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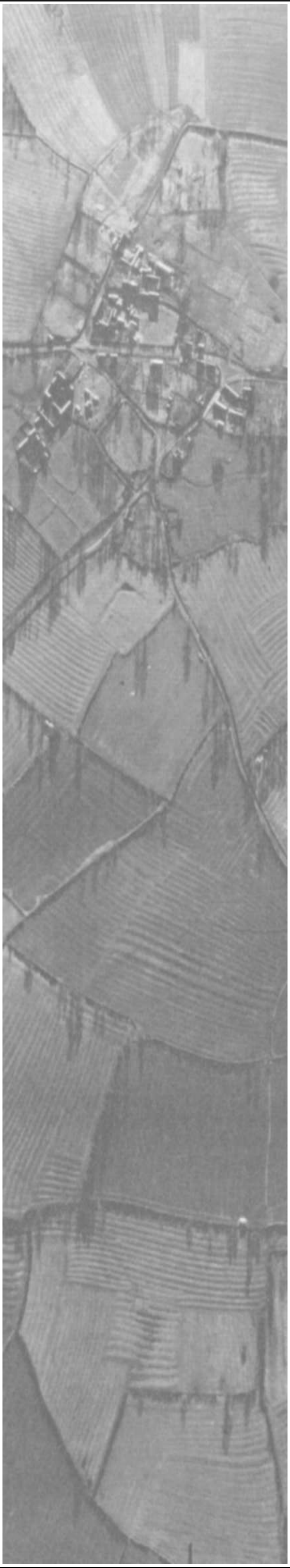

Manor Farm
West Worldham
Hampshire

MAGNETOMETER SURVEY REPORT

for

A & W Brock Ltd

Kerry Donaldson & David Sabin

May 2021

Ref. no. J859

ARCHAEOLOGICAL SURVEYS LTD

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West Worldham
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SUMMARY

Detailed magnetometry was carried out by Archaeological Survey Ltd ahead of a planning application for a proposed solar farm at West Worldham in Hampshire. The results indicate the presence of two series of rectilinear enclosures and a possible trackway primarily within the northern part of the site (north of the B3006), but there is some evidence for one enclosure just extending into the southern part of the site (south of the B3006). Within the rest of the site the survey has located a number of positive linear anomalies but the majority of these are very weak, short and lack a coherent morphology preventing confident interpretation. Much of the southern part of the site appears to have been subject to the introduction of magnetic contamination which is usually associated with the process of soil conditioning and which may have partially obscured the weaker anomalies.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Juno Energy, on behalf of A & W Brock Ltd, to undertake a magnetometer survey of an area of land at Manor Farm, West Worldham in Hampshire. The site has been outlined for a proposed development of a solar farm and the survey forms part of an archaeological assessment.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin. The survey was carried out using an ATV-towed array of 5 sensors spaced 0.5m apart in April 2021 (see 2.2 for survey detail).

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) *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 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. For this reason should targeting of anomalies by excavation be carried out, care should be taken to place trenches over solid lines or features visible on the abstraction and interpretation plots.

1.4 Site location, description and survey conditions

1.4.1 The site is located on agricultural land 800m west of West Worldham and 1.2km south of Alton within the parish of Worldham in Hampshire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SU 72800 37300, see Figs 01 and 02.

1.4.2 The geophysical survey covers approximately 60ha within nine separate land parcels. Areas 1 to 4 lie to the south of the B3006 Selborne Road and Areas 5 to 9 lie to the north of it. The majority of the survey areas were awaiting cultivation or drilling, while areas 3, 8 & 9 were under pasture.

1.4.3 Area 1 is a level field with evidence of a shallow linear depression orientated east – west in the northern half representing a former ditch or drain. A pylon is located in the central part of the field and dilapidated agricultural buildings lie immediately beyond the north eastern corner in an area known as Darby's Dell. During the survey the ground surface was very dry and uneven due to poaching and the presence of flint nodules. Land boundaries are a mixture of hedgerows with post and wire fencing. Area 2 is similar and lies immediately east of Area 1 and west of Copse Close. Area 3 is a narrow pasture field immediately west of Area 1. Area 4 lies immediately north of Area 1 and Darby's Dell. The field contained patchy vegetation and much of the surface was uneven or rutted. The area slopes down towards the north west and there is evidence of an infilled quarry pit near the south eastern corner.

1.4.4 Area 5 contains a low hilltop in the central part of the field with land sloping down towards the north and south. The western side was deeply rutted in places and contained a narrow zone of cover crop The area is located immediately north west of Wild Duck Copse. Area 6 is located to the south east of the copse on reasonably level ground. The south eastern boundary appears to be a hedgebank. Area 7 lies to the north of Hamble Pits Copse, the eastern side of the field is fairly level with land sloping down to the west. A pylon is located adjacent to the southern boundary and the far northern part of the field contained a cover crop at the time of survey. Area 8 lies immediately east of Area 7 and is partly bounded on the north east side by the deeply incised track known as Water Lane. The central part of the field contains a pylon and to the south of this there was a large steel animal feeder. The northern part of the field contains a large, deep pit representing a former quarry. Area 9 is a narrow field immediately north east of Area 6. An earth bank crosses the southern part of the field and a very small separate area of grass, close to the southern end, appears to be defined by earth banks.

1.4.5 The ground conditions across the site were variable due to poached and rutted ground but were generally considered to be suitable for the collection of magnetometry data. Some very small zones of cover crop in Areas 5 and 7 were unsurveyable due to the height of the vegetation. The steep side of the former quarry pit at the northern end of Area 8 were also unsurveyable. Sources of magnetic disturbance were identified and these include steel pylons, high voltage overhead electricity cables, a large steel animal feeder, gates, troughs, etc. Weather conditions during the survey were mainly fine and dry.

1.5 Site history and archaeological potential

1.5.1 An Archaeological Desk-Based Assessment has been produced for the site (Wessex Archaeology, 2021). It outlines that the Hampshire Historic Environment Record (HER) records the location of two 19th century cottages, known as 1 and 2 Little Wood Cottages, within the southern part of the site. Also, within and immediately surrounding the site are a number of old chalk pits recorded on 19th century mapping.

1.5.2 Within the wider vicinity there are several findspots of prehistoric flint scatters, Iron Age and Romano-British pottery scatters and cropmarks of possible field boundaries identified from aerial photographs to the north east.

1.5.3 There is a limited amount of archaeological sites and findspots directly within the site; however, this can be partly due to a lack of previous archaeological investigations. There is always potential for the geophysical survey to locate anomalies that relate to archaeological features, should they be present within the site.

1.6 Geology and soils

1.6.1 The underlying geology within the southern and eastern parts of the site (Areas 1- 4, 6 & 9) is calcareous sandstone and siltstone from the Upper Greensand Formation. Within the western and northern parts of the site (Areas 5, 7 & 8) the underlying geology is from the West Melbury Marly Chalk Formation. There is a narrow band of overlying head deposits within the dry valley between Areas 5 and 7 and within Area 9 (BGS, 2017).

1.6.2 The overlying soil across the majority of the site is from the Harwell association and is a typical argillic brown earth. It consists of a well drained, loamy soil over sandstone. Within the majority of Areas 5 and 7 and the north western corners of Areas 4 and 8 the soil is from Coombe 1 association which is a typical brown calcareous earth and consists of a well drained, fine, silty soil, deep in valley bottoms, shallow to chalk on valley sides (Soil Survey of England and Wales, 1983).

1.6.3 The underlying geology and soils are frequently associated with low magnetic contrast and low levels of magnetic susceptibility. However, cut features of archaeological potential may be located where human activity has altered the magnetic characteristics of the soil sufficiently. 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 100Hz. The cart is towed using an ATV. 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 Data processing has been carried out in all areas except for Area 6 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. Additional data processing has been carried out for Areas 3, 6, 7 & 8 in the form of low pass filtering. This 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.

2.3.5 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 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 nine survey areas covering approximately 60ha.

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

3.1.3 Anomalies located within each survey area have been numbered and are described in 3.4 to 3.12 below with subsequent discussion in Section 4.

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.

3.2.2 Some fields within the site contain moderate levels of magnetic debris considered likely to be associated with the use of magnetic material within soil conditioners or possibly due to use of contaminated green waste. Data have been subject to additional filtering due to slight defects caused by magnetic disturbance associated with large steel objects, rutted or uneven ground conditions and cultivation trends.

3.2.3 Anomalies located by the survey appear very low in magnitude which can be indicative of low levels of soil magnetic susceptibility. It is likely that slightly acid conditions are present within the soil which can mobilise ferrous minerals effectively lowering the iron content of the topsoil. Chalk soils can be associated with very low levels of iron and soils derived from Upper Greensand are frequently associated with low levels of magnetic susceptibility, probably due to the prevalence of glauconite, a ferrous mineral that does not readily produce magnetic enhancement. A single soil sample was taken at random from Area 9 and a mass specific magnetic susceptibility measurement was made using a Bartington MS2 with MS2B sensor. The average value (X_{lf}) obtained from a subset of the topsoil sample was 2.75 $10^{-8}m^3kg^{-1}$ which is very low. However, although the sample is consistent with the very weak anomalies located by the magnetometry, a single sample may not be fully representative, and where anthropogenic activity is sufficiently intensive or long-lived, useful enhancement is still possible.

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	The category applies to a range of anomalies where <u>there is not enough evidence to confidently</u>

origin	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.

Table 1: List and description of interpretation categories

3.4 Summary of anomalies - Area 1

Area centred on OS NGR 472590 136820, see Figs 06 – 08.

3.4.1 Area 1 contains a number of very weakly positive linear anomalies. They are all generally short, lack a coherent morphology and do not obviously continue into adjacent survey areas. They cannot be clearly identified as cut features, some could be associated with land drainage. The entire area contains numerous and widespread strong, discrete, dipolar anomalies indicative of magnetically contaminated spreads possibly associated with composted green waste or other soil conditioners. Other anomalies relate to a recently removed field boundary, land drains and magnetic debris and disturbance adjacent to the barns in the north and a pylon.

3.5 Summary of anomalies - Area 2

Area centred on OS NGR 472855 136905, see Figs 09 – 11.

Anomalies of archaeological potential

(1) – A short, positive linear anomaly extends into the north eastern part of the survey area for approximately 13m. It appears to be a continuation of the enclosure ditch (17) seen within Area 6 immediately to the north east.

Anomalies with an uncertain origin

(2) – A number of weakly positive linear anomalies are located in the north eastern part of the survey area. They lack a coherent morphology and cannot be clearly associated with the enclosures to the north; however, given their proximity to them an archaeological origin should be considered.

(3) – A positive linear anomaly extends across the central part of the survey area and could relate to a cut, linear ditch. Other anomalies within the area are generally very short and lack a coherent morphology.

Anomalies associated with land management

(4) – A series of land drains can be seen towards the north eastern part of the survey area.

Anomalies associated with magnetic debris

(5) – The whole of the survey area is covered with widespread magnetic debris, although only the densest areas have been abstracted in order not to obscure weaker anomalies. Although there is a dense zone towards the south west, within the area indicated on the HER for the 19th century Little Wood Cottages (HER ID 42316) the magnetic debris is generally similar to the rest of the survey area and not consistent with a demolished building.

(6) – The entire survey area contains widespread and numerous strong, discrete, dipolar responses. This generally relates to ferrous and other magnetically thermoremnant objects that are incorporated within soil conditioners.

3.6 Summary of anomalies - Area 3

Area centred on OS NGR 472445 136795, see Figs 06 – 08.

3.6.1 Area 3 contains a small number of weakly positive linear anomalies and a discrete area of magnetic enhancement, these are uncertain in origin. Other anomalies are associated with a formerly mapped field boundary and an infilled pond in the south eastern part of the field.

3.7 *Summary of anomalies - Area 4*

Area centred on OS NGR 472628 137260, see Figs 12 –14.

Anomalies with an uncertain origin

(7) – Three parallel positive linear anomalies can be seen in the south eastern part of Area 4. It is possible that they relate to land drains leading towards anomaly (9).

(8) – The survey area contains a small number of weakly positive linear anomalies. They lack a well defined morphology and it is not possible to determine if they relate to cut features.

Anomalies associated with land management

(9) – A multiple dipolar linear anomaly relates to a land drain and may be associated with anomalies (7).

(10) – Weakly positive linear anomalies associated with strong dipolar responses and patches of magnetic debris relate to formerly mapped field boundary ditches.

Anomalies associated with magnetic debris

(11) – A large area of strongly magnetic debris and associated magnetic disturbance is a response to modern ferrous material used within the infill of a former chalk pit (Darby's Dell).

3.8 *Summary of anomalies - Area 5*

Area centred on OS NGR 472915 137445, see Figs 15 – 17.

Anomalies of archaeological potential

(12) – A number of broad, weakly positive, linear responses can be seen in the northern part of the survey area. They appear to be a continuation of anomalies (24) seen within Area 7 to the west.

Anomalies with an uncertain origin

(13 & 14) – Area 5 contains a small number of weakly positive linear (13) and discrete (14) anomalies. Several are grouped near to anomalies (12), but it is not clear if they relate to cut features with archaeological potential.

Anomalies associated with land management

(15) – The southern and western parts of the survey area contain evidence for land drainage.

Anomalies with a modern origin

(16) – A strong, multiple dipolar linear anomaly extends across the northern part of the survey area and is a response to a service or pipe within the line of a formerly mapped field boundary ditch.

3.9 Summary of anomalies - Area 6

Area centred on OS NGR 473065 137175, see Figs 18 – 20.

Anomalies of archaeological potential

(17) – The survey area contains a number of sub-rectilinear enclosure ditches, with two conjoined and one overlying another. Two of the enclosures appear to have entrances on the eastern sides. The southernmost enclosure also appears to extend southwards partially into Area 2 as anomaly (1). The morphology would indicate they relate to enclosures from the Roman or possibly Iron Age period. There appears to be only a small number of pits within the confines of the enclosures, but a small patch of magnetic debris could relate to occupation material.

(18) – A positive linear anomaly is located to the south east of the enclosures and although it is on a slightly different orientation, the response is consistent with that of a cut, linear ditch. Other positive linear anomalies can be seen to the west and these could also be of archaeological potential given their proximity to and possible relationship with the enclosures.

Anomalies with an uncertain origin

(19) – A number of positive linear anomalies extend through and to the west of the enclosures. They have a similar orientation to the enclosures; however, this is also the same orientation as the southern boundary of the site and the agricultural anomalies (21) and they could have an association with former agricultural activity,

and possibly ridge and furrow.

Anomalies associated with land management

(20) – A series of land drains appear to be located along the western boundary.

Anomalies with an agricultural origin

(21) – The survey area contains a number of parallel linear anomalies. These relate to agricultural activity.

Anomalies associated with magnetic debris

(22) – A patch of magnetic debris can be seen in the northern part of the survey area. This part of the survey area was part of the adjacent Wild Duck Copse until the late 20th century and this type of response is indicative of the burning of trees.

3.10 Summary of anomalies - Area 7

Area centred on OS NGR 473105 137740, see Figs 21 – 23.

Anomalies of archaeological potential

(23) – A number of weakly positive rectilinear anomalies are located towards the south eastern corner of Area 7. They relate to enclosures, one of which appears to have been truncated by anomaly (24).

(24) – Two sinuous positive broad linear anomalies flank a central negative response. This type of anomaly is indicative of a former trackway, and although former mapping shows field boundaries with narrow strips of woodland within the survey area, they do not correspond to any of the anomalies present. The positive responses can be seen to continue westwards into the northern part of Area 5 (12). The positive responses appear to relate to flanking ditches with an internal surface indicated by the negative response.

Anomalies with an uncertain origin

(25) – The survey area contains a number of short, weakly positive linear anomalies. It is possible that they relate to further cut features, with several short anomalies possibly relating to a continuation of the enclosure ditches (23).

Anomalies associated with land management

(26) – A number of land drains can be seen in the western half of the survey area.

Anomalies associated with magnetic debris

(27) – A linear zone of magnetic debris in the south western part of the survey area is associated with infill of a formerly mapped boundary ditch.

