

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

ARCHAEOLOGICAL

S E R V I C E S

**Land North of Beetle Cottage,
Moulsford, Oxfordshire**

Geophysical Survey (Magnetic)

by Tim Dawson and Nick Dawson

Site Code: BCM14/254

(SU 5923 8373)

**Land North of Beetle Cottage,
Moulsford, Oxfordshire**

Geophysical Survey (Magnetic) Report

For Mr and Mrs Varian

by Tim Dawson and Nick Dawson

Thames Valley Archaeological Services Ltd

Site Code BCM
14/254

January 2015

Summary

Site name: Land North of Beetle Cottage, Moulsoford, Oxfordshire

Grid reference: SU 5923 8373

Site activity: Magnetometer survey

Date and duration of project: 22th January 2015

Project manager: Steve Ford

Site supervisor: Tim Dawson

Site code: BCM 14/254

Area of site: 0.058ha

Summary of results: The geophysical survey recorded a variety of magnetic anomalies. The main feature of archaeological potential being the possible rectangular feature that may correspond to earlier LiDAR. There is also the apparent semi-circle of small pits. There were a number of obstructions to the survey, which may have had a masking effect on further anomalies in these areas which could be archaeological in origin.

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

*This report may be copied for bona fide research or planning purposes without the explicit permission of the copyright holder. All TVAS unpublished fieldwork reports are available on our website:
www.tvas.co.uk/reports/reports.asp.*

Report edited/checked by: Steve Ford ✓ 28.01.15

Andrew Muddin ✓ 28.01.15

Land North of Beetle Cottage, Mouldsford, Oxfordshire A Geophysical Survey (Magnetic)

by Tim Dawson and Nick Dawson

Report 14/254

Introduction

This report documents the results of a geophysical survey (magnetic) carried out on land north of Beetle Cottage, The Street, Mouldsford (NGR SU 5923 8373) (Fig. 1). The work was commissioned by Carroll & Partners, 2 St Mary's Court, Wallingford, Oxon, OX10 0EB on behalf of Mr. and Mrs Varian.

Planning permission is to be sought for the construction of a new house and detached garage on a plot of land of c.580sqm. due to potential disturbance of below ground archaeological features an archaeological field evaluation is to be submitted along with the planning application to South Oxfordshire District Council. This is in accordance with the Department for Communities and Local Government's National Planning Policy Framework (NPPF 2012), and the South Oxfordshire District Council policies on archaeology. The field investigation was carried out to a specification approved by Richard Oram, Planning Archaeologist for Oxfordshire County Archaeological Services (Oram 2015). The fieldwork was undertaken by Tim Dawson and Rebecca Constable, on 22th January 2015 and the site code is BCM 14/254.

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

Location, topography and geology

The site is located in the village of Mouldsford, Oxfordshire on the west bank of the River Thames, 6km southwest of Wallingford, 3.5km north of Goring and Streatley. It is centred on NGR SU 5923 8373, comprising an area of 0.058ha of level ground at a height of 59m above Ordnance Datum. On the occasion the fieldwork was undertaken the land was use as a private garden. The smaller north-eastern area was lawn, bounded clockwise on three sides from north-west to south-east by hedges including developed conifer trees (Pl. 1). To the south-west a planting bed of shrubs and bushes separated it from the larger part of the survey area which in the main was covered with rough grass. The north and south-east the site was bounded by private gardens, whilst to the north-east a 14m wide band of developed trees and shrubs separated it from the River Thames. There were no physical boundaries to the western and southern sides of the site where it was set in open rough grass (Pl. 2).

The site lies on Quaternary Northmoor Member riverine sand and gravel ground with underlying geology of Cretaceous West Melbury Marley Chalk Formation (BGS 1980). The soil is classified as free draining lime-rich loam of moderate fertility (NSRI 2015). The conditions at the time of survey were dry and cold.

