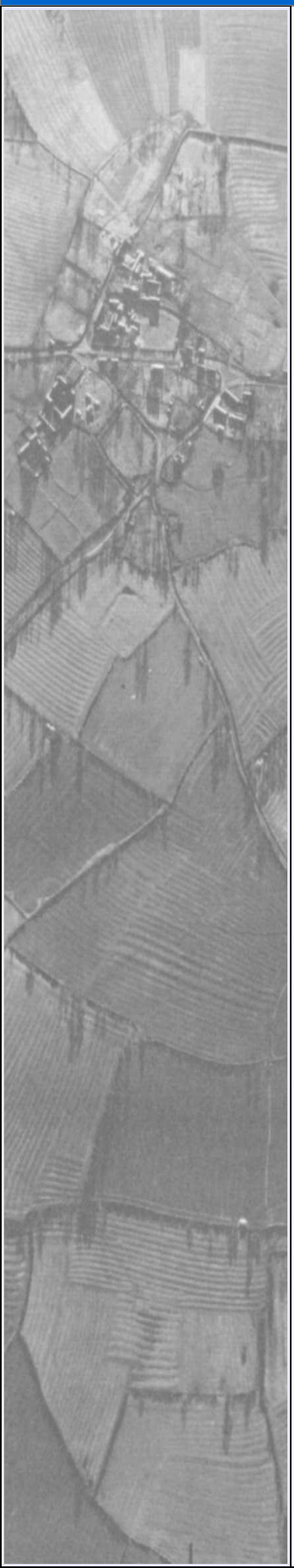

Land at The Marsh
Wanborough
Swindon

MAGNETOMETER SURVEY REPORT

for

Cotswold Archaeology

on behalf of

Fairwater Homes Ltd

Kerry Donaldson & David Sabin

March 2019

Ref. no. J781

ARCHAEOLOGICAL SURVEYS LTD

Land at The Marsh
Wanborough
Swindon

Magnetometer Survey Report

for

Cotswold Archaeology

on behalf of

Fairwater Homes 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 – 14th March 2019
Ordnance Survey Grid Reference – **SU 20190 83730**

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Web: www.archaeological-surveys.co.uk

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SUMMARY

A geophysical survey, comprising detailed magnetometry, was carried out by Archaeological Surveys Ltd on land at The Marsh, in Wanborough, Swindon. The survey located anomalies associated with a formerly mapped house or cottages and ancillary buildings in the western part of the site. Other anomalies in the vicinity are likely to be associated. Magnetic debris has also been used to infill the surrounding boundary as well as being widespread elsewhere within the survey area. A single weakly positive linear anomaly is located in the far northern part of the site, but it is not possible to determine its origin.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Cotswold Archaeology, on behalf of their client Fairwater Homes Ltd, to undertake a magnetometer survey of an area of land at The Marsh, Wanborough, Swindon. The site has been outlined for a proposed residential development and the survey forms part of an archaeological assessment.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2019) and approved by Melanie Pomeroy-Kellinger, County Archaeologist for Wiltshire Council.

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 lines; broken or fragmented anomalies may well correspond closely with subsurface truncation.

1.4 Site location, description and survey conditions

1.4.1 The site is located to the north of The Marsh in Wanborough, Swindon. It is centred on Ordnance Survey National Grid Reference (OS NGR) SU 20190 83730, see Figs 01 and 02.

1.4.2 The geophysical survey covers approximately 1ha of pasture land split between three small fields. The western side of the site is bounded by a small brook and there is a pond in the south eastern corner. A small agricultural building, constructed of wood with some steel, is located in the northern part of the site. Field boundaries are mainly constructed using post and rail fencing.

