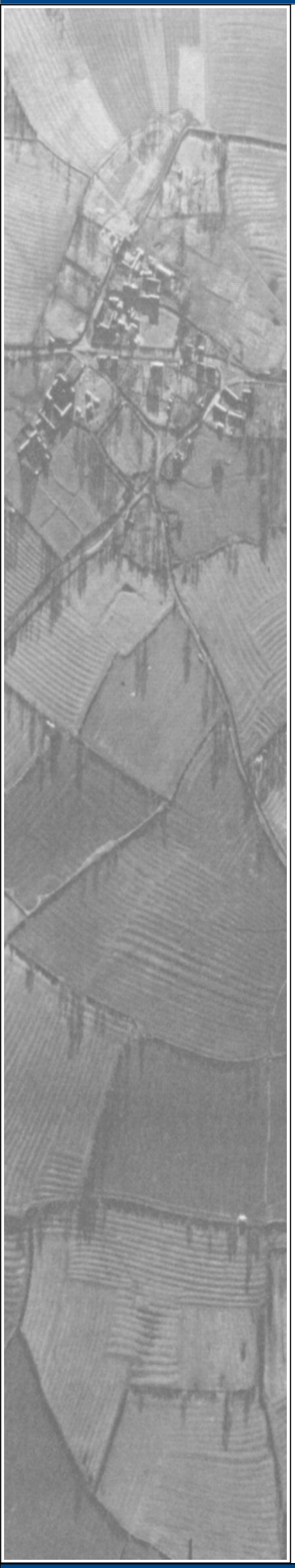

Land east of Showell Farm
Lacock
Wiltshire

MAGNETOMETER SURVEY REPORT

for

Orion Heritage

Kerry Donaldson & David Sabin

November 2021

Ref. no. J876

ARCHAEOLOGICAL SURVEYS LTD

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Lacock
Wiltshire

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Ordnance Survey Grid Reference – **ST 91355 70845**

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SUMMARY

A geophysical survey, comprising detailed magnetometry, was carried out by Archaeological Surveys Ltd over 27ha on land east of Showell Farm, to the north of Lacock and south of Chippenham in Wiltshire. The result indicate the presence of a number of enclosures and at least three ring ditches, two of which could be associated with prehistoric round houses, while the third could be consistent with a small enclosure or possible round barrow ditch. A small number of linear and rectilinear anomalies of archaeological potential have also been located near the northern, south western and north western peripheries of the site.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Orion Heritage to undertake a magnetometer survey of an area of land to the east of Showell Farm, Lacock, Wiltshire. The site has been outlined for a proposed residential development and the survey forms part of an archaeological assessment.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2021) and issued to Wiltshire Council Archaeology Service prior to commencing the survey.

1.2 Survey objectives and techniques

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

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

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

1.3.1 The survey and report follow the recommendations set out by: European Archaeological Council (2015) *Guidelines for the Use of Geophysics in Archaeology;* Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations.* The work has been carried out to the Chartered Institute for Archaeologists (2014) (updated 2020) *Standard and Guidance for Archaeological Geophysical Survey.*

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

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

1.3.4 Where targeting of anomalies by excavation is to be carried out, care should be taken to place trenches over solid lines or features visible on the abstraction and interpretation plots. Archaeological Surveys abstraction and interpretation avoids the use of dashed or dotted line formats, and broken or fragmented lines used in interpretive plots may well correspond closely with truncation of archaeological features.

1.4 Site location, description and survey conditions

1.4.1 The site is located within agricultural land to the east of Showell Farm, 2km to the north of Lacock and 1.5km south of Chippenham in Wiltshire. It is centred on Ordnance Survey National Grid Reference (OS NGR) ST 91355 70845, see Figs 01 and 02.

1.4.2 The geophysical survey covers approximately 27ha within six separate fields. Areas 1 and 2 contained stubble, Areas 3-6 were pasture. It is bounded to the north by agricultural land and Showell Nurseries, to the south by agricultural land, to the west by the B4528 and to the east by the River Avon; however, the eastern limit of the survey did not go up to the river and was defined by an arbitrary line just east of the base of a river terrace.

1.4.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data with the exception of the north western edge of Area 3, where waterlogged ground and tall vegetation was encountered. Weather conditions during the survey were variable but mainly fine.

Plate 1: Area 3 looking east

1.5 Site history and archaeological potential

1.5.1 A historic desk-based assessment has been produced for the site (Orion Heritage, 2020). It outlines that the site contains evidence for medieval ridge and furrow with prehistoric and Roman field systems in the surrounding area. A ring ditch has been located at Showell Nurseries, c30m to the north, which may relate to a Bronze Age round barrow as well as evidence for occupation of the wider area from the Neolithic to Roman periods.

1.5.2 18th century mapping shows that the site was divided into at least 13 separate land parcels, with a large number of strip fields oriented east-west and running down to the River Avon to the east with the smaller fields becoming amalgamated into larger land parcels throughout the 20th century.

1.5.3 The location of archaeological features in the immediate vicinity indicates that there is potential for the survey to locate geophysical anomalies that relate to further archaeology.

1.6 Geology and soils

1.6.1 The underlying solid geology across the western part of the site is limestone from the Cornbrash Formation, with sandstone, siltstone and mudstone from the Kellaways Formation in the centre and east. The central and eastern parts of the site are overlain by River Terrace Deposits of sand and gravel, with alluvium in the far east within the floodplain of the River Avon (BGS, 2017).

1.6.2 The overlying soil across the western part of the survey area is from the

Wickham 3 association and is a typical stagnogey soil. It consists of a slowly permeable, seasonally waterlogged soil. In the centre of the site the soil is from the Badsey 1 association and is a typical brown calcareous earth consisting of a well drained, calcareous, fine, loamy soil over limestone gravel. In the far east, the soil is from the Fladbury 1 association and is a pelo-alluvial gley consistomg of a stoneless, clayey soil over the alluvium (Soil Survey of England and Wales, 1983).

1.6.3 Magnetometry survey carried out across similar soils has produced good results. 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 (also known as thermoremanence) are factors associated with the formation of localised fields.

2.1.2 Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased, and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features, such as pits and ditches, may produce 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). Additional details are set out in 2.2 below and within Appendix A.

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using a SENSYS MAGNETO®MXPDA 5 channel cart-based system. The instrument has 5 fluxgate gradiometers (FGM650) spaced 0.5m apart with readings recorded at 20Hz. The cart is pushed at walking speed and not towed. Each sensor is not zeroed in the field as the vertical axis alignment is precisely fixed leaving sensor offsets that are

removed during data processing. The fixing of the vertical alignment ensures the sensors are not unduly influenced by localised magnetic fields and that the vertical component of a magnetic anomaly is measured. The gradiometers have a measurement range of ±8000nT, although the recorded range is ±3000nT, and resolution is around 0.1nT. They are linked to a Leica GS10 RTK GNSS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged PDA computer system.

2.2.2 Due to the fixed offsets within the fluxgate sensors, as a result of the manufacturing and tensioning process, the survey data do not provide a visually useful dataset until a zero median traverse algorithm is applied. It is recognised that this has the potential to affect some anomalies detrimentally by removing linear features orientated parallel to survey transects. However, this has not been noted as a particular problem with the system due to the high resolution data collection, generally long length of traverses and variability within the magnetic characteristics of a linear anomaly.

