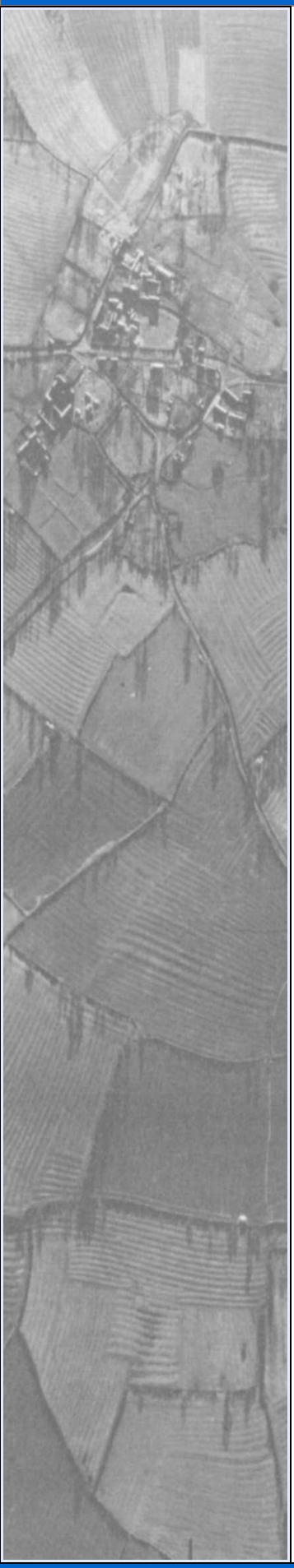

Land to the west of Church Road
Maisemore
Gloucestershire

MAGNETOMETER SURVEY REPORT

for

Rubicon Heritage Services Ltd

Kerry Donaldson & David Sabin

September 2017

Ref. no. J726

ARCHAEOLOGICAL SURVEYS LTD

Land to the west of Church Road
Maisemore
Gloucestershire

Magnetometer Survey Report

for

Rubicon Heritage Services Ltd

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 – 24th August 2017
Ordnance Survey Grid Reference – **SO 81245 21425**

Archaeological Surveys Ltd
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SUMMARY

A detailed magnetometer survey was carried out by Archaeological Surveys Ltd on land to the west of Church Road, Maisemore in Gloucestershire. The results indicate the presence of a group of discrete positive responses in the central western part of the site that may relate to cut, pit-like features. Elsewhere, positive and negative linear and discrete positive responses are weak and poorly defined. The lack of a coherent morphology does not enable them to be confidently interpreted as cut features. Other anomalies relate to modern disturbance associated with services and dumped magnetic debris.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Rubicon Heritage Services to undertake a magnetometer survey on land to the west of Church Road, Maisemore, Gloucestershire. The survey was commissioned in order to provide information on the archaeological potential of land likely to be disturbed by a proposed residential development.

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 Charles Parry, Archaeologist for Gloucestershire County Council, prior to commencing the survey.

1.2 Survey objectives and techniques

1.2.1 The objectives of the survey are to use non-intrusive geophysical techniques to establish the presence/absence and extent of any archaeological deposits within the proposed development area.

1.2.2 The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation;* European Archaeological Council (2015) *Guidelines for the Use of Geophysics in Archaeology;* Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations*. The work has been carried out to the Chartered Institute for Archaeologists (2014) *Standard and Guidance for Archaeological Geophysical Survey.*

1.3 Site location, description and survey conditions

1.3.1 The site is located to the west of Church Road, Maisemore, Gloucestershire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SO 81245 21425, see Figs 01 and 02.

1.3.2 The geophysical survey covers approximately 1.25ha of agricultural land that contained stubble at the time of survey. The site slopes down from approximately 25m AODN near the southern end of the site to 15m AODN along the northern boundary. Field boundaries are mainly hedgerows with the exception of the eastern boundary that is a post and rail fence with an avenue of lime trees running along Church Road.

