

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

ARCHAEOLOGICAL

S E R V I C E S

**Land at Milton Road, Shipton-under-Wychwood,
Oxfordshire**

Geophysical Survey (Magnetic)

by David Sanchez

Site Code: SUW18/32

(SP 2720 1790)

Land at Milton Road, Shipton-under-Wychwood, Oxfordshire

Geophysical Survey (Magnetic) Report

For Deanfield Homes Ltd

by David Sanchez

Thames Valley Archaeological Services Ltd

Site Code SUW 18/32

May 2018

Summary

Site name: Land at Milton Road, Shipton-under-Wychwood, Oxfordshire

Grid reference: SP 2720 1790

Site activity: Magnetometer survey

Date and duration of project: 17th May 2018

Project coordinator: Tim Dawson

Site supervisor: Kyle Beaverstock

Site code: SUW 18/32

Area of site: 3.32ha

Summary of results: The geophysical survey recorded several magnetic anomalies including a small volume of anomalies of possible archaeological nature comprised by two linear anomalies, one of them only partially recorded which most likely continue beyond the limits of the investigated area. A long negative anomaly, possible earthworks, and a ridge and furrow field system across the southeast corner of the area complete the results of the survey.

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: Steve Ford✓ 18.05.18 Tim Dawson✓ 18.05.18
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Land at Milton Road, Shipton-under-Wychwood, Oxfordshire A Geophysical Survey (Magnetic)

by David Sanchez

Report 18/32

Introduction

This report documents the results of a geophysical survey (magnetic) carried out on a parcel of land south of Milton Road, Shipton-under-Wychwood (Fig. 1). The work was commissioned by Mr Tom Rider, Land Director of Deanfield Homes Ltd, 8 Packhorse Road, Gerrard Cross, Buckinghamshire, SL9 7QE.

Outline planning permission (16/02851/OUT) has been gained from West Oxfordshire District Council to develop the site for housing. The consent was subject to two conditions (6 and 7) relating to archaeology but this geophysical survey was carried out at the request of the client and was not a part of the planning permission conditions. The field work was undertaken by Kyle Beaverstock and Ashley Kruger on 17th May 2018 and the site code is SUW 18/32.

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

Location, topography and geology

The site lies west of Wychwood Business Park and to the rear (south) of Wychwood Primary School off Milton Road (Fig. 1) (SP 2720 1790). The south west boundary is defined by the watercourse known as 'The Liffs', which flows from the River Evenlode. This feeds water into the Wychwood Wild Gardens to the south which contains ornamental ponds. The site lies at a height of c. 108m above Ordnance Datum (OD) at Milton Road and slopes down to c. 102m in the west. The underlying geology is 2nd gravel terrace of the River Evenlode (BGS 1982).

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 east to west zig-zag orientation across the northern survey area and north-west to south-east in the eastern field.

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 Chartered Institute for Archaeologists (2002, 2011, 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 -3.80 to 4.20 nT	Enhance the contrast of the image to improve the appearance of possible archaeological anomalies.
Interpolate: <i>y</i> doubled	Increases the resolution of the readings in the <i>y</i> axis, enhancing the shape of anomalies.
De-stripe: median, all sensors	Removes the striping effect caused by differences in sensor calibration, enhancing the visibility of potential archaeological anomalies.
De-spike: threshold 1, window size 3×3	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 processed data plot is presented as a greyscale plot shown in relation to the site (Fig. 2), followed by a third plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 3). 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 proposed survey area comprise a large field with a total extension of 3.32ha of which only the west and south west part (1.60ha) was surveyed with the eastern area of the site abandoned due to ground conditions and overgrowth vegetation.

Several anomalies were detected over the course of the survey (Fig. 2 and 3). The most significant magnetic anomalies are two strong positive anomalies of linear shape located on the southern half of the

surveyed area. The first of these anomalies has a linear slightly curving shape with a SE-NW alignment and a length of 32m. At the south east corner of the surveyed area a second linear positive anomaly was only partially recorded as it seems to continue towards the eastern area of the site beyond the limits of the investigated area. It has a length of 27m with a SE-NW alignment and both ends turning east towards the unsurveyed area of the site. Positive linear anomalies usually evidence ditch type features such as ditch boundaries or enclosures and therefore has the potential of evidence the presence of features of archaeological interest in the site.

A series of parallel positive anomalies was also recorded in the eastern half of the site with up to 12 linear anomalies with a SW-NE alignment covering an area of 0.36ha. These are considered to be linear features of agricultural origin, ridge and furrow lines caused by ploughing the field for agricultural use and were partially visible on the site surface during the field work.

