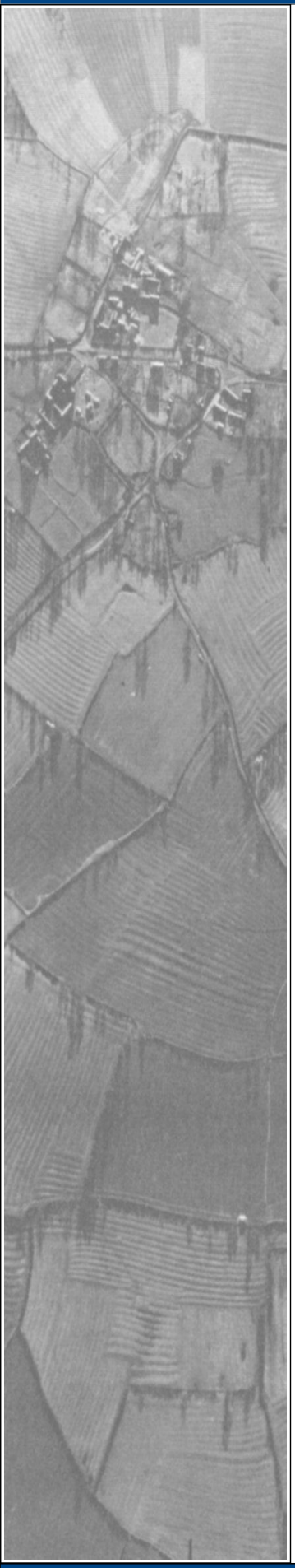

Land off Snowswick Lane
Coleshill
Oxfordshire

MAGNETOMETER SURVEY REPORT

for

Cotswold Archaeology

Kerry Donaldson & David Sabin

February 2023

Ref. no. J943

ARCHAEOLOGICAL SURVEYS LTD

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Coleshill
Oxfordshire

MAGNETOMETER SURVEY REPORT

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Report checked by David Sabin
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Ordnance Survey Grid Reference – **SU 22640 94280**

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SUMMARY

A geophysical survey, comprising detailed magnetometry, was carried out by Archaeological Surveys Ltd over 52ha of arable land near Coleshill, Oxfordshire. The results reveal the presence of a prehistoric settlement of probable Iron Age date consisting of trackways, irregularly shaped enclosures and at least 100 round houses covering approximately 7ha. There are a number of phases to the development of the site and evidence for round house reconstructions. Realignment of field boundary ditches to the east of the settlement may be consistent with a Romano-British phase of occupation. The trackways continue to the north, south and east beyond the limits of the settlement, with a further wide Y-shaped trackway, located 300m to the south east, associated with a curvilinear ditch and a number of enclosures to the north and south. Away from the main core of the settlement the geophysical anomalies are very weak due to poor magnetic contrast, and it is likely that there are other features with archaeological potential within the site that are not visible in the results.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Cotswold Archaeology to undertake a magnetometer survey of an area of land at Land off Snowswick Lane to the north of Coleshill in Oxfordshire. The site has been outlined for a proposed development of a solar farm 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 (2022) and approved by Steven Weaver, Planning Archaeologist for Oxfordshire County Council and archaeological advisor to Vale of White Horse District Council, prior to commencing the fieldwork.

1.2 Survey objectives and techniques

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

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

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

1.3.1 Archaeological Surveys Ltd is a Registered Organisation with the Chartered Institute for Archaeologists (CIfA) and both company directors are Members of the Chartered Institute for Archaeologists (MCIfA) and have therefore been assessed for their technical competence and ethical suitability and abide by the CIfA Codes of Conduct. The survey and report follow the recommendations set out by: European Archaeological Council (2015) *Guidelines for the Use of Geophysics in Archaeology;* Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations.* The work has been carried out to the Chartered Institute for Archaeologists (2014, updated 2020) *Standard and Guidance for Archaeological Geophysical Survey.*

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

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

1.3.4 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 north west of Coleshill in Oxfordshire. It lies to the west of Snowswick Lane and east of the River Cole which marks the boundary between Oxfordshire and Swindon (Wiltshire) to the west. It is centred on Ordnance Survey National Grid Reference (OS NGR) SU 22640 94280, see Figs 01 and 02.

1.4.2 The geophysical survey covers approximately 52ha of arable land within seven separate fields. Six of the fields were cover in entirety (Areas 1-6), with only the higher ground in the northern part of the most south westerly field (Area 7).

1.4.3 Area 1 is the north western field bounded to the west by the River Cole, to the north by a stream with hedgerow boundaries to the south and east. The land tends to slope down from around 78m AODN near the south eastern corner to 75m AODN near the north western corner. A wide field margin of mixed wild flowers and plants runs along the western side of the field separating the arable zone from the River Cole, a narrower margin also runs along the northern side of the field also; the margins were unsurveyable due to the vegetation and lie outside the proposed scheme. At the time of survey a crop was just emerging and generally survey conditions were poor due to wet, sticky clay soil.

1.4.4 Area 2 lies immediately east of Area 1 and is also bounded by a stream along the north side with hedgerows forming field boundaries. The land tends to slope down gently towards the north. Along the northern side of the field there is a wide track raised above the field by approximately 1m; this relates to reinstatement of land along the northern sides of Areas 1 and 2 after recent construction of a large water pipeline. The northern part of the field is prone to flooding and waterlogging. At the time of survey a crop was just emerging and generally survey conditions were very poor due to wet, sticky clay soil.

1.4.5 Area 3 lies to the south of Areas 1 and 2. The central part of the field is elevated above surrounding land at just over 80m AODN. The western side of the field contains a continuation of the wide wild flower and plant margin present in Area 1. The majority of the field contained an emerging arable crop, although a wide margin along the eastern side is probably associated with a cover crop. Survey conditions were generally poor due to wet, sticky soil, at times the western part of the field was unsurveyable due to increased clay content.

1.4.6 Area 4 lies to the south east of Area 3 in the central part of the site. The field slopes down gently towards the south east from just below 80m AODN near its western corner. The field contained a short crop at the time of survey and on several occasions survey was abandoned due to heavy, sticky clay soil that could not be traversed. In addition, up to 50% of the field became flooded preventing survey for a number of weeks due to the depth of water and boggy ground.

1.4.7 Area 5 lies to the south east of Area 4 in the southern part of the site. The central part of the field is elevated above most of the surrounding land at around 82m AODN. The field contained a short crop at the time of survey and on several occasions survey was abandoned due to heavy, sticky clay soil that could not be traversed, survey was only possible on frozen ground. Flooding along the northern and south western boundaries also impeded survey, a very small area of flooding near the western corner persisted and could not be surveyed.

1.4.8 Area 6 lies to the east of Area 5 and forms the south eastern part of the site. The land tends to slope down towards the north and west from around 90m

AODN near the south eastern corner. The field contained a short crop at the time of survey and on several occasions survey was abandoned due to heavy, sticky clay soil that could not be traversed, survey was only possible on frozen ground.

1.4.9 Area 7 is a small triangular area at the northern end of a field and is located to the south of Area 3 and west of Area 4. The area slopes down to the south and crosses a short arable crop and wide field margin of grass and wild vegetation.

1.4.10 The ground conditions across the site were generally considered to be very poor for surveying due to high levels of rainfall and the sticky nature of the soil, as well as periods of flooding. Weather conditions during the survey were variable but predominantly wet. Very cold conditions allowed completion of the survey on frozen ground.

1.5 Site history and archaeological potential

1.5.1 A large enclosure, subdivided into a dozen irregularly shaped paddocks with ridge and furrow, has been recorded from aerial photos on land just to the north and east of the survey area, south east of Worsell Farm (MOX10130) and the earthwork remains of a medieval moat is situated 260m to the east (MOX10126). A Saxon inhumation and grave goods were located during construction of a water pipe in 1841 approximately 530m to the east (MOX10128). A small, penannular enclosure with radiating ditches has been identified from aerial photographs approximately 430m to the north (MOXX10033). Recent geophysical surveys along the line of a replacement water main located a group of ring ditches relating to a late prehistoric settlement approximately 2km north east of the site (Archaeological Surveys, 2021a & 2021b).

1.5.2 The nearest scheduled monuments are a group of circular enclosures at Common Farm, Highworth, 1.3km to the south east (HE List entry no: 1016385/1016390/1016389). These form part of a larger group of enclosures known as the “Highworth Circles” within a 3.3km radius of Highworth and likely to have been used for the temporary keeping of livestock. A Deserted Medieval Settlement to the south west of Eastrop Farm on the eastern edge of Highworth lies 1.75km to the south west (HE List entry no: 1016310). The Iron Age hillfort of Badbury Camp (HE List entry no: 1004857) lies 3km to the east.

