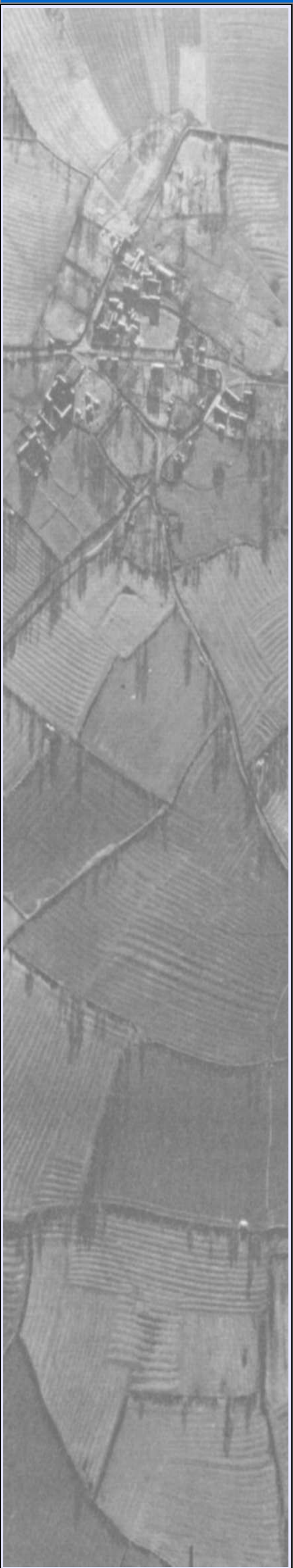

Land off Castle Street
Mere
Wiltshire

MAGNETOMETER SURVEY REPORT

for

CgMs Consulting

Kerry Donaldson & David Sabin

May 2016

Ref. no. 661

ARCHAEOLOGICAL SURVEYS LTD

Land off Castle Street
Mere
Wiltshire

Magnetometer Survey Report

for

CgMs Consulting

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

Survey dates – 5th & 6th May 2016
Ordnance Survey Grid Reference – **ST 80500 32100**

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SUMMARY

Detailed magnetometry was carried out by Archaeological Surveys Ltd, at the request of CgMs Consulting, within an area of land to the south of Castle Street on the south-western edge of Mere in south-west Wiltshire. The results indicate the presence of a linear anomaly that correlates with a former mapped boundary feature also partly visible as an extant linear bank. A broad, curvilinear anomaly of uncertain origin appears to have been possibly truncated by the boundary; however, it appears to define a low rise in the field and a natural origin should be considered. Other linear and discrete anomalies could not be confidently interpreted due their fragmented nature and lack of definable morphology.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by CgMs Consulting to undertake a magnetometer survey of an area of land to the south of Castle Street on the south-western edge of Mere in Wiltshire. The site has been outlined for development, and the survey forms part of an archaeological assessment of the site.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2016) and approved by Clare King, Assistant Archaeologist for Wiltshire Council, prior to commencing the fieldwork.

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 The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation;* and 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) *Standard and Guidance for Archaeological Geophysical Survey.*

1.3 Site location, description and survey conditions

1.3.1 The site is located on the south-western edge of Mere in south-west Wiltshire. It lies to the south of Castle Street, to the east of Mapperton Hill, west of

Townsend Nursery and north of agricultural land. It is centred on Ordnance Survey National Grid Reference (OS NGR) ST 88500 32100, see Figs 01 and 02.

1.3.2 The geophysical survey covers approximately 6ha within two pasture fields separated by a post and wire fence. The site generally slopes down gently towards the south with the exception of a low ridge orientated north-east to south-west in the northern part of the survey area.

Plate 1: Eastern part of survey area looking east towards Mere

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Weather conditions during the survey were fine and warm.

