

**Barton Marina
Barton-under-Needwood
Staffordshire**

MAGNETOMETER SURVEY REPORT

for

Archaeology Warwickshire

Kerry Donaldson & David Sabin

August 2016

Ref. no. J678

ARCHAEOLOGICAL SURVEYS LTD

Barton Marina
Barton-under-Needwood
Staffordshire

Magnetometer Survey Report

for

Archaeology Warwickshire

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Report checked by David Sabin

Primary archive location - Archaeological Surveys Ltd, Yatesbury, Wiltshire

Survey date – 8th August 2016

Ordnance Survey Grid Reference – **SK 19610 18050**



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SUMMARY

Magnetometry was carried out by Archaeological Surveys Ltd over approximately 1ha of recreational land at Barton Marina, Barton-under-Needwood, Staffordshire. The survey was carried out ahead of a lakeside residential development. The results demonstrate the presence of several positive linear and discrete anomalies of uncertain origin and a former field boundary ditch. Widespread magnetic debris in the central and northern parts of the site may relate to ground disturbance and subsequent landscaping associated with former gravel extraction or other construction works at the marina. The location of the former field boundary ditch implies less disturbance within the southern part of the survey area.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Archaeology Warwickshire to undertake a magnetometer survey of an area of land at Barton Marina, Barton-under-Needwood in Staffordshire. The site has planning permission for a lakeside residential development of 54 dwellings by Cameron Homes (Planning Application Number P/2015/01588). The survey forms part of an archaeological assessment of the site.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin so that they may be assessed prior to development of the site. The methodology is considered an efficient and effective approach to archaeological prospection.

1.2.2 The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation*; and 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 at Barton Marina, Barton-under-Needwood, Staffordshire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SK 19610 18050, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 1ha of grassland located in a narrow strip of land between a fishing lake and car parks associated with the

marina. The area currently has open access and is maintained for recreational purposes, some landscaping is evident around the edge of the lake.



Plate 1: Southern part of survey area looking north

- 1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Numerous sources of magnetic disturbance were present in the form of parked and moving cars along the full length of the eastern side of the survey area. In addition, sources of disturbance in the form of inspection chambers, steel lamp posts, etc. were present within the northern part of the site. Weather conditions during the survey were fine.

1.4 Site history and archaeological potential

- 1.4.1 The site lies immediately east of a zone identified as containing ridge and furrow, although much of this has been removed by gravel extractions. Within the wider area are a number of enclosures, field systems, ring ditches, linear ditches and pits which relate to widespread archaeological activity within a 200m to 500m radius of the site. It also lies 400m west of Ryknild Street Roman Road, now the A38. Prior to the gravel extraction in the late 20th century, the site was under agricultural use and a field boundary, running east to west crossed the centre of the site. The area now lies between the lakes formed from the gravel pits and car parks, roads and buildings associated with the marina. It is likely that landscaping and groundworks have taken place within the site. However, due to the widespread location of archaeological features in the surrounding area, there is still potential that the survey could

locate further archaeological features should they exist within the site.

1.5 *Geology and soils*

- 1.5.1 The underlying geology is Mercia Mudstone with overlying Holme Pierrepont Sand and Gravel Member (BGS, 2016).
- 1.5.2 The overlying soil across the site is from the Wigton Moor association which is a typical cambic gley soil. It consists of a permeable, fine and coarse, loamy soil formed over river terraces and glaciofluvial drift (Soil Survey of England and Wales, 1983).
- 1.5.3 The underlying geology and soils are frequently associated with low magnetic contrast and low levels of magnetic susceptibility. However, cut features of archaeological potential may be located where human activity has altered the magnetic characteristics of the soil sufficiently. 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 spaced 0.5m apart with readings recorded at 20Hz. The gradiometers have a range of recording data between 0.1nT and 10,000nT. The sensors are not zeroed in the field, as the vertical axis alignment is fixed using a tension band system. In order to produce visible, useful greyscale images a zero median traverse process is undertaken in TerraSurveyor. The system is linked to a Leica GS10 RTK GPS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged computer.
- 2.2.2 Data are collected along a series of parallel survey tracks wherever possible. The length of each track is variable and relates to the size of the survey area and other factors including ground conditions. A visual display aids accurate placing of tracks and their separation.
- 2.2.3 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).