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

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

2.3 Data processing and presentation

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

2.3.2 Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display within TerraSurveyor. The removal of the offset values (compensation) of the sensors is also carried out in TerraSurveyor using a zero median traverse function. Data are then considered to be minimally processed. Note: without the zero median traverse function it is not possible to create a meaningful data plot as all sensors have a different offset value. 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 The minimally processed data are collected between limits of ±3000nT and clipped for display at ±3nT. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track.

2.3.4 Additional data processing has been carried out in the form of high pass filtering. This effectively removes low frequency variation along a traverse that has been caused by large magnetic bodies, cultivation or rapid temperature change. Data treated to additional processing have been compared to unprocessed data to ensure that no significant anomalies have been removed.

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

2.3.6 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. With regard to the Sensys MXPDA, minimally processed data are considered by the manufacturer to be data that are compensated by SENSYS MAGNETO DLMGPS software, see 2.3.1 and 2.3.2. Note: traceplots are not considered to be appropriate as they do not provide an accurate or useful assessment of the magnetic anomalies due to the very high density of data collection. In addition, traceplots cannot be meaningfully plotted against base mapping and in areas of complexity traces may be lost or highly confused. Traceplots may be used to demonstrate characteristic magnetic profiles across discrete features where it is considered beneficial.

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

2.3.8 An abstraction and interpretation is drawn and plotted for all geophysical anomalies located by the survey. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for

paper printing. Appendix E sets out CAD layer names with colour and graphic content for each interpretation category, see 3.3.

2.3.9 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.

2.3.10 The abstraction and interpretation procedure has been supported by analysis of a digital terrain model plot derived from the Environment Agency's LiDAR data. Shaded relief plots and contours are created using Surfer 15 (Azimuth:28, Altitude:28, Z factor:10), (Fig 15).

2.3.11 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 6 survey areas covering approximately 27ha.

3.1.2 Magnetic anomalies located can be generally classified as positive responses of archaeological potential, positive and negative anomalies of an uncertain origin, anomalies associated with land management, linear anomalies of an agricultural origin, anomalies with a natural 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.

3.1.3 Anomalies located within each survey area have been numbered and are described in 3.4 to 3.8 below with subsequent discussion in Section 4. Anomalies within Areas 3 and 6 have been grouped together.

3.2 Statement of data quality and factors influencing the interpretation of anomalies

3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the dataset. Magnetic disturbance caused by modern ferrous objects has the potential to obscure more significant anomalies in very localised zones.

3.2.2 Soil magnetic susceptibility appears variable across the site and is likely to be low in frequently waterlogged areas adjacent to the River Avon with higher levels over the Cornbrash in the western part of the site. Truncation by

modern ploughing may be apparent in Areas 1 and 2 where former cut features of archaeological potential have a variable magnetic response and are fragmented. Magnetically noisy conditions within Area 2 may relate to soil conditioning with material contaminated with ferrous fragments. Modern cultivation trends are also evident within Areas 1 and 2.

3.2.3 The survey has demonstrated useful results despite the generally weak and variable magnetic contrast across the site. A number of anomalies of archaeological potential have been located.

3.3 Data interpretation

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

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

Anomalies with a natural origin	Naturally formed magnetic anomalies are caused by localised variability in the magnetic susceptibility of soils, subsoils and other drift or solid geologies. Anomalies may be amorphous, linear or curvilinear and may appear 'fluvial' or discrete; the latter are almost impossible to distinguish from pit-like anomalies with an anthropogenic origin. Fluvial, glacial and periglacial processes may be responsible for their formation within drift material and subsoil. Igneous and metamorphic activity can lead to anomalies within more solid geology.

Table 1: List and description of interpretation categories

3.4 List of anomalies - Area 1

Area centred on OS NGR 391240 170730, see Figs 06 – 08.

Anomalies of archaeological potential

(1.1) – Area 1 contains a series of rectilinear enclosures. They are on a similar orientation to enclosures (2.1) seen in Area 2 approximately 100m to the north east, and although it is possible that they extend into adjacent survey areas, this is not clearly defined in the results. They appear to contain a ring ditch (1.2) and a number of pits (1.3); however, a number of other anomalies are located in the vicinity and it is not clear if they are associated.

(1.2) – A positive curvilinear anomaly with an 11m diameter forms a ring ditch feature which could relate to a former round house. The north eastern part is not visible in the data and two other short, positive linear anomalies can be seen to the east which could represent similar or related features.

(1.3) – Located in the south eastern corner of the series of rectilinear enclosures (1.1) are three discrete positive responses. They are slightly elongated, with dimensions of 1.9m by 0.7-1m.

Anomalies with an uncertain origin

(1.4) – A number of positive linear and discrete anomalies are located in the centre of the rectilinear enclosures (1.1) and they are associated with a spread of weakly magnetic debris. These anomalies are moderately enhanced (8-18nT) compared to the rectilinear enclosures (1.5-3nT) which suggests a possible association with industrial activity. It is, therefore, possible that they relate to features with archaeological potential; however, an association with modern burning is also possible and they are therefore uncertain in origin.

(1.5) – A positive linear anomaly is present in the southern part of the survey area. The ground was deeply rutted here and it is not possible to determine if the anomaly is associated with the agricultural vehicle ruts, a headland associated with the ridge and furrow or if it relates to a cut feature, possibly associated with the rectilinear enclosures (1.1).

(1.6) – The survey area contains a number of very weakly positive linear, curvilinear

and discrete anomalies. It is possible that they relate to further cut features with archaeological potential; however, such features could in places relate to the underlying geology, or more modern activities, including agriculture.

Anomalies with an agricultural origin

(1.7) – A series of parallel linear anomalies relate to former ridge and furrow.

3.5 List of anomalies - Area 2

Area centred on OS NGR 391455 170780, see Figs 09 – 11.

Anomalies of archaeological potential

(2.1) – Positive curvilinear and rectilinear anomalies relate to a D-shaped enclosure with a rectilinear enclosure joined to its northern side. The D-shaped enclosure has been truncated by two conjoined services; however, it does seem to end abruptly at its northern and north western ends. It also appears to contain three discrete, pit-like anomalies. Extending northwards from it is a rectilinear enclosure which contains a smaller D-shaped enclosure (2.2). It is fragmented in places and it is not clear if the western side is defined by (2.2) as it does not clearly extend westwards into Area 3. The general orientation is similar to that of rectilinear enclosures (1.1) seen 100m to the south west.

(2.2) – A small, D-shaped enclosure appears to be contained by and may partly form the western edge of enclosure (2.1). It appears to contain other linear and discrete anomalies of archaeological potential. It is situated less than 50m south east of other curvilinear anomalies (3.1) seen in Area 3 and an association is possible.

(2.3) – A positive linear anomaly could relate to an extension of the northern edge of the rectilinear anomaly a short distance to the west.

Anomalies with an uncertain origin

(2.4) – A number of positive linear anomalies can be seen in the north eastern part of the survey area. It is not clear if they relate to further cut features of archaeological potential or if they have an association with agricultural activity.

(2.5) – A group of discrete, positive responses can be seen close to the western edge of the survey area. Although they could relate to naturally formed features, they are located 85m east of the ring ditch (1.2) seen within Area 1 to the west and an archaeological origin is possible.

