

**Griffins Farm Quarry  
Stockton  
Warwickshire**

**MAGNETOMETER SURVEY REPORT**

for

**Cotswold Archaeology**

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ARCHAEOLOGICAL SURVEYS LTD

**Griffins Farm  
Stockton  
Warwickshire**

Magnetometer Survey Report

for

**Cotswold Archaeology**

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## SUMMARY

Detailed magnetometry was carried out by Archaeological Surveys Ltd over the site for the proposed Griffins Farm Quarry, near Stockton, Warwickshire. The results demonstrate the presence of a number of previously unrecorded archaeological features including evidence for a banjo enclosure in the southern part of the site. Within the vicinity of the banjo enclosure are a large number of linear ditches, enclosures, ring ditches and pits indicating phases of occupation and activity within the site. Further archaeological anomalies have been located to the west and to the north east and together the archaeological features cover at least 8.5ha within the 42ha site. Approximately 5ha was unsurveyable due to roughly ploughed saturated soil, but it is possible that archaeological features may extend into this unsurveyed area from features visible immediately to the south. All of the survey areas contain former ridge and furrow which has partially truncated many of the anomalies.

## 1 INTRODUCTION

### 1.1 *Survey background*

- 1.1.1 Archaeological Surveys Ltd was commissioned by Cotswold Archaeology, on behalf of CEMEX UK, to undertake a magnetometer survey of an area of land at Griffins Farm to the south west of Stockton in Warwickshire. The site has been outlined for a proposed quarry and the survey forms part of an archaeological assessment of the site.
- 1.1.2 The north western corner of the site has been previously surveyed and reported on (Archaeological Surveys, 2015), and the greyscale images of the results have also been included with the current survey.
- 1.1.3 Area 4, within the northern part of the site could not be surveyed due to very roughly ploughed soils.

### 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 as a quarry. The methodology is considered an efficient and effective approach to archaeological prospection.
- 1.2.2 The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation*; and Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations*. The work has been carried out to the Chartered Institute for Archaeologists (2014) *Standard and Guidance for Archaeological Geophysical Survey*.

### 1.3 *Site location, description and survey conditions*

- 1.3.1 The site is located at Griffins Farm between Southam and Stockton in Warwickshire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SP 42570 63135, see Figures 01 and 02.
- 1.3.2 The geophysical survey covers approximately 37ha within nine survey areas, but labelled Areas 1-10 for the purposes of this report. Areas 1 and 2 contained mainly stubble, Area 3 was open soil that had been rolled and drilled, Area 4 contained very roughly ploughed land that became waterlogged and boggy and could not be surveyed, Area 5 contained rough soil and stubble, Area 6 was a small area of pasture with well-preserved ridge and furrow earthworks and Areas 7-10 had been recently drilled with emerging crop in places. Generally the site slopes down gently towards the south and south east.
- 1.3.3 Weather conditions during the survey were variable with periods of heavy rain and high winds. Most areas with open soil were very difficult to traverse due to saturated clayey soil.

### 1.4 *Site history and archaeological potential*

- 1.4.1 The Warwickshire online Historic Environment Record indicates that the survey area is located close to a number of archaeological sites and findspots. These include cropmarks recorded from aerial photographs of rectangular enclosures and linear features 200m to the east (MWA 6796), with further cropmark features 600m to the south east (MWA13389) and a possible Iron Age banjo enclosure 750m east (MWA 7253). A Roman coin hoard was discovered 130m to the south east of Area 2 (MWA940) and a Romano-British settlement recorded at School Street, Stockton, 900m to the north east (MWA13271). Ridge and furrow has also been recorded 700m to the north east (MWA7248) (Warwickshire County Council, 2013).
- 1.4.2 A previous geophysical survey carried out within the northern part of the site located a number of positive linear and discrete anomalies. One linear feature appears to have been truncated by ridge and furrow (Archaeological Surveys, 2015). Another geophysical survey carried out prior to quarrying on land immediately to the north of the site, located a linear ditch and pit-like features which appeared to pre-date the ridge and furrow (Archaeological Surveys, 2006).
- 1.4.3 The location of a number of cropmark features within the wider vicinity may indicate that there is potential for the site to contain further archaeological features.
- 1.4.4 The surface conditions within parts the site were suitable for the observation



of cultural material during the course of the survey. Within Area 2, a number of fire-cracked quartzite pebbles were noted in the eastern part of the field. Area 3 contained a broken leaf-shaped flint arrowhead, Area 6 contained well-preserved ridge and furrow earthworks, Areas 7-9 contained occasional Romano-British pottery sherds and Area 10 contained numerous Romano-British pottery sherds, fire-reddened stone and spreads of fragmented limestone and tile.

## 1.5 *Geology and soils*

- 1.5.1 The underlying geology is interbedded mudstone and limestone from the Rugby Limestone Member (Blue Lias) (BGS, 2015).
- 1.5.2 The overlying soil across the survey area is from the Evesham 2 association and is a typical calcareous pelosol. It consists of a slowly permeable, calcareous, clayey soil (Soil Survey of England and Wales, 1983).
- 1.5.3 Magnetometry carried out over similar geology and soil has produced good results. The site is, therefore, considered suitable for magnetic survey.

## 2 METHODOLOGY

### 2.1 *Technical synopsis*

- 2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Magnetic susceptibility and magnetic thermoremnance are factors associated with the formation of localised fields. Additional details are set out below and within Appendix A.
- 2.1.2 Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased, and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features, such as pits and ditches, may produce magnetic anomalies that can be mapped by magnetic prospection.
- 2.1.3 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth, oven etc. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.
- 2.1.4 The localised variations in magnetism are measured as sub-units of the Tesla, which is a SI unit of magnetic flux density. These sub-units are nano Teslas (nT), which are equivalent to  $10^{-9}$  Tesla (T).

## 2.2 *Equipment configuration, data collection and survey detail*

- 2.2.1 The detailed magnetic survey was carried out using a SENSYS MAGNETO®MXPDA 5 channel cart-based system. The instrument has 5 fluxgate gradiometers spaced 0.5m apart with readings recorded at 20Hz. The gradiometers have a range of recording data between 0.1nT and 10,000nT. The system is linked to a Leica GS10 RTK GPS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged computer.
- 2.2.2 Data are collected along a series of parallel survey tracks wherever possible. The length of each track is variable and relates to the size of the survey area and other factors including ground conditions. A visual display aids accurate placing of tracks and their separation.
- 2.2.3 Data are not collected within fixed grids and data points are considered to be random even though the data are collected in a systematic manner covering all accessible areas (Aspinall, Gaffney and Schmidt, 2009).

## 2.3 *Data processing and presentation*

- 2.3.1 Magnetic data collected by the MAGNETO®MXPDA cart-based system are initially prepared using SENSYS MAGNETO®DLMGPS software. Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display using TerraSurveyor.
- 2.3.2 The data are collected between limits of  $\pm 10000$ nT and clipped for display at  $\pm 3$ nT. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track. A zero median traverse function is required in order to remove fixed offset values present within the sensors which do not undergo a zeroing procedure in the field. The approach ensures that the gradiometer sensors are very accurately aligned and fixed to the vertical magnetic field and are not influenced by localised magnetic fields or disturbed by vibration. Although a zero median traverse algorithm can remove anomalies aligned with the survey tracks, in practice this rarely occurs due to the use of long traverses, high resolution measurement and variability within the magnetic susceptibility of long linear features.
- 2.3.3 Appendix C contains metadata concerning the survey and data attributes and is derived directly from TerraSurveyor. Reference should be made to Appendix B for further information on any processes, such as clipping, carried out on the data.
- 2.3.4 A TIF file is produced by TerraSurveyor software along with an associated world file (.TFW) that allows automatic georeferencing (OSGB36 datum) when using GIS or CAD software. The main form of data display used in the report is the minimally processed greyscale plot.
- 2.3.5 The raster images are combined with base mapping using ProgeCAD Professional 2014, creating DWG (2010) file formats. All images are

externally referenced to the CAD drawing in order to maintain good graphical quality. The CAD plots are effectively georeferenced facilitating relocation of features using GPS, resection method, etc.

- 2.3.6 An abstraction and interpretation is also drawn and plotted for all geophysical anomalies located by the survey. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.
- 2.3.7 A brief summary of each anomaly, with an appropriate reference number, is set out in list form within the results (Section 3) to allow a rapid and objective assessment of features within each survey area. Where further interpretation is possible, or where a number of possible origins should be considered, more subjective discussion is set out in Section 4.
- 2.3.8 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 37ha.
- 3.1.2 Magnetic anomalies located can be generally classified as positive linear, curvilinear, rectilinear 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, 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 below with subsequent discussion in Section 4.

### 3.2 *Statement of data quality*

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

### 3.3 *Data interpretation*

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

indicated to allow cross referencing to the abstraction and interpretation plot. CAD layer names are included to aid reference to associated digital files (.dwg/.dxf). Sub-headings are then used to group anomalies with similar characteristics for each survey area.
















Report sub-heading CAD layer names and plot colour	Description and origin of anomalies
<p><b>Anomalies with archaeological potential</b></p> <p>AS-ABST MAG POS LINEAR ARCHAEOLOGY </p> <p>AS-ABST MAG POS DISCRETE ARCHAEOLOGY </p> <p>AS-ABST MAG POS CURVILINEAR RING DITCH </p> <p>AS-ABST MAG POS ENCLOSURE DITCH </p>	<p>Anomalies have the characteristics (mainly morphological) of a range of archaeological features such as pits, ring ditches, enclosures, etc..</p>
<p><b>Anomalies with an uncertain origin</b></p> <p>AS-ABST MAG POS LINEAR UNCERTAIN </p> <p>AS-ABST MAG NEG LINEAR UNCERTAIN </p> <p>AS-ABST MAG POS DISCRETE UNCERTAIN </p> <p>AS-ABST MAG POS UNCERTAIN </p>	<p>The category applies to a range of anomalies where <u>there is not enough evidence to confidently suggest an origin</u>. Anomalies in this category <u>may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered</u>. 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.</p>
<p><b>Anomalies relating to land management</b></p> <p>AS-ABST MAG BOUNDARY </p> <p>AS-ABST MAG LAND DRAIN </p>	<p>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 a ceramic land drain.</p>
<p><b>Anomalies with an agricultural origin</b></p> <p>AS-ABST MAG RIDGE AND FURROW </p>	<p>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.</p>
<p><b>Anomalies associated with magnetic debris</b></p> <p>AS-ABST MAG DEBRIS </p> <p>AS-ABST MAG STRONG DIPOLAR </p>	<p>Magnetic debris often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. It often occurs where there has been dumping or ground make-up and is related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material. This type of response is occasionally associated with kilns, furnace structures, or hearths and <u>may therefore be archaeologically significant</u>. 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.</p>
<p><b>Anomalies with a modern origin</b></p> <p>AS-ABST MAG DISTURBANCE </p> <p>AS-ABST MAG SERVICE </p>	<p>The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc.. Often a significant area around such features has a strong magnetic flux which may create magnetic disturbance; such disturbance can effectively obscure low magnitude anomalies if they are present. Fluxgate sensors may respond erratically and with hysteresis adjacent to strong magnetic sources. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction.</p>

Table 1: List and description of interpretation categories

### 3.4 *List of anomalies - Area 1*

Area centred on OS NGR 442905 263532, see Figures 05 & 06.

