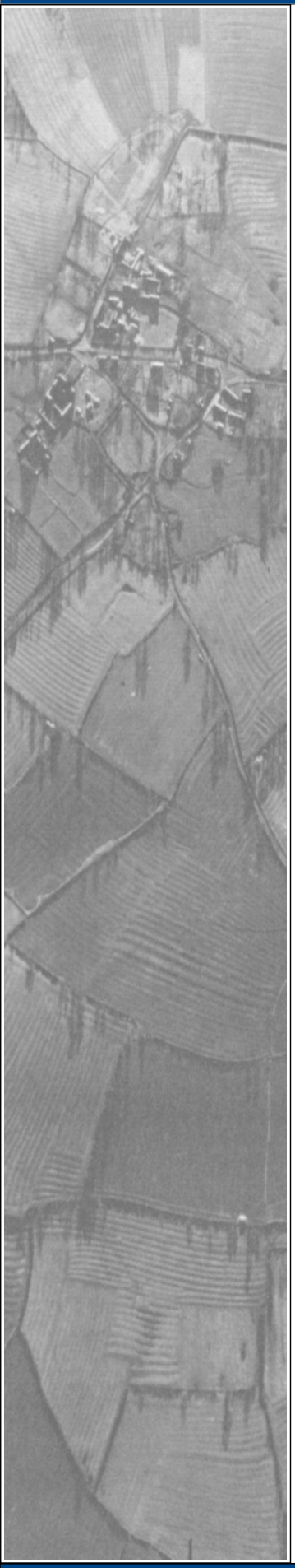

Land to the rear of Brand Hill House
Woodhouse Eaves
Leicestershire

MAGNETOMETER SURVEY REPORT

for

Mr M Mattu

Kerry Donaldson & David Sabin

January 2023

Ref. no. J946

ARCHAEOLOGICAL SURVEYS LTD

Land to the rear of Brand Hill House

MAGNETOMETER SURVEY REPORT

for

Mr M Mattu

Fieldwork by David Sabin BSc (Hons) MCIfA
Report by Kerry Donaldson BSc (Hons) MCIfA
Report checked by David Sabin
Primary archive location - Archaeological Surveys Ltd, Yatesbury, Wiltshire

Survey date – 11th January 2023
Ordnance Survey Grid Reference – **SK 53505 13775**

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SUMMARY

A geophysical survey, comprising detailed magnetometry was carried out by Archaeological Surveys Ltd on land to the rear of Brand Hill House, Woodhouse Eaves, Leicestershire. The site had been used for wartime billeting and a number of Nissen hut bases and other ancillary buildings have been recorded within the site. The results of the survey show widespread distribution of strongly magnetic material remaining after demolition of the buildings. Services and paths and trackways have also been located. In the north eastern corner of the site a small number of weakly positive and negative linear anomalies have been located, but it is not possible to confidently interpret their origin.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by David Granger Architectural Design Ltd, on behalf of Mr M Mattu, to undertake a magnetometer survey of an area of land to the rear of Brand Hill House, Woodhouse Eaves, Leicestershire. The site has been outlined for a proposed development of a new dwelling and the survey forms part of an archaeological assessment.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin so that they may be assessed prior to development of the site. The methodology is considered an efficient and effective approach to archaeological prospection.

1.2.2 Geophysical survey can provide useful information on the archaeological potential of a site; however, the outcome of any survey relies on a number of factors and as a consequence results can vary. The success in meeting the aims and objectives of a survey is, therefore, often impossible to predetermine.

1.3 Standards, guidance and recommendations for the use of this report

1.3.1 Archaeological Surveys Ltd is a Registered Organisation with the Chartered Institute for Archaeologists and both company directors are Members of the Chartered Institute for Archaeologists (MCIfA) and have therefore been assessed for their technical competence and ethical suitability and abide by the CIfA Codes of Conduct. The survey and report follow the recommendations set out by: European Archaeological Council (2015) *Guidelines for the Use of Geophysics in Archaeology;* Institute for

Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations.* The work has been carried out to the Chartered Institute for Archaeologists (2014, updated 2020) *Standard and Guidance for Archaeological Geophysical Survey.*

1.3.2 Archaeological Surveys Ltd provide a detailed geophysical survey report and it is recommended that where possible the contents should be considered in full. The Summary provides a brief overview of the results with more detail available in the Discussion and/or Conclusion. The *List of anomalies* within the Results provides a detailed assessment of the anomalies within separate categories which can be useful in inferring a level of confidence to the interpretation. Quality and factors influencing the interpretation of anomalies is also set out within the results.

1.3.3 It is recommended that the full report should always be considered when using data and interpretation plots; where this is not possible, in the field for example, the abstraction and interpretation plots should retain their colour coding and be used with a corresponding legend.