1.5.3 A previous geophysical survey carried out prior to the laying of a replacement water main along the northern edge of the site identified a small number of possible ditch-like features (Archaeological Surveys, 2018). A number of ditches and gullies were identified through excavation within this part of the site, but although one dated to the later prehistoric period, the majority were undated (Cotswold Archaeology, 2019).

1.5.4 The surface conditions within the site were generally suitable for the

observation of cultural material during the course of the survey although light conditions were poor. A stone scatter covering a large area was noted within Areas 3 and 4. The scatter included fire-reddened sarsen and limestone fragments, the largest being approximately 0.4m in length. A small number of pieces of ferruginous sandstone probably relate to the Faringdon Sand Formation, the nearest source being located 3km east at Badbury Hill. Several quernstone fragments were noted, some of sandstone but a number of pieces of conglomerate similar to Hertfordshire puddingstone. Numerous pottery fragments were observed with the stone scatter and these mainly consist of coarse material with large inclusions typical of prehistoric pottery. A small number of pieces of Roman greyware were also present as well as sherds representing large vessels of Savernake Ware.

1.6 Geology and soils

1.6.1 The underlying solid geology across the site is mudstone from the Oxford Clay Formation with overlying alluvial deposits along the northern and western edges as well as a broad zone extending across the centre of the site and a small lens of sand and gravel in Area 3 (BGS, 2022).

1.6.2 The overlying soil across the survey area is from the Denchworth association (712b) and is a pelo-stagnogley soil. It consists of a slowly permeable, seasonally waterlogged clayey soil (Soil Survey of England and Wales, 1983).

1.6.3 Magnetometry survey carried out across similar soils has produced variable results as the they are often associated with low magnetic susceptibility resulting in poor magnetic contrast between cut features and the material into which they are cut. However, cut features of archaeological potential may be located where human activity has been sufficiently intensive to alter the magnetic characteristics of the soil, such as an occupation site or where there has been industrial activity. Features associated with less intensive activity, such as land boundaries or short-lived sites may not have sufficient magnetic enhancement be to located through magnetometry. Low lying parts of the site subject to frequent waterlogging and damp soil may not support sufficient enhancement of magnetic susceptibility for the location of former archaeological 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 (also known as thermoremanence) are factors associated with the formation of localised magnetic fields.

2.1.2 Iron minerals within the soil may become altered by burning and the break

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

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

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

2.2 Equipment configuration, data collection and survey detail

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

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

2.2.3 Data are collected along a series of parallel survey transects to achieve 100% coverage of the surveyable land. The length of each transect is variable and relates to the size of the survey area and other factors including ground conditions. A visual display allows accurate placing of transects and helps

maintain the correct separation between adjacent traverses. Data are not collected within fixed grids and data points are considered to be random even though the data are collected in a systematic manner covering all accessible areas (Aspinall, Gaffney and Schmidt, 2009).

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

2.3 Data processing and presentation

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

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

2.3.3 The minimally processed data are collected between limits of ±3000nT and clipped for display at ±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 for Areas 1, 2 & 4 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.

2.3.5 A low pass filter has also been applied to the data in Area 2 which effectively removes high frequency variation along a traverse that has been caused by uneven ground and associated vibration. Data treated to additional processing

have been compared to unprocessed data to ensure that no significant anomalies have been removed.

2.3.6 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.

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

2.3.8 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.

2.3.9 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.

2.3.10 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.

2.3.11 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 7 survey areas covering approximately 52ha.

3.1.2 Magnetic anomalies located can be generally classified as positive and negative linear and discrete 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.

3.1.3 Anomalies located within each survey area have been numbered and are described in 3.4 to 3.10 below with subsequent discussion in Section 4.

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

3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the dataset.

3.2.2 The survey conditions across most of the site were considered to be very poor due to the wet, sticky clay soil. Frequent heavy rainfall prior to and during much of the survey period produced saturated and waterlogged ground, with low lying areas underwater for long periods. Traversing the land was very difficult due to accumulating mud on footwear, at times traversing was impossible and survey could only be completed in some areas when the soil was frozen. Accumulations of mud on footwear and the magnetometer cart occasionally produced unacceptably noisy data as a result of small magnetic fragments being picked up or large chunks of mud accumulating and breaking away within a traverse. In order to maintain data quality at as high a level as possible, a system of daily analysis and review was carried out to identify traverses where noise levels were unacceptably high. Where traverses were identified as unacceptable these were removed from the dataset and resurveyed.

3.2.3 The survey located a significantly large zone of positive anomalies of archaeological potential. The anomalies are mainly clear and well defined demonstrating strong magnetic contrast between the fill of former cut features and the surrounding natural subsoil and geology. However, towards the periphery of this zone anomalies appear to fade away to a level where they can no longer be perceived within the data. A major factor associated with the strong magnetic contrast shown by many of the anomalies is the 'habitation effect' where soils accumulate significant enhancement of magnetic susceptibility by human habitation and its associated activities. In addition, however, the strongest anomalies occur on elevated and comparatively well drained land, and it is likely that soil moisture content is also an important factor as features appear to disappear completely on the wetter low lying soils. It should be considered that there are implications for the effectiveness or reliability of magnetometry for lower parts of the site subject to frequent waterlogging and flooding. The underlying geology may also be a factor in that the strongest anomalies occur within a small zone of sand and gravel mapped by the British Geological Survey, although surface observations suggest a widespread stone scatter derived from habitation structures etc.

3.2.4 The site contains very few sources of modern magnetic disturbance or debris and only a few small zones in the south western part of the site producing naturally formed anomalies.

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	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 422185 194575, see Figs 05 – 07.

Anomalies of archaeological potential

(1) – A fragmented, positive linear anomaly relates to a continuation of a linear ditch previously identified through earlier geophysical survey at the northern end of the survey area. Subsequent evaluation of the ditch dated it to the late prehistoric period. The present survey indicates that this ditch extends directly from a late prehistoric settlement to the south.

Anomalies with an uncertain origin

(2) – A very weakly positive curvilinear anomaly is situated in the south eastern part of Area 1. Its morphology indicates that it may relate to an isolated round house, but the response is very weak (0.3nT) and indistinct.

(3) – A group of weakly positive linear, curvilinear and discrete anomalies are situated in the northern part of the survey area. Although they are weak and appear truncated, it is possible that they relate to cut features with archaeological potential.

(4) – A discrete positive anomaly is located towards the south eastern corner of the survey area. It has a response of up to 25nT which may indicate an association with burning or burnt material within a pit. Other pit-like features can be seen further west, but it is not possible to confidently interpret them.

(5) – A number of very weakly positive linear anomalies can be seen, mainly in the western and southern parts of Area 1. It is possible that they relate to cut features, but they are very indistinct.

Anomalies associated with land management

(6) – A series of land drains are evident in the north eastern part of Area 1.

Anomalies with an agricultural origin

(7) – A series of parallel linear anomalies can be seen in the central western part of Area 1. These appear to relate to former ridge and furrow cultivation.

Anomalies associated with magnetic debris

(8) – Magnetic debris can be seen towards the north western corner. It is associated with material used during construction of the water pipeline.

3.5 List of anomalies - Area 2

Area centred on OS NGR 422420 194700, see Figs 08 – 10.

Anomalies of archaeological potential

(9) – Two parallel linear anomalies extend north north westwards towards the north western corner of Area 2. They have been truncated by land drains (14) and likely other agricultural activity but can be seen as very weak features further north. They relate trackway ditches and extend into Area 3 to the south (15).

(10) – Several linear anomalies can be seen parallel with and to the east of the trackway ditches (9). They relate to very weak linear field ditches associated with the archaeological features (25) to the south.

Anomalies with an uncertain origin

(11) – Zones of magnetic enhancement are not clearly defined, but could be associated with the adjacent archaeology.

(12) – A small number of discrete, pit-like anomalies have been located within the eastern part of the field. It is possible that they are of archaeological potential.

(13) – Short, weakly positive, linear anomalies are situated in the eastern part of Area 2. It is not possible to determine if they relate to cut features.

Anomalies associated with land management

(14) – A series of land drains extend across much of Area 2 and have truncated the earlier archaeological features.

3.6 List of anomalies - Area 3

Area centred on OS NGR 422445 194450, see Figs 11, 12, 16 & 17.

Anomalies of archaeological potential

(15) – Parallel positive linear anomalies, 6-9m apart, are a continuation of the trackway (9) that extends to the north west. Although it runs through the centre of a settlement, it appears to overlie several ring ditches, but at times it is difficult to clearly see the phasing so that is appears that it is overlain by other ring ditches. It continues through the settlement and into Area 4 to the south (29) and links to other trackways that extend through and around the settlement. There is some evidence for a negative response to patches of the internal trackway surface.