#### *Anomalies with an uncertain origin*

(1) - Two positive linear anomalies appear to join to form a "T" shaped feature. A third linear anomaly appears to extend towards it from the south. It is possible that these relate to cut, ditch-like features; however, land drainage should also be considered.

(2) - A number of short, fragmented, weakly positive, linear anomalies are located in the south eastern corner of the survey area. It is not possible to determine if they relate to cut features; however, it is possible that they have been truncated by ridge and furrow and a continuation of anomalies (7), within Area 2 to the south, should be considered.

(3) - A small number of discrete positive responses have been located. Although they appear pit-like, it is not possible to determine their origin.

#### *Anomalies with an agricultural origin*

(4 & 5) - The survey area contains a series of parallel linear anomalies that represent the dominant trend in the ridge and furrow (4). In the eastern part of the site, several linear anomalies have a slightly different orientation (5), but also appear to relate to ridge and furrow.

#### *Anomalies associated with magnetic debris*

(6) - A zone of magnetic debris extends along the southern boundary of the survey area. This is likely to relate to a spread of magnetically thermoremanent material.

### 3.5 *List of anomalies - Area 2*

Area centred on OS NGR 442817 263328, see Figures 07 & 8.

#### *Anomalies of archaeological potential*

(7) - Positive linear anomalies appear to form a fragmented rectilinear feature that encloses other cut features (8). The anomalies are weak (1.5nT) and they have been truncated by ridge and furrow.

(8) - Positive linear and curvilinear anomalies located within the confines of anomaly (7). At least one anomaly may indicate a ring ditch feature.

(9) - A small group of discrete positive responses are located just to the south west

of anomaly (7). They have a response 4-13nT, and they appear to relate to large pits or areas of burning.

#### *Anomalies with an uncertain origin*

(10) - In the southern part of the survey area are a number of short or fragmented weakly positive linear anomalies. It is not certain if they relate to cut, ditch-like features, or if they are associated with land drainage.

(11) - The survey area contains a small amount of short positive linear and discrete anomalies. They have no coherent form and their origin is uncertain.

#### *Anomalies associated with land management*

(12) - A positive linear anomaly crosses the central part of the survey area and relates to a formerly mapped land boundary.

(13) - In the western part of the survey area are a series of land drains. One similar response can be seen close to the eastern edge of the survey area.

#### *Anomalies with an agricultural origin*

(14) - A series of parallel linear anomalies relate to ridge and furrow.

### 3.6 *List of anomalies - Area 3*

Area centred on OS NGR 442595 263235, see Figures 09 & 10.

#### *Anomalies with an uncertain origin*

(15) - The survey area contains a small number of short positive linear and discrete responses of uncertain origin.

#### *Anomalies associated with land management*

(16) - A small number of ceramic land drains can be seen in the data.

#### *Anomalies with an agricultural origin*

(17) - A series of parallel linear anomalies relate to ridge and furrow.

### 3.7 *List of anomalies - Area 5*

Area centred on OS NGR 442341 262996, see Figures 11 & 12.

*Anomalies of archaeological potential*

(18) - Situated in the south eastern corner of the survey area is the northern part of an oval enclosure, with the majority of the feature seen in Area 8 to the south (32).

*Anomalies with an uncertain origin*

(19) - The survey area contains a small number of weakly positive linear anomalies. Due to their weak response and short form they are indistinct, but cut features should be considered.

*Anomalies associated with land management*

(20) - A positive linear anomaly extends across the centre of the survey area and relates to a former field boundary.

*Anomalies with an agricultural origin*

(21) - The survey area contains ridge and furrow.

### 3.8 List of anomalies - Area 6

Area centred on OS NGR 442455 262988, see Figures 11 & 12.

*Anomalies of archaeological potential*

(22) - Positive linear and rectilinear anomalies relate to linear ditches and enclosure features. They have been truncated by ridge and furrow (25). These features may extend northwards into the unsurveyed Area 4.

(23) - A positive curvilinear anomaly relates to a ring ditch with a 10.5m diameter. It is associated with anomalies (23) and indicates a round house feature.

*Anomalies with an uncertain origin*

(24) - A small number of very short, positive linear and discrete responses are located within the survey area. They may relate to cut features, but this is not certain.

*Anomalies with an agricultural origin*

(25) - The survey area contains extant ridge and furrow. This appears to have partially truncated, but also partially preserved the underlying archaeology.

*Anomalies associated with magnetic debris*

(26) - The survey area contains a number of strong, discrete, dipolar anomalies.

Although located close to the archaeological features, they lie within a small paddock close to farm buildings and may well be relatively modern in origin.

### 3.9 *List of anomalies - Area 7*

Area centred on OS NGR 442177 262874, see Figures 13 & 14.

#### *Anomalies of archaeological potential*

(27) - Positive rectilinear anomalies forming three sides of a rectangular enclosure 86m wide. It has been truncated by a pipeline/service (31) and also ridge and furrow (30) and it appears that it extends westwards beyond the limits of the survey area.

(28) - Within the confines of anomaly (27) are a number of positive curvilinear, linear and discrete anomalies. These relate to cut linear features, pits and ring ditches. The ring ditches are small, with a diameter of 5m to 6.5m.

#### *Anomalies with an uncertain origin*

(29) - The survey area contains several weak, short and fragmented positive linear, discrete and curvilinear anomalies. Several have been truncated by ridge and furrow which indicates that they could relate to earlier archaeological features.

#### *Anomalies with an agricultural origin*

(30) - A series of parallel linear anomalies relates to ridge and furrow.

#### *Anomalies with a modern origin*

(31) - Two strong, multiple dipolar, linear anomalies are located at the western edge of the survey area and relate to buried pipes or services.

### 3.10 *List of anomalies - Area 8*

Area centred on OS NGR 442407 262800, see Figures 15 & 16.

#### *Anomalies of archaeological potential*

(32) - A positive curvilinear anomaly which forms an oval enclosure with anomaly (18) in Area 5 to the north. It has dimensions of 83m by 59m and it contains a number of linear, curvilinear and discrete responses (35). The magnetic response varies within the circuit, 1-2nT in the north and west with discrete zones in the southern part having a response of 10-18nT. It has an entrance in the south west and has been affected by former and extant land boundaries in the north east. It



appears, with anomalies (33 & 34), to form an Iron Age banjo enclosure.

(33 & 34) - Two positive linear anomalies extend south westwards from anomaly (32) for 24m, where one then turns sharply to the north west and then again to the south (33) and the other turns to the south east (34). Anomaly (33) does not appear to join the oval enclosure (32); however, it may have been truncated by ridge and furrow. Anomaly (33) is generally stronger and more well defined than anomaly (34), with a response of generally 2.5-6nT, with a very strong response of over 40nT close to where it changes direction. Anomaly (34) has a response of less than 1nT and is fragmented. These anomalies indicate the elongated passage way and antennae ditches associated with a banjo enclosure.

(35) - Within the confines of anomaly (32) are discrete positive responses, a number of fragmented positive curvilinear anomalies and an almost complete ring ditch with an 11m diameter. This indicates settlement associated with the enclosure and the other curvilinear anomalies may also relate to truncated round house ring ditches.

(36) - A number of positive linear anomalies are located in the vicinity of anomalies (33) and (34), with a complex of linear and rectilinear features further to the south. Many appear to be a continuation of anomalies (53) within Area 10 to the south west, and it is not possible to determine if they are directly associated with the banjo enclosure.

(37) - A number of positive linear anomalies are located in the vicinity of the elongated entranceway to the oval enclosure (32). Their relationship or sequencing is not clear from the data.

(38) - A number of parallel linear anomalies within the south eastern part of the site may continue northwards as anomaly (39) and also to the south as anomaly (54) within Area 10.

(39) - A positive linear anomaly that may be a continuation of anomalies (38) and appears to have an association with anomalies (40) and (41).

(40) - A positive linear anomaly extends throughout the northern part of the survey area. Although it doesn't appear within Area 6 to the north, it is possible that it is associated with anomalies (22) in that part of the site.

(41) - A positive linear anomaly extends between anomalies (39) and (32).

#### *Anomalies with an uncertain origin*

(42) - The survey area contains a large number of positive linear and curvilinear anomalies. However, these are generally very weak (0.5nT), fragmented and poorly defined although it is possible that they relate to further archaeological features.

(43) - A positive linear anomaly extends throughout the western part of the survey

area. It is generally parallel with the western field boundary and may indicate a modern plough mark; however, it is possible that it just extends into Area 5 to the north.

(44) - A positive linear anomaly is located close to anomaly (40). It has the position and general orientation to anomalies (46); however, it is much stronger than the ridge and furrow, although this may indicate that magnetically enhanced material from anomaly (40) has become incorporated into it.

#### *Anomalies associated with land management*

(45) - The survey area was previously split into three separate fields by former boundary features.

#### *Anomalies with an agricultural origin*

(46) - The survey area contains several series of ridge and furrow.

#### *Anomalies with a modern origin*

(47) - Magnetic debris is from ferrous material used to infill a pond.

### 3.11 *List of anomalies - Area 9*

Area centred on OS NGR 442157 262706, see Figures 17 & 18.

#### *Anomalies of archaeological potential*

(48) - The western part of the survey area contains a number of positive linear, curvilinear, rectilinear and discrete anomalies that relate to a group of ditches, enclosures and pits. These lie to the south of the large rectilinear enclosure (27) in Area 7 and it is possible that they are associated.

#### *Anomalies with an uncertain origin*

(49) - Within the site there are a number of short, weakly positive linear and discrete anomalies. They lack a coherent morphology and they are indistinct and therefore their origin is uncertain.