Plate 1: Survey area looking east north-east

1.3.3 Sources of magnetic disturbance were noted within and surrounding the site. These include an electricity pole with stays in the eastern part of the site and corrugated iron sheets within the field boundary adjacent to the south western corner. Broken Victorian bottles within the soil along the northern edge of the site were observed and are considered likely to indicate some minor dumping likely to be associated with magnetic debris. Minor dumping adjacent to residential boundaries was also observed in the southern part of the site.

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

1.4 Site history and archaeological potential

1.4.1 The site lies south of the medieval church and the deserted medieval village of Maisemore. Two possible house platforms and a holloway are recorded by the Gloucestershire HER to the east of Church Road. The site lies in a wider landscape along the River Severn with recorded prehistoric and Roman

remains.

1.4.2 Although the field contained stubble, it was possible to observe the soil surface across much of the site. No significant cultural material was noted. Minor areas of dumping possibly in the 19th - 20th centuries are referred to in 1.3.3. There was no evidence of extant ridge and furrow earthworks within the survey area. In addition, no earthworks were noted from analysis of LiDAR data.

1.4.3 There is always potential for the geophysical survey to locate previously unrecorded archaeological features should they be present within the site.

1.5 Geology and soils

1.5.1 The underlying solid geology across the site is mudstone and limestone from the Rugby Limestone Member (Lower Lias) with overlying sand and gravel deposits from the Kidderminster Station Member in the southern part of the site (BGS, 2017).

1.5.2 The overlying soil across the survey area is from the Waterstock association and is a gleyic, argillic brown earth. It consists of a deep, permeable, mainly fine, loamy soil variably affected by groundwater (Soil Survey of England and Wales, 1983). Minor dumping may have modified the soil in the northern part of the site and adjacent to residential boundaries in the south western part.

1.5.3 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 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 ±5nT. 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.

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

2.3.7 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.

2.3.10 The abstraction and interpretation procedure has been supported by analysis of a digital terrain model (DTM) derived the Environment Agency's LiDAR data. Shaded relief plots and contours are created using Surfer 10. As no significant features were visible within the DTM, no plots have been included with the report.

2.3.11 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 1.2ha.

3.1.2 Magnetic anomalies located can be generally classified as positive and negative anomalies of an uncertain origin, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance, strong discrete dipolar anomalies relating to ferrous objects and strong multiple dipolar linear anomalies relating to buried services or pipelines.

3.1.3 Anomalies located within the 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. Zones of magnetic disturbance are present within the dataset and these have been caused by underground services, an electricity pole with steel wire stays and corrugated iron sheets with other modern objects in the vicinity of the south western corner of the site.

3.2.2 Although high magnitude magnetic disturbance has the potential to obscure weaker anomalies of archaeological potential, this is unlikely as the disturbance is localised within the vicinity of ferrous objects. Additional high pass filtering was used to suppress the effects of the disturbance and minimise its extent. Both filtered and unfiltered data were analysed and have been plotted. The high pass filtering has not removed significant anomalies.

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.

Report sub-heading CAD layer names and plot colour	**Description and origin of anomalies**
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG NEG LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN 	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil.
Anomalies with an agricultural origin AS-ABST MAG AGRICULTURAL 	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 AS-ABST MAG SERVICE AS-ABST MAG LAND DRAIN 	The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc.. Often a significant area around such features has a strong magnetic flux which may create magnetic disturbance; such disturbance can effectively obscure low magnitude anomalies if they are present. Fluxgate sensors may respond erratically and with

	hysteresis adjacent to strong magnetic sources. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction. A weakly multiple dipolar response indicates a ceramic land drain.

Table 1: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 381245 221425, see Figures 03 & 04.

Anomalies with an uncertain origin

(1) - A small cluster of discrete positive responses can be seen towards the centre of the survey area. They have a response of between 3nT and 15nT and appear to relate to pit-like features, an archaeological origin is possible.

(2) - A group of discrete positive responses are situated close to a number of very weakly positive and a negative linear anomalies in the eastern part of the site. It is not possible to determine if they relate to cut features.

