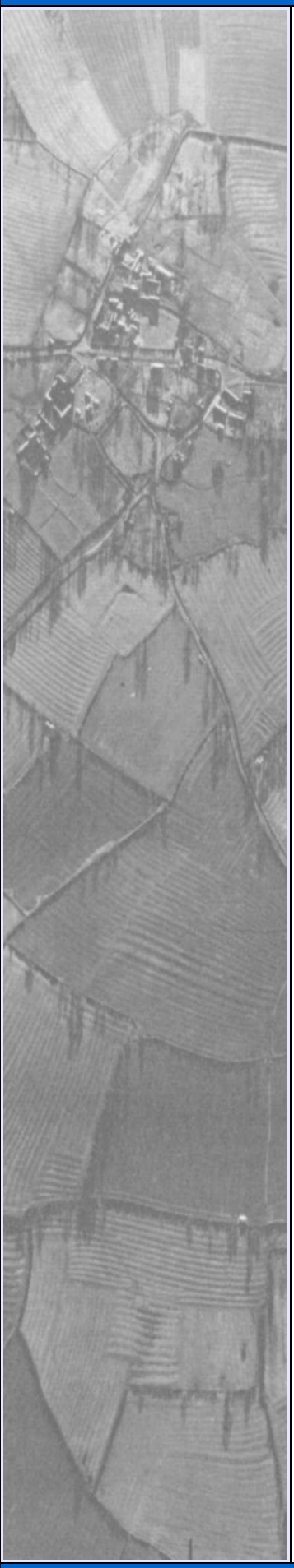

Englands Sports Field
Poulton
Cirencester

MAGNETOMETER SURVEY REPORT

for

The Trustees, Poulton Playing Field and Allotment Charity

David Sabin and Kerry Donaldson

February 2013

Ref. no.457

ARCHAEOLOGICAL SURVEYS LTD

Englands Sports Field, Poulton, Cirencester, Gloucestershire

Magnetometer Survey Report

for

The Trustees, Poulton Playing Field and Allotment Charity

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

Survey date – 5th February 2013
Ordnance Survey Grid Reference – **SP 09655 00628**

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SUMMARY

A detailed magnetometer survey was carried out by Archaeological Surveys Ltd at the request of the Trustees of Poulton Playing Field and Allotment Charity ahead of a potential extension to the Englands Sports Field in Poulton, near Cirencester, Gloucestershire. The sports field is known to contain a Romano-British settlement with enclosures, pottery scatters and the remains of at least four buildings. The survey was commissioned to locate features that may extend westwards into the proposed sports field extension. The results of the survey indicate that the northern part of the site contains a number of positive linear and rectilinear anomalies that are likely to directly relate to the settlement site. The central part of the survey area has been subject to former quarrying which is not recorded on Ordnance Survey mapping and may be of some antiquity, possibly associated with the Roman site immediately to the east. However, it is possible that the ground disturbance associated with the quarry is more recent and has removed or truncated any archaeological features that may have existed within the central part of the site.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by the Trustees of Poulton Playing Field and Allotment Charity to undertake a magnetometer survey of an area of land next to Englands Sports Field in Poulton near Cirencester. The site has been outlined for the proposed extension of the sports field.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2013) and approved by Charles Parry, Senior Archaeological Officer, Gloucestershire County Council.

1.2 Survey objectives and techniques

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

1.2.2 The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation;* and Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations*. The work has been carried out to the Institute for Archaeologists (2011) *Standard and Guidance for Archaeological Geophysical Survey.*

1.3 Site location, description and survey conditions

1.3.1 The site is located immediately south west of Poulton, 6km east of Cirencester in Gloucestershire. It is centred on Ordnance Survey National Grid Reference (OS NGR) SP 09655 00628, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 1.9ha and comprises the northern corner of an arable field that lies immediately west of the current sports field. As there was no boundary or outline defining a southern edge to the site, the survey area was set out north to south and a small area to the south west of, and outside the proposed sports field, was also surveyed.

Plate 1: Survey area looking towards the south west

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Parts of the site were boggy and waterlogged resulting in difficult traversing although much of the central part of the site was stoney and more easily crossed. Weather conditions during the survey were generally fine.

