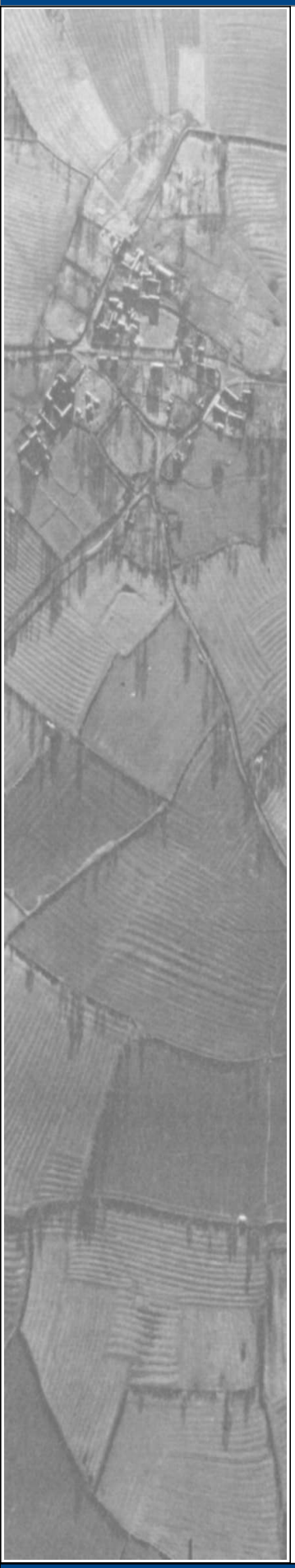

# Land at Uckington Farm
# Uckington
# Gloucestershire

## MAGNETOMETER SURVEY REPORT

for

**Pegasus Group**

on behalf of

**Newland Homes Ltd**

Kerry Donaldson & David Sabin

November 2022

Ref. no. J939

ARCHAEOLOGICAL SURVEYS LTD

# Land at Uckington Farm
# Uckington
# Gloucestershire

## MAGNETOMETER SURVEY REPORT

for

## Pegasus Group

on behalf of

## Newland Homes Ltd

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 – 25th October 2022
Ordnance Survey Grid Reference – **SO 91785 24980**

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# CONTENTS

LIST OF FIGURES



LIST OF PLATES



LIST OF TABLES

# SUMMARY

A detailed magnetometry survey was carried out within a small area at Uckington Farm, Uckington in Gloucestershire. Magnetic debris from a former barn, agricultural tracks, ground make-up and dumping were recorded. Magnetic disturbance from barns, fencing and a buried pipe also resulted in strongly magnetic responses. Two short, positive linear anomalies were located to the north of the development boundary but these appear to extend towards a zone of magnetic debris that may relate to a bonfire, and it is possible that they relate to vehicular ruts or tracks.

# 1 INTRODUCTION

## *1.1 Survey background*

1.1.1 Archaeological Surveys Ltd was commissioned by Pegasus Group, on behalf of Newland Homes Ltd, to undertake a magnetometer survey of an area of land at Uckington Farm, Uckington, Gloucestershire. The site has been outlined for a proposed residential development and the survey forms part of an archaeological assessment.

## *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 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 at Uckington Farm, Uckington, Gloucestershire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SO 91785 24980, see Figs 01 and 02.

1.4.2 The development boundary is approximately 1ha in area; however, the site includes a barn, fencing, trees, overgrown vegetation, hardstanding and tracks. The geophysical survey covers approximately 0.65ha split between a small area of grass and farm track in the south, with the largest area of grass field to the north and two small areas of orchard in the east. A slightly larger area was surveyed to the north of the red line boundary for context.

1.4.3 The ground conditions across the site were variable and data were collected where possible. Weather conditions during the survey were fine.