(28) – Small patches of weakly magnetic debris close to and within the confines of anomalies (23) could be a response to occupation material associated with the enclosures.

3.11 Summary of anomalies - Area 8

Area centred on OS NGR 473263 137890, see Figs 24 – 26.

Anomalies with an uncertain origin

(29) – The survey area contains a number of weakly positive linear anomalies, with a large number towards the eastern edge. They generally lack a coherent morphology and are poorly defined.

(30) – Two pit-like anomalies in the central western part of the survey area could be related to removed trees associated with a formerly mapped field boundary.

(31) – The northern part of the survey area contains a large depression, likely to relate to a former chalk pit. There are a number of discrete positive responses associated with an area of weakly magnetic debris.

(32) – A small number of short, weakly positive, curvilinear anomalies are located within the northern part of the survey area. It is not clear if they are deliberate cut features, or if they are associated with the former chalk extraction.

Anomalies with an agricultural origin

(33) – A series of parallel linear anomalies relate to former cultivation.

3.12 Summary of anomalies - Area 9

Area centred on OS NGR 473160 137220, see Figs 15 – 20.

Anomalies with an uncertain origin

(34) – Area 9 contains a number of positive linear anomalies. It is possible that they

relate to cut, ditch-like features.

Anomalies associated with magnetic debris

(35) – Situated at the southern end of the survey area is a broad curvilinear zone of magnetic debris and disturbance. This relates to a former line of the Selborne Road, which was straightened and redirected to the south in the mid-20th century.

4 DISCUSSION

4.1.1 The geophysical survey located anomalies associated with archaeological features primarily within the northern part of the site, relating to enclosures and a possible former trackway. Within Area 6, to the north of the B3006 Selborne Road, are three predominantly rectilinear enclosures(17) with some curvilinear elements on their eastern sides. Two are interconnected, while one appears to overlie another. There are a small number of positive linear anomalies in the vicinity which could relate to further cut features and also a small number of pit-like anomalies within the confines. The southernmost enclosure appears to just extend south westwards into Area 2 to the south of the B3006. Other anomalies in the north eastern part of Area 2 could also be associated but these are very weak and poorly defined.

4.1.2 Area 7 also contains a small number of weakly positive rectilinear anomalies (23) relating to further enclosures on the same orientation to and situated 480m north north east of the enclosures seen within Area 6. They appear to have been truncated by a possible former trackway feature (24) and also a shallow depression seen within the ground surface.

4.1.3 The survey areas contain weakly positive linear anomalies but the majority of them are short, weak and poorly defined and cannot be confidently interpreted as cut features. Several of the survey areas contain evidence for land drainage and formerly mapped field boundaries, as well as the original line of the Selborne Road (35) within Area 9 that was re-routed to the south in the mid-20th century.

4.1.4 The very low magnitude of former cut features is consistent with the very low magnitude of the topsoil mass specific magnetic susceptibility sample (see 3.2.3). Although the survey has clearly identified archaeological features, it cannot be determined whether remains are more extensive due to a lack of magnetic contrast associated with weak magnetic susceptibility.

5 CONCLUSION

5.1.1 The geophysical survey located anomalies within all of the survey areas but the majority were either short, weak or lacked a coherent morphology preventing confident interpretation. However, the results indicate the presence of anomalies relating to archaeological features primarily within two survey areas within the northern part of the site (Areas 6 & 7).

5.1.2 Other anomalies are generally associated with relatively modern use of the site, including evidence for land drains, formerly mapped field boundaries and the former route of the B3006 Selborne Road. Magnetic debris is evident within the infill of at least one former chalk pit and a pond; however, widespread magnetic contamination can be seen in the southern part of the site due to the introduction of ferrous items within spreads of soil conditioner.

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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

Filename: J859-mag-Area1-proc.xcp
Instrument Type: Sensys DLMGPS
UTM Zone: 30U
Survey corner coordinates (X/Y):OGB36
Northwest corner: 472486.36, 137074.81 m
Southeast corner: 472703.80, 136558.75 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Dimensions
Survey Size (meters): 217 m x 516 m
X&Y Interval: 0.18 m
Source GPS Points: Active: 5096010, Recorded: 5096010
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.82
Mean: 0.03
Median: 0.01
Composite Area: 11.221 ha
Surveyed Area: 9.3137 ha
PROGRAM
Name: TerraSurveyorPre
Version: 3.0.36.24
GPS based Proce4
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: J859-mag-Area1-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.73
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: 450
5 Clip from -3.00 to 3.00

Area 2

Filename: J859-mag-Area2-proc.xcp
Northwest corner: 472706.08, 137178.34 m
Southeast corner: 473035.78 136649.74 m
Dimensions
Survey Size (meters): 330 m x 529 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 5281434, Recorded: 5281434
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.06
Mean: 0.04
Median: 0.05
Composite Area: 17.428 ha
Surveyed Area: 10.862 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 2 filtered data

Filename: J859-mag-Area2-proc-hpf-lpf.xcp
Stats
Max: 5.53
Min: -5.50
Std Dev: 1.24
Mean: 0.04
Median: 0.04
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 400
4 Lo pass Uniform (median) filter: Window dia: 15
5 Clip from -5.00 to 5.00

Area 3

Filename: J859-mag-Area3-proc.xcp
Northwest corner: 472403.24, 137075.18 m
Southeast corner: 472520.84, 136510.43 m
Survey Size (meters): 118 m x 565 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 1716577, Recorded: 1716577
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.97
Mean: -0.02
Median: 0.02
Composite Area: 6.6415 ha
Surveyed Area: 3.7187 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: J859-mag-Area3-proc-hpf-lpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.71
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: 300
5 Lo pass Uniform (median) filter: Window dia: 15
6 Clip from -3.00 to 3.00

Area 4

Filename: J859-mag-Area4-proc.xcp
Northwest corner: 472453.60, 137488.04 m
Southeast corner: 472864.00, 137074.49 m
Dimensions
Survey Size (meters): 410 m x 414 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 5189023, Recorded: 5189023
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.79
Mean: 0.02
Median: 0.01
Composite Area: 16.972 ha
Surveyed Area: 9.3199 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: J859-mag-Area4-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.71
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: 300
5 Clip from -3.00 to 3.00

Area 5

Filename: J859-mag-Area5-proc.xcp
Northwest corner: 472768.16, 137687.62 m
Southeast corner: 473018.81, 137228.62 m
Dimensions
Survey Size (meters): 251 m x 459 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 2820468, Recorded: 2820468
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.75
Mean: 0.05
Median: 0.04
Composite Area: 11.505 ha
Surveyed Area: 5.2548 ha
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 600
5 Clip from -3.00 to 3.00

Area 5 filtered data
Filename: J859-mag-Area5-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.72
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: 300
5 Clip from -3.00 to 3.00

Area 6

Filename: J859-mag-Area6-proc.xcp
Northwest corner: 472921.45, 137355.83 m
Southeast corner: 473158.90, 137010.83 m
Dimensions
Survey Size (meters): 237 m x 345 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 1612452, Recorded: 1612452
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.70
Mean: 0.05
Median: 0.04
Composite Area: 8.192 ha
Surveyed Area: 3.7486 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 filtered data
Filename: J859-mag-Area6-proc-lpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.68
Mean: 0.04
Median: 0.03
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Lo pass Uniform (median) filter: Window dia: 15
5 Clip from -3.00 to 3.00

Area 7

Filename: J859-mag-Area7-proc.xcp
Northwest corner: 472936.42, 137968.24 m
Southeast corner: 473274.67, 137539.09 m
Dimensions
Survey Size (meters): 338 m x 429 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 3679694, Recorded: 3679694
Stats
Max: 3.21
Min: -3.20
Std Dev: 0.45
Mean: 0.00
Median: 0.00
Composite Area: 14.516 ha
Surveyed Area: 8.029 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 7 filtered data
Filename: J859-mag-Area7-proc-hpf-lpf.xcp
Stats
Max: 3.21
Min: -3.20
Std Dev: 0.45
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: 450
5 Lo pass Uniform (median) filter: Window dia: 15
6 Clip from -3.00 to 3.00

Area 8

Filename: J859-mag-Area8-proc.xcp
Northwest corner: 473153.78, 138076.19 m
Southeast corner: 473345.33, 137688.14 m
Dimensions
Survey Size (meters): 192 m x 388 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 2018047, Recorded: 2018047
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.97
Mean: 0.05
Median: -0.03
Composite Area: 7.4331 ha
Surveyed Area: 3.7158 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 8 filtered data

Filename: J859-mag-Area8-proc-hpf-lpf.xcp
Northwest corner: 473153.78, 138076.19 m
Southeast corner: 473345.33, 137688.14m
Dimensions
Survey Size (meters): 192 m x 388 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 2018047, Recorded: 2018047
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.62
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: 400
5 Lo pass Uniform (median) filter: Window dia: 13
6 Clip from -3.00 to 3.00

Area 9
Filename: J859-mag-Area9-proc.xcp
Northwest corner: 473001.97, 137513.85 m
Southeast corner: 473265.22, 136908.30 m
Dimensions
Survey Size (meters): 263 m x 606 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 1666579, Recorded: 1666579
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.16
Mean: 0.01
Median: 0.03
Composite Area: 15.941 ha
Surveyed Area: 3.4131 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 9 filtered data
Filename: J859-mag-Area9-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.90
Mean: 0.00
Median: 0.00
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: 350
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 Hampshire 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	J859-mag-**[area number/name]**.asc J859-mag-**[area number/name]**.xcp J859-mag-**[area number/name]**-proc.xcp	Raw data as ASCII CSV TerraSurveyor raw data TerraSurveyor minimally processed data
Graphics	J859-mag-**[area number/name]**-proc.tif	Image in TIF format
Drawing	J859-**[version number]**.dwg	CAD file in 2018 dwg format
Report	J859 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 ARCHAEOLOGY		Red 255,0,0	Polygon (cross hatched ANSI37)
AS-ABST MAG POS LINEAR ARCHAEOLOGY		Red 255,0,0	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 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 BOUNDARY		127,0,0	Line, polyline or polygon (solid or cross hatched ANSI37)
AS-ABST MAG PATH/ROAD/TRACK		0, 153,153	Line, polyline or polygon (solid or partly cross hatched ANSI38)
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
Anomalies associated with magnetic debris			
AS-ABST MAG DEBRIS		132, 132, 132	Polygon (cross hatched ANSI37)
AS-ABST MAG STRONG DIPOLAR		132, 132, 132	Solid donut, point or polygon (solid)
Anomalies with a modern origin			
AS-ABST MAG DISTURBANCE		132, 132, 132	Polygon (hatched ANSI31)
AS-ABST MAG SERVICE		132, 132, 132	Line or polyline

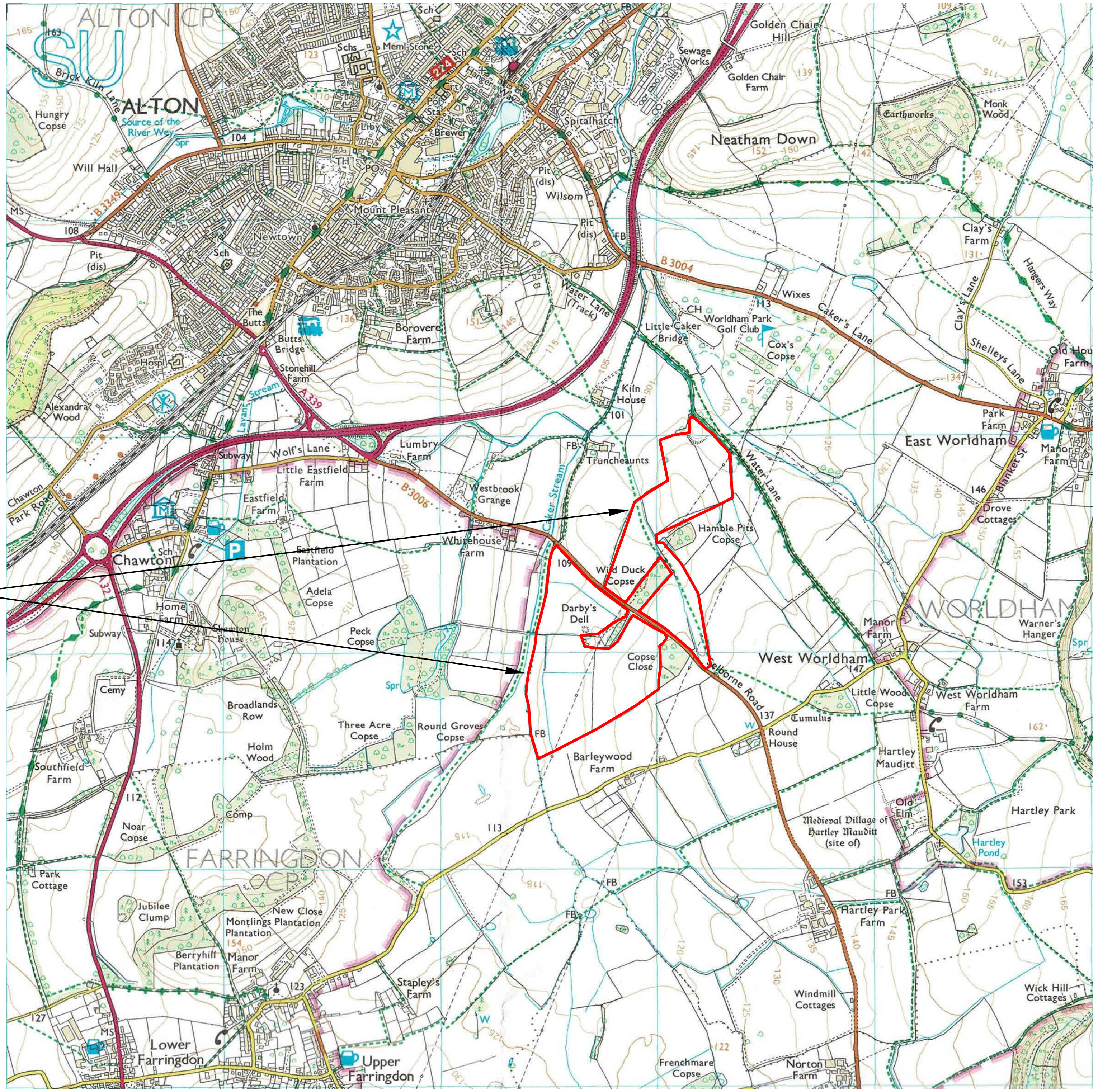
Table 3: CAD layering

Appendix F – copyright and intellectual property

Title of Goods remains with Archaeological Surveys Ltd until payment has cleared. Late payment may jeopardise any planning decision as there will be no transfer of title, licensing or any other right of copy or use of this report. Archaeological Surveys Ltd do not give permission for use of the report and associated data in cases of late payment. Any such use will be considered to be in breach of copyright. Late payment may also incur interest at 8% over the Bank of England base rate. Non-payment will be pursued by legal action.