1.4 Site history and archaeological potential

1.4.1 The survey area is surrounded by a number of archaeological sites listed on the Gloucestershire Sites and Monuments Record (SMR). This includes rectilinear enclosures and linear cropmarks of a Romano-British settlement (SMR 2017) that may extend into the eastern part of the survey area. Occupation debris and the remains of three or four possible Romano-British buildings have been recorded immediately to the east. Ring ditches relating to Bronze Age round barrows (SMR 3291, SMR 3089, SMR 34201) have also

been located just to the east and south of the survey area and a possible Bronze Age field system (SMR 34224) extends to the west and south of the site.

1.4.2 The widespread evidence for archaeological features within the immediate vicinity may indicate a high potential to locate geophysical anomalies that may relate to further archaeological features within the survey area.

1.4.3 Surface observations during the course of the survey indicated a very light scattering of Romano-British pottery sherds increasingly slightly towards the eastern side of the site. Occasional slag and burnt stone was also noted in the eastern part of the field. Also observed was the frequent occurrence of well preserved bivalve fossils along the southern part of the site with some examples >0.15m in length.

1.5 Geology and soils

1.5.1 The underlying solid geology across the site is Cornbrash (BGS, 2013).

1.5.2 The overlying soil across the survey area is from the Evesham 1 association, which are slowly permeable, calcareous clayey soils associated with shallow, well drained brashy calcareous soils over limestone (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry survey carried out across similar soils has produced good results. The underlying geology and soils are therefore considered acceptable for magnetic survey, although naturally formed pit-like features can be difficult to distinguish from those with an anthropogenic origin.

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

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

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

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

2.2.5 The Bartington gradiometer undergoes regular servicing and calibration by the manufacturer. A current assessment of the instrument is shown in Table 1 below.

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

Table 1: Bartington fluxgate gradiometer sensor calibration results

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

2.2.6 Data were collected at 0.25m centres along traverses 1m apart. The survey area was separated into 40m by 40m grids (1600m²) giving 6400 measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 2008).

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

2.3 Data processing and presentation

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

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

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

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

2.3.3 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. A brief summary of each anomaly, with an appropriate reference number, is set out in list form within the results (Section 3) to allow a rapid and objective assessment of features within the survey area. Where further interpretation is possible, or where a number of possible origins should be considered, more subjective discussion is set out in Section 4.

2.3.4 The main form of data display prepared for this report is the greyscale plot. Both 'raw' and 'processed' data have been shown followed by an abstraction and interpretation plot. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.

2.3.5 Graphic raster images in bitmap format (.BMP) are initially prepared in ArcheoSurveyor. Regardless of survey orientation, data captured along each traverse are displayed and processed by ArcheoSurveyor from left to right; this corresponds to a direction of south to north in the field. Prior to displaying against base mapping, raster graphics require a rotation of 90° anticlockwise to restore north to the top of the image upon insertion into AutoCAD.

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

2.3.7 A digital archive is produced with this report, see Appendix D below. The main archive is held at the offices of Archaeological Surveys Ltd.

3 RESULTS

3.1 General assessment of survey results

3.1.1 The detailed magnetic survey was carried out within one survey area covering 1.9ha.

3.1.2 Magnetic anomalies located can be generally classified as positive linear and discrete positive responses of archaeological potential, positive anomalies of an uncertain origin,anomalies associated with ground disturbance, linear anomalies of an agricultural origin and strong discrete dipolar anomalies relating to ferrous objects.

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

3.2 Statement of data quality

3.2.1 Data are considered representative of the magnetic anomalies present within the site. No significant defects exist within the dataset. Some positional correction was carried out on data in the southern part of the site as a result of irregular pacing due to boggy ground.

3.2.2 Ferrous fencing materials have produced a zone of magnetic disturbance at the extreme northern end of the site. It is possible that anomalies have been obscured within this zone, though this is only likely to occur within 6-7m of the northern boundary.

3.3 Data interpretation

3.3.1 The list of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, a basic key is indicated to allow cross referencing to the abstraction and interpretation plot. CAD layer names are included to aid reference to associated digital files (.dwg/.dxf). Sub-headings are then used to group anomalies with similar characteristics for each survey area.

Report sub-heading CAD layer names and plot colour	**Description and origin of anomalies**
Anomalies with archaeological potential AS-ABST MAG POS LINEAR ARCHAEOLOGY AS-ABST MAG POS DISCRETE ARCHAEOLOGY	Anomalies have the characteristics (mainly morphological) of a range of archaeological features such as pits, ring ditches, enclosures, etc..
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil.
Anomalies with an agricultural origin AS-ABST MAG AGRICULTURAL	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.
Anomalies associated with magnetic debris AS-ABST MAG STRONG DIPOLAR	Strong discrete dipolar anomalies are responses to ferrous or other magnetically thermoremnant objects within the topsoil.
Anomalies associated with ground disturbance AS-ABST MAG GROUND DISTURBANCE	Variable responses that indicate ground disturbance or quarrying. This may be recent, historical or archaeological in origin.