Site history and archaeological background

Moulsford is not mentioned in the Domesday survey (Williams & Martin 2002) and the earliest records of the settlement date to c. 1110. In the Old English form *Muleforda* it is believed to refer to a 'ford of a man called Mul' (Mills 1998, 247). In archaeological circles the village is known best for two separate discoveries of Bronze Age goldwork from the same field c. 850m north-west of the site. A torc (bracelet) was uncovered during ploughing in 1960 (Wymer 1961) and a metal detectorist discovered a plain neck ring in 2001 (PAS 2015). The project brief notes that the modern A329 road through the village corresponds broadly with that of the Roman road from Dorchester-on-Thames to Silchester and further to the west there is cropmark evidence for a potentially Iron Age or Roman track way and field system (Oram 2015). In the wider area between Moulsford and Goring presumed prehistoric field systems survive as earthworks (Fenner and Dyer 1994, 21). Excavations c. 1km west of the site at Halfpenny Lane found evidence of Iron Age and Roman settlement during work on a gas pipeline, close to where the Bronze Age objects were found (Ford 1990). An inhumation burial, Roman pits and rare possible Saxon pottery were found during excavations c. 550m north-west of the site at Cranford School revealed (Platt 2012a and b) and within 600m to the south further possible enclosures and a possible Roman villa have been recorded. Elsewhere, Roman coins and two Neolithic axes have also been recovered in the vicinity (Platt 2012a, 2). It is thought that a number of shallow earthworks in a rectangular pattern within the site itself may be the remains of an earlier house. A second similar feature has also been identified 30m to the southwest of the site. Both were identified from a Environment Agency LiDAR survey (Oram 2015).

Methodology

Sample interval

Data collection required a temporary grid to be established across the survey area using wooden pegs at 20m intervals with further subdivision where necessary. Readings were taken at 0.25m intervals along traverses 1m apart. This provides 1600 sampling points across a full 20m × 20m grid (English Heritage 2008), providing an appropriate methodology balancing cost and time with resolution. A single grid was placed on a northeast to southwest orientation across the whole survey area using a Nikon total station. Obstructions included, boats, a

metal fire-pit and a pile of garden waste located northeast of the centre of site and a plant bed running northwest to southeast through the survey area. Also to the northwest of site centre.

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 English Heritage (2008) and the Institute *for* Archaeologists (2002, 2011).

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 fast yet detailed survey of an area.

The detailed magnetometry survey was carried out using a dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometer. The instrument consists of two fluxgates mounted 1m vertically apart with a second set positioned at 1m horizontal distance. 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.

A Trimble Geo7x handheld GPS system with sub-decimetre real-time accuracy was used to tie the site grid 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 3.00 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 archaeological anomalies.
Search & Replace from: 30 to 100 with 0/from -100 to -30 with 0	Replaces outlying magnetic points caused by interference of metal objects within the survey area with a dummy reading.
De-stagger: all grids, both by -1 intervals	Cancels out effects of site's topography on irregularities in the traverse speed.

Once processed, the results are presented as a greyscale plot shown in relation to the site (Fig. 3), followed by a second plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 4). Anomalies are shown as colour-coded lines, points and polygons. The grid layout and georeferencing information (Fig. 2) is prepared in EasyCAD v.7.58.00, producing a .FC7 file format, and printed as a .PDF for inclusion in the final report.

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 2.4.1 (Brighton) 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

Northeast Area (Figs. 3 and 4)

Interference was evident on the plot masking the effectiveness of the survey along the northwest, north east and south east borders of the survey area [Fig. 4: 1] caused by metal fences and the presence of a garden shed approximately a quarter of the way up the north eastern edge [2].