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

1.5 Site history and archaeological potential

1.5.1 The site does not contain any designated or undesignated heritage assets;

however, it lies within an area containing archaeological features. These include a former medieval moated site situated 60m to the north east of the survey area. Prior to the construction of the residential dwellings at St Katherine's Place, at Marsh Farm immediately west of the site, two medieval ditches and a gully were located. These contained 13th to 15th century pottery and may have been associated with the moated site just to the north (Taylor, 2007). A number of geophysical surveys within the wider vicinity have revealed evidence for prehistoric and Roman archaeology, including several ring ditches, enclosures, linear ditches and a building within 200m to 600m south west of the site (Archaeological Surveys, 2015 & 2017).

1.5.2 Ordnance Survey mapping between 1882 and 1900 indicates that the western part of the survey area contained two cottages with outbuildings surrounded by a boundary and that these had been removed by 1925. A line of mature trees is also depicted to the east, possibly representing an earlier removed boundary.

1.5.3 The surface appeared to contain a number of undulations perhaps relating to low earthworks. However, the landowner indicated that material had been brought onto the site during the construction of the M4 motorway and this may account for the surface variation.

1.6 Geology and soils

1.6.1 The underlying solid geology across the site is Gault Clay (BGS, 2017).

1.6.2 The overlying soil across the survey area is from the Denchworth association and is a pelo-stagnogley soil. It consists of a slowly permeable, seasonally waterlogged, clayey soil (Soil Survey of England and Wales, 1983).

1.6.3 The soils and geology can be associated with low levels of magnetic susceptibility and there can be poor magnetic contrast between the fill of cut features and the material into which they are cut, However, magnetometry survey carried out across similar soils has produced good results in the vicinity. The underlying geology and soils are, therefore, considered acceptable for magnetic survey.

2 METHODOLOGY

2.1 Technical synopsis

2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Magnetic susceptibility and magnetic thermoremnance 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 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®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 ±20nT (Fig 04). A plot of the data clipped at at ±50nT has also been shown with values above +40nT highlighted in red and those below -40nT highlighted in blue (Fig 03). 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.

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 GPS, 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 approximately 1ha within three land parcels.

3.1.2 Magnetic anomalies located can be generally classified as positive and negative responses associated with former structural remains, 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 Widespread magnetic debris of moderate to high magnitude was located by

the survey, and it is likely that this has a modern origin or is associated with ground make-up with soil already contaminated with ferrous objects. The magnetic response created by the debris has the potential to obscure other weakly magnetic features should they be present within the site.

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, see Table 1.

Interpretation category	Description and origin of anomalies
Anomalies associated with former structural remains	Anomalies have the characteristics (mainly morphological) of a range of features associated with formerly mapped buildings. Negative linear anomalies can relate to former walling foundations, positive responses from exterior cut features or magnetically enhanced features associated with the former structure and its demolition.
Anomalies with an uncertain origin	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. 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 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.

Table 1: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 420190 183730, see Figs 03 – 05.

Anomalies associated with former structural remains

(1) - A series of negative linear and rectilinear anomalies are generally associated with former buildings recorded on Ordnance Survey mapping in 1882 and 1900, but they had been removed by 1925.

Anomalies with an uncertain origin

(2) - A number of further positive and negative linear anomalies can be seen surrounding anomalies (1). These are likely to be associated with the former buildings, although it is not possible to determine if they relate to unmapped structures, or if they relate to former garden features, such as paths, walls and beds.

(3) - In the far northern part of the survey area is a weakly positive linear anomaly. It is not possible to determine if it relates to a cut feature.

Anomalies associated with magnetic debris

(4) - Strongly magnetic debris in the western part of the site is a response to highly magnetic material used to infil the former boundary that surrounded the buildings to the west.

(5) - Strongly magnetic debris that extends along the line of formerly mapped trees, possibly indicating an infilled former boundary ditch.

(6) - Much of the site contains magnetic debris. This is likely to relate to ground make-up/consolidation using soil contaminated with ferrous material.