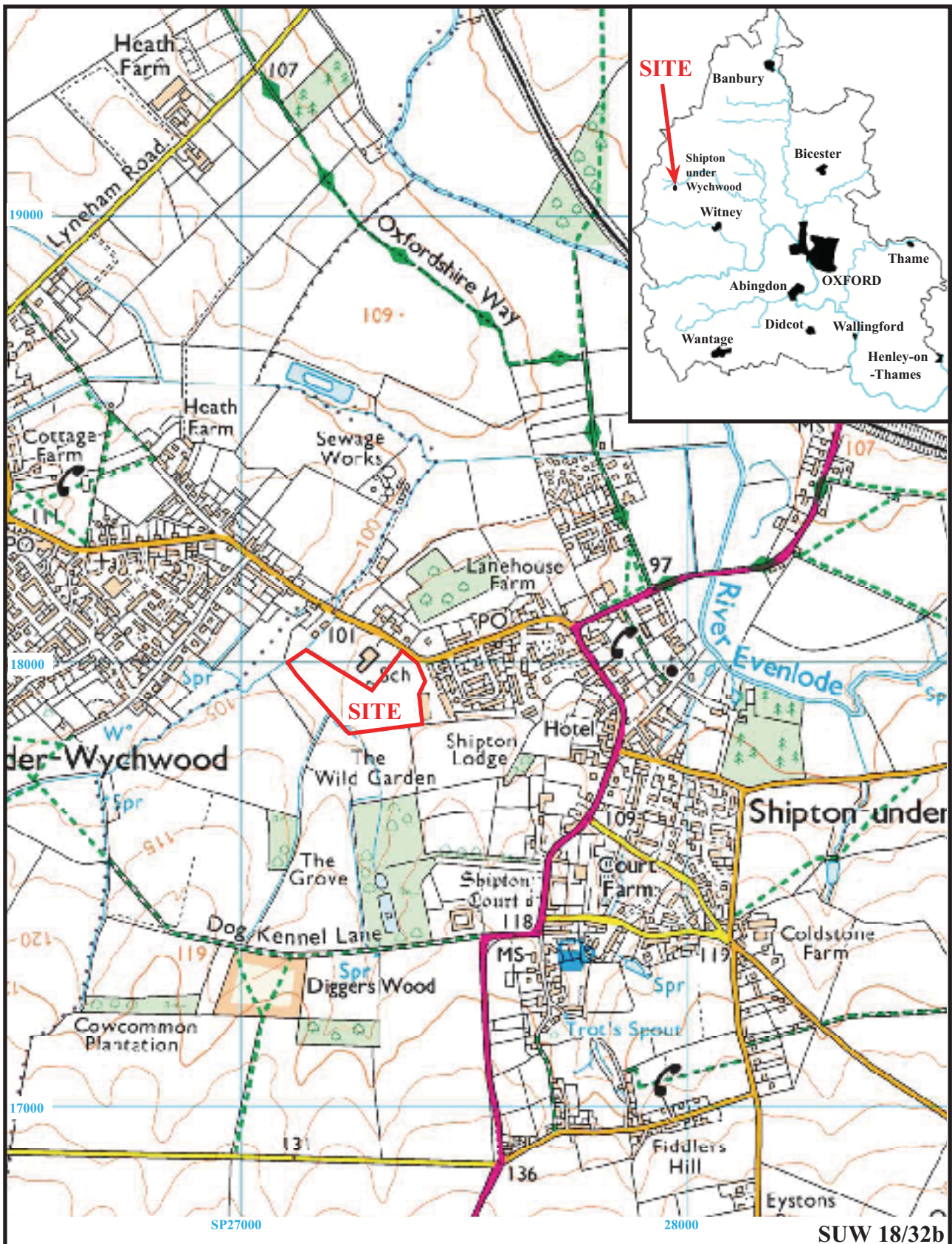
One last magnetic anomaly was recorded consisting of a long negative linear anomaly running across the whole extension of the site with a SE-NW alignment, immediately to the south west of the ridge and furrow field system. Negative anomalies such as this are usually evidence of earthworks and along with the agricultural anomalies suggest a field boundary bank.

Conclusion

The geophysical survey recorded several magnetic anomalies including a small volume of anomalies of possible archaeological origin. These comprised by two linear anomalies, one of them only partially recorded which most likely continue beyond the limits of the investigated area towards the east. A long negative anomaly, possible earthworks, and a ridge and furrow field system across the southeast corner of the area complete the results of the survey.

