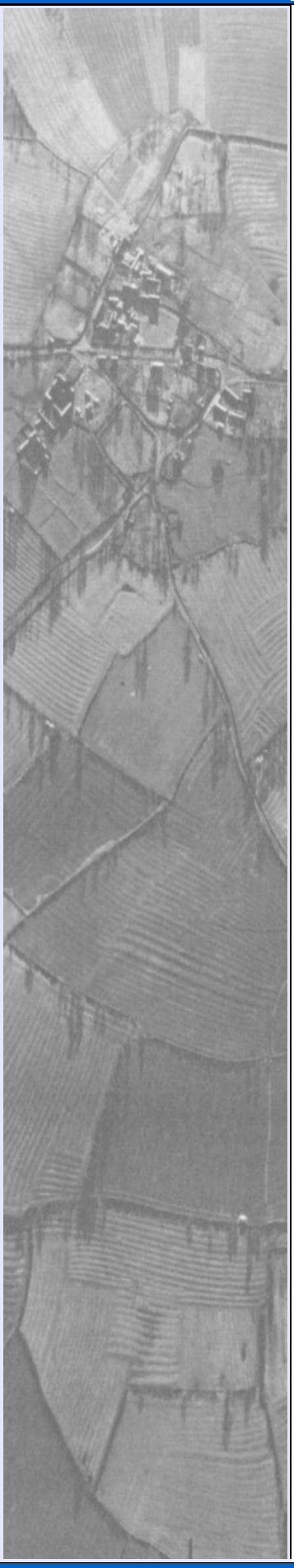

Land at Gatcombe Farm
Long Ashton
North Somerset

MAGNETOMETER SURVEY REPORT

for

Cotswold Archaeology

David Sabin and Kerry Donaldson

September 2012

Ref. no. 432

ARCHAEOLOGICAL SURVEYS LTD

Land at Gatcombe Farm
Long Ashton
North Somerset

Magnetometer Survey Report

for

Cotswold Archaeology

Fieldwork by David Sabin and Jack Cousins
Report by David Sabin BSc (Hons) MIFA and Kerry Donaldson BSc (Hons)

Survey dates – **7th to 11th September 2012**
Ordnance Survey Grid Reference – **ST 52990 69910**

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SUMMARY

Archaeological Surveys Ltd were commissioned by Cotswold Archaeology to carry out a magnetometer survey at Gatcombe Farm, near Long Ashton in North Somerset. Part of the survey area lies within the Scheduled Monument of Gatcombe Roman Settlement and crosses a series of earthworks associated with a field system. The survey located a number of positive linear, rectilinear, curvilinear and discrete anomalies of archaeological potential that are likely to be associated with former enclosures and boundary ditches. Two separate clusters of discrete positive anomalies within the southern part of the site appear to contain strongly enhanced magnetic material and are also associated with linear anomalies representing former ditches. The ditches appear to also contain strongly enhanced material in the immediate vicinity of the clusters and may infer that there has been intense burning or industrial activity in two separate zones. A series of parallel anomalies, predominantly in the northern part of the site, relate to former boundary or cultivation features visible as extant earthworks and reflected by the extant field boundaries.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Cotswold Archaeology, on behalf of the Long Ashton Land Company Ltd, to undertake a magnetometer survey of an area of land at Gatcombe Farm, Long Ashton, North Somerset. The survey forms part of an archaeological assessment of the site aimed at informing a potential future planning application.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Cotswold Archaeology (2012b) and formulated following discussions with Vince Russett, North Somerset County Archaeologist and Hugh Beamish, English Heritage Inspector of Ancient Monuments.

1.1.3 Approximately 6.2ha of the site lies within Gatcombe Roman Settlement - Scheduled Monument number 22848/1011978. The geophysical survey was carried out with a licence from English Heritage under section 42 of the Ancient Monuments and Archaeological Areas Act 1979.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to detect and precisely locate any potential buried archaeological features using non-intrusive techniques. 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 Institute for Archaeologists (2011) *Standard and Guidance for Archaeological Geophysical Survey.*

1.3 Site location, description and survey conditions

1.3.1 The site is located to the north of Weston Road to the west of Long Ashton in North Somerset. It is centred on Ordnance Survey National Grid Reference (OS NGR) ST 52990 69910, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 11ha within five fields. They are numbered Areas 1 to 5 for the purposes of this report, starting in the south west with Area 1, with Areas 2 and 3 to the east, Area 4 to the north east and Area 5 in the north west. Areas 1 – 3 contained stubble and Areas 4 and 5 were permanent pasture.

1.3.3 The site tends to slope down towards the south and a series of linear earthworks was visible within Areas 4 and 5. The Scheduled Monument includes Area 1, 4 and 5 with Areas 2 and 3 lying immediately outside the boundary to the south east.

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

1.4 Site history and archaeological potential

1.4.1 A desk-based assessment has been compiled by Cotswold Archaeology (2012a) and outlines that the Scheduled Monument of Gatcombe Roman settlement extends into the northern and western parts of the survey area. The Roman villa and associated settlement are located 20m to the west and there is no recorded evidence for Roman structural remains within the survey area itself.

1.4.2 The remains of a possible Romano-British field system are recorded within the northern and western parts of the survey area, as a series of banks, terraces and lynchets. The earthworks are part of the Scheduled Monument although they have not been subject to archaeological investigation and remain undated. There are also several undated earthworks and cropmark features beyond the limits of the scheduled area within the eastern part of the survey area.

1.4.3 As the site contains earthworks within the scheduled area and given the proximity to the Roman villa and settlement there was considered to be a high potential to locate geophysical anomalies that relate to archaeological

features. Observations of the soil surface made during the survey across Areas 1 – 3 failed to identify any cultural material of Roman origin despite quite good conditions for fieldwalking. Post medieval glass and ceramic fragments were noted within Area 3. No soil was visible within Areas 4 and 5.

1.5 Geology and soils

1.5.1 The underlying geology is mudstone and halite stone from the Mercia Mudstone Group within Area 1, 2, 3 and the south western part of Area 4 with zones of Quarzitic Sandstone Formation extending over the south eastern part of Area 4 and northern parts of Areas 2 and 3. The northern parts of Areas 4 and 5 are underlain by Oxwich Head Limestone Formation (BGS, 2012).

1.5.2 The overlying soils across the site are unmapped as the site is adjacent to an urban location; however, immediately to the north and west they are from the Whimple 1 association which are stagnogleyic, argillic brown earths. These consist of reddish, fine, loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging (Soil Survey of England and Wales, 1983).

1.5.3 As the site overlies several different solid geology formations, it is possible that the magnetometry results may show anomalies of a natural origin. These can often be difficult to decipher from cut features.

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 Bartington Grad 601-2 gradiometers. The instruments effectively measure a magnetic gradient between two fluxgate sensors mounted vertically 1m apart. Two sets of sensors are mounted on a single frame 1m apart horizontally.

2.2.2 The instruments are extremely sensitive and are able to measure magnetic variation to 0.01nanoTesla (nT), with an effective resolution of 0.03nT. The data are limited to ±100nT when surveying with the highest sensitivity. All readings are saved to an integral data logger for analysis and presentation.

2.2.3 The instruments are operated according to the manufacturer's instructions with consideration given to the local conditions. An adjustment procedure is required, prior to collection of data, in order to balance the sensors and remove the effects of the Earth's magnetic field; further adjustment is required during the survey due to instrument drift often associated with temperature change.