1.4 Site history and archaeological potential

1.4.1 The Wiltshire Historic Environment Record lists that the site contains a number of undated earthwork features that may relate to former field boundaries (ST83SW642-MWI798) and have been affected by ploughing. At least one boundary feature is recorded on mapping from 1821 and 1848, together with the former line of the Gillingham Road which extended along the northern part of the site in 1821 and was realigned to the present position as Mapperton Hill by 1848. The site lies 280m south-west of the medieval core of Mere (ST83SW453-MWI733) and 360m south-west of Mere Castle (Scheduled Monument no. 1017018/26870) (ST83SW454-MWI734). This is the site of a medieval castle, built in 1253 by Richard, Duke of Cornwall. A group of four barrows on Long Hill, 220m west of Mere Castle (Scheduled monument no. 1016569/32611) are also located 350m to the north-east of the site. A number of Romano-British pottery fragments are also recorded 200m to the north (ST83SW305-MWI725).

1.4.2 The location of earthwork features within the site may indicate that there is potential for the magnetometer survey to locate anomalies that relate to former land boundaries and other archaeological features. During the course of the survey, extant linear earthworks typical of former field boundaries were observed.

1.5 Geology and soils

1.5.1 The underlying solid geology along the northern edge of the site is Cretaceous sandstone from the Boyne Hollow Chert Member. Melbury Sandstone Member underlies the majority of the site (Upper Greensand) although in the south western corner there is mudstone from the Kimmeridge Clay Formation with overlying head deposits of clay, silt, sand and gravel (BGS, 2016).

1.5.2 The overlying soil across the survey area is mapped as from the Denchworth association and is a pelo-stagnogley. It consists of a slowly permeable, seasonally waterlogged, clayey soil. Along the northern edge the soil is from the Ardington association and is a typical brown earth consisting of a deep, well drained, fine and course loamy glauconitic soil (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry survey carried out across similar soils has produced variable results. There can be very low magnetic susceptibility within such soils. However, where there has been prolonged occupation or industrial activity, there can be useful magnetic contrast. The underlying geology and soils are therefore considered acceptable for magnetic survey.

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 are factors associated with the formation of localised fields. Additional details are set out below and within Appendix A.

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 magnetic anomalies that can be mapped by magnetic prospection.

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).

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 spaced 0.5m apart with readings recorded at 20Hz. The gradiometers have a range of recording data between 0.1nT and 10,000nT. The sensors are not zeroed in the field, as the vertical axis alignment is fixed using a tension band system. In order to produce visible, useful greyscale images a zero median traverse process is undertaken in TerraSurveyor. The system is linked to a Leica GS10 RTK GPS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged computer.

2.2.2 Data are collected along a series of parallel survey tracks wherever possible. The length of each track is variable and relates to the size of the survey area and other factors including ground conditions. A visual display aids accurate placing of tracks and their separation.

2.2.3 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).

2.3 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. Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display using TerraSurveyor.

2.3.2 The data are collected between limits of ±10000nT and clipped for display at ±2nT. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track. A zero median traverse function is required in order to remove fixed offset values present within the sensors which do not undergo a zeroing procedure in the field. The approach ensures that the gradiometer sensors are very accurately aligned and fixed to the vertical magnetic field and are not influenced by localised magnetic fields or disturbed by vibration. Although a zero median traverse algorithm can remove anomalies aligned with the survey tracks, in practice this rarely occurs due to the use of long traverses, high resolution measurement and variability within the magnetic susceptibility of long linear features.

2.3.3 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 any processes, such as clipping, carried out on the data. .

2.3.4 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.

2.3.5 The raster images are combined with base mapping using ProgeCAD Professional 2014, creating DWG (2010) 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 GPS, resection method, etc.

2.3.6 An abstraction and interpretation is also 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.

2.3.7 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 each survey area. Where further interpretation is possible, or where a number of possible origins should be considered, more subjective discussion is set out in Section 4.

2.3.8 The abstraction and interpretation procedure has been supported by analysis of a digital terrain model and contour plot derived from GPS height data automatically logged during the survey (see Fig 05). The heights are converted from the ETRS89 ellipsoid using the National Geoid Model OSGM02 to obtain ODN (Ordnance Datum Newlyn) + the GPS antenna height (approximately 1.5m). Shaded relief plots and contours are created using Surfer 10.

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 a total of two survey areas covering approximately 6ha. The results of both areas are considered together.