References

- BGS, 1982, *British Geological Survey*, 1:50 000, Sheet 236, Solid and Drift Edition, Keyworth
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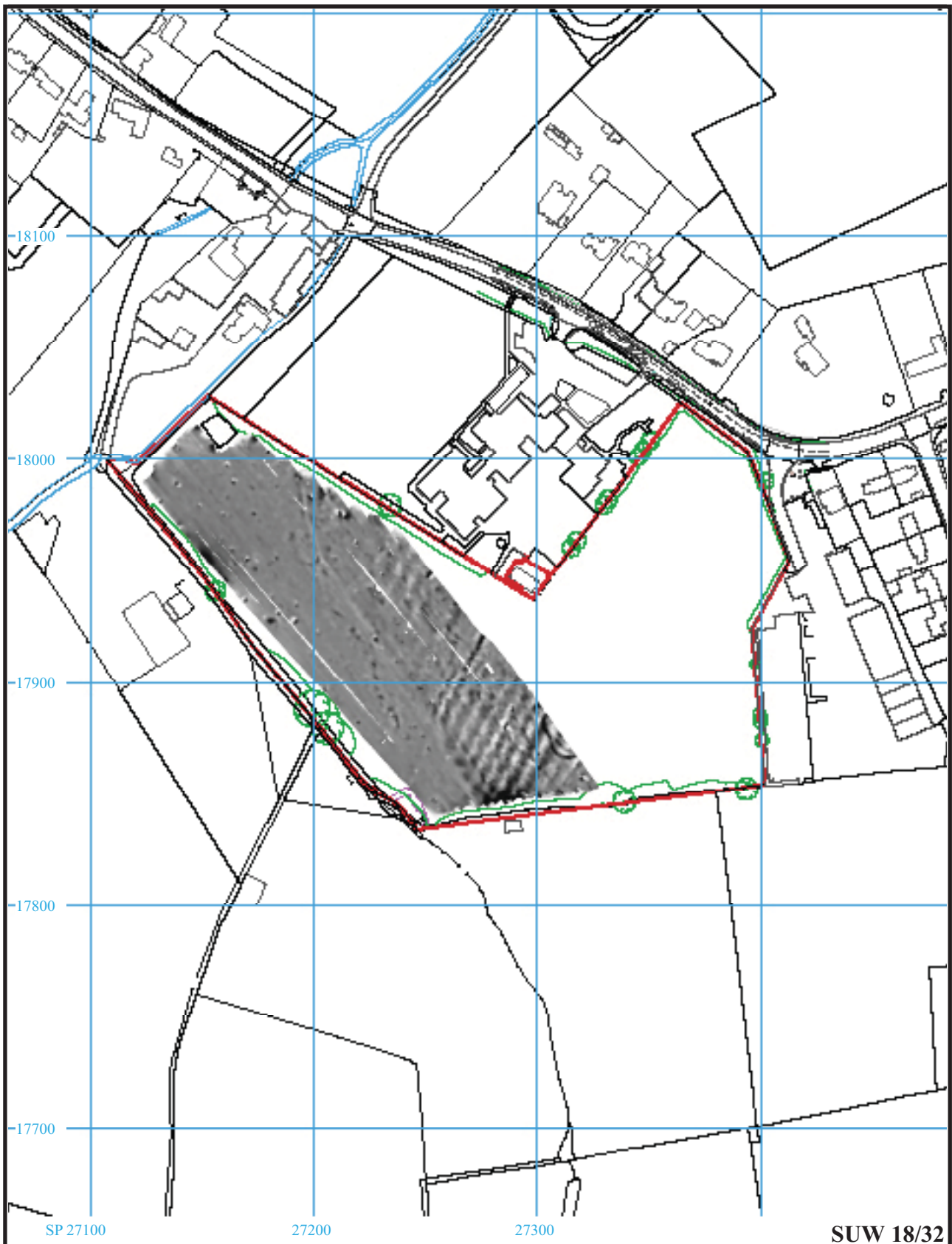
**Land at Milton Road, Shipton-under-Wychwood,
Oxfordshire, 2018**

Geophysical Survey (Magnetic)

Figure 1. Location of site within Shipton-under-Wychwood and Oxfordshire.