#### *Anomalies associated with land management*

(50) - Land drains are evident close to the eastern boundary.

#### *Anomalies with an agricultural origin*

(51) - A series of parallel linear anomalies relate to ridge and furrow.

### *Anomalies with a modern origin*

(52) - Magnetic disturbance from an electricity pole.

### 3.12 *List of anomalies - Area 10*

Area centred on OS NGR 442280 262630, see Figures 17 & 18.

#### *Anomalies of archaeological potential*

(53) - The survey area contains a complex series of positive linear, rectilinear, curvilinear and discrete response that relate to phases of enclosures, linear ditches, ring ditches and pits. They do not appear to extend further west into Area 9, but do extend northwards into Area 8.

(54) - A series of discrete positive responses relates to a fragmented positive linear anomaly that has been severely truncated by ridge and furrow (55). It is possible that this feature extends northwards into Area 8 and continues as anomaly (38).

#### *Anomalies with an agricultural origin*

(55) - A series of ridge and furrow has clearly truncated the archaeological features within Area 10.

## 4 DISCUSSION

- 4.1.1 Area 1 in the northern part of the site has been partially previously subject to a geophysical survey. A positive linear anomaly can be seen to extend further south within the survey area, joining another to form a "T" shaped feature. These may relate to cut features, but land drainage should also be considered.
- 4.1.2 In the north eastern corner of Area 2 are a number of linear and curvilinear cut features. It appears that it may represent a rectilinear enclosure with possible ring ditches inside. Externally there are a group of pit-like features, or area of burning. To the south are a number of very weakly positive responses, and it is possible that these relate to further cut features. During the survey, observations were made of fire-cracked quartzite pebbles in the vicinity.
- 4.1.3 In the south eastern corner of Area 5 is the northern part of an oval enclosure, the majority of which is located in Area 8 to the south. This enclosure encompasses an area of 0.4ha, and contains an almost complete ring ditch and several others that are more truncated. It has a 4.5m entrance on the

south western side beyond which is an elongated passageway 24m long and antenna ditches extending east and west at the end of the passageway. The form of these anomalies indicates that this represents a previously unrecorded banjo enclosure. Another cropmark example of a banjo enclosure is recorded 1.4km to the north east, within fields to the south of the cemetery in Stockton.

- 4.1.4 There are a number of other complex cut linear, rectilinear, curvilinear and discrete anomalies to the south east and east of the banjo enclosure that continue southwards into Area 10 and possibly into Area 6 to the north. Area 6 is located in a very small paddock containing extant ridge and furrow. Beneath this are partially preserved and partially truncated archaeological features including linear ditches, enclosures and a ring ditch. It appears possible that these archaeological features may extend into the southern part of Area 4 that could not be surveyed due to roughly ploughed saturated soil.
- 4.1.5 In the southern part of the site, within Area 10 there is a complex of linear ditches, enclosures, ring ditches and pits that relate to several phases of settlement, with possible Iron Age occupation within round houses and later settlement in the Roman period. During the course of the survey numerous Romano-British pottery sherds were noted along with quernstone fragments and spreads of limestone. Many of the limestone fragments were fire-reddened and with the presence of terracotta tile fragments, the material may well represent the remains of more substantial stone built structures that are not apparent within the magnetic data.
- 4.1.6 These features within Area 10 extend northwards into Area 8, but they do not appear to extend westwards directly into Area 9. However, at the western edge of Area 9 and Area 7 to the north, are a number of rectilinear enclosures, linear ditches and ring ditches that also indicate probable late prehistoric and/or Roman settlement.
- 4.1.7 In total the archaeological features within the site cover at least 8.5ha, with several other zones of indistinct positive linear anomalies outside of this that may indicate further archaeological features. All of the survey areas contain evidence for former ridge and furrow and this has truncated much of the archaeology to a certain degree, with some features appearing to be much better preserved than others.

## 5 CONCLUSION

- 5.1.1 The geophysical survey located a large number of archaeological features within the site. These include evidence for a previously unrecorded banjo enclosure, several other rectangular enclosures, linear ditches and several ring ditch features indicating phases of occupation within the site from at least the Iron Age and into the Roman period.

- 5.1.2 The majority of the archaeological features are located within the southern part of the site, although there is evidence of a possible enclosure and ring ditch features in the north eastern part of the site also.
- 5.1.3 All of the survey areas contain a number of short or fragmented weakly positive linear anomalies that are poorly defined. There is evidence of some of these anomalies being truncated by ridge and furrow and they too may relate to further archaeological features. All of the survey areas contained former ridge and furrow, which has affected many of the anomalies of archaeological potential.

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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 thermoremanent 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.

Thermoremanent 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. Thermoremanent features include ovens, hearths, and kilns. In addition thermoremanent material such as tile and brick may also be associated with human activity and settlement.

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

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

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

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

## Appendix B – data processing notes

### *Clipping*

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. It has been found that clipping data to ranges between  $\pm 5nT$  and  $\pm 3nT$  often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

### *Zero (dstrip) Median/Mean Traverse*

The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise differences between the baseline value of gradiometer sensors.

### *High Pass Filtering*

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

## Appendix C – survey and data information

### Area 1

COMPOSITE  
 Path: C:\Business\Jobs\J634 Stockton  
 2\Data\Area 1\comps\  
 Filename: J634-mag-Area1-proc.xcp  
 Description: Imported as Composite from: J634-  
 mag-Area1.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates (X/Y):OSGB36  
 Northwest corner: 442789.001043544,  
 263650.069320902 m  
 Southeast corner: 442984.751043544,  
 263435.419320902 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702  
 Source GPS Points: 796800

Dimensions  
 Composite Size (readings): 1305 x 1431  
 Survey Size (meters): 196 m x 215 m  
 Grid Size: 196 m x 215 m  
 X Interval: 0.15 m  
 Y Interval: 0.15 m

Stats  
 Max: 3.32  
 Min: -3.30  
 Std Dev: 1.16  
 Mean: 0.05  
 Median: 0.03  
 Composite Area: 4.2018 ha  
 Surveyed Area: 2.3568 ha

Processes: 1  
 1 Base Layer

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

### Area 2

COMPOSITE  
 Path: C:\Business\Jobs\J634 Stockton  
 2\Data\Area 2\comps\  
 Filename: J634-mag-Area2-proc.xcp  
 Description: Imported as Composite from: J634-  
 mag-Area2.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates (X/Y):OSGB36  
 Northwest corner: 442565.656571091,  
 263535.818071029 m  
 Southeast corner: 442996.606571091,  
 263111.168071029 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702  
 Source GPS Points: 3563900

Dimensions  
 Composite Size (readings): 2873 x 2831  
 Survey Size (meters): 431 m x 425 m  
 Grid Size: 431 m x 425 m  
 X Interval: 0.15 m  
 Y Interval: 0.15 m

Stats  
 Max: 3.00  
 Min: -3.00  
 Std Dev: 1.02  
 Mean: 0.06  
 Median: -0.01  
 Composite Area: 18.3 ha  
 Surveyed Area: 10.023 ha

Processes: 3  
 1 Base Layer  
 2 Clip from -5.00 to 5.00 nT  
 3 Clip from -3.00 to 3.00 nT

GPS based Proce3  
 1 Base Layer.  
 2 Unit Conversion Layer (Lat/Long to OSGB36).  
 3 DeStripe Median Traverse:

### Area 3

COMPOSITE  
 Path: C:\Business\Jobs\J634 Stockton  
 2\Data\Area 3\comps\  
 Filename: J634-mag-Area3.xcp  
 Description: Imported as Composite from: J634-  
 mag-Area3.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates (X/Y):OSGB36  
 Northwest corner: 442396.463695913,  
 263379.073979587 m  
 Southeast corner: 442789.763695913,  
 263083.723979587 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702  
 Source GPS Points: 1967200

Dimensions  
 Composite Size (readings): 2622 x 1969  
 Survey Size (meters): 393 m x 295 m  
 Grid Size: 393 m x 295 m  
 X Interval: 0.15 m  
 Y Interval: 0.15 m

Stats  
 Max: 3.32  
 Min: -3.30  
 Std Dev: 0.86  
 Mean: 0.03  
 Median: 0.00  
 Composite Area: 11.616 ha  
 Surveyed Area: 6.034 ha

Processes: 1  
 1 Base Layer

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

### Area 5

COMPOSITE  
 Path: C:\Business\Jobs\J634 Stockton  
 2\Data\Area 5\comps\  
 Filename: J634-mag-Area5.xcp  
 Description: Imported as Composite from: J634-  
 mag-Area5.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates (X/Y):OSGB36  
 Northwest corner: 442175.145712589,  
 263143.233010693 m  
 Southeast corner: 442461.645712589,  
 262864.983010693 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702  
 Source GPS Points: 1510300

Dimensions  
 Composite Size (readings): 1910 x 1855  
 Survey Size (meters): 287 m x 278 m  
 Grid Size: 287 m x 278 m  
 X Interval: 0.15 m  
 Y Interval: 0.15 m

Stats  
 Max: 3.32  
 Min: -3.30  
 Std Dev: 0.97  
 Mean: 0.04  
 Median: 0.01  
 Composite Area: 7.9719 ha  
 Surveyed Area: 3.7543 ha

Processes: 1  
 1 Base Layer

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

### Area 6

COMPOSITE  
 Path: C:\Business\Jobs\J634 Stockton  
 2\Data\Area 6\comps\  
 Filename: J634-mag-Area6.xcp  
 Description: Imported as Composite from: J634-  
 mag-Area6.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates (X/Y):OSGB36  
 Northwest corner: 442402.067017246,  
 263029.407505335 m  
 Southeast corner: 442517.567017246,  
 262935.507505335 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702  
 Source GPS Points: 182900

Dimensions  
 Composite Size (readings): 770 x 626  
 Survey Size (meters): 116 m x 93.9 m  
 Grid Size: 116 m x 93.9 m  
 X Interval: 0.15 m  
 Y Interval: 0.15 m

Stats  
 Max: 3.32  
 Min: -3.30  
 Std Dev: 1.38  
 Mean: 0.02  
 Median: 0.06  
 Composite Area: 1.0845 ha  
 Surveyed Area: 0.56137 ha

Processes: 1  
 1 Base Layer

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

### Area 7

COMPOSITE  
 Path: C:\Business\Jobs\J634 Stockton  
 2\Data\Area 7\comps\  
 Filename: J634-mag-Area7-proc.xcp  
 Description: Imported as Composite from: J634-  
 mag-Area7.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates (X/Y):OSGB36  
 Northwest corner: 442080.708046736,  
 262998.582325716 m  
 Southeast corner: 442277.508046736,  
 262748.832325716 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702  
 Source GPS Points: 1015100