Table 2: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 409655 200628, see Figures 04 & 05.

Anomalies of archaeological potential

(1 & 2) – A positive linear anomaly relates to a ditch that crosses the northern part of the survey area with a north west to south east orientation (1). It is stronger at the eastern end (20-40nT) than at the western end (3-6nT) which indicates that strongly magnetic material is incorporated within it at the eastern end. It is possible that the eastern end is directly associated with anomaly (2) forming an "L" shaped feature and that the western part of (1) is a later extension.

(3) – A positive linear anomaly that extends north eastwards from the western part of anomaly (1) for approximately 9m. The response is generally 6-10nT and there is some possibility that it is associated with anomaly (4).

(4) – Positive anomalies appear to form a rectilinear enclosure that may be associated with, or have been cut by, anomaly (1). The majority of the response is <2nT, indicating much lower levels of magnetic enhancement than adjacent anomalies.

(5) – Positive linear anomaly roughly parallel with anomaly (1) and may be associated with it.

(6) – Positive responses located between anomalies (1) and (2) are likely to be associated with them. They have a magnitude of up to 10nT which may indicate burnt material.

(7) – A range of positive linear anomalies which are likely to be associated with others of archaeological potential. The general response is often less than 1nT and they are often short or fragmented.

Anomalies with an uncertain origin

(8) – A positive linear anomaly extends across the western half of the southern part of the survey area. At its eastern end it becomes more complex with curvilinear, linear and discrete anomalies. The strength of the response is generally 2-3nT, and it appears to relate to a cut feature that defines the southern edge of the quarried area (16).

(9) – A positive linear anomaly extends north to south within the southern half of the survey area and appears to have a gap close to its southern end . It appears to be associated with the quarried area (16) with the northern edge either extending to it, or being incorporated within it, or perhaps truncated by it. The response is up to 6nT in magnitude, indicating a cut feature containing material with a moderate level of enhancement.

(10) – A very weakly positive linear anomaly (<1nT) located parallel with, and 11m east of (9).

(11) – A positive linear anomaly located to the west of anomaly (9). It is parallel with other linear anomalies of agricultural origin, and may have a similar origin. However, it has a stronger response (up to 3nT) and is broader than adjacent plough marks.

(12) – A discrete positive anomaly approximately 7m by 5m and having a response of 2-3nT. It is located immediately east of the gap within anomaly (9) and may indicate an infilled pit-like feature or depression. It is possible that it is associated with former quarrying activity. The southern half of the survey area contains a number of other pit-like anomalies that may also be associated with quarrying; however, an archaeological origin should not be ruled out.

(13) – A broad, weakly positive linear anomaly extends across the southern part of the survey area. It is parallel with, and located 10m south of, anomaly (8) and it appears to extend towards anomaly (9). The response is very low (<1nT) and it is possible that this may relate to a former earthwork. Often this type of response is associated with former ridge and furrow or strip cultivation.

(14) – The survey area contains several very weak, short linear and curvilinear responses that cannot be easily interpreted.

(15) – Positive linear anomalies located in the north western corner of the survey area may relate to cut features, although it is possible that they have been formed by agricultural activity.

Anomalies associated with ground disturbance

(16) – A large zone in the centre of the site containing magnetically variable responses. This part of the site has been subject to quarrying and covers an area of approximately 0.5ha. The positive response is generally 3-6nT indicating moderate levels of enhancement. This can be caused by increased depth of topsoil, although it may contain magnetically enhanced material of anthropogenic origin. It does not contain large amounts of ferrous or other magnetically thermoremnant material, indicating that this may have been infilled in antiquity. This quarry is not indicated as a feature on any Ordnance Survey mapping which may indicate an early date. It also appears not to extend northwards beyond anomaly (1), although it does not contain material that is as magnetically enhanced as the fill of anomaly (1), which may indicate that this was open at a different date to the infilling of the ditch. It is possible that it has truncated earlier features to the south of anomaly (1).

Anomalies with an agricultural origin

(17) – A series of parallel linear anomalies seen primarily in the south eastern part of the survey area and oriented north west to south east . A second series is parallel with the western field boundary and both relate to agricultural activity.