(16-22) – A large number of positive curvilinear ring ditches relate to round houses forming a settlement. There is evidence for phases of development, with many ring ditches truncated by later ones and also by linear ditches (16). Several groups are contained within and joined to external surrounding enclosure ditches (19) while other groups are conjoined (20). While the majority are round, with a diameter of 8-11m, others are much larger, with a diameter of up to 19m. There is also evidence for several more square features (21), which may also relate to former dwellings. Many of the ring ditches are associated with internal, and sometimes external, negative anomalies (19). While the positive response to the ring ditch relates to magnetically enhanced material within a cut feature, the negative anomaly is a response to material such as stone or sub-soil, which could relate to up-cast material, a surface/flooring or packing material within post-holes.

(23) – A number of round house ring ditches lie to the west of and outside of the main confines of the settlement. There is evidence for phasing and intercutting and the features tend to be less magnetically enhanced further away from the main core of the settlement. It is highly likely that there are further examples that cannot be seen in the data due to poor magnetic contrast.

(24) – A number of positive rectilinear and irregularly shaped enclosures form the core of the settlement. They are associated with the adjacent trackway ditches.

(25) – A number of weakly positive linear and rectilinear anomalies are situated to the north east of the settlement. These relate to field boundary ditches within the agricultural hinterland of the settlement, the more regular, rectangular layout could suggest a Romano-British date.

Anomalies with an uncertain origin

(26) – A number of weakly positive and some negative linear, curvilinear, rectilinear and discrete anomalies are situated in the western part of Area 3. They are so weak and poorly defined it is not possible to determine their origin, but it is possible that they relate to further archaeological features.

3.7 List of anomalies - Area 4

Area centred on OS NGR 422620 194275, see Figs 13 – 17.

Anomalies of archaeological potential

(27) – A complex series of ring ditches appear to lie within an enclosure with several appearing to be later cut by a trackway ditch. There are several phases of construction and two seemingly conjoined large ring ditches with a diameter of 18m and 21m. There is evidence for internal features, including widespread negative curvilinear and discrete anomalies indicating a response to possible surfaces and up-cast or construction material.

(28) – A linear group of up to 20 ring ditches extends south westwards from anomalies (27) just into the south eastern corner of Area 7. These relate to a number of round houses, with evidence for at least three phases of construction. Several appear to be overlain by the trackway ditches (29). Amongst the group is a D-shaped feature that also extends into Area 7.

(29) – Parallel positive linear anomalies form phases of trackway ditches extending south south eastwards from the core of the settlement to the north. They appear to have truncated several ring ditches and a small group of discrete positive responses lie in between them.

(30) – A series of positive and negative linear anomalies appear to be a continuation of the trackway (29). This part of the site is low lying waterlogged ground, and it appears that the trackway has migrated several times through this area. It also appears to continue south south eastwards into Area 5 (40). Several negative linear anomalies appear to have been truncated by the trackway and it is possible that these are associated with an earlier phase of drainage features within the lowest part of the field.

(31 & 32) – Parallel positive linear anomalies relate to two further trackways extending from the settlement to the east and south east.

(33) – A small number of pits are evident to the south of the core of the settlement. They appear to be in two parallel linear groups.

Anomalies with an uncertain origin

(34) – The southern part of the site contains a number of discrete positive responses. The majority are weak with no coherent layout; however, a group of five pit-like features do appear to form a ring and could have archaeological potential.

(35) – A number of weakly positive linear anomalies are situated in the south eastern part of Area 4. The magnetic susceptibility of the soils in this part of the site appear suppressed and so the anomalies are very weak and indistinct. Although there is a lack of magnetic contrast, it is possible that they relate to further cut features but an association with later activity, such as cultivation, is possible for some.

3.8 List of anomalies - Area 5

Area centred on OS NGR 422790 194010, see Figs 18 & 19.

Anomalies of archaeological potential

(36) – Positive linear anomalies relate to trackway ditches forming a Y-shaped feature that extend from the north east and east towards the River Cole to the west.

It cannot be seen clearly to the north in Area 4 or further east of Area 5, but it appears to be limited by anomaly (46) in Area 6

(37 & 38) – A small group of positive linear, rectilinear and curvilinear anomalies relate to enclosures (37), linear ditches and a possible ring ditch (38) bounded to the north by the southern trackway ditch.

(39) – A number of positive linear, rectilinear and discrete anomalies appear to the north of the trackway ditches with a few in between them.

(40) – Three positive linear anomalies appear to be a continuation of the trackway seen as anomalies (29 & 30) within Area 4 to the north west. The southern limit is not clear due to an area of periodically waterlogged ground causing magnetic anomalies (45).

Anomalies with an uncertain origin

(41) – Area 5 contains a number of weakly positive linear and curvilinear anomalies. They are so indistinct that they are barely visible in the data, although it is possible that they relate to further cut features with archaeological potential.

(42) – A linear group of five, short positive linear responses appear to relate to magnetic material disturbed or preserved by the ridge and furrow. They cannot be clearly resolved as a feature, but it is possible that the material is derived from an archaeological context.

Anomalies with an agricultural origin

(43) – The survey area contains ridge and furrow on two different orientations. It has truncated several of the earlier archaeological features.

(44) – Linear anomalies associated with more modern agricultural activity.

Anomalies with a natural origin

(45) – Patches of magnetic variation in the north western part of the survey area indicate a response to natural features.

3.9 List of anomalies - Area 6

Area centred on OS NGR 422085 194080, see Figs 20 & 21.

Anomalies of archaeological potential

(46) – A very weakly positive curvilinear anomaly appears to bound the trackway ditches seen in Area 5 to the west.

Anomalies with an uncertain origin

(47) – A number of short, weakly positive linear anomalies are located within and adjacent to anomaly (46). They lack a coherent morphology, but is possible that some relate to associated cut features.

(48) – Area 6 contains a small number of weakly positive discrete anomalies. Some form clusters with a linear group evident in the north. It is possible that they relate to cut features but their origin is uncertain.

(49) – A number of short, positive linear anomalies could relate to a fragmented linear ditch.

(50) – The central and eastern part of the survey area contain broad linear and curvilinear zones of magnetic enhancement. The cause of this enhancement is uncertain.

3.10 List of anomalies - Area 7

Area centred on OS NGR 422375 194215, see Figs 22 & 23.

Anomalies of archaeological potential

(51) – Positive linear anomalies appear to bound the western edge of the settlement seen to the north and east. There are a number of archaeological features including a small number of ring ditches at the north eastern and south eastern edges of Area 7, as well as further ditches associated with a trackway and a D-shaped enclosure.

Anomalies with a natural origin

(52) – Sinuous anomalies at the western edge of the site relate to natural features within the floodplain of the River Cole.

4 DISCUSSION

4.1.1 The survey has located a previously unrecorded prehistoric settlement covering at least 7ha and containing a number of trackways, enclosures and ring ditches relating to approximately 100 round houses. It appears that there are perhaps three or four phases of ring ditches in some groups (17) and although several have been truncated by later ditches (16), several appear to overlie the ditches. This could be due to a number of factors, such as the later ditches are shallower than the earlier ones or material has been redeposited in the later features. The ring ditches range in diameter from 8m to 19m, with

the majority circular (16), with others more oval in shape (17) and a small number more square in construction (19). They are clustered in groups, with several groups conjoined (18 & 20), but with many groups overlying one another in phases.

4.1.2 The ring ditches lie within and outside of the confines of a number of irregularly shaped enclosures (24) either side of the central trackway (15) which extends for at least 700m. To the north east of the settlement are a number of weakly positive linear and rectilinear anomalies (25) which relate field and paddock boundary ditches within the agricultural hinterland of the settlement. The rectilinear layout of the ditches could indicate a later Romano-British phase associated with realignment of field boundaries.

4.1.3 There are a number of Iron Age settlements within the vicinity, including the defended settlement of Badbury Camp hillfort, situated 3.5km to the east, a recently discovered late prehistoric undefended settlement at Gorse Hill, 2km to the north east (Archaeological Surveys, 2021a & 2021b) and a similar Iron Age settlement on the northern edge of Highworth, Swindon, 2.3km to the south west (Archaeological Surveys, 2018 & 2019). Although the full extent of these nearby settlements has not be identified, they appear less densely occupied than, or as large as, the site located at Coleshill which is almost equidistant between the two.

4.1.4 During the course of the survey pottery sherds and a widespread stone scatter correlating with the settlement were were noted, (see 1.5.4). The pottery sherds were mainly small dark grey fragments of coarse fabrics with clear inclusions of a white quartzite, some sherds with angular inclusions, others rounded. A simple rim form was visible on one sherd, another appeared very light and organically tempered, some contained limestone inclusions. Within the southern part of Area 3 and northern part of Area 4 several sherds relating to large vessels of Savernake Ware (having flint inclusions) were observed and a very small number of Roman greyware sherds. Sherds were only observed during the survey and were not collected; however, generally they infer widespread occupation in the Iron Age lasting into the Roman period. The Roman material appeared less widespread occurring as a small number of sherds in the central eastern part of the settlement. The widespread scatter of mixed stone types, often fire-reddened, would infer debris associated with former structures and habitation as well as trackways and consolidated surfaces. There was no clear evidence of stone tiles or masonry suitable for walling.

