THAMES VALLEY

ARCHAEOLOGICAL

SERVICES

St Mary and St Nicholas Church, Aldworth Road Compton, West Berkshire

Geophysical Survey

by Kyle Beaverstock

Site Code: ARC19/18

(SU 5264 7954)

St Mary and St Nicholas Church, Aldworth Road, Compton, West Berkshire

Geophysical Survey (Magnetic) Report

For Compton Parish Council

by Kyle Beaverstock

Thames Valley Archaeological Services Ltd

Site Code ARC 19/18

March 2019

Summary

Site name: St Mary and St Nicholas Church, Aldworth Road, Compton, West Berkshire

Grid reference: SU 5264 7954

Site activity: Magnetometer survey

Date and duration of project: 15th of March 2019

Project coordinator: Tim Dawson

Site supervisor: Kyle Beaverstock

Site code: ARC19/18

Area of site: 0.65ha

Summary of results: A small number of magnetic anomalies representing possible buried pits were detected over the course of the survey.

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

Report edited/checked by:	Steve Ford✓ 28.03.19
	Tim Dawson✓ 28.03.19

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St Mary and St Nicholas Church, Aldworth Road, Compton, West Berkshire
A Geophysical Survey (Magnetic)

by Kyle Beavertsock

Report 19/18

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Aldworth Road, Compton, West Berkshire (SU 5264 7954) (Fig. 1). The work was commissioned by Dr. Sarah Marshman on behalf of Compton Parish Council, Wilkins Centre, Burrell Road, Compton, Newbury, RG20 6NP.

An application to construct a new car park and churchyard extension in a field to the south of St Mary and St Nicholas Church has been submitted to West Berkshire County Council. In accordance with the Department for Communities and Local Government's National Planning Policy Framework (NPPF 2012) and the County's policies on archaeology a programme of archaeology has been implemented. The fieldwork was undertaken by Kyle Beaverstock and Jamie Williams on the 15th of March 2019 and the site code is ARC19/18.

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 approximately 0.7km to the east of Compton and directly to the south of St Mary and St Nicholas Church (Fig. 2). The site is bounded by Aldworth Road to the north, fencing to the east, an unpaved trackway to the west and open farmland to the south. The northern half of the site is currently disused and the southern half is being utilised as arable farmland. This rectangular parcel of land sits at a height of 95m above Ordinance Datum (aOD) in the north before sloping up to 102m aOD in the south and the underlying geology is stated as 2nd River Terrace Deposit in the northern half of the site and 1st River Terrace Deposit above Lewes Nodular Chalk Formation (BGS 2006).

Site history and archaeological background

The main archaeological potential for the site is mainly derived from its location immediately to the south of a 'historic' settlement. Beyond this are a scattering of archaeological sites such as Perborough Castle, an Iron Age hillfort which lies *c*.1.7km to the south of Compton, while the site of a Roman building and possible villa to the

east of Eling, *c*.4.6km to the south. Other earthworks have also been recorded such as Bronze Age barrows on Folly Hill and within Park Wood, to the east and south-west.

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 north to south zig-zag orientation across the site. There were no significant obstructions within the survey area other than some overgrowth along the western and northern boundaries.

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 -5.50 to 5.53 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.
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 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 3.4.4 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

Over a course of the survey, only a few possible anomalies of archaeological interest were detected (Fig. 3). These consisted of two areas of positive points, which are spatially small positive responses clustered in a specific area. These may represent a series of cut features such as pits although considering they are almost entirely within an area of geological disturbance they may also be of natural origin (Fig. 4). Between these is a possible weak positive linear anomaly measuring approximately 9m long and is orientated northwest to southeast. This may represent a linear feature such as a ditch or gully. In the southern half of the survey area is a possible negative linear anomaly. This is approximately 28m long and orientated roughly east to west and may represent a buried earthwork-type feature.

In the north of the site there is an area of magnetic disturbance, this is most likely due to the fence and gate area at the site entrance. To the south of this is a roughly circular area of magnetic disturbance that is centred on a point with a strong bipolar response, this most likely represents a significant ferrous buried object. To the immediate south of this area is an area of possible geological disturbance. This is represented by intermittent weak positive and negative responses covering two areas with a slight positive background noise. These areas correspond with a geological 'channel' of river terrace gravel before the topography rises to the area where it is stated to be lower chalk.

A number of magnetic spikes were detected across the site, these bipolar data spikes are normally the result of small buried ferrous objects.

Conclusion

Over the course of the survey a number of possible pits were detected in the northern half of the surveyed area although these were recorded in an area of geological disturbance. There was some interference from fencing and a buried ferrous object(s) in the north of the site but no other anomalies of interest were detected.