1.4 Site location, description and survey conditions

1.4.1 The site is located on land immediately east of Brand Hill House, Brand Hill, Woodhouse Eaves, Leicestershire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SK 53505 13775, see Figs 01 and 02.

1.4.2 The geophysical survey covers approximately 1.4ha within a grassland field to the rear of Brand Hill House. The land tends to slope down towards the east with an increasing gradient towards the south western corner of the field. The western side of the area contains a track giving access to Brand Hill House and woodland to the north. A number of brick building foundations can be seen along the southern and northern edges of the site and there is a small agricultural building or stable in the north western part of the area. The area is generally surrounded by mature trees, with more formal planting along the western side of the area and a small number of specimen and coniferous trees in the north western part. Within the field there are two wooden electricity poles, one having enclosed steel cable stays. A very small fenced enclosure within the central part of the field surrounds an inspection chamber.

1.4.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. However, the area of building foundations close to the southern boundary is associated with very uneven ground that was very difficult to traverse. In addition, the foundations are located amongst mature trees that affected the GNSS positioning at times, survey around the periphery of the whole area was similarly affected due to the presence of tall trees around the majority of the site. Weather conditions during the survey were mainly fine.

Plate 1: Survey area looking east

Plate 2: Hut bases in south eastern part of site looking east

1.5 Site history and archaeological potential

1.5.1 Brand Hill House was purchased by local hosiery manufacturer TP Towle to be used as a convalescent home for women and children in 1943, and known as the Ellen Towle Memorial Home. Ordnance Survey mapping from the

1950s and 1960s shows a number of T-shaped buildings along the southern edge of the survey area, together with a former access track on the northern side and a number of further ancillary buildings to the north. During the Second World War the land to the rear was utilised for billeting of Auxiliary Territorial Service (ATS) and Navy, Army and Air Force Institutes (NAAFI) women serving in the Y-station at Beaumanor Hall and Garets Hay located 1 mile to the north (Ebbs and Rico, 2021). The Y station supported the X station at Bletchley Park by monitoring and intercepting enemy wireless communications. Within the site the remains of the buildings exist as brick foundations with dimensions of c5m by 11m (16ft by 36ft) and spaced 6m apart in two rows, 7m apart. There is no evidence that they were T-shaped or interlinked as indicated by the mapping, but do appear to relate to the foundations of Nissen huts.

1.5.2 In the wider vicinity the Leicestershire Historic Environment records evidence for linear and curvilinear cropmarks approximately 250m to the north east (MLE1129) and the site is situated 300m east south east of the core of the historic settlement of Woodhouse Eaves (MLE1144).

1.5.3 The location of the Nissen huts and other ancillary buildings within the site indicate a high potential for the survey to locate magnetic features associated with them. The location of cropmarks to the north east may indicate that there is some potential for similar features to extend into the survey area.

1.5.4 Observations during the course of the survey confirmed the presence of building debris, foundations and associated earthworks along much of the southern part of the survey area and into the trees along the southern boundary. A number of inspection chambers were also noted in the vicinity of these. The extant stables also appears to be partly associated with earlier buildings and along the northern boundary of the survey area, to the north east of the stables, there is evidence of further wartime buildings, possibly a wash room and boiler house.

1.6 Geology and soils

1.6.1 The underlying geology is Triassic mudstone from the Gunthorpe Member with overlying head deposits (BGS, 2022).

1.6.2 The overlying soil across the site is from the Claverley association (711l) and is a typical stagnogley soil. It consists of a slowly permeable, seasonally waterlogged, reddish soil (Soil Survey of England and Wales, 1983).

1.6.3 Magnetometry carried out over similar geology and soil has produced variable results as they can be associated with low magnetic susceptibility. If, however, the site contains evidence for long term occupation or industrial activity the soils can become sufficiently enhanced for the creation of magnetic anomalies.

2 METHODOLOGY

2.1 Technical synopsis

2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Magnetic susceptibility and magnetic thermoremnance (also known as thermoremanence) are factors associated with the formation of localised magnetic fields.

2.1.2 Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased, and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features, such as pits and ditches, may produce positive magnetic anomalies that can be mapped by magnetic prospection. In addition, where soil is displaced by material of comparatively low magnetic susceptibility, such as many types of sedimentary rock, anomalies of negative value may occur which could be indicative of structural remains.

2.1.3 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth, oven etc. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.

2.1.4 The localised variations in magnetism are measured as sub-units of the Tesla, which is a SI unit of magnetic flux density. These sub-units are nano Teslas (nT), which are equivalent to 10^{-9} Tesla (T). Additional details are set out in 2.2 below and within Appendix A.