4.1.5 The settlement is located on a higher area of ground within Area 3, surrounded by alluvial deposits to the north, west and south. There are superficial deposits of Quaternary sands and gravels recorded in this part of the site, but during the survey there were frequent observations of stone, prehistoric pottery and other occupational debris, rather than naturally sandy and gravelly soil. The anomalies relating to round houses and enclosures within the settlement are of a higher magnitude at 5-12nT than the trackway ditches (9) and enclosures (25) outside of the core which are generally 0.5-

1.5nT. This appears to be partly due to the 'habitation effect', where the magnetic strength of the anomalies decreases away from the core of the settlement due to the diminishing volume of magnetically enhanced material within the cut features, but a significant factor is also likely to be the hydrology of the soil, where frequently wet or waterlogged ground in lower lying areas is preventing magnetic enhancement. As a consequence, as features extend away from the core area of the settlement into lower ground, associated magnetic anomalies fade and become invisible, this is particularly evident for the trackway ditches that extend to the north and south of the site. It is likely, therefore, that some archaeological features have not been located by the survey and as well as trackway ditches and field boundaries, these could include further ring ditches that lie further from the core of the settlement immediately beyond the limit of those located.

4.1.6 Situated approximately 300m to the south of the settlement in Area 5 there are further archaeological features including a Y-shaped trackway. It is not clear if it is directly associated with the settlement to the north, but a number of enclosures, linear ditches and a ring ditch can be seen either side of the trackway which appears to end abruptly at a curvilinear ditch forming a terminus at the eastern end within Area 6. Despite good conditions for surface observations, no cultural material was seen in the zone of archaeological anomalies within Areas 6 and 7 which contrasts strongly with Areas 3 and 4.

5 CONCLUSION

5.1.1 The geophysical survey has located evidence for a settlement, with a number of trackways, enclosures and round houses spread over an area of approximately 7ha in the central part of the site. Further south there is evidence of a trackway with associated enclosures of archaeological potential. The archaeology appears to be located on the higher ground above the floodplain of the River Cole; however, the lower ground is subject to periodic flooding and waterlogging, and it is possible that some features are present within these zones but have not produced magnetic anomalies.

5.1.2 The settlement is associated with a widespread stone and pottery sherd scatter, the latter inferring an Iron Age date extending at least into the early Roman period. The morphology and phasing of the anomalies may also be consistent with a long period of use through the Iron Age with some evidence for the realignment of field boundaries on the eastern side of the settlement probably indicative of Roman activity.

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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: J943-mag-Area1-proc.xcp
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 422022.25, 194722.124 m
Southeast corner: 422336.20, 194418.22 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Dimensions
Survey Size (meters): 314 m x 304 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 1766026, Recorded: 1766031
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.64
Mean: 0.00
Median: 0.00
Composite Area: 9.5409 ha
Surveyed Area: 5.3015 ha
PROGRAM
Name: TerraSurveyor
Version: 3.0.37.0
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Area 1 filtered data
Filename: J943-mag-Area1-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.63
Mean: 0.01
Median: 0.00
GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 201
5 Clip from -3.00 to 3.00 nT

Area 2 minimally processed data
Filename: J943-mag-Area2-proc.xcp
Northwest corner: 422253.68, 194897.53 m
Southeast corner: 422579.33, 194518.48 m
Dimensions
Survey Size (meters): 326 m x 379 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 2407259, Recorded: 2407264
Max: 3.32
Min: -3.30
Std Dev: 0.74
Mean: 0.01
Median: 0.00
Composite Area: 12.344 ha
Surveyed Area: 6.797 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Area 2 filtered data
Filename: J943-mag-Area2-proc-hpf-lpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.61
Mean: 0.01
Median: 0.00
GPS based Proce6
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 300
5 Lo pass Uniform (median) filter: Window dia: 13
6 Clip from -3.00 to 3.00 nT

Area 3 minimally processed data
Filename: J943-mag-Area3-proc.xcp

Northwest corner: 422182.73, 194660.07 m
Southeast corner: 422675.93, 194237.82 m
Dimensions
Survey Size (meters): 493 m x 422 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 3369793, Recorded: 3369793
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.09
Mean: 0.03
Median: 0.01
Composite Area: 20.825 ha
Surveyed Area: 10.157 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 4 minimally processed data
Filename: J943-mag-Area4-proc.xcp
Northwest corner: 422419.93, 194492.44 m
Southeast corner: 422833.33, 194063.14 m
Dimensions
Survey Size (meters): 413 m x 429 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 3474637, Recorded: 3474642
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.90
Mean: 0.02
Median: 0.00
Composite Area: 17.747 ha
Surveyed Area: 9.3909 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Area 4 filtered data
Filename: J943-mag-Area4-proc-hpf.xcp
stats
Max: 3.32
Min: -3.30
Std Dev: 0.86
Mean: 0.02
Median: 0.00
GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 300
5 Clip from -3.00 to 3.00 nT

Area 5 minimally processed data
Filename: J943-mag-Area5-proc.xcp
Northwest corner: 422547.27, 194208.29m
Southeast corner: 423005.22, 193855.49 m
Dimensions
Survey Size (meters): 458 m x 353 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 3079403, Recorded: 3079408
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.73
Mean: 0.02
Median: -0.01
Composite Area: 16.156 ha
Surveyed Area: 9.569 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

Area 6 minimally processed data

Filename: J943-mag-Area6-proc.xcp
Northwest corner: 422855.04, 194250.06 m
Southeast corner: 423328.74, 193871.31 m
Dimensions
Survey Size (meters): 474 m x 379 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 3430413, Recorded: 3430418
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.67
Mean: 0.00
Median: 0.00
Composite Area: 17.941 ha
Surveyed Area: 10.148 ha

Area 7 minimally processed data
Filename: J943-mag-Area7-proc.xcp
Northwest corner: 422250.32, 194289.70 m
Southeast corner: 422497.07, 194171.05 m
Dimensions
Survey Size (meters): 247 m x 119 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 529419, Recorded: 529424
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.88
Mean: 0.02
Median: 0.00
Composite Area: 2.9277 ha
Surveyed Area: 1.5213 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (UTM to OSGB36).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00 nT

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 draft copy will be supplied to the Oxfordshire county archaeological officer for comment and the agreed final copy supplied in PDF format to the Oxfordshire Historic Environment Record. The data will be archived with the Archaeology Data Service (ADS) and the report uploaded to Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

File type	Naming scheme	Description
Data	J943-mag-**[area number/name]**.asc J943-mag-**[area number/name]**.xcp J943-mag-**[area number/name]**-proc.xcp	Raw data as ASCII CSV TerraSurveyor raw data TerraSurveyor minimally processed data
Graphics	J943-mag-**[area number/name]**-proc.tif	Image in TIF format
Drawing	J943-**[version number]**.dwg	CAD file in 2018 dwg format
Report	J943 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 TRACK ARCHAEOLOGY		127,63,79	Line, polyline or polygon (solid)
AS-ABST MAG NEG LINEAR ARCHAEOLOGY		127,0,255	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)
AS-ABST MAG POS UNCERTAIN		255,127,0	Polygon (cross hatched ANSI37)
Anomalies relating to land management			
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)
Anomalies with a natural origin			
AS-ABST MAG NATURAL FEATURES		204,178,102	Polygon (cross hatched ANSI37)

Table 3: CAD layering

Appendix F – copyright and intellectual property

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Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Land off Snowswick Lane
Coleshill
Oxfordshire

Map of survey area

Survey location

Site centred on OS NGR
SU 22640 94280

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 01

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Land off Snowswick Lane
Coleshill
Oxfordshire

Referencing information

422000 422100 422200 422300 422400 422500 422600 422700 422800 422900 423000 423100 423200 423300 423400 423500

194800 194700 194600 194500 194400 194300 194200 194100 194000 193900 193800 193700 193600

Figs 05-07
Figs 08-10
Figs 11-12
Figs 13-15
Figs 16-17
Figs 18-19
Figs 20-21
Figs 22-23

Area 1
Area 2
Area 3
Area 4
Area 5
Area 6
Area 7

N

Referencing grid to OSGB36 datum at 100m intervals

422600 194300

Survey tracks

Survey track start

Survey track stop

SCALE 1:5000

0m 100 200m

SCALE TRUE AT A3

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KTD	DJS	FIG 02

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Greyscale plot of minimally processed magnetometer data

