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ARCHAEOLOGICAL

SERVICES

Little Sparrows, Blounts Court Road, Sonning Common, Oxfordshire

Geophysical Survey (Magnetic)

by Kyle Beaverstock and Tim Dawson

Site Code: BCR19/131

(SU 7134 8048)

Little Sparrows, Blounts Court Road, Sonning Common, Oxfordshire

Geophysical Survey (Magnetic) Report

For Senior Living (Sonning Common) and Investfront Ltd

by Kyle Beaverstock and Tim Dawson

Thames Valley Archaeological Services Ltd

Site Code BCR 19/131

October 2019

Summary

Site name: Little Sparrows, Blounts Court Road, Sonning Common, Oxfordshire

Grid reference: SU 7134 8048

Site activity: Magnetometer survey

Date and duration of project: 14th October 2019

Project coordinator: Tim Dawson

Site supervisor: Kyle Beaverstock

Site code: BCR 19/131

Area of site: 3.92ha

Summary of results: The geophysical survey recorded a range of magnetic anomalies across the site. They include areas of positive readings, which may represent changes in the underlying geology, and large discrete positive circles, with likely indicate buried manmade features, possibly quarry pits.

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✓ 9.10.19
	Tim Dawson✓ 9.10.19

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Little Sparrows, Blounts Court Road, Sonning Common, Oxfordshire
A Geophysical Survey (Magnetic)

by Kyle Beaverstock and Tim Dawson

Report 19/131

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Little Sparrows, Blounts Court Road, Sonning Common, Oxfordshire (SU 7134 8048) (Fig. 1). The work was commissioned by Mr Phil Docherty, Senior Living (Sonning Common) and Investfront Ltd, Units 3 & 4, Cedars Office Park, Butt Lane, Normanton on Soar, Leicestershire LE12 5EE.

Planning consent is to be sought from South Oxfordshire District Council for the development of the site as a Continuing Care Retirement Community (CCRC)/care village. An additional 15m buffer outside the site's southern and eastern boundaries has been identified for tree planting. An archaeological evaluation has been requested in order to inform the Council's response to the planning application. This is in accordance with the Department for Communities and Local Government's National Planning Policy Framework (NPPF 2018), and the District's policies on archaeology. The field investigation was carried out to a specification approved by Mr Richard Oram, Planning Archaeologist for South Oxfordshire District Council. The fieldwork was undertaken by Kyle Beaverstock and Sophie Peng on 7th October 2019 and the site code is BCR 19/131.

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 on the eastern edge of Sonning Common, a large village in South Oxfordshire District, some 5.5km to the west of Henley-on-Thames and 7km north of Reading (Fig. 1). It is currently an unused grass field which occupies the ridge of a peninsular of land 97.5m above Ordnance Datum (aOD) at its south-eastern end and falling to 92m aOD at the north-western end. The ground to the north and south slopes downhill although it rises again to meet Blounts Court Road at the site's northern boundary, creating a shallow valley. The site is bounded by hedgerows and trees with houses lying beyond to the west, Blounts Court Road to the north and a large field to the east and south (Fig. 2). The underlying geology is recorded as Winter Hill gravel overlying Lambeth group clay silt and sand (BGS 2000).

Site history and archaeological background

The archaeology of the Chiltern Hills of South Oxfordshire is relatively poorly understood with a modest range of sites and finds recorded in the county Historic Environment Record. This, perhaps, is due to a lack of opportunity for survey rather than a genuine absence. A modest number of finds are recorded in the area such as Neolithic flinty and Bronze Age bronze tools, Roman pottery and an enclosure visible from the air of Iron age into Roman date. Roman and Bronze Age material have been recovered from within the site itself. The site also lies close to Blounts Court with the surviving farmhouse retaining some 16th century components and the settlement having medieval origins. Of more significance is the probable presence of a Roman pottery production site on the proposal site itself. This was represented by a large volume of pottery recovered from the surface of the field.

A geophysical survey and subsequent evaluation trenching were undertaken immediately to the north of the site and to the west of Blounts Court in 2019 (Beaverstock 2019a, 2019b). The geophysics identified several magnetic anomalies which had potentially indicated the presence of buried archaeological remains. The trenching targeted these anomalies and identified the remains of Roman occupation and evidence of a large area of burning, possibly associated with pottery production.