Anomalies associated with magnetic debris

(19) – Strong dipolar anomalies are responses to ferrous and other magnetically thermoremnant objects within the topsoil.

4 DISCUSSION

4.1.1 The northern part of the survey area contains a number of linear, rectilinear and discrete anomalies that are likely to be an extension of the Romano-British settlement immediately to the east. This settlement is recorded covering at least 3 acres (1.2ha) with Roman pottery scatters and building debris suggesting 3 or 4 small buildings with associated cropmark enclosures centred on SP09800060, 80m south east of the survey area. Anomaly (1) contains an increase in response at the eastern end (20-40nT) with a much lower response to the west. The decrease in magnitude indicates that the western end of the feature is likely to be more peripheral to the core of the settlement, and/or that potential industrial activity or intense burning is located close to the eastern end of the feature. There also appears to be several phases of activity within the survey area, with the potential for the western half of anomaly (1) to be a later extension and also weaker linear and rectilinear anomalies that may have been cut by anomaly (1).

4.1.2 The central part of the site contains evidence for former quarrying. This is not recorded on any Ordnance Survey mapping, which indicates that it may be pre 19th century. This zone does not appear to extend northwards into the area containing the archaeological features, although it is possible that the quarrying has removed or truncated earlier features. The southern part of the site contains a number of linear ditch-like features and discrete pit-like features that appear to be associated with the quarry, defining the southern and south eastern edges. It is possible that they are archaeological in origin, although without dating evidence it is difficult to be certain.

4.1.3 Site observations indicate that there is a large scatter of surface stone distributed over the area of quarrying and that the surface is fairly level which may also be an indication of some antiquity. Some of the stone is fire-reddened, particularly towards the eastern side of the survey area. Although impossible to confidently infer a date from the geophysics, quarrying frequently occurs within close vicinity to Roman sites for extraction of building stone and the production of lime mortar. The material used to backfill the quarry does not appear to contain many ferrous or magnetically thermoremnant fragments which may also support a pre-19th century date.

5 CONCLUSION

5.1.1 The results of the detailed magnetometer survey have revealed a number of linear and rectilinear anomalies in the northern part of the survey area. It is likely that these are a direct extension of the Romano-British site located immediately to the east within the current sports field (SMR 2017). There is some indication of several phases of construction of the cut features, with much higher levels of magnetic enhancement within the fill of those towards the eastern edge of the survey area. This may indicate burning or some form of industrial activity.

5.1.2 The central part of the site contains evidence for former quarrying covering an area of 0.5ha which is not recorded on any Ordnance Survey mapping. The magnetometry does not indicate the presence of modern material used for backfilling. Ditch-like anomalies can be seen to the south and south east of the quarried area, possibly defining the edges of it. It is possible that these ditch-like features have some archaeological potential, and that others have been removed by the quarrying in the central part of the site.

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Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremnant material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field upon cooling.

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

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

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

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength the magnetic field created by the buried feature. If no enhanced feature is present the field measured by both sensors will be similar and the difference close to zero.

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

Appendix B – data processing notes

Clipping

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. It has been found that clipping data to ranges between ±5nT and ±1nT often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

Zero Median/Mean Traverse

The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise slight differences between the set-up and stability of gradiometer sensors and can remove striping. The process can remove archaeological features that run along a traverse so data analysis is also carried out prior its application.

De-stagger

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

Deslope

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

Edge Match

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

FFT (Fast Fourier Transform) spectral filtering

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

Appendix C – survey and data information

Raw magnetometer data

COMPOSITE
Filename: J457-mag-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 05/02/2013
Assembled by: on 05/02/2013
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702

Dimensions
Composite Size (readings): 800 x 160
Survey Size (meters): 200 m x 160 m
Grid Size: 40 m x 40 m
X Interval: 0.25 m
Y Interval: 1 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 3.21
Mean: -0.75
Median: -0.54
Composite Area: 3.2 ha
Surveyed Area: 1.9047 ha

PROGRAM
Name: ArcheoSurveyor
Version: 2.5.19.3

Processed magnetometer data

COMPOSITE
Filename: J457-mag-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.36
Mean: -0.01
Median: -0.03
Composite Area: 3.2 ha
Surveyed Area: 1.9044 ha