Southwest Field (Figs. 3 and 4)

The survey plot of the southwest field identified three linear anomalies with strong positive and negative components, one [3] running northeast to southwest, the second abutting running northwest to southeast [4] and a third shorter and less clear [5] running southwest to northeast parallel to the first. These appear to form a rectangular feature, *c.*8m across located to the northeast end of the field and centre of survey area. The feature lies on a northeast to southwest orientation. This has the potential to be the same rectangular feature identified to be partly within the survey area by the Environment Agency LiDAR or alternatively it could also be subsurface or subsoil landscaping. The northwest side is slightly obscured by strong readings [6] caused by a small trailer, boat, fire-pit and pile of garden waste (Pl. 1). To the southeast of the potential rectangular feature the magnetic plot is obscured by heavy interference from a fountain [7] (Pl. 1). To the southwest of the fountain appears to be a semicircular line of discreet positive anomalies, potentially small buried pits [8], running north to south. At the south-western end of the survey area lies another linear anomaly [9] running northwest to southeast for *c.*10m.

Conclusion

The geophysical survey of the garden and an area of field that comprise the site at Beetle Cottage was completed successfully, recording a variety of magnetic anomalies. The main feature of archaeological potential being the possible rectangular feature that may correspond to earlier LiDAR. There is also the apparent semi-circle of small pits. There were a number of obstructions to the survey, which may have had a masking effect on further anomalies in these areas which could be archaeological in origin. Due to the limiting factors at the site it appears to be not suitable for further non-invasive investigation with only trial trench evaluation providing information about the features recorded.

References

- BGS, 1980, *British Geological Survey*, 1:50,000, Sheet E254, Solid and Drift Edition, Keyworth
- English Heritage, 2008, *Geophysical Survey in Archaeological Field Evaluation*, English Heritage, Portsmouth (2nd edn)
- Fenner, E and Dyer, A, 1994, *The Thames Valley Project: A report for the National Mapping Programme*, RCHME
- Ford, S, 1990, 'The Archaeology of the Cleeve–Didcot pipeline, South Oxfordshire, 1989', *Oxoniensia*, **55**, 1–40
- IFA, 2002, *The Use of Geophysical Techniques in Archaeological Evaluation*, IFA Paper No. 6, Reading
- IFA, 2011, *Standard and Guidance: for archaeological geophysical survey*, Reading
- Mills, A, 1998, *Dictionary of English Place-Names*, Oxford
- NPPF, 2012, *National Planning Policy Framework*, Dept Communities and Local Government, London
- NSRI, 2015, *Soilscapes*, <http://www.landis.org.uk/soilscapes/> (accessed: 27th January 2015), Cranford University
- Oram, R, 2015, *Land North of Beetle Cottage, The Street, Moulsoford: Design Brief for Archaeological Field Evaluation*
- PAS, 2015, *Portable Antiquities Scheme: PAS-BF4245*, <http://finds.org.uk/> (accessed: 27th January 2015)
- Platt, D, 2012a, *New artificial turf pitch, Cranford House School, Moulsoford, Oxfordshire, an archaeological evaluation*, *Thames Valley Archaeological Services report 12/05*, Reading
- Platt, D, 2012b, *New artificial turf pitch, Cranford House School, Moulsoford, Oxfordshire, an archaeological recording action*, *Thames Valley Archaeological Services report 12/05b*, Reading
- Williams, A and Martin, G H, 2002, *Domesday Book, a complete translation*, London
- Wymer, J, 1961, 'The Discovery of a gold Torc at Moulsoford', *Berkshire Archaeological Journal* **59**, 36-7

Appendix 1. Survey and data information

Raw data

Instrument Type: Grad 601 (Magnetometer)
Units: nT
Survey corner coordinates (X/Y):
Northwest corner: 459198.47, 183694.43 m
Southeast corner: 459238.47, 183614.43 m
Direction of 1st Traverse: 334.4745 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 2047.5

Dimensions

Composite Size (readings): 160 x 80
Survey Size (meters): 40 m x 80 m
Grid Size: 20 m x 20 m
X Interval: 0.25 m
Y Interval: 1 m