2.2.4 It can be very difficult to obtain optimum balance for the sensors due to localised magnetic vectors that may be associated with large ferrous objects, geological/pedological features, 'magnetic debris' within the topsoil and natural temperature fluctuations. Imperfect balance results in a heading error often visible as striping within the data; this can be effectively removed by software processing and generally has little effect on the data unless extreme.

2.2.5 The Bartington gradiometers undergo regular servicing and calibration by the manufacturer. A current assessment of the instruments is shown in Table 1 below.

Sensor type and serial numbers	Bartington Grad - 01 – 1000 Nos. 084, 085, 242 and 396
Date of certified calibration/service	Sensors 084 and 085 - 17th August 2012 (due Aug 2014) Sensors 242 and 396 - 14th October 2011 (due Oct 2013)
Bandwidth	12Hz (100nT range) both sensors
Noise	<100pT peak to peak
Adjustable errors	<2nT

Table 1: Bartington fluxgate gradiometer sensor calibration results

The instruments were considered to be in good working order prior to the survey, with no known faults or defects.

2.2.6 Data were collected at 0.25m centres along traverses 1m apart. The survey area was separated into 30m by 30m grids (900m²) giving 3600 recorded measurements per grid. This sampling interval is very effective at locating

archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 2008).

2.2.7 Survey traverses were walked in a zigzag manner starting grids from west to east. The orientation was chosen in order to provide reasonably level traverses along ground sloping down to the south.

2.2.8 The survey grids were set out to the Ordnance Survey OSGB36 datum using a Penmap RTK GPS. The GPS is used in conjunction with Leica's SmartNet service, where positional corrections are sent via a mobile telephone link. Positional accuracy of around 10 – 20mm is possible using the system. The instrument is regularly checked against the ETRS89 reference framework using Ordnance Survey ground marker C1ST7784 (Horton).

2.3 Data processing and presentation

2.3.1 Magnetometry data downloaded from the Grad 601-2 data logger are analysed and processed in specialist software known as ArcheoSurveyor. The software allows greyscale and trace plots to be produced for presentation and display. Survey grids are assembled to form an overall composite of data (composite file) creating a dataset of the complete survey area. Appendix C contains specific information concerning the survey and data attributes and is derived directly from ArcheoSurveyor; this should be used in conjunction with information provided by Figure 02.

2.3.2 Only minimal processing is carried out in order to enhance the results of the survey for display. Raw data are always analysed, as processing can modify anomalies. The following schedule sets out the data and image processing used in this survey:

- clipping of the raw data at ±30nT to improve greyscale resolution,
- clipping of processed data at ±3nT to enhance low magnitude anomalies,
- zero median/mean traverse is applied in order to balance readings along each traverse.

Reference should be made to Appendix B for further information on the specific processes carried out on the data. Appendix C metadata includes details on the processing sequence used for each survey area.

2.3.3 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. 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.

2.3.4 The main form of data display prepared for this report is the greyscale plot.

Both 'raw' and 'processed' data have been shown followed by an abstraction and interpretation plot. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.

2.3.5 Graphic raster images in bitmap format (.BMP) are initially prepared in ArcheoSurveyor. Regardless of survey orientation, data captured along each traverse are displayed and processed by ArcheoSurveyor from left to right; this corresponds to a direction of west to east in the field and the image does not need to be rotated.

2.3.6 The raster images are combined with base mapping using ProgeCAD Professional 2009 and AutoCAD LT 2007, creating DWG file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. Quality can be compromised by rotation of graphics in order to allow the data to be orientated with respect to grid north; this is considered acceptable as the survey results are effectively georeferenced allowing relocation of features using GPS, resection method etc.

2.3.7 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 five survey areas covering approximately 10ha.

3.1.2 Magnetic anomalies located can be generally classified as positive linear and discrete positive responses of archaeological potential, positive and negative anomalies of an uncertain origin, anomalies relating to land management, areas of magnetic debris and disturbance and strong discrete dipolar anomalies relating to ferrous objects.

3.1.3 Anomalies located within each survey area have been numbered and are described below with subsequent discussion in Section 4.

3.2 Statement of data quality

3.2.1 Data are considered representative of the magnetic anomalies present within the site. No significant defects are present within the dataset. Localised zones of magnetic disturbance occur adjacent to ferrous gates and fencing.

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 then used to group anomalies with similar characteristics for each survey area.

Report sub-heading CAD layer names and plot colour	**Description and origin of anomalies**
Anomalies with archaeological potential AS-ABST MAG POS LINEAR ARCHAEOLOGY AS-ABST MAG POS DISCRETE ARCHAEOLOGY	Anomalies have the characteristics (mainly morphological) of a range of archaeological features such as pits, ring ditches, enclosures, etc..
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 AREA UNCERTAIN AS-ABST MAG NEG AREA 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). 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 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	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.

Table 2: List and description of interpretation categories

3.4 List of anomalies - Area 1

Area centred on OS NGR 352985 169930, see Figures 06 & 07.

Anomalies of archaeological potential

(1) – A positive linear anomaly and group of discrete anomalies appear to form cut features with some archaeological potential. The general response of these anomalies is over 10nT, with some peaking at 88nT indicating that ferrous and/or other magnetically thermoremnant material has been incorporated into them. It is possible that they are associated with former industrial activity.

Anomalies with an uncertain origin

(2) – Located immediately to the east of anomaly (1) are two parallel positive linear anomalies. It is possible that these relate to cut features and are associated with (1); however, they do extend westwards from a gateway and so a modern origin cannot be ruled out.

(3) – A positive rectilinear anomaly and several discrete anomalies are located close to the north western corner of the survey area. It is possible that they relate to cut features, although this is not certain.

(4) – The survey area contains several weak, short or fragmented positive linear anomalies. Their origin cannot be interpreted through lack of coherent morphology.

(5) – A weakly positive anomaly extends from the northern field boundary towards the centre of the survey area. A curvilinear anomaly is located to the east of it. These anomalies are slightly more magnetically enhanced than the surrounding topsoil, although the cause of the enhancement is not known.

(6) – A positive and parallel negative linear anomaly are located close to the south western corner of the survey area. The negative anomaly then appears to extend north eastwards towards anomaly (1). The parallel form of the anomalies may suggest a former land boundary or lynchet, although they do not reflect the underlying trend of all the other extant and former field boundaries within the site.

3.5 List of anomalies - Area 2

Area centred on OS NGR 352932 169852, see Figures 06 & 07.

Anomalies of archaeological potential

(7) – A positive rectilinear anomaly forms two parts of an "L" shaped feature. It extends from the northern part of the survey area in a south-south-easterly direction for 115m where, after a gap, it changes direction to extend westwards towards the western field boundary. It is possible that it is associated with anomalies (1) in Area 1. At its northern limit it is located 25m east of rectilinear enclosure (10) that extends northwards into Area 4 (24).

(8) – A cluster of pit-like anomalies with a very strong response of between 20nT and 45nT indicates that magnetically enhanced or magnetically thermoremnant material is incorporated into, or associated with them. They are likely to be associated with anomaly (7). The strength of the anomalies may suggest that they have been formed by industrial activity.

(9) – Positive rectilinear anomalies to the south of anomalies (7) and (8) may be associated, and could be of archaeological potential.

(10) – A positive linear anomaly, located in the northern part of the survey area is likely to relate to the southern ditch of an enclosure which extends northwards into Area 4 as anomaly (24). The eastern edge of this anomaly is located 25m from the northern part of anomaly (7). It is likely that these anomalies are associated.

Anomalies with an uncertain origin

(11) – A negative anomaly is located close to the south eastern corner of the survey area. It could be agricultural in origin, possibly relating to a headland or boundary.

(12) – Three short, positive linear anomalies are located close to the south eastern corner of the survey area. It is possible that they have an association with other features within the site.

