WYAS Archaeological Services

Aston Barclay Parking

Prees Heath

Whitchurch

Shropshire

Geophysical Survey

Report no. 3087
January 2018

Client: Archaeology Collective

Aston Barclay Parking, Prees Heath, Whitchurch, Shropshire

Geophysical Survey

Summary

A geophysical (magnetometer) survey, covering approximately 2.6 hectares, was undertaken on land to the west of Heath Road, Prees Heath, Whitchurch, Shropshire. This was part of a programme of archaeological works in advance of a proposed development. The magnetic survey has detected no anomalies of archaeological origin. Responses recorded are mainly of a natural or geological origin along with field drains and ferrous anomalies.

WYAS Archaeological Services

Report Information

Client:	Archaeology Collective
Address:	The Office Paddington, 19 Eastbourne Terrace, London, W2 6LG
Report Type:	Geophysical Survey
Location:	Prees Heath
County:	Shropshire
Grid Reference:	SJ 5553 3835
Period(s) of activity:	Modern
Report Number:	3087
Project Number:	6945
Site Code:	ABA18
OASIS ID:	Archaeol11-310479
Date of fieldwork:	January 2018
Date of report:	January 2018
Project Management:	Emma Brunning BSc MCIfA
Fieldwork:	Chris Sykes BSc MSc MCIfA
	David Inglis BA
Report:	Emma Brunning
Illustrations:	Emma Brunning
Photography:	Chris Sykes
Research:	Rosie Scales BA

Authorisation for distribution: ----------

Nepshaw Lane South, Morley, Leeds LS27 7JQ
Telephone: 0113 383 7500.
Email: admin@aswyas.com

Contents

List of Figures

List of Plates

1 Introduction

Archaeological Services WYAS (ASWYAS) were commissioned by Archaeology Collective to undertake a geophysical (magnetometer) survey on land to the east of Heath Road, Prees Heath, Whitchurch, Shropshire. This is in advance of a proposed development for Aston Barclay Parking. Guidance contained within the National Planning Policy Framework (DCLG 2012) was followed, in line with current best practice (CIfA 2014; David *et al*. 2008). The survey was carried out on the 22nd January 2018.

Site location, topography and land-use

The survey area is centred on National Grid Reference SJ 5553 3835 and comprises one single field totalling approximately 2.6ha, under a cover of pasture. The site is bounded to the east by Heath Road, to the north by Aston Barclay Car Auctions, to the south by further pasture fields and to the west by a stream. The survey area is generally level and lies approximately 94m above Ordnance Datum (aOD).

Soils and geology

The underlying bedrock geology comprises of Lias Group, Mudstone (BGS 2018). The overlying soils belong to the Wick association (541r) described deep well drained coarse loamy and sandy soils, locally over gravel (SSEW 1983).

2 Archaeological Background

The following information has been taken from the Pastscape website, where a preliminary investigation of a 1km radius from the survey area, revealed the following;

A late Bronze Age cinerary urn was found in 1915, 720m to the southeast of the survey area it contained the cremated remains of a female adult. An unurned cremated male was found nearby, as well as a further two individuals entombed in stone. (Monument No. 70834)

A find spot of a Whetstone thought to be of Roman date was located at the junction of the A41 and A49 (Monument No. 881366), south of the survey area.

Approximately 750m to the north of the area a Roman occupation site was partially excavated. Many cobbled surfaces and tegulae gave indication of former building. Considerable quantities of iron slag, some nails, fragments of knives, a bronze brooch and much imported and local pottery give a probable date of occupation from late 1st to 3rd century. (Monument No. 70838)

The Roman Road from Whitchurch to Stretton passes within the vicinity of the area, it is visible following hedgerows and an agger measuring 11m wide and 0.3m deep visible in places. (Monument No. 1165867)

3 Aims, Methodology and Presentation

The main aim of the geophysical survey was to provide additional information on the known archaeology within the area. To achieve this, a magnetometer survey covering all available parts of the PDA was undertaken (see Fig. 2).

The general objectives of the geophysical survey were:

- to provide information about the nature and possible interpretation of any magnetic anomalies identified;
- to therefore determine the presence/absence and extent of any buried archaeological features; and
- to prepare a report summarising the results of the survey.