Stats

Max: 100.00
Min: -100.00
Std Dev: 17.66
Mean: -6.44
Median: -1.75
Composite Area: 0.32 ha
Surveyed Area: 0.1594 ha

PROGRAMME

Name: TerraSurveyor
Version: 3.0.25.0

Source Grids: 5

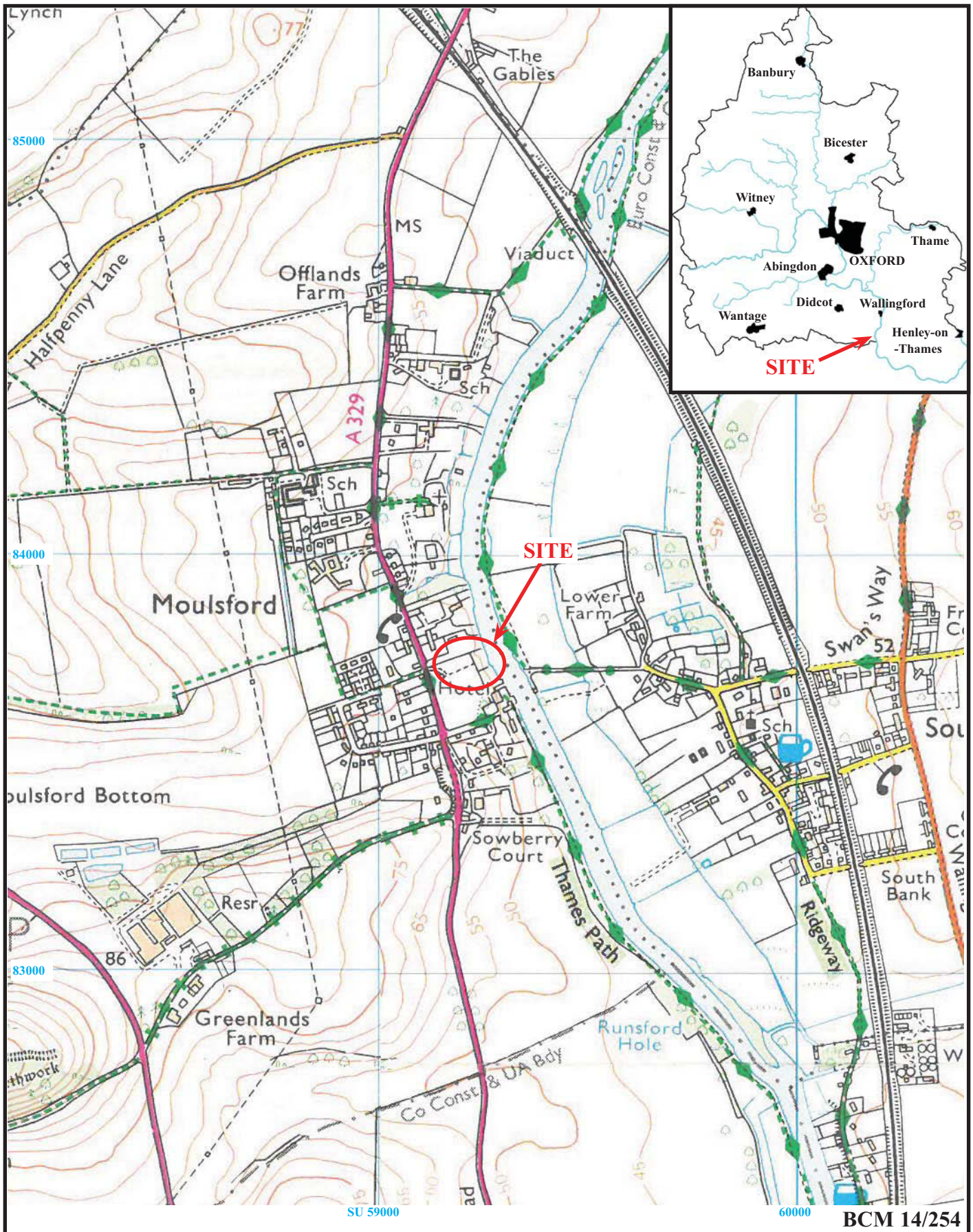
- 1 Col:0 Row:3 grids\04.xgd
- 2 Col:1 Row:0 grids\01.xgd
- 3 Col:1 Row:1 grids\02.xgd
- 4 Col:1 Row:2 grids\03.xgd
- 5 Col:1 Row:3 grids\05.xgd