N

Survey location



Geophysical Survey
Manor Farm
West Worldham
Hampshire

Map of survey area

Survey location

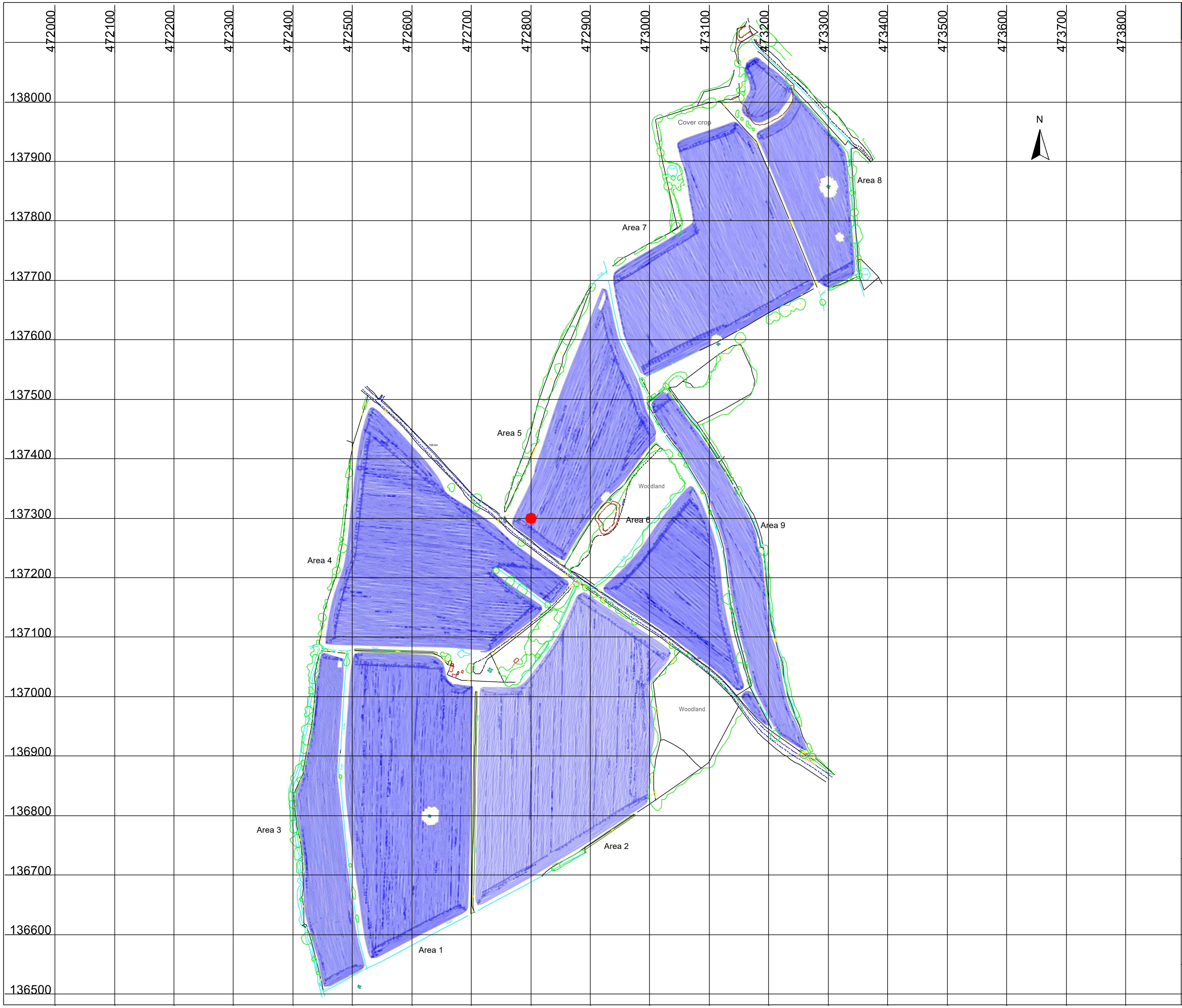
Site centred on OS NGR
SU 72800 37300

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 01



Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Manor Farm
West Worldham
Hampshire

Referencing information

Referencing grid to OSGB36 datum at 100m intervals

472900 137400

Survey tracks

Survey track start

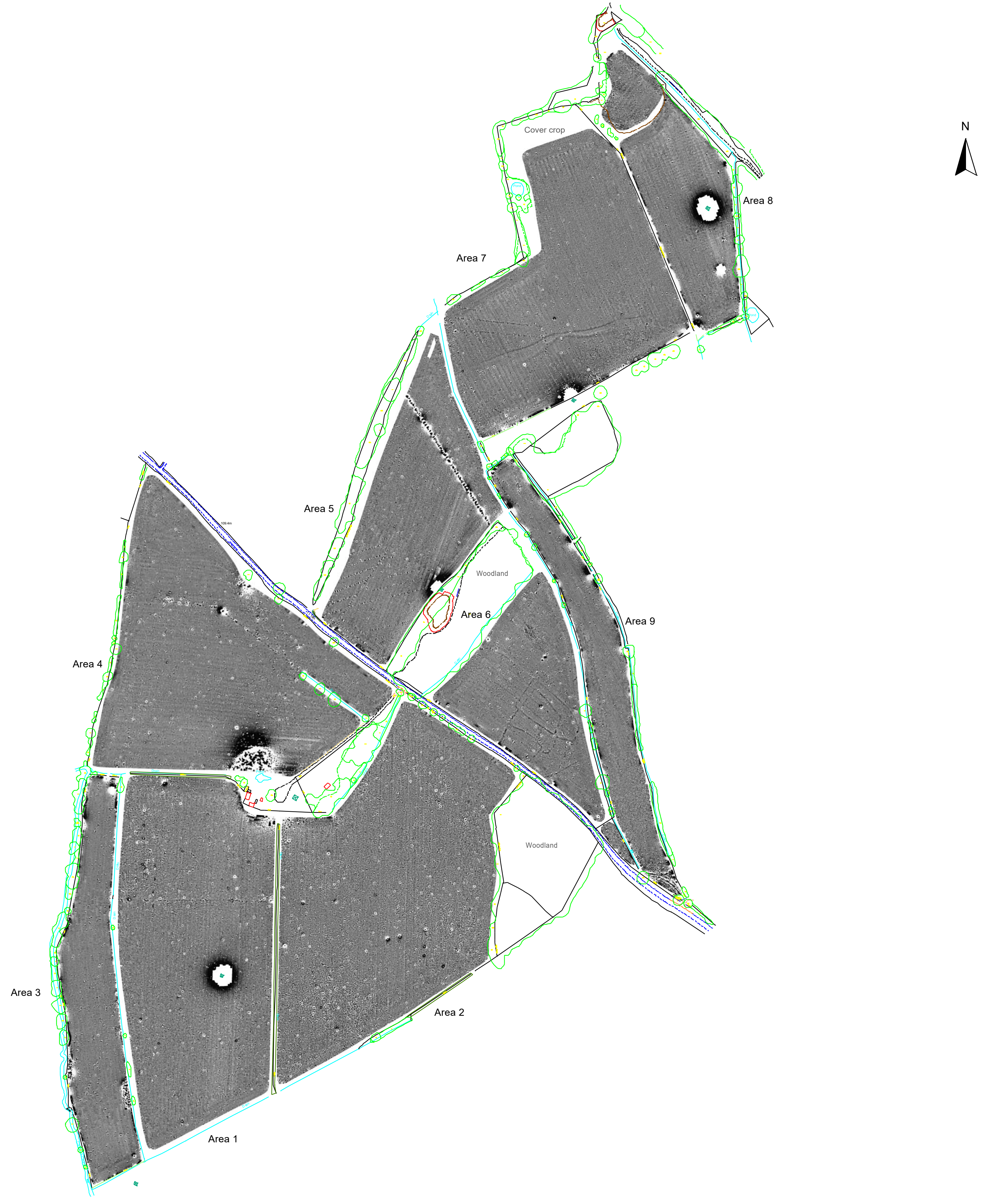
Survey track stop

SCALE 1:6000

0m 60 120 180 240 300m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 02



Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Manor Farm
West Worldham
Hampshire

Greyscale plot of minimally processed magnetometer data

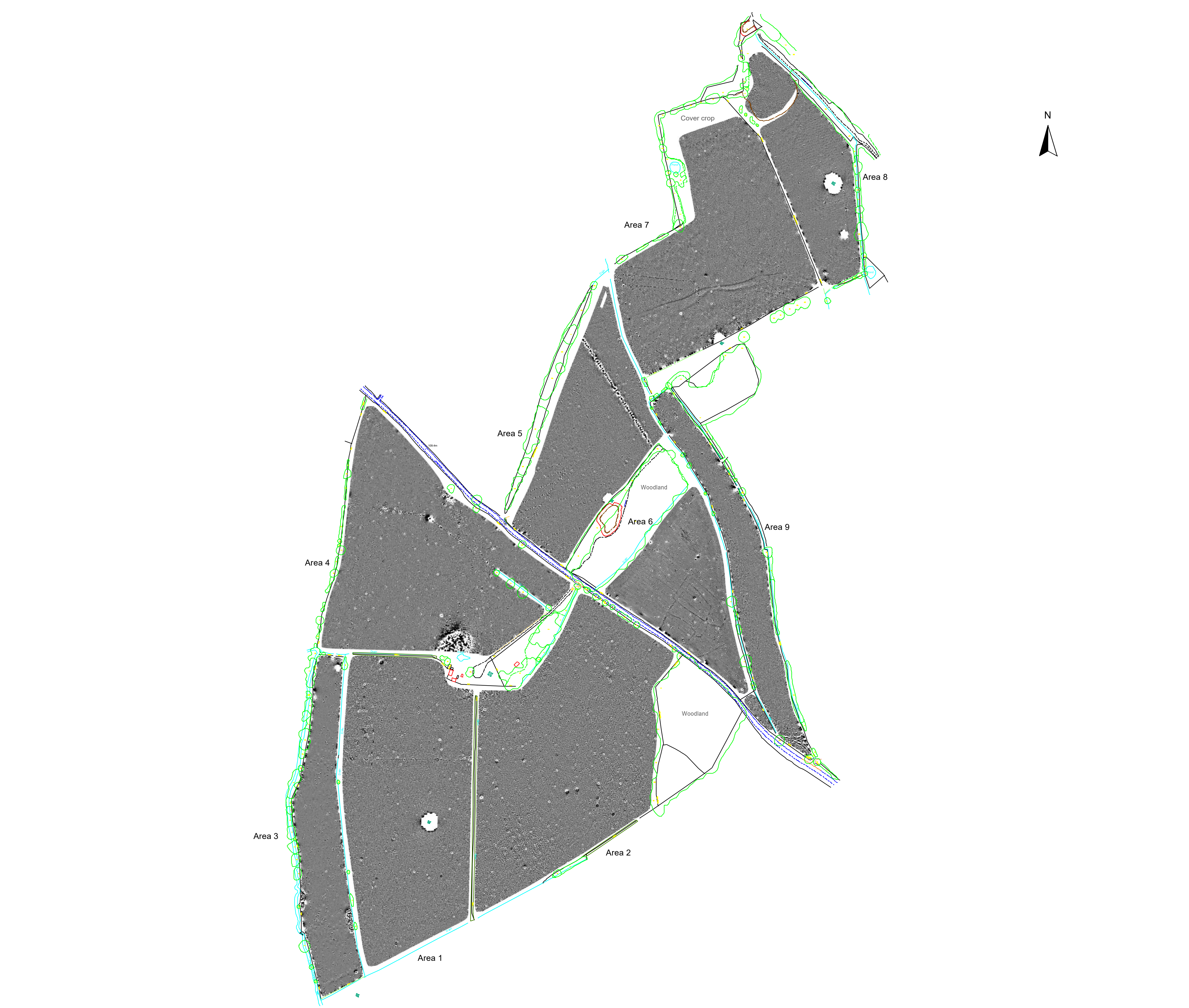
+3nT
-3nT

SCALE 1:6000

0m 60 120 180 240 300m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 03



Archaeological Surveys
Specialist Geophysical Surveyors

**Geophysical Survey
Manor Farm
West Worldham
Hampshire**

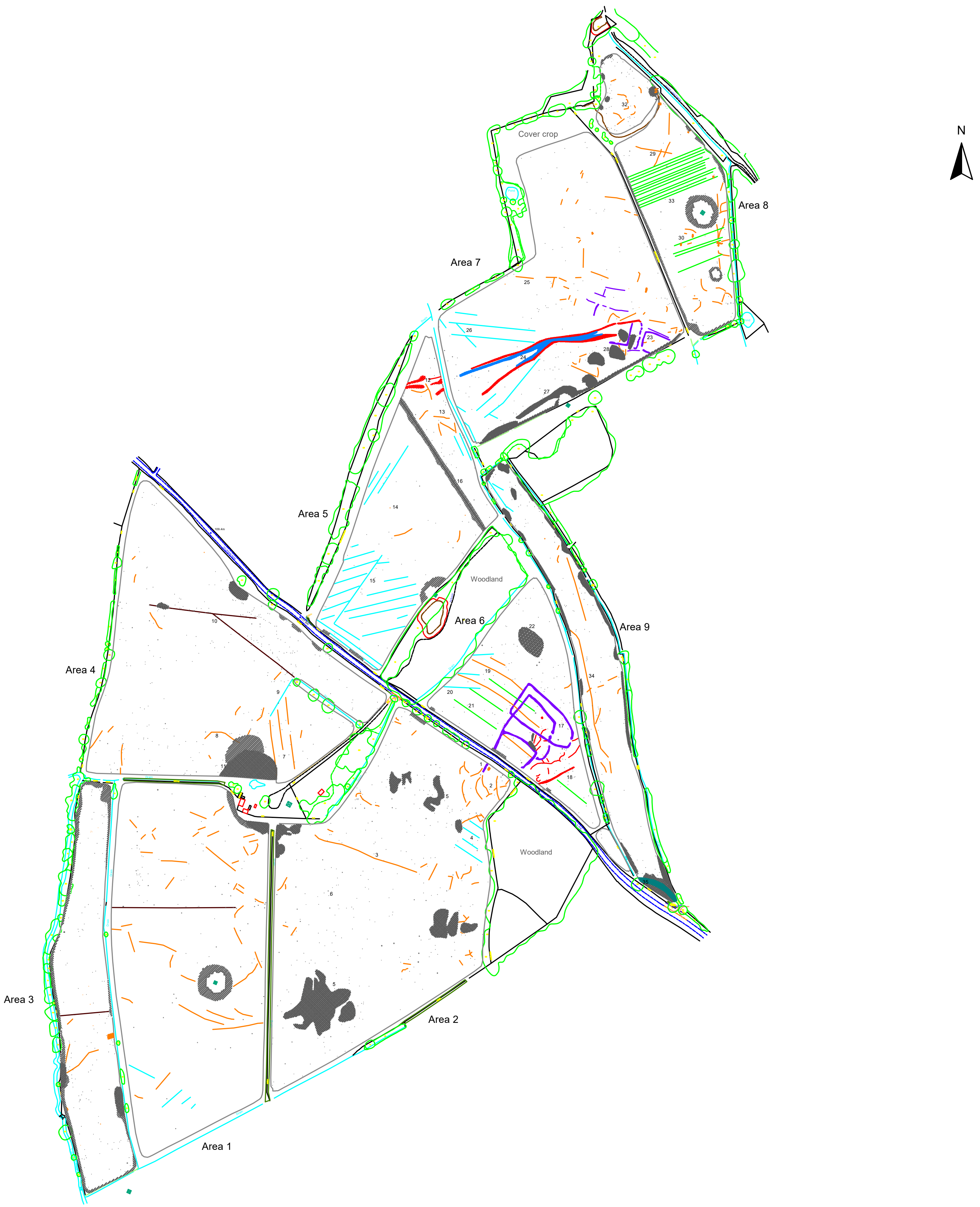
Greyscale plot of filtered magnetometer data

SCALE 1:6000

0m 60 120 180 240 300m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 04



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Specialist Geophysical Surveyors