Magnetometer survey

The site grid was laid out using a Trimble R8s GNSS system. The survey was undertaken using Bartington Grad601 magnetic gradiometers. These were employed taking readings at 0.25m intervals on zig-zag traverses 1.0m apart within 30m by 30m grids, so that 3600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Geoplot 3 (Geoscan Research) software was used to process and present the data. Further details are given in Appendix 1.

Reporting

A general site location plan, incorporating the 1:50000 Ordnance Survey (OS) mapping, is shown in Figure 1. Figure 2 shows a more detailed site location plan at a scale of 1:1250. The processed and minimally processed data, together with an interpretation of the survey results are presented in Figures 3 to 5 inclusive at a scale of 1:1000.

Technical information on the equipment used, data processing and survey methodologies are given in Appendix 1. Technical information on locating the survey area is provided in Appendix 2. Appendix 3 describes the composition and location of the archive. A copy of the completed OASIS form is included in Appendix 4.

The survey methodology, report and any recommendations comply with guidelines outlined by English Heritage (David *et al.* 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All figures reproduced from Ordnance Survey mapping are with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The figures in this report have been produced following analysis of the data in processed formats and over a range of different display levels. All figures are presented to most

suitably display and interpret the data from this site based on the experience and knowledge of Archaeological Services staff.

4 Results and Discussion (see Figs 2 to 5)

Geological anomalies

A number of anomalies have been recorded in the west of the survey area and have been interpreted as geological. It is likely that they are associated with the stream to the immediate west and perhaps represent flooding or alluvial deposits.

Similar responses have been located to the northwest which may be due to the slight changes in the topography. These responses have a slightly higher magnetic response than the anomalies recorded close to the stream and an anthropogenic origin cannot be ruled out entirely.

Agricultural anomalies

Field drains have been recorded within the survey area on roughly a north to south alignment. No other anomalies of an agricultural origin were detected suggesting the field has been under pasture for some time.

Ferrous anomalies

Ferrous anomalies, as individual ‘spikes’, or as large discrete areas are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris or material is common on rural sites, often being present as a consequence of manuring or tipping/infilling. There is no obvious pattern or clustering to their distribution in this survey to suggest anything other than a random background scatter of ferrous debris in the plough-soil.

Magnetic disturbance has been recorded along the northern, eastern and southern limits and are associated with metal fencing in the field boundaries and the western limits of Area 1. A handful of larger areas of magnetic disturbance within the survey area are likely to be buried ferrous objects of a modern origin.

5 Conclusions

The magnetic survey has detected no anomalies of archaeological origin. The majority of the responses recorded are associated with geological or natural origins. A handful of field drains have also been recorded along with areas of magnetic disturbance.

Based on this geophysical survey, the archaeological potential for this site is deemed to be low.