Processed data

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.89
Mean: -0.04
Median: 0.03

Processes: 7

- 1 Base Layer
- 2 Search & Replace From: -100 To: -30 With: Dummy
- 3 Search & Replace From: 30 To: 100 With: Dummy
- 4 DeStripe Median Sensors: All
- 5 De Stagger: Grids: All Mode: Both By: -2 intervals
- 6 Move (Area: Top 0, Left 80, Bottom 59, Right 159) to X -40, Y 0
- 7 Clip from -3.00 to 3.00 nT

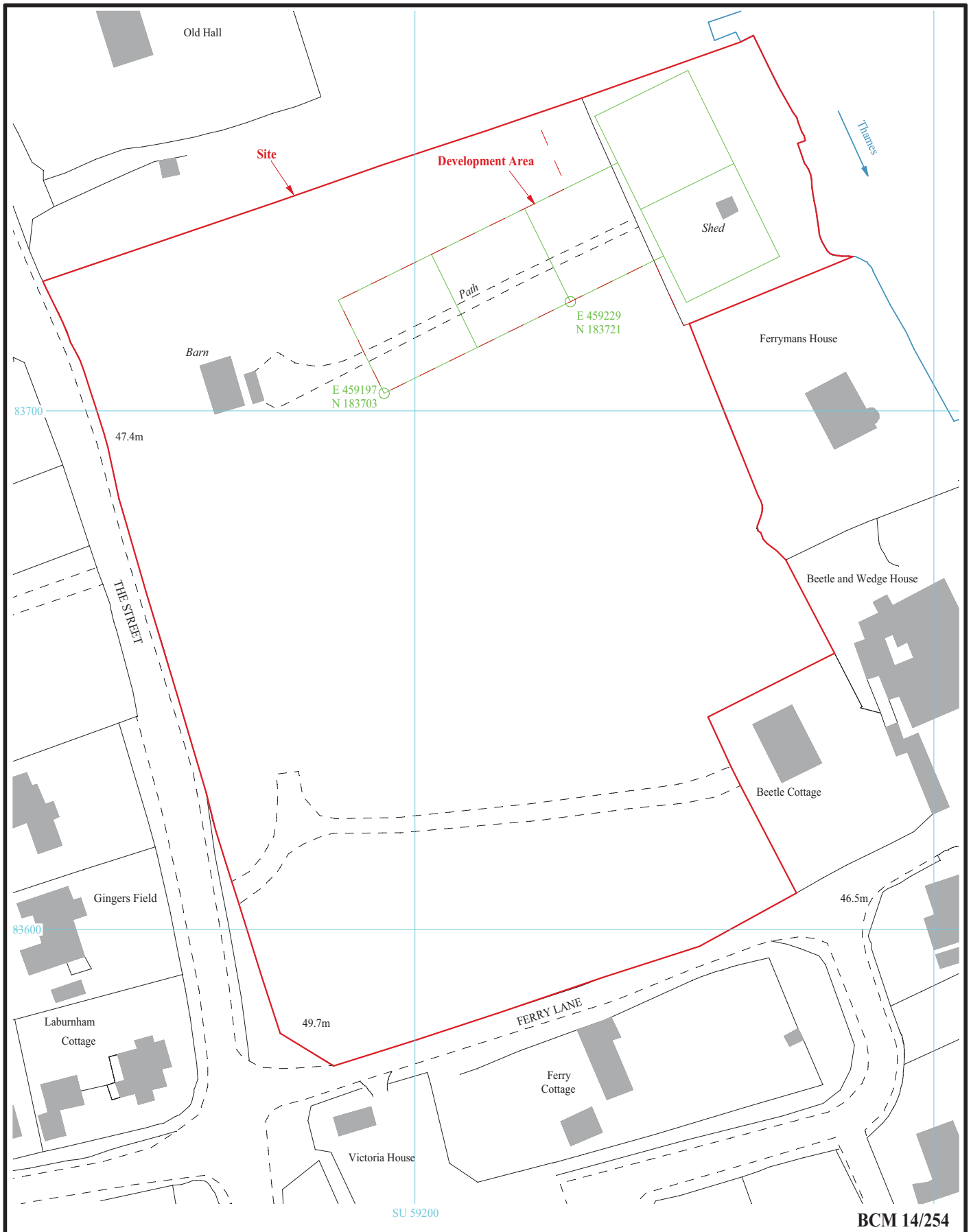