Geophysical Survey
Manor Farm
West Worldham
Hampshire

Abstraction and interpretation of magnetic anomalies

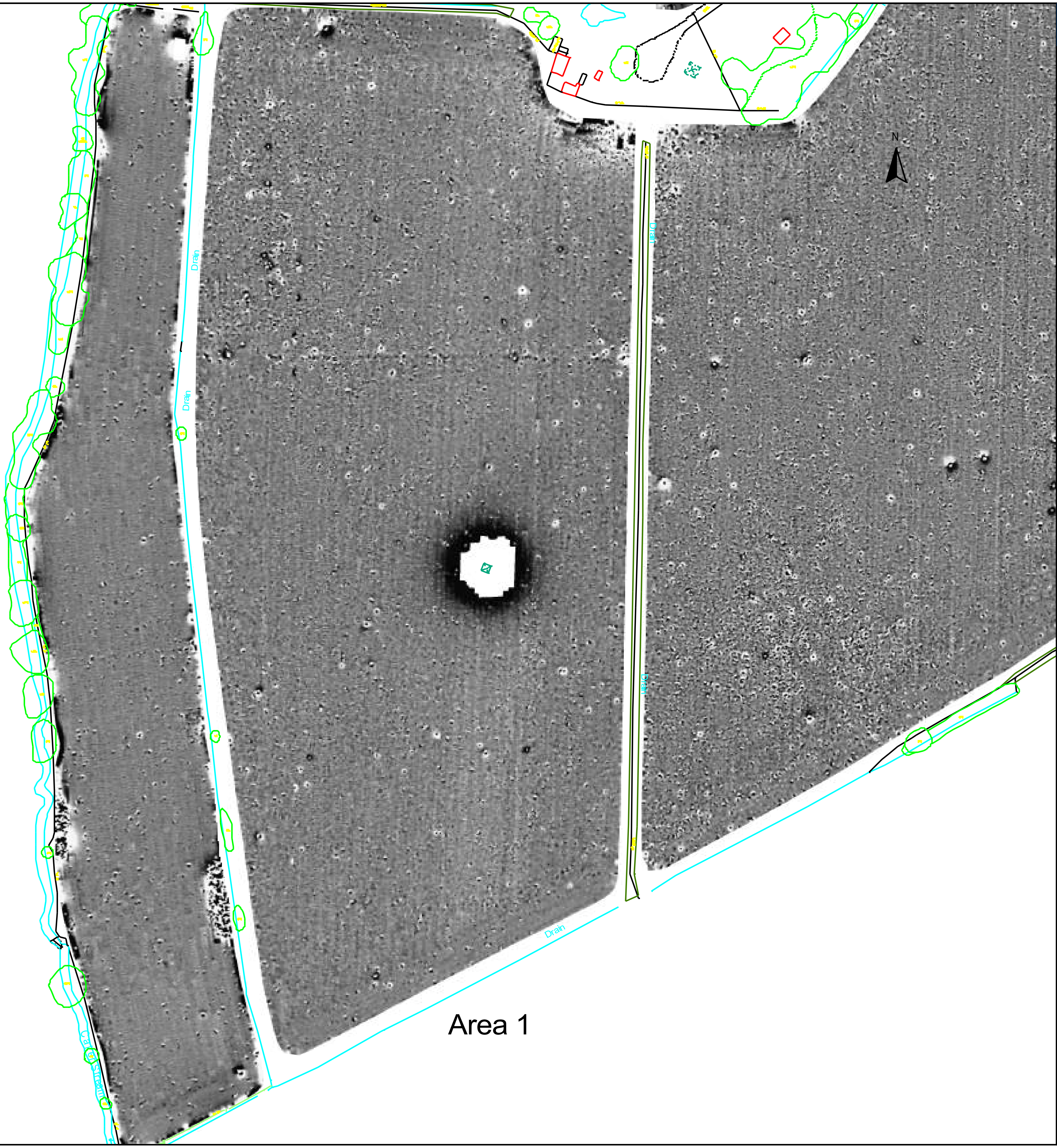
- Positive linear anomaly - cut feature of archaeological potential
- Positive curvilinear/rectilinear anomaly - enclosure ditch
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Positive/weak multiple dipolar linear anomaly - land drain
- Positive linear anomaly - former field boundary
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetic enhancement of archaeological potential
- Negative anomaly - material of low magnetic susceptibility
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic debris & disturbance - former road surface
- Magnetic debris - associated with tree burning
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:6000

0m 60 120 180 240 300m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 05



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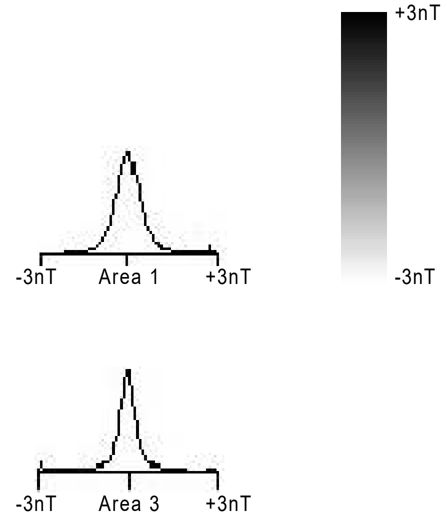
Manor Farm
West Worldham
Hampshire

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



SCALE 1:2000

0m 20 40 60 80 100m

KTD	DJS	FIG 06

Archaeological Surveys
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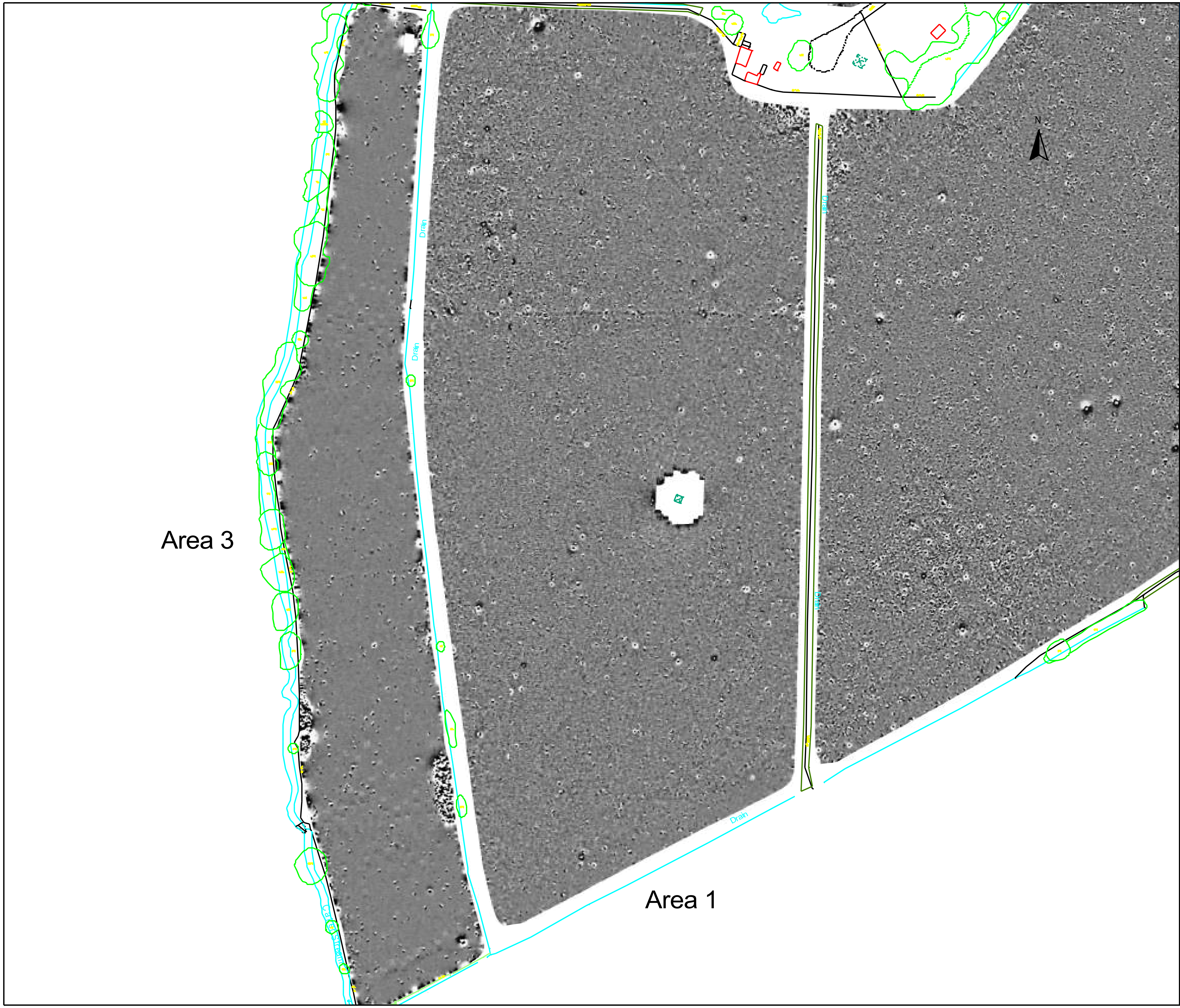
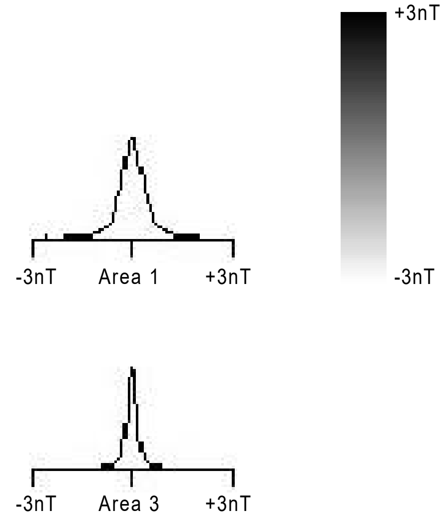
Manor Farm
West Worldham
Hampshire



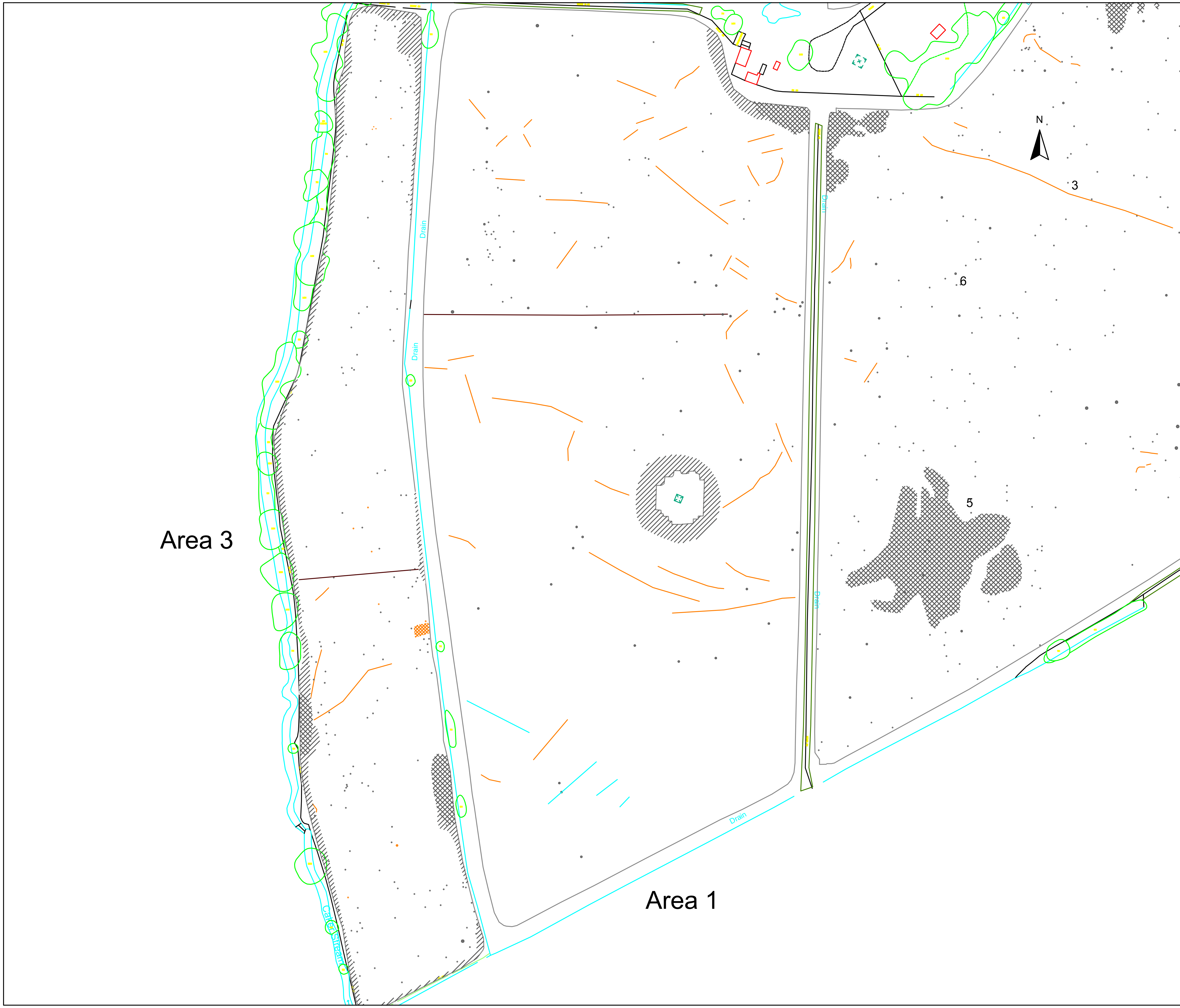
Greyscale plot of filtered magnetometer data - Areas 1 & 3



SCALE 1:2000

0m 20 40 60 80 100m

KTD	DJS	FIG 07



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Geophysical Survey
Manor Farm
West Worldham
Hampshire

Abstraction and interpretation of magnetic anomalies - Areas 1 & 3

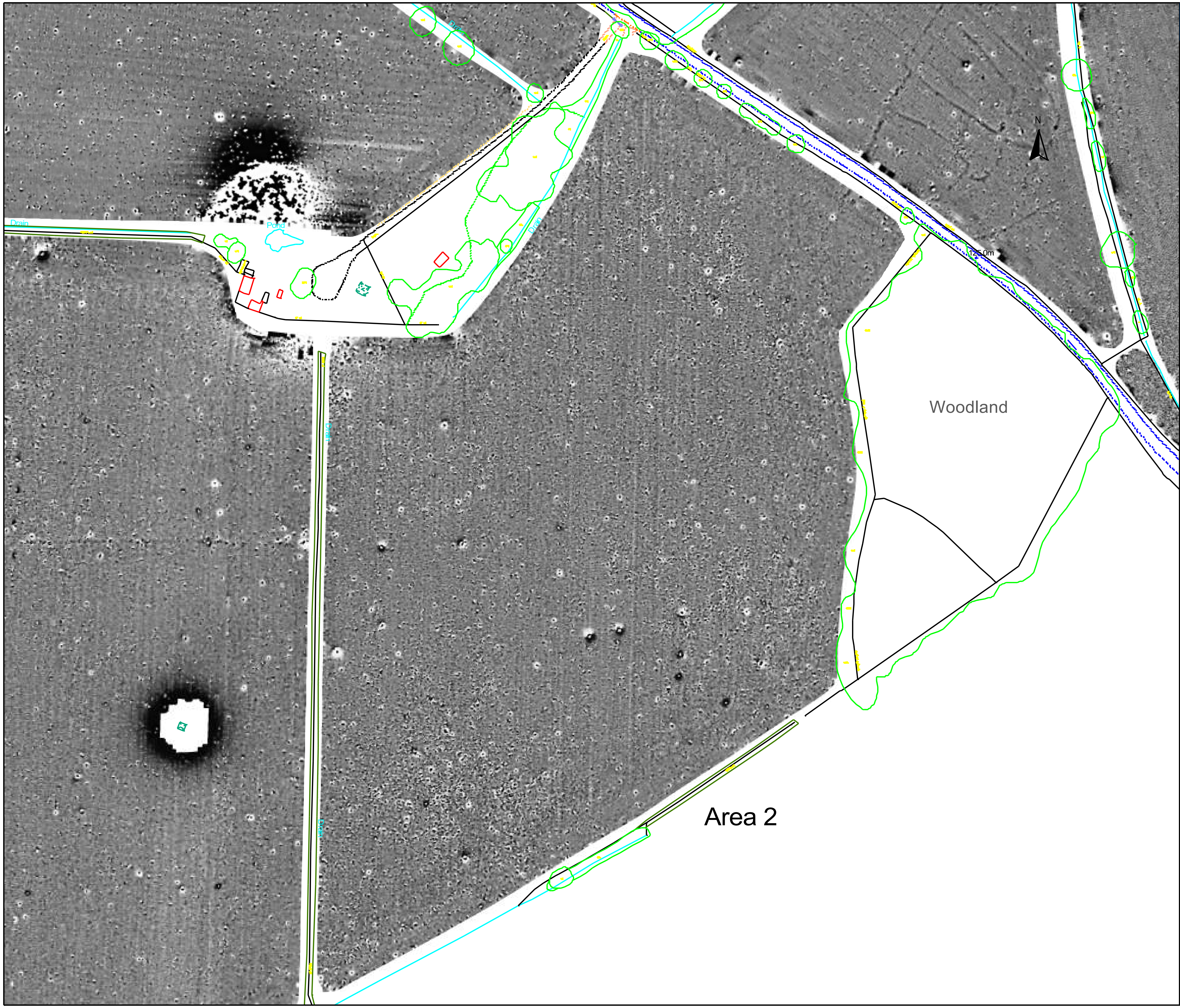
- Positive linear anomaly - possible ditch-like feature
- Positive/weak multiple dipolar linear anomaly - possible land drain
- Positive linear anomaly - former field boundary
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 08



Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Manor Farm
West Worldham
Hampshire

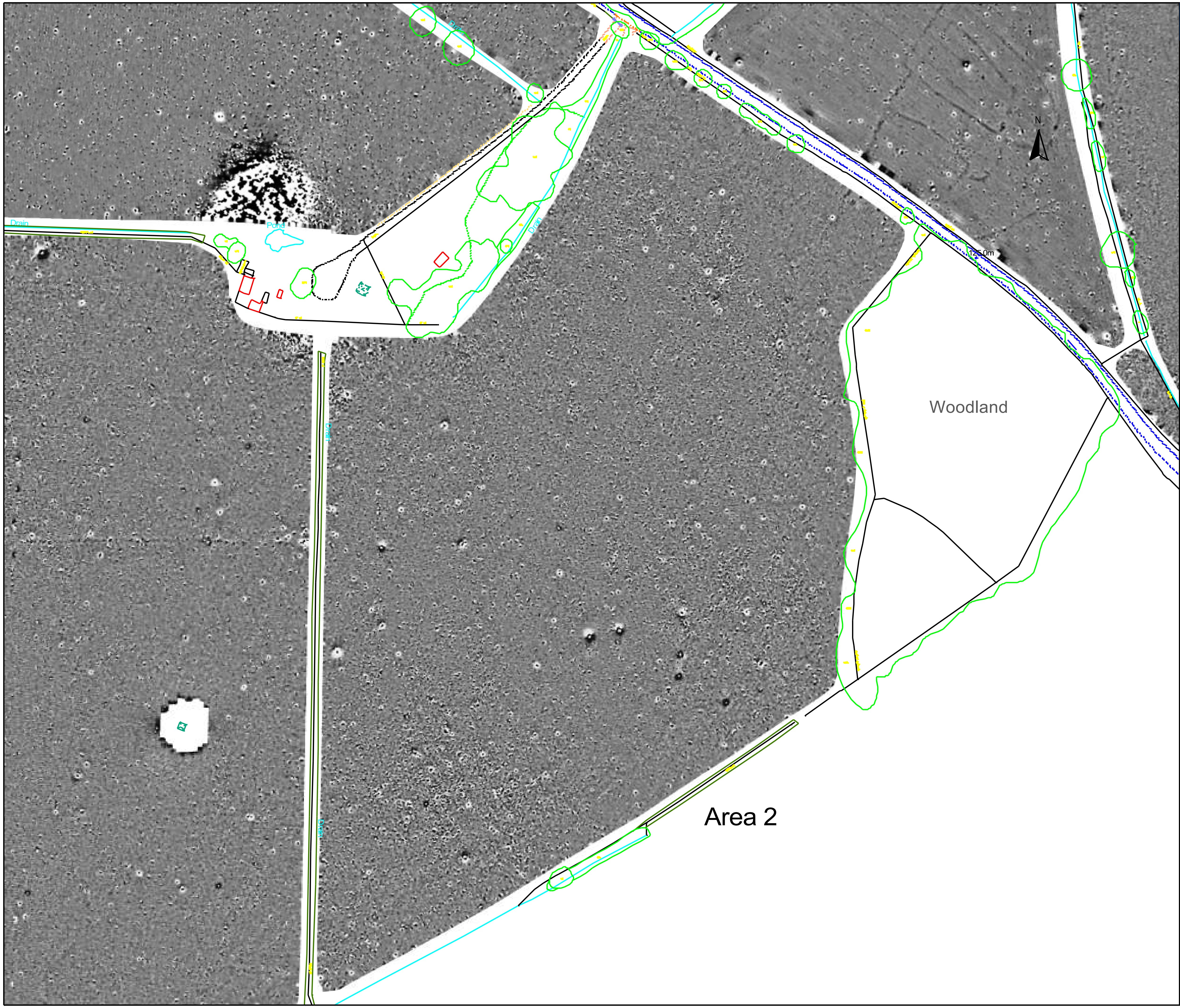
Greyscale plot of minimally processed magnetometer data - Area 2

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

SCALE 1:2000

0m 20 40 60 80 100m

KTD	DJS	FIG 09



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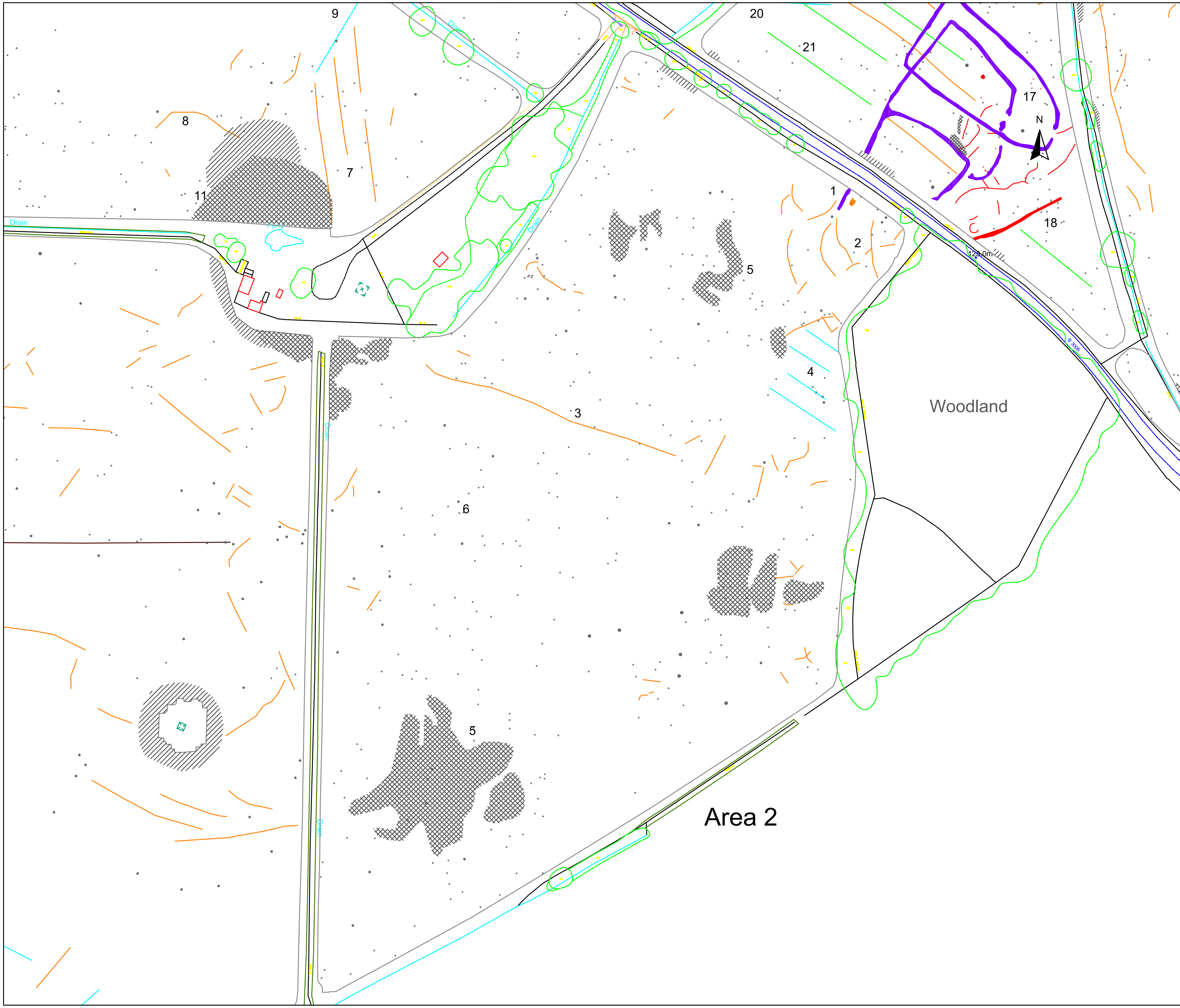
Greyscale plot of filtered magnetometer data - Area 2

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

SCALE 1:2000

0m 20 40 60 80 100m

KTD	DJS	FIG 10



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Abstraction and interpretation of magnetic anomalies - Area 2

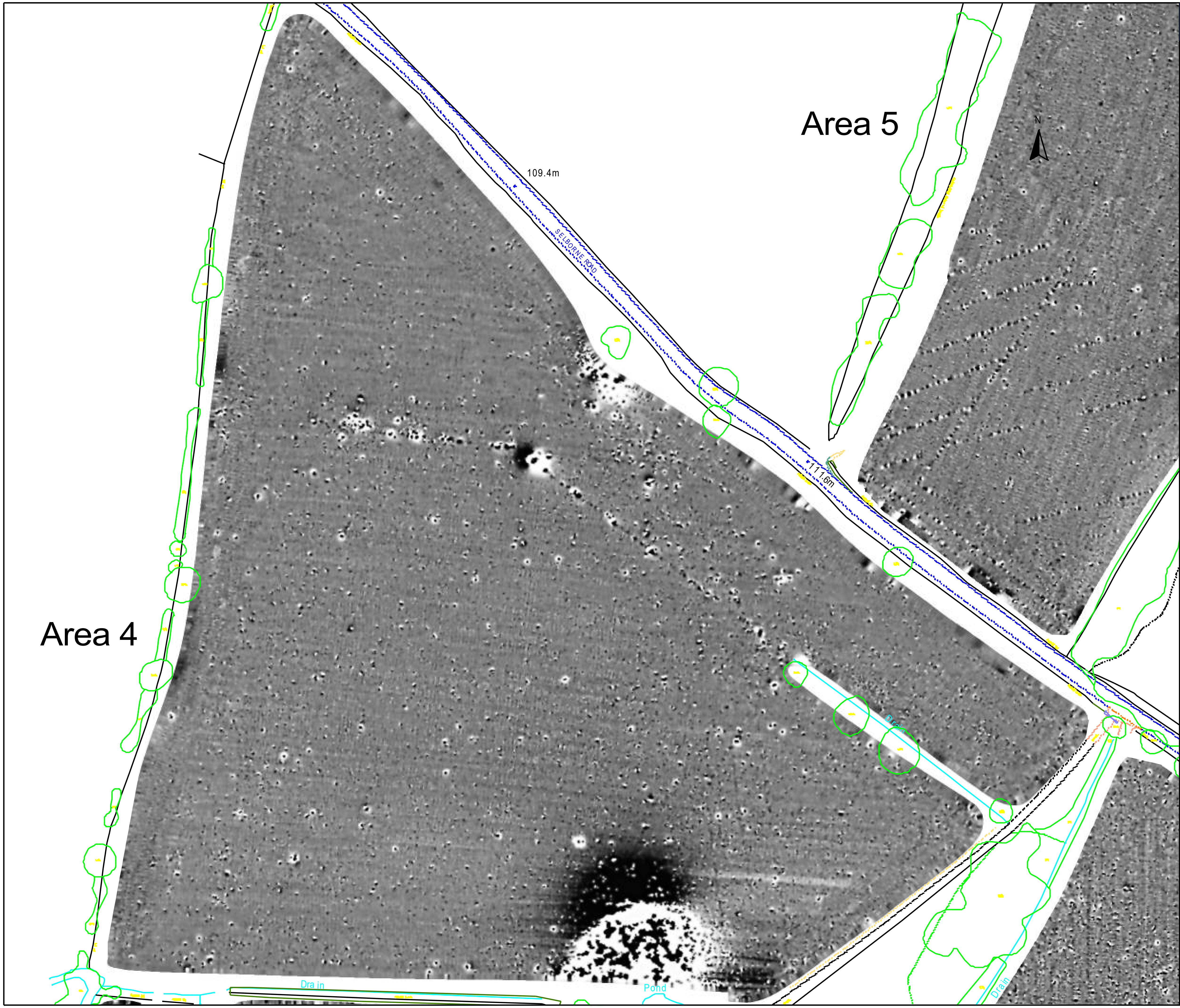
- Positive rectilinear anomaly - enclosure ditch
- Positive linear anomaly - possible ditch-like feature
- Positive/weak multiple dipolar linear anomaly - land drain
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:2000

0m 20 40 60 80 100m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 11



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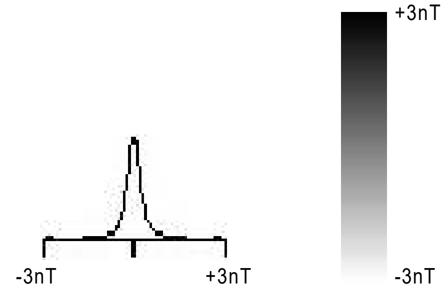
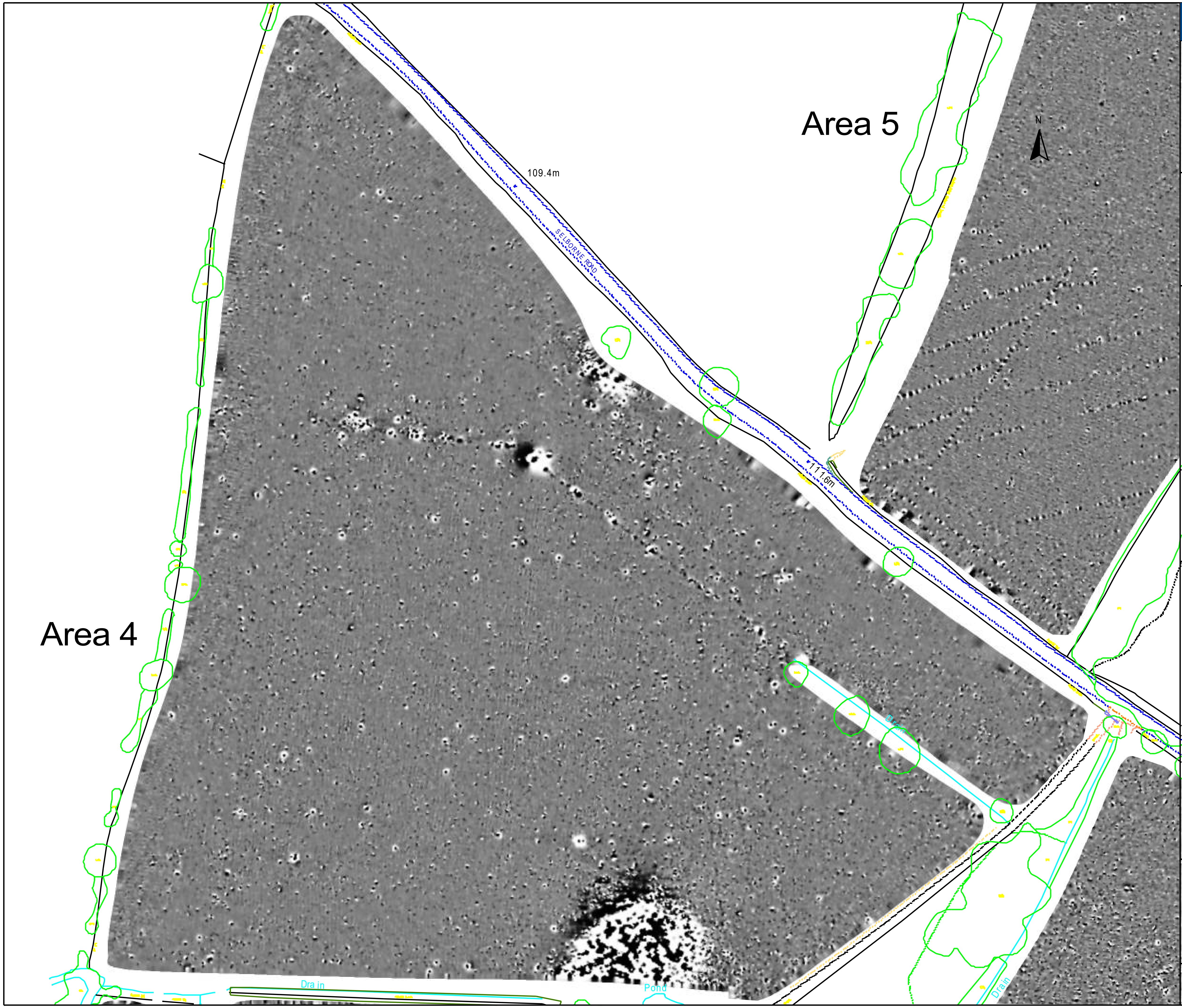
Greyscale plot of minimally processed magnetometer data - Area 4