3.1.2 Magnetic anomalies located can be generally classified as positive and negative anomalies of an uncertain origin, anomalies associated with land management, linear anomalies of an agricultural 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 have been numbered and are described in 3.4 below.

3.2 Statement of data quality

3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the dataset. Widespread magnetic debris and zones of magnetic disturbance around the periphery of the survey area are unlikely to obscure weak anomalies of archaeological potential.

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 basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, a basic key is indicated to allow cross referencing to the abstraction and interpretation plot. CAD layer names are included to aid reference to associated digital files (.dwg/.dxf). Sub-headings are used to group anomalies with similar characteristics.

Report sub-heading **CAD layer names and plot colour**	**Description and origin of anomalies**
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG NEG LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN AS-ABST MAG POS UNCERTAIN	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. 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 relating to land management AS-ABST MAG BOUNDARY	Anomalies are mainly linear and may be indicative of the magnetically enhanced fill of cut features (i.e. ditches) or negative responses (i.e banks) or a combination of both. The anomalies may be long and/or form rectilinear elements and they may relate to topographic features or be visible on early mapping. Associated agricultural anomalies (e.g. headlands, plough marks and former ridge and furrow) may support the interpretation.
Anomalies with an agricultural origin AS-ABST MAG AGRICULTURAL	The anomalies are often linear and form a series of parallel responses or are parallel to extant land boundaries. Where the response is broad, former ridge and furrow is likely; narrow

	response is often related to modern ploughing.
Anomalies associated with magnetic debris AS-ABST MAG DEBRIS AS-ABST MAG STRONG DIPOLAR	Magnetic debris often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. It often occurs where there has been dumping or ground make-up and is 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, or hearths 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 AS-ABST MAG DISTURBANCE AS-ABST MAG SERVICE	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 such 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 and with hysteresis 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 380500 132100 see Figs 03 & 04.

Anomalies with an uncertain origin

(1) - A broad, weakly positive, curvilinear anomaly located within the western part of the site (Area 1). It is possible that the response relates to a cut feature, and it may have been have been truncated by anomaly (7). It does, however, appear to surround a low rise within the field, and a natural origin cannot be ruled out.

(2) - A broad, weakly positive anomaly located within the eastern part of the site (Area 2). A linear boundary feature is recorded on the HER from aerial photographs taken in 1971 on a similar orientation.

(3 & 4) - Weakly positive, broad, linear responses. Anomaly (3) extends between a gateway and an electricity pole, and anomaly (4) is parallel with the north-western part of anomaly (1).

(5) - A number of weakly positive linear anomalies and a group of discrete positive responses are located in the western part of the site. They lack a coherent morphology, and it is not possible to determine if they relate to cut ditch-like and pit-like features or if they relate to natural features.

(6) - Located in the south-western part of the site are a number of negative linear and rectilinear anomalies. Such a response may indicate agricultural activity or possible land drainage features, but a number of pit-like responses are also located in the vicinity.

Anomalies associated with land management

(7) - A partly positive and partly negative linear response forms a "Z" shape. This relates to a boundary mapped in 1821 and 1848, and it also relates to an earthwork feature visible as a low bank within the field (see Fig 05). The surface model also indicates that it may have extended northwards.

Anomalies with an agricultural origin

(8) - Negative linear anomalies relate to former agricultural activity. They appear to respect the former land boundary (7).

Anomalies associated with magnetic debris

(9) - Located immediately adjacent to and on anomaly (7) are patches of magnetic debris. These are likely to be related to modern/agricultural activity, such as livestock feeding.

(10) - Several zones of magnetic debris are evident, primarily at the edges of the survey area close to gateways. They are associated with dumped magnetically thermoremnant material that has been used for ground consolidation.

(11) - The survey area contains widespread and numerous strong, discrete, dipolar anomalies which are a response to ferrous and other magnetically thermoremnant objects within the topsoil.

Anomalies with a modern origin

(12) - Extending along the northern edge of a low linear mound or ridge at the northern edge of the site is a strong, multiple dipolar linear anomaly relating to a service or pipeline.