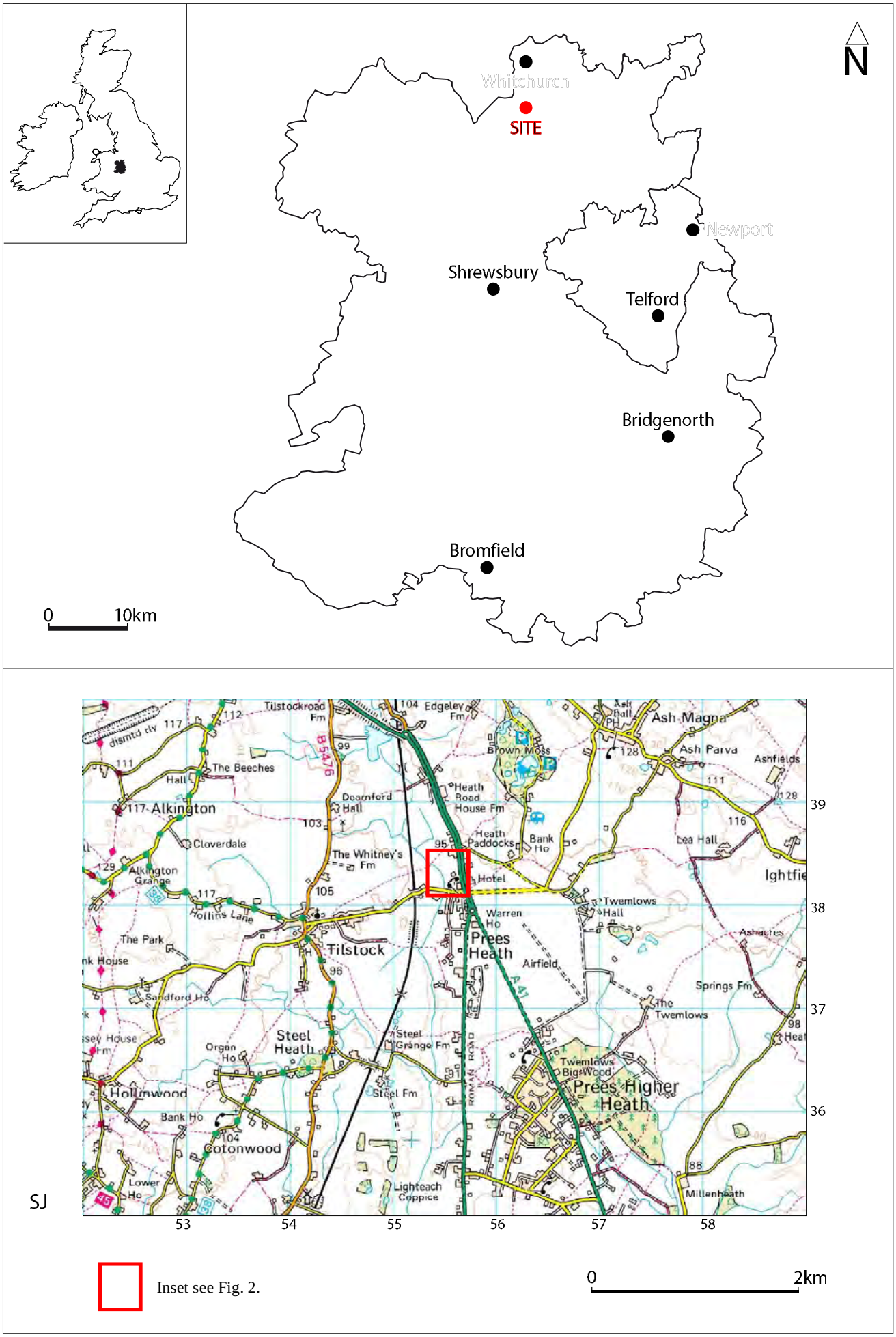

Fig. 1. Site location

PROJECT ID: 6945_ABA18

1 LOCATION & DIRECTION OF PLATES

N

Invictus

Path (um)

Artro

Prees Heath

kca T

2.0

-1.0

nT

384400

3554 00

3556 00

1

2

Archaeological Services W Y A S
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 383 7500

0 50m

Fig. 2. Location of survey area showing greyscale magnetometer data (1:1000 @ A3)

Fig. 3. Processed greyscale magnetometer data (1:1000 @ A3)

PROJECT ID: 6945_ABA18

N

Path (um)

Prees Heath

Artro

kca T

20.0 nT/cm

3384 00

3554 00

3556 00

0 50m

Archaeological Services W Y A S
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 383 7500

Fig. 4. XY trace plot of minimally processed magnetometer data (1:1000 @ A3)