(3) - A small number of very weakly positive linear anomalies have been located elsewhere within the site. They are weak, indistinct and lack a coherent morphology preventing confident interpretation.

Anomalies with an agricultural origin

(4) - Linear anomalies, oriented north-north-west to south-south-east relate to agricultural activity.

Anomalies associated with magnetic debris

(5) - A number of zones of magnetic debris are evident around the margins of the field and relate to dumped ferrous and magnetically thermoremnant material.

(6) - Numerous strong, discrete, dipolar anomalies are responses to ferrous and other magnetically thermoremnant objects within the topsoil.

Anomalies with a modern origin

(7 & 8) - Two strong, multiple dipolar linear anomalies relate to buried services.

(9) - A weak, multiple dipolar linear anomaly along the north-eastern edge of the survey area may relate to a land drain or a buried service.

4 CONCLUSION

4.1.1 The detailed magnetometry located a number of anomalies across the site; however, the majority are classified as uncertain in origin as they are weak, fragmented or lack any coherent morphology. A small group of discrete positive responses in the central, western part of the site do appear to relate to pit-like features and their archaeological potential should be considered.

5 REFERENCES

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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 data

Filename: J726-mag-proc.xcp
Description: Imported as Composite from: J726-mag.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 381147.86836334, 221475.365381559 m
Southeast corner: 381344.81836334, 221363.165381559 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702

Source GPS Points: 411500

Dimensions
Composite Size (readings): 1313 x 748
Survey Size (meters): 197 m x 112 m
Grid Size: 197 m x 112 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 5.53
Min: -5.50
Std Dev: 2.02
Mean: 0.03
Median: 0.02
Composite Area: 2.2098 ha
Surveyed Area: 1.2303 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0

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 -5.00 to 5.00 nT

Filtered data

Filename: J726-mag-proc-hpf.xcp

Stats
Max: 5.53
Min: -5.50
Std Dev: 1.81
Mean: 0.03
Median: 0.00
Composite Area: 2.2089 ha
Surveyed Area: 1.2276 ha

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: 230
5 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:

Geophysical data - path: J726_Maisemore_Geophysics				
Path and Filename	**Software**	**Description**	**Date**	**Creator**
J726_mag_raw.zip	Sensys DLMGPS	ASCII CSV (tab) file representing survey Area 1 in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number.	07/09/17	K.T.Donaldson
Mag\comps\J726-mag.xcp	TerraSurveyor 3.0.23.0	Composite data file derived from ASCII CSV.	07/09/17	K.T.Donaldson
J726_mag_proczip	TerraSurveyor 3.0.23.0	Minimally processed composite data file (zmt and clipping to ±5nT).	07/09/17	K.T.Donaldson
J726_mag_proc-hpf.zip	TerraSurveyor 3.0.23.0	Processed composite data file with high pass filter used to suppress magnetic disturbance from modern ferrous objects.	07/09/17	K.T.Donaldson
Graphic data - path: J726_MaisemoreGIS				
J726_mag_proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±5nT.	24/08/17	D.J.Sabin
J726_mag_proc.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	24/08/17	D.J.Sabin
J726_mag_proc_hpf.tif	TerraSurveyor 3.0.23.0	TIF file showing a high pass filtered greyscale plot clipped to ±5nT.	24/08/17	D.J.Sabi
J726_mag_proc_hpf.tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	24/08/17	D.J.Sabin
CAD data - path: J726_Maisemore_CAD				
J726_CAD.dwg	ProgeCAD 2016	CAD file with referencing and abstraction and interpretation. Grid coordinates as OSGB. AutoCAD 2010 format.	13/09/17	K.T.Donaldson
Text data - path: J726 Maisemore\Report				
J726 report.odt	OpenOffice.org 3.0.1 Writer	Report text as an Open Office document.	30/08/17	K.T.Donaldson