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

4 CONCLUSION

4.1.1 The geophysical survey located anomalies in the western part of the site that are associated with a former farmhouse/cottages and ancillary buildings mapped in the late 19th and early 20th centuries. Other anomalies in the vicinity do not clearly correspond to buildings but are likely to be associated, possibly related to garden features. The structures were removed by 1925 and the surrounding boundary has been infilled with strongly magnetic debris. To the east is further magnetic debris, including very strongly magnetic material which has the potential to obscure weakly magnetic features if they are present. In the northern part of the site is a single, short, weakly positive linear anomaly; however, it is not possible to determine if it relates to a cut feature.

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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. 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 - 50nT

Filename: J781-mag-proc.xcp
Description: Imported as Composite from: J781-mag.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 420118.49, 183803.98 m
Southeast corner: 420232.79, 183670.78 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Source GPS Points: 282500
Dimensions
Composite Size (readings): 762 x 888
Survey Size (meters): 114 m x 133 m
Grid Size: 114 m x 133 m
X Interval: 0.15 m
Y Interval: 0.15 m
Stats
Max: 55.25
Min: -55.00
Std Dev: 19.20
Mean: -0.36
Median: 0.01

Composite Area: 1.5225 ha
Surveyed Area: 0.83125 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 -50.00 to 50.00 nT

Minimally processed data - 20nT

Stats
Max: 22.10
Min: -22.00
Std Dev: 10.34
Mean: -0.25
Median: 0.02
GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -50.00 to 50.00 nT
5 Clip from -20.00 to 20.00 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 PDF copy will be supplied to the Wiltshire Historic Environment Record. with printed copies on request. The georeferenced greyscale images and abstraction layers can also be supplied on request. The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

File type	Naming scheme	Description
Data	J781-mag.asc J781-mag].xcp J781-mag-proc.xcp	Raw data as ASCII CSV TerraSurveyor raw data TerraSurveyor minimally processed data
Graphics	J781-mag-proc.tif	Image in TIF format
Drawing	J781-version 1.dwg	CAD file in 2010 dwg format
Report	J781 report.odt	Report text in Open Office 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 associated with former structures			
AS-ABST MAG POS STRUCTURAL REMAINS		255,0,127	Line, polyline or polygon (solid)
AS-ABST MAG NEG STRUCTURAL REMAINS		0,78,36	Line, polyline or polygon (solid)
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)
AS-ABST MAG POS DISCRETE UNCERTAIN		255,127,0	Solid donut, point or polygon (solid)
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)