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using a SENSYS MAGNETO®MXPDA 5 channel cart-based system. The instrument has 5 fluxgate gradiometers (FGM650) spaced 0.5m apart with readings recorded at 20Hz. The cart is pushed at walking speed and not towed. Each sensor is not zeroed in the field as the vertical axis alignment is precisely fixed leaving sensor offsets that are removed during data processing. The fixing of the vertical alignment ensures the sensors are not unduly influenced by localised magnetic fields and that the vertical component of a magnetic anomaly is measured. The gradiometers have a measurement range of ±8000nT, although the recorded range is ±3000nT, and resolution is approximately 0.1nT. They are linked to a Leica GS10 RTK GNSS with data recorded by SENSYS MonMX software on a rugged notebook computer system.

2.2.2 Due to the fixed offsets within the fluxgate sensors, as a result of the manufacturing and tensioning process, the survey data do not provide a visually useful dataset

until a zero median traverse algorithm is applied. It is recognised that this has the potential to affect some anomalies detrimentally by removing linear features orientated parallel to survey transects. However, this has not been noted as a particular problem with the system due to the high resolution data collection, generally long length of traverses and variability within the magnetic characteristics of a linear anomaly.

2.2.3 Data are collected along a series of parallel survey transects to achieve 100% coverage of the surveyable land. The length of each transect is variable and relates to the size of the survey area and other factors including ground conditions. A visual display allows accurate placing of transects and helps maintain the correct separation between adjacent traverses. Data are not collected within fixed grids and data points are considered to be random even though the data are collected in a systematic manner covering all accessible areas (Aspinall, Gaffney and Schmidt, 2009).

2.2.4 Fluxgate sensors are highly sensitive to temperature change and this manifests as drift during the course of a survey. This can be particularly noticeable during the morning as temperatures rise and the equipment warms or cools. Sensor drift within the course of a traverse will appear as a line trending from negative to positive after processing with a zero median traverse algorithm. To remove the potential for temperature drift, data were collected after a 20 minute stabilisation period and traverses were limited to a time of generally <100s.

2.3 Data processing and presentation

2.3.1 Magnetic data collected by the MAGNETO®MXPDA cart-based system are initially prepared using SENSYS MAGNETO®DLMGPS software. The software effectively allocates a geographic position for each data point and can compensate for fixed offsets present within the FGM650 sensors. The offsets are positive or negative values present on all fluxgate gradiometer sensors. Some systems use manual or electronic balancing to effectively zero the sensors; however, this is a short term measure that is prone to drift through temperature changes and vibration and can easily be incorrectly set due to localised magnetic fields. The FGM650 sensors are very accurately aligned to the vertical magnetic gradient and are highly stable showing negligible drift on long traverses. The offset values are removed using TerraSurveyor software.

2.3.2 Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display within TerraSurveyor. The removal of the offset values (compensation) of the sensors is also carried out in TerraSurveyor using a zero median traverse function. Data are then considered to be minimally processed. Note: without the zero median traverse function it is not possible to create a meaningful data plot as all sensors have a different offset value.

2.3.3 The minimally processed data are collected between limits of ±3000nT and

clipped for display at ±100nT and also at ±3nT in order to see weaker anomalies. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track.

2.3.4 Appendix C contains metadata concerning the survey and data attributes and is derived directly from TerraSurveyor. Reference should be made to Appendix B for further information on processing.

2.3.5 A TIF file is produced by TerraSurveyor software along with an associated world file (.TFW) that allows automatic georeferencing (OSGB36 datum) when using GIS or CAD software. The main form of data display used in the report is the minimally processed greyscale plot. Minimally processed data are considered by the manufacturer to be data that are compensated by SENSYS MAGNETO DLMGPS software, see 2.3.1 and 2.3.2. Note: traceplots are not considered to be appropriate as they do not provide an accurate or useful assessment of the magnetic anomalies due to the very high density of data collection. In addition, traceplots cannot be meaningfully plotted against base mapping and in areas of complexity traces may be lost or highly confused. Traceplots may be used to demonstrate characteristic magnetic profiles across discrete features where it is considered beneficial.

2.3.6 The raster images are combined with base mapping using ProgeCAD Professional 2021, creating DWG (2018) file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. The CAD plots are effectively georeferenced facilitating relocation of features using GNSS, resection method, etc.

2.3.7 An abstraction and interpretation is drawn and plotted for all geophysical anomalies located by the survey. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing. Appendix E sets out CAD layer names with colour and graphic content for each interpretation category, see 3.3.

2.3.8 A brief summary of each anomaly, with an appropriate reference number, is set out in list form within the results (Section 3) to allow a rapid and objective assessment of features within the survey area.

2.3.9 A digital archive is produced with this report, see Appendix D below. The main archive is held at the offices of Archaeological Surveys Ltd.

3 RESULTS

3.1 General assessment of survey results

3.1.1 The detailed magnetic survey was carried out over approximately 1.4ha within a single grassland field.

3.1.2 Magnetic anomalies located can be generally classified as positive and

negative linear anomalies of an uncertain origin, areas of magnetic debris and disturbance, strong discrete dipolar anomalies relating to ferrous objects and strong multiple dipolar linear anomalies relating to buried services or pipelines. Anomalies located within each survey area have been numbered and are described in 3.4 below.