4 DISCUSSION

4.1.1 The results of the geophysical survey show a combination of weakly positive and negative anomalies (7) that relate to a "Z" shaped former boundary feature. It was mapped in 1821 and 1848, but removed by 1887. This feature is also recorded within the height data (see Fig 05 and 2.3.8) and was visible as an extant bank during the survey. Fig 05 also highlights a broad linear bank or ridge orientated north-east to south-west within the northern part of the site which appears to relate to the former Gillingham Road, mapped in 1821 and realigned as Mapperton Hill by 1848. This does, however, coincide with the junction between the Boyne Hollow Chert Member and the Melbury Sandstone Member, with the Mere Fault in the vicinity, and a geological origin is possible, with later utilisation for the road. A service or pipeline (12) runs along the northern edge of this linear feature but there is no other obvious response within the magnetic data. To the east is a broad, weakly positive, linear anomaly (2) that may also relate to a linear boundary feature recorded from cropmarks, but there is no longer any surface expression associated with it.

4.1.2 The results also show a broad, curvilinear anomaly (1), possibly crossed or truncated by the "Z" shaped boundary (7). It also appears to end abruptly with no obvious response continuing into Area 2, similar to anomaly (7). The response is broad and weak, and it is possible that it relates to a cut feature, although a natural origin should also be considered.

5 CONCLUSION

5.1.1 The detailed magnetometer survey located a combination of weakly positive and negative broadly linear responses that relate to a former field boundary mapped in 1821 and 1848. Further east, a second weakly positive linear response may also relate to a former boundary feature, although a natural origin is possible. A broad, curvilinear anomaly has a similar response to the former boundary feature, and it too may relate to a cut feature, although a natural origin should also be considered.

5.1.2 The results also demonstrate the presence of a number of agricultural anomalies which extend generally towards, but not over, the former boundary feature. A group of negative linear/rectilinear responses in the south-west of the site appear in the vicinity of a group of pit-like anomalies. The linear responses may be indicative of land drainage or possible former cultivation edges. The entire site contains widespread magnetic debris indicating the presence of ferrous and other magnetically thermoremnant material such as brick and tile. This may relate to waste material used in soil conditioning and to ferrous debris of modern origin.

5.1.3 The anomalies are generally very weak, and the geology and soils can be poor for magnetic survey. However, the response to former field boundaries, which generally lack magnetic enhancement compared to settlement/industrial features are present in the data. Any potential cut features should have enough magnetic contrast for them to be recorded within the data if they contain magnetically enhanced material.

6 REFERENCES

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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 field. The difference between the two sensors will relate to the strength 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. It has been found that clipping data to ranges between ±5nT and ±3nT often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

Zero (destripe) Median/Mean Traverse

The median (or mean) of 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 baseline value of gradiometer sensors.

High Pass Filtering

A mathematical process used to remove low frequency anomalies relating to survey tracks and modern agricultural features.

Appendix C – survey and data information

Area 1

COMPOSITE
Filename: J661-mag-Area1-proc.xcp
Description: Imported as Composite from: J661-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y): OSGB36
Northwest corner: 380359.977952285, 132234.034604484 m
Southeast corner: 380606.877952285, 131923.984604484 m
Direction of 1st Traverse: 90 deg
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702

Source GPS Points: 1489400

Dimensions
Composite Size (readings): 1646 x 2067
Survey Size (meters): 247 m x 310 m
Grid Size: 247 m x 310 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 2.00
Min: -2.00
Std Dev: 0.89
Mean: 0.01
Median: 0.00
Composite Area: 7.6551 ha
Surveyed Area: 4.6168 ha

PROGRAM
Name: TerraSurveyor
Version: 3.0.23.0

Processes: 2
1 Base Layer
2 Clip from -2.00 to 2.00 nT

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Area 2

COMPOSITE
Filename: J661-mag-Area2-proc.xcp
Description: Imported as Composite from: J661-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 380534.687133254, 132245.62215611 m
Southeast corner: 380646.587133254, 132063.37215611 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702