References

BGS, 2006, *British Geological Survey*, 1:50,000, Sheet 267, Bedrock and Superficial Edition, Keyworth

CI*f*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

NPPF, 2012, *National Planning Policy Framework*, Dept Communities and Local Government, London

Appendix 1. Survey and data information

Programme:
Name: TerraSurveyor
Version: 3.0.25.0

Raw data
Filename: Compton RAW.xcp
Instrument Type: MLgrad Import
Units:
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 452628.521666049, 179611.904791995 m
Southeast corner: 452662.971666049, 179406.634791995 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 2 @ 0.50 m spacing.
Dummy Value: 32702

Dimensions
Survey Size (meters): 34.4 m x 205 m
X&Y Interval: 0.13 m
Source GPS Points: Active: 41463, Recorded: 41463

Stats
Max: 107.44
Min: -109.75
Std Dev: 10.89
Mean: -0.15
Median: 1.00
Composite Area: 0.70716 ha
Surveyed Area: 0.64313 ha

Processed data
Filename: Compton.xcp
Stats
Max: 5.53
Min: -5.50
Std Dev: 2.08
Mean: -0.26
Median: 0.04
Composite Area: 0.70716 ha
Surveyed Area: 0.64392 ha

GPS based Proce6
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Despike Threshold: 1 Window dia: 3
5 Clip from -5.00 to 5.00
6 DeStagger by: 100.00cm, Shift Positions