(13) – A group of positive anomalies is located in the north western part of the survey area. Although indicating low levels of magnetic enhancement, their origin is uncertain.

(14) – The survey area contains several weak, short or fragmented positive linear anomalies. Whilst it is possible for these to relate to cut features, their form and magnitude prevent confident interpretation.

Anomalies associated with magnetic debris

(15) – The survey area contains several small patches of magnetic debris. This may indicates localised scatters of industrial waste material although could be

associated with manuring.

3.6 List of anomalies - Area 3

Area centred on OS NGR 353030 169900, see Figures 08 & 09.

Anomalies with an uncertain origin

(16) – Positive linear anomalies located in the north western corner of the survey area may indicate an enclosure with internal features and divisions. It is located immediately east of anomaly (7) and 25m south east of anomaly (10) and it is possible that they are associated. However, it is also possible that this is formed by several unrelated anomalies.

(17) – The survey area contains several weakly positive linear and rectilinear anomalies. Whilst it is possible for these anomalies to relate to cut features, their weak response and fragmented morphology prevent confident interpretation.

(18) – Weakly positive curvilinear anomalies could relate to cut features, but this is uncertain.

(19) – A negative rectilinear anomaly indicates material with a lower magnetic susceptibility than the surrounding topsoil. An agricultural origin is possible.

(20) – The northern part of the survey area contains several weakly positive anomalies. Whilst they may indicate cut features, the origin of the magnetic enhancement is uncertain.

Anomalies associated with land management

(21) – Three positive linear anomalies extend across the southern part of the survey area and relate to former earthworks visible on aerial photographs.

Anomalies associated with magnetic debris

(22) – Several patches of magnetic debris are evident within the survey area. Although likely to be a response to spreads of magnetically thermoremnant material, their origin is uncertain.

Anomalies with a modern origin

(23) – Magnetic disturbance close to the south western corner of the survey area is a response to a buried ferrous or strongly magnetically thermoremnant object.

3.7 List of anomalies - Area 4

Area centred on OS NGR 352942 170020, see Figures 10 & 11.

Anomalies of archaeological potential

(24) – A group of positive linear anomalies are associated with an enclosure, the southern side of which is located in Area 2 as anomaly (10) to the south. The western and northern parts of the enclosure have been located, together with linear and discrete anomalies that relate to internal ditches and possible pits.

Anomalies with an uncertain origin

(25) – Areas of weak enhancement are located within the confines of anomaly (24). While they may relate to archaeological features, it is possible that they are associated with other uncertain positive anomalies (28) within the survey area.

(26) – Located close to the south western corner of the survey area is a positive rectilinear anomaly. It is possible that this relates to a cut feature, although this is not certain.

(27) – The survey area contains numerous positive linear, rectilinear and curvilinear anomalies. It is not possible to determine the origin of these anomalies and the widespread nature of them may indicate that they are natural in origin.

(28) – Discrete positive anomalies often appearing in groups or clusters. It is possible that these anomalies are natural in origin though they may indicate pit-like features.

(29) – The survey area contains several broad, often linear or sinuous positive anomalies. There is a north east to south west trend in the western part of the survey area, but other orientations are evident. It is possible that these anomalies relate to natural features within the underlying soils and geology.

Anomalies associated with land management

(30) – Parallel positive and negative linear anomalies have been located within the survey area. They reflect the orientation of extant land boundaries and relate to former boundaries visible on aerial photographs.

Anomalies associated with magnetic debris

(31) – Patches of magnetic debris may indicate magnetically thermoremant material. The origin of this material is uncertain, it is possible that some patches may indicate former industrial activity although the material may have been used for ground consolidation or been derived from modern manuring or burning.

3.8 List of anomalies - Area 5

Area centred on OS NGR 352809 169938, see Figures 10 & 11.

Anomalies of archaeological potential

(32) – Located at the western edge of the survey area is a positive rectilinear anomaly. Its form and proximity to the core of the Roman settlement indicates that this may relate to ditches associated with an enclosure.

Anomalies with an uncertain origin

(33) – The survey area contains several groups of positive linear, rectilinear, curvilinear and discrete anomalies that may relate to cut features. Two of these groups in the northern part of the survey area appear to be associated with magnetic debris.

(34) – Extending across the centre of the survey area with a north east to south west orientation are a series of positive anomalies. They have a dendritic form, possibly indicating some fluvial or other natural process.

(35) – The survey area contains many short positive and negative linear anomalies with no coherent form or pattern.

(36) – Discrete positive anomalies may indicate pit-like features.

Anomalies associated with land management

(37) – Located in the western half of the survey area are a series of positive and negative broadly linear anomalies. They are parallel with the extant field boundaries and relate to former field boundaries or cultivation strips visible as earthworks within the field and on aerial photographs.

Anomalies associated with magnetic debris

(38) – Patches of magnetic debris are a response to magnetically thermoremnant material. Some patches may be associated with groups of rectilinear or curvilinear anomalies (33).

(39) – Strong discrete dipolar anomalies are a response to ferrous and other magnetically thermoremnant material within the topsoil. All of the survey areas contain these responses.

Anomalies with a modern origin

(40) – Magnetic disturbance is located close to the eastern edge of the survey area and is a response to modern ferrous material.

4 DISCUSSION

4.1.1 The detailed magnetometer survey located a number of anomalies with archaeological potential within the site. Within Areas 1 and 2 clusters of discrete anomalies have a very high magnitude and an associated negative response which may indicate that these features are associated with intense burning (anomalies 1 and 8). The anomalies may represent evidence of industrial activity within the site. Although it is possible for the high magnitude anomalies to relate to modern ferrous debris use for infill or consolidation, the clusters appear to be associated with long positive linear anomalies suggesting the presence of former ditches. In addition, the ditches appear most strongly enhanced within the vicinity of the clusters of discrete anomalies, and their magnitude falls rapidly with increasing distance. This would suggest that the ditches contain similar material and this type of effect has been seen on other sites where industrial activity has occurred.

4.1.2 In the north eastern part of the site, positive linear, curvilinear, rectilinear and discrete anomalies relate to an incomplete enclosure which straddles Areas 2 and 4 (anomalies 10 and 24). There is evidence for internal pits and ditches and it may extend further east within Area 4.

4.1.3 Located close to the western edge of the survey area the survey located a positive rectilinear anomaly that may also relate to part of an enclosure (anomaly 32). This is situated within 20m of the core of the Roman settlement and an archaeological origin should therefore be considered.

4.1.4 Evidence for former land boundaries or cultivation, associated with earthworks visible on aerial photographs and within the fields, has been located as a series of positive and negative broad linear anomalies. These anomalies generally reflect the extant field boundaries, suggesting that the modern layout has been established on an earlier field system.

4.1.5 The survey area contains numerous positive linear, amorphous and discrete anomalies that could not be confidently interpreted. Whilst it is possible that some relate to ditches and pits containing a weakly magnetically enhanced fill, and others to possible field boundaries, many are fragmented or incoherent and it is possible that they are related to natural features within the underlying soils and geology.

5 CONCLUSION

5.1.1 A number of cut features with archaeological potential were located during the detailed magnetometer survey. Rectilinear anomalies in the north eastern part of the site relate to an enclosure containing evidence for internal features in the form of ditches and pits or areas of burning. The enclosure underlies the modern field boundaries in this part of the site.

5.1.2 Located within the southern part of the site are discrete anomalies that may contain material derived from intense burning or industrial activity. Two separate areas of possible activity were located and both appear to have associated ditches with increasing enhanced fills in the vicinity of the discrete features. This type of effect has been noted at other sites where industrial activity has occurred.