Table 3: CAD layering

Appendix F – copyright and intellectual property

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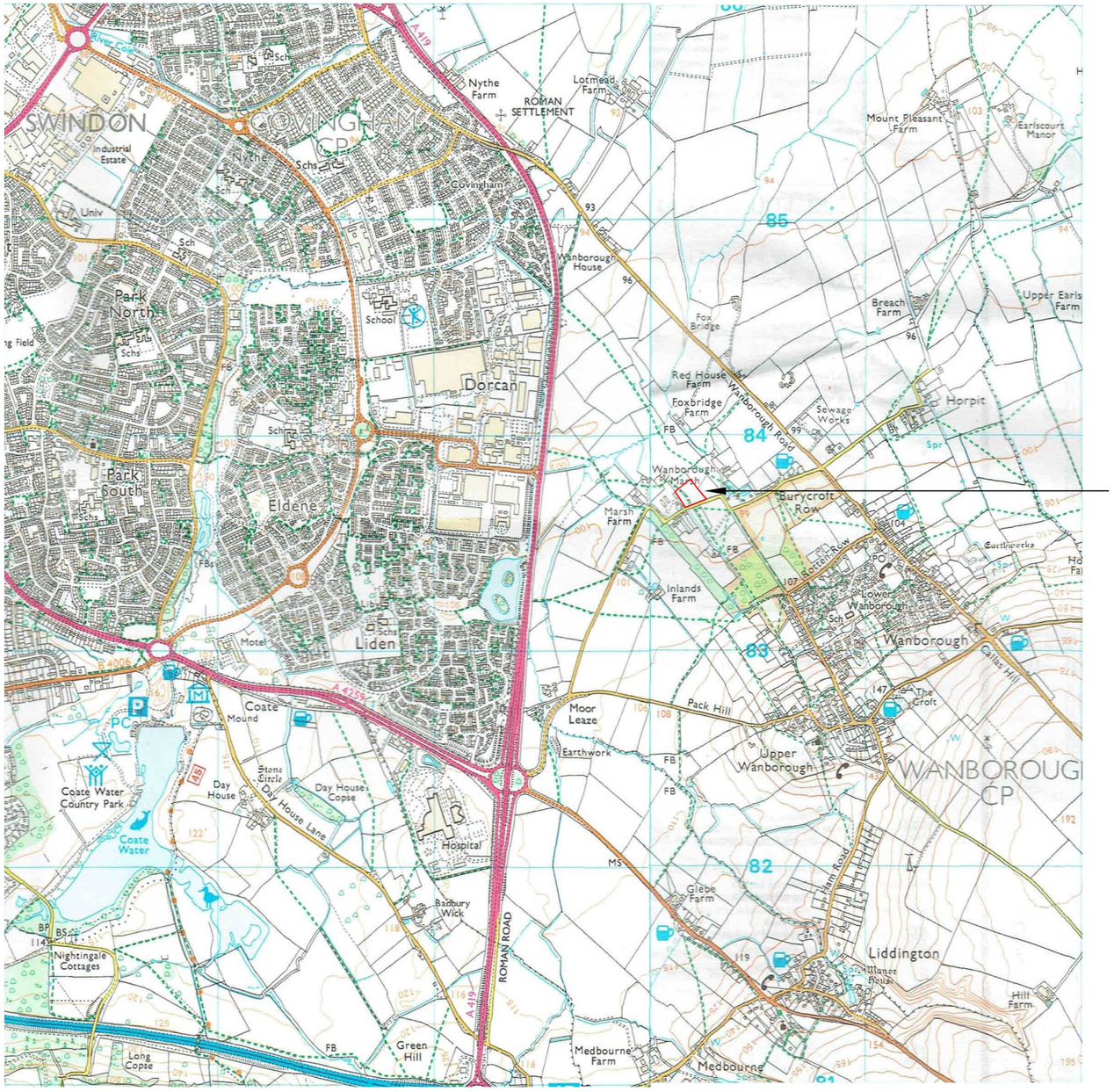
Archaeological Surveys Ltd