PROGRAM
Name: ArcheoSurveyor
Version: 2.5.19.3
Processes: 8
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Mean Traverse: Grids: 11.xgd 14.xgd 12.xgd 13.xgd Threshold: 1 SDs
4 DeStripe Median Traverse: Grids: 01.xgd 02.xgd 03.xgd 17.xgd 04.xgd 05.xgd 06.xgd 16.xgd 07.xgd 08.xgd 09.xgd 15.xgd
5 Clip from -3.00 to 3.00 nT
6 De Stagger: Grids: 02.xgd Mode: Both By: -1 intervals
7 De Stagger: Grids: 11.xgd Mode: Both By: -1 intervals
8 Clip from -3.00 to 3.00 nT

Appendix D – digital archive

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

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

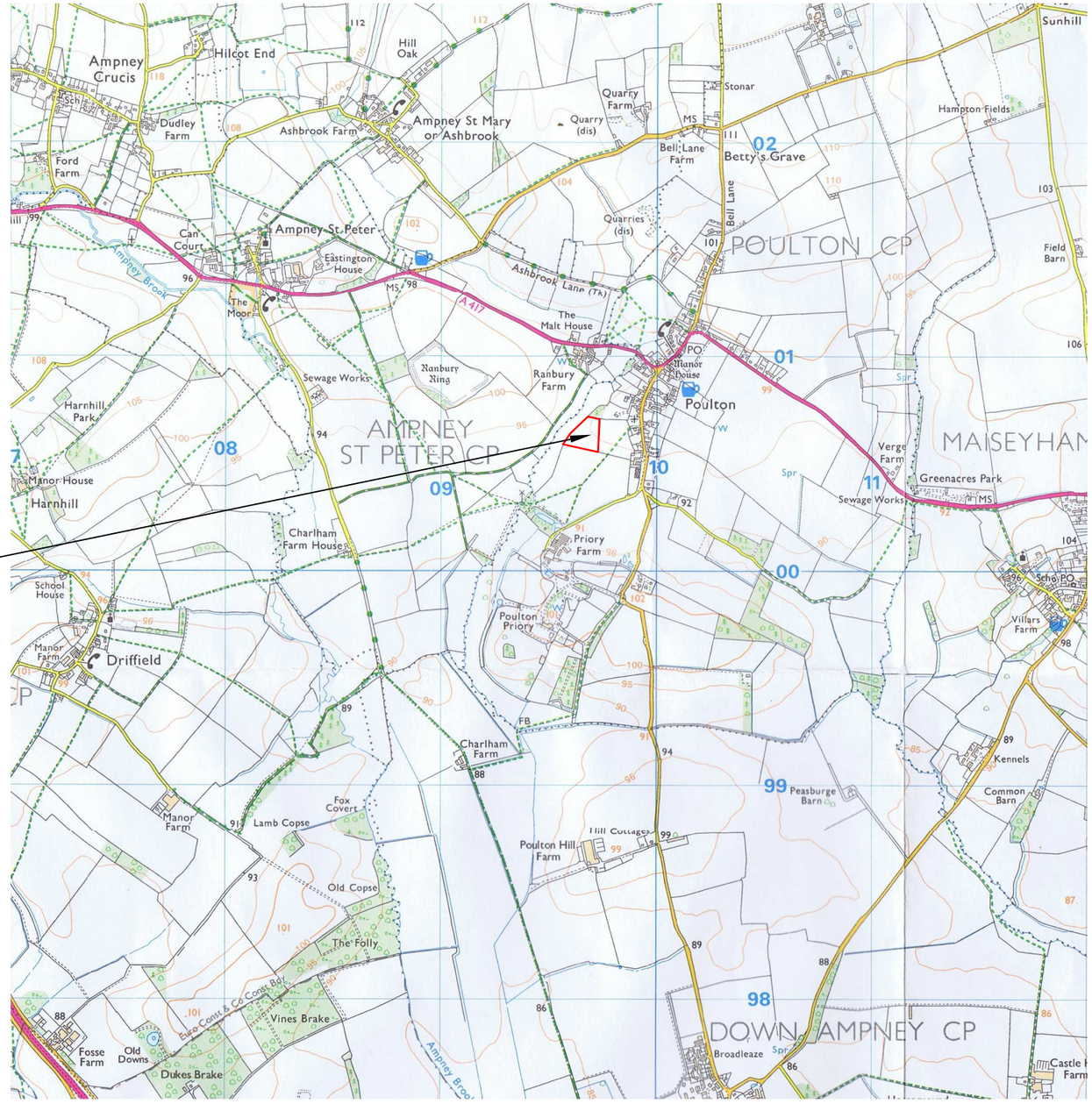
This report has been prepared using the following software on a Windows XP platform:

- ArcheoSurveyor version 2.5.19.3 (geophysical data analysis),
- ProgeCAD Professional 2009 (report graphics),
- AutoCAD LT 2007 (report figures),
- OpenOffice.org 3.0.1 Writer (document text),
- PDF Creator version 0.9 (PDF archive).