5.1.3 Located at the western edge of the site, close to the core of the Romano-British settlement, is another rectilinear anomaly that may relate to a further enclosure ditch that extends beyond the limit of the survey.

5.1.4 The site contains a number of parallel broadly linear anomalies which are related to former boundary or cultivation features. The majority of these are visible as extant earthworks associated with a former field system. Other anomalies within the site may relate to similar features although their form is unclear. Amorphous and dendritic anomalies appear widespread across the site and probably relate to naturally formed features within the subsoil or near-surface geology.

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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 gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 1m apart. The instrument is carried about 30cm 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. If no enhanced feature is present the field measured by both sensors will be similar and the difference close to zero.

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 ±1nT 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 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 slight differences between the set-up and stability of gradiometer sensors and can remove striping. The process can remove archaeological features that run along a traverse so data analysis is also carried out prior its application.

De-stagger

Compensates for small positional errors within data collection by shifting the position of the readings along each traverse by a specified amount. Data lost at the end of each traverse are extrapolated from adjacent value in the same row.

Deslope

Corrects for striping and distortion caused by metal objects/services etc.. The process calculates a curve based on a polynomial best fit mathematical function for each traverse. This curve is then subtracted from the actual data.

Edge Match

Calculates the mean of the 2 lines (rows or columns) of data either side of the edge to match. It then subtracts the difference between the means from all datapoints in the selected area.

FFT (Fast Fourier Transform) spectral filtering

A mathematical process used to determine the frequency components of a traverse. Repetitive features, such as plough marks, produce characteristic spectral zones that can be suppressed allowing greyscale images to appear clearer.

Appendix C – survey and data information

Area 1 raw magnetometer data

COMPOSITE
Filename: J432-mag-Area1-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 10/09/2012
Assembled by: on 10/09/2012
Direction of 1st Traverse: 90 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702.00

Dimensions
Composite Size (readings): 720 x 180
Survey Size (meters): 180.00m x 180.00 m
Grid Size: 30.00 m x 30.00 m
X Interval: 0.25 m
Y Interval: 1.00 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 3.05
Mean: 0.37
Median: 0.36
Composite Area: 3.24 ha
Surveyed Area: 1.67 ha

PROGRAM
Name: ArcheoSurveyor
Version: 2.5.16.0

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 28
1 Col:0 Row:0 grids\01.xgd
2 Col:0 Row:1 grids\05.xgd
3 Col:0 Row:2 grids\06.xgd
4 Col:1 Row:0 grids\02.xgd
5 Col:1 Row:1 grids\07.xgd
6 Col:1 Row:2 grids\08.xgd
7 Col:1 Row:3 grids\09.xgd
8 Col:1 Row:4 grids\10.xgd
9 Col:1 Row:5 grids\28.xgd
10 Col:2 Row:0 grids\03.xgd
11 Col:2 Row:1 grids\11.xgd
12 Col:2 Row:2 grids\12.xgd
13 Col:2 Row:3 grids\13.xgd
14 Col:2 Row:4 grids\14.xgd
15 Col:2 Row:5 grids\27.xgd
16 Col:3 Row:0 grids\04.xgd
17 Col:3 Row:1 grids\15.xgd
18 Col:3 Row:2 grids\16.xgd
19 Col:3 Row:3 grids\17.xgd
20 Col:3 Row:4 grids\18.xgd
21 Col:3 Row:5 grids\26.xgd
22 Col:4 Row:1 grids\19.xgd
23 Col:4 Row:2 grids\20.xgd
24 Col:4 Row:3 grids\21.xgd
25 Col:4 Row:4 grids\22.xgd
26 Col:4 Row:5 grids\25.xgd
27 Col:5 Row:3 grids\23.xgd
28 Col:5 Row:4 grids\24.xgd

Area 1 processed magnetometer data

COMPOSITE
Filename: J432-mag-Area1-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.22
Mean: 0.01
Median: 0.00
Composite Area: 3.24 ha
Surveyed Area: 1.67 ha

Processes: 4
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Median Traverse: Grids: All
4 Clip from -3.00 to 3.00 nT

Area 2 raw magnetometer data

COMPOSITE
Filename: J432-mag-Area2-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 10/09/2012
Assembled by: on 11/09/2012
Direction of 1st Traverse: 90 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702.00

Dimensions
Composite Size (readings): 840 x 240
Survey Size (meters): 210.00m x 240.00 m
Grid Size: 30.00 m x 30.00 m
X Interval: 0.25 m
Y Interval: 1.00 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 3.39
Mean: -0.57
Median: -0.68
Composite Area: 5.04 ha
Surveyed Area: 2.22 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 38
1 Col:0 Row:2 grids\01.xgd
2 Col:0 Row:3 grids\02.xgd
3 Col:1 Row:1 grids\03.xgd
4 Col:1 Row:2 grids\04.xgd
5 Col:1 Row:3 grids\05.xgd
6 Col:1 Row:4 grids\19.xgd
7 Col:1 Row:5 grids\20.xgd
8 Col:1 Row:6 grids\21.xgd
9 Col:2 Row:0 grids\06.xgd
10 Col:2 Row:1 grids\07.xgd
11 Col:2 Row:2 grids\08.xgd
12 Col:2 Row:3 grids\09.xgd
13 Col:2 Row:4 grids\22.xgd
14 Col:2 Row:5 grids\23.xgd
15 Col:2 Row:6 grids\24.xgd
16 Col:2 Row:7 grids\25.xgd
17 Col:3 Row:0 grids\10.xgd
18 Col:3 Row:1 grids\11.xgd
19 Col:3 Row:2 grids\12.xgd
20 Col:3 Row:3 grids\13.xgd
21 Col:3 Row:4 grids\26.xgd
22 Col:3 Row:5 grids\27.xgd
23 Col:3 Row:6 grids\28.xgd
24 Col:3 Row:7 grids\29.xgd
25 Col:4 Row:0 grids\14.xgd
26 Col:4 Row:1 grids\15.xgd
27 Col:4 Row:2 grids\16.xgd
28 Col:4 Row:3 grids\17.xgd
29 Col:4 Row:4 grids\30.xgd
30 Col:4 Row:5 grids\31.xgd
31 Col:4 Row:6 grids\32.xgd
32 Col:4 Row:7 grids\33.xgd
33 Col:5 Row:3 grids\18.xgd
34 Col:5 Row:4 grids\34.xgd
35 Col:5 Row:5 grids\35.xgd
36 Col:5 Row:6 grids\36.xgd
37 Col:6 Row:5 grids\37.xgd
38 Col:6 Row:6 grids\38.xgd

Area 2 processed magnetometer data

COMPOSITE
Filename: J432-mag-Area2-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.27
Mean: 0.03
Median: 0.00
Composite Area: 5.04 ha
Surveyed Area: 2.22 ha

Processes: 4
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Median Traverse: Grids: All
4 Clip from -3.00 to 3.00 nT

Area 3 raw magnetometer data

COMPOSITE
Filename: J432-mag-Area3-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 11/09/2012
Assembled by: on 11/09/2012
Direction of 1st Traverse: 90 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702.00