SCALE 1:1500

0m 10 20 30 40 50m

KTD	DJS	FIG 12



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Greyscale plot of filtered magnetometer data - Area 4

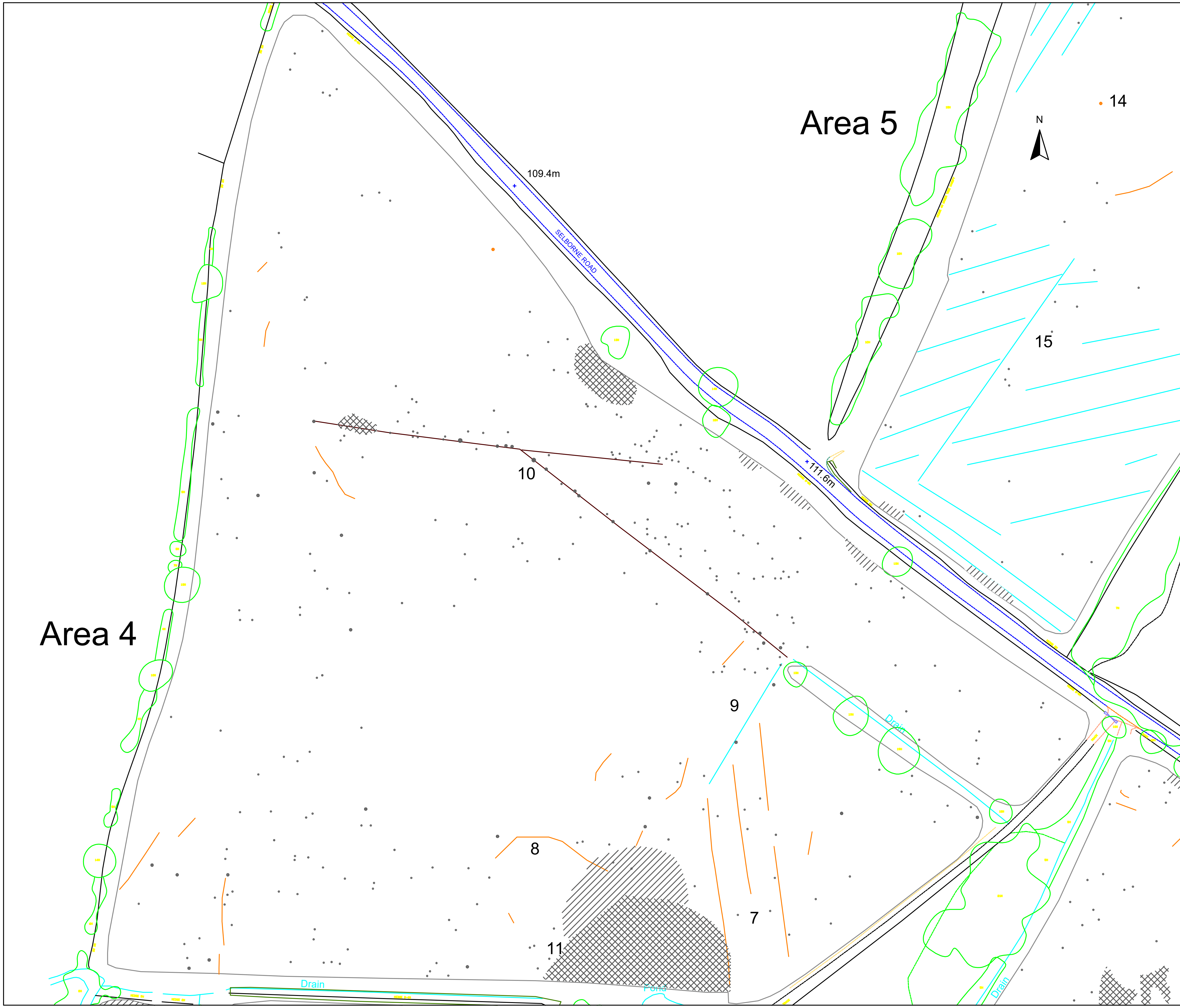
-3nT +3nT

+3nT
-3nT

SCALE 1:1500

0m 10 20 30 40 50m

KTD	DJS	FIG 13



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Abstraction and interpretation of magnetic anomalies - Area 4

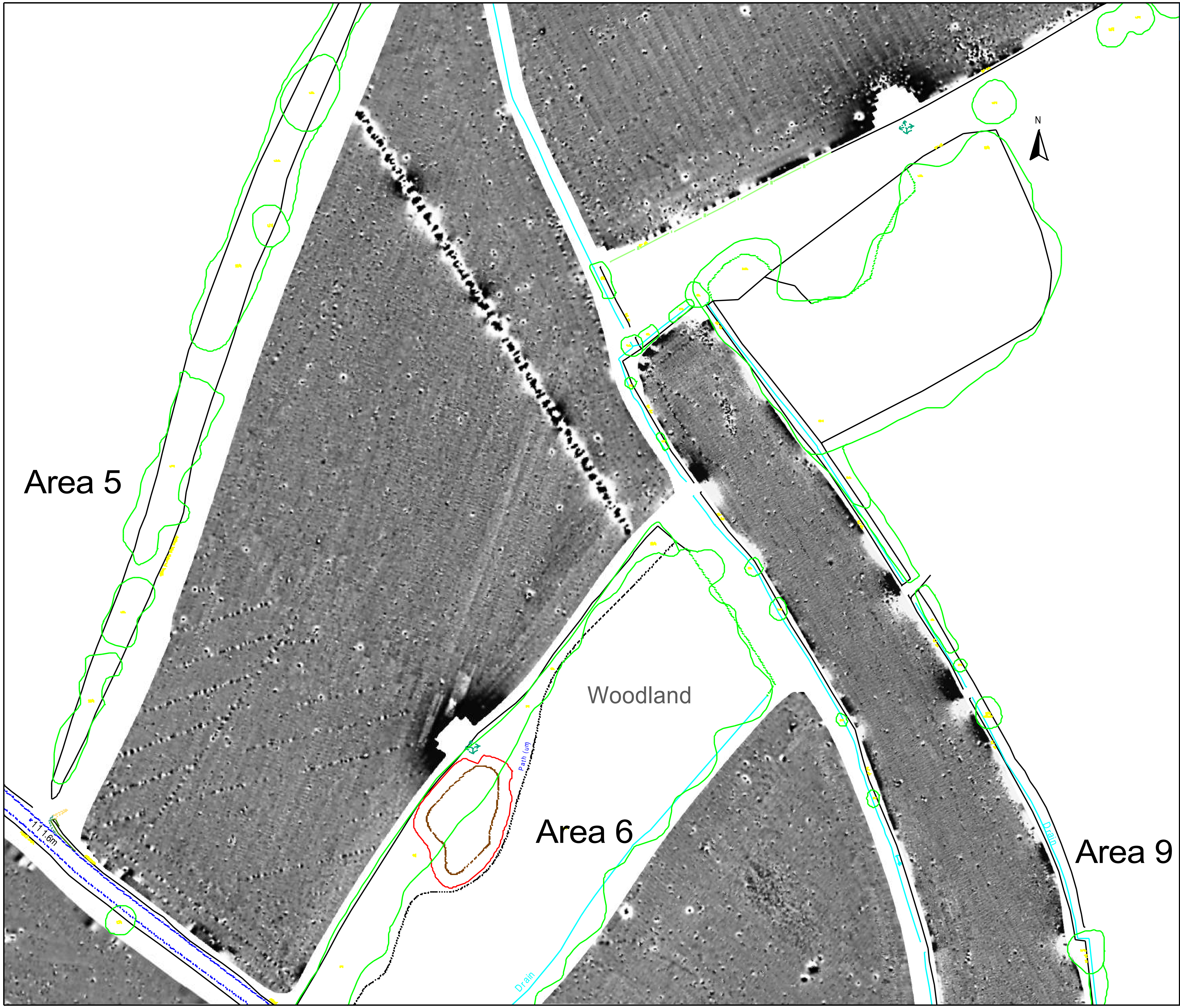
- Positive linear anomaly - possible ditch-like feature
- Positive linear anomaly - former field boundary
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 14



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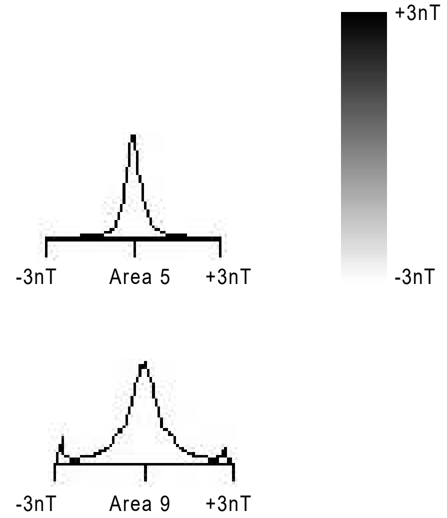
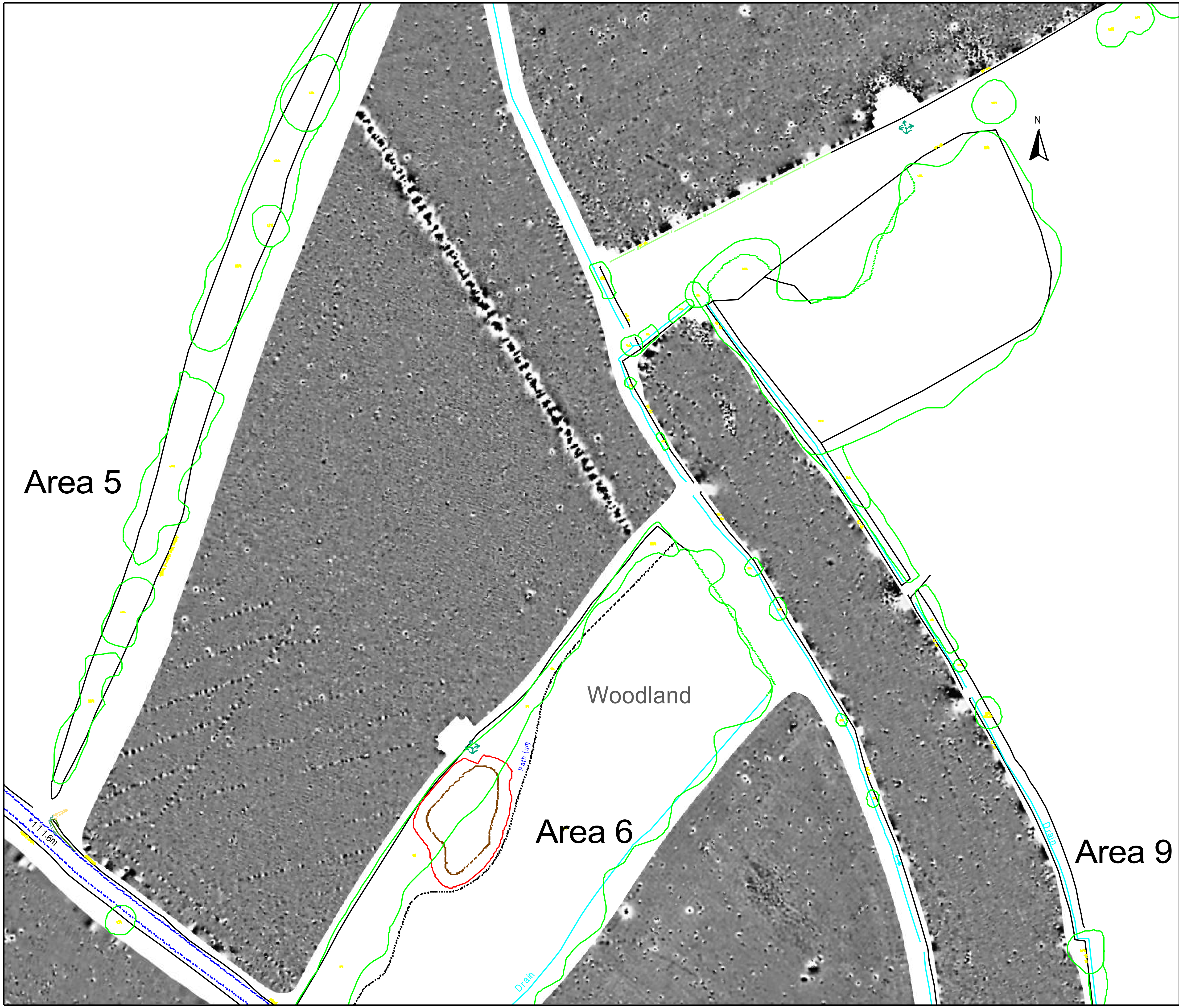
Greyscale plot of minimally processed magnetometer data - Areas 5 & 9 north



SCALE 1:1500

0m 10 20 30 40 50m

KTD	DJS	FIG 15



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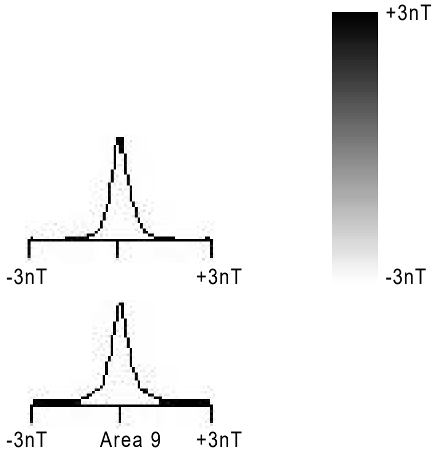
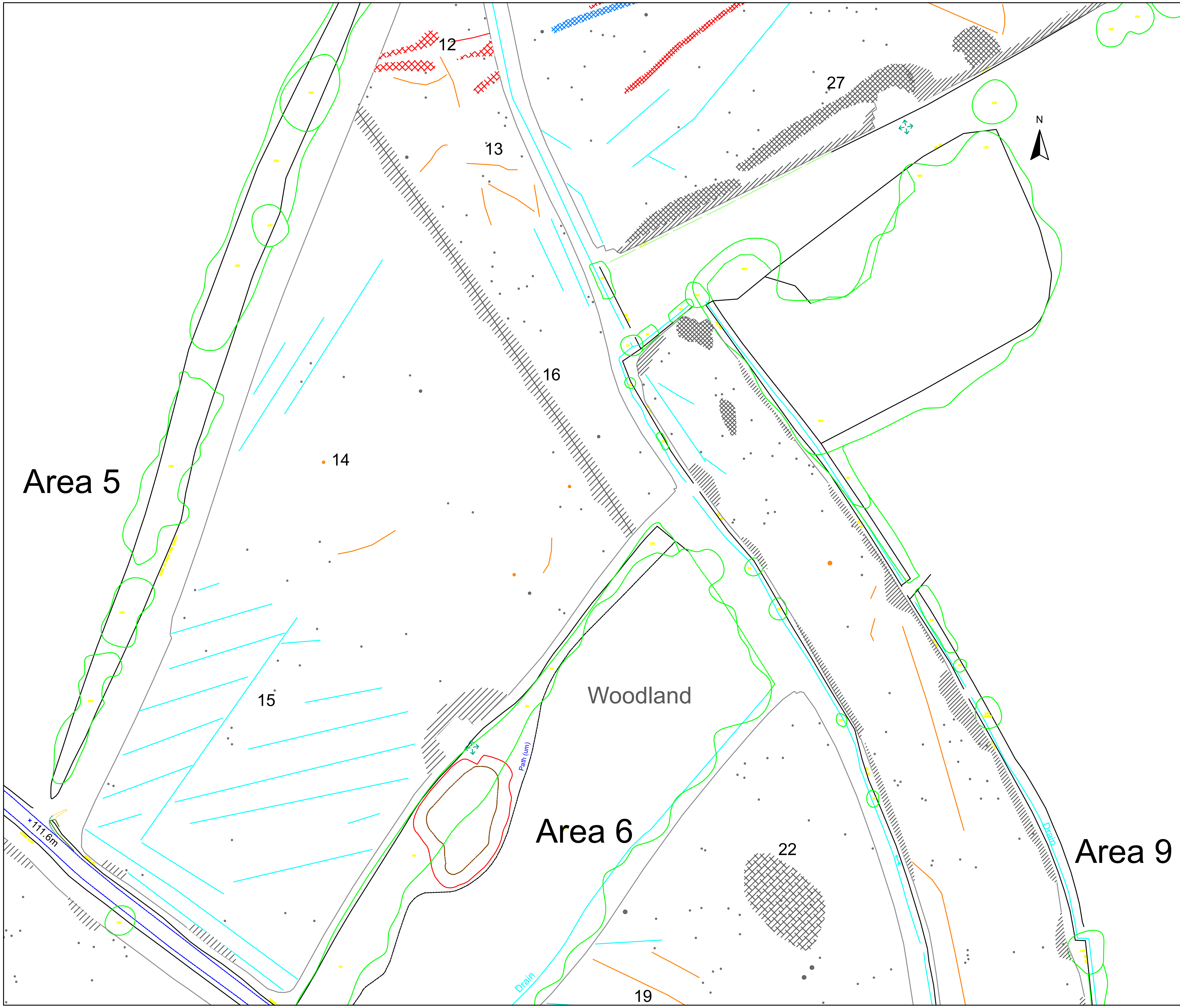
Greyscale plot of filtered magnetometer data - Areas 5 & 9 north