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

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

Survey location



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Poulton
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Map of survey area

Survey location

Site centred on OS NGR
SP 09655 00628

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01

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Referencing information

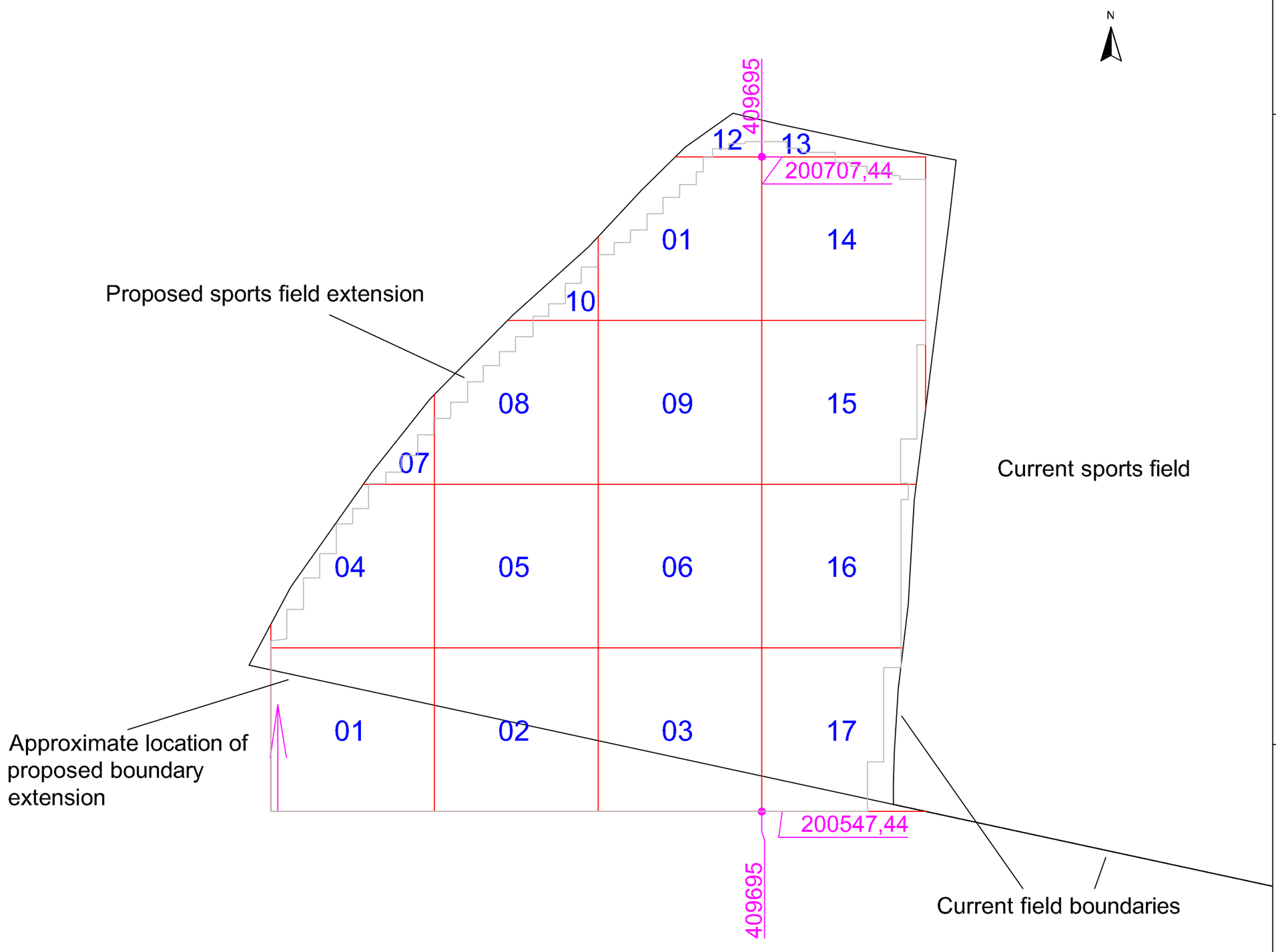
Grid coordinates based on Ordnance Survey OSGB36 datum