Dimensions
Composite Size (readings): 720 x 240
Survey Size (meters): 180.00m x 240.00 m
Grid Size: 30.00 m x 30.00 m
X Interval: 0.25 m
Y Interval: 1.00 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 3.19
Mean: -0.30
Median: -0.21
Composite Area: 4.32 ha
Surveyed Area: 2.15 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 36
1 Col:0 Row:0 grids\01.xgd
2 Col:0 Row:1 grids\02.xgd
3 Col:0 Row:2 grids\03.xgd
4 Col:0 Row:3 grids\04.xgd
5 Col:1 Row:0 grids\05.xgd
6 Col:1 Row:1 grids\06.xgd
7 Col:1 Row:2 grids\07.xgd
8 Col:1 Row:3 grids\08.xgd
9 Col:1 Row:4 grids\34.xgd
10 Col:1 Row:5 grids\35.xgd
11 Col:1 Row:6 grids\36.xgd
12 Col:2 Row:1 grids\09.xgd
13 Col:2 Row:2 grids\10.xgd
14 Col:2 Row:3 grids\11.xgd
15 Col:2 Row:4 grids\30.xgd
16 Col:2 Row:5 grids\31.xgd
17 Col:2 Row:6 grids\32.xgd
18 Col:2 Row:7 grids\33.xgd
19 Col:3 Row:1 grids\12.xgd
20 Col:3 Row:2 grids\13.xgd
21 Col:3 Row:3 grids\14.xgd
22 Col:3 Row:4 grids\26.xgd
23 Col:3 Row:5 grids\27.xgd
24 Col:3 Row:6 grids\28.xgd
25 Col:3 Row:7 grids\29.xgd
26 Col:4 Row:1 grids\15.xgd
27 Col:4 Row:2 grids\16.xgd
28 Col:4 Row:3 grids\17.xgd
29 Col:4 Row:4 grids\23.xgd
30 Col:4 Row:5 grids\24.xgd
31 Col:4 Row:6 grids\25.xgd
32 Col:5 Row:2 grids\18.xgd
33 Col:5 Row:3 grids\19.xgd
34 Col:5 Row:4 grids\20.xgd
35 Col:5 Row:5 grids\21.xgd
36 Col:5 Row:6 grids\22.xgd

Area 3 processed magnetometer data

COMPOSITE
Filename: J432-mag-Area3-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.18
Mean: -0.02
Median: -0.01
Composite Area: 4.32 ha
Surveyed Area: 2.15 ha

Processes: 5
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Median Traverse: Grids: 01.xgd 02.xgd 03.xgd 04.xgd 05.xgd 06.xgd 07.xgd 08.xgd 34.xgd 35.xgd 36.xgd 09.xgd 10.xgd 11.xgd 30.xgd 31.xgd 32.xgd 33.xgd 12.xgd 13.xgd 14.xgd 26.xgd 27.xgd 28.xgd 29.xgd 15.xgd 16.xgd 17.xgd 23.xgd 24.xgd 25.xgd
4 DeStripe Mean Traverse: Grids: 18.xgd 19.xgd 20.xgd 21.xgd 22.xgd Threshold: 1 SDs
5 Clip from -3.00 to 3.00 nT

Area 4 raw magnetometer data

COMPOSITE
Filename: J432-mag-Area4-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 11/09/2012
Assembled by: on 11/09/2012
Direction of 1st Traverse: 90 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702.00

Dimensions
Composite Size (readings): 720 x 180
Survey Size (meters): 180.00m x 180.00 m
Grid Size: 30.00 m x 30.00 m
X Interval: 0.25 m
Y Interval: 1.00 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 3.03
Mean: 0.49
Median: 0.48
Composite Area: 3.24 ha
Surveyed Area: 2.00 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 29
1 Col:0 Row:2 27.xgd
2 Col:0 Row:3 28.xgd
3 Col:0 Row:4 29.xgd
4 Col:1 Row:1 01.xgd
5 Col:1 Row:2 23.xgd
6 Col:1 Row:3 24.xgd
7 Col:1 Row:4 25.xgd
8 Col:1 Row:5 26.xgd
9 Col:2 Row:0 02.xgd
10 Col:2 Row:1 03.xgd
11 Col:2 Row:2 19.xgd
12 Col:2 Row:3 20.xgd
13 Col:2 Row:4 21.xgd
14 Col:2 Row:5 22.xgd
15 Col:3 Row:0 04.xgd
16 Col:3 Row:1 05.xgd
17 Col:3 Row:2 15.xgd
18 Col:3 Row:3 16.xgd
19 Col:3 Row:4 17.xgd
20 Col:3 Row:5 18.xgd
21 Col:4 Row:0 06.xgd
22 Col:4 Row:1 07.xgd
23 Col:4 Row:2 12.xgd
24 Col:4 Row:3 13.xgd
25 Col:4 Row:4 14.xgd
26 Col:5 Row:0 08.xgd
27 Col:5 Row:1 09.xgd
28 Col:5 Row:2 10.xgd
29 Col:5 Row:3 11.xgd

Area 4 processed magnetometer data

COMPOSITE
Filename: J432-mag-Area4-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.29
Mean: 0.05
Median: 0.00
Composite Area: 3.24 ha
Surveyed Area: 2.00 ha

Processes: 4
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Median Traverse: Grids: All
4 Clip from -3.00 to 3.00 nT

Area 5 raw magnetometer data

COMPOSITE
Filename: J432-mag-Area5-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 12/09/2012

Assembled by: on 12/09/2012
Direction of 1st Traverse: 90 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702.00

Dimensions
Composite Size (readings): 720 x 210
Survey Size (meters): 180.00m x 210.00 m
Grid Size: 30.00 m x 30.00 m
X Interval: 0.25 m
Y Interval: 1.00 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 3.77
Mean: 0.18
Median: 0.00
Composite Area: 3.78 ha
Surveyed Area: 1.88 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 33
1 Col:0 Row:1 grids\01.xgd
2 Col:0 Row:2 grids\02.xgd
3 Col:0 Row:3 grids\33.xgd
4 Col:0 Row:4 grids\34.xgd
5 Col:0 Row:5 grids\35.xgd
6 Col:1 Row:1 grids\03.xgd
7 Col:1 Row:2 grids\04.xgd
8 Col:1 Row:3 grids\29.xgd
9 Col:1 Row:4 grids\30.xgd
10 Col:1 Row:5 grids\31.xgd
11 Col:1 Row:6 grids\32.xgd
12 Col:2 Row:0 grids\07.xgd
13 Col:2 Row:1 grids\05+08.xgd
14 Col:2 Row:2 grids\06+09.xgd
15 Col:2 Row:3 grids\25.xgd
16 Col:2 Row:4 grids\26.xgd
17 Col:2 Row:5 grids\27.xgd
18 Col:2 Row:6 grids\28.xgd
19 Col:3 Row:0 grids\10.xgd
20 Col:3 Row:1 grids\11.xgd
21 Col:3 Row:2 grids\12.xgd
22 Col:3 Row:3 grids\21.xgd
23 Col:3 Row:4 grids\22.xgd
24 Col:3 Row:5 grids\23.xgd
25 Col:3 Row:6 grids\24.xgd
26 Col:4 Row:0 grids\13.xgd
27 Col:4 Row:1 grids\14.xgd
28 Col:4 Row:2 grids\15.xgd
29 Col:4 Row:3 grids\17.xgd
30 Col:4 Row:4 grids\18.xgd
31 Col:4 Row:5 grids\19.xgd
32 Col:4 Row:6 grids\20.xgd
33 Col:5 Row:3 grids\16.xgd

Area 5 processed magnetometer data

COMPOSITE
Filename: J432-mag-Area5-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.62
Mean: 0.06
Median: 0.00
Composite Area: 3.78 ha
Surveyed Area: 1.88 ha

Processes: 4
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Median Traverse: Grids: All
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 (see inside cover for address). 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.