**Land north of Beetle Cottage,
Moulsoford, Oxfordshire, 2015
Geophysical Survey (Magnetic)**

Figure 1. Location of site within Moulsoford and Oxfordshire

Reproduced from Ordnance Survey Explorer 170-171 at 1:12500
Ordnance Survey Licence 100025880

THAMES VALLEY
ARCHAEOLOGICAL
 SERVICES



N



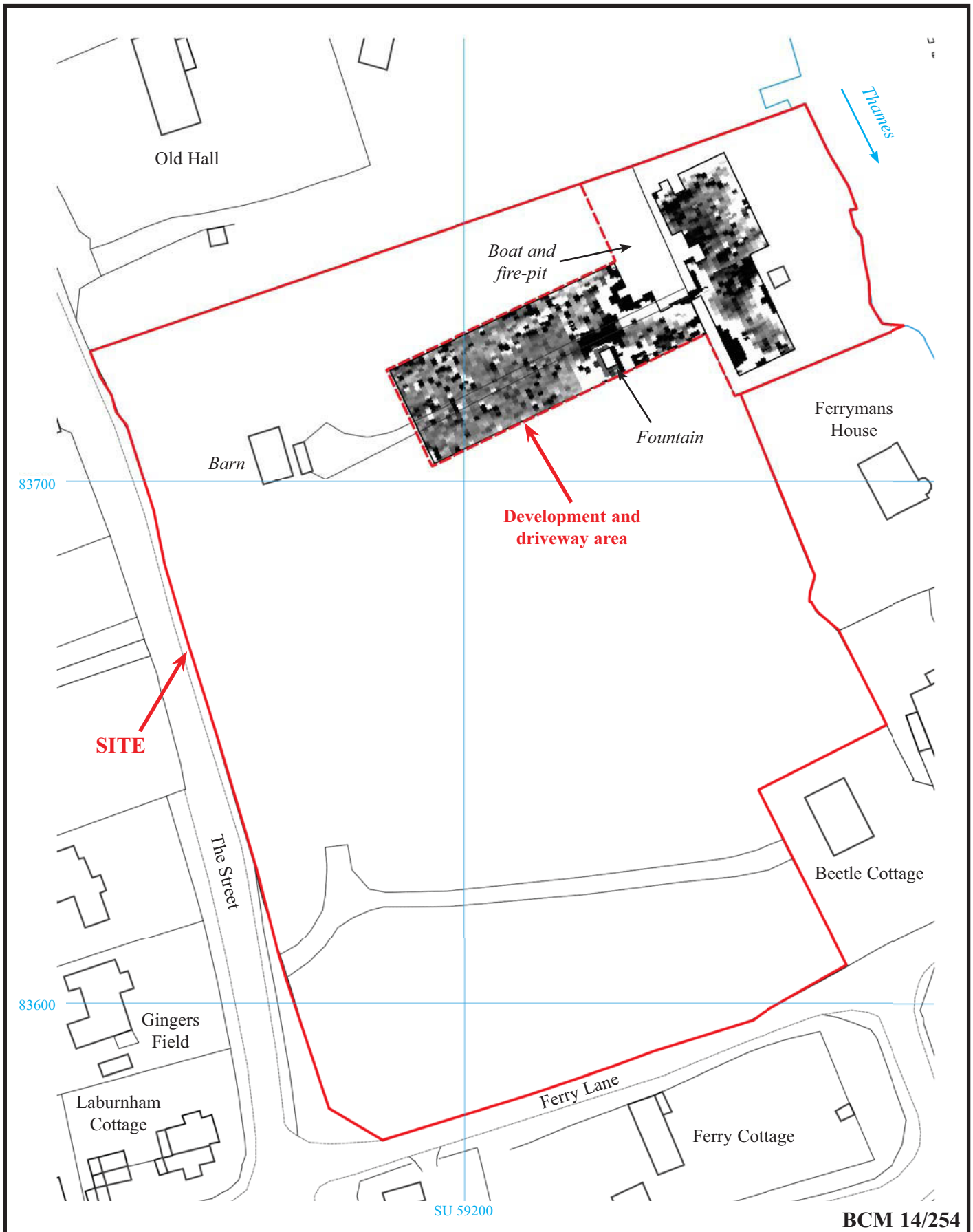
**Land north of Beetle Cottage,
Moulsoford, Oxfordshire, 2015
Geophysical Survey (Magnetic)**