Geophysical Survey
Land at The Marsh
Wanborough
Swindon

Map of survey area



● Survey location

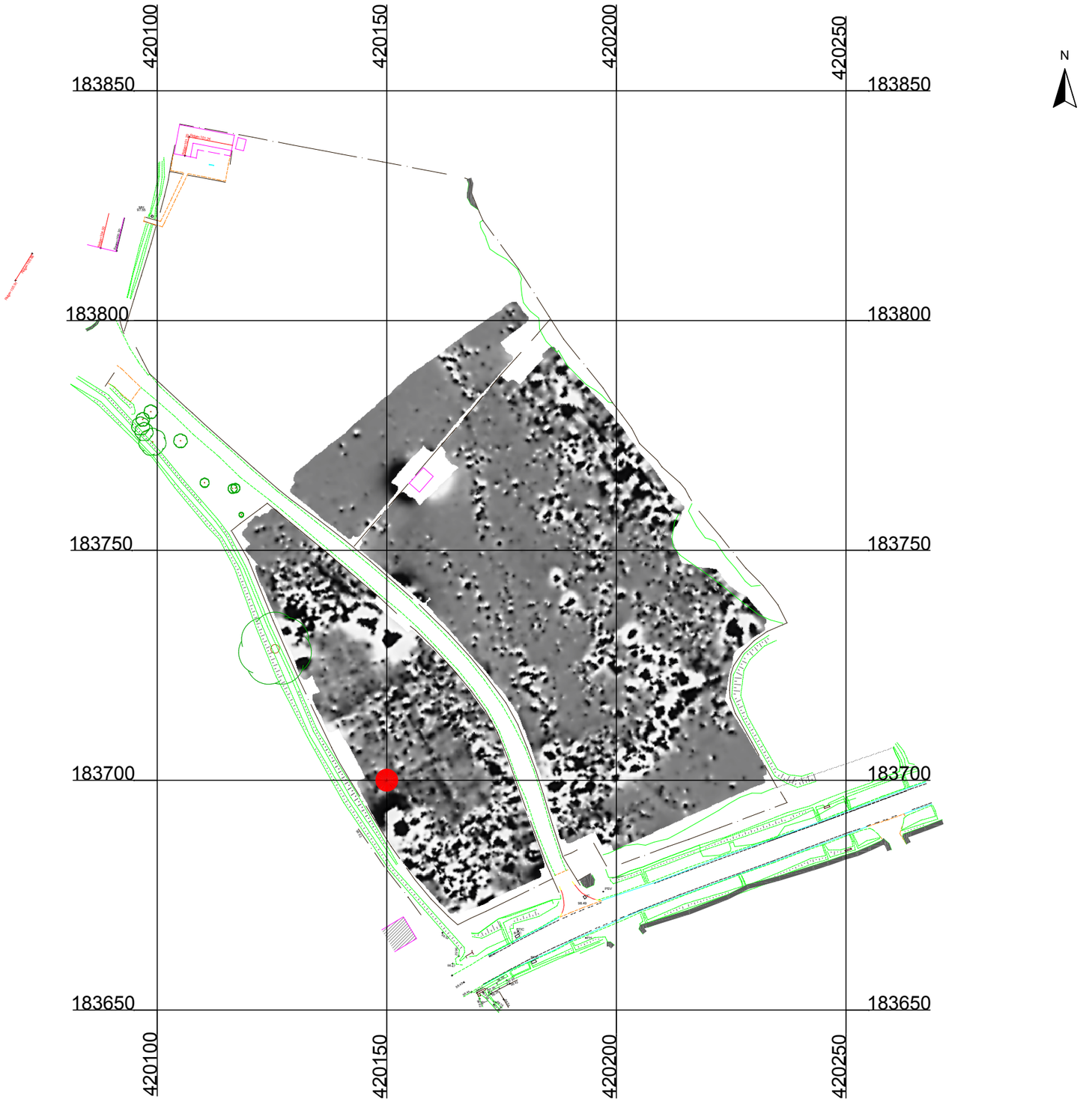
Site centred on OS NGR
SU 20190 83730

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 01



Archaeological Surveys Ltd

Geophysical Survey
Land at The Marsh
Wanborough
Swindon

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

● 420150 183700

SCALE 1:1000

0m 10 20 30 40 50m

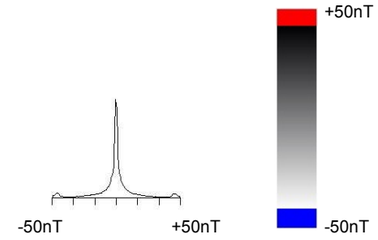
SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 02