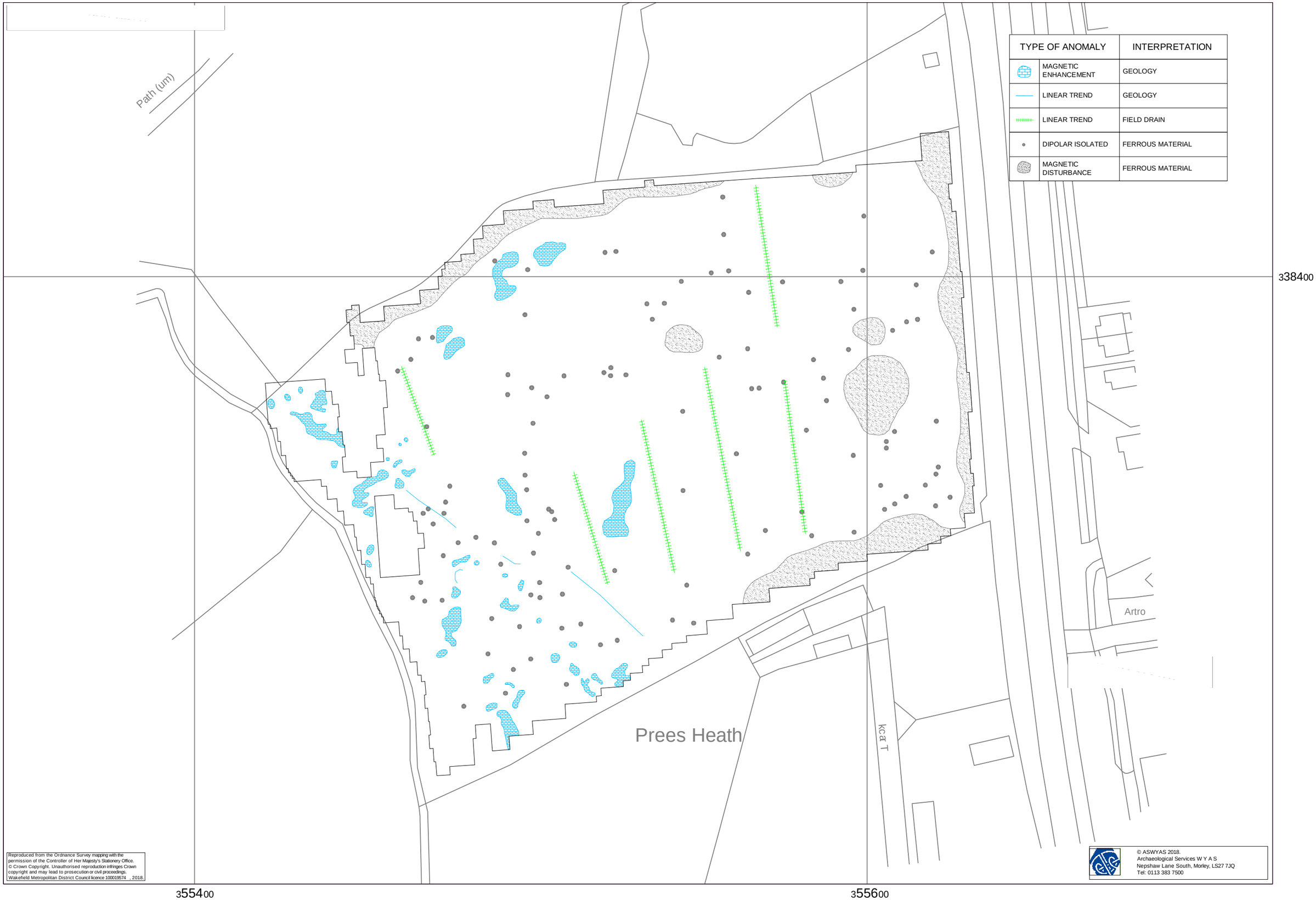

Fig. 5. Interpretation of magnetometer data (1:1000 @ A3)

Plate 1. General view of site, looking northwest

Plate 2. General view of site, looking northeast

Appendix 1: Magnetic survey - technical information

Magnetic Susceptibility and Soil Magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haemetite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms. Areas of human occupation or settlement can then be identified by measuring the magnetic susceptibility of the topsoil because of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected. The magnetic susceptibility of a soil can also be enhanced by the application of heat and the fermentation and bacterial effects associated with rubbish decomposition. The area of enhancement is usually quite large, mainly due to the tendency of discard areas to extend beyond the limit of the occupation site itself, and spreading by the plough.

Types of Magnetic Anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic ‘spiky’ trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an ‘iron spike’ anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

Methodology: Gradiometer Survey

The main method of using the fluxgate gradiometer for commercial evaluations is referred to as ***detailed survey*** and requires the surveyor to walk at an even pace carrying the instrument within a grid system. A sample trigger automatically takes readings at predetermined points, typically at 0.25m intervals, on traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation.

During this survey a Bartington Grad601 magnetic gradiometer was used taking readings on the 0.1nT range, at 0.25m intervals on zig-zag traverses 0.5m apart within 30m by 30m square grids. The instrument was checked for electronic and mechanical drift at a common point and calibrated as necessary. The drift from zero was not logged.