SCALE 1:1500

0m 10 20 30 40 50m

KTD	DJS	FIG 16



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Abstraction and interpretation of magnetic anomalies - Areas 5 & 9 north

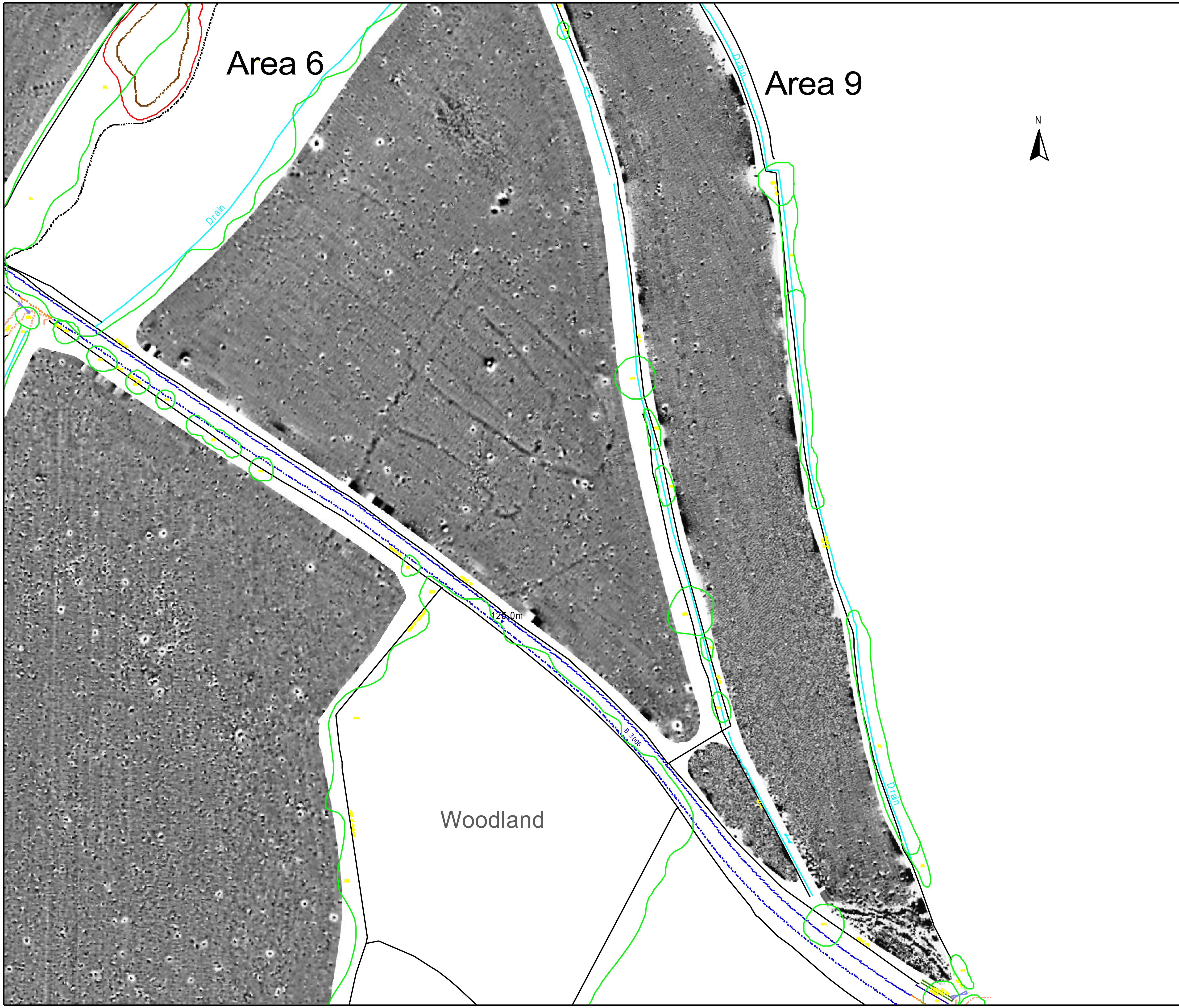
- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Positive/weak multiple dipolar linear anomaly - land drain
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetic enhancement of archaeological potential
- 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 17



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Greyscale plot of minimally processed magnetometer data - Areas 6 & 9 south

+3nT

-3nT

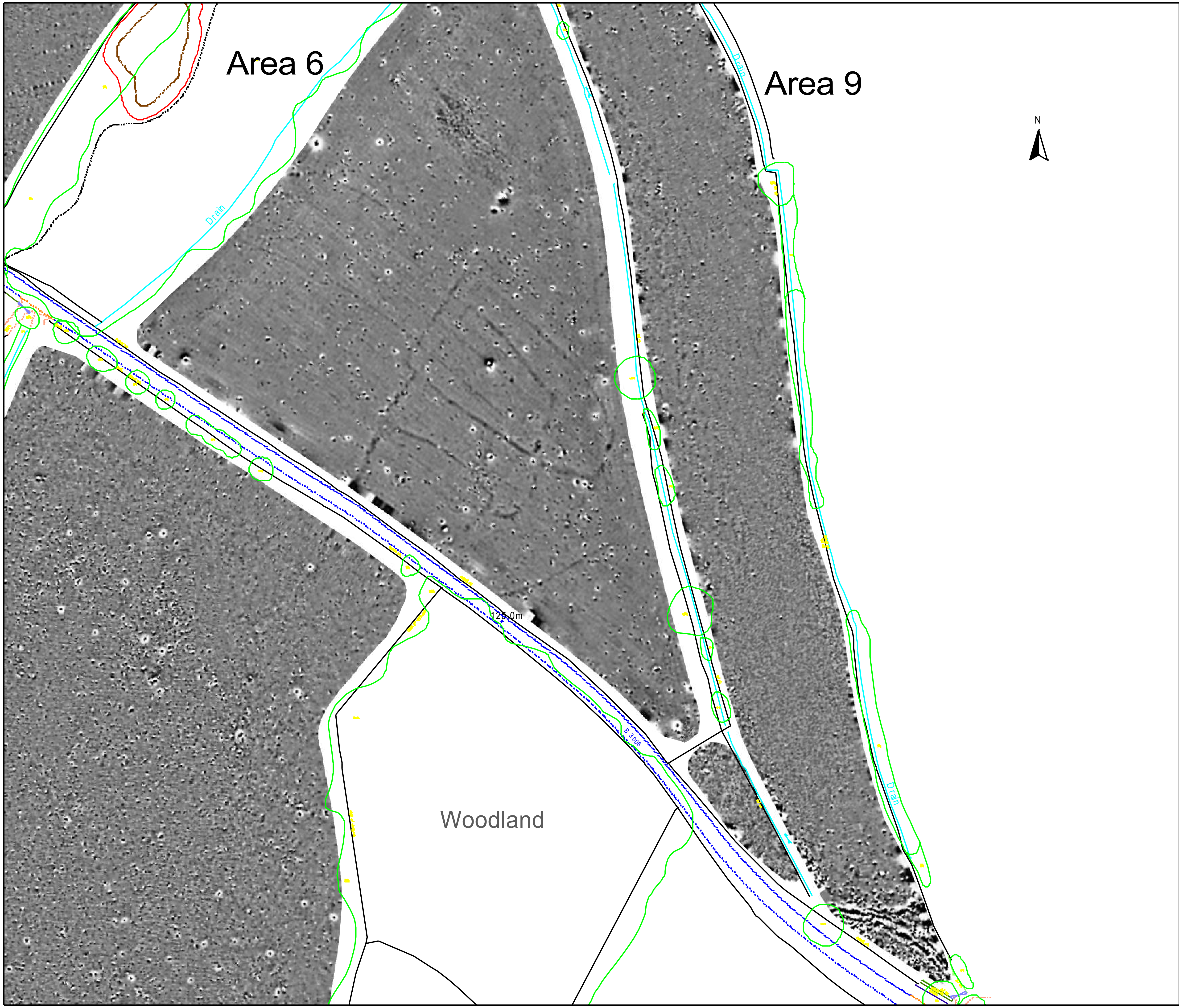
-3nT Area 6 +3nT

-3nT Area 9 +3nT

SCALE 1:1500

0m 10 20 30 40 50m

KTD	DJS	FIG 18



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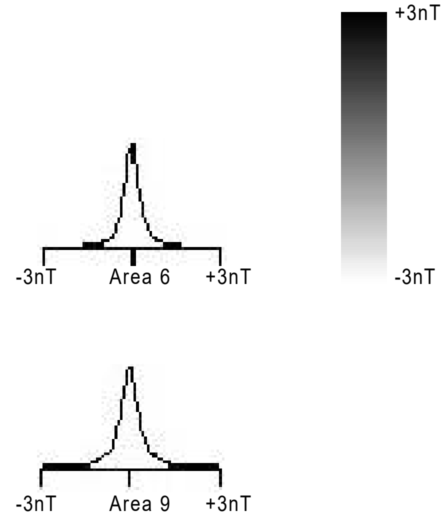
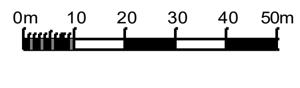
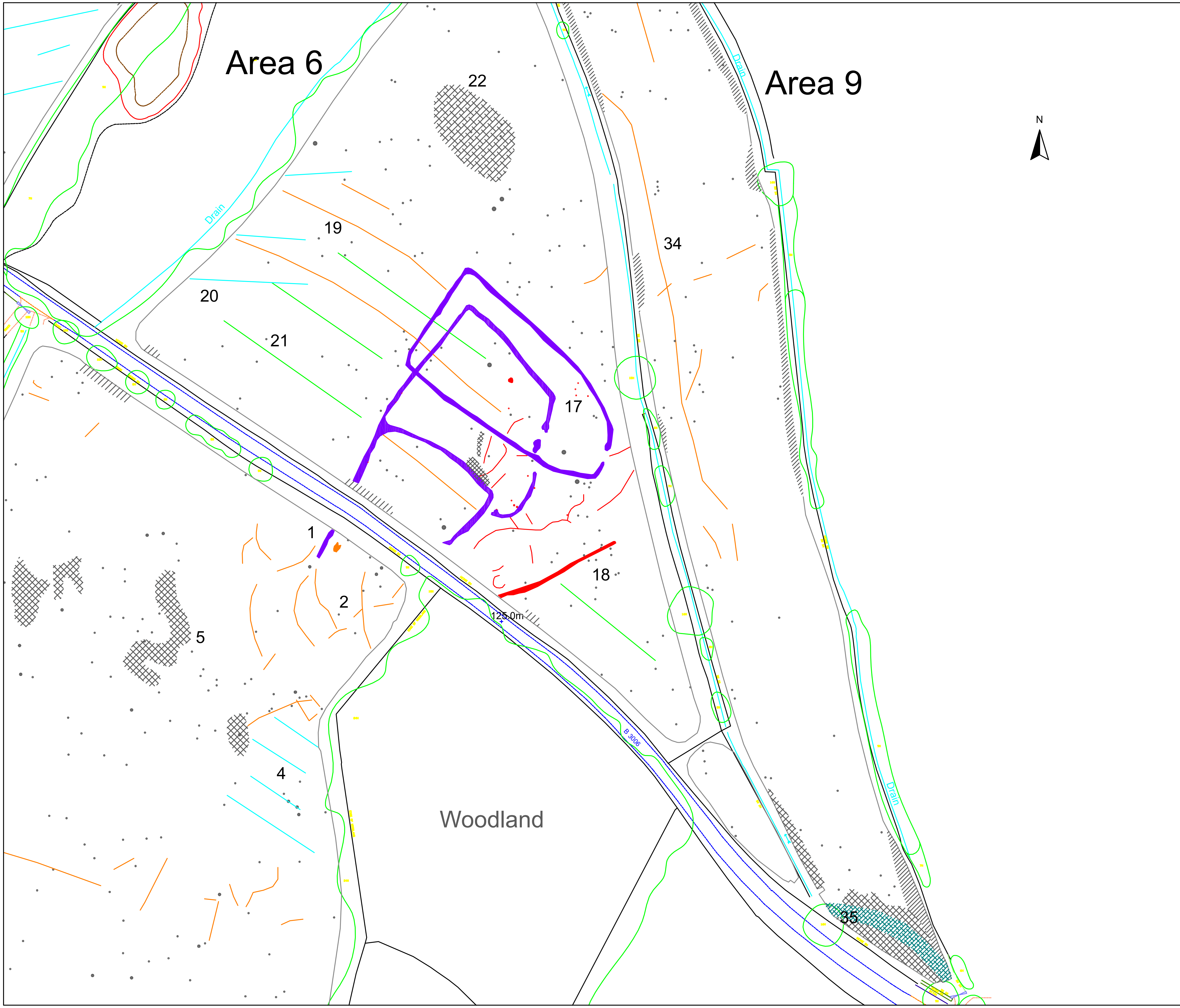
Greyscale plot of filtered magnetometer data - Areas 6 & 9 south



SCALE 1:1500



KTD	DJS	FIG 19



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Abstraction and interpretation of magnetic anomalies - Areas 6 & 9 south

- Positive curvilinear/rectilinear anomaly - enclosure ditch
- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Positive/weak multiple dipolar linear anomaly - possible land drain
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Magnetic debris & disturbance associated with former road
- Magnetic debris - associated with tree burning
- 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

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 20

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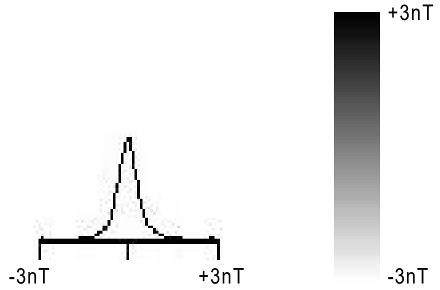
Greyscale plot of minimally processed magnetometer data - Area 7