Dimensions  
 Composite Size (readings): 1312 x 1665  
 Survey Size (meters): 197 m x 250 m  
 Grid Size: 197 m x 250 m  
 X Interval: 0.15 m  
 Y Interval: 0.15 m

Stats  
 Max: 3.32  
 Min: -3.30  
 Std Dev: 1.00



Mean: 0.02  
 Median: 0.01  
 Composite Area: 4.9151 ha  
 Surveyed Area: 3.3849 ha

Processes: 1  
 1 Base Layer

GPS based Proce4

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

Area 8

COMPOSITE

Path: C:\Business\Jobs\J634 Stockton  
 2\Data\Area 8\comps\  
 Filename: J634-mag-Area8.xcp  
 Description: Imported as Composite from: J634-  
 mag-Area8.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates (X/Y):OSGB36  
 Northwest corner: 442218.059245873,  
 262960.008794085 m  
 Southeast corner: 442594.559245873,  
 262645.008794085 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702

Source GPS Points: 2115800

Dimensions

Composite Size (readings): 2510 x 2100  
 Survey Size (meters): 377 m x 315 m  
 Grid Size: 377 m x 315 m  
 X Interval: 0.15 m  
 Y Interval: 0.15 m

Stats

Max: 3.32  
 Min: -3.30  
 Std Dev: 0.83  
 Mean: 0.02  
 Median: 0.00  
 Composite Area: 11.86 ha  
 Surveyed Area: 6.4438 ha

Processes: 1  
 1 Base Layer

GPS based Proce4

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

Area 9

COMPOSITE

Path: C:\Business\Jobs\J634 Stockton  
 2\Data\Area 9\comps\  
 Filename: J634-mag-Area9-proc.xcp  
 Description: Imported as Composite from: J634-  
 mag-Area9.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates (X/Y):OSGB36  
 Northwest corner: 442087.433228881,  
 262780.006828391 m  
 Southeast corner: 442244.933228881,  
 262622.056828391 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702

Source GPS Points: 557300

Dimensions

Composite Size (readings): 1050 x 1053  
 Survey Size (meters): 158 m x 158 m  
 Grid Size: 158 m x 158 m  
 X Interval: 0.15 m  
 Y Interval: 0.15 m

Stats

Max: 3.32  
 Min: -3.30  
 Std Dev: 0.91  
 Mean: 0.03  
 Median: 0.02  
 Composite Area: 2.4877 ha  
 Surveyed Area: 1.3906 ha

Processes: 1  
 1 Base Layer

GPS based Proce4

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

Area 10

COMPOSITE

Path: C:\Business\Jobs\J634 Stockton  
 2\Data\Area 10\comps\  
 Filename: J634-mag-Area10-proc.xcp  
 Description: Imported as Composite from: J634-  
 mag-Area10.asc  
 Instrument Type: Sensys DLMGPS  
 Units: nT  
 UTM Zone: 30U  
 Survey corner coordinates (X/Y):OSGB36  
 Northwest corner: 442197.461445324,  
 262698.64925465 m  
 Southeast corner: 442362.311445324,  
 262567.99925465 m  
 Collection Method: Randomised  
 Sensors: 5  
 Dummy Value: 32702

Source GPS Points: 399600

Dimensions

Composite Size (readings): 1099 x 871  
 Survey Size (meters): 165 m x 131 m  
 Grid Size: 165 m x 131 m  
 X Interval: 0.15 m  
 Y Interval: 0.15 m

Stats

Max: 3.32  
 Min: -3.30  
 Std Dev: 1.47  
 Mean: 0.07  
 Median: 0.01  
 Composite Area: 2.1538 ha  
 Surveyed Area: 1.1504 ha

Processes: 1  
 1 Base Layer

GPS based Proce4

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

## Appendix D – digital archive

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

Three printed copies of the report and a PDF copy will be supplied to the Warwickshire Historic Environment Record. The report will also be uploaded to the Online Access to the Index of archaeological investigations (OASIS). A summary of the survey will also be supplied to *West Midlands Archaeology*.

Archive contents:

Geophysical data - path: J634 Stockton 2 \Data\				
Path and Filename	Software	Description	Date	Creator
stockton1\MX\ stockton2\MX\ stockton3\MX\ stockton5\MX\ stockton6\MX\ stockton7\MX\ stockton8\MX\ stockton9\MX\ .prm.,.dgb.,.disp	Sensys MXPDA	Proprietary data formats representing magnetometer survey traverses logged to a PDA.	22/10/15 22/10/15 20/10/15 26/10/15 03/11/15 27/10/15 05/11/15 02/11/15	D.J.Sabin
stockton1\MX\Area1-mag.asc stockton2\MX\Area2-mag.asc stockton3\MX\Area3-mag.asc stockton5\MX\Area5-mag.asc stockton6\MX\Area6-mag.asc stockton7\MX\Area7-mag.asc stockton8\MX\Area8-mag.asc stockton9\MX\Area9-mag.asc stockton9\MX\Area10-mag.asc	Sensys DLMGPS	ASCII CSV (tab) file representing survey Area in eastings, northings (UTM Z30N), magnetic measurement, traverse file and sensor number.	04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15	D.J.Sabin
Area1\comps\J634-mag-Area1.xcp Area2\comps\J634-mag-Area2.xcp Area3\comps\J634-mag-Area3.xcp Area5\comps\J634-mag-Area5.xcp Area6\comps\J634-mag-Area6.xcp Area7\comps\J634-mag-Area7.xcp Area8\comps\J634-mag-Area8.xcp Area9\comps\J634-mag-Area9.xcp Area10\comps\J634-mag-Area10.xcp	TerraSurveyor 3.0.23.0	Composite data file derived from ASCII CSV.	04/11/15 04/11/15 04/11/15 04/11/15 14/10/15 14/10/15 19/10/15 19/10/15 14/10/15	D.J.Sabin
Area1\comps\J634-mag-Area1-proc.xcp Area2\comps\J634-mag-Area2-proc.xcp Area3\comps\J634-mag-Area3-proc.xcp Area5\comps\J634-mag-Area5-proc.xcp Area6\comps\J634-mag-Area6-proc.xcp Area7\comps\J634-mag-Area7-proc.xcp Area8\comps\J634-mag-Area8-proc.xcp Area9\comps\J634-mag-Area9-proc.xcp Area10\comps\J634-mag-Area10-proc.xcp	TerraSurveyor 3.0.23.0	Processed composite data file (zmt and clipping to $\pm 3nT$ ).	04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15	D.J.Sabin
Graphic data - path: J634 Stockton 2\Data\				
Area1\graphics\J634-mag-Area1-proc.tif Area1\graphics\J634-mag-Area1-proc.tfw Area2\graphics\J634-mag-Area2-proc.tif Area2\graphics\J634-mag-Area2-proc.tfw Area3\graphics\J634-mag-Area3-proc.tif Area3\graphics\J634-mag-Area3-proc.tfw Area5\graphics\J634-mag-Area5-proc.tif Area5\graphics\J634-mag-Area5-proc.tfw Area6\graphics\J634-mag-Area6-proc.tif Area6\graphics\J634-mag-Area6-proc.tfw Area7\graphics\J634-mag-Area7-proc.tif Area7\graphics\J634-mag-Area7-proc.tfw Area8\graphics\J634-mag-Area8-proc.tif Area8\graphics\J634-mag-Area8-proc.tfw Area9\graphics\J634-mag-Area9-proc.tif Area9\graphics\J634-mag-Area9-proc.tfw Area10\graphics\J634-mag-Area10-proc.tif Area10\graphics\J634-mag-Area10-proc.tfw	TerraSurveyor 3.0.23.0	TIF file showing a minimally processed greyscale plot clipped to $\pm 3nT$ . World file (tfw) for georeferencing TIF to OSGB36.	04/11/15 06/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15 04/11/15	D.J.Sabin
CAD data - path: J634 Stockton 2\CAD\				
J634 version 1.dwg	ProgeCAD 2016	CAD file for creating plots of greyscales, abstraction, interpretation and mapping. Grid coordinates as OSGB. AutoCAD 2010 format.	13/10/15	K.T.Donaldson
Text data - path: J634 Stockton 2\Documentation\				
J634 report.odt	OpenOffice.org 3.0.1 Writer	Report text as an Open Office document.	19/11/15	K.T.Donaldson

## Appendix E – copyright and intellectual property

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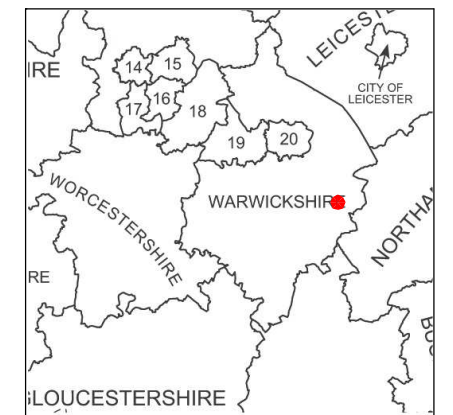
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**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Map of survey area**