Anomalies with a modern origin

(2.6) – Two strong, multiple dipolar linear anomalies relate to water pipes that join in

the northern part of the survey area and extend westwards into Areas 1 and 6 and just northwards into Area 5.

3.6 List of anomalies - Areas 3 & 6

Areas centred on OS NGR 391160 170870, see Figs 06 – 08.

Anomalies of archaeological potential

(3.1) – Situated in the north eastern corner of Area 3 is a positive curvilinear anomaly with a 21m diameter. A ring ditch with such a diameter is likely to be too large to represent a round house, and it is possible that it relates to a small round barrow ditch or a small enclosure. A ring ditch with a 35m diameter relating to a probable Bronze Age round barrow was located during a previous survey some 350m to the north north west (Archaeological Surveys, 2017). Anomaly (3.1) appears to contain a large number of positive responses, it is not clear if these relate to in-situ features, or if they relate to magnetically enhanced material that has been disturbed by a linear drainage ditch that bisects the ring ditch.

(3.2) – A positive curvilinear anomaly with a 13m diameter appears to relate to a possible prehistoric round house. Positive linear and discrete responses are situated within and nearby and appear to relate to further features with archaeological potential.

(3.3) – Situated to the north of ring ditches (3.1 & 3.2) are a number of discrete positive responses, short positive curvilinear anomalies and patches of weakly magnetic debris which could relate to spreads of occupation material.

(3.4) – Located towards the centre of Area 3 is an L-shaped positive rectilinear anomaly that appears to relate to the southern and eastern parts of a rectilinear enclosure. It is situated 100m north north west of anomalies (1.1), it is on a similar orientation and could be associated.

(3.5) – A positive linear anomaly is situated in the south western corner of Area 3. Although it is not clearly associated with other features, it is generally on a similar orientation to the enclosures (1.1) seen 185m to the east. It also appears to have been truncated by later agricultural activity, and it may have archaeological potential.

(3.6) – An L-shaped, positive rectilinear anomaly is located at the north western corner of Area 6. Although there is a lot of modern debris and disturbance in this part of the site, it looks like it may have been truncated by a pipe. It also extends directly towards the location of a ring ditch possibly relating to a Bronze Age barrow located during a previous geophysical survey 35m to the north.

Anomalies with an uncertain origin

(3.7) – A positive linear anomaly could relate to a continuation of one of the linear anomalies associated with the rectilinear enclosures (1.1) seen to the south east.

(3.8) – Negative linear and positive linear anomalies situated in the south western part of Area 3 could be associated with ditch-like features. However, they are generally parallel with the geological trend and an association with natural features is possible.

(3.9) – A group of discrete positive anomalies located in the south western part of Area 3. This appears to lie in between two zones of magnetically variable responses that relate to naturally formed, soil-filled features within the cornbrash geology that is mapped within this part of the site (3.15). It is, therefore, not clear if they relate to further naturally formed features, or if they are associated with pit-like features with archaeological potential.

(3.10) – Areas 3 and 6 contain a number of positive linear, rectilinear and discrete anomalies, with several clustered towards the north west and north east. They are generally weak and/or indistinct and lack a coherent morphology for their date and function to be interpreted. However, an archaeological origin cannot be ruled out.

Anomalies associated with land management

(3.11) – A number of linear and rectilinear anomalies relate to formerly mapped field boundaries.

(3.12) – Negative linear anomalies relate to extant and former land drainage ditches.

Anomalies with an agricultural origin

(3.13) – Former ridge and furrow is evident within the earlier field layout.

(3.14) – A series of linear anomalies associated with agricultural activity that truncates the earlier ridge and furrow within the western part of Area 3.

Anomalies with a natural origin

(3.15) – The western and southern parts of Area 3 contain zones of magnetically variable responses which also encroach into the south western corner of Area 2. These relate to naturally formed, soil-filled features within the underlying geology.

(3.16) – Magnetic disturbance likely to indicate a recent lightning strike.

3.7 List of anomalies - Area 4

Area centred on OS NGR 391590 170250, see Figs 09 – 11.

Anomalies with an uncertain origin

(4.1) – A positive linear anomaly is located near the north western corner of Area 4. It is situated at the base of a river terrace which rises up to the west and could relate to a natural feature or have an association with agricultural activity. However, it is possible that it has an association with the enclosures (2.1) situated parallel with it and 100m further west.

Anomalies associated with land management

(4.2) – Positive and negative linear anomalies relate to a formerly mapped boundary ditch. A land drain appears to extend towards it from the west.

Anomalies with a natural origin

(4.3) – A number of broad, linear zones of magnetically variable responses and discrete positive responses are situated within the floodplain of the adjacent River Avon and are associated with former palaeochannels and features associated with periodic episodes of waterlogging and drying.

Anomalies associated with magnetic debris

(4.4) – A patch of magnetic debris is likely to relate to magnetically thermoremnant material used for ground consolidation

3.8 List of anomalies - Area 5

Area centred on OS NGR 391535 171085, see Figs 12 – 14.

Anomalies of archaeological potential

(5.1) – Located in the northern part of the survey area are a number of positive linear and discrete anomalies. A Romano-British field system has been identified through previous geophysical survey, National Monument Mapping Programme and evaluation on land immediately to the west, and it is likely that these anomalies relate to associated features.

(5.2) – Weakly positive linear and rectilinear anomalies have been located to the south of (5.1). They are also on a similar orientation to the Romano-British field system recorded immediately to the west.

Anomalies with an uncertain origin

(5.3) – The survey area contains a number of weakly positive linear and curvilinear anomalies. Due to the weak response and lack of coherent morphology they cannot be confidently interpreted, but an archaeological origin is possible.

Anomalies associated with land management

(5.4) – Linear anomalies relate to former land boundaries.

(5.5) – A linear anomaly relates to an extant land drainage ditch.

Anomalies with a natural origin

(5.6) – The survey area contains broad, linear zones of magnetically variable responses and discrete positive responses that relate to naturally formed features within the floodplain.

4 DISCUSSION

4.1.1 Area 1 contains evidence for a series of rectilinear enclosures (1.1), one of which contains a ring ditch (1.2) which could be associated with a round house with an 11m diameter. To the south of this are a small number of elongated pits with dimensions of 1.9m by 0.7-1m (1.3). It is not clear if the enclosures extend directly into the adjacent areas; however, a small L-shaped enclosure (3.4) can be seen with the same orientation 100m to the north north west within Area 3. Also on the same orientation is a conjoined D-shaped and rectangular enclosure (2.1) situated 100m to the north east in Area 2. The orientation for the main axis for all of these enclosures is generally north north west to south south east and although a Romano-British field system has been recorded on land immediately to the north of the site, the general trend is different, with the main axis of the field system being north north east to south south west.

4.1.2 The rectilinear enclosure of (2.1) either contains or is partially bounded by a smaller D-shaped enclosure (2.2). Situated less than 50m north west of this is a ring ditch with a 21m diameter (3.1) and situated 350m further north west is the location of a 35m wide ring ditch, likely to relate to a Bronze Age barrow, and recorded through previous geophysical survey on land immediately to the north (Archaeological Surveys, 2017). A further small ring ditch (3.2) has also been located 25m to the west of ring ditch (3.1) and while (3.1) at 21m appears to be too large for a round house, (3.2) at 13m diameter could suggest an association with such a feature. Situated in the vicinity are further ditch-like and pit-like features as well as weakly magnetic debris (3.3) which could suggest an association with occupation debris. Other, weak and poorly defined anomalies are also situated nearby (3.10) and could also have

archaeological potential.