*Plate 1: Southern part of survey area looking south*

*Plate 2: Northern part of survey area looking north*

## *1.5 Site history and archaeological potential*

1.5.1 There are no designated or undesignated heritage assets within the site; however, there are a number within the surrounding vicinity. These include a Romano-British settlement situated between 300m and 1km to the east south east (HER5437 & HER 27597), with pits and a penannular ring ditch identified

through geophysical survey 300m to the north east (HER44928), cropmarks of linear ditches situated 200m to the north north east (HER44929) and cropmarks of a prehistoric/Romano-British settlement 470m to the north north west (HER48029). Further evidence for Iron Age and Romano-British settlement were identified through cropmarks, geophysical survey and evaluation 700m to the west (HER8637). The scheduled monument of the medieval moated site at Uckington (HER5413) (HE List entry no: 1016835) lies 200m to the south south west with possible further evidence for medieval ponds at Manor Farm situated 420m to the south west.

1.5.2 Early mapping indicates that the site was used as an orchard with a large pond in the north western corner during the 19th century. An agricultural barn is recorded on aerial photographs within the western part of the site during the late 20th and early 21st century.

1.5.3 The presence of widespread late prehistoric and Romano-British settlement along with medieval sites within the wider vicinity indicates that there could be some potential for similar features to lie within the survey area. However, modern agricultural use including barns, hardstanding and tracks may result in anomalies that obscure the underlying features, if they are present within the site.

### *1.6 Geology and soils*

1.6.1 The underlying geology is from the Charmouth Mudstone Formation with overlying Cheltenham Sand and Gravel deposits (BGS, 2022).

1.6.2 The overlying soil across the site is from the Badsey 2 association (511i) and is a typical brown calcareous earth. It consists of a well drained, calcareous, fine, loamy soil over limestone gravel (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® MX V3 6 channel cart-based system. The instrument has 6 fluxgate gradiometers (FGM650) spaced 0.5m apart with readings recorded at 20Hz. 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 measurement range of ±8000nT, although the recorded range is ±3000nT, and resolution is around 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 <60s.

### *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 ±100nT. 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 both low pass and high pass filtering. Low pass filtering effectively removes high frequency variation along a traverse that has been caused by uneven ground and associated vibration. High pass filtering effectively removes low frequency variation along a traverse that has been caused by large magnetic bodies, cultivation or rapid temperature change. Data treated to additional processing have been compared to unprocessed data to ensure that no significant anomalies have been removed. Filtered data has been clipped at ±5nT in order to see weaker anomalies outside of the main areas of magnetically contaminated ground.

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. 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.

2.3.7 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.

2.3.8 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.

2.3.9 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 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 0.65ha.

3.1.2 Magnetic anomalies located can be generally classified as positive linear anomalies of an uncertain origin, anomalies associated with land management, 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. 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 survey has located widespread and frequently high magnitude magnetic debris and disturbance relating to ferrous materials of modern origin. The high magnitude of the responses has the potential to obscure weaker anomalies within the site should they be present.

## *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. |
| ***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. Associated agricultural anomalies (e.g. headlands, tracks, plough marks and former ridge and furrow) may support the interpretation. |
| ***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 391785 224980, see Figs 03 – 05.

*Anomalies with an uncertain origin*

(1) – Two positive parallel linear anomalies are located to the north of the development boundary. It is not possible to determine if they relate to cut features. They appear similar to ruts or tracks caused by large agricultural vehicles and they appear to be heading directly towards a circular area of magnetic debris (3).

*Anomalies associated with land management*

(2) – Parallel linear anomalies relate to an agricultural track associated with magnetic debris.

*Anomalies associated with magnetic debris*

(3) – A circular area of magnetic debris is located in the north eastern part of the site just north of the development boundary. It is possible that this relates to the site of a former bonfire or dumped material.

(4) – Widespread magnetic debris in the western part of the site is associated with demolition material from a former agricultural building.

(5) – Strong, discrete, dipolar anomalies are a response to ferrous, and other magnetically thermoremnant objects, such as brick and tile within the topsoil. Spreads of soil containing such material was observed during the survey particularly in the southern part of the site.

*Anomalies with a modern origin*

(6) – A number of strong, discrete, dipolar responses are arranged in linear groups and are a response to the remains of steel uprights used in construction of the former barn.

(7) – A strong, multiple dipolar, linear anomaly crosses the site from the western edge towards the south eastern corner. This is a response to a steel or iron pipe.