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● Survey location

Site centred on OS NGR  
SP 42570 63135

SCALE 1:25 000



SCALE TRUE AT A3



Survey location

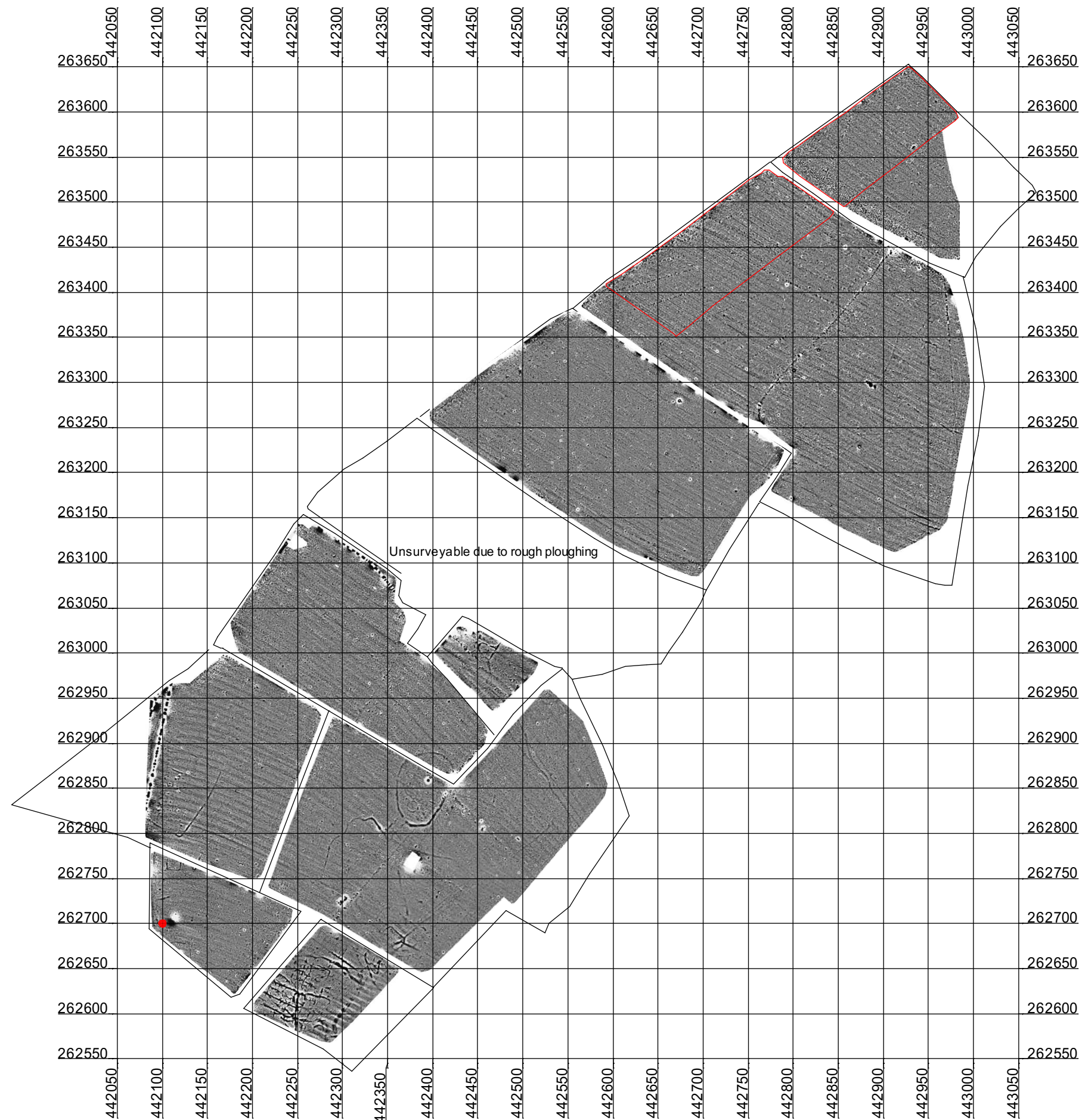
**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Referencing information**

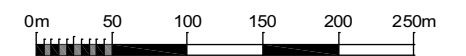
Referencing grid to OSGB36 datum at 50m intervals

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

- 442100 262700
- ▭ Former geophysical survey area



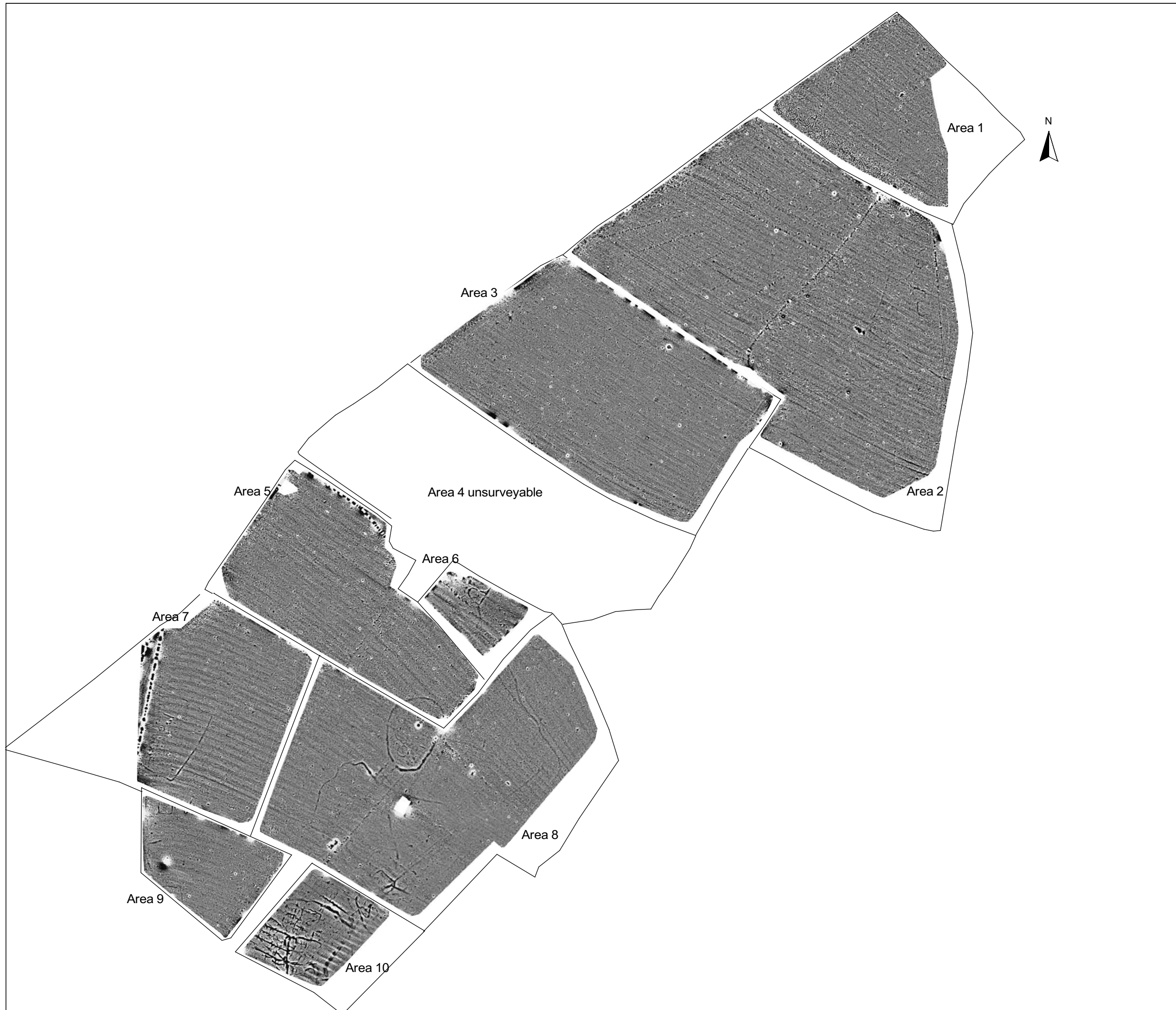
SCALE 1:5000



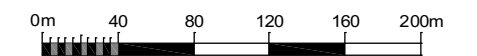
SCALE TRUE AT A3

**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Greyscale plot of minimally  
processed magnetometer data**



**SCALE 1:4000**


















SCALE TRUE AT A3

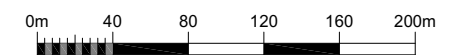
**FIG 03**

**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Abstraction and interpretation of  
magnetometer anomalies**

-  Positive linear anomaly - cut feature of archaeological potential
-  Positive rectilinear/curvilinear anomaly - enclosure ditch
-  Positive curvilinear anomaly - ring ditch
-  Positive linear anomaly - possible ditch-like feature
-  Linear anomaly - of agricultural origin
-  Linear anomaly - ridge and furrow
-  Positive linear anomaly - possible land drain
-  Positive linear anomaly - possible former field boundary
-  Discrete positive response - cut feature of archaeological potential
-  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 multiple dipolar linear anomaly - pipeline / cable / service
-  Strong dipolar anomaly - ferrous object