SCALE 1:1500

0m 10 20 30 40 50m

KTD	DJS	FIG 21

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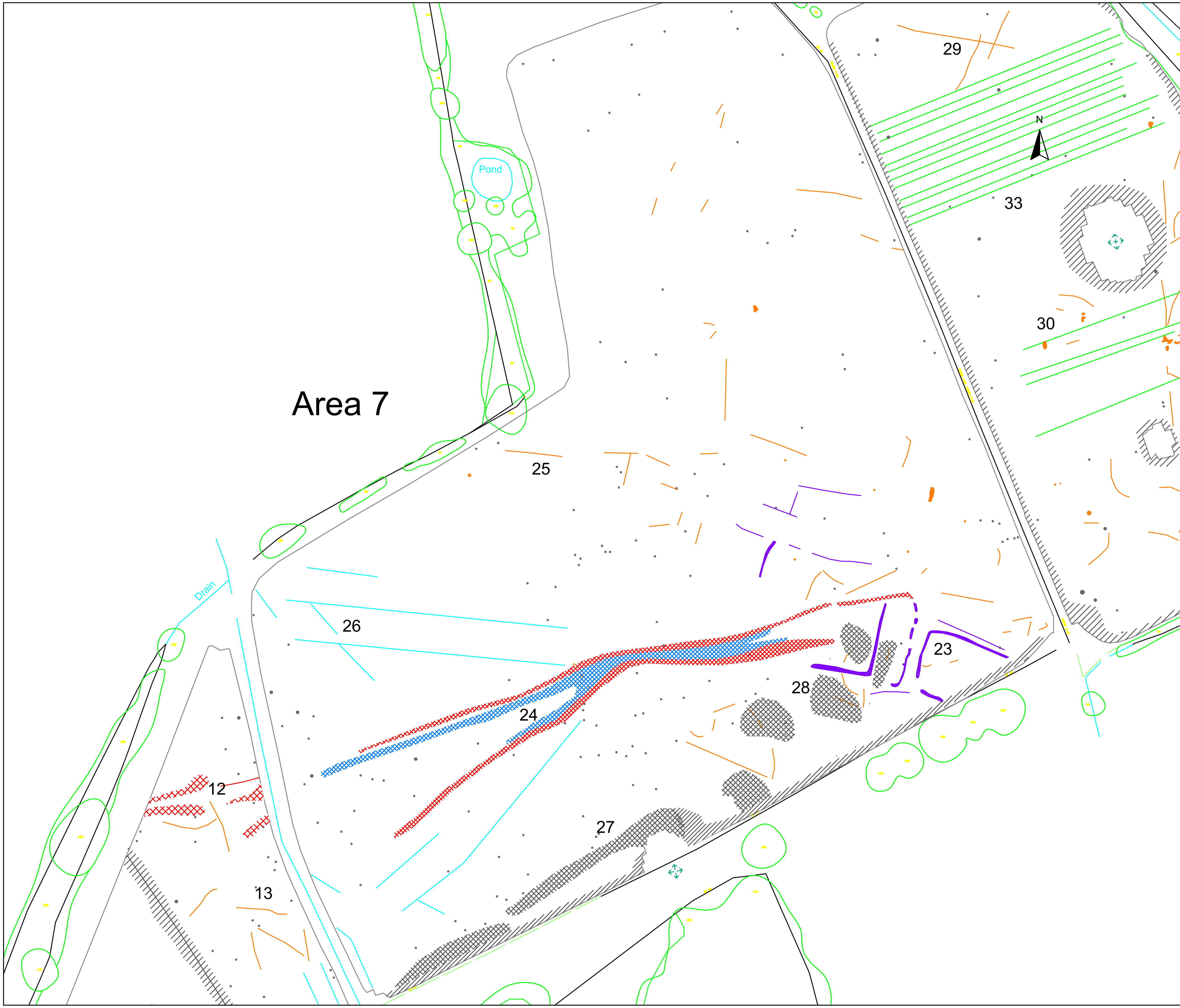
Greyscale plot of filtered magnetometer data - Area 7

SCALE 1:1500

KTD | DJS | FIG 22



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Abstraction and interpretation of magnetic anomalies - Area 7

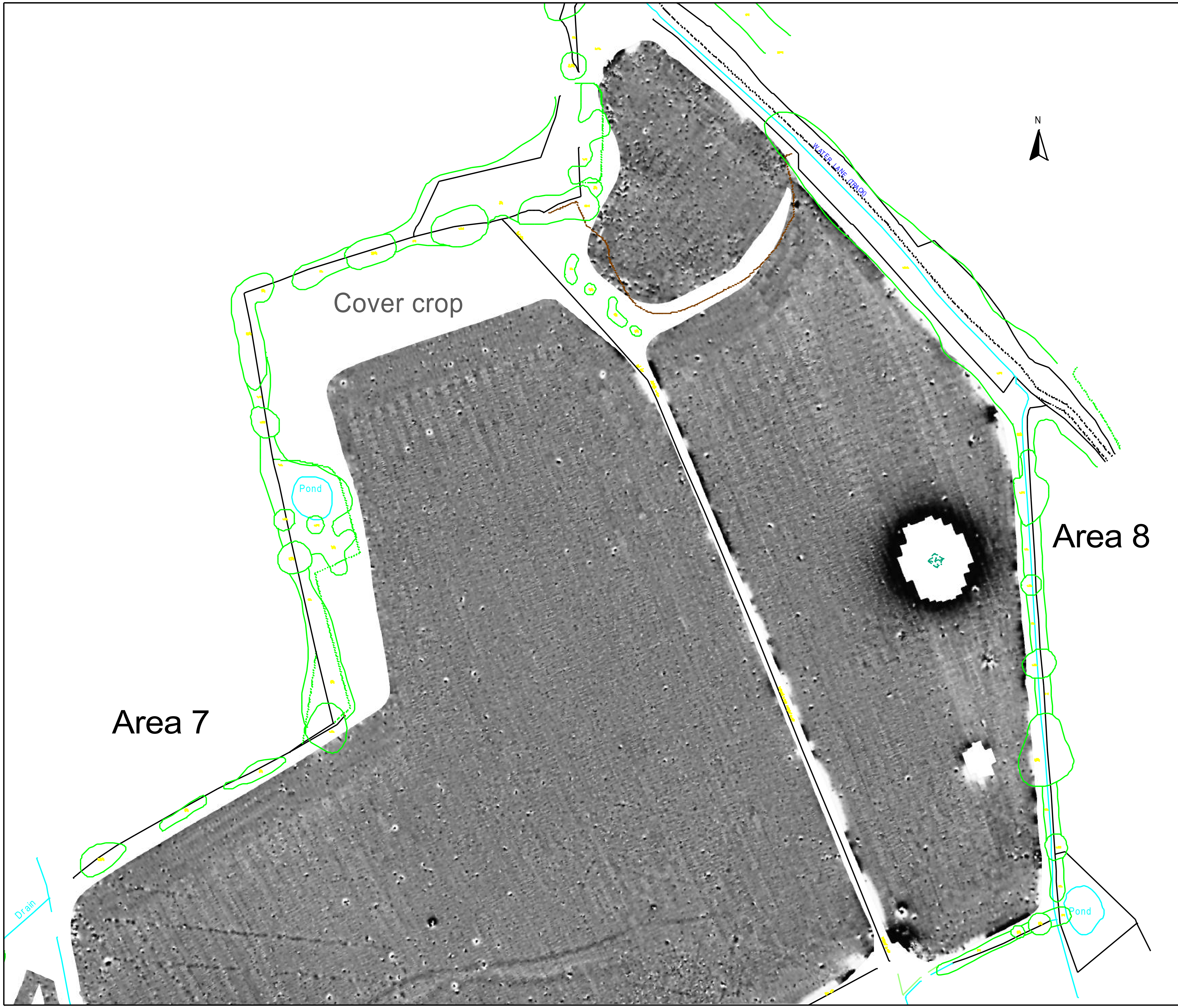
- Positive curvilinear/rectilinear anomaly - enclosure ditch
- Positive linear anomaly - possible ditch-like feature
- Positive/weak multiple dipolar linear anomaly - land drain
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetic enhancement of archaeological potential (possible ditches)
- Negative anomaly - material of low magnetic susceptibility (possible surface)
- 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

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 23



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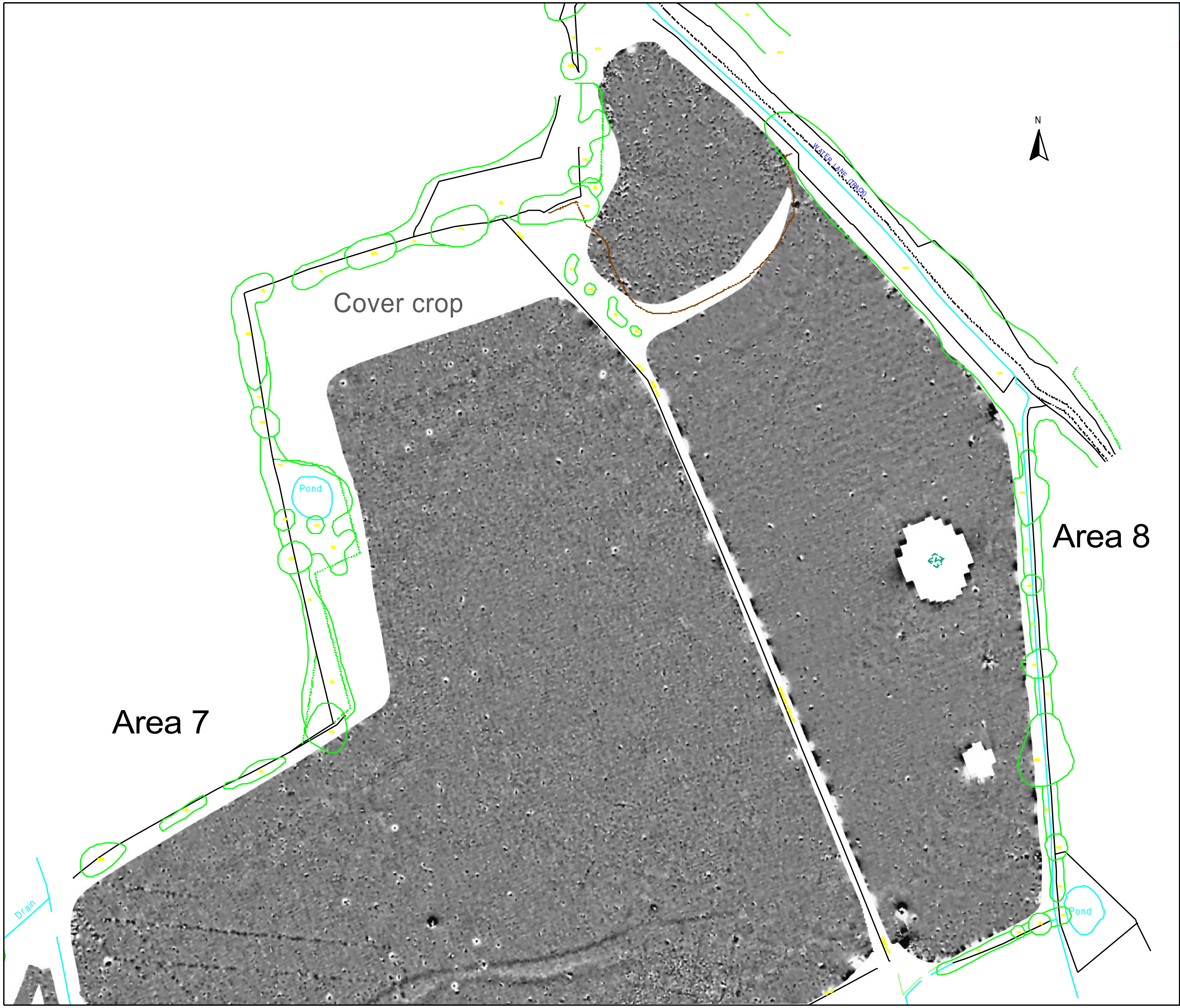
Greyscale plot of minimally processed magnetometer data - Area 8

SCALE 1:1500

0m 10 20 30 40 50m

KTD	DJS	FIG 24



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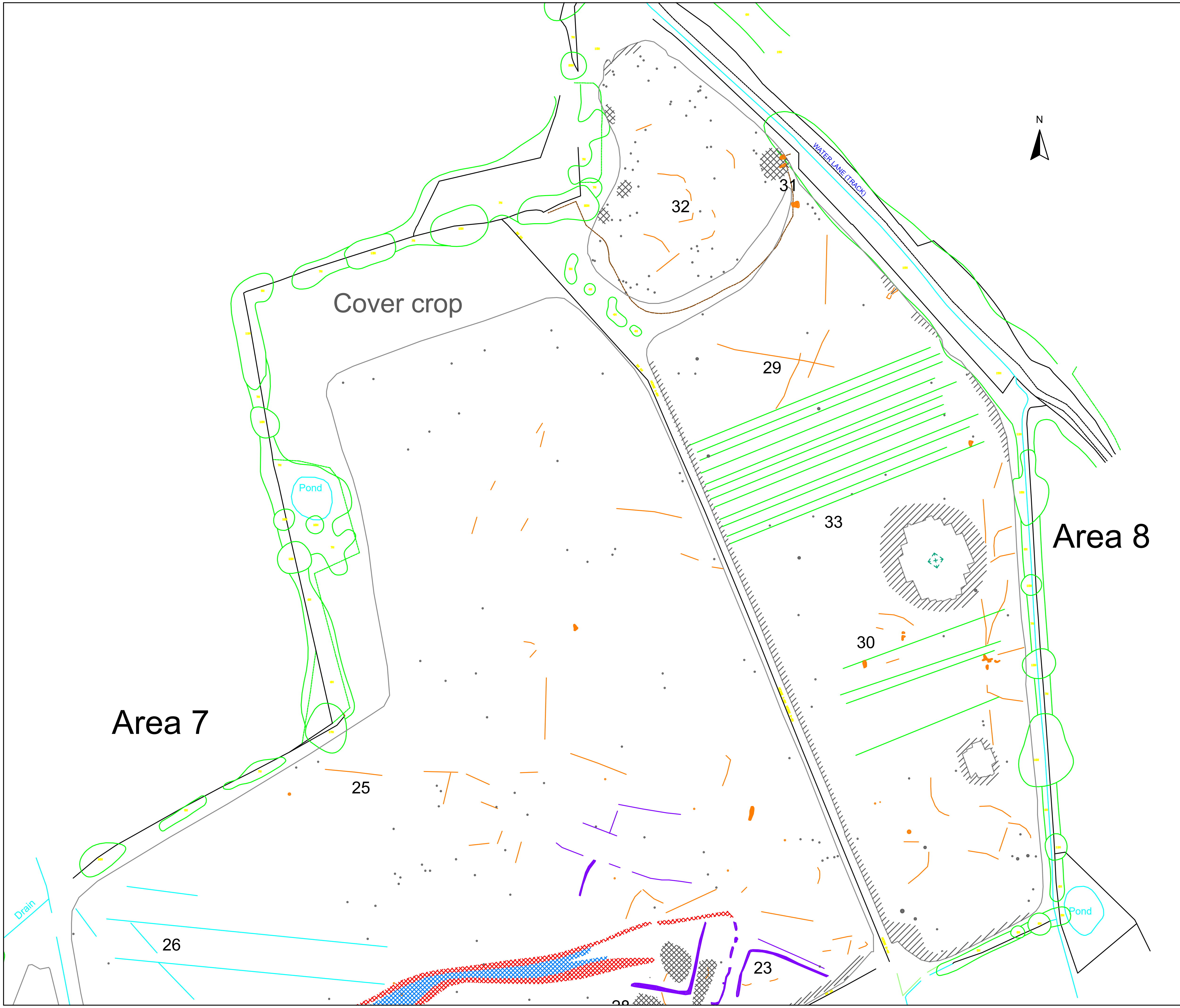
Greyscale plot of filtered magnetometer data - Area 8

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

SCALE 1:1500

0m 10 20 30 40 50m

KTD	DJS	FIG 25



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Abstraction and interpretation of magnetic anomalies - Area 8

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- 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

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 26