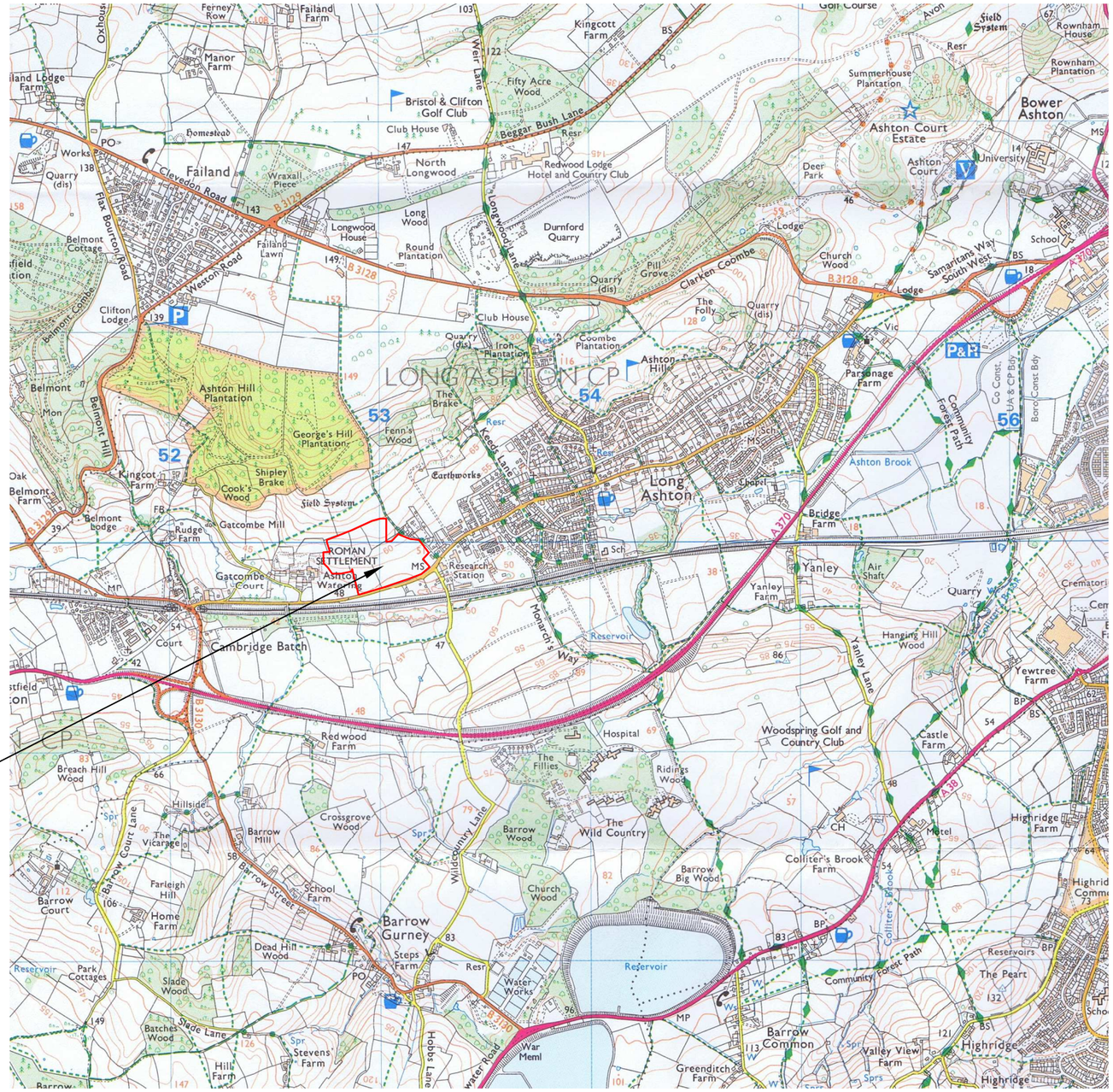
Surveys are reported on in hardcopy (recycled paper) using A4 for text and A3 for plots (all plots are scaled for A3). The distribution of both hardcopy report and digital data is considered the responsibility of the Client unless explicitly stated in the survey Brief, Written Scheme of Investigation or other contractual agreement.

This report has been prepared using the following software on a Windows XP platform:

- ArcheoSurveyor version 2.5.16.0 (geophysical data analysis),
- ProgeCAD Professional 2009 (report graphics),
- AutoCAD LT 2007 (report figures),
- OpenOffice.org 3.0.1 Writer (document text),
- PDF Creator version 0.9 (PDF archive).

Digital data produced by the survey and report include the following files:

- ArcheoSurveyor grid and composite files for all geophysical data,
- CSV files for raw and processed composites,
- geophysical composite file graphics as Bitmap images,
- AutoCAD DWG files in 2000 and 2007 versions,
- report text as OpenOffice.org ODT file,
- report text as Word 2000 doc file,
- report text as rich text format (RTF),
- report text as PDF,
- PDFs of all figures.

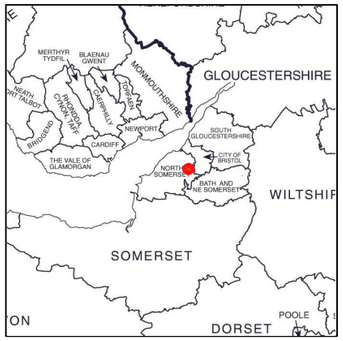


Survey location

Archaeological Surveys Ltd

Geophysical Survey
Land at Gatcombe Farm
Long Ashton
North Somerset

Map of survey area



● Survey location

Site centred on OS NGR
ST 52985 69930

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01

Archaeological Surveys Ltd

Geophysical Survey
Land at Gatcombe Farm
Long Ashton
North Somerset

Referencing information

Grid coordinates based on Ordnance Survey OSGB36 datum

Grids set out using RTK GPS with Leica SmartNet correction data RTCMv2 format OSTN02 transformation

Survey grid size = 30m

Survey start and traverse direction

01 Grid reference number and filename

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

FIG 02

N

Area 1

Area 2

Area 3

Area 4

Area 5

WARREN LANE

No.3

WESTON ROAD

WOODEN BARN

FARMHOUSE

GATCOMBE FARM SHOP

352730

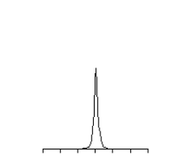
353210

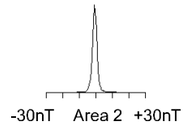
169930

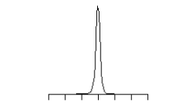
Archaeological Surveys Ltd

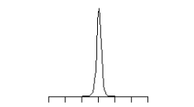
Geophysical Survey
Land at Gatcombe Farm
Long Ashton
North Somerset