SCALE 1:4000



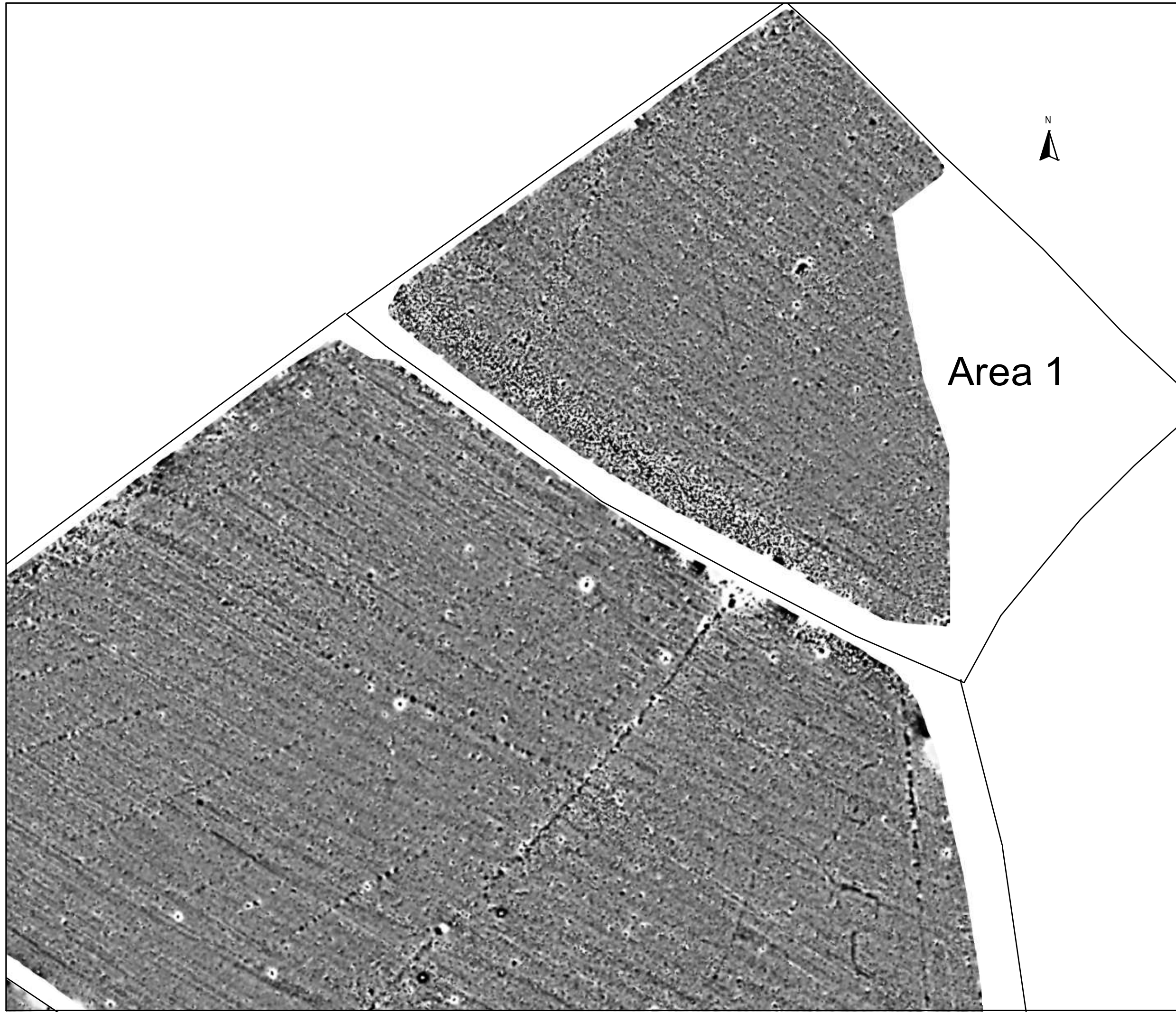
SCALE TRUE AT A3

FIG 04

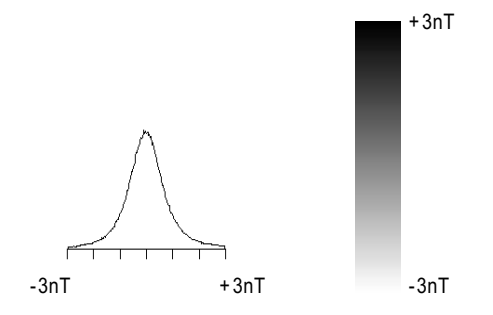


**Griffins Farm Quarry  
Stockton  
Warwickshire**

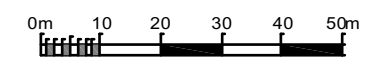
**Greyscale plot of minimally  
processed magnetometer data -  
Area 1**



Area 1










SCALE 1:1250





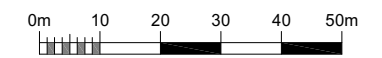
**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Abstraction and interpretation of  
magnetometer anomalies -  
Area 1**

-  Positive linear anomaly - possible ditch-like feature
-  Linear anomaly - ridge and furrow
-  Positive linear anomaly - possible land drain
-  Negative linear anomaly - material of low magnetic susceptibility
-  Discrete positive response - possible pit-like feature
-  Magnetic debris - spread of magnetically thermoremnant/ferrous material
-  Strong dipolar anomaly - ferrous object



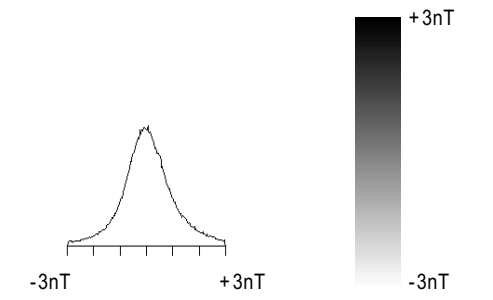
SCALE 1:1250



SCALE TRUE AT A3

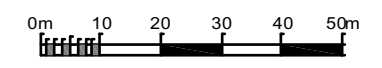
**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Greyscale plot of minimally  
processed magnetometer data -  
Area 2**














**Area 2**

**SCALE 1:1250**

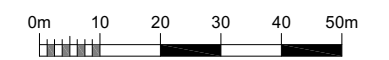


**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Abstraction and interpretation of  
magnetometer anomalies - Area 2**

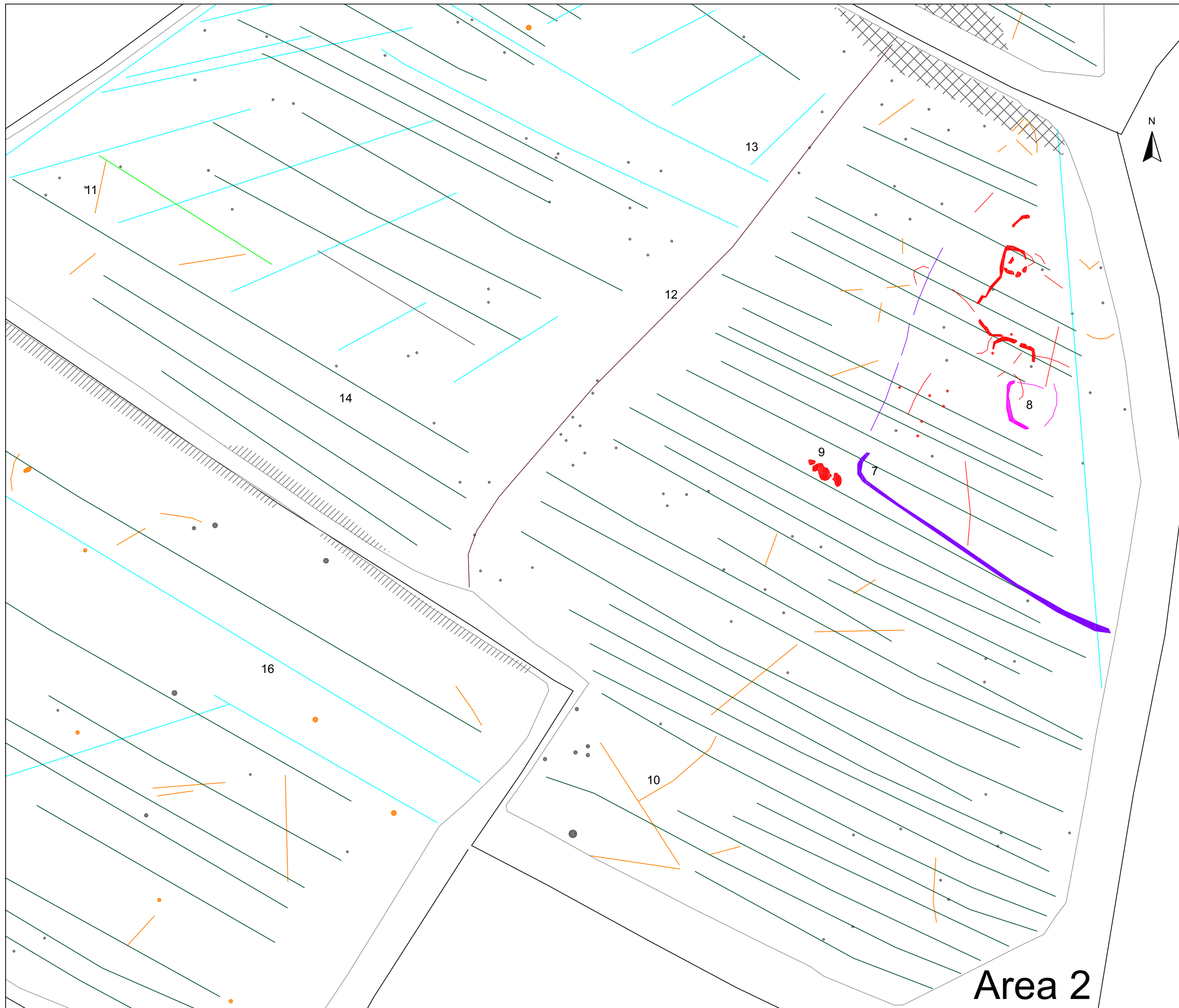
-  Positive linear anomaly - cut feature of archaeological potential
-  Positive rectilinear anomaly - enclosure ditch
-  Positive curvilinear anomaly - ring ditch
-  Positive linear anomaly - possible ditch-like feature
-  Linear anomaly - ridge and furrow
-  Positive linear anomaly - possible land drain
-  Positive linear anomaly - former field boundary
-  Discrete positive response - cut feature of archaeological potential
-  Discrete positive response - possible pit-like feature
-  Magnetic debris - spread of magnetically thermoremnant/ferrous material
-  Strong dipolar anomaly - ferrous object

SCALE 1:1250



SCALE TRUE AT A3

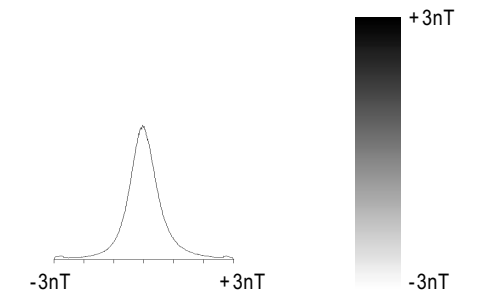
**Area 2**



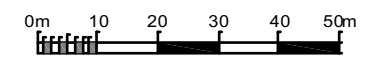
**Griffins Farm Quarry  
Stockton  
Warwickshire**

Area 3

**Greyscale plot of minimally  
processed magnetometer data -  
Area 3**









SCALE 1:1250



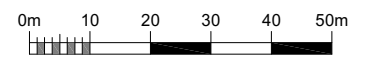
**Griffins Farm Quarry  
Stockton  
Warwickshire**