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. Conditions during the survey were damp and overcast but the field was free from obstructions and, as such, it was possible to survey its entire area within the main site. The 15m buffer outside the southern and eastern site boundaries was too narrow to allow clear survey results to be recorded once the existing boundary vegetation had been taken into account.

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 -1.8 to 2.2 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 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 was able to cover the entire site area (Fig. 2) and recorded a variety of magnetic anomalies (Fig. 3). The majority of these anomalies are likely to be natural in origin or caused by the presence of near-by magnetically-enhanced objects but there are a small number which may be man-made but of unknown date (Fig. 4). These latter anomalies consist of three strong positive areas, each roughly circular and approximately 10-11m in diameter **[Fig. 4: 1-3]**. The strength and definition of these anomalies suggest that they are large features which have been cut through the underlying geology, possibly by people. If this is their origin then it is likely that they represent quarry pits which have been dug to extract the underlying gravel. They appear to be associated with a series of weaker positive anomalies which form patches across the central areas of the site **[4-6]**. The irregular shapes and variable strength of these suggest that they may represent changes in the underlying

geology. Those at **[6]** appear to correspond with the shallow dry valley which lies between the high ground at Blounts Court Road and the high point of the ridge towards the site's south-eastern corner.

A large amount of magnetic disturbance was encountered along the site's northern boundary, at its western end and within the north-eastern area **[7]**. The areas along the boundary are likely to be caused by ferrous fencing and the linear shape at **[7]** corresponds to the loose tarmac trackway which extends south-west from the field gate onto Blounts Court Road. Several areas of magnetic disturbance, debris and spikes were recorded, again particularly in the north-eastern part of the field, but also spread generally across the site area. These most likely indicate the presence of magnetically enhanced objects, e.g. broken farm equipment, within the topsoil.

Conclusion

The survey of the development site was successfully undertaken and recorded a variety of magnetic anomalies. The majority of these are likely to be of either natural or modern origin but there are a small number which may indicate the presence of buried cut features, potentially quarry pits of unknown date. The strong magnetic disturbance encountered along the site's northern boundary and in the north-eastern may mask weaker anomalies of possible archaeological origin.

References

Beaverstock, K, 2019a, 'Land at Blounts Court, Sonning Common, Oxfordshire: Geophysical survey (magnetic)', Thames Valley Archaeological Services report 18/215a, Reading

Beaverstock, K, 2019b, 'Land at Blounts Court, Sonning Common, Oxfordshire: An archaeological evaluation', Thames Valley Archaeological Services report 18/215b, Reading

BGS, 2000, *British Geological Survey*, 1:50,000, Sheet 268, Solid and Drift Edition, KeyworthCI*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: 3.0.35.15

Raw data
Instrument Type: MLgrad Import
Units:
UTM Zone: 30
Survey corner coordinates (X/Y):
Northwest corner: 471174.239727916, 180581.063099428 m
Southeast corner: 471484.679727916, 180375.013099428 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 2 @ 1 m spacing.
Dummy Value: 32702

Dimensions
Survey Size (meters): 310 m x 206 m
X&Y Interval: 0.13 m
Source GPS Points: Active: 94071, Recorded: 94071

Stats
Max: 106.54
Min: -109.73
Std Dev: 6.17
Mean: -2.19
Median: -1.92
Composite Area: 6.3966 ha
Surveyed Area: 3.1332 ha

Processed data
Stats
Max: 2.41
Min: -2.00
Std Dev: 0.80
Mean: -0.05
Median: 0.01

GPS based Processes: 6
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip at 1.00 SD
5 Despike Threshold: 1 Window dia: 3
6 Clip from -1.80 to 2.20