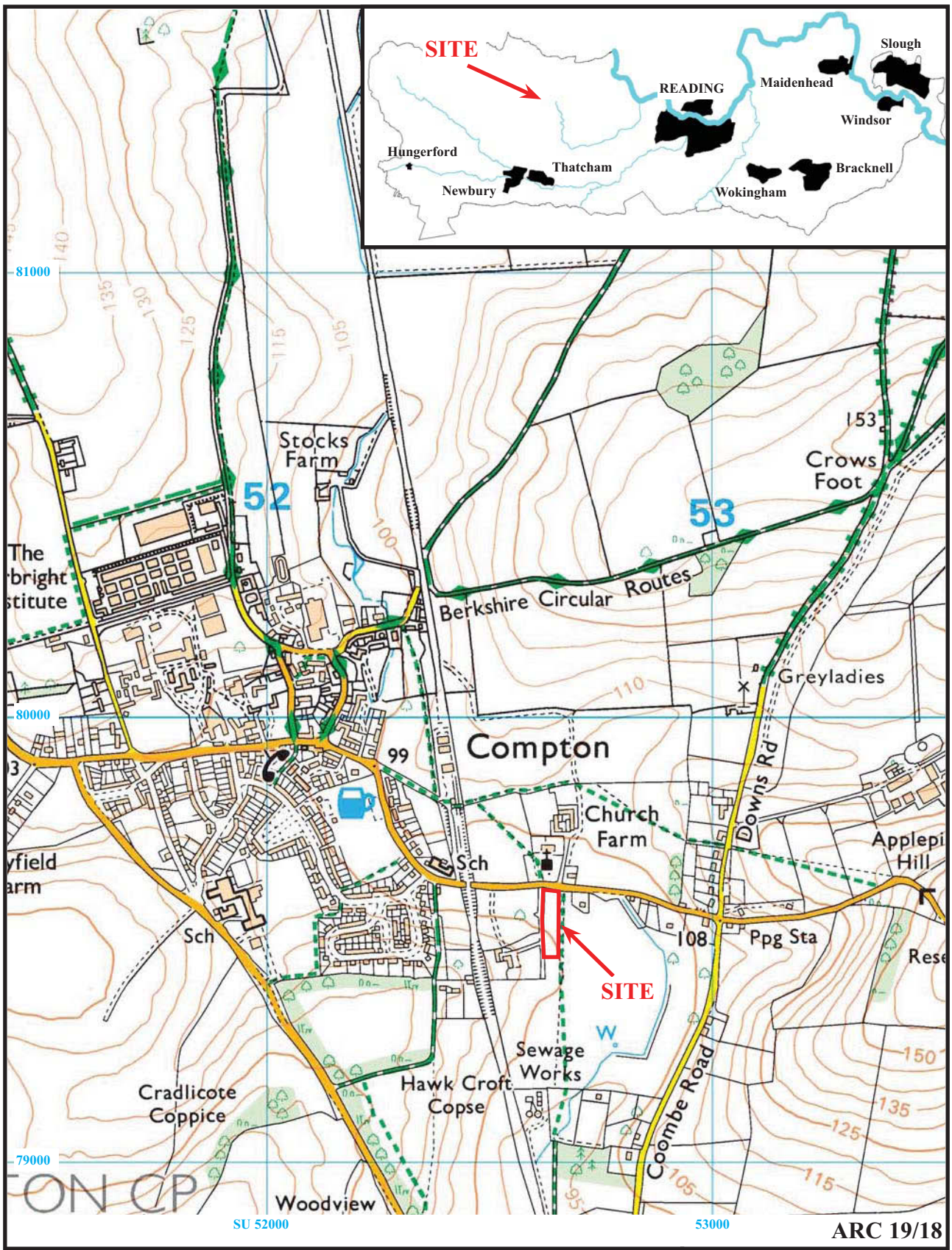

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Figure 1. Location of site within Compton and Berkshire.

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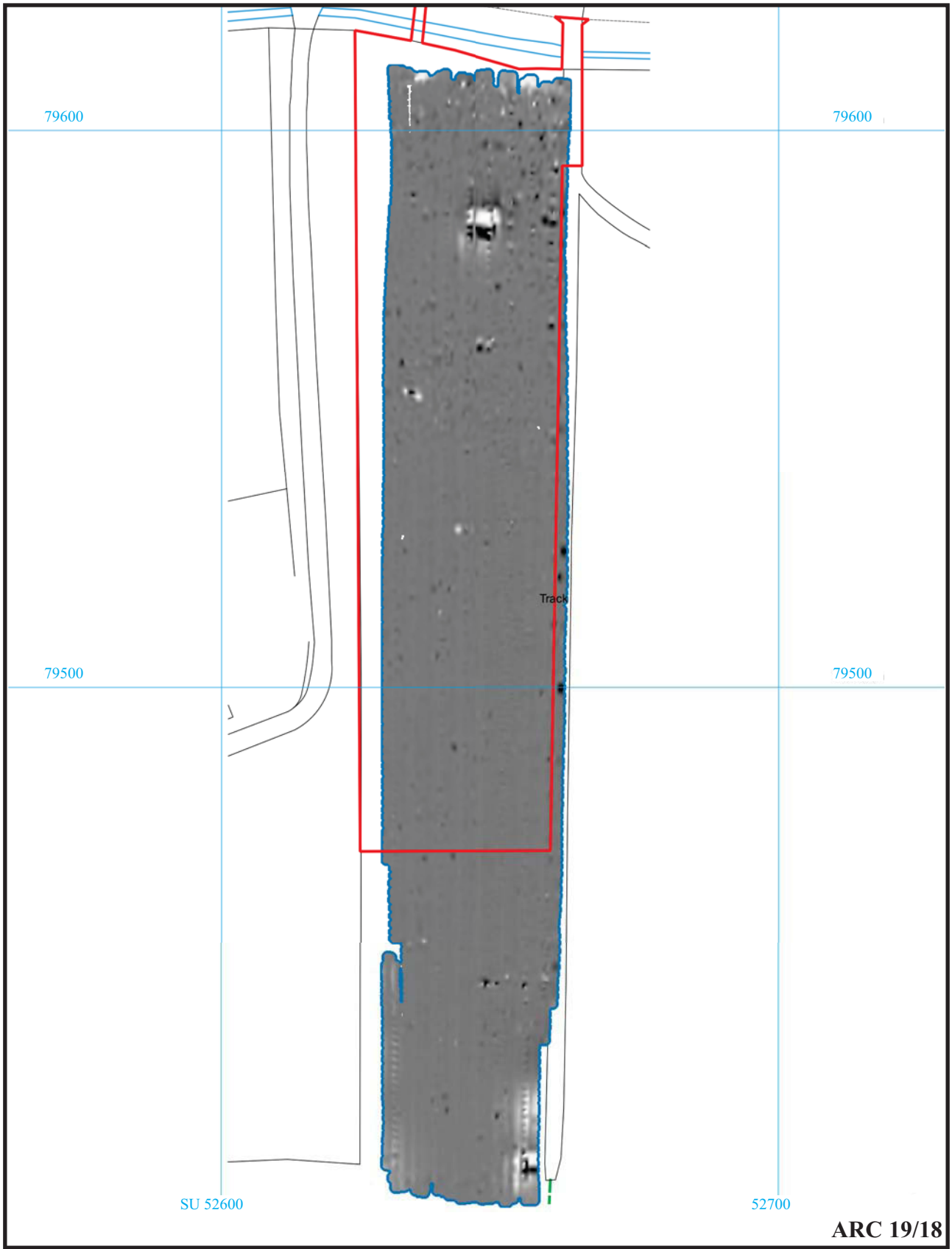

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Figure 2. Plot of raw gradiometer data.