Area 3

**Abstraction and interpretation of  
magnetometer anomalies -  
Area 3**

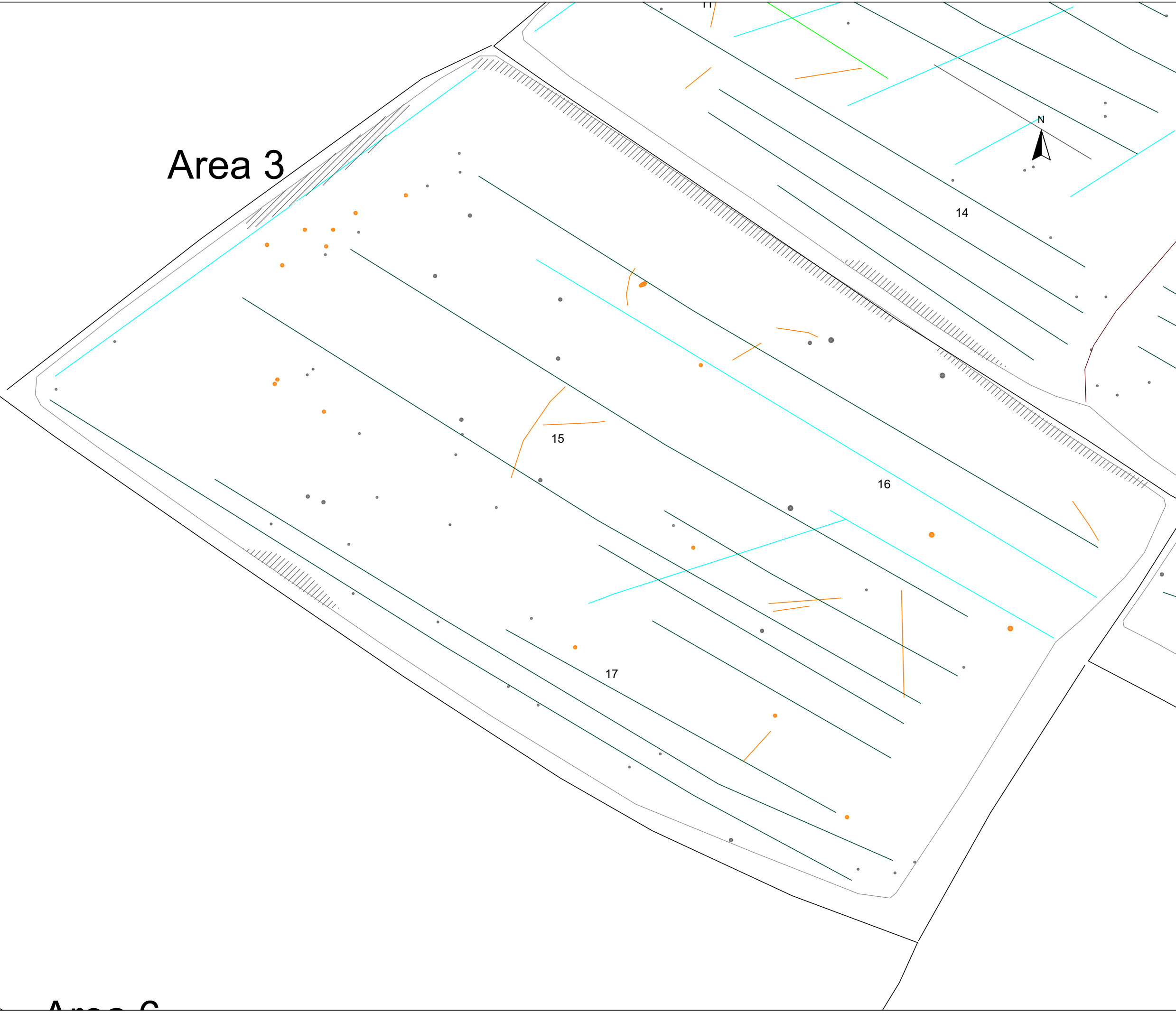
-  Positive linear anomaly - possible ditch-like feature
-  Linear anomaly - ridge and furrow
-  Positive linear anomaly - possible land drain
-  Discrete positive response - possible pit-like feature
-  Magnetic disturbance from ferrous material
-  Strong dipolar anomaly - ferrous object

SCALE 1:1250



SCALE TRUE AT A3

FIG 10



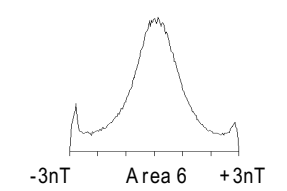
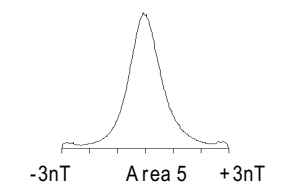
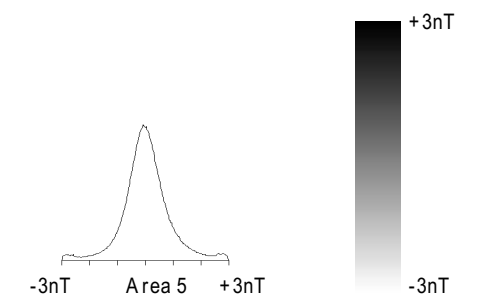
**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Greyscale plot of minimally  
processed magnetometer data -  
Areas 5 & 6**

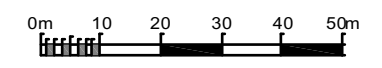


Area 5

Area 6












SCALE 1:1250

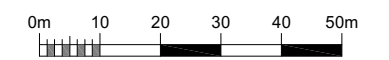


**Griffins Farm Quarry  
Stockton  
Warwickshire**

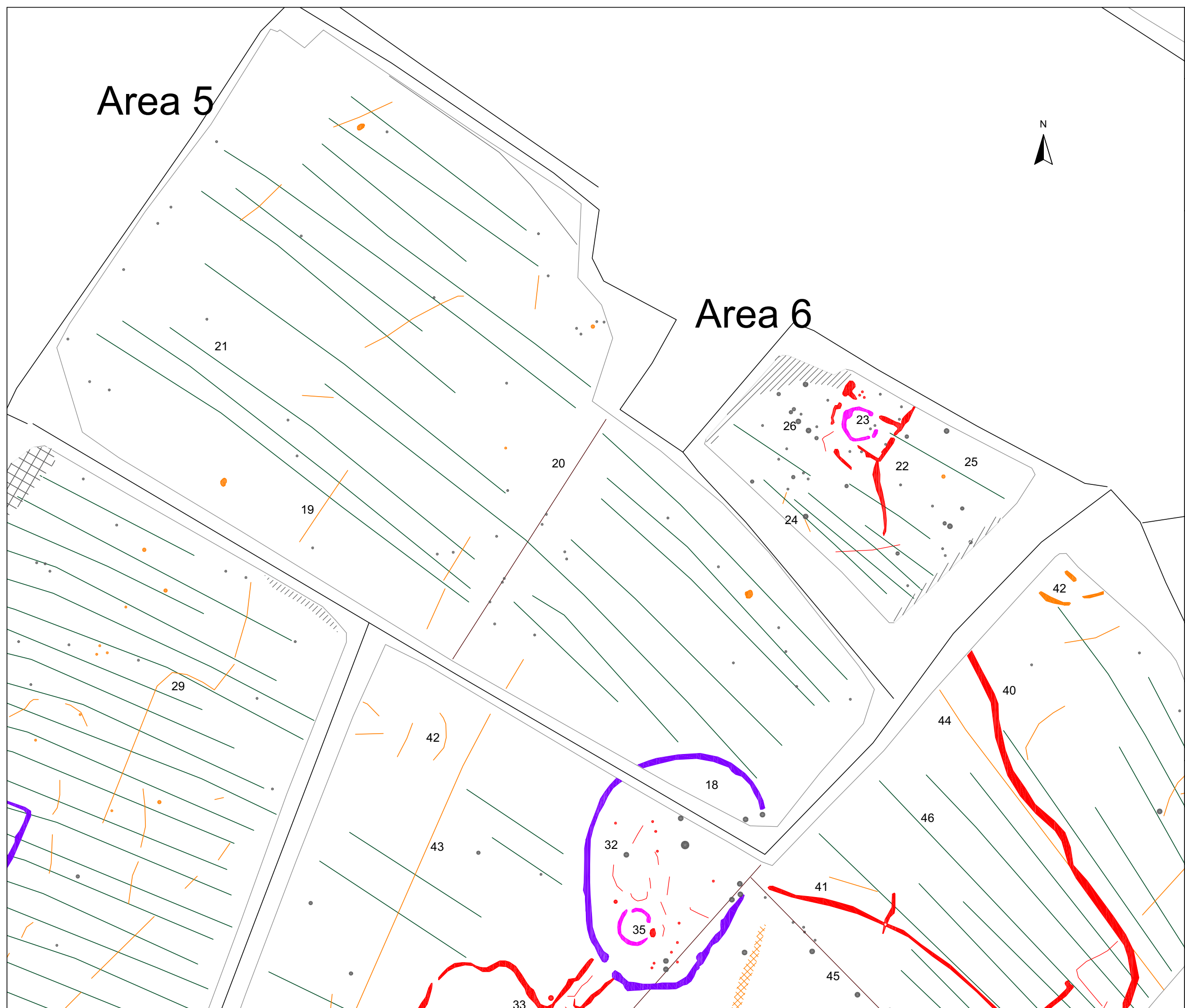
**Abstraction and interpretation of  
magnetometer anomalies -  
Areas 5 & 6**

-  Positive linear anomaly - cut feature of archaeological potential
-  Positive curvilinear anomaly - ring ditch
-  Positive linear anomaly - possible ditch-like feature
-  Linear anomaly - ridge and furrow
-  Positive linear anomaly - former field boundary
-  Discrete positive response - cut feature of archaeological potential
-  Discrete positive response - possible pit-like feature
-  Magnetic disturbance from ferrous material
-  Strong dipolar anomaly - ferrous object

SCALE 1:1250



SCALE TRUE AT A3



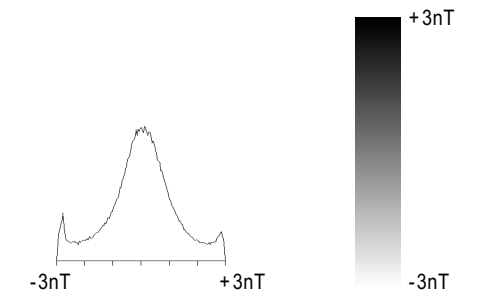
Area 5

Area 6

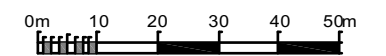
FIG 12

**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Greyscale plot of minimally  
processed magnetometer data -  
Area 7**



SCALE 1:1250














Area 9



**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Abstraction and interpretation of  
magnetometer anomalies -  
Area 7**

-  Positive linear anomaly - cut feature of archaeological potential
-  Positive rectilinear anomaly - enclosure ditch
-  Positive curvilinear anomaly - ring ditch
-  Positive linear anomaly - possible ditch-like feature
-  Linear anomaly - ridge and furrow
-  Discrete positive response - cut feature of archaeological potential
-  Discrete positive response - possible pit-like feature
-  Magnetic debris - spread of magnetically thermoremanent/ferrous material
-  Magnetic disturbance from ferrous material
-  Strong multiple dipolar linear anomaly - pipeline / cable / service
-  Strong dipolar anomaly - ferrous object

SCALE 1:1250



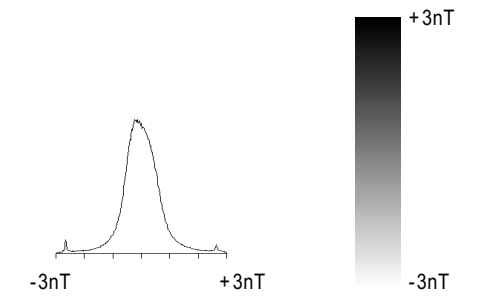
SCALE TRUE AT A3

Area 7

Area 9

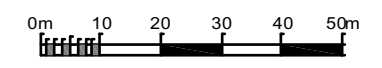
**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Greyscale plot of minimally  
processed magnetometer data -  
Area 8**