Figure 2. Survey grid layout.



THAMES VALLEY
ARCHAEOLOGICAL
SERVICES

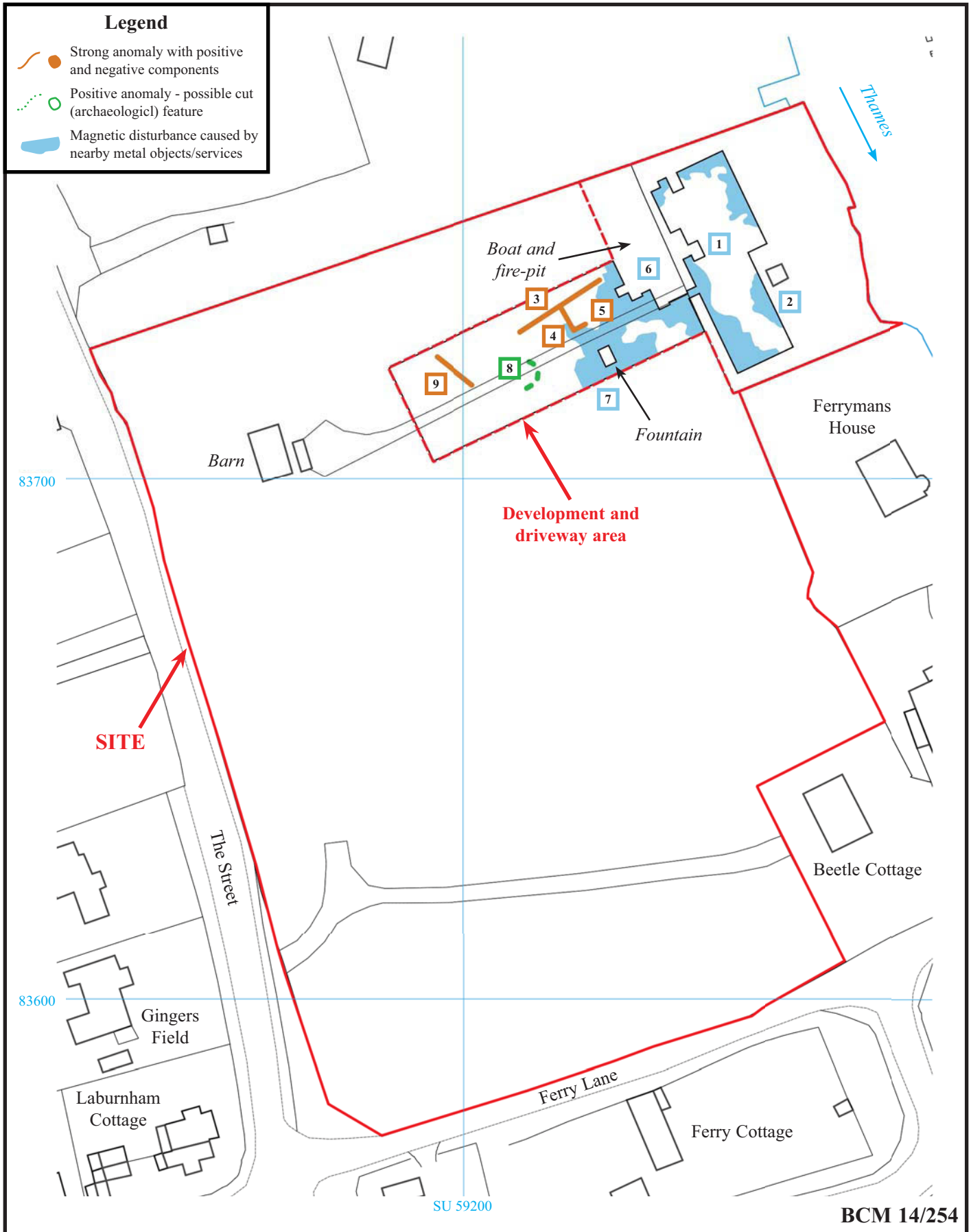
BCM 14/254



**Land north of Beetle Cottage,
Moulsford, Oxfordshire, 2015
Geophysical Survey (Magnetic)**

Figure 3. Plot of minimally processed gradiometer data.





Land north of Beetle Cottage,
Moulsford, Oxfordshire, 2015
Geophysical Survey (Magnetic)

Figure 4. Interpretation plot.





Plate 1. Driveway area, looking north-east towards the house site. Note fountain and other obstructions which caused magnetic disturbance.



Plate 2. House site, looking north.

BCM 14/254