3.2 Data quality and factors affecting the interpretation or formation of anomalies

3.2.1 Data are considered representative of the magnetic anomalies present within the site. High magnitude magnetic debris covers much of the survey area and relates to ferrous and magnetically thermoremnant material such as brick. The debris is incoherent and obscures the detail of in situ building remains or other features. Only the north eastern quarter of the field appears comparatively free of debris and capable of producing low magnitude anomalies associated with feature fills.

3.2.2 The presence or tall trees and dense woodland prevented consistent high position accuracy of data around the periphery of the field due to shielding of satellite signals and multipath effects. However, due to the randomised nature of the magnetic material present within the site, this has not seriously affected the results.

3.3 Data interpretation

3.3.1 The list of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A general explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, see Table 1.

Interpretation category	Description and origin of anomalies
Anomalies with an uncertain origin	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Morphology may be unclear or uncharacteristic and there may be a lack of additional supporting information. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil.
Anomalies associated with magnetic debris	Magnetic debris often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. They often occur where there has been dumping or ground make-up and are related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material. This type of response is occasionally associated with kilns, furnace structures, hearths and nail spreads from former wooden structures or rooves and may, therefore, be archaeologically significant. It is also possible that the response may be caused by natural material such as certain gravels and fragments of igneous or metamorphic rock. Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.
Anomalies with a modern origin	The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc. Often a significant area around these features has a strong magnetic flux which may create magnetic disturbance; such disturbance can effectively obscure low magnitude anomalies if they are present. Fluxgate sensors may respond erratically adjacent to strong magnetic sources. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction.

Table 1: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 453505 313775, see Figs 03 & 04.

Anomalies with an uncertain origin

(1) – A number of weakly positive and negative linear anomalies are located towards the north eastern corner of the site beyond the zone of widespread magnetic debris. It is not possible to determine if these relate to cut features with any archaeological potential or if they have an association with the wartime and modern use of the site.

(2) – A small, positive rectilinear anomaly is located towards the centre of the site. It is likely that it is associated with the wartime use of the site.

(3) – An L-shaped rectilinear anomaly is located in the north western part of the site, close to an area previously containing wartime ancillary buildings. It is possible that it relates to former structural foundations or possibly a path.

(4) – A negative linear anomaly in the northern part of the site could relate to walling associated with a former wartime structure.

Anomalies with a modern origin

(5 – 7) – The survey area contains a number of strong, multiple dipolar linear anomalies. These relate to services (5 & 6) and possibly a cable (7) extending between former wartime buildings.

(8 & 9) – A linear zone of magnetic debris (8) relates to a surface or sub-surface of a former track that gave access to the rows of Nissen huts to the south. A curvilinear zone of magnetic debris (9) is associated and also relates to the track.

(10 & 11) – Two positive linear and rectilinear anomalies are likely to relate to the sub-surface of former paths between the Nissen huts and the ancillary buildings to the north.

Anomalies associated with magnetic debris

(12) – The site contains widespread strongly magnetic debris, although it is strongest and more concentrated in the western half. This is a response to ferrous and other magnetically thermoremnant material, such as brick, within the topsoil. It relates to material from the Nissen huts and ancillary buildings which has been spread across the site during demolition.

(13) – Strong, discrete, dipolar anomalies relate to ferrous and other magnetically thermoremnant objects such as brick and these also relate to the spreads of

magnetic debris seen throughout the site.

4 CONCLUSION

4.1.1 The geophysical survey located widespread magnetic debris throughout the site. Due to the very highly magnetic response and widespread distribution it was not possible to identify further examples of the wartime hut bases beyond those previously identified through topographic survey. A number of tracks and paths as well as services have been identified.

4.1.2 Little of the site remains unaffected by the magnetic debris suggesting that once the corrugated roofing and framework was removed from the huts, the brick foundations, along with other fittings and general debris remained. The high magnitude responses suggest shallow burial of mixed material beneath topsoil with minimal reinstatement and landscaping.

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Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremnant material. Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field. Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field upon cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremnant features include ovens, hearths, and kilns. In addition thermoremnant material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to the topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The SENSYS gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 65cm apart. The instrument is carried about 10-20cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried magnetic field. The difference between the two sensors will relate to the strength of the magnetic field created by the buried feature.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

Appendix B – data processing notes

Clipping

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

Zero Median/Mean Traverse

The median (or mean) of data from each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise differences between the offset values of the gradiometer sensors. The process can remove archaeological features that run along a traverse but with the high resolution datasets created by the Sensys FGM650 sensors and the method of data collection this has not been a notable problem. In fact, the removal of offsets using software avoids carrying out a balancing procedure on site, which inevitably can never be done in magnetically clean conditions and results in improperly aligned fluxgate sensors and/or electronic adjustment values.