2.3 *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. Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display using TerraSurveyor.
- 2.3.2 The data are collected between limits of ± 10000 nT and clipped for display at ± 3 nT. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track. A zero median traverse function is required in order to remove fixed offset values present within the sensors which do not undergo a zeroing procedure in the field. The approach ensures that the gradiometer sensors are very accurately aligned and fixed to the vertical magnetic field and are not influenced by localised magnetic fields or disturbed by vibration. 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 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 any processes, such as clipping, carried out on the data.
- 2.3.4 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.

- 2.3.5 The raster images are combined with base mapping using ProgeCAD Professional 2014, 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.
- 2.3.6 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.
- 2.3.7 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.
- 2.3.8 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 a single survey area split by a path close to its northern limit.
- 3.1.2 Magnetic anomalies located can be generally classified as positive anomalies of an uncertain origin, areas of magnetic debris and disturbance and strong discrete dipolar anomalies relating to ferrous objects. Anomalies located have been numbered and are described in 3.4 below.

3.2 *Statement of data quality*

- 3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the dataset. Magnetic disturbance along the eastern side of the survey area has been caused by cars with services, lamp posts, inspection chambers, etc. causing disturbance in the northern part of 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, 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 within the survey area.







| Report sub-heading CAD layer names and plot colour | Description and origin of anomalies |
|---|---|
| <p>Anomalies with an uncertain origin</p> <p>AS-ABST MAG POS LINEAR UNCERTAIN  AS-ABST MAG POS DISCRETE UNCERTAIN </p> | <p>The category applies to a range of anomalies where <u>there is not enough evidence to confidently suggest an origin</u>. Anomalies in this category <u>may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered</u>. 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.</p> |
| <p>Anomalies relating to land management</p> <p>AS-ABST MAG BOUNDARY </p> | <p>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, plough marks and former ridge and furrow) may support the interpretation.</p> |
| <p>Anomalies associated with magnetic debris</p> <p>AS-ABST MAG DEBRIS  AS-ABST MAG STRONG DIPOLAR </p> | <p>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 thermoremanent 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 <u>may therefore be archaeologically significant</u>. 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.</p> |
| <p>Anomalies with a modern origin</p> <p>AS-ABST MAG DISTURBANCE </p> | <p>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.</p> |

Table 1: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 419610 318050, see Fig 03.

Anomalies with an uncertain origin

(1) - A short, positive linear anomaly appears to have pits at both ends. Although a small number of discrete responses and a weakly positive linear anomaly (2) are

located to the north, the widespread magnetic debris (6), disturbance (8) and lack of definable characteristics prevents confident interpretation.

(2) - A weakly positive linear anomaly appears to extend across the northern part of the survey area. Widespread magnetic contamination has partly obscured the anomaly and its origin is uncertain.

(3) - In the southern part of the site are a number of weakly positive linear anomalies. All are indistinct and poorly defined and as a consequence cannot be confidently interpreted.

(4) - In the northern part of the site are a cluster of discrete positive responses. They are close to a number of strong, discrete, dipolar responses and a zone of magnetic disturbance and although they may appear pit-like, a modern origin is possible.

Anomalies associated with land management

(5) - A positive linear anomaly extends across most of the southern section of the site from west to east. This appears to relate to a field boundary that continued to the west and was removed prior to the gravel extraction in the late 1990s.

Anomalies associated with magnetic debris

(6) - The site contains widespread magnetic debris with concentrations in the centre and around the periphery. This indicates that modern magnetic material has been incorporated into the soil. It may highlight areas that have been subject to some degree of landscaping, perhaps after disturbance by gravel extraction and other construction works associated with the marina.

(7) - Strong, discrete, dipolar anomalies are located throughout the site in large numbers. These are associated with (6) and indicate that ferrous and other magnetically thermoremanent material, such as brick, slag etc, has been spread throughout the site.