Appendix E – copyright and intellectual property

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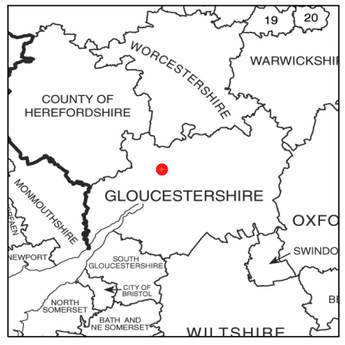
Survey location

Archaeological Surveys Ltd

Geophysical Survey
Land to the west of Church Road
Maisemore
Gloucestershire

Map of survey area



Survey location

Site centred on OS NGR
SO 81245 21425

SCALE 1:25 000

0m 500m 1000m

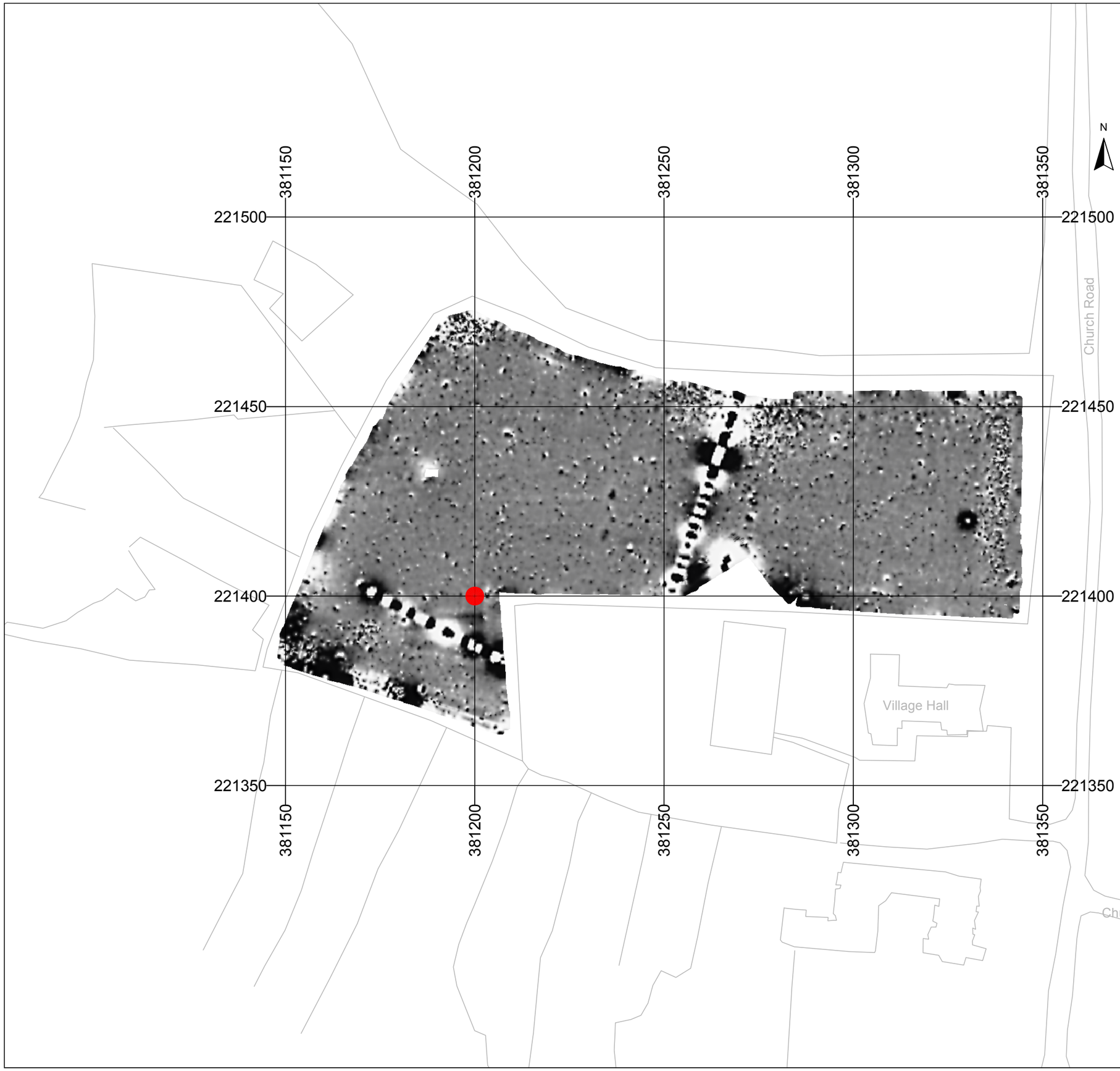
SCALE TRUE AT A3

FIG 01

Archaeological Surveys Ltd

Geophysical Survey
Land to the west of Church Road Maisemore Gloucestershire