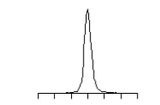
Greyscale plot of raw magnetometer data











SCALE 1:2000

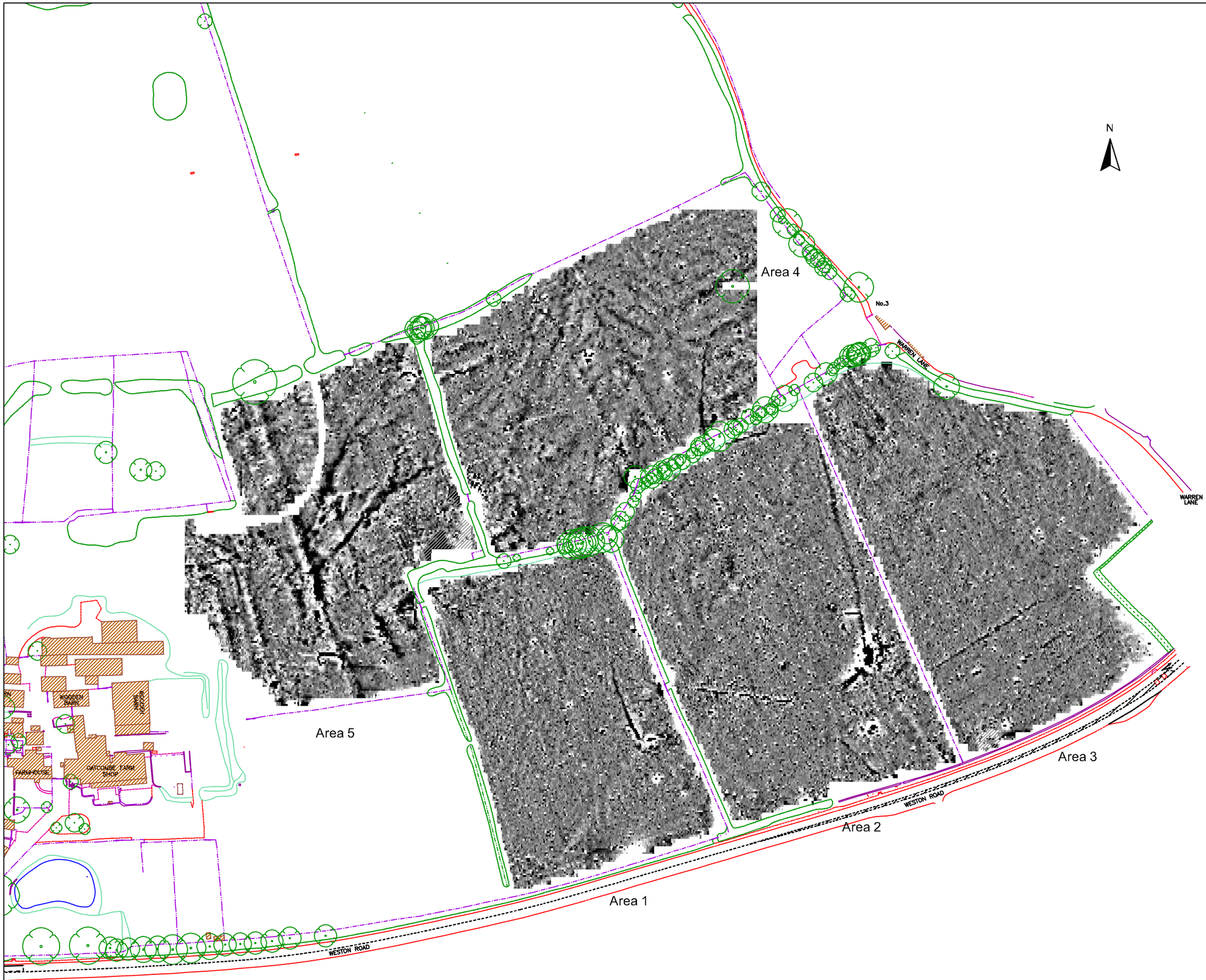
SCALE TRUE AT A3

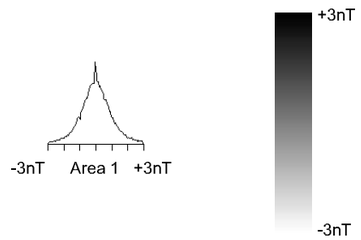
FIG 03

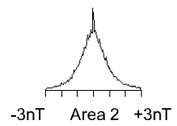
Archaeological Surveys Ltd

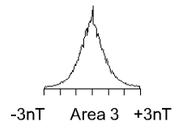
Geophysical Survey
Land at Gatcombe Farm
Long Ashton
North Somerset

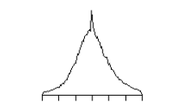
Greyscale plot of processed magnetometer data

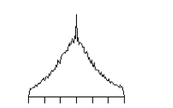




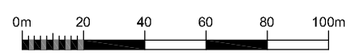








SCALE 1:2000



SCALE TRUE AT A3

FIG 04

Archaeological Surveys Ltd

Geophysical Survey
Land at Gatcombe Farm
Long Ashton
North Somerset

Abstraction and interpretation of magnetometer anomalies

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Broad linear anomaly - former field boundary
- Positive anomaly - magnetically enhanced material
- Negative anomaly - material of low magnetic susceptibility
- Discrete positive response of archaeological potential - pit/burnt material
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:2000

0m 20 40 60 80 100m

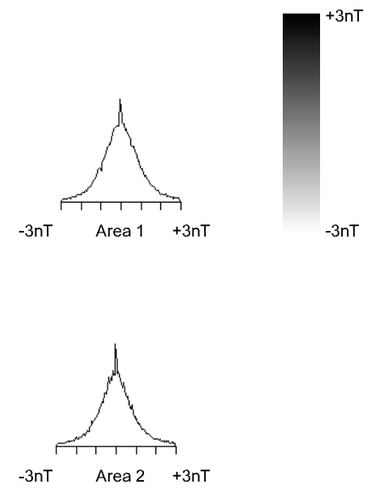
SCALE TRUE AT A3

FIG 05

Archaeological Surveys Ltd

Geophysical Survey
Land at Gatcombe Farm
Long Ashton
North Somerset

Greyscale plot of processed magnetometer data - Areas 1 & 2



SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 06

Area 1

Area 2

WESTON ROAD

Archaeological Surveys Ltd

Geophysical Survey
Land at Gatcombe Farm
Long Ashton
North Somerset

Abstraction and interpretation of magnetometer anomalies - Areas 1 & 2

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Positive anomaly - magnetically enhanced material
- Negative anomaly - material of low magnetic susceptibility
- Discrete positive response of archaeological potential - pit/burnt material
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Strong dipolar anomaly - ferrous object