# 4 CONCLUSION

4.1.1 The geophysical survey located widespread magnetic debris associated with a demolished modern barn, agricultural tracks and a possible bonfire. Two parallel linear anomalies appear to lead towards the possible bonfire and it appears likely that they relate to agricultural vehicle tracks, these lie to the north of the development boundary. Magnetic disturbance from steel buildings, fencing and a pipe has also been encountered.

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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.

*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

Minimally processed data
Filename: J939-mag-proc.xcp
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 391733.86, 225036.18 m
Southeast corner: 391845.91, 224899.83m
Collection Method: Randomised
Sensors: 6
Dummy Value: 32702
Dimensions
Survey Size (meters): 112 m x 136 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 197231, Recorded: 197231
Stats
Max: 110.50
Min: -110.00
Std Dev: 36.04
Mean: -3.42
Median: -0.07
Composite Area: 1.5278 ha
Surveyed Area: 0.63417 ha
PROGRAM
Name: TerraSurveyor
Version: 3.0.37.0
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -100.00 to 100.00

Filtered data

Stats
Max: 5.53
Min: -5.50
Std Dev: 3.32
Mean: -0.12
Median: -0.03
GPS based Proce6
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Lo pass Uniform (median) filter: Window dia: 10
5 High pass Uniform (median) filter: Window dia: 200
6 Clip from -5.00 to 5.00

## 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. The report will be uploaded to Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

| File type | Naming scheme | Description |
|---|---|---|
| Data | J939-mag-**[area number/name]**.asc<br>J939-mag-**[area number/name]**.xcp<br>J939-mag-**[area number/name]**-proc.xcp | Raw data as ASCII CSV<br>TerraSurveyor raw data<br>TerraSurveyor minimally processed data |
| Graphics | J939-mag-**[area number/name]**-proc.tif | Image in TIF format |
| Drawing | J939-**[version number]**.dwg | CAD file in 2018 dwg format |
| Report | J939 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 LINEAR UNCERTAIN | | 255,127,0 | Line, polyline or polygon (solid) |
| ***Anomalies relating to land management*** | | | |
| AS-ABST MAG PATH/ROAD/TRACK | | 0, 153,153 | Line, polyline or polygon (solid or partly cross hatched ANSI38) |
| ***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) |
| AS-ABST MAG SERVICE | | 132, 132, 132 | Line or polyline |