Appendix C – survey and data information

Filename: J946-mag-proc-3nT.xcp
Description: Imported as Composite from:
J946-mag.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 453402.76, 313816.66 m
Southeast corner: 453616.51, 313710.61 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Dimensions
Survey Size (meters): 214 m x 106 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 444309, Recorded: 444652
Stats
Max: 3.32
Min: -3.30
Std Dev: 2.32
Mean: 0.00
Median: 0.05
Composite Area: 2.2668 ha
Surveyed Area: 1.3774 ha
PROGRAM
Name: TerraSurveyor
Version: 3.0.37.0
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT
Filename: J946-mag-proc-100nT.xcp
Stats
Max: 110.50
Min: -110.00
Std Dev: 37.26
Mean: -0.05
Median: 0.06
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -100.00 to 100.00 nT

Appendix D – digital archive

Archaeological Surveys Ltd hold the primary digital archive at their offices in Wiltshire. Data are backed-up onto an on-site data storage drive and at the earliest opportunity data are copied to CD ROM for storage on-site and off-site.

A PDF copy will be supplied to the Leicestershire Historic Environment Record with greyscale images and abstraction layers made available on request. The digital data will also be archived with the Archaeology Data Service (ADS). The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

File type	Naming scheme	Description
Data	J946-mag.asc J946-mag.xcp J946-mag-proc.xcp	Raw data as ASCII CSV TerraSurveyor raw data TerraSurveyor minimally processed data
Graphics	J946-mag-proc.tif	Image in TIF format
Drawing	J946-**[version number]**.dwg	CAD file in 2018 dwg format
Report	J946 report.odt	Report text in LibreOffice odt format

Table 2: Archive metadata

Appendix E – CAD layers for abstraction and interpretation plots

The table below sets out Archaeological Surveys Ltd CAD layer names with associated colours and graphical content. Where CAD files are available layers may be extracted for further CAD/GIS use. Note: hatched polygon boundaries are contained within layers with the RGB colour code 254, 255, 255 (near white) in order to prevent their visibility.

Report sub-heading and associated CAD layer names	Colour with RGB index	Layer content
Anomalies with an uncertain origin		
AS-ABST MAG POS LINEAR UNCERTAIN	255,127,0	Line, polyline or polygon (solid)
AS-ABST MAG NEG LINEAR UNCERTAIN	Blue 0,0,255	Line, polyline or polygon (solid)
Anomalies relating to land management		
AS-ABST MAG PATH/ROAD/TRACK	0, 153,153	Line, polyline or polygon (solid or partly cross hatched ANSI38)
Anomalies associated with magnetic debris		

AS-ABST MAG DEBRIS		132, 132, 132	Polygon (cross hatched ANSI37)
AS-ABST MAG STRONG DIPOLAR		132, 132, 132	Solid donut, point or polygon (solid)
Anomalies with a modern origin			
AS-ABST MAG DISTURBANCE		132, 132, 132	Polygon (hatched ANSI31)
AS-ABST MAG SERVICE		132, 132, 132	Line or polyline