Source GPS Points: 431900

Dimensions
Composite Size (readings): 746 x 1215
Survey Size (meters): 112 m x 182 m
Grid Size: 112 m x 182 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 2.00
Min: -2.00
Std Dev: 1.05
Mean: 0.01
Median: 0.03
Composite Area: 2.0394 ha
Surveyed Area: 1.2764 ha

Processes: 2
1 Base Layer
2 Clip from -2.00 to 2.00 nT

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 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 printed copy of the report and a PDF copy will be supplied to the Wiltshire Historic Environment Record. The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

Geophysical data - path: J661 Mere\Data				
Path and Filename	**Software**	**Description**	**Date**	**Creator**
mere1\MX\ mere2\MX\ .prm .dgb .disp	Sensys MXPDA	Proprietary data formats representing magnetometer survey traverses logged to a PDA.	05/05/16	D.J.Sabin
mere1\MX\J661-mag-Area1.asc mere2\MX\J661-mag-Area2.asc	Sensys DLMGPS	ASCII CSV (tab) file representing survey Area 1 in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number.	06/06/16	D.J.Sabin
Area1\comps\J661-mag-Area1.xcp Area2\comps\J661-mag-Area2.xcp	TerraSurveyor 3.0.23.0	Composite data file derived from ASCII CSV.	06/05/16	D.J.Sabin
Area1\comps\J661-mag-Area1-proc.xcp Area2\comps\J661-mag-Area2-proc.xcp	TerraSurveyor 3.0.23.0	Processed composite data file (zmt and clipping to ±2nT).	06/05/16	D.J.Sabin
Graphic data - path: J661 Mere\Data				
Area1\graphics\J661-mag-Area1-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±2nT.	06/05/16	K.T.Donaldson
Area1\graphics\J661-mag-Area1-proctfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	06/05/16	K.T.Donaldson
Area2\graphics\J661-mag-Area2-proc.tif	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to ±2nT.	06/15/16	K.T.Donaldson
Area2\graphics\J661-mag-Area2-proc..tfw	TerraSurveyor 3.0.23.0	World file for georeferencing TIF to OSGB36.	06/05/16	K.T.Donaldson
CAD data - path: J661 Mere\CAD				
J661 version 1.dwg	ProgeCAD 2016	CAD file for creating plots of greyscales, abstraction, interpretation and mapping. Grid coordinates as OSGB. AutoCAD 2010 format.	28/04/16	K.T.Donaldson
Text data - path: Jxxx xxxxxx\Documentation				
Jxxx report.odt	OpenOffice.org 3.0.1 Writer	Report text as an Open Office document.	10/05/16	K.T.Donaldson