0m 100m

+100
nT
-100

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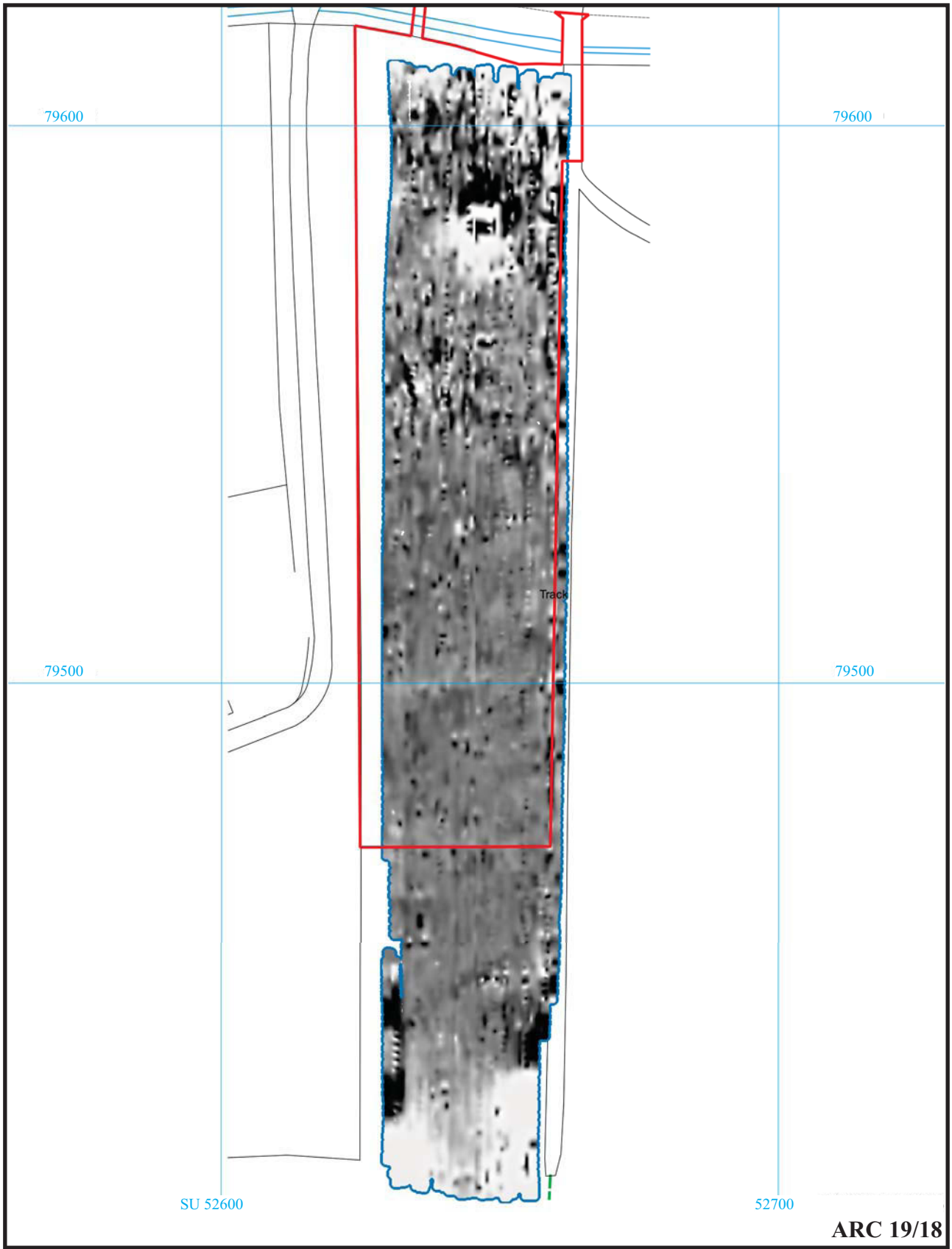

St Mary and St Nicholas, Aldwroth Road, Compton, West Berkshire, 2019
Geophysical Survey (Magnetic)
Figure 2. Plot of processed gradiometer data.