The gradiometer data have been presented in this report in processed greyscale format. The data in the greyscale images have been interpolated and selectively filtered to remove the effects of drift in instrument calibration and other artificial data constructs and to maximise the clarity and interpretability of the archaeological anomalies.

The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by direct investigation of sub-surface deposits.

Appendix 2: Survey location information

The survey grid was set out using a Trimble R8s GNSS system with its integrated Trimble 360 tracking technology which supports signals from all existing and planned constellations and augmentation systems tracking the full range of satellite systems including GPS, GLONASS, Galileo, BeiDou and QZSS. The accuracy of this equipment is better than 0.01m. The survey grids were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if co-ordinates are measured off hard copies of the mapping rather than using the digital co-ordinates.

Archaeological Services WYAS cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

Appendix 3: Geophysical archive

The geophysical archive comprises:-

- an archive disk containing compressed (WinZip 8) files of the raw data, report text (Microsoft Word 2000), and graphics files (Adobe Illustrator CS6 and AutoCAD 2008) files; and
- a full copy of the report.

At present the archive is held by Archaeological Services WYAS although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (i.e. available for consultation in the Shropshire Historic Environment Record).

Appendix 4: Oasis form

OASIS DATA COLLECTION FORM: England

List of Projects | Manage Projects | Search Projects | New project | Change your details | HER coverage | Change country | Log out

Printable version

OASIS ID: archaeol11-310479

Project details

Project name	Aston Barclay
Short description of the project	A geophysical (magnetometer) survey, covering approximately 2.6 hectares, was undertaken on land to the west of Heath Road, Prees Heath, Whitchurch, Shropshire. This was part of a programme of archaeological works in advance of a proposed development. The magnetic survey has detected no anomalies of archaeological origin. Responses recorded are mainly of a natural or geological origin along with field drains and ferrous anomalies.
Project dates	Start: 22-01-2018 End: 22-01-2018
Previous/future work	Not known / Not known
Any associated project reference codes	ABA18 - Sitecode
Type of project	Field evaluation
Monument type	NA None
Significant Finds	NA None
Methods & techniques	"Geophysical Survey"
Development type	Not recorded
Prompt	Planning condition
Position in the planning process	Not known / Not recorded
Solid geology	LOWER LIAS
Drift geology	Unknown
Techniques	Magnetometry

Project location

Country	England
Site location	SHROPSHIRE NORTH SHROPSHIRE WHITCHURCH URBAN Aston Barclay Parking
Study area	2.6 Hectares
Site coordinates	

	SJ 5553 3835 52.940382696756 -2.661796374113 52 56 25 N 002 39 42 W Point
Height OD / Depth	Min: 94m Max: 94m

Project creators

Name of Organisation	Archaeological Services WYAS
Project brief originator	Archaeological Collective
Project design originator	Archaeological Services WYAS
Project director/manager	E. Brunning
Project supervisor	C. Sykes

Project archives

Physical Archive Exists?	No
Digital Archive recipient	ASWYAS
Digital Contents	"Survey"
Digital Media available	"Images vector","Survey","Text","Images raster / digital photography","GIS","Geophysics"
Paper Archive Exists?	No

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Aston Barclay Parking, Prees Heath, Whitchurch, Shropshire
Author(s)/Editor(s)	Brunning, E.
Date	2018
Issuer or publisher	ASWYAS
Place of issue or publication	Morley, Leeds

Entered by	Jamie Ranaldi (Jamie.Ranaldi@aswyas.com)
Entered on	28 February 2018

Bibliography

British Geological Survey, 2018. http://mapapps.bgs.ac.uk/geologyofbritain/home.html (viewed January 2018)

CIfA, 2014. *Standard and Guidance for Archaeological Geophysical Survey*. Chartered Institute for Archaeologists

David, A., N. Linford, P. Linford and L. Martin, 2008. *Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines (2nd edition)* English Heritage

DCLG, 2012. *National Planning Policy Framework*. Department of Communities and Local Government

SSEW, 1983. Soil Survey of England and Wales, Sheet 3, Midland and Western England