+3nT

-3nT

SCALE 1:4000

0m 40 80 120 160 200m

SCALE TRUE AT A3

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KTD	DJS	FIG 03

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Abstraction and interpretation of magnetic anomalies

Area 1

Area 2

Area 3

Area 4

Area 5

Area 6

Area 7

N

- Positive linear anomaly - cut feature of archaeological potential
- Positive curvilinear/rectilinear anomaly - enclosure ditch
- Positive curvilinear anomaly - round house ring ditch
- Negative linear anomaly - of archaeological potential
- Positive linear anomaly - trackway ditch
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Linear anomaly - ridge and furrow
- Positive/weak multiple dipolar linear anomaly - possible land drain
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Variable magnetic response - of natural origin
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:4000

0m 40 80 120 160 200m

SCALE TRUE AT A3

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KTD	DJS	FIG 04

Area 1

N

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Greyscale plot of minimally processed magnetometer data - Area 1

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

SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 05

Area 1

N

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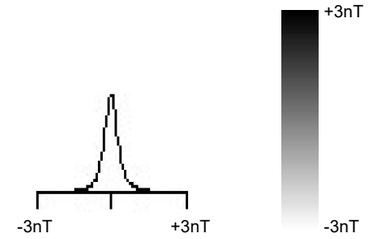
Greyscale plot of filtered magnetometer data - Area 1



SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 06

Area 1

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Abstraction and interpretation of magnetic anomalies - Area 1

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Positive/weak multiple dipolar linear anomaly - land drain
- Linear anomaly - ridge and furrow
- 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 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 07

Area 2

rea 1

N

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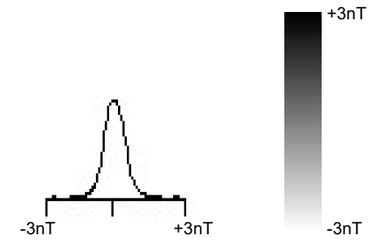
Greyscale plot of minimally processed magnetometer data - Area 2



SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 08

Area 2

Area 1

N

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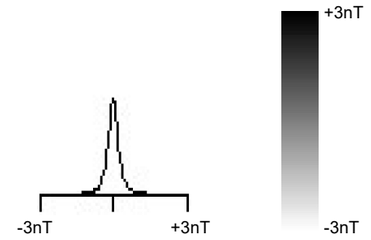
Greyscale plot of filtered magnetometer data - Area 2



SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 09

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Abstraction and interpretation of magnetic anomalies - Area 2

Area 1

Area 2

N

1 2 3 4 5 6 7 9 10 11 12 13 14 17 20 25

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - trackway ditch
- Positive linear anomaly - possible ditch-like feature
- Positive/weak multiple dipolar linear anomaly - land drain
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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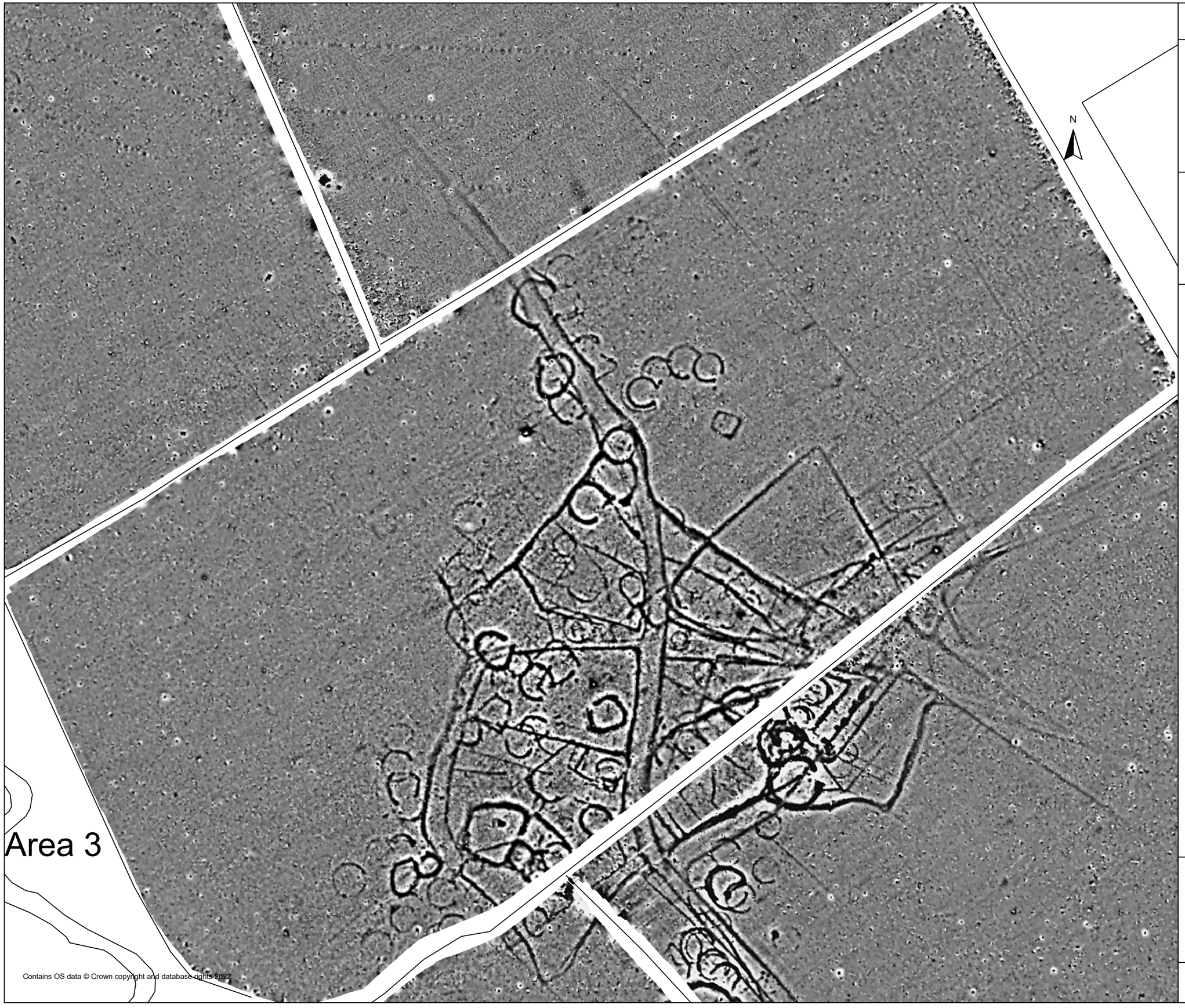
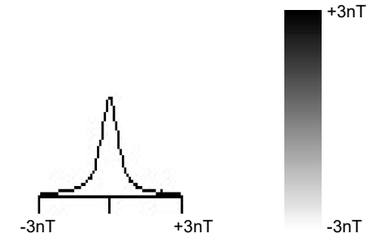
Greyscale plot of minimally processed magnetometer data - Area 3





SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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Abstraction and interpretation of magnetic anomalies - Area 3

N

Area 3

- Positive linear anomaly - cut feature of archaeological potential
- Negative linear anomaly - of archaeological potential
- Positive linear anomaly - trackway ditch
- Positive rectilinear/curvilinear anomaly - enclosure ditch
- Positive curvilinear anomaly - round house ring ditch
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Strong dipolar anomaly - ferrous object