Appendix E – copyright and intellectual property

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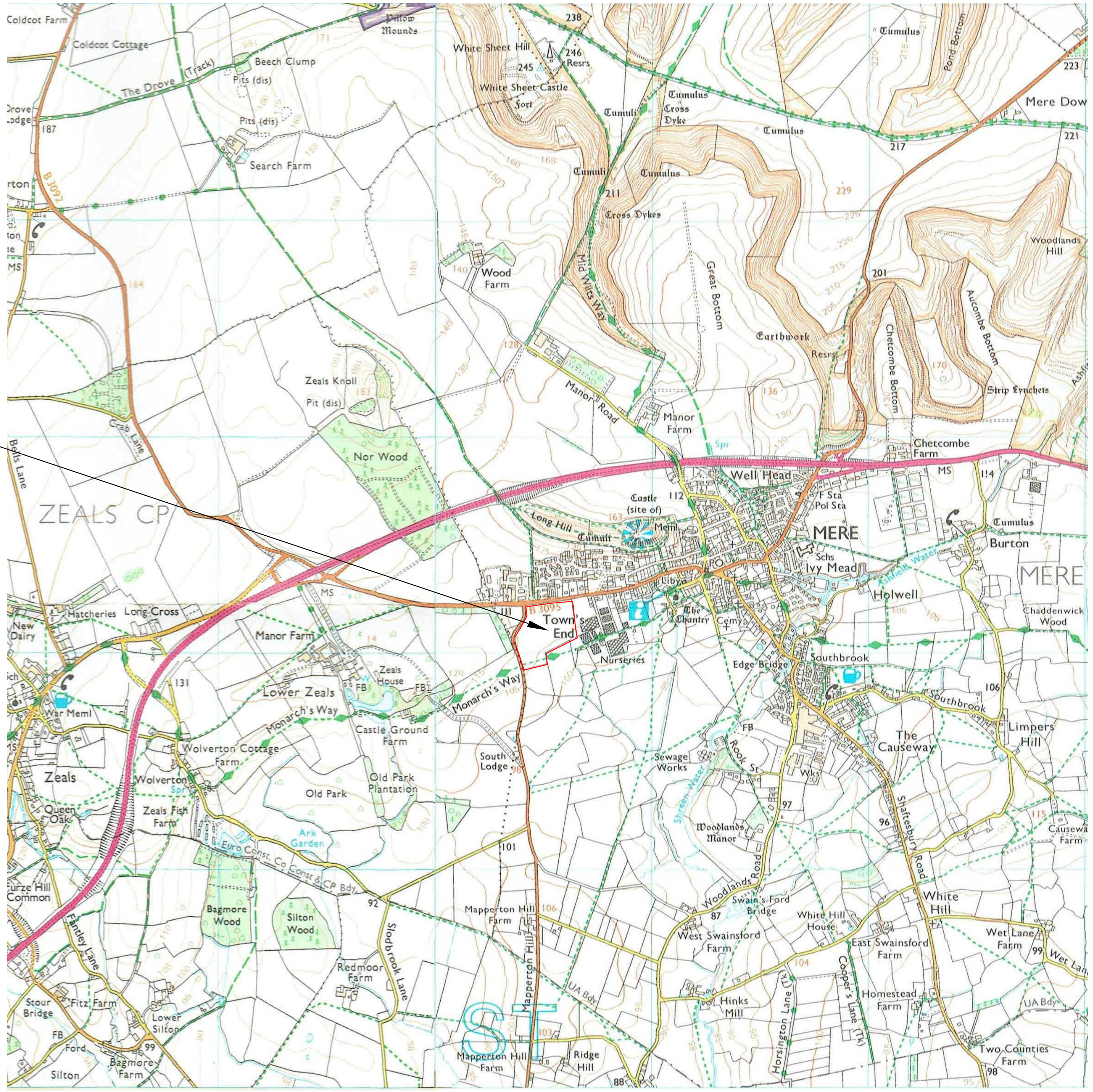
Survey location



N

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Mere
Wiltshire

Map of survey area

Reproduced from OS Explorer map nos.142 & 143 1:25 000 by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office.

● Survey location

Site centred on OS NGR ST 80500 32100

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01

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Referencing information

Referencing grid to OSGB36 datum at 50m intervals

Data collected at 20Hz and georeferenced to ETRS89 zone 30 with conversion to OSGB36 using OSTN02

● 380400 131950

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

FIG 02

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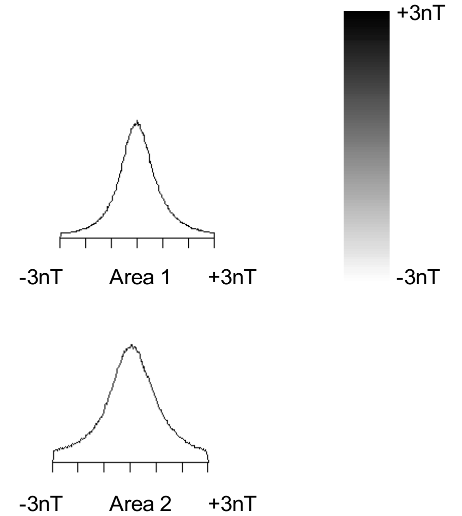
Wiltshire