Table 3: CAD layering

Appendix F – copyright and intellectual property

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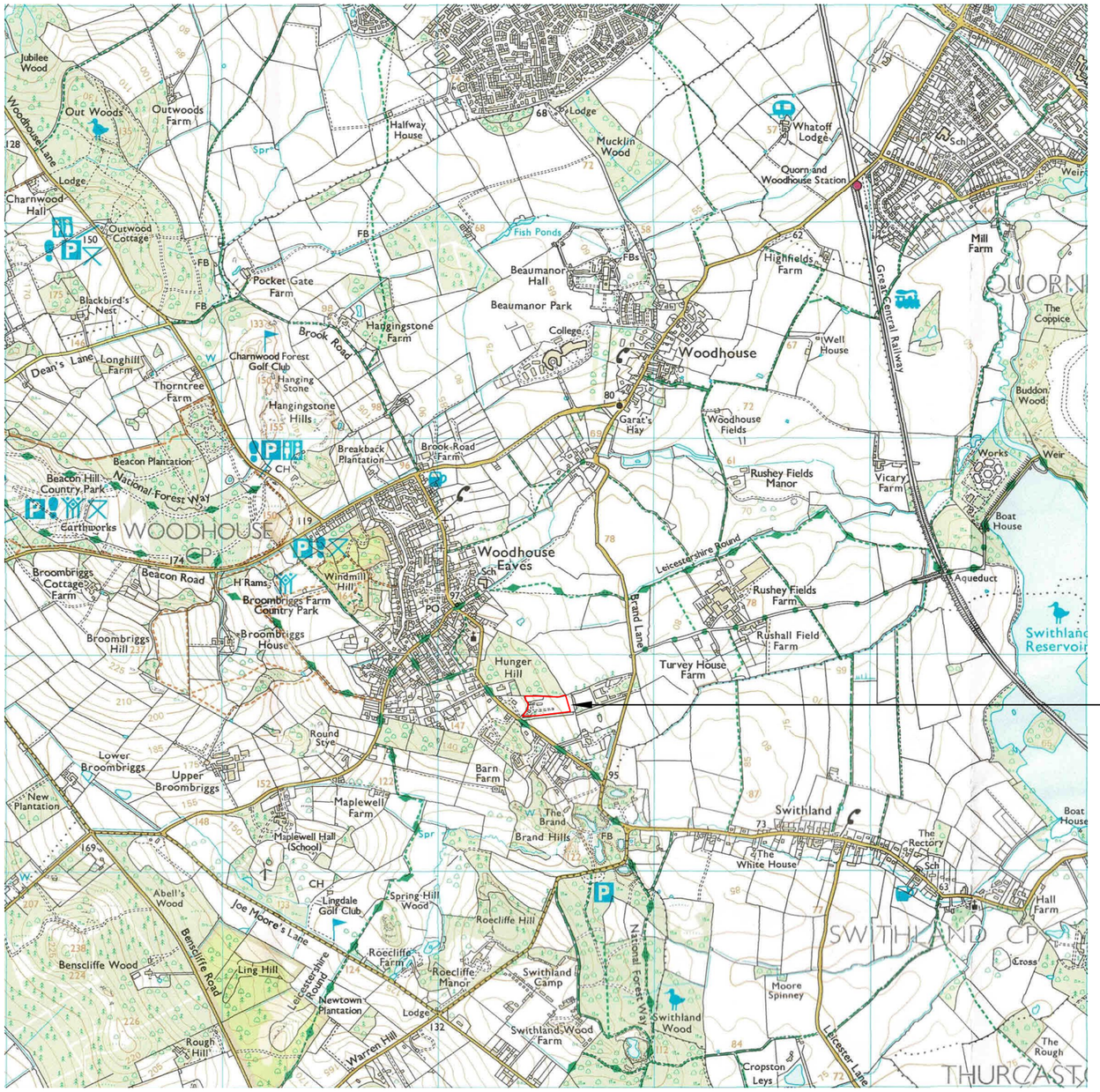
Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Land to the rear of
Brand Hill House
Woodhouse Eaves
Leicestershire

Map of survey area



● Survey location

Site centred on OS NGR
SK 53505 13775

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

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KTD	DJS	FIG 01

453350
453400
453450
453500
453550
453600
453650
313850
313800
313750
313700
313650