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

Survey grid size = 40m

Survey start and traverse direction

01 Grid reference number and filename



SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 02

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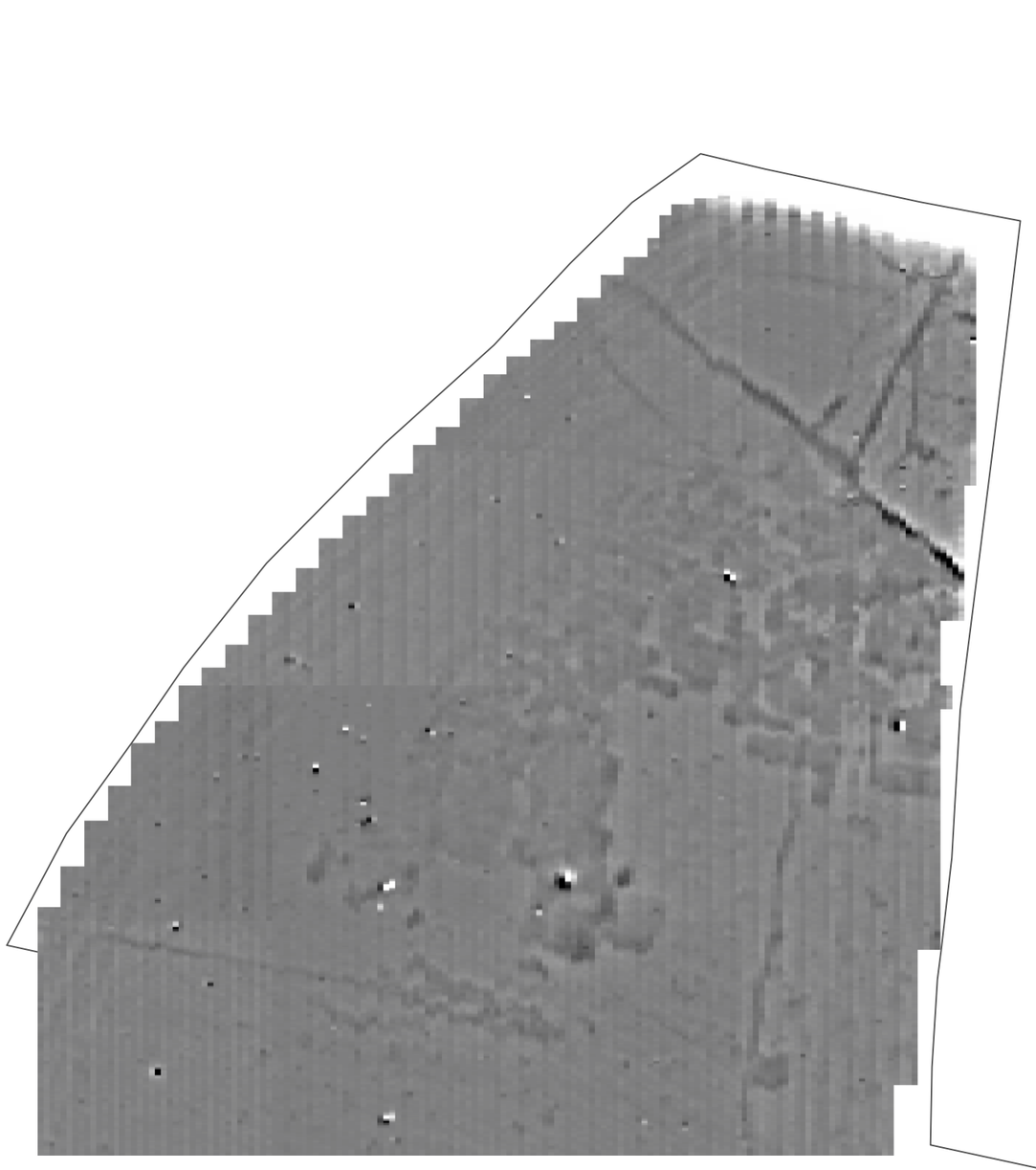
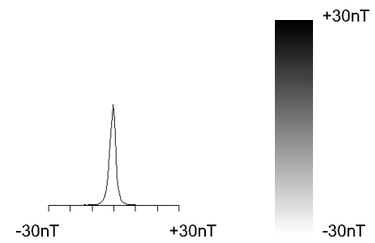
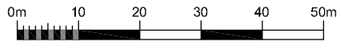