Greyscale plot of minimally processed magnetometer data



SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 03

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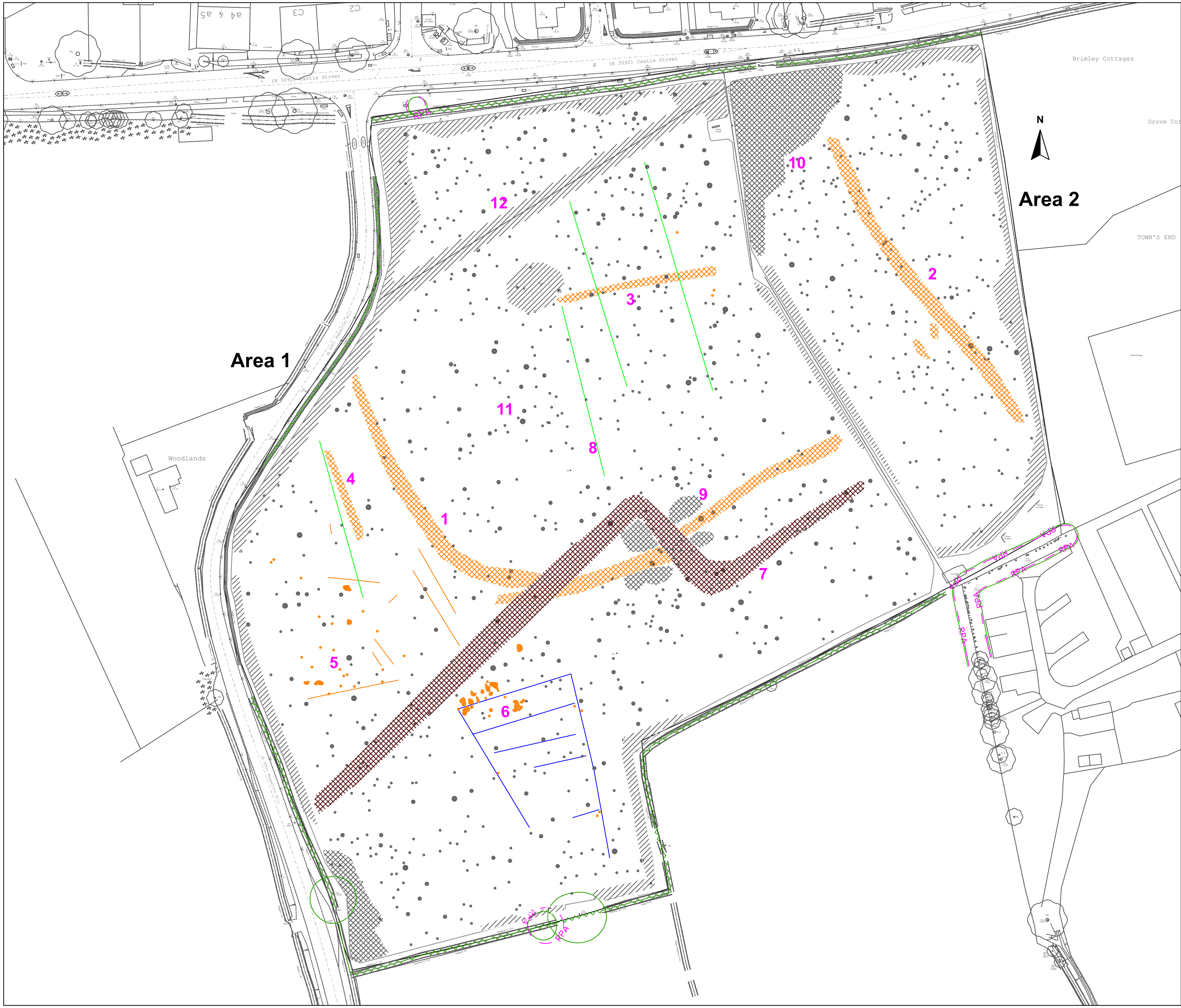