Brand Hill House
116.9m
IB
BRAND HILL
Hut bases recorded in topographic survey
N

Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Land to the rear of
Brand Hill House
Woodhouse Eaves
Leicestershire

Referencing information

Referencing grid to OSGB36 datum at 50m intervals

453500 313750

Survey tracks

Survey track start

Survey track stop

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 02

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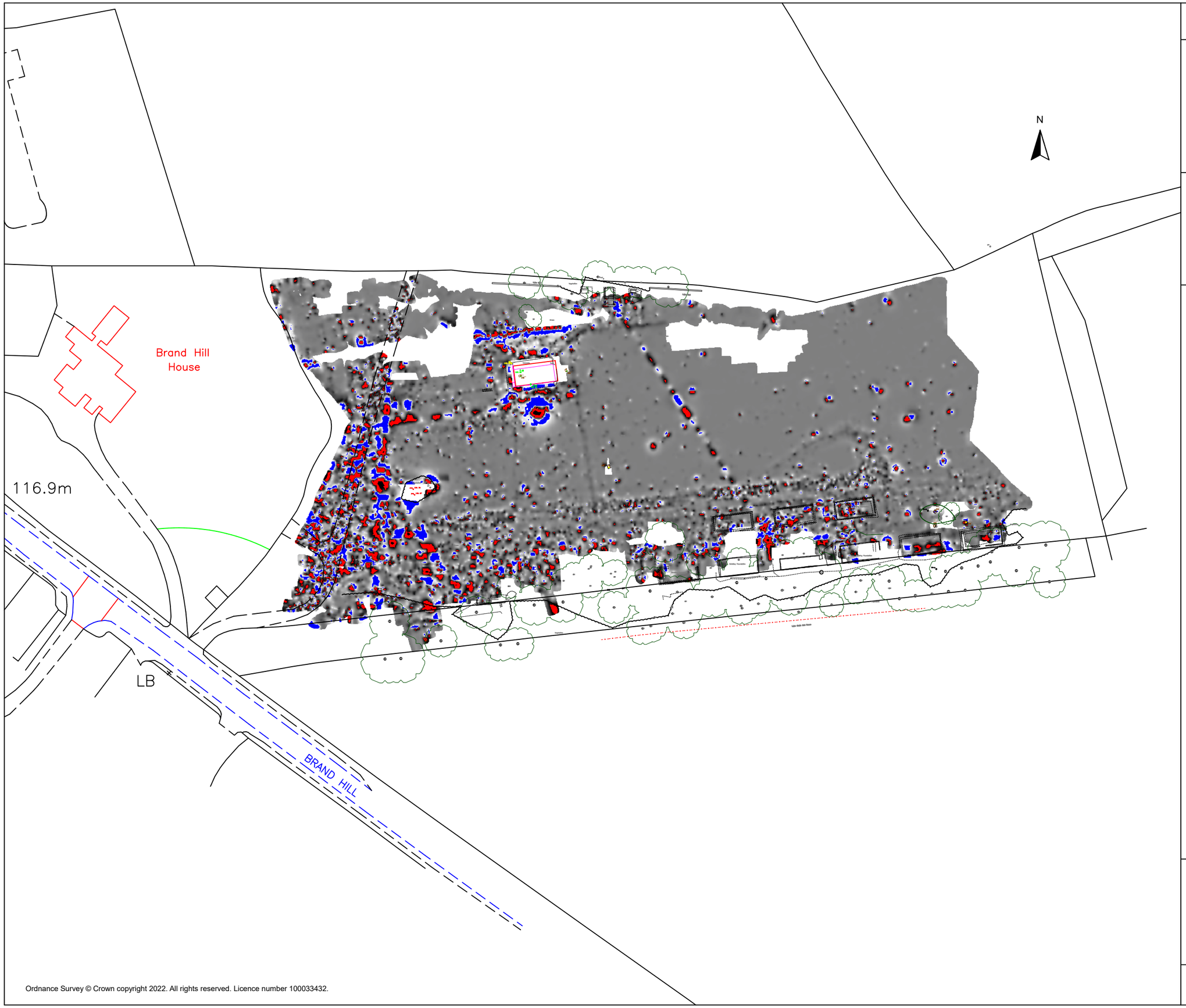
Greyscale plot of minimally processed magnetometer data clipped at ±100nT