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

● 381200 221400

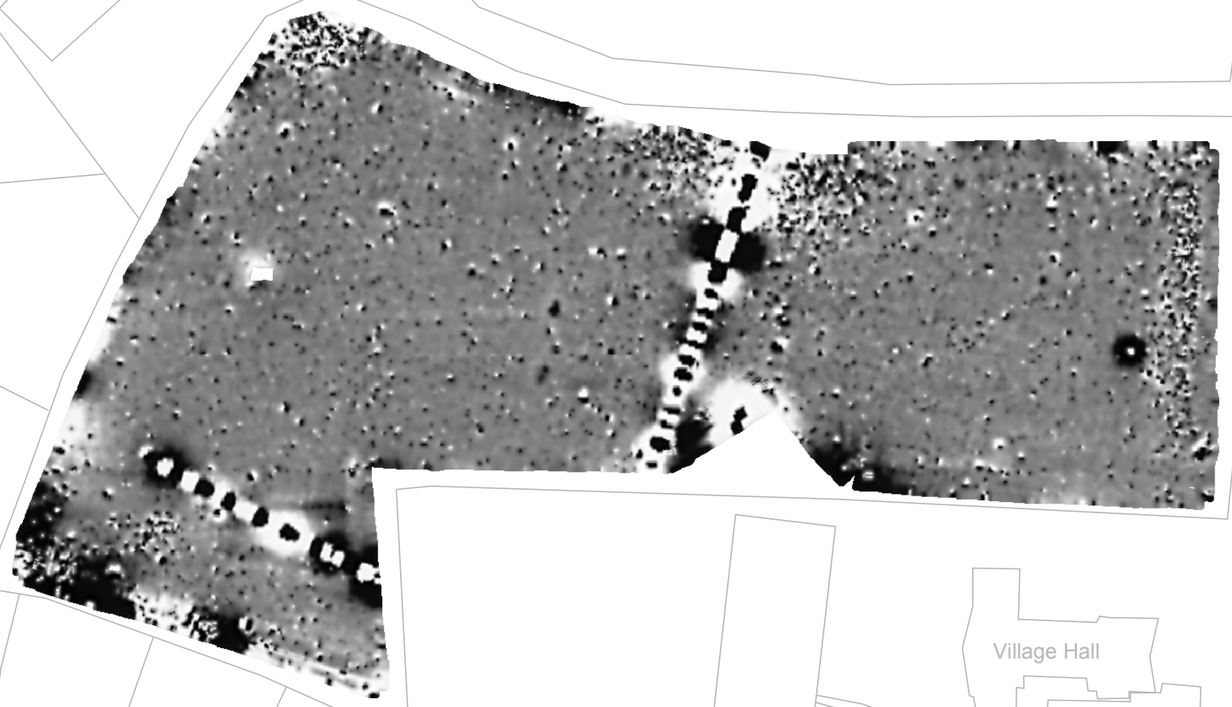
SCALE 1:1000

0m 10 20 30 40 50m

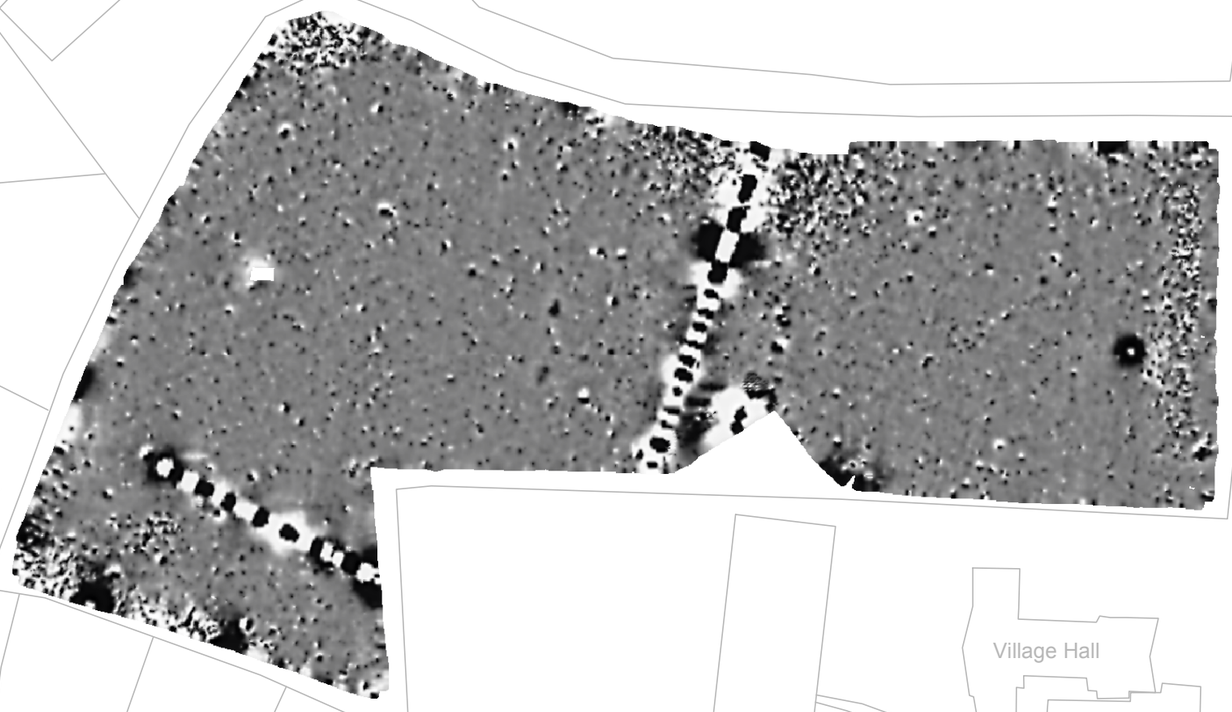
SCALE TRUE AT A3

FIG 02

Greyscale plot of minimally processed magnetometer data



Greyscale plot of high pass filtered magnetometer data



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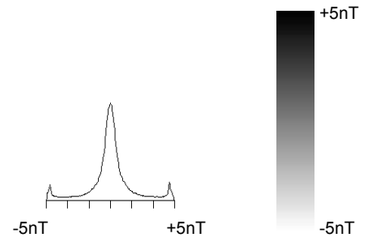
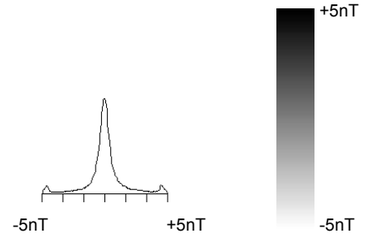
Greyscale plot of minimally processed and high pass filtered magnetometer data

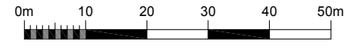


Minimally processed data



High pass filtered data

SCALE 1:1000



SCALE TRUE AT A3

FIG 03

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Abstraction and interpretation of magnetic anomalies

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Weakly multiple dipolar linear anomaly - possible land drain
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from 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

FIG 04