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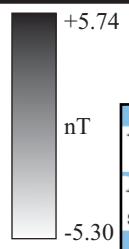
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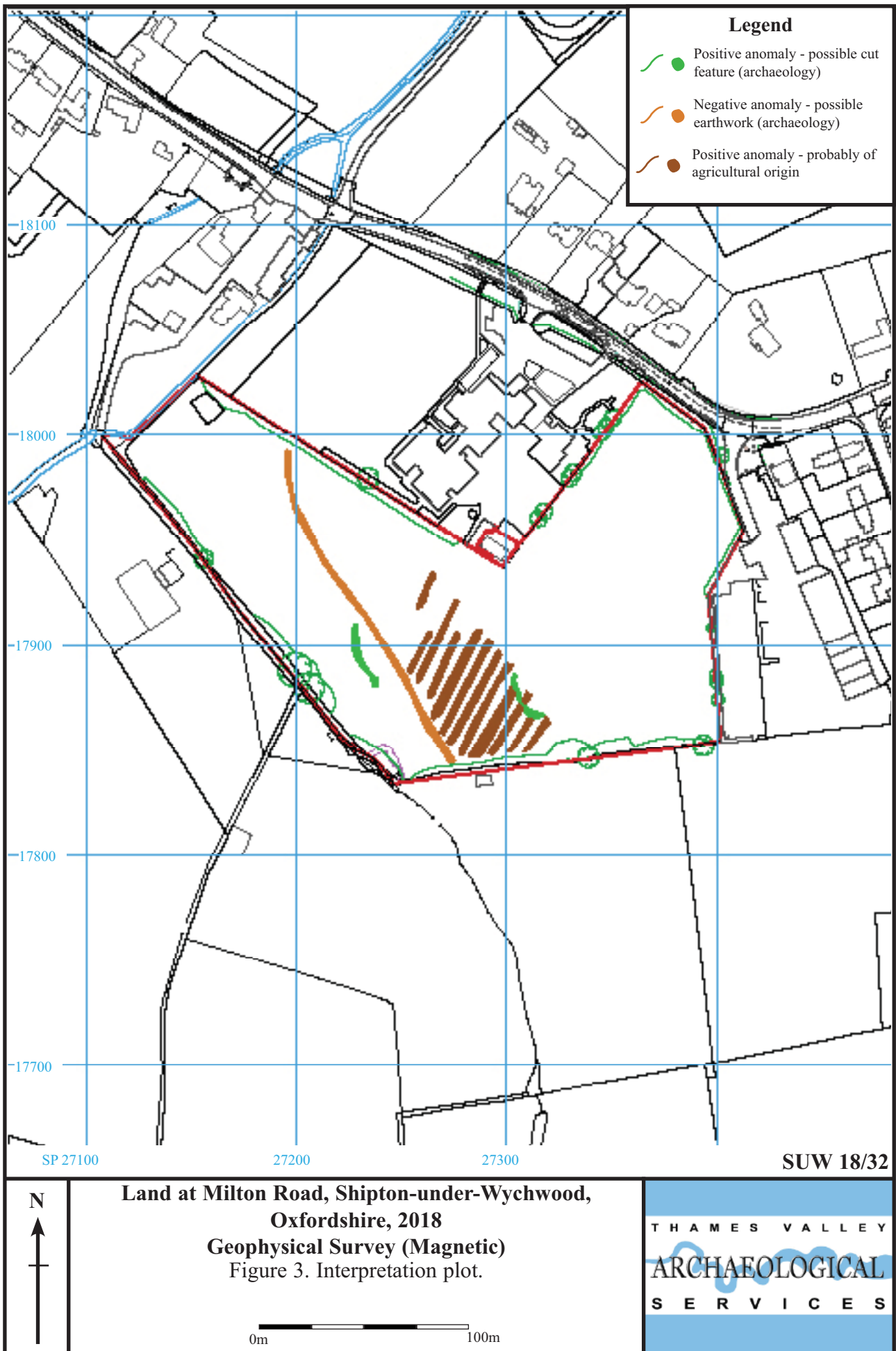


**Land at Milton Road, Shipton-under-Wychwood,
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Geophysical Survey (Magnetic)

Figure 2. Plot of processed gradiometer data.

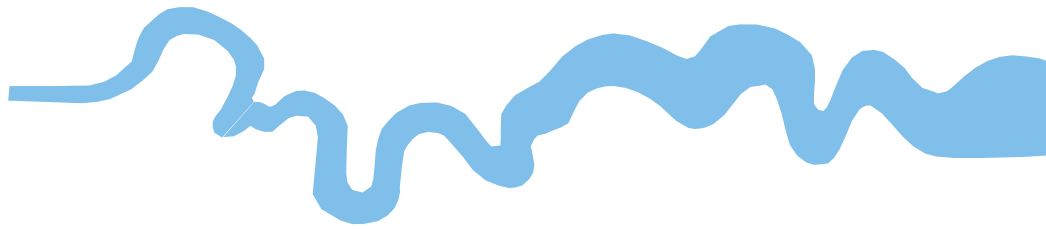




TIME CHART

	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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