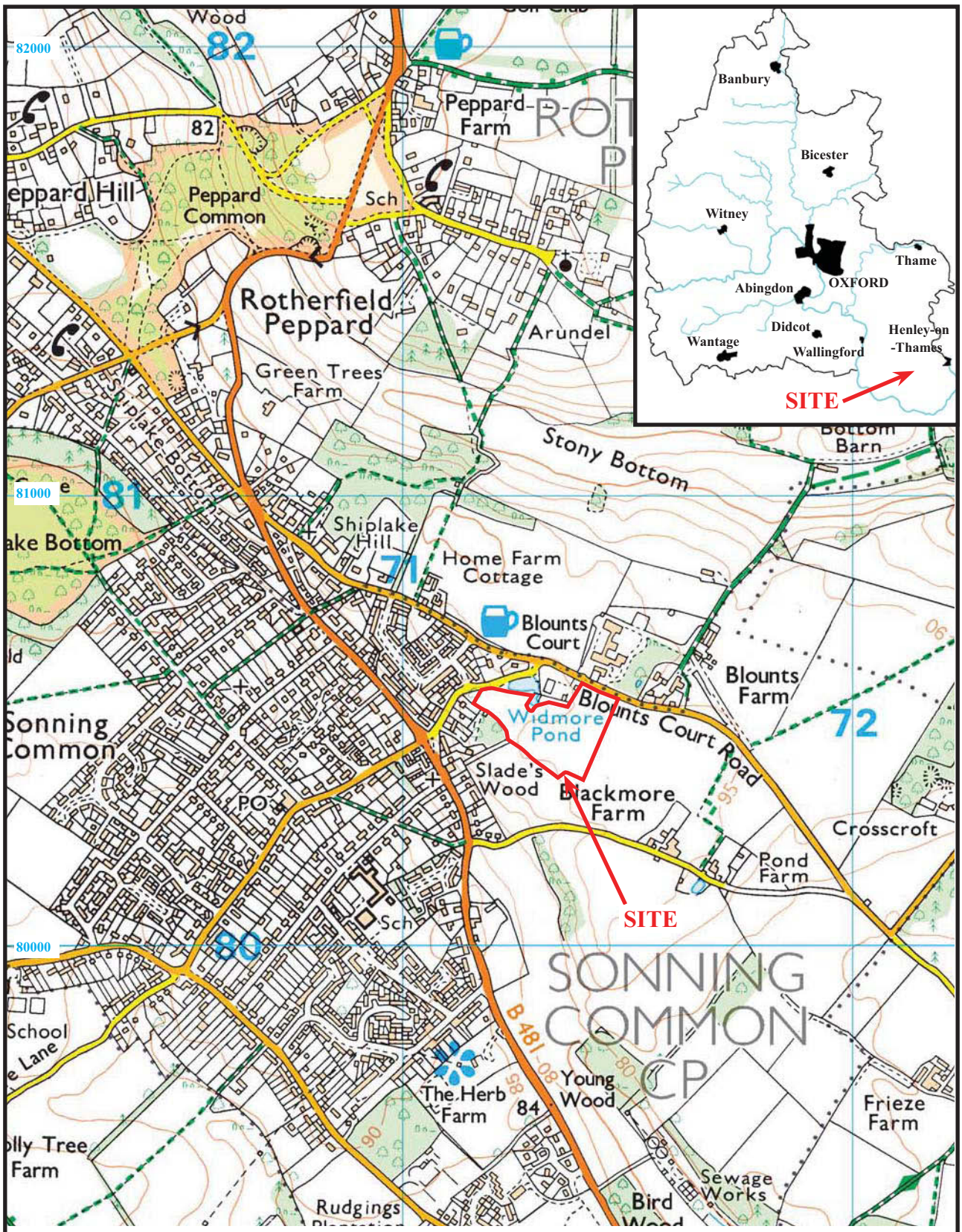

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Figure 1. Location of site within Sonning Common and Oxfordshire.

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Little Sparrows, Blounts Court Road, Sonning Common, Oxfordshire, 2019
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Figure 2. Plot of raw gradiometer data.

0m 100m

+100
nT
-100

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Figure 3. Plot of processed gradiometer data.