-100nT +100nT

+100nT
-100nT

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 03

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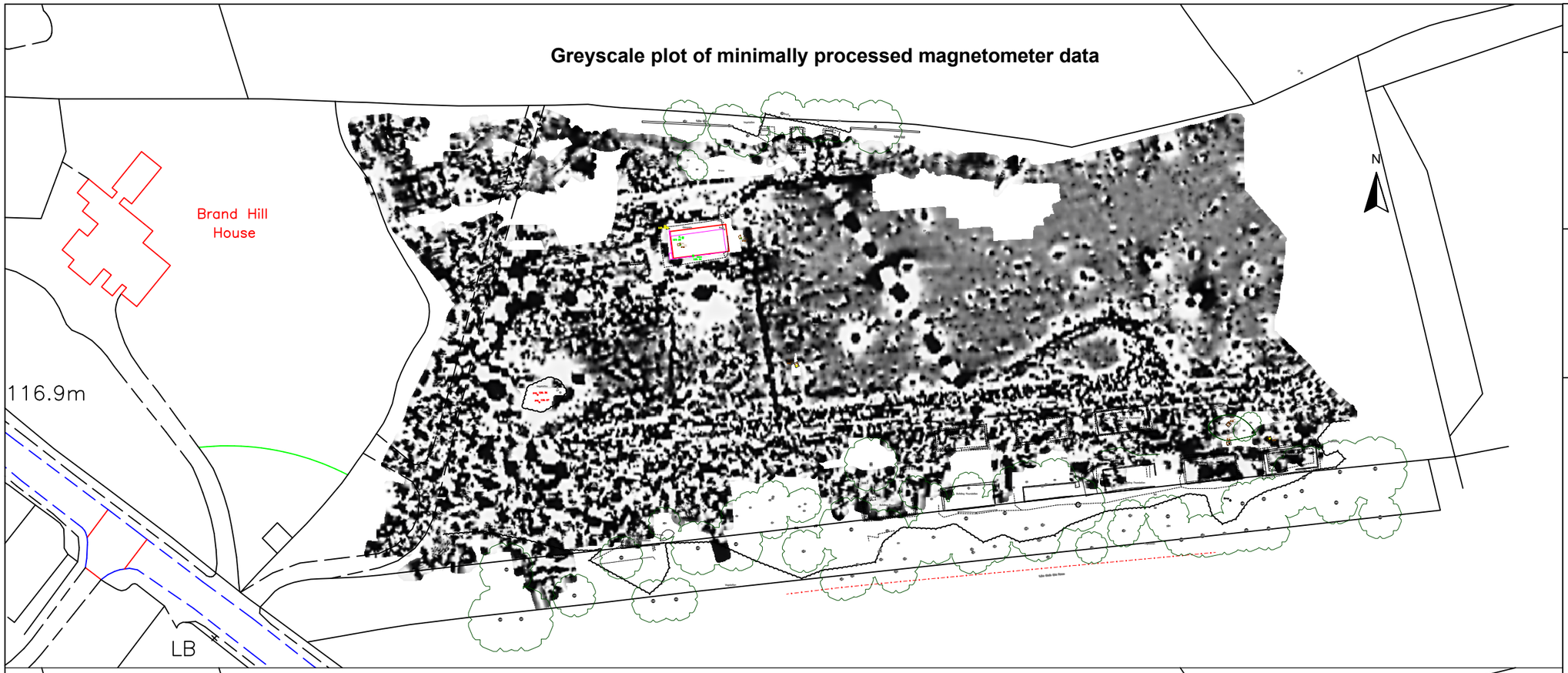
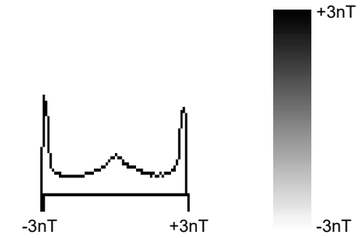
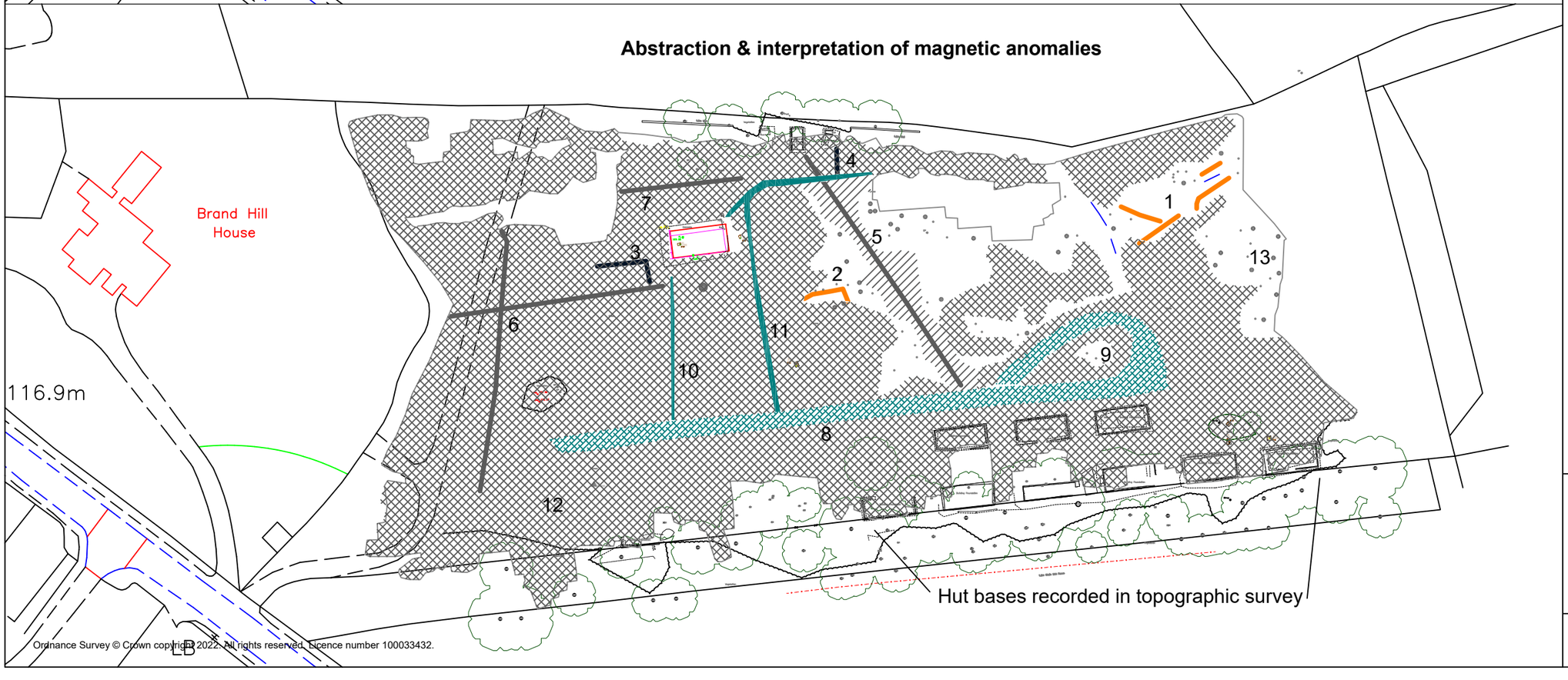
Greyscale plot of minimally processed magnetometer data



Greyscale plot of minimally processed magnetometer data clipped at ±3nT & abstraction & interpretation of magnetic anomalies



Abstraction & interpretation of magnetic anomalies



- Positive linear anomaly - of uncertain origin
- Negative linear anomaly - of uncertain origin
- Linear anomaly - possible structure/path
- Linear anomaly - former path
- Magnetic debris - former track
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipe / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 04