Archaeological Surveys Ltd

Geophysical Survey
Land at The Marsh
Wanborough
Swindon

Greyscale plot of minimally processed magnetometer data clipped at ±50nT

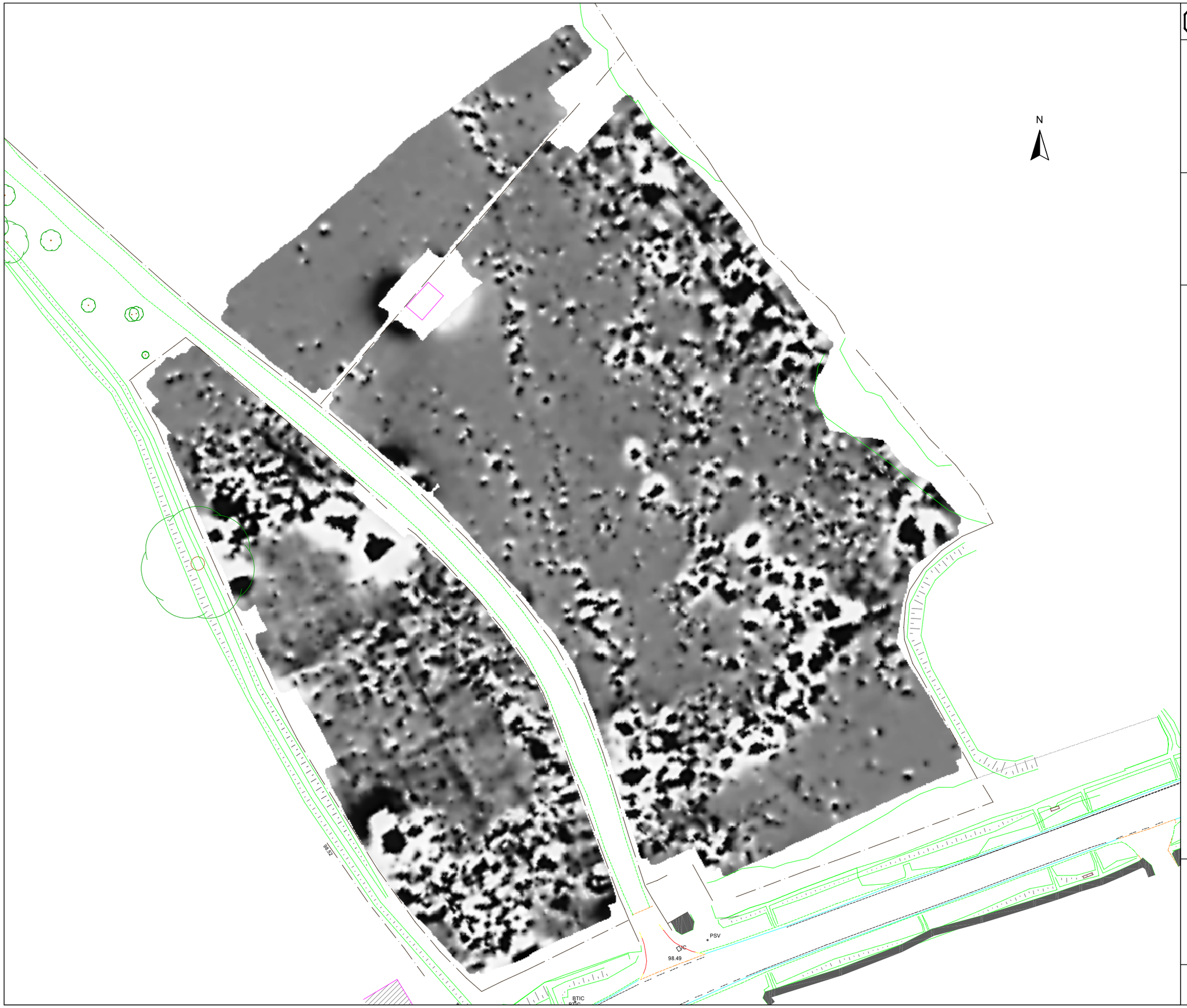


SCALE 1:500

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 minimally processed magnetometer data clipped at 20nT

+20nT
-20nT
+20nT
-20nT

SCALE 1:500

0m 5 10 15 20 25m

SCALE TRUE AT A3

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Abstraction and interpretation of magnetic anomalies

- Positive linear anomaly - associated with former c19th century structure
- Negative linear anomaly - associated with former c19th century structure
- Positive linear anomaly - of uncertain origin
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:500

0m 5 10 15 20 25m

SCALE TRUE AT A3

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KTD	DJS	FIG 05