**Area 8**

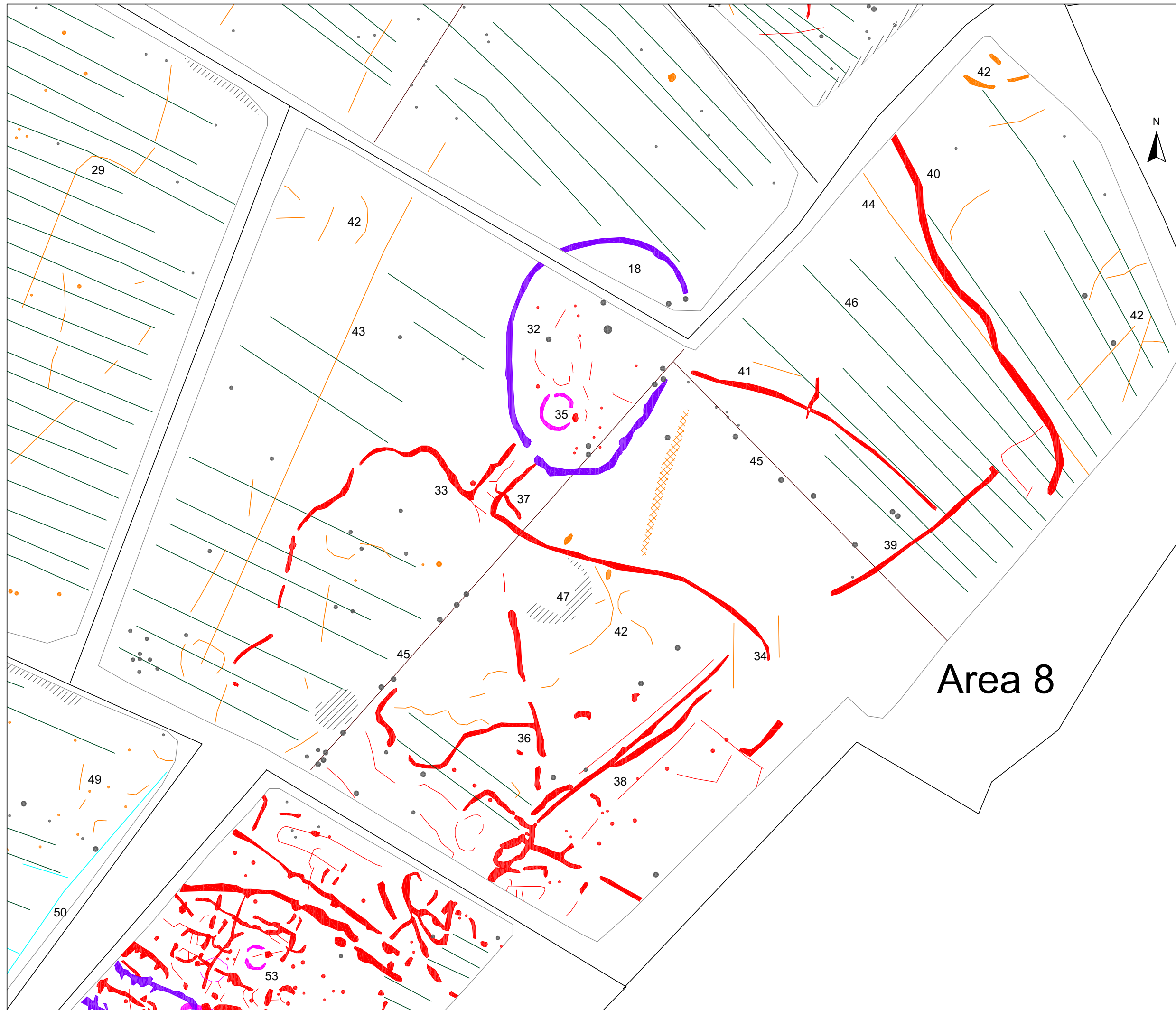
**SCALE 1:1250**



**Griffins Farm Quarry  
Stockton  
Warwickshire**

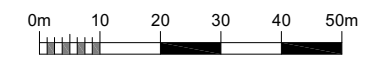
**Abstraction and interpretation of  
magnetometer anomalies -  
Area 8**

-  Positive linear anomaly - cut feature of archaeological potential
-  Positive curvilinear anomaly - enclosure ditch
-  Positive curvilinear anomaly - ring ditch
-  Positive linear anomaly - possible ditch-like feature
-  Linear anomaly - ridge and furrow
-  Discrete positive response - cut feature of archaeological potential
-  Discrete positive response - possible pit-like feature
-  Magnetic disturbance from ferrous material
-  Strong dipolar anomaly - ferrous object



Area 8

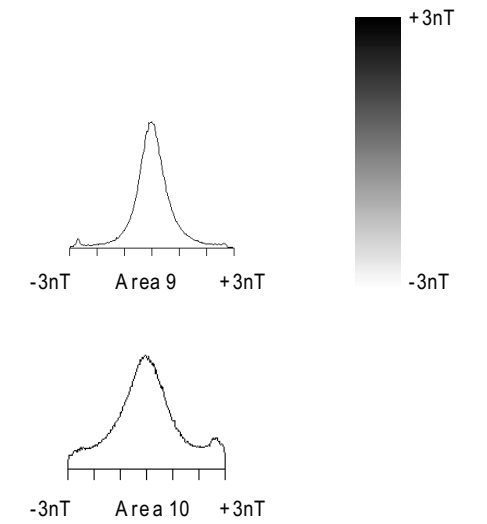
SCALE 1:1250



SCALE TRUE AT A3

**Griffins Farm Quarry  
Stockton  
Warwickshire**

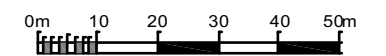
**Greyscale plot of minimally  
processed magnetometer data -  
Areas 9 & 10**



Area 9







Area 10

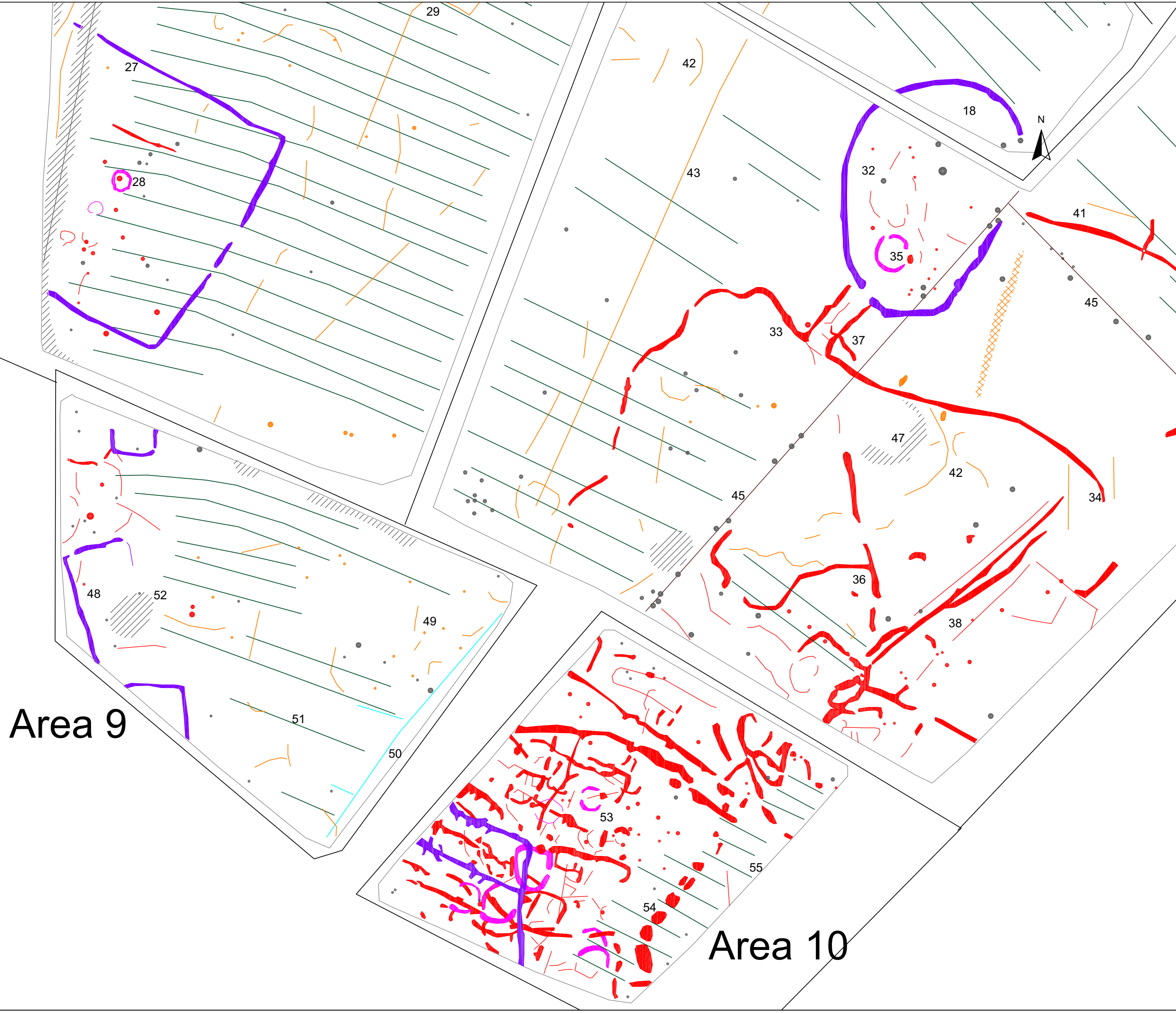
SCALE 1:1250



**Griffins Farm Quarry  
Stockton  
Warwickshire**

**Abstraction and interpretation of  
magnetometer anomalies -  
Areas 9 & 10**

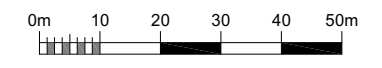
-  Positive linear anomaly - cut feature of archaeological potential
-  Positive rectilinear anomaly - enclosure ditch
-  Positive curvilinear anomaly - ring ditch
-  Linear anomaly - ridge and furrow
-  Discrete positive response - cut feature of archaeological potential
-  Strong dipolar anomaly - ferrous object



Area 9

Area 10

SCALE 1:1250



SCALE TRUE AT A3