N

SCALE 1:1000

0m 10 20 30 40 50m

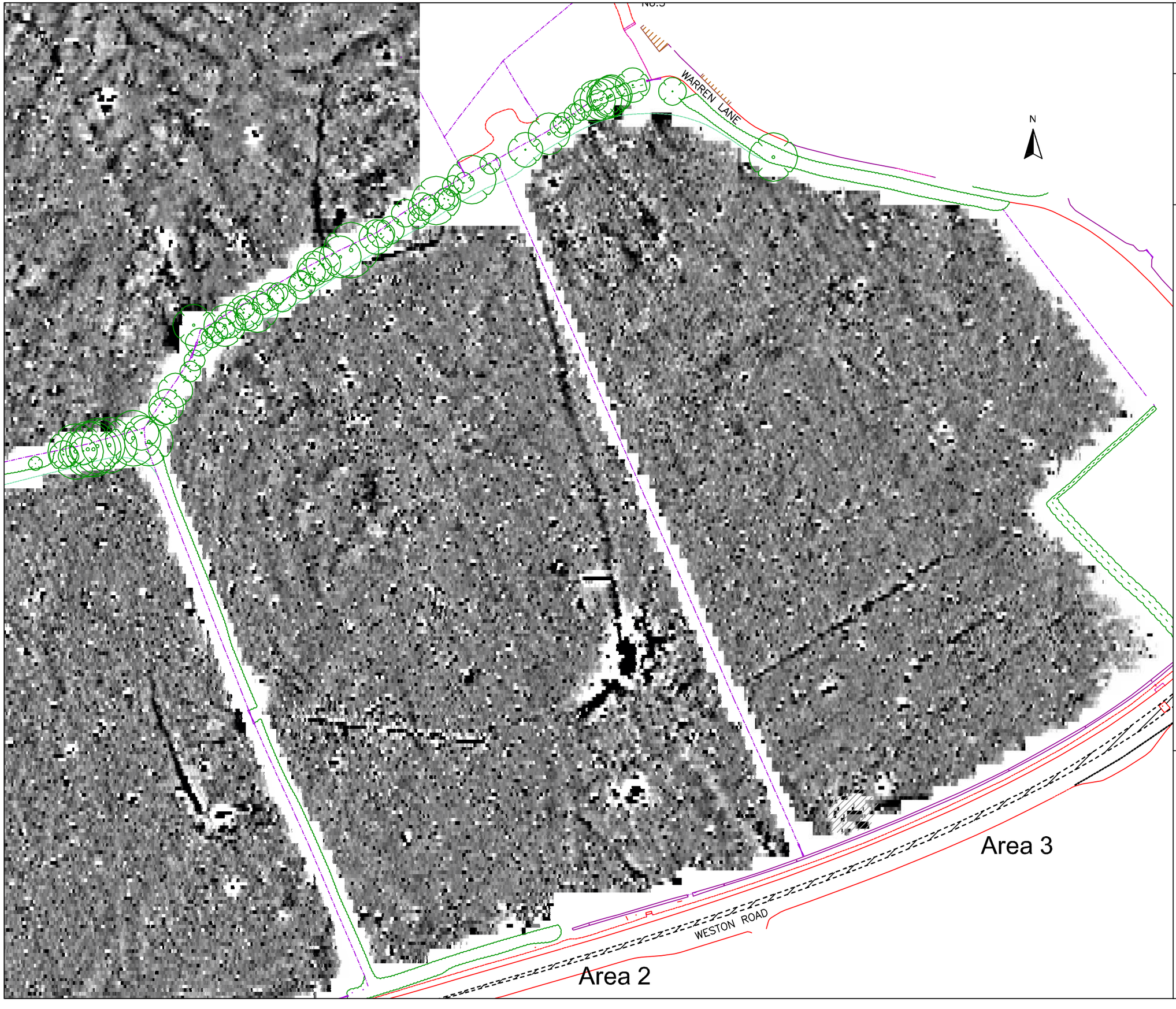
SCALE TRUE AT A3

FIG 07

Area 1

Area 2

WESTON ROAD



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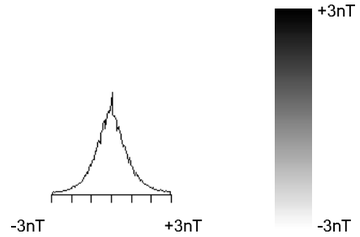
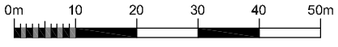
Greyscale plot of processed magnetometer data - Area 3



SCALE 1:1000



SCALE TRUE AT A3

FIG 08

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Abstraction and interpretation of magnetometer anomalies - Area 3

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Broad linear anomaly - former field boundary
- Positive anomaly - magnetically enhanced material
- Discrete positive response of archaeological potential - pit/burnt material
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

N

WARREN LANE

WESTON ROAD

Area 2

Area 3

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 09

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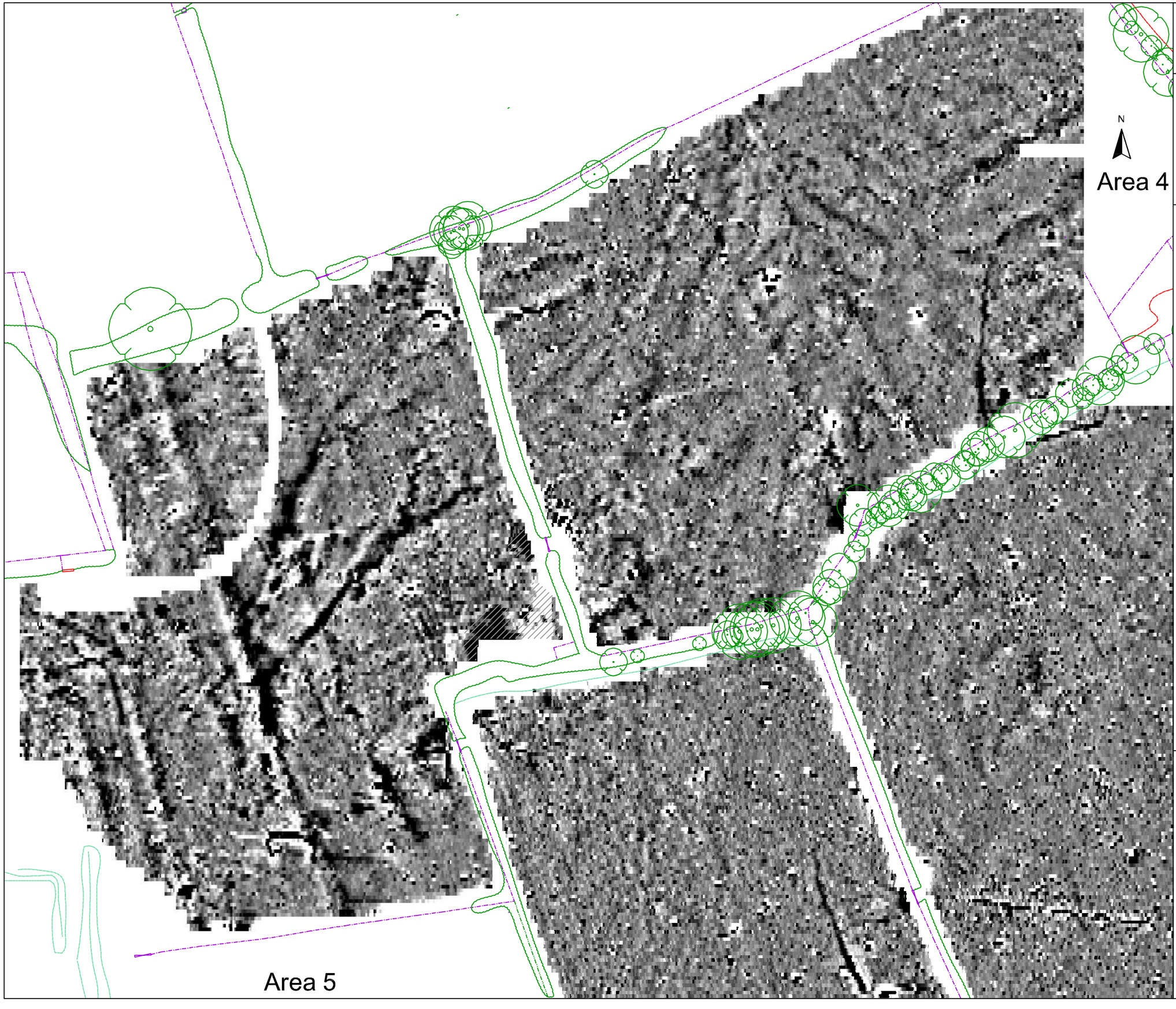
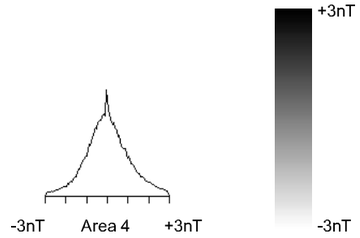
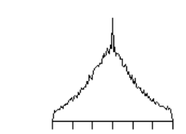
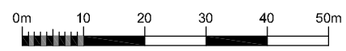
Greyscale plot of processed magnetometer data - Areas 4 & 5







SCALE 1:1000



SCALE TRUE AT A3

FIG 10

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N

Area 4

Area 5

Abstraction and interpretation of magnetometer anomalies - Areas 4 & 5

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Broad linear anomaly - former field boundary
- Positive anomaly - magnetically enhanced material
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 11