Anomalies with a modern origin

(8) - A zone of magnetic disturbance along the eastern edge of the site is a response to adjacent parked and moving cars. In the northern part of the site there are other modern ferrous objects and material causing a strong response.

4 CONCLUSION

- 4.1.1 The results of the detailed magnetometry demonstrate the presence of a number of linear and discrete positive anomalies, but it has not been possible to provide a confident interpretation as the majority are very weak and lack a coherent morphology. A positive linear anomaly with an east west orientation in the southern part of the site represents a former field boundary ditch.
- 4.1.2 Widespread magnetic debris within the northern and central parts of the site is likely to relate to modern ferrous material spread within the topsoil. It may imply a greater degree of former ground disturbance and subsequent landscaping associated with gravel working or other construction work associated with the marina. The location of the former field boundary possibly implies less disturbance to the southern half of the site.

5 REFERENCES

Aspinall, A., Gaffney, C. and Schmidt, A. 2009. *Magnetometry for Archaeologists*. Lanham (US), AltaMira Press.

British Geological Survey, 2015. *Geology of Britain viewer, 1:50 000 scale [online]* available from <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> [accessed 9/8/2016].

Chartered Institute for Archaeologists, 2014. *Standard and Guidance for archaeological geophysical survey*. IfA, University of Reading.

English Heritage, 2008. *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No.1*. 2nd ed. Swindon: English Heritage.

Institute for Archaeologists, 2002. *The use of Geophysical Techniques in Archaeological Evaluations*. IfA Paper No. 6. IfA, University of Reading.

Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 3 Midland & Western England*.

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 thermoremanent 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.

Thermoremanent 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. Thermoremanent features include ovens, hearths, and kilns. In addition thermoremanent 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 $\pm 5nT$ and $\pm 3nT$ 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 and modern agricultural features.

Appendix C – survey and data information

Minimally processed data

COMPOSITE
 Filename: J678-mag-proc.xcp
 Description: Imported as Composite from: J678-mag.asc
 Instrument Type: Sensys DLMGPS
 Units: nT
 UTM Zone: 30U
 Survey corner coordinates (X/Y): OSGB36
 Northwest corner: 419572.430917, 318143.417214112 m
 Southeast corner: 419684.630917, 317954.417214112 m
 Collection Method: Randomised
 Sensors: 5
 Dummy Value: 32702

Source GPS Points: 338400

Dimensions
 Composite Size (readings): 748 x 1260
 Survey Size (meters): 112 m x 189 m
 Grid Size: 112 m x 189 m
 X Interval: 0.15 m
 Y Interval: 0.15 m

Stats
 Max: 3.32
 Min: -3.30
 Std Dev: 1.71
 Mean: 0.01
 Median: 0.03
 Composite Area: 2.1206 ha
 Surveyed Area: 1.0131 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 -3.00 to 3.00 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 printed copy and a PDF copy of the report will be sent to the Staffordshire County Council Principal Archaeologist/HER. A submission of the report will also be made to the Online Access to the Index of archaeological investigations (OASIS).

Archive contents:

| Geophysical data - path: J678 Barton Marina\Data | | | | |
|--|-----------------------------|---|-------------|----------------|
| Path and Filename | Software | Description | Date | Creator |
| barton1\MX\prn.,dgb,.disp | Sensys MXPDA | Proprietary data formats representing magnetometer survey traverses logged to a PDA. | 08/08/16 | D.J.Sabin |
| barton1\MX\J678-mag.asc | Sensys DLMGPS | ASCII CSV (tab) file representing survey Area 1 in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number. | 09/08/16 | K.T.Donaldson |
| Mag\comps\J678-mag.xcp | TerraSurveyor 3.0.23.0 | Composite data file derived from ASCII CSV. | 09/08/16 | K.T.Donaldson |
| Mag\comps\J678-mag-proc.xcp | TerraSurveyor 3.0.23.0 | Processed composite data file (zmt and clipping to $\pm 3nT$). | 09/08/16 | K.T.Donaldson |
| Graphic data - path: J678 Barton Marina\Data | | | | |
| Mag\graphics\J678-mag-proc.tif | TerraSurveyor 3.0.23.0 | TIF file showing a minimally processed greyscale plot clipped to $\pm 3nT$. | 09/08/16 | K.T.Donaldson |
| Mag\graphics\J678-mag-proc.tfw | TerraSurveyor 3.0.23.0 | World file for georeferencing TIF to OSGB36. | 09/08/16 | K.T.Donaldson |
| CAD data - path: J678 Barton Marina\CAD\ | | | | |
| J678 version 1.dwg | ProgeCAD 2016 | CAD file for creating plots of greyscales, abstraction, interpretation and mapping. Grid coordinates as OSGB. AutoCAD 2010 format. | 09/08/16 | K.T.Donaldson |
| Text data - path: J678 Barton Marina\Documentation\ | | | | |
| J678 report.odt | OpenOffice.org 3.0.1 Writer | Report text as an Open Office document. | 09/08/16 | K.T.Donaldson |

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Appendix F.
Staffordshire County Council Sites and Monuments Record
Activity and Source Submission Form.

Submission date - August 2016

Site Activity or Event

Name of **event** (eg. Watching Brief at The Blue Boar, Ipstones.)

Magnetometer survey on land west of Barton Marina

Location of **event** (eg. The Blue Boar P.H. Overton Lane, Ipstones.)

Barton Marina, Barton-under-Needwood, Staffordshire
NGR SK 19620 18020

Civil Parish

Barton-under-Needwood

Brief Description of **event** (eg. Watching brief during cellar alterations and renovation, prior to conversion to residential use.)

Detailed magnetometer survey carried out over c1ha within and area of land to the west of Barton Marina ahead of a residential development.

"Activity Type(s)" (highlight as appropriate) *Air Photography / Evaluation-trial excavation /*

*Field Walking / Measured survey-drawing / Geophysical survey / Archaeological excavation-full /
Archaeological excavation-part / Field survey / Photogrammetric survey / Rectified photo survey /
Photographic record / AP interpretation / Salvage-rescue excavation / Watching brief / Environmental
sampling / Post-excavation analysis / Documentary research*

Commencement date (eg. 01-May-1978)

08-Aug-2016

Completion date (eg. 02-Sept-1983)

08-Aug-2016

Organisation or contractor details (organisation name, address, telephone, e-mail etc.)

Archaeological Surveys Ltd, 1 West Nolands, Nolands Road, Yatesbury, Calne, SN11 8YD
01249 814231
info@archaeological-surveys.co.uk

Report Details

Date

August 2016

Type of document (highlight as appropriate) *Written / Photographic / Cartographic / Drawn*

Title

Barton Marina, Barton-under-Needwood, Staffordshire, Magnetometer Survey Report

Author(s)

Donaldson, K. & Sabin, D.

Brief summary of contents

Magnetometry was carried out ahead of development on a narrow strip of land between the marina and lake and located a number of positive linear and discrete anomalies. The responses were either very weak, or partially obscured by stronger magnetic anomalies. Much of the central and northern part of the site was subject to dumping of magnetic debris, possibly associated with landscaping or during gravel extraction. A former field boundary ditch has also been located in the southern part of the site indicating that ground disturbance is less prevalent in this part of the site.

Brief description of document (eg. Written text with illustrations, bibliography and references. Appendices dealing with environmental sampling. 32 pages. etc.)

Written magnetometer survey report with 14 A4 pages including appendices, and 3 A3 figures including location map, referencing plot and plot with magnetometry greyscale and abstraction and interpretation of magnetic anomalies

Cross references to Staffordshire SMR (if applicable please list Primary record numbers)

Appendix G - OASIS DATA COLLECTION FORM: England

[List of Projects](#) | [Manage Projects](#) | [Search Projects](#) | [New project](#) | [Change your details](#) | [HER coverage](#) | [Change country](#) | [Log out](#)

[Printable version](#)

OASIS ID: [archaeol20-259812](#)

Project details

| | |
|--|---|
| Project name | Barton Marina, Barton-under-Needwood, Staffordshire, Magnetometer Survey Report |
| Short description of the project | Magnetometry was carried out by Archaeological Surveys Ltd over approximately 1ha of recreational land at Barton Marina, Barton-under-Needwood, Staffordshire. The survey was carried out ahead of a lakeside residential development. The results demonstrate the presence of several positive linear and discrete anomalies of uncertain origin and a former field boundary ditch. Widespread magnetic debris in the central and northern parts of the site may relate to ground disturbance and subsequent landscaping associated with former gravel extraction or other construction works at the marina. The location of the former field boundary ditch implies less disturbance within the southern part of the survey area. |
| Project dates | Start: 08-08-2016 End: 08-08-2016 |
| Previous/future work | Not known / Not known |
| Any associated project reference codes | J678 - Contracting Unit No. |
| Type of project | Field evaluation |
| Monument type | DITCH Post Medieval |
| Significant Finds | NONE None |
| Methods & techniques | "Geophysical Survey" |
| Development type | Housing estate |
| Prompt | National Planning Policy Framework - NPPF |
| Position in the planning process | After full determination (eg. As a condition) |
| Solid geology | TRIASSIC MUDSTONES |
| Drift geology | RIVER TERRACE DEPOSITS |
| Techniques | Magnetometry |

Project location

| | |
|------------------|--|
| Country | England |
| Site location | STAFFORDSHIRE EAST STAFFORDSHIRE BARTON UNDER NEEDWOOD Barton Marina, Barton-under-Needwood, Staffordshire |
| Study area | 1 Hectares |
| Site coordinates | SK 19620 18020 52.759093468095 -1.709233150068 52 45 32 N 001 42 33 W Point |

Project creators

| | |
|---------------------------|----------------------------|
| Name of Organisation | Archaeological Surveys Ltd |
| Project brief originator | Archaeology Warwickshire |
| Project design originator | Archaeological Surveys Ltd |
| Project director/manager | Archaeological Surveys Ltd |
| Project supervisor | Archaeological Surveys Ltd |

Project archives

| | |
|---------------------------|----------------------------|
| Physical Archive Exists? | No |
| Digital Archive recipient | Archaeological Surveys Ltd |
| Digital Contents | "Survey" |
| Digital Media available | "Geophysics","Text" |
| Paper Archive Exists? | No |

Project bibliography 1

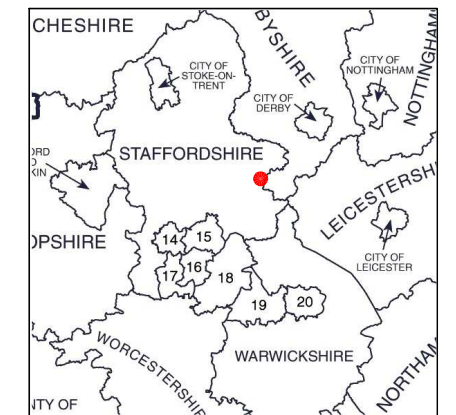
| | |
|-------------------------------|---|
| Publication type | Grey literature (unpublished document/manuscript) |
| Title | Barton Marina, Barton-under-Needwood, Staffordshire, Magnetometer Survey Report |
| Author(s)/Editor(s) | Donaldson, K. and Sabin, D. |
| Other bibliographic details | Report ref J678 |
| Date | 2016 |
| Issuer or publisher | Archaeological Surveys Ltd |
| Place of issue or publication | Yatesbury |

| | |
|------------|--|
| Entered by | Kerry Donaldson (kerry.donaldson@archaeological-surveys.co.uk) |
| Entered on | 11 August 2016 |

Geophysical Survey Barton Marina Barton-under-Needwood Staffordshire

Map of survey area

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● Survey location

Site centred on OS NGR
SK 19620 18020

SCALE 1:25 000



SCALE TRUE AT A3



Survey location

**Geophysical Survey
Barton Marina
Barton-under-Needwood
Staffordshire**

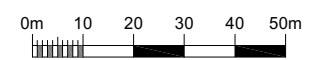
Referencing information

Referencing grid to OSGB36 datum at 50m intervals

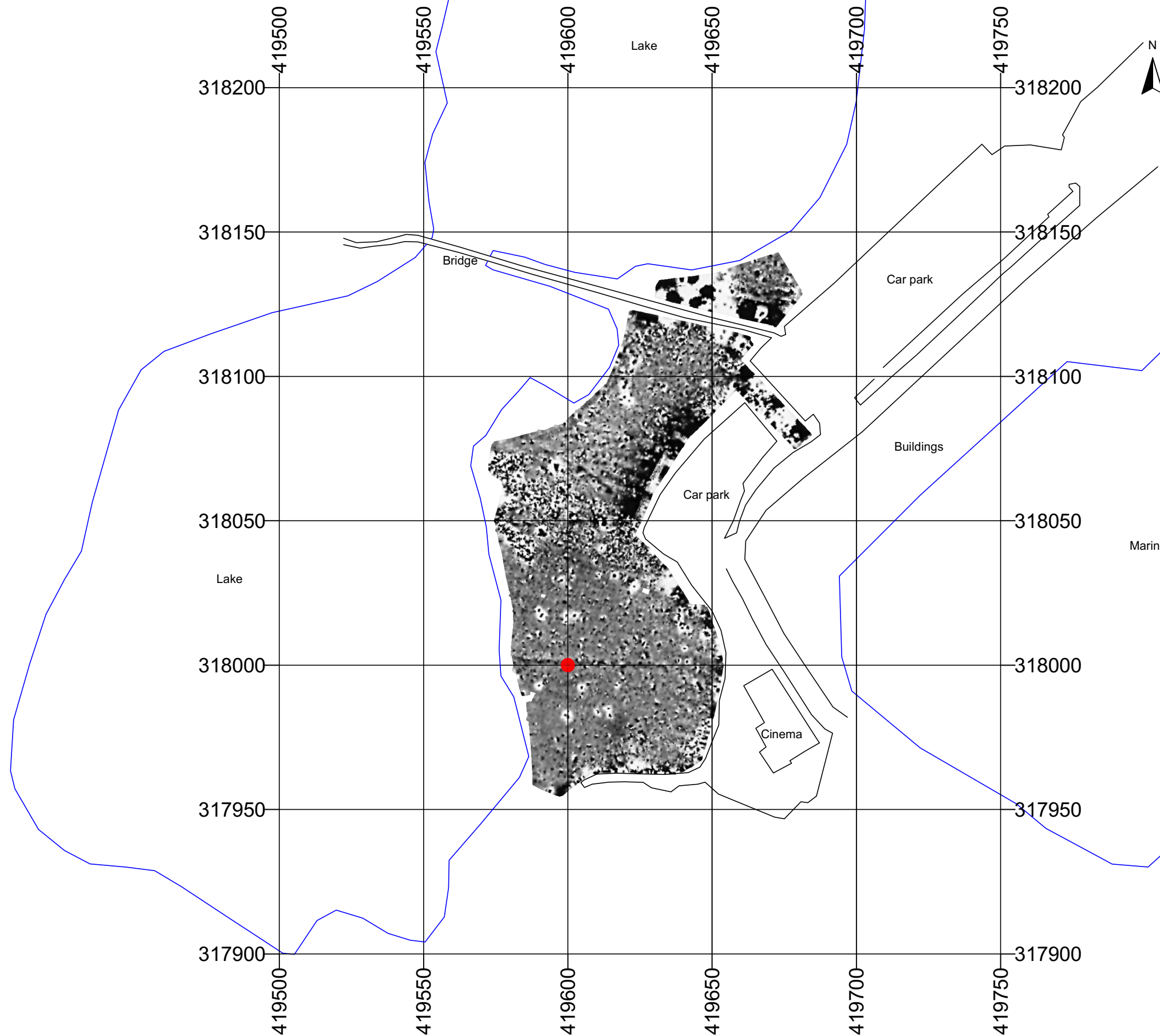
Data collected at 20Hz and georeferenced to ETRS89 zone 30 with conversion to OSGB36 using OSTN02

● 419600 318000

SCALE 1:1500









SCALE TRUE AT A3



**Geophysical Survey
Barton Marina
Barton-under-Needwood
Staffordshire**

**Abstraction and interpretation of
magnetometer anomalies**

-  Positive linear anomaly - possible ditch-like feature
-  Positive linear anomaly - possible former field boundary
-  Discrete positive response - possible pit-like feature
-  Magnetic debris - spread of magnetically thermoremanent/ferrous material
-  Magnetic disturbance from ferrous material
-  Strong dipolar anomaly - ferrous object

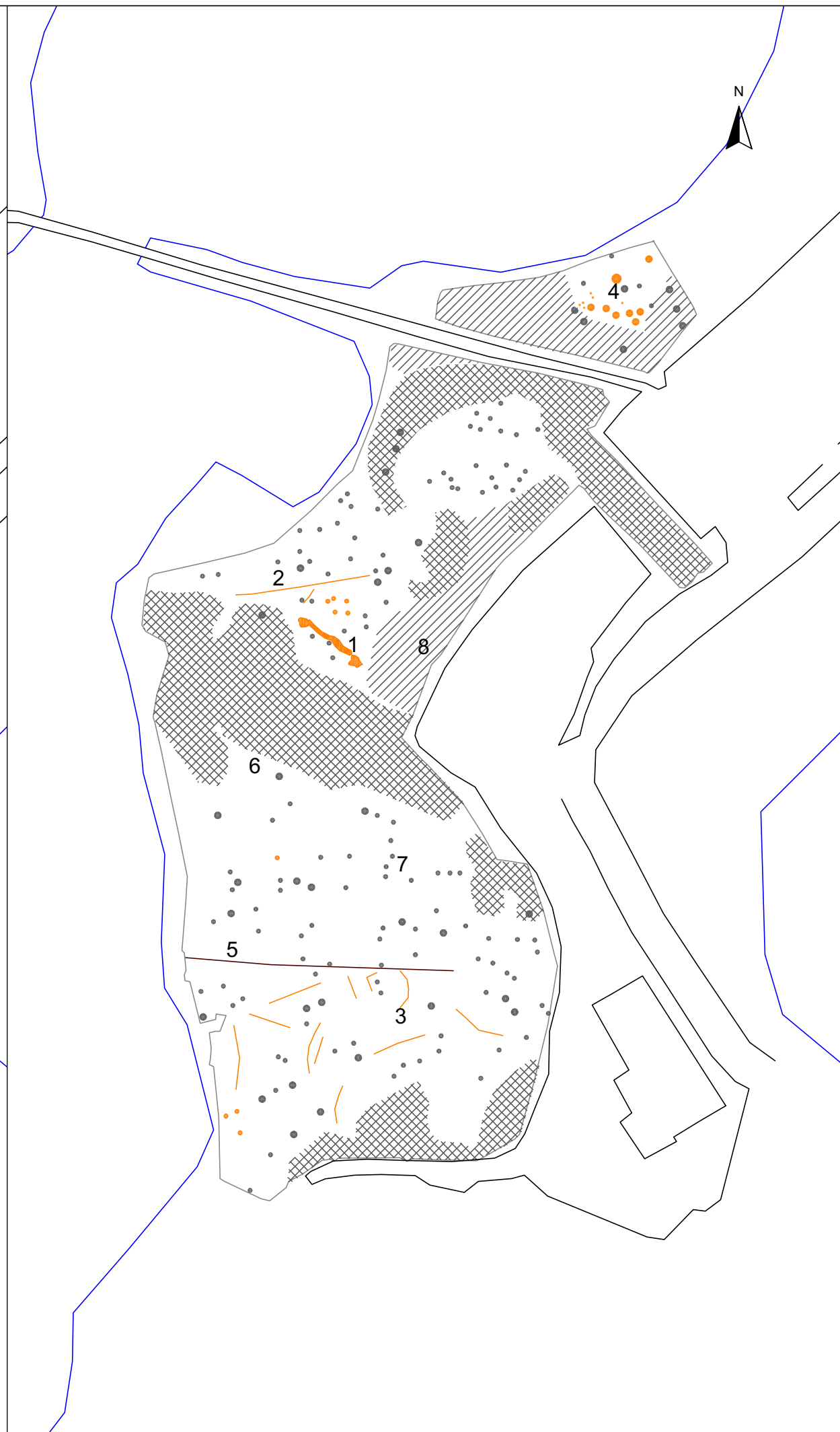
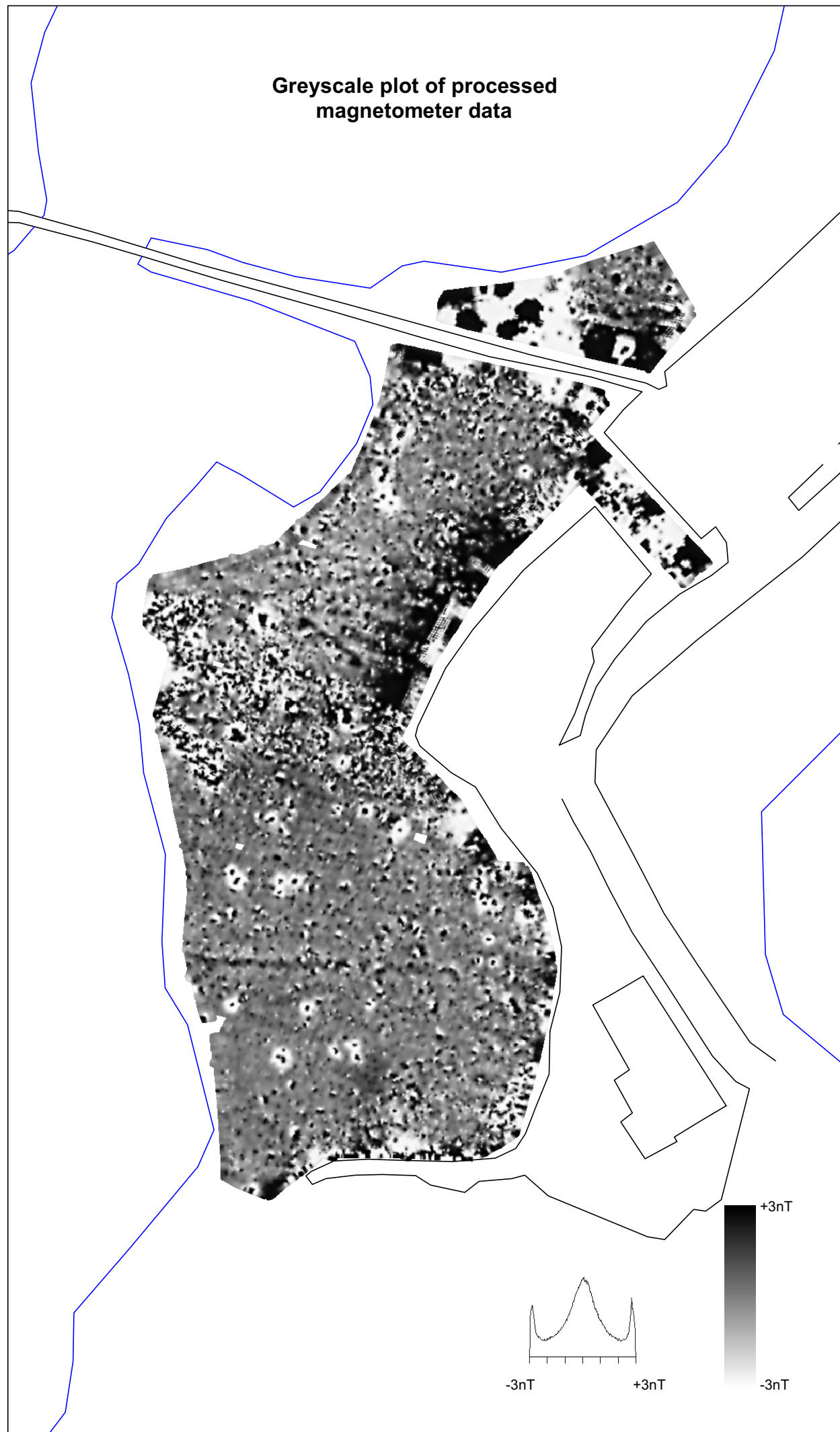
SCALE 1:1000



SCALE TRUE AT A3

FIG 03

**Greyscale plot of processed
magnetometer data**



N