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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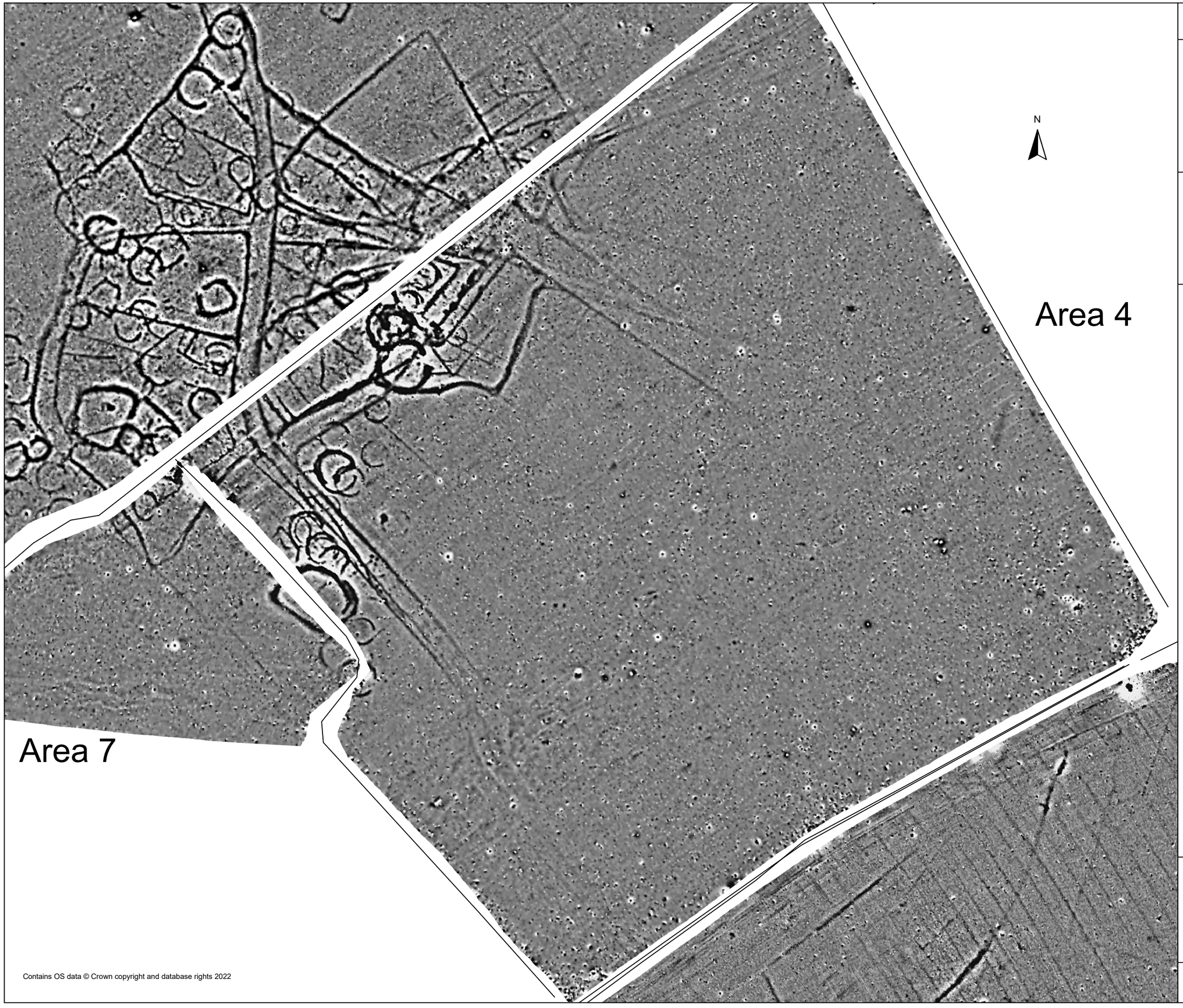
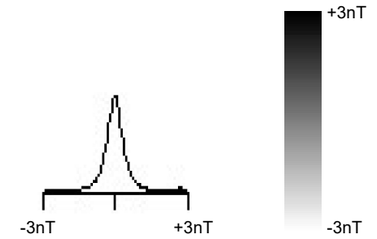
Greyscale plot of minimally processed magnetometer data - Area 4





SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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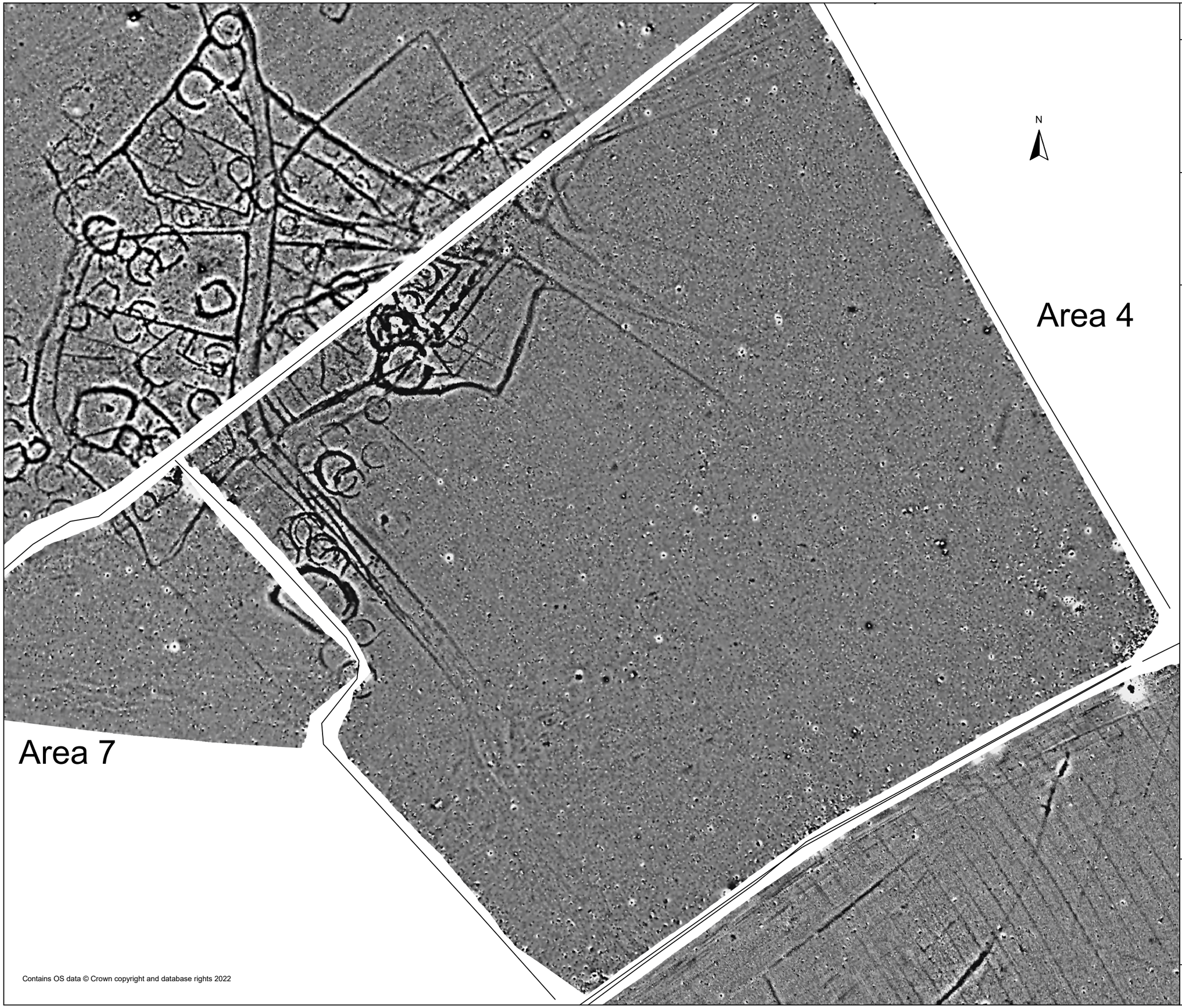
KTD	DJS	FIG 13



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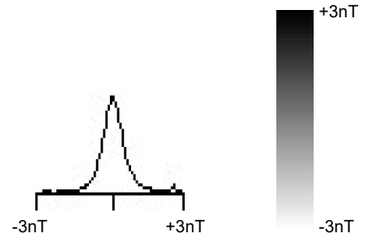
Greyscale plot of filtered magnetometer data - Area 4



SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 14

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Abstraction and interpretation of magnetic anomalies - Area 4

Area 4

Area 7

N

- Positive linear anomaly - cut feature of archaeological potential
- Negative linear anomaly - of archaeological potential
- Positive linear anomaly - trackway ditch
- Positive rectilinear/curvilinear anomaly - enclosure ditch
- Positive curvilinear anomaly - round house ring ditch
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Strong dipolar anomaly - ferrous object

SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 15

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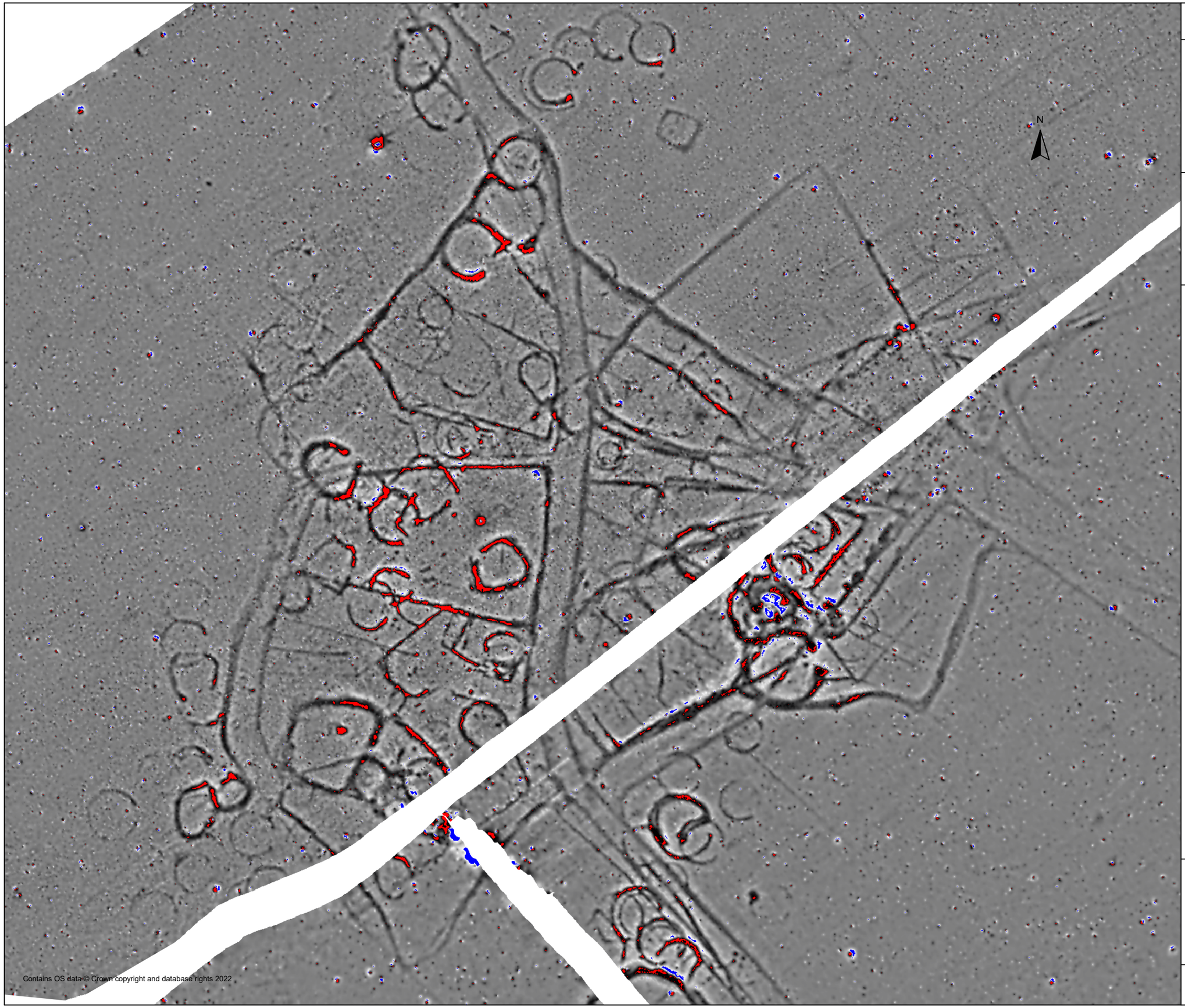
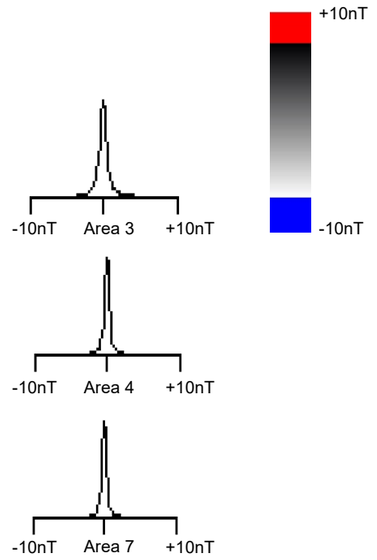
Greyscale plot of minimally processed magnetometer data - main area of archaeology





SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 16

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Abstraction and interpretation of magnetic anomalies - main area of archaeology

N

- Positive linear anomaly - cut feature of archaeological potential
- Negative linear anomaly - stone/subsoil of archaeological potential
- Positive linear anomaly - trackway ditch
- Positive rectilinear/curvilinear anomaly - enclosure ditch
- Positive curvilinear anomaly - ring ditch
- Discrete positive response - cut feature of archaeological potential
- Discrete negative response - stone/subsoil
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 17

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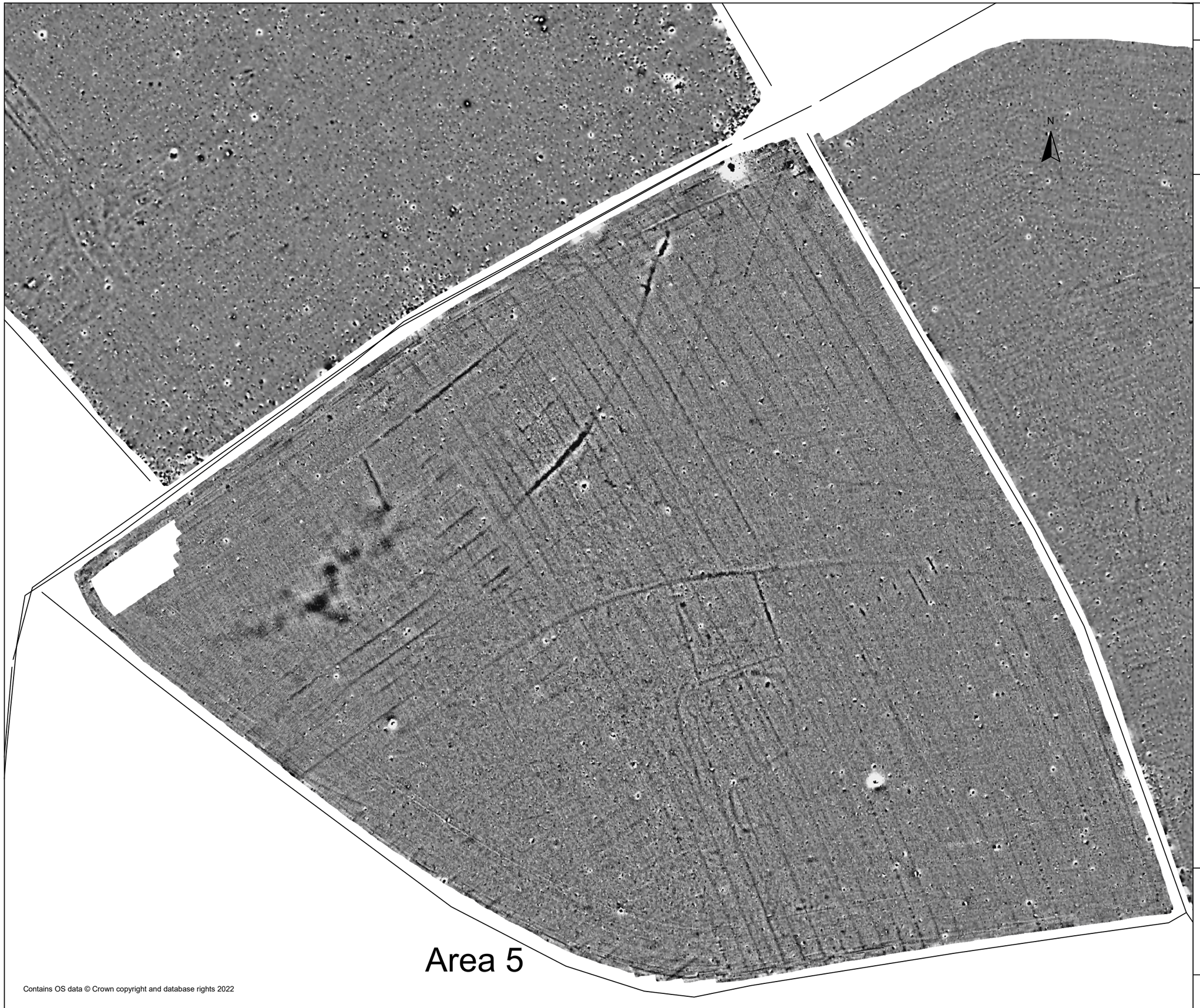
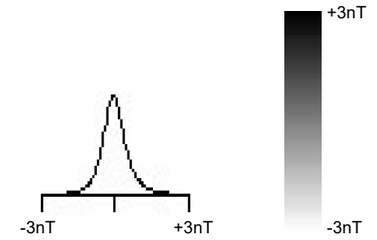
Greyscale plot of minimally processed magnetometer data - Area 5





SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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Abstraction and interpretation of magnetic anomalies - Area 5

N

29
30
34
39
40
45
36
47
46
42
37
38
41
43
44

Area 5

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - trackway ditch
- Positive rectilinear/curvilinear anomaly - enclosure ditch
- Positive curvilinear anomaly - round house ring ditch
- Positive linear anomaly - possible ditch-like feature
- Positive linear anomaly - ridge & furrow
- Linear anomaly - of agricultural origin
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Variable magnetic response - of natural origin
- Strong dipolar anomaly - ferrous object

SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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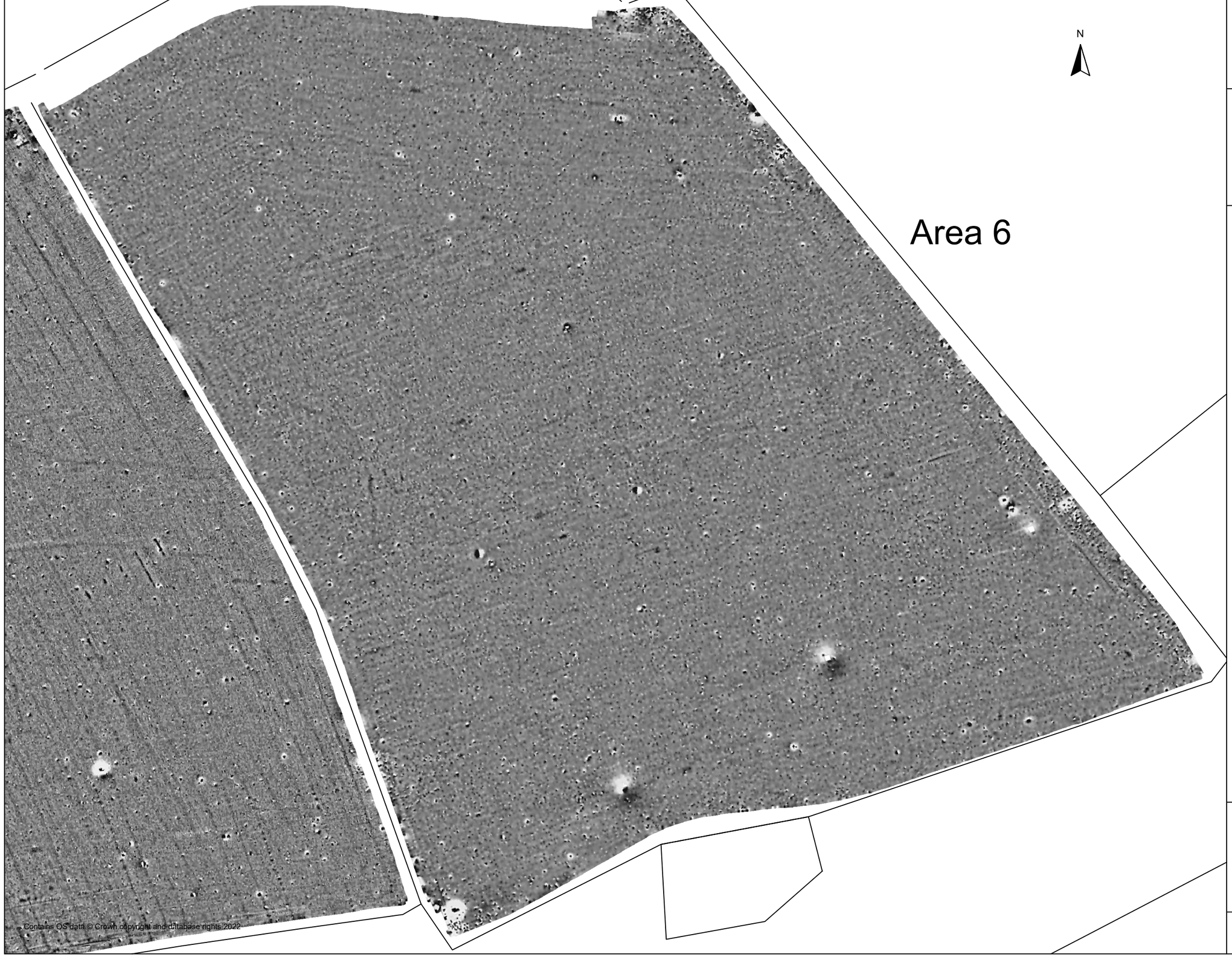
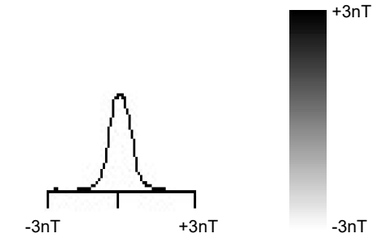
Greyscale plot of minimally processed magnetometer data - Area 6





SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 20

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Abstraction and interpretation of magnetic anomalies - Area 6

N

Area 6

50
48
47
46
42
49
37
43

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- 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 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 21

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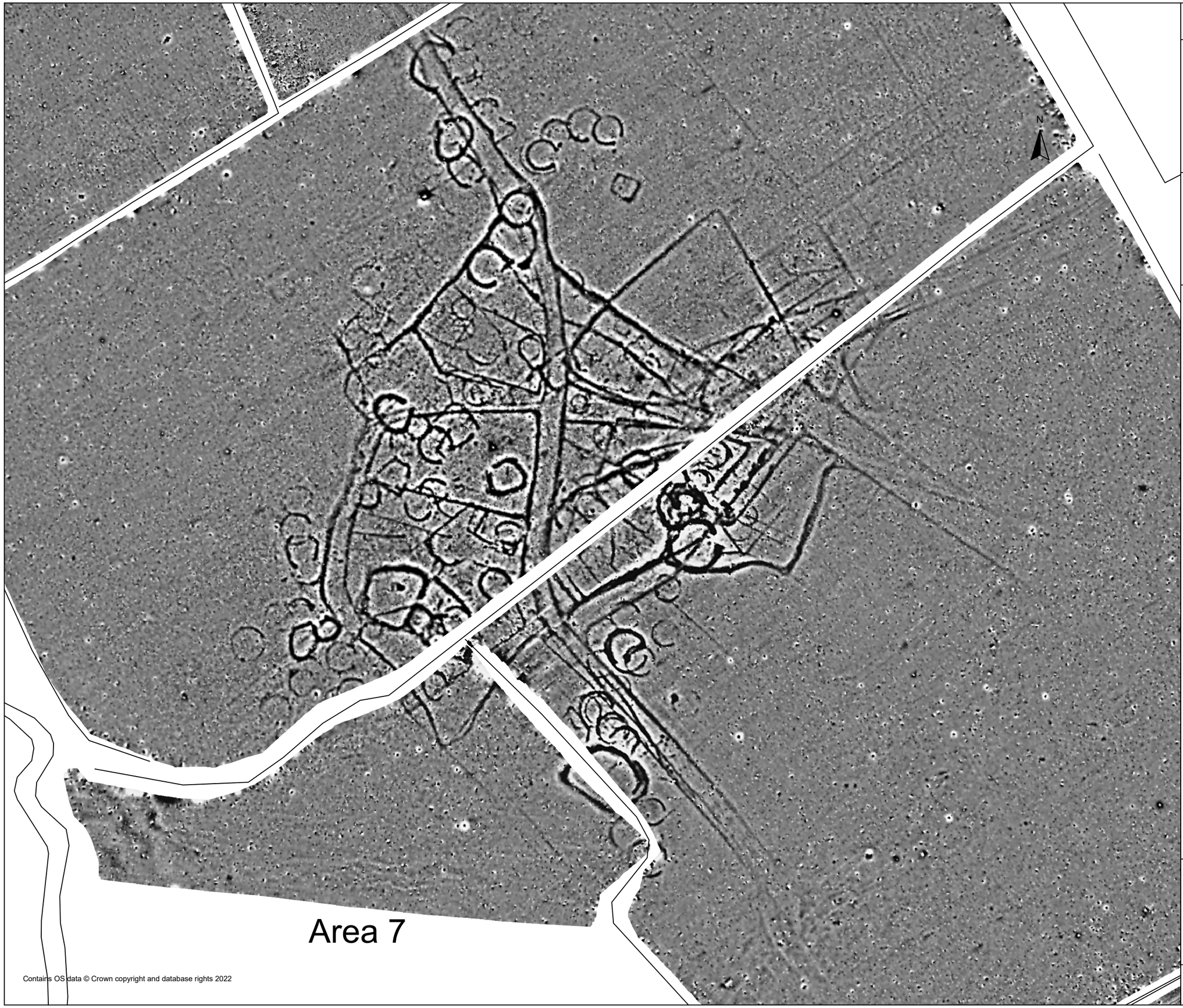
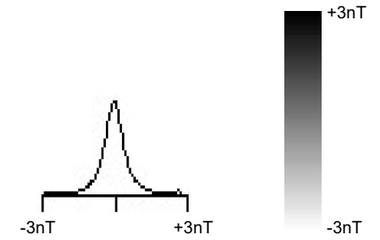
Greyscale plot of minimally processed magnetometer data - Area 7





SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 22

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Abstraction and interpretation of magnetic anomalies - Area 7

N

Area 7

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - trackway ditch
- Positive rectilinear/curvilinear anomaly - enclosure ditch
- Positive curvilinear anomaly - round house ring ditch
- Negative linear anomaly - of uncertain origin
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Variable magnetic response - of natural origin
- Strong dipolar anomaly - ferrous object

SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

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KTD	DJS	FIG 23