4.1.3 Although the anomalies with archaeological potential are mainly concentrated towards the centre of the site, there are a small number of positive linear anomalies near the south western, north western and north eastern corners, which just project into the survey area. In the south west a positive linear anomaly (3.5) appears to have been truncated by later agricultural activity and has a similar orientation to the rectilinear enclosures (1.1) seen 185m to the east. Close to the north western corner is an L-shaped rectilinear anomaly (3.6) which although situated within an area with modern disturbance, does appear to extend directly towards the location of a previously identified round barrow ring ditch situated 30m to the north and an association is possible. In the far north are a number of linear anomalies (5.1) that suggest cut features and an association with the Romano-British field system recorded on land to the west is possible.

4.1.4 Elsewhere within the site are a number of linear anomalies that relate to former boundaries and extant land drainage gullies. Some of these are mapped, some are not and it is not possible to determine their age. One of these gullies has truncated the larger ring ditch (3.1) and may have disturbed archaeological material. The site contains a number of weakly positive linear and discrete anomalies that generally lack a coherent morphology and clear definition. While some could relate to cut features with archaeological potential, others could be associated with agricultural activity, former drainage and natural features. The eastern edge of the site lies within the floodplain of the River Avon and the survey has located anomalies (4.3 & 5.6) associated with former fluvial channels and periods of waterlogging and drying. In the west, the Cornbrash geology appears to be associated with numerous soil-filled features (3.15) which can be difficult to distinguish from anomalies with an anthropogenic origin.

5 CONCLUSION

5.1.1 The geophysical survey located a number of archaeological features within the site. These include a series of rectilinear enclosures within Area 1 in the southern part of the site, one of which contains a ring ditch that could be indicative of a round house. To the north east in Area 2 is a large D-shaped enclosure, joined by a rectilinear enclosure which appears to contain a smaller D-shaped enclosure. To the west of this in Area 3 are two ring ditch features, one could relate to a round house, the other potentially to a barrow ditch or small circular enclosure. In the far northern part of the site (Area 5) there are a number of positive linear anomalies that could relate to linear ditches associated with a Romano-British field system recorded on land immediately to the west outside of the survey area.

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Appendix A – basic principles of magnetic survey

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

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

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

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

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

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

Appendix B – data processing notes

Clipping

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

High Pass Filter

Removes low frequency anomalies within the data that are not considered to be archaeologically significant and may be natural in origin. A window passes over the data, the mean of all the data within the window is subtracted from the centre value. The size of the window is adjusted as is the weighting which may be uniform or Gaussian. The process is used to improve the visibility of anomalies of interest.

Low Pass Filter

Removes high frequency anomalies or 'noise' within datasets and provides a smoother output. A window passes over the data, the mean of all the data within the window is used to replace the centre value. The size of the window is adjusted as is the weighting. The process is used to improve the visibility of anomalies of interest.

Zero Median/Mean Traverse

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

Appendix C – survey and data information

Area 1 minimally processed data

Filename: J876-mag-Area1-proc.xcp
Instrument Type: Sensys DLMGPS
Units:
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 391106.59, 170843.63 m
Southeast corner: 391354.24, 170636.18 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Dimensions
Survey Size (meters): 248 m x 207 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 1088700, Recorded: 1088700
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.71
Mean: 0.02
Median: 0.01
Composite Area: 5.1375 ha
Surveyed Area: 3.8158 ha
PROGRAM
Name: TerraSurveyorPre
Version: 3.0.36.24
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 1 filtered data
Filename: J876-mag-Area1-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.66
Mean: 0.02
Median: 0.01
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Lo pass Uniform (median) filter: Window dia: 11
5 Clip from -3.00 to 3.00

Area 2 minimally processed data

Filename: J876-mag-Area2-proc.xcp
Northwest corner: 391354.34, 170954.25 m
Southeast corner: 391566.29, 170614.65 m
Dimensions
Survey Size (meters): 212 m x 340 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 1550580, Recorded: 1550580
Stats
Max: 5.53
Min: -5.50
Std Dev: 1.23
Mean: -0.02
Median: 0.00
Composite Area: 7.1978 ha
Surveyed Area: 5.4774 ha
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -5.00 to 5.00

Area 3 minimally processed data

Filename: J876-mag-Area3-proc.xcp
Northwest corner: 390944.56, 171014.46 m
Southeast corner: 391428.46, 170645.61 m
Dimensions
Survey Size (meters): 484 m x 369 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 2550475, Recorded: 2550475
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.15
Mean: 0.00
Median: 0.01
Composite Area: 17.849 ha
Surveyed Area: 9.6026 ha
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 3 filtered data

Filename: J876-mag-Area3-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.09
Mean: 0.01
Median: 0.00
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 300
5 Clip from -3.00 to 3.00

Area 4 minimally processed data
Filename: J876-mag-Area4-proc.xcp
Northwest corner: 391533.02, 170944.16 m
Southeast corner: 391653.92, 170561.81 m
Dimensions
Survey Size (meters): 121 m x 382 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 896658, Recorded: 896658
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.83
Mean: 0.01
Median: 0.01
Composite Area: 4.6226 ha
Surveyed Area: 3.1314 ha
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 4 filtered data
Filename: J876-mag-Area4-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.74
Mean: 0.00
Median: 0.00
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 250
5 Clip from -3.00 to 3.00

Area 5 minimally processed data

Filename: J876-mag-Area-proc.xcp
Northwest corner: 391470.09, 171251.28 m
Southeast corner: 391598.79, 170936.73 m
Dimensions
Survey Size (meters): 129 m x 315 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 984191, Recorded: 984191
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.92
Mean: 0.02
Median: 0.01
Composite Area: 4.0483 ha
Surveyed Area: 3.175 ha
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00
Area 5 minimally processed data
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.92
Mean: 0.02
Median: 0.01
GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 250
5 Clip from -3.00 to 3.00

Area 6 minimally processed data

Filename: J876-mag-Area6-proc.xcp
Northwest corner: 390970.70, 171013.92 m
Southeast corner: 391035.20, 170902.02 m
Dimensions
Survey Size (meters): 64.5 m x 112 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 176100, Recorded: 176100
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.68
Mean: 0.01
Median: 0.01
Composite Area: 0.72176 ha
Surveyed Area: 0.59904 ha
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 6 minimally processed data

Filename: J876-mag-Area6-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.68
Mean: 0.01
Median: 0.01
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 250
5 Clip from -3.00 to 3.00

Appendix D – digital archive

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

A PDF copy will be supplied to the Wiltshire Historic Environment Record with greyscale images and abstraction layers made available on request. The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

File type	Naming scheme	Description
Data	J876-mag-**[area number/name]**.asc J876-mag-**[area number/name]**.xcp J876-mag-**[area number/name]**-proc.xcp	Raw data as ASCII CSV TerraSurveyor raw data TerraSurveyor minimally processed data
Graphics	J876-mag-**[area number/name]**-proc.tif	Image in TIF format
Drawing	J876-**[version number]**.dwg	CAD file in 2018 dwg format
Report	J876 report.odt	Report text in LibreOffice odt format