+2.2
nT
-1.8

0m 100m

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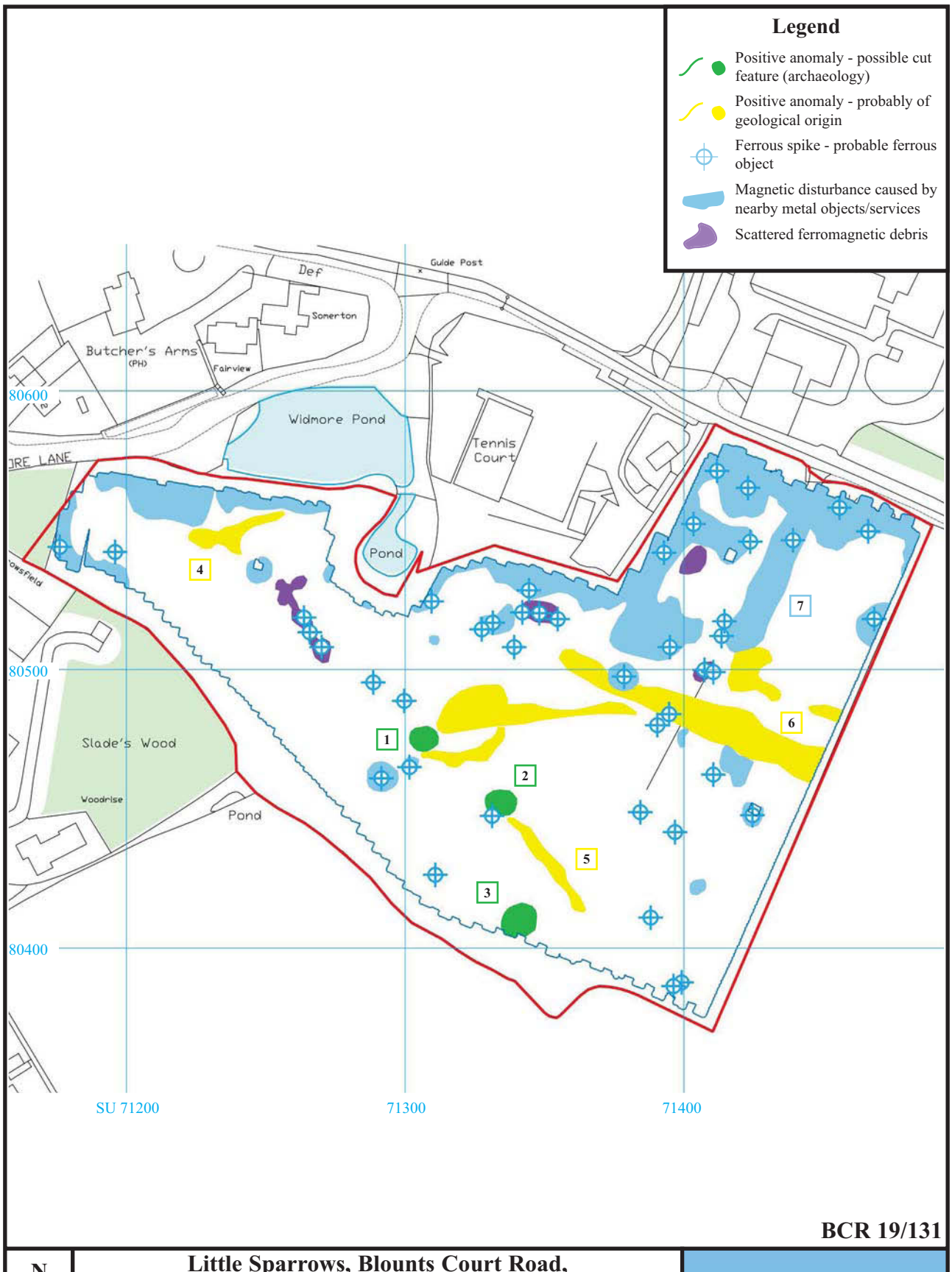

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Little Sparrows, Blounts Court Road, Sonning Common, Oxfordshire, 2019
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Figure 4. Interpretation plot.

0m 100m

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Plate 1. Eastern end of the site, looking south-west.

Plate 2. Looking west along the length of the site.

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Little Sparrows, Blounts Court Road,
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Plates 1 and 2.

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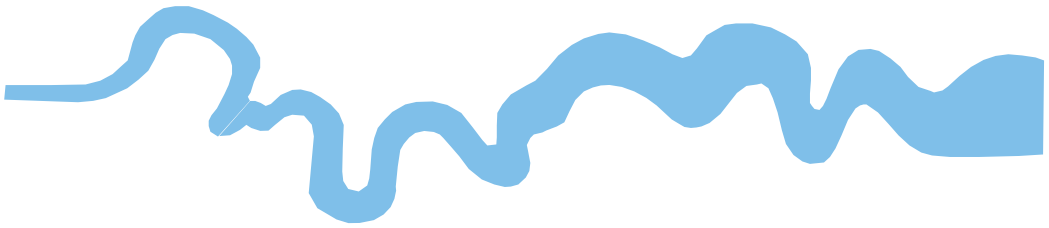
TIME CHART

	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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