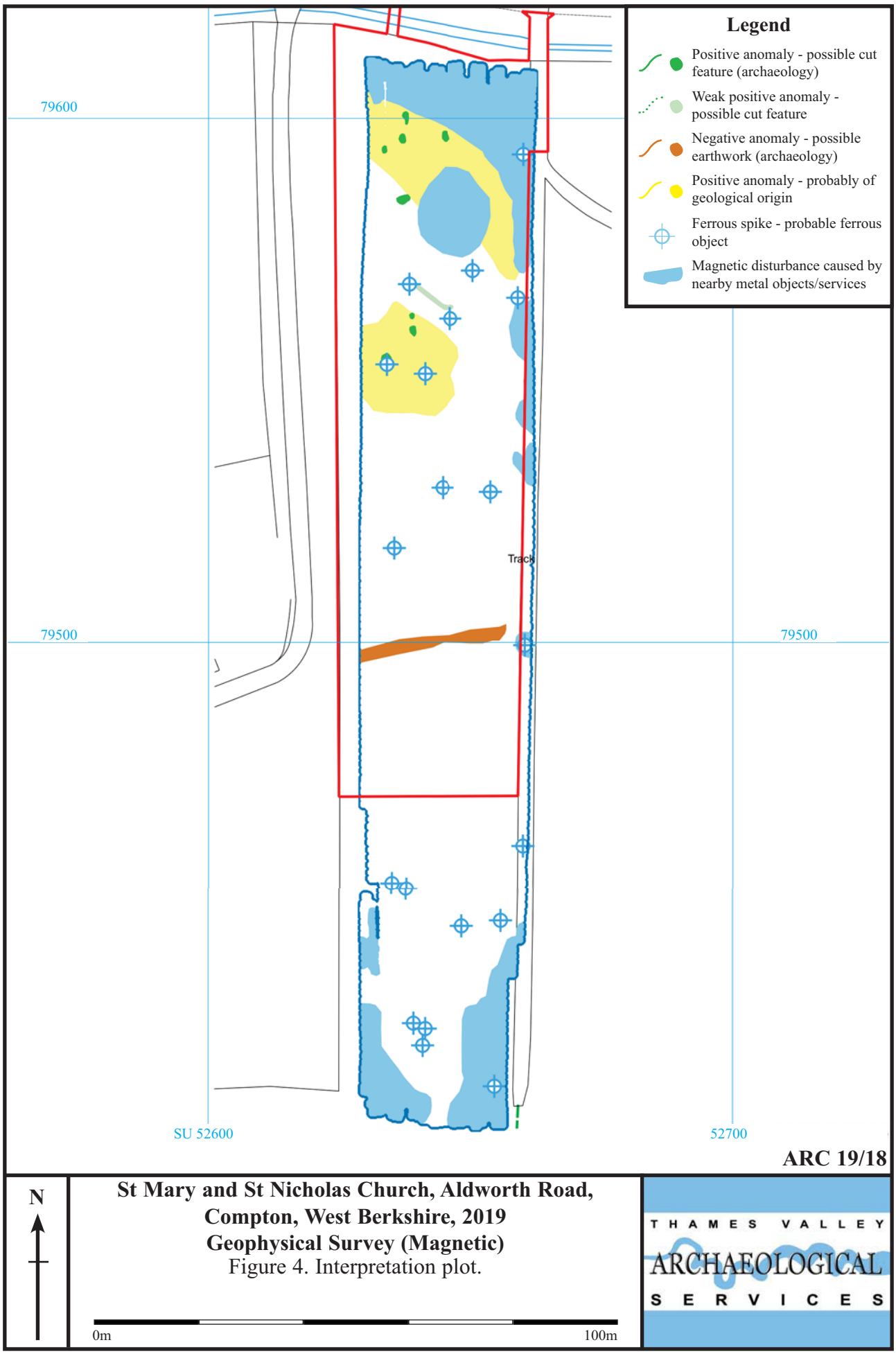

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Figure 4. Interpretation plot.

Plate 1. Southern end of the field looking north.

Plate 2. Northern end of the field looking south.

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St Mary and St Nicholas Church, Aldworth Road, Compton, West Berkshire, 2019
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Plates 1 and 2.

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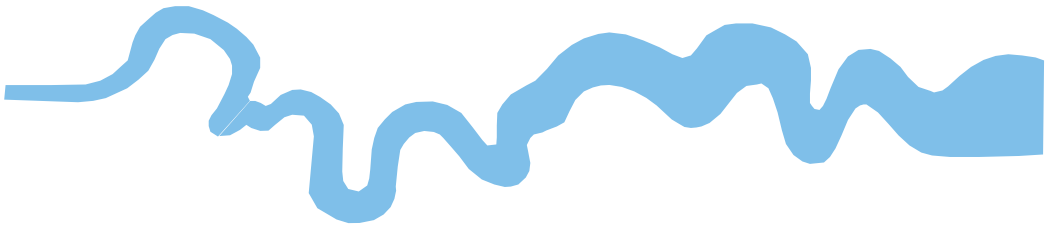
TIME CHART

	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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