Table 2: Archive metadata

Appendix E – CAD layers for abstraction and interpretation plots

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

Report sub-heading and associated CAD layer names	Colour with RGB index		Layer content
Anomalies with archaeological potential			
AS-ABST MAG POS DISCRETE ARCHAEOLOGY		Red 255,0,0	Solid donut, point or polygon (solid)
AS-ABST MAG POS LINEAR ARCHAEOLOGY		Red 255,0,0	Polyline or polygon (solid)
AS-ABST MAG POS CURVILINEAR RING DITCH		Magenta 255,0,255	Polyline or polygon (solid)
AS-ABST MAG DEBRIS ARCHAEOLOGY		127,63,79	Line, polyline or polygon (solid)
AS-ABST MAG POS ENCLOSURE DITCH		127,0,255	Line, polyline or polygon (solid)
Anomalies with an uncertain origin			
AS-ABST MAG POS LINEAR UNCERTAIN		255,127,0	Line, polyline or polygon (solid)
AS-ABST MAG NEG LINEAR UNCERTAIN		Blue 0,0,255	Line, polyline or polygon (solid)
AS-ABST MAG POS DISCRETE UNCERTAIN		255,127,0	Solid donut, point or polygon (solid)
Anomalies relating to land management			
AS-ABST MAG BOUNDARY		127,0,0	Line, polyline or polygon (solid or cross hatched ANSI37)
AS-ABST MAG LAND DRAIN		Cyan 0,255,255	Line or polyline
Anomalies with an agricultural origin			
AS-ABST MAG AGRICULTURAL		Green 0,255,0	Line or polyline
AS-ABST MAG RIDGE AND FURROW		0,127,63	Line, polyline or polygon (cross hatched ANSI37)
Anomalies associated with magnetic debris			
AS-ABST MAG DEBRIS		132, 132, 132	Polygon (cross hatched ANSI37)

AS-ABST MAG STRONG DIPOLAR		132, 132, 132	Solid donut, point or polygon (solid)
Anomalies with a modern origin			
AS-ABST MAG DISTURBANCE		132, 132, 132	Polygon (hatched ANSI31)
AS-ABST MAG SERVICE		132, 132, 132	Line or polyline
Anomalies with a natural origin			
AS-ABST MAG NATURAL FEATURES		Yellow 255,255,0	Polygon (cross hatched ANSI37, Dots, solid)

Table 3: CAD layering

Appendix F – copyright and intellectual property

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Geophysical Survey
Land east of Showell Farm
Lacock
Wiltshire

Map of survey area

N

Survey location

Survey location

Site centred on OS NGR
ST 91355 70845

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 01

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Referencing information

Referencing grid to OSGB36 datum at 50m intervals

391300 170850

Survey tracks

Survey track start

Survey track stop

Development boundary

SCALE 1:2500

0m 50 100m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 02

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Greyscale plot of minimally processed magnetometer data

SCALE 1:2500

0m 50 100m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 03

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Greyscale plot of filtered magnetometer data

+3nT

-3nT

SCALE 1:2500

0m 50 100m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 04

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Abstraction and interpretation of magnetic anomalies

Area 1
Area 2
Area 3
Area 4
Area 5
Area 6

Cottages
Pond
Tank
Windsmeet
Showell Farm
Farm
The Old Barn
Pond
Pond
Pond
CG
ETL
Drain
CK
ED Body

N

- Positive linear anomaly - cut feature of archaeological potential
- Positive curvilinear anomaly - ring ditch
- Positive curvilinear/rectilinear anomaly - enclosure ditch
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Positive linear anomaly - formerly mapped field boundary
- Negative linear anomaly - extant drainage ditch
- Weak, multiple dipolar linear anomaly - ceramic land drain
- Linear anomaly - ridge and furrow
- Linear anomaly - of agricultural origin
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Discrete positive response - of natural origin
- Magnetic debris - magnetically thermo-remnant material of archaeologial potential
- Variable magnetic response - of natural origin (palaeochannel)
- Variable magnetic response - of natural origin (geology)
- 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 1:2500

0m 50 100m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 05

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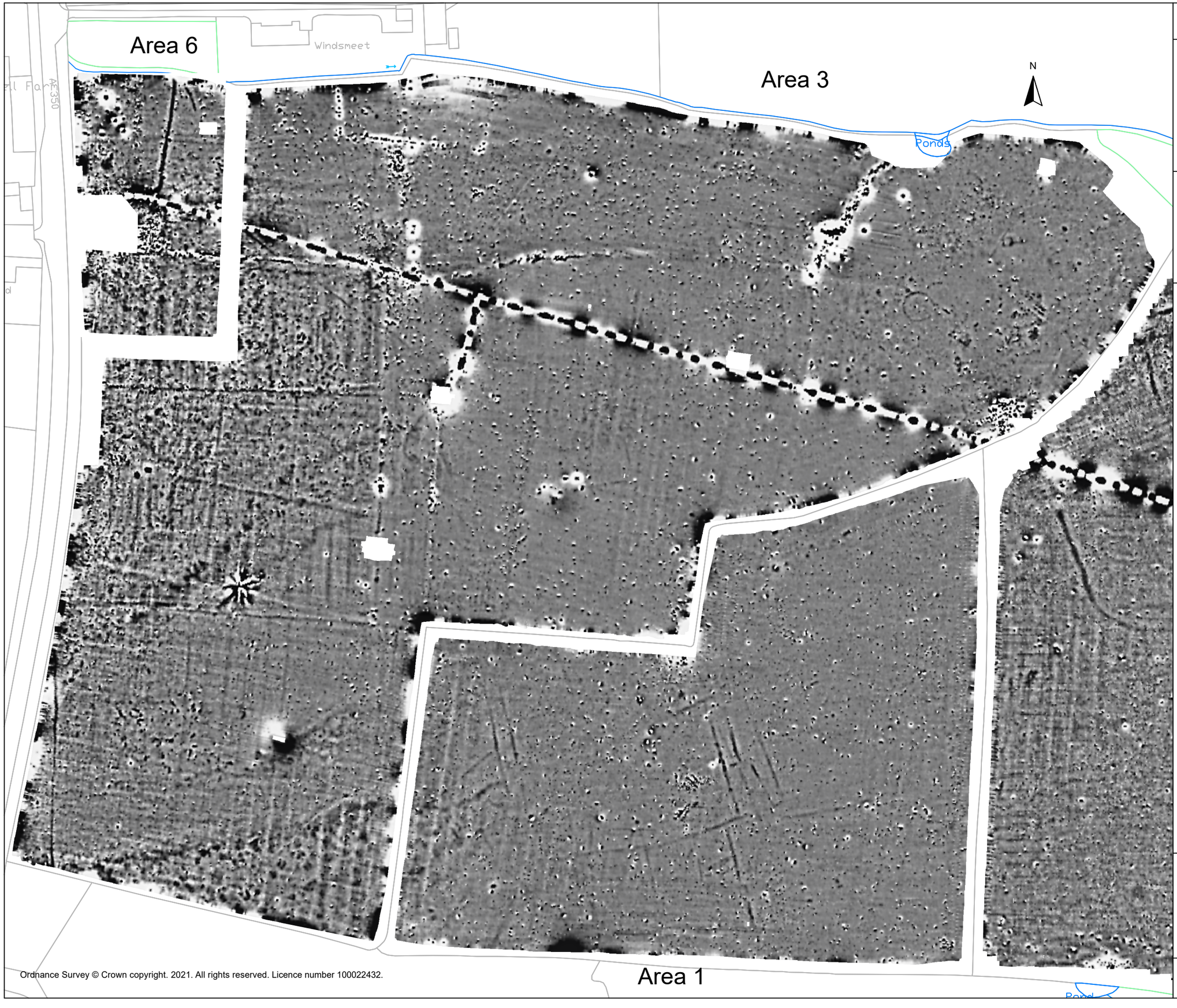
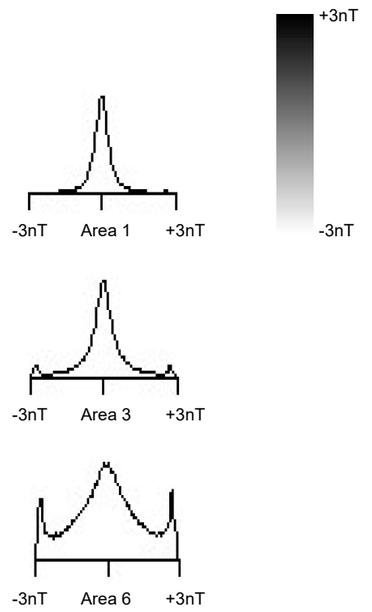
Greyscale plot of minimally processed magnetometer data - Areas 1, 3 & 6





SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 06

Area 6

Windsmeet

Area 3

N

Ponds

Area 1

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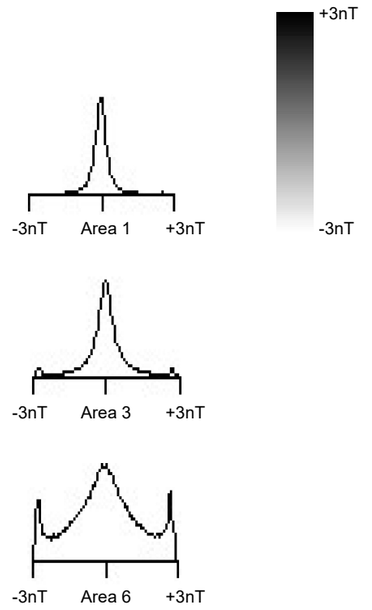
Greyscale plot of filtered magnetometer data - Areas 1, 3 & 6



SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 07

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Abstraction and interpretation of magnetic anomalies - Areas 1, 3 & 6

- Positive linear anomaly - cut feature of archaeological potential
- Positive curvilinear anomaly - ring ditch
- Positive curvilinear/rectilinear anomaly - enclosure ditch
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Positive linear anomaly - formerly mapped field boundary
- Negative linear anomaly - extant drainage ditch
- Weak, multiple dipolar linear anomaly - ceramic land drain
- Linear anomaly - ridge and furrow
- Linear anomaly - of agricultural origin
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Magnetic debris - magnetically thermo-remnant material of archaeologial potential
- Variable magnetic response - of natural origin (geology)
- 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 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 08

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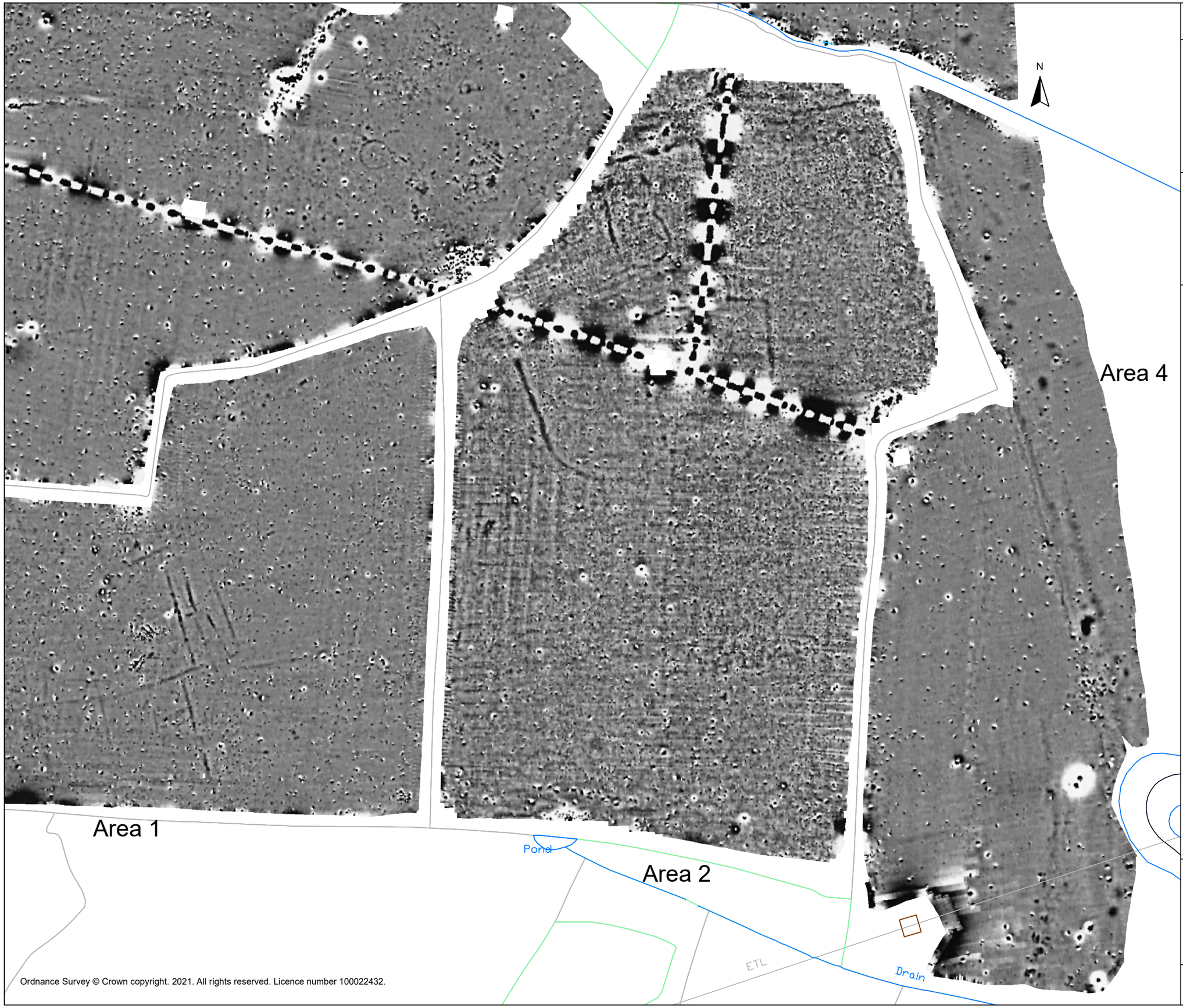
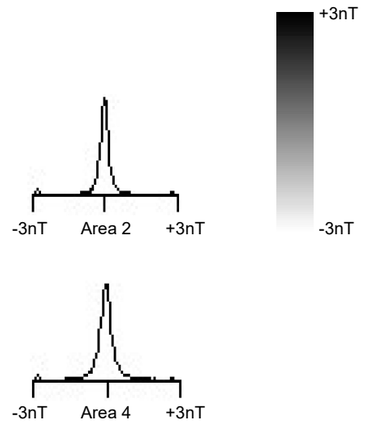
Greyscale plot of minimally processed magnetometer data - Areas 2 & 4





SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 09

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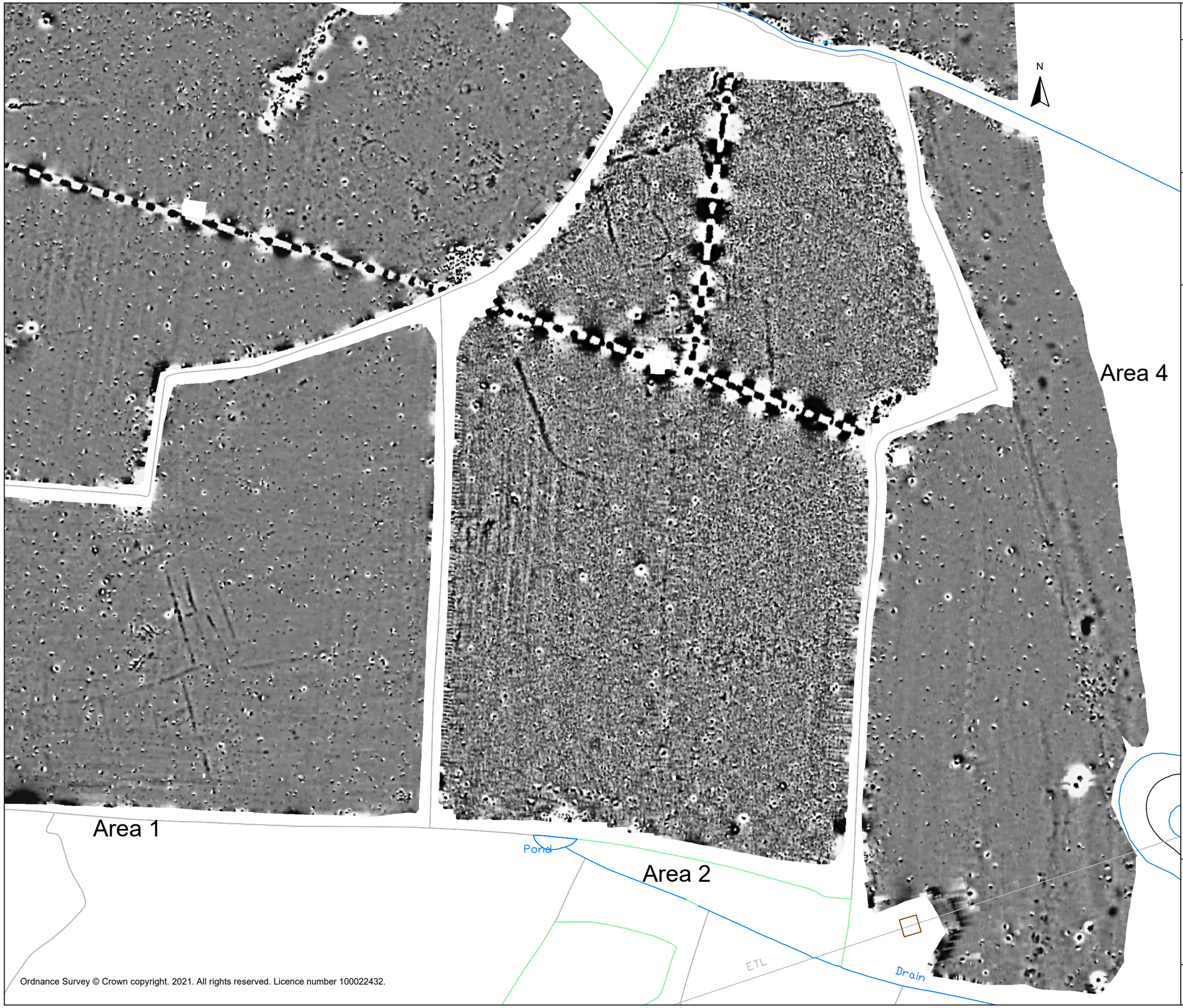
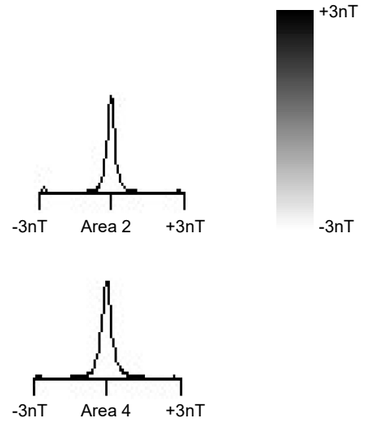
Wiltshire

Greyscale plot of filtered magnetometer data - Areas 2 & 4





SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 10

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Abstraction and interpretation of magnetic anomalies - Areas 2 & 4

3.12
3.11
3.3
3.10
3.1
3.2
2.3
4.1
2.4
2.2
3.4
2.6
2.1
Area 4
1.6
1.2
2.5
4.2
4.3
1.4
1.1
1.3
1.7
4.4
1.5
Area 1
Pond
Area 2
ETL
Drain
N