Abstraction and interpretation of magnetometer anomalies

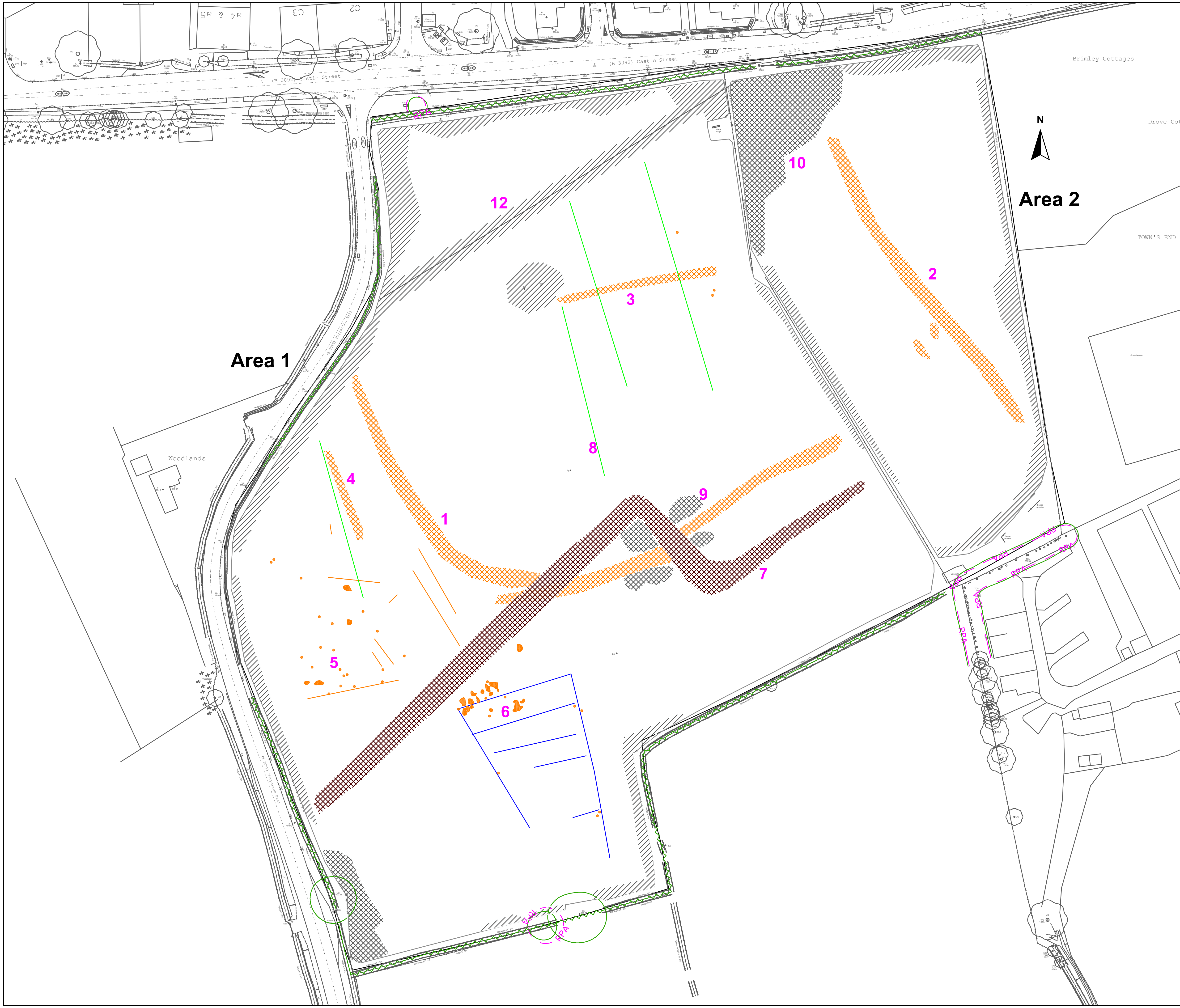
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Linear anomaly - of agricultural origin
- Discrete positive response - possible pit-like feature
- Weakly positive/negative broad linear anomaly - earthwork boundary feature
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 04



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Abstraction and interpretation of magnetometer anomalies (without strong dipolars)

- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Linear anomaly - of agricultural origin
- Discrete positive response - possible pit-like feature
- Weakly positive/negative broad linear anomaly - earthwork boundary feature
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 05

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Shaded relief model derived from height data collected using RTK GPS during magnetometer survey

Height data converted from WGS84 to ODN plus antenna height of 1.5m using OSGM02

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 06