Discrete positive response - possible pit-like feature
- Discrete positive response - natural pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- 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

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KTD	DJS	FIG 03