- Positive linear anomaly - cut feature of archaeological potential
- Positive curvilinear anomaly - ring ditch
- Positive curvilinear/rectilinear anomaly - enclosure ditch
- Positive linear anomaly - possible ditch-like feature
- Positive linear anomaly - formerly mapped field boundary
- Negative linear anomaly - extant drainage ditch
- Weak, multiple dipolar linear anomaly - ceramic land drain
- Linear anomaly - ridge and furrow
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Discrete positive response - of natural origin
- Magnetic debris - magnetically thermo-remnant material of archaeologial potential
- Variable magnetic response - of natural origin (palaeochannel)
- 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 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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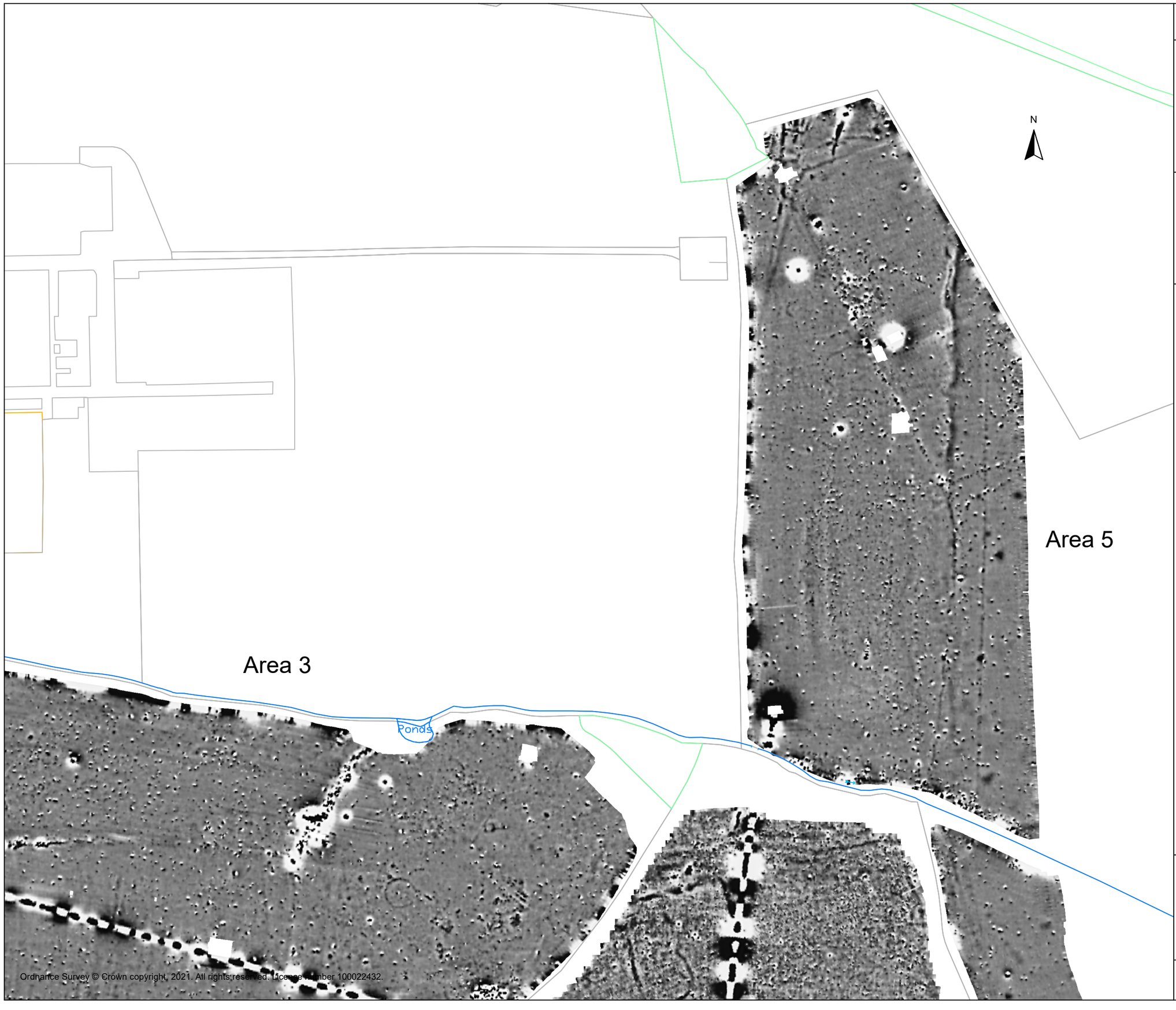
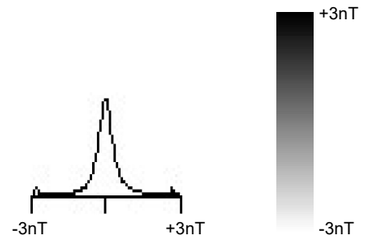
Greyscale plot of minimally processed magnetometer data - Area 5





SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 12

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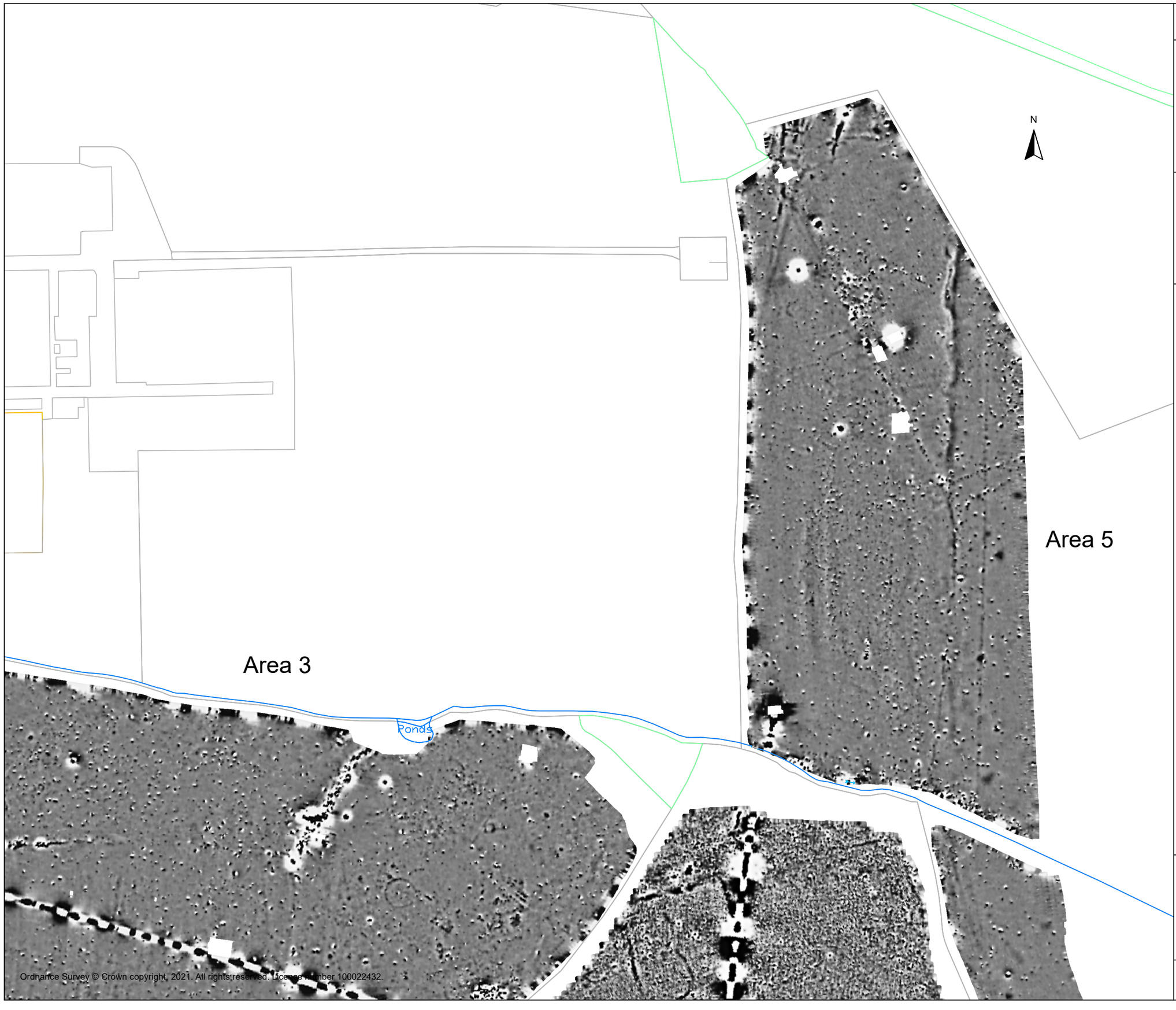
Greyscale plot of filtered magnetometer data - Area 5



+3nT
-3nT
-3nT
+3nT

SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 13

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Abstraction and interpretation of magnetic anomalies

N

Area 5

Area 3

Ponds

5.1
5.2
5.3
5.4
5.5
5.6
3.1
3.2
3.3
3.10
3.11
3.12
2.2
2.3
2.4
4.1

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Positive linear anomaly - formerly mapped field boundary
- Negative linear anomaly - extant drainage ditch
- Linear anomaly - ridge and furrow
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Discrete positive response - of natural origin
- Variable magnetic response - of natural origin (palaeochannel)
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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Digital Terrain Model

Derived from Environment Agency's LiDAR data 1m resolution

SCALE 1:2500

0m 50 100m

SCALE TRUE AT A3

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KTD	DJS	FIG 15