Greyscale plot of raw magnetometer data



SCALE 1:1000



SCALE TRUE AT A3

FIG 03

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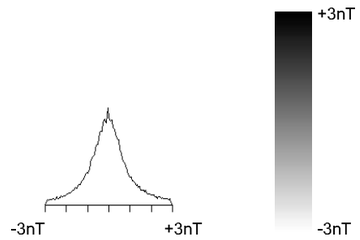
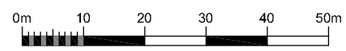
Greyscale plot of processed magnetometer data



SCALE 1:1000



SCALE TRUE AT A3

FIG 04

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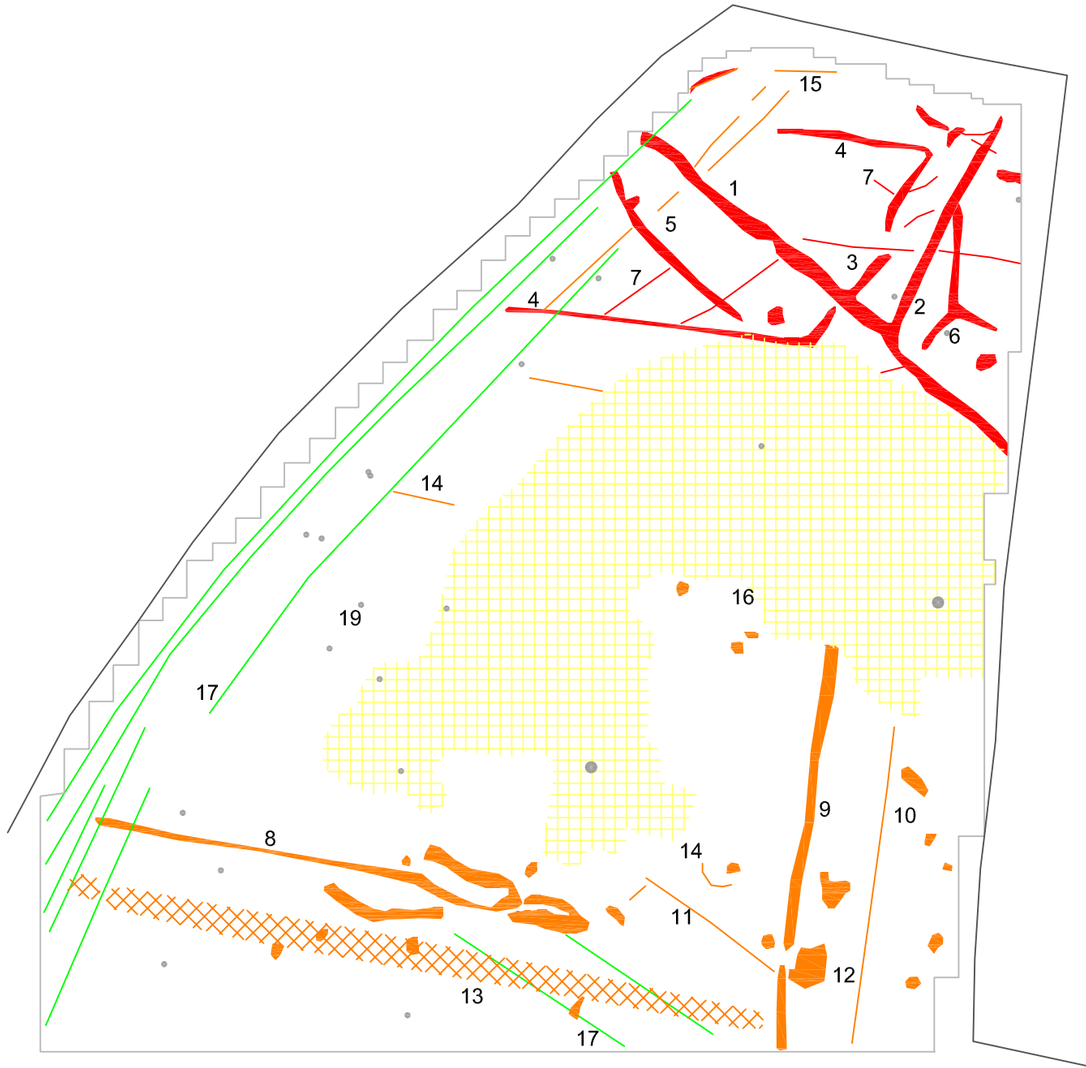
Abstraction and interpretation of magnetometer anomalies



- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Variable magnetic response - former quarrying/ground disturbance
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 05