Table 3: CAD layering

## Appendix F – copyright and intellectual property

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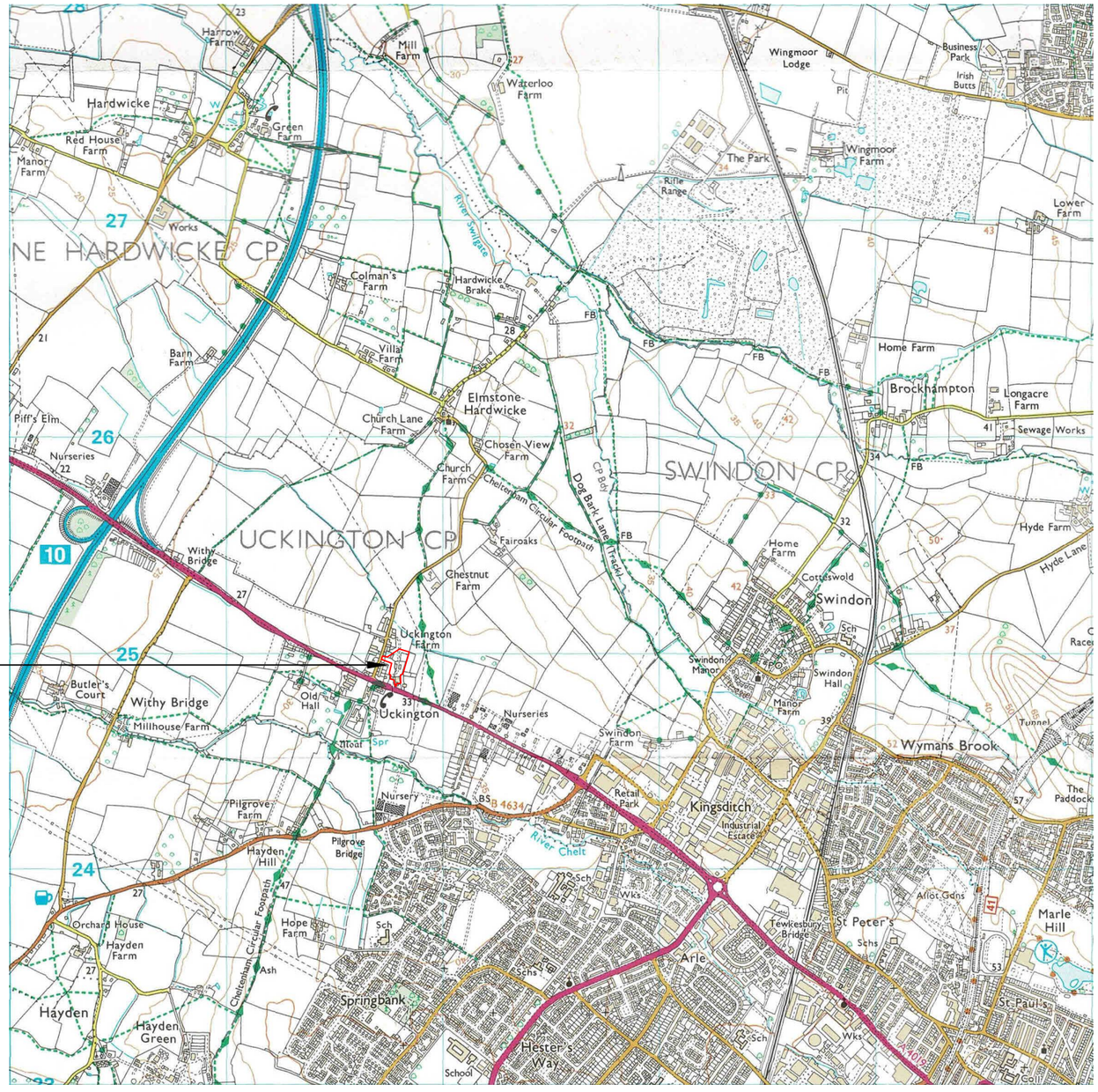
# Geophysical Survey
# Land at Uckington Farm
# Uckington
# Gloucestershire

## Map of survey area




Survey location


Survey location

Site centred on OS NGR
SO 91785 24980

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

| DRAWN BY | CHECKED BY | |
|---|---|---|
| KTD | DJS | FIG 01 |

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# Geophysical Survey
# Land at Uckington Farm
# Uckington
# Gloucestershire

## Referencing information

Referencing grid to OSGB36 datum at 50m intervals

391800 225000

Survey tracks

Survey track start

Survey track stop

Development boundary

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

| DRAWN BY | CHECKED BY | |
|---|---|---|
| KTD | DJS | FIG 02 |

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## Greyscale plot of minimally processed magnetometer data

+100nT
-100nT
-100nT +100nT

Development boundary

SCALE 1:500

0m 5 10 15 20 25m

SCALE TRUE AT A3

| DRAWN BY | CHECKED BY | |
|---|---|---|
| KTD | DJS | FIG 03 |

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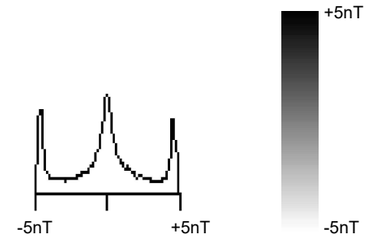
## Greyscale plot of filtered magnetometer data




Development boundary

SCALE 1:500

0m 5 10 15 20 25m

SCALE TRUE AT A3

| DRAWN BY | CHECKED BY | |
|---|---|---|
| KTD | DJS | FIG 04 |

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## Abstraction and interpretation of magnetic anomalies

- Positive linear anomaly - of uncertain origin
- Linear anomaly - agricultural track
- 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

Development boundary

SCALE 1:500

0m 5 10 15 20 25m

SCALE TRUE AT A3

| DRAWN BY | CHECKED BY | |
|---|---|---|
| KTD | DJS | FIG 05 |