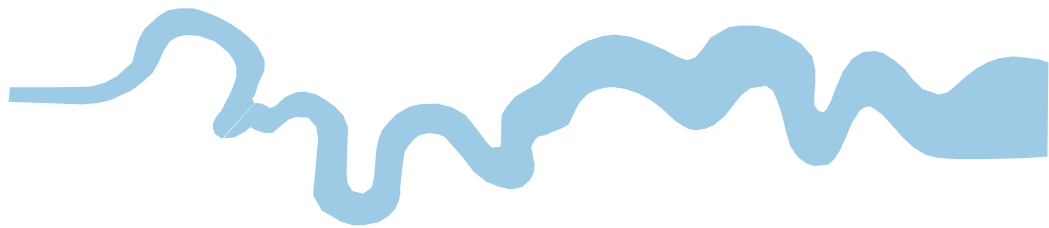
**Land north of Beetle Cottage,
Moulsford, Oxfordshire, 2015
Geophysical Survey (Magnetic)**
Plates 1 - 2.

THAMES VALLEY
ARCHAEOLOGICAL
SERVICES

TIME CHART

	Calendar Years
Modern _____	AD 1901
Victorian _____	AD 1837
Post Medieval _____	AD 1500
Medieval _____	AD 1066
Saxon _____	AD 410
Roman _____	AD 43
Iron Age _____	BC/AD 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





**Thames Valley Archaeological Services Ltd,
47-49 De Beauvoir Road, Reading,
Berkshire, RG1 5NR**

**Tel: 0118 9260552
Fax: 0118 9260553
Email: tvas@tvas.co.uk
Web: www.tvas.co.uk**