

T H A M E S V A L L E Y

ARCHAEOLOGICAL

S E R V I C E S

**Land east of Manor Road,
Goring-on-Thames, Oxfordshire**

Geophysical Survey (Magnetic)

by Kyle Beaverstock

Site Code: MRG 21/140

(SU 6011 8017)

**Land east of Manor Road,
Goring-on-Thames, Oxfordshire**

Geophysical Survey (Magnetic) Report

For Elegant Homes

by Kyle Beaverstock

Thames Valley Archaeological Services Ltd

Site Code MRG 21/140

July 2021

Summary

Site name: Land east of Manor Road, Goring-on-Thames, Oxfordshire

Grid reference: SU 6011 8017

Site activity: Magnetometer survey

Date and duration of project: 19th of July 2021

Project coordinator: Tim Dawson

Site supervisor: Kyle Beaverstock

Site code: MRG21/140

Area of site: 2.62 ha

Summary of results: A small number weak positive linear anomalies were detected by geophysical survey. These indicate the possible presence of features of archaeological interest.

Location of archive: The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

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Report edited/checked by: Tim Dawson✓ 26.7.21

Land east of Manor Road, Goring-on-Thames, Oxfordshire A Geophysical Survey (Magnetic)

by Kyle Beaverstock

Report 21/140

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at land at Manor Road, Goring-on-Thames, Oxfordshire (SU 6011 8018) (Fig. 1). The work was commissioned by Mr John Neville of Elegant Homes, The Granary, 1 Patrick Road, Reading, RG4 8DD.

Planning permission (app P/19/S2923/O) has been sought from South Oxfordshire District Council for the construction of 20 dwellings and associated works. Due to the potential disturbance of below ground archaeological features a staged programme of archaeological work has been requested in order to determine the archaeological potential of the site. This is in accordance with the *National Planning Policy Framework* (NPPF 2019) and the District's policies on archaeology. The field investigation was carried out to a specification drawn up according to a brief supplied by Oxfordshire County Archaeological Services (Weaver 2021) and approved by Mr Steven Weaver, Planning Archaeologist at OCAS. The fieldwork was undertaken by Kyle Beaverstock on 19th July 2021 and the site code is MRG 21/140.

The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

Location, topography and geology

The site consists of an irregularly-shaped field on the southern edge of the village of Goring-on-Thames, Oxfordshire (Fig. 1). The River Thames flows south-eastward some 400m south-west of the site and Reading is approximately 11km downstream. The site is an arable field 2.62ha in area centred on NGR SU 6011 8018 and bounded by Manor Road to the west, sparse housing to the north and east and further fields to the south. The ground slopes gently downhill from 45m above Ordnance Datum (aOD) in the north to 43m aOD in the south and the underlying geology is recorded as Kempton Park Gravel Member overlying Holywell Nodular Chalk Formation and New Pit Chalk Formation (BGS 2021).

Site history and archaeological background

The archaeological potential of the site has been highlighted in a brief for the project prepared by Steven Weaver of Oxfordshire County Archaeological Service (Weaver 2021). In summary, this potential stems from its location 550m north-west of the site of a Roman villa at Gatehampton (VCH 2019, 13-4). Excavations have uncovered a corndrier and materials suggesting the presence of a high-status building, including hypocaust tiles, floors, walls and tegulae. Further afield to the south is an area of multi-period settlement which has been identified through aerial photography and investigated by excavation. This has revealed an extensive complex including an Upper Palaeolithic butchering site (Allen, 1995), Neolithic causewayed enclosure and settlement and a Bronze Age barrow cemetery. Goring itself has Saxon origins and was recorded in Domesday Book in 1086 (Williams and Martin 2002). There are a wealth of other sites and finds in the wider area of the valley to north and south of Goring (e.g. Booth et al 2007; Lambrick et al 2009; Benson and Miles 1974).

Methodology

Sample interval

Data collection involved the traversing of the survey area along straight and parallel lines using two cart-mounted Bartington Grad601-2 fluxgate gradiometers. Even coverage was achieved with the use of regularly spaced markers at the ends of traverses and the real-time positional trace plot. Readings were taken at 0.25m intervals along traverses 1m apart, providing an appropriate methodology balancing cost and time with resolution. Traverses were walked at an alternating zig-zag pattern along a south-east to north-west orientation across the survey area. Other than some trees along the surrounding boundary there were no significant obstructions on the site. Conditions during the survey were dry and bright (Pl. 1-2)

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. Under normal operating conditions it can be expected to identify buried features >0.5m in diameter. Features which can be detected include disturbed soil, such as the fill of a ditch, structures that have been heated to high temperatures (magnetic thermoremnance) and objects made from ferro-magnetic materials. The strength of the magnetic field is measured in nano Tesla (nT), equivalent to 10^{-9} Tesla, the SI unit of magnetic flux density.

Equipment

The purpose of the survey was to identify geophysical anomalies that may be archaeological in origin in order to inform a targeted archaeological investigation of the site prior to development. The survey and report generally follow the recommendations and standards set out by both European Archaeological Council (EAC 2015) and the Chartered Institute *for* Archaeologists (2002, 2014).

Magnetometry was chosen as a survey method as it offers the most rapid ground coverage and responds to a wide range of anomalies caused by past human activity. These properties make it ideal for the fast yet detailed surveying of an area.

The detailed magnetometry survey was carried out using two dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometers mounted upon a Bartington non-magnetic cart. A two-wheeled lightweight structure pushed by hand, the cart consisted a bank of four vertically-mounted Bartington Grad601-2 magnetic sensor tubes at 1m apart and a Trimble Geo 7x centimetre edition GPS. Readings were collected by two Bartington Grad601-2 loggers and collated using MLgrad601 software on a Linx 12x64 tablet running Windows 10 mounted at the rear of the cart. This enables readings to be taken of both the general background magnetic field and any localised anomalies with the difference being plotted as either positive or negative buried features. All sensors are calibrated to cancel out the local magnetic field and react only to anomalies above or below this base line. On this basis, strong magnetic anomalies such as burnt features (kilns and hearths) will give a high response as will buried ferrous objects. More subtle anomalies such as pits and ditches can be seen from their infilling soils containing higher proportions of humic material, rich in ferrous oxides, compared to the undisturbed subsoil. This will stand out in relation to the background magnetic readings and appear in plan following the course of a linear feature or within a discrete area.

The Trimble Geo7x centimetre edition GPS system with centimetre real-time accuracy was used to tie the cart traverses into the Ordnance Survey national grid. This unit offers both real-time correction and post-survey processing; enabling a high level of accuracy to be obtained both in the field and in the final post-processed data.

Data gathered in the field was processed using the TerraSurveyor software package. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies, particularly those likely to be of archaeological origin. The table below lists the processes applied to this survey, full survey and data information is recorded in Appendix 1.

Process	Effect
Clip from -3.00 to 2.80 nT	Enhance the contrast of the image to improve the appearance of possible archaeological anomalies.
De-stripe: median, all sensors	Removes the striping effect caused by differences in sensor calibration, enhancing the visibility of potential

De-spike: threshold 1, window size 3×3	archaeological anomalies. Compresses outlying magnetic points caused by interference of metal objects within the survey area.
De-stagger: all grids, both by -1 intervals	Cancels out effects of site's topography on irregularities in the traverse speed.

The raw data plot is presented as a greyscale plot shown in relation to the site (Fig. 2) with the processed data then presented as a second figure (Fig. 3), followed by a third plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 4). Anomalies are shown as colour-coded lines, points and polygons.

The greyscale plot of the processed data is exported from TerraSurveyor in a georeferenced portable network graphics (.PNG) format, a raster image format chosen for its lossless data compression and support for transparent pixels, enabling it to easily be overlaid onto an existing site plan. The data plot is combined with grid and site plans in QGIS 2.18.15 and exported again in .PNG format in order to present them in figure templates in Adobe InDesign CS5.5, creating .INDD file formats. Once the figures are finalised, they are exported in .PDF format for inclusion within the finished report.

Results

The survey of the site was completed successfully and identified a range of magnetic anomalies (Figs. 2, 3). The data is characterised by background variations in the data (noise) with positive and negative points forming a low amplitude 'wave' pattern. This magnetic variation is likely to be caused by the underlying geology of mixed gravel. In the south-east area of the site is a positive linear-shaped area of magnetic disturbance **[Fig. 4: 1]**, this is represented by dipolar response of a high amplitude crossing the field and is most likely caused by a buried service pipe or cable. In the south-western region of the site is a patch of magnetic disturbance represented by a positive response over a large area and which is most likely caused by the ferrous gate. In the east of the site are two weak positive linear anomalies **[2]**, one of which runs from the south-east corner of the site to the north-west for c.64.5m, segmented in the centre by magnetic disturbance **[1]**. To the north-west of this is another weak positive linear anomaly running south-west to north-east for c.38m, together these two anomalies may represent a buried field boundary ditch and the alignment, which is significantly different to the modern field boundaries, suggests some antiquity. To the west of these is another short length of weak positive linear anomaly **[3]**, which is aligned north to south, runs for c.45m and may be related to the potential linear anomalies to the east.

Conclusion

The geophysical survey of the site at Manor Road was undertaken successfully although a small number of weak linear magnetic anomalies were detected by the geophysical survey. These have potential to represent buried ditches and, if so, appear to form a series of field boundaries, these field boundaries are on a different alignment and may indicate it has some antiquity.

References

- Allen, T, 1995, *Lithics and Landscape: archaeological discoveries on the Thames Water pipeline at Gatehampton Farm, Goring, Oxfordshire 1985-92*, Oxford
- Benson, D and Miles, D, 1974, *The Upper Thames Valley: an archaeological survey of the river gravels*, Oxfordshire Archaeological Unit Survey 2, Oxford.
- BGS, 2021, *Geology of Britain Viewer*, 1:50,000, <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> (last accessed 26th July 2021)
- Booth, P, Dodd, A, Robinson, M and Smith, A, 2007, *The Thames through Time: The Archaeology of the Gravel Terraces of the Upper and Middle Thames: The early historical period AD1–1000*, Oxford Archaeology Thames Valley Landscapes Monogr 27, Oxford
- CI/A, 2014, 'Standard and Guidance for archaeological geophysical survey', Reading
- EAC, 2015, *EAC Guidelines for the use of Geophysics in Archaeology: Questions to Ask and Points to Consider*, EAC Guidelines 2, Namur
- IFA, 2002, 'The Use of Geophysical Techniques in Archaeological Evaluation', IFA Paper No. 6, Reading
- Lambrick, G, Robinson, M and Allen, T, 2009, *The Thames through Time: The Archaeology of the Gravel Terraces of the Upper and Middle Thames: The Thames Valley in Later Prehistory: 1500BC–AD50*, Oxford Archaeol Thames Valley Landscapes Monogr 29, Oxford
- NPPF, 2019, *National Planning Policy Framework (revised)*, Ministry for Housing, Communities and Local Government, London
- VCH, 2019, 'Oxfordshire Texts in Progress. Goring. Introduction: Landscape, Settlement, and Buildings', <https://www.history.ac.uk/sites/default/files/file-uploads/2019-09/Goring%20%20INTRO%20July%202019%20WEB.pdf>
- Weaver, S, 2021, 'Land to the east of Manor Road, Goring-on-Thames: Design Brief for Evaluation and a Staged Mitigation', OCAS, Oxford
- Williams, A and Martin, G H, 2002, *Domesday Book, a complete translation*, London

Appendix 1. Survey and data information

Programme:

Name: TerraSurveyor
Version: 3.0.25.0

Raw data

Filename: Manor Road RAW.xcp
Instrument Type: MLgrad Import
Units:
UTM Zone: 30
Survey corner coordinates (X/Y):
Northwest corner: 460012.94190475, 180290.214468333 m
Southeast corner: 460213.01190475, 180081.694468333 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 2 @ 1 m spacing.
Dummy Value: 32702

Dimensions

Survey Size (meters): 200 m x 209 m
X&Y Interval: 0.13 m
Source GPS Points: Active: 56167, Recorded: 56167

Stats

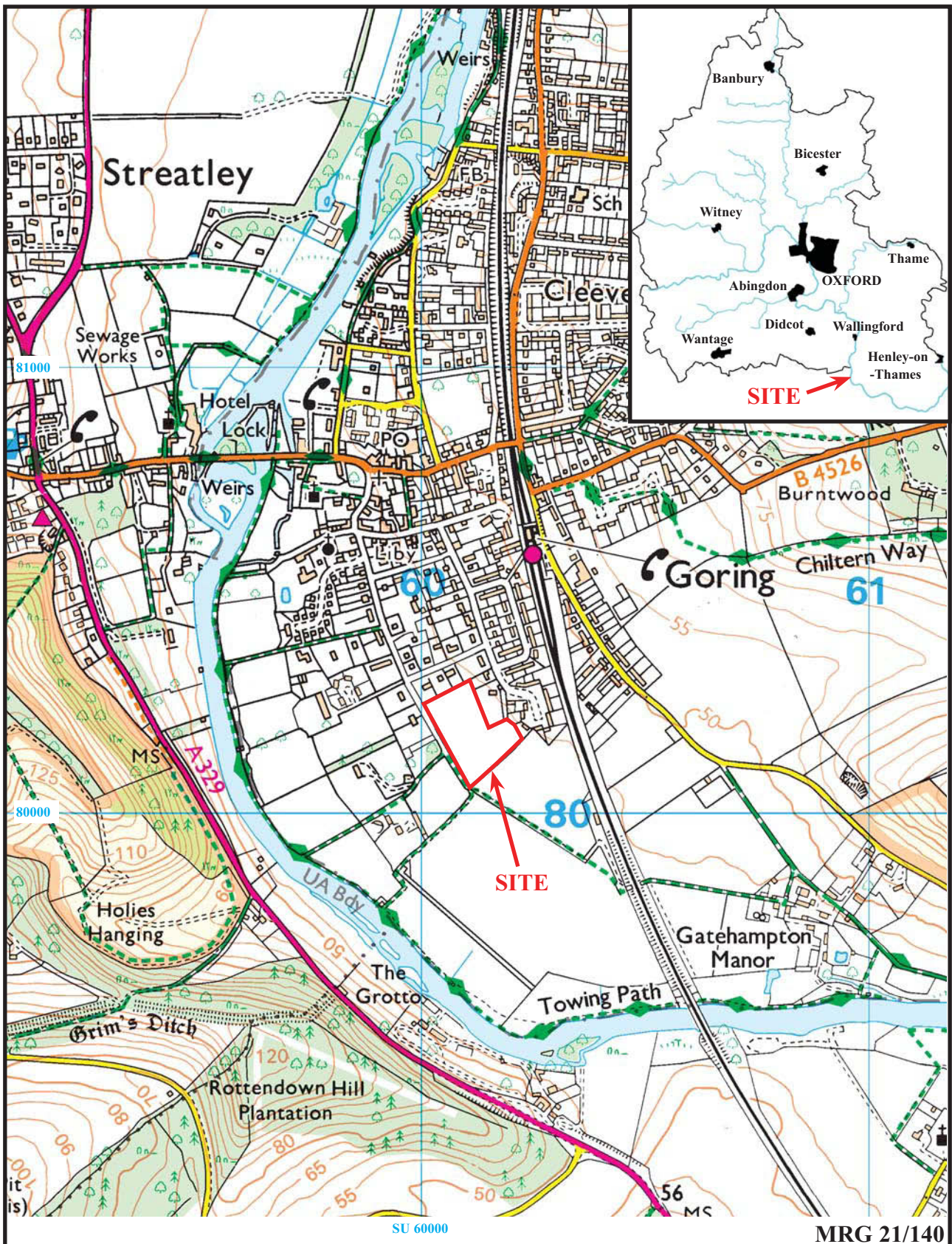
Max: 97.20
Min: -99.90
Std Dev: 6.77
Mean: 0.33
Median: 0.24
Composite Area: 4.1719 ha
Surveyed Area: 1.823 ha

Processed data

Filename: Manor Road.xcp
Stats
Max: 2.80
Min: -3.00
Std Dev: 1.27
Mean: 0.10
Median: 0.07
Composite Area: 4.1719 ha
Surveyed Area: 1.823 ha

GPS based Proce7

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 DeStagger by: 100.00cm, Shift Values
- 5 Despike Threshold: 1.5 Window dia: 3
- 6 Clip from -3.00 to 3.80
- 7 Clip from -3.00 to 2.80



Land east of Manor Road,
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 Geophysical Survey (Magnetic)

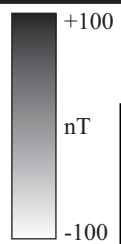
Figure 1. Location of site within Goring and Oxfordshire.

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**Land east of Manor Road,
 Goring-on-Thames, Oxfordshire, 2021
 Geophysical Survey (Magnetic)**
 Figure 2. Plot of raw gradiometer data.



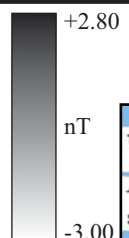
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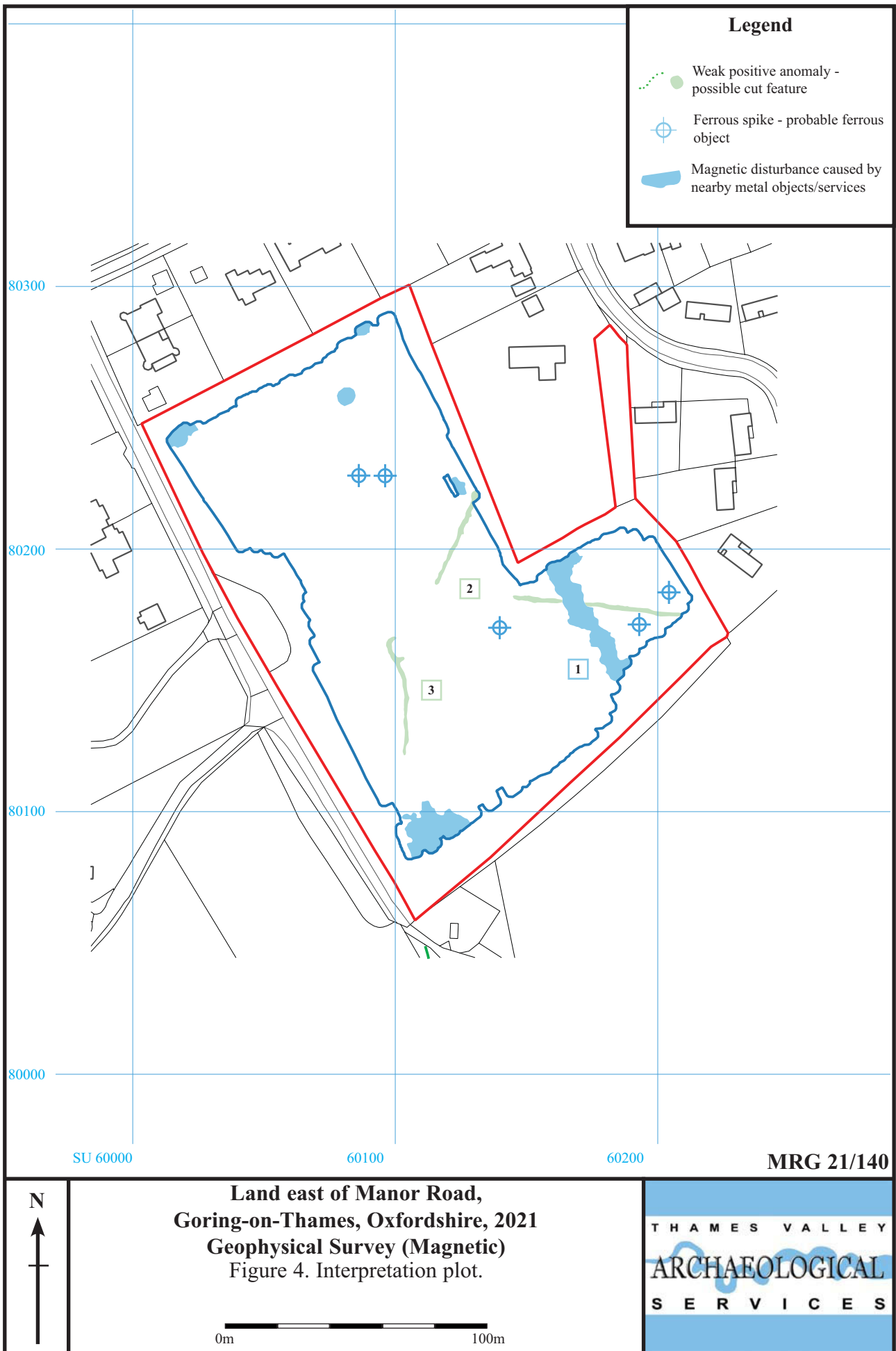


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**Land east of Manor Road,
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Figure 3. Plot of processed gradiometer data.







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Land east of Manor Road,
 Goring-on-Thames, Oxfordshire, 2021
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 Figure 5. X-Y trace plot.



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Plate 1. General site view, looking south.



Plate 2. General site view, looking south-east.

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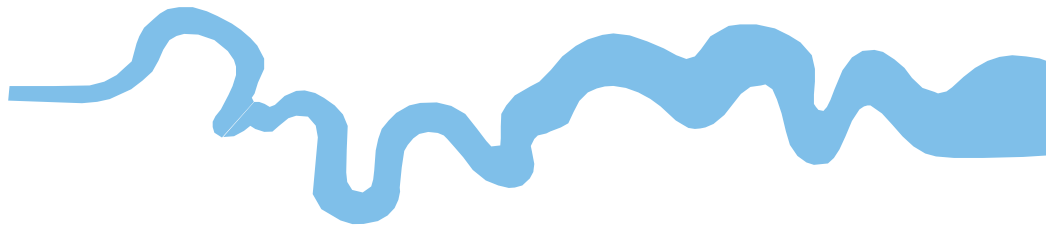
**Land east of Manor Road,
Goring-on-Thames, Oxfordshire, 2021
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Plates 1 and 2.**

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TIME CHART

	Calendar Years
Modern _____	AD 1901
Victorian _____	AD 1837
Post Medieval _____	AD 1500
Medieval _____	AD 1066
Saxon _____	AD 410
Roman _____	AD 43 AD 0 BC
Iron Age _____	750 BC
Bronze Age: Late _____	1300 BC
Bronze Age: Middle _____	1700 BC
Bronze Age: Early _____	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
Mesolithic: Late	6000 BC
Mesolithic: Early	10000 BC
Palaeolithic: Upper	30000 BC
Palaeolithic: Middle	70000 BC
Palaeolithic